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Cold Springs Project

Northern Hills Ranger District, Black Hills National Forest
Lawrence County, South Dakota



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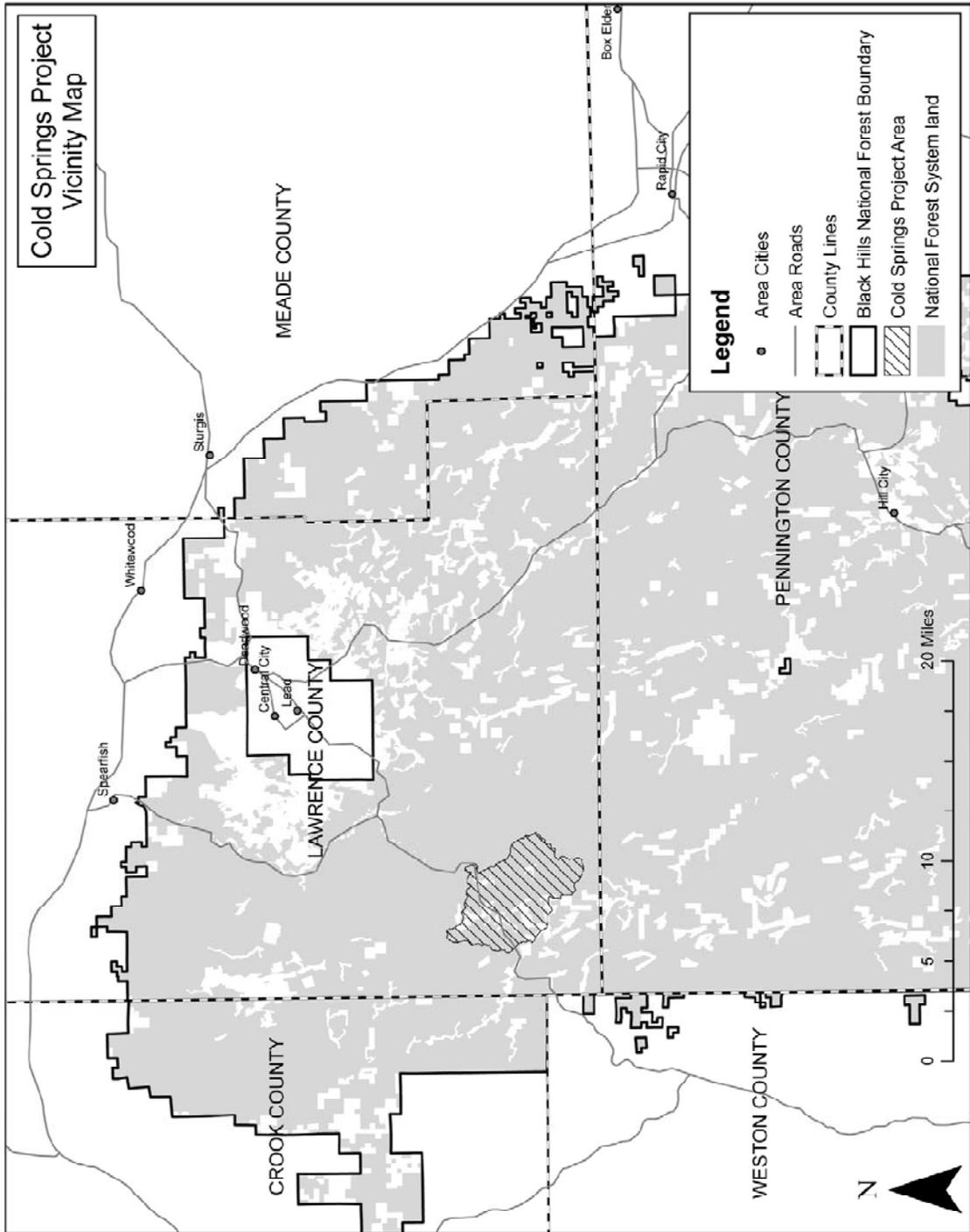


Figure 1. Cold Springs Project vicinity map

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Introduction

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the modified proposed action and no-action alternatives. The document is organized into the following parts:

- **Purpose and Need:** This section includes information on the history of the project, the purpose and need for the project, and the proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Alternatives, including the Modified Proposed Action:** This section provides a more detailed description of the agency's modified proposed action. This discussion also includes project design features developed to reduce impacts or insure project compliance with the Black Hills Forest Plan (forest plan) or laws and regulations. Finally, this section provides a summary table that compares the environmental consequences associated with the modified proposed action and no-action alternatives.
- **Environmental Consequences:** This section describes the environmental effects of implementing the modified proposed action and no-action alternatives. The effects of the no-action alternative provide a baseline for evaluating and comparing the modified proposed action.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the Cold Springs Project Environmental Assessment.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project record located at the Northern Hills Ranger District in Spearfish, South Dakota.

Background

The Cold Springs project area in the Black Hills National Forest encompasses approximately 12,300 acres of National Forest System lands and 1,700 acres of private lands on the southwestern corner of the Northern Hills Ranger District in the O'Neil Pass vicinity. The 12,300 acres of National Forest System lands include approximately 11,800 acres with forest cover. Ponderosa pine forest covers approximately 83 percent of the area.

Management Direction

The Black Hills National Forest Land and Resource Management Plan, usually called the “forest plan,” provides guidance for all resource management activities on the Black Hills National Forest. It provides overall forest management goals and objectives, standards and guidelines, and management area-specific goals, objectives, standards, and guidelines. The forest plan, as

amended, supported by the final environmental impact statement (FEIS) for the revision and the Phase II Amendment (USDA Forest Service 2005a, 2005b, 2006), is the Forest programmatic document required by the rules implementing the Forest and Rangeland Renewable Resources Act of 1974 as amended by the National Forest Management Act of 1976 .

Project area National Forest System lands include two forest plan management areas (MA): 4.1, Limited Motorized Use and Forest Products Emphasis; and 5.1, Resource Production Emphasis. Management area 4.1 is managed for non-motorized recreation, while providing for timber production, forage production, visual quality, and a diversity of wildlife. Management area 5.1 is managed for wood products, water yield, and forage production, while providing other commercial products, visual quality, diversity of wildlife, and a variety of goods and services.

Mountain Pine Beetles

Mountain pine beetles, *Dendroctonus ponderosae*, are infesting project area pine stands. The mountain pine beetle is the most aggressive and destructive insect affecting pines in western North America and ponderosa pine trees are a primary host (USDA Forest Service 2000, Allen 2010). The beetle is a native insect that is always present in pine forests. At endemic levels, beetles survive in stressed or weakened trees. When favorable conditions exist, populations can quickly increase to epidemic proportions. At such times, apparently, healthy pines are attacked and frequently killed. Food availability, in the form of thick phloem often found in large trees, is most directly associated with the development of beetle epidemics. Beetle populations can build and spread relatively quickly. During an epidemic, large group killing often occurs over a widespread area of mature and younger overstocked stands.

In general, the mountain pine beetle prefers stands of dense, large-diameter mature and overmature pine. Extensive areas of the preferred habitat are at greater risk of large-scale epidemic, given the presence of beetle population, than forested areas that include a mixture of age classes and tree species.

Stands with the highest risk for mountain pine beetle-caused losses are generally single-storied with most (75 percent) of the stems in the 7- to 13-inch diameter at breast height (d.b.h.) range and stocking above 120 square feet of basal area (Allen 2010). Stands with the lowest risk are multi-storied with an average diameter less than 6 inches and less than 80 square feet of basal area (USDA Forest Service 2000). Recent research indicates the lower the residual stocking, the greater the reduction in mountain pine beetle-caused mortality, in even- and uneven-aged stands (Schmid et al. 2007, Negron et al. 2008).

Healthy Forests Restoration Act

The Cold Springs Project has been developed under the authority of the Healthy Forests Restoration Act. The Black Hills National Forest Supervisor, with the assistance of Rocky Mountain Region Forest Health Management staff, has determined that epidemic insect conditions exist in the Cold Springs project area and vicinity (Bobzien 2010). Forest conditions in the project area are susceptible to mountain pine beetle infestation and corresponding mortality. Mountain pine beetle-caused mortality poses a threat to management area goals for wood-fiber production, timber products, and wildlife habitat. The Cold Springs Project qualifies for expedited vegetation management under Section 102(a)(4) of the Healthy Forests Restoration Act.

Purpose and Need for Action

The purpose of this project is to decrease the risk of mountain pine beetle infestation in ponderosa pine stands within an area managed for timber production and wood products. This action is needed, because mountain pine beetle infestation is increasing within the project area and vicinity. Aerial survey for mountain pine beetle-caused mortality in 2009 indicated approximately 30 areas with mountain pine beetle-caused mortality. Field surveys in the autumn of 2010 indicate mountain pine beetle-caused mortality is spreading and most project area pine stands have some level of infestation, with stands averaging 11 percent overstory mortality (Allen 2010). The increase in infested trees, compared to those killed in 2009, indicates a growing infestation. A large portion of the project area ponderosa pine stands are susceptible to mountain pine beetle-caused losses and have conditions favorable to support an epidemic. Approximately 48 percent of project area ponderosa pine stands have a high risk of mountain pine beetle infestation, and another 19 percent are at moderate risk (USDA Forest Service 2010b).

The forest plan includes direction to protect forest stands from insect and disease epidemics and minimize susceptibility to mountain pine beetle epidemics (USDA Forest Service 2006, p. II-46). Black Hills National Forest goals and objectives related to insects and disease:

- **Goal 10.** *Establish and maintain a mosaic of vegetation conditions to reduce occurrences of catastrophic fire, insect, and disease events, and facilitate insect and disease management and firefighting capability.*
- **Objective 10-07.** *Where outbreaks of mountain pine beetle could present risks to management objectives for ponderosa pine, reduce acreage of ponderosa-pine stands that are in medium or high risk for infestation.*

Forestwide standards and guidelines related to insects and disease:

- **Guideline 4201 a.** *Plan management activities with consideration for potential insect or disease outbreaks. Use integrated pest management strategies where insect or disease outbreaks may adversely affect management objectives. Utilize prevention vegetation management practices, including silvicultural treatments, to protect forest stands from insect and disease epidemics.*
- **Standard 4201 b.** *During scheduled management activities, minimize susceptibility to mountain pine beetle epidemics by reducing average basal area to 70 or less in pine stands, except where denser stands are needed to meet other management objectives.*
- **Standard 4201 c.** *Use the following insect-and-disease protection measures: Manage vegetation in and adjacent to high-use recreation areas to improve forest conditions, as needed to maintain or improve the desired recreation settings(s) or to conserve R2 sensitive or species of local concern and snails. In and adjacent to developed recreation sites actively treat insect and diseases to reduce pest populations.*
- **Standard 4201 d.** *Consider spatial array of stand conditions when planning harvests to reduce their potential for mountain pine beetle epidemics. For example, silvicultural treatments may be appropriate within or adjacent to dense mature stands.*
- **Guideline 4205.** *Consider applying preventive silvicultural treatments or other integrated pest management strategies to National Forest System land adjoining other land ownerships to reduce the likelihood of insect and disease epidemics and spread. Plan suppression strategies to reduce mountain pine beetle populations in pine stands during epidemics. Prioritize according to values, risk and management objectives. Priority should be given to areas in which values to be protected exceed the cost of protection.*

- **Guideline 4206.** *Project plans should consider existing infestations of insects or disease within a project area. Activities should be designed to minimize the risks of spreading the infestation while still providing habitat for those wildlife species dependent upon the presence of insects and disease.*

Modified Proposed Action

The modified proposed action includes vegetation treatments to reduce the risk of mountain pine beetle infestation, sanitation to reduce mountain pine beetle populations, road management activities associated with access for vegetation treatment and activity, and wildland fuel treatments. A variety of treatments and actions are proposed to reduce the risk of mountain pine beetle infestation in ponderosa pine stands. Treatments that reduce stocking and corresponding risk of attack are proposed across 4,904 acres. In addition to reduced stocking, proposed treatments would increase stand age class and species diversity, which reduces the amount of host material susceptible at any given time.

Fuel treatments are proposed to reduce natural fuels and activity-generated slash. Proposed fuel treatments across 1,670 acres would break up continuous fuel concentrations and reduce fire hazard.

Area roads would provide access for proposed vegetation management activities. Many of the roads needed for treatment access are already in place; however, some new National Forest System roads and temporary roads would be needed. Four miles of new system roads are proposed, approximately 8 miles of temporary road would be constructed, and 2 miles of non-system road would be converted to National Forest System road. Existing roads would require maintenance and reconstruction. Approximately 48 miles of road maintenance and reconstruction is proposed. All newly constructed roads and converted National Forest System roads would be closed to motorized vehicle traffic following completion of management activities. Reconstructed roads would remain a part of the National Forest System and their allowable use would be determined by the Black Hills National Forest Travel Management Plan. Road decommissioning would eliminate a 2-mile stretch of road located in a meadow bottom. A new system road, located on a forested, dry side-hill, would replace the existing road.

The proposed action identified during scoping was updated to incorporate changes in response to an issue identified during scoping and to correct minor errors or interdisciplinary team concerns. More information regarding the modified proposed action, along with the modifications, and rationale for the changes, are discussed in the “Alternatives Considered in Detail” section of this document.

Decision Framework

The responsible official will decide whether to implement the modified proposed action or take no action after reviewing this environmental assessment and supporting documents, and considering all public input on this project.

Public Involvement and Scoping

Scoping is the process of obtaining public comments about proposed Federal actions to determine the range of issues to be addressed. We solicited comments on the proposed action from members of the public, other public agencies, tribal governments, adjacent property owners, interest

groups, and Forest Service specialists. We used various methods to request comments, including the following:

- We mailed a scoping letter to over 220 interested parties, including property owners, tribal members, State and Federal agencies, and other organizations on January 18, 2011. This letter included a description of the project area, an overview of the planning process, a general explanation of the proposed actions, and an invitation to submit written comments.
- We submitted a news release to the local news media on January 19, 2011. This release introduced the project to the public by providing a description of the project area and an explanation of the proposal. The release also solicited written public comment on the project.
- The *Rapid City Journal* published a legal notice announcing the project on January 20, 2011.
- The Northern Hills Ranger District office held a public open house meeting on January 26, 2011. Nine interested parties attended the meeting and met with Forest Service officials to view project area maps and discuss the proposed actions. Attendees were encouraged to submit comments or document their concerns associated with the proposed actions.
- We posted the proposed action on the Forest's web page.
- We listed the project in the Black Hills National Forest, Northern Hills Ranger District Schedule of Proposed Actions in January 2011.

Fourteen parties provided written feedback during the formal comment period. Many of the comments included statements of support for the project, observations about the data used to develop the proposed action, observations and thoughts about management approaches used on the Black Hills National Forest, and interpretations of management direction contained in the Black Hills National Forest Land and Resource Management Plan: 1997 Revision—Phase II Amendment (i.e., forest plan). The interdisciplinary team assigned to this project reviewed the comments and identified seven distinct issues, which are discussed in the next section. All comments received during the formal comment period and a discussion of how the interdisciplinary team used the comments can be found in Appendix B.

Issues

Per Forest Service Handbook 1909.15, chapter 10, issues “serve to highlight effects or unintended consequences that may occur from the proposed action” and are “best identified during scoping early in the process to help set the scope of the actions, alternatives, and effects to consider” (USDA Forest Service 2010c, p. 26). The interdisciplinary team and district ranger identified the following issues during project scoping.

Issue 1—Habitat Fragmentation

Issue Statement from Comments: The proposed action could cause habitat fragmentation. Strategic habitat corridors and habitat connectivity should be maintained while treating to reduce the risk of mountain pine beetle infestation. Trees infested with mountain pine beetle continue to provide habitat for many species even after they die and fall. Allow for some areas within the project area where endemic levels of mountain pine beetle can remain.

Discussion: The proposed action was designed to implement forest plan direction regarding management of plant and wildlife habitat. Project-level measures to conserve wildlife and plant habitat are evidenced in the design criteria applicable to the project and the stand-level treatment determinations that comprise the proposed action. Habitat for wildlife and plants, including habitat corridors for the pine marten (a region 2 sensitive species), would be retained under the modified proposed action.

Even with implementation of the modified proposed action, endemic levels of mountain pine beetles would continue to persist in the project area; mountain pine beetles would not be eradicated. Pine stands within the project area have experienced approximately 11 percent mortality due to mountain pine beetles during the past 3 years. These dead trees would remain.

Issue Disposition: This issue was dismissed from further consideration. The modified proposed action includes habitat conservation measures and follows forest plan direction regarding habitat management. Project analysis includes an assessment of the effects of proposed activities on plant and wildlife habitat.

Issue 2—Efficacy of Thinning to Reduce Mountain Pine Beetle Risk

Issue Statement from Comments: The proposed action relies on thinning activities to reduce the risk of mountain pine beetle infestation in the project area. There is no conclusive science that supports the notion that thinning reduces mountain pine beetle risk.

Discussion: The Cold Springs Project tiers to the 1996 Revised Land and Resource Management Plan Final Environmental Impact Statement and the Black Hills National Forest Phase II Amendment: 1997 Land and Resource Management Plan Final Environmental Impact Statement. The analyses contained therein are grounded in science and conclude that management activities in ponderosa pine stands can affect the risk of attack by mountain pine beetle. Subsequent research that has taken place on the Black Hills National Forest indicates that partial cutting can minimize mountain pine beetle in ponderosa pine stands (Schmid, et al. 2007). Additional studies on the effectiveness of silviculture treatments are documented in *The Effectiveness of Vegetation Management Practices for Prevention and Control of Bark Beetle Infestations in Coniferous Forests of the Western and Southern United States* (Fettig et al. 2007).

The Cold Springs proposed action is intended to implement direction contained in the forest plan. Forest plan goal 10 states that “the susceptibility of vegetation to stand-replacing fire and outbreaks of insect and disease pests will be reduced through vegetation management practices that promote vigorous, productive, resilient and diverse ecosystems” (forest plan, p. I-35). Forest plan objective 10-07 states that in areas where outbreaks of mountain pine beetle could present risks to management objectives for ponderosa pine, resource managers should reduce the acreage of ponderosa-pine stands that have a medium or high risk of infestation.

Issue Disposition: This issue was dismissed from further consideration. The modified proposed action is based on forest plan direction and research. Project analysis includes an assessment of the effects of proposed activities on the risk of mountain pine beetle infestation within the project area. Furthermore, the analysis makes use of the best available science.

Issue 3—Effects of the Road System

Issue Statement from Comments: The proposed action contains too much road work (e.g., construction, conversion, reconstruction, and pre-use maintenance). There are too many roads in

the project area, and road use can lead to road damage, damage to riparian areas, the spread of noxious weeds, and soil erosion.

Discussion: The road management activities in the modified proposed action are necessary to provide harvest access and to reduce or minimize resource damage. The use of roads for management activities is consistent with the goals and objectives outlined in the forest plan for management areas 4.1 and 5.1. The majority of the road work proposed is the reconstruction or maintenance of existing roads (48 miles). These activities would improve or reestablish drainage to reduce erosion. A transportation engineer and hydrologist have been involved in project development to assure roads are properly located, constructed, and maintained. The Cold Springs proposed action includes road decommissioning. A road currently located in a draw bottom would be relocated and moved out of the bottom to reduce road-related impacts.

Issue Disposition: The project interdisciplinary team considered an alternative that did not include any of the road-related actions identified in the proposed action. See the “Alternatives Considered but Eliminated from Detailed Study” section for further discussion.

Issue 4—Reducing Mountain Pine Beetle Risk

Issue Statement from Comments: The scoping brochure indicates that the purpose of the Cold Springs Project is to decrease the risk of mountain pine beetle infestation in ponderosa pine stands within an area managed for timber production and wood products. The proposed action leaves a number of ponderosa pine stands untreated. The risk of infestation in these stands will not be reduced. Minimizing mountain pine beetle-caused mortality should be the primary objective in all stands. Stands lost to mountain pine beetle will not contribute to any management objective.

Discussion: Based on this issue, the interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation.

Issue Disposition: This issue was used to modify the proposed action. Discussion of the modifications is included in the “Alternatives” section.

Issue 5—Optimal Stocking Levels

Issue Statement from Comments: The proposed action will not maximize mountain pine beetle infestation risk reduction because it does not reduce residual stocking levels to 40 to 60 square feet of basal area. Stand stocking should be reduced to a residual stocking level of 40 to 60 square feet of basal area to provide maximum reduced risk of mountain pine beetle-caused losses.

Discussion: Stand stocking at 40 to 60 square feet of basal area would result in the establishment of pine regeneration. Residual trees in this particular area would likely be subject to windthrow and breakage, and the stands would have considerably low stocking levels. Proposed treatments to 70 square feet of basal area (or less) would leave the stands stocked to provide suitable growing space for a healthy stand. The project area includes lands managed for forest wood-fiber production, and there will be periodic entries for timber harvest that can maintain stands stocked at levels suitable to maintain reduced risk of beetle infestation.

The desired condition for long-term forest health includes a diversity of age classes across the project area. Thinning to low stocking levels across the landscape, compounded by the potential

for breakage and windthrow, would result in the establishment of pine regeneration across 31 percent of the project area, which is not desired.

Issue Disposition: The project interdisciplinary team considered an alternative that reduced stocking levels to 40 to 60 square feet of basal area. See the “Alternatives Considered but Eliminated from Detailed Study” section for further discussion.

Issue 6—Project Area Boundary

Issue Statement from Comments: Suitable habitat for mountain pine beetles and areas currently infested with mountain pine beetle exist just outside the project area to the south on the Hell Canyon Ranger District and to the north of State Highway 85. These areas are in need of treatment to reduce mountain pine beetle populations and to reduce the risk of additional infestation. The project area boundary should be expanded to include these areas.

Discussion: The need for treatment in these areas is not disputed. However, expanding the project area boundary would require time for additional field work. In addition, it is likely that expanding the scope of the project in this way would require the interdisciplinary team to begin the NEPA planning process again. These activities would delay project implementation. Since mountain pine beetles reproduce and spread to new areas on an annual basis, it is important to keep the project on its current timeline so that implementation is not delayed.

Issue Disposition: The project interdisciplinary team considered an alternative that increased the size of the project area. See the “Alternatives Considered but Eliminated from Detailed Study” section for further discussion.

Issue 7—Reestablishing Ponderosa Pine Stands

Issue Statement from Comments: Seral ponderosa pine stands are in transition to spruce. There is abundant spruce regeneration within the understory of mature pines. Mountain pine beetles are now killing a large percentage of the remaining pine in these stands and converting them to spruce. Allowing pine stands to convert to spruce does not follow forest plan objective 200-01. To address this issue, all commercial-sized white spruce should be cut, masticated, and then burned to kill the submerchantable spruce. These treatments would reestablish pine as the dominant species.

Discussion: The forest plan does not contain an objective numbered 200-01. An objective numbered 200-01 was included in the Phase II FEIS prepared in support of the forest plan (USDA Forest Service 2005a). This objective was adopted in the forest plan and numbered objective 239-LVD. This objective indicates that land managers on the Forest should manage for 20,000 acres of spruce across the Forest using active management to achieve multiple-use objectives.

As the discussion in the Phase II FEIS indicates, the objective is intended to favor hardwoods where spruce is encroaching upon hardwoods, but to favor spruce where spruce is encroaching into pine stands, “especially where it improves connectivity between spruce stands” (USDA Forest Service 2005a, p. III-25). In working to maintain at least 20,000 acres of spruce across the Forest, the Phase II FEIS recognized that there would be losses in spruce where hardwood conversion occurred or where spruce was removed to reduce fire hazard in close proximity to structures; however, that loss was expected to be balanced by gains due to succession in other areas (USDA Forest Service 2005a, p. III-27).

Stands that are white spruce, or mixed spruce and pine, have value for wildlife habitat and add to vegetative diversity in the project area. Treatments in selected seral ponderosa pine and white spruce stands were deferred to retain habitat for wildlife and plants.

The project purpose and need is to decrease the risk of mountain pine beetle infestation in ponderosa pine stands within an area managed for timber production and wood products. Reestablishing pine as the dominant species in seral stands is not related to the purpose and need for the project and is not consistent with the intent of objective 239-LVD.

Issue Disposition: The project interdisciplinary team considered an alternative to the proposed action that converts seral pine stands back to pine-dominated forest. See the “Alternatives Considered but Eliminated from Detailed Study” section for further discussion.

Alternatives

This section provides a detailed description of the no-action alternative (alternative A) and the modified proposed action (alternative B). This section also presents the alternatives in comparative form, providing a clear basis for choice among options by the decision maker and the public. Alternatives considered by the interdisciplinary team and the decision maker but eliminated from detailed study are also discussed.

All figures are approximate and may vary due to irregular stand structure, small inclusions of inoperable ground, application of design criteria, or other factors. Actual figures may increase or decrease during on-the-ground preparation of the project.

Alternatives Considered in Detail

Alternative A – No Action

Under the no-action alternative, none of the elements of the proposed action would take place in the Cold Springs project area. There would be no actions to respond to the purpose and need for action, or the issues brought forth during scoping. Vegetation management would not take place unless authorized by other decisions. Vegetation structure would change over time through natural growth, mortality, and events such as wildfires, storms, and insect outbreaks. The existing road network would persist until modified by future decisions. Activities authorized by previous decisions such as ongoing timber sales and post-sale projects would continue. Routine activities not tied to this project such as scheduled road maintenance, treatment of noxious weeds, livestock grazing, and fire suppression would also continue.

Alternative B – Modified Proposed Action

The proposed action identified during scoping was updated to incorporate changes in response to an issue identified during scoping and to correct minor errors or interdisciplinary team concerns.

The interdisciplinary team reviewed the project to assess the potential to include additional treatments to further reduce the risk of mountain pine beetle infestation. The team focused its review on ponderosa pine stands with medium or high risk of mountain pine beetle infestation for which no commercial treatment was identified in the proposed action. In summary, nearly 1,900 acres of ponderosa pine in the high or medium risk categories have less than 60 square feet of basal area of commercial pine. Applying a commercial treatment in these stands would not substantially reduce the risk of mountain pine beetle infestation and there is no need for change in

these stands. The project's sanitation harvest provision could be applied in the event that mountain pine beetles are detected within the stands. This accounts for nearly 75 percent of the pine acreage that has a medium or high insect risk rating and that was not proposed for commercial treatment in the initial proposed action.

The remaining 25 percent of the untreated pine was further reviewed. Nearly 15 percent of the acreage (approximately 350 acres) is steep or inoperable ground. About 4 percent of the acreage (approximately 112 acres) was not proposed for commercial treatment to comply with forest plan direction regarding goshawk nest management. Less than 1 percent (approximately 14 acres) was not proposed for commercial treatment because of the presence of habitat that might support region 2 sensitive plant species or because they are very small or isolated pine stands.

Six additional stands (approximately 121 acres) in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation were identified. Treating these stands would not require any new road construction. Because these treatments would further address the purpose and need identified for the project, they were incorporated into the project.

The sanitation harvest provision that was part of the proposed action was adjusted to apply to any stand within the project area rather than limiting the provision to stands with a pine cover type. This allows for the potential to remove additional infested trees if needed.

Minor modifications were made to correct errors in the proposed action. Initial field review showed the trees in one stand (071301-31) were paint marked, indicating they were in an existing timber sale. Further investigation indicated the stand was not part of any sale. The treatment identified for this stand was changed from precommercial thinning to commercial thinning followed by precommercial thinning.

An existing unclassified road could be decommissioned to reduce the potential for unauthorized access to National Forest System road 209.3DC, a system road proposed for decommissioning under the proposed action. The road is not currently part of the district transportation system. Decommissioning unclassified road U100072 has been incorporated into the project.

The modified proposed action includes vegetation treatments to reduce the risk of mountain pine beetle infestation, sanitation to reduce mountain pine beetle populations, road-management activities associated with access for vegetation treatment and activity, and wildland fuel treatments. A variety of treatments and actions are proposed to reduce the risk of mountain pine beetle infestation in ponderosa pine stands. Treatments that reduce stocking and corresponding risk of attack are proposed across 4,904 acres. In addition to reduced stocking, proposed treatments would increase stand age-class and species diversity, which reduces the amount of host material susceptible at any given time. Treatments are also proposed to decrease mountain pine beetle populations. Treatments are summarized in Table 1 and descriptions of the treatments follow. A list of treatment units is included Appendix A. Maps of the modified proposed action vegetation and fuel treatments are included in Appendix F.

Fuel treatments are proposed to reduce natural fuels and activity-generated slash. Proposed fuel treatments would break up continuous fuel concentrations and reduce fire hazard.

Table 1. Proposed vegetation and fuel treatments

Commercial Vegetation Treatments	Acres
Aspen Release	83
Commercial Thin	1,398
Commercial Thin, 50 percent canopy cover	25
Single-tree Selection	523
Single-tree Selection, 50 percent canopy cover	108
Shelterwood Preparation	531
Shelterwood Preparation, 50 percent canopy cover	107
Shelterwood Removal	357
Shelterwood Establishment	1,290
Total Commercial Treatment Area	4,424
Noncommercial Vegetation Treatments	Acres
Aspen Release	242
Aspen Release Following Commercial Treatment	247
Precommercial Thin	155
Precommercial Thin Following Commercial Treatment	1,060
Precommercial Thin & Aspen Release Following Commercial Treatment	107
Wildlife Timber Stand Improvement	83
Wildlife Timber Stand Improvement Following Commercial Treatment	34
Total Noncommercial Vegetation Treatment	1,928 ¹
Fuel Treatments	Acres
Broadcast Burn	240
Broadcast Burn Following Vegetation Treatment	657
Pile and Burn Following Vegetation Treatment	279
Slash, Pile and Burn Following Vegetation Treatment	494
Total Fuel Treatment Area	1,670 ²
Sanitation	
Sanitation/Salvage and Noncommercial Sanitation Within Commercial Treatment Units ³	4,424
Sanitation/Salvage and Noncommercial Sanitation, Outside Treatment Units ⁴	7,337

Area roads would provide access for proposed vegetation management activities. Many of the roads needed for treatment access are already in place; however some new National Forest System roads and temporary roads would be needed. Existing roads would require maintenance and reconstruction. All newly constructed roads and converted National Forest System roads would be closed to motorized vehicle traffic following completion of management activities. Reconstructed roads would remain a part of the National Forest System and their allowable use would be determined by the Black Hills National Forest Travel Management Plan (USDA Forest Service 2010a). Temporary roads would be needed to provide log-truck access to suitable landing

¹ Both commercial and noncommercial treatments are planned on 1,448 acres.

² Fuel treatments follow vegetation treatment on 1,430 acres.

³ The area of sanitation treatment would depend on the level of mountain pine beetle infestation; all treatment units (4,424 acres) have the potential for sanitation treatment.

⁴ The area of sanitation treatment would depend on the level of mountain pine beetle infestation; all forest stands (11,761 acres) have the potential for sanitation treatment.

areas where trees are processed into logs. Proposed road management activities are summarized in Table 2.

Table 2. Proposed road management activities

Transportation Actions	Miles
New National Forest System Road Construction	4.0
Non-system Road to System Road Conversion	2.4
Temporary Road Construction	7.8 ⁵
National Forest System Road Reconstruction/Pre-use Maintenance	48.1
Forest System Road Decommissioning	2.3
Total Miles of Transportation Activities	64.6

Vegetation Treatments

Sanitation and Salvage Harvest

Sanitation treatments are considered to be preventative and are most effective before an epidemic starts. Populations of mountain pine beetles would be reduced by harvesting or treating infested trees. Infested trees of sawtimber size (9 inches diameter breast height (d.b.h.) and larger) could be salvaged. Salvage harvest of sawtimber-sized trees is preferred; infested trees would be cut and logs removed from the forest and processed at a sawmill. Processing the infested logs prior to adult mountain pine beetle emergence would kill the beetles. Infested trees, both sawtimber and less than sawtimber size, could also be treated in-place: felled, limbed, and bucked to short lengths, and part of the bark would be scarified or removed to dry out the wood, making it unsuitable habitat for the beetles. Infested trees of sawtimber size would be treated in-place where it is not practical to use salvage harvest.

Sanitation and salvage treatments would occur within treatment units and throughout the project area at mountain pine beetle infestation locations. The most recent information available regarding beetle infestation (aerial survey, field reconnaissance) would be used to strategize and design sanitation and salvage treatments.

Prior to implementation, resource specialists would review areas of sanitation and salvage treatment outside of harvest units to determine whether any special design criteria are needed to protect forest resources and ensure the proposals comply with forest plan direction. No new system roads would be constructed to access sanitation and salvage units.

Commercial Thinning

The stocking of pine-dominated stands would be reduced by cutting commercial-sized trees and removing the logs from the site. The best-formed, insect- and disease-free dominant overstory trees would be retained. Commercial thinning would reduce the stocking and decrease susceptibility to mountain pine beetle infestation. Reducing stand densities to 60 to 80⁶ square

⁵ Temporary road miles are approximate; the actual miles of temporary road would depend on the timber purchaser's logging system.

⁶ Approximately 70 square feet of basal area would be about 90 12-inch-diameter trees on each acre, or 128 10-inch-diameter trees.

feet of basal area⁷ generally provides the best compromise between maximizing growth rates, minimizing mountain pine beetle risk, and allowing sufficient time between harvest entries (USDA Forest Service 2000).

Shelterwood Preparation

Shelterwood preparation would decrease the stocking of dense, mature pine sawtimber stands. The intent of the harvest is to prepare the stand for a future shelterwood establishment cut. The preparation cut would open the overstory and allow the residual trees to establish windfirmness and cone baring crowns prior to an establishment cut. The best-formed, insect- and disease-free dominant overstory trees would be retained. After treatment, stand densities would be 60 to 80 square feet of basal area, decreasing susceptibility to mountain pine beetle infestation.

Shelterwood Establishment

Shelterwood establishment cutting would initiate pine regeneration in mature stands. Stands would be cut to a relatively low stocking level (approximately 30 square feet of basal area⁸), leaving the best overstory trees to serve as a seed source for a new stand. The low-stocked overstory would be at low risk to mountain pine beetle-caused mortality, and the new stand of trees would promote diversity across the project area. Increasing the mix of age classes reduces the amount of susceptible host forest.

Shelterwood Removal

Shelterwood removal would remove most overstory pine trees in stands that have been fully regenerated in the past with a shelterwood establishment cut. After most large overstory trees are removed, the stand that remains would generally be well stocked (300 or more stems per acre) with 6- to 20-foot conifers. This treatment completes the transition to a young stand, increasing the mix of age classes, and reduces the amount of susceptible host forest.

Aspen Release

Aspen release would maintain or encourage aspen growth by removing conifer competition. Maintaining or expanding aspen is desirable to provide a diversity of habitat. Increased diversity across the project area reduces the amount of host material for mountain pine beetles. Aspen exists in stands where it's the predominant forest cover, and as a minor component of pine dominated stands. Where aspen is the predominant forest cover, all conifers would be removed. Where aspen occurs as a small group or inclusion within a pine stand, the conifers in close proximity to the aspen would be removed. Aspen release would be accomplished through commercial timber harvest and through post-sale, noncommercial cutting.

Single-tree Selection

Single-tree selection would decrease stocking in pine and mixed pine/spruce stands that have a multi-storied or uneven-aged structure. Trees would be cut in all diameter classes to achieve the desired stocking of approximately 70 square feet of basal area. Single-tree selection would maintain or promote an uneven-aged stand structure and diversity.

Additional measures would be taken to increase stand diversity where management is primarily for wildlife habitat. There would be an increased focus on retaining mature trees approximately

⁷ Basal area: the cross-sectional area of a stand of trees measured at breast height. The area is generally expressed in terms of square feet per acre.

⁸ Approximately 30 square feet of basal area would be about 21 16-inch-diameter trees on each acre.

18 inches d.b.h. and larger. Mature overstory trees would be retained in irregularly spaced clumps featuring interlocking crowns.

Precommercial Thinning

Precommercial thinning would decrease stocking in stands composed of small-diameter stems, generally less than 9 inches d.b.h. Approximately 150 to 250 stems per acre of the best formed trees would remain. Cut trees would be lopped and scattered on site, or piled and burned.

Wildlife Timber Stand Improvement

The understory of stands with management emphasis on wildlife habitat would be thinned to a variable density. Understory trees exhibiting the best vigor and form would be retained and released from competition. Inferior and cull noncommercial pine less than 6 inches d.b.h. would be cut and slashed.

Fuel Treatments

Broadcast Prescribed Burning

Forest stands and meadows would be burned with a low-intensity surface fire. The low-intensity burn would reduce natural and activity surface fuels, along with developing ladder fuels and conifer saplings. Broadcast burning of activity slash and natural fuels would enhance soil conditions by returning to the soil inorganic and organic chemicals found in the foliage and small woody material. Overstory tree mortality is not desired; however, some overstory trees may be killed due to the burn. Broadcast burns would require control lines, where forest litter is cleared down to mineral soil. Hand crews or small crawler tractors would construct control lines; or existing roads would serve as control lines.

Pile and Burn

Concentrations of surface and ladder fuels would be hand- or machine-piled and burned. This treatment would reduce and break up concentrations of activity and natural fuels. Piling and burning would also decrease fire hazard near structures.

Fuel Slashing

Small conifer trees in excess of those desired for a fully stocked stand and brush would be cut prior to piling and burning. This treatment would reduce ladder fuels.

Road Management Activities

New Road Construction

Three new roads, approximately 4 miles, are proposed to be constructed where no route has previously been developed. The new roads are needed to provide harvest access, and there is a long-term, reoccurring need for the roads. New roads would be constructed to Forest Service specifications and would adhere to forest plan standards and guidelines, region 2 watershed conservation practices, and project-specific design criteria.

Two new roads would be closed following the completion of management activities. The method of closure would be determined based on site conditions. The new road that replaces 209.3D would remain open to motorized vehicle use.

Non-system to System Road Conversion

Approximately 2 miles of existing non-system roads would be added to the forest road system. The routes proposed for conversion are unclassified, user-created routes or routes that were National Forest System roads, but have since been decommissioned. The road template already exists. The route would be added to the National Forest System and improved as necessary to meet Forest Service specifications. These roads would also adhere to forest plan standards and guidelines, region 2 watershed conservation practices, and project-specific design criteria. These routes would be closed to motorized vehicle use following management activities.

Reconstruction or Pre-use Maintenance of Existing Roads

Reconstruction or pre-use maintenance is proposed for approximately 48 miles of existing National Forest System roads that need improvement prior to proposed vegetation and fuel management activities. Reconstruction is more intensive than pre-use maintenance and could include surface rock placement, improvement of drainage structures, and realignment. Pre-use maintenance involves blading the road surface to provide a smooth running surface, establishing proper drainage, reestablishing the road shoulder, and removing brush.

Temporary Road Construction

Temporary roads would be constructed to provide harvest access. Temporary roads are essentially a path cleared to allow logging equipment access. The temporary roads would be blocked and revegetated following use.

Road Decommissioning

A National Forest System road (road 209.3D) and an unclassified road (U100072) located in the upper portion of Clayton Draw would be decommissioned, and a new road would be constructed to replace road 209.3D. Road 209.3D is located in the bottom of a meadow, and proper drainage is not possible. Use of the road for log hauling could result in unacceptable erosion. The replacement road would be located to the east, outside of the meadow and in a location where proper drainage can be maintained. The new location would also allow timber harvest landings to be located in forest stands, outside of meadows. Motorized vehicle use of road 209.3D, authorized by the Black Hills National Forest Travel Management Plan Record of Decision (USDA Forest Service 2010a), would not change.

Unclassified road U100072, which crosses National Forest System Road 209.3D, is not part of the forest transportation system and decommissioning would increase the effectiveness of road 209.3D decommissioning.

The existing roadbeds would be removed from the National Forest System and blocked to vehicle traffic, and vegetation would be reestablished. The intent of road decommissioning is to stop motorized vehicle traffic and return the roadbed to natural conditions to the extent practicable.

Harvest System and Implementation

Forest vegetation treatments would be accomplished primarily through commercial harvest and service contracts, including timber sale and stewardship contracts. Harvest operations would yield sawtimber and roundwood products. These products would contribute to Forest goals for wood products. Standard harvest operations in the Black Hills area include tree felling, removal, and processing with mechanized equipment. Harvested trees are usually transported from the stump to central landing areas adjacent to roads where they are limbed and processed into logs. Limbs and tops are usually piled for burning at the landing. Piled limbs and tops could also be hauled off site

if markets develop for biomass (chips). In some cases, limbs and tops could be lopped and scattered across the harvest unit. This is usually done where landing area is limited, or slash needs to be retained on site due to resource concerns.

Most areas proposed for harvest could be accessed with conventional wheeled or tracked logging equipment; however, five units (approximately 130 acres) would require skyline yarding. Skyline yarding involves transporting cut trees from the stump to a central landing by a suspended cable system.

Commercial-sized live trees fall into two classes: sawtimber and products other than sawtimber. Sawtimber-sized trees are 8 to 9 inches d.b.h. and greater; products other than sawtimber (POL) are trees 5 to 9 inches d.b.h. There is a ready market for sawtimber trees; however the market for POL is variable. Cutting trees in the 5- to 9-inch d.b.h. size class is important to reduce stocking to the desired level and decrease mountain pine beetle risk. The harvest of POL-sized trees could be accomplished through a variety of means, depending on market conditions: POL could be included in a timber sale contract and harvested along with the sawtimber trees; POL-sized trees could be offered for sale separate from the sawtimber; or POL could be cut and decked through a service contract.

Commercial harvest units are scheduled for sale in fiscal year 2013, and the timber sale would take up to 3 years to complete; the sale could be sold as early as October 2012. Depending on mountain pine beetle populations in the project area, the timeframe for sale, or harvest unit completion, could be shortened. Noncommercial vegetation treatments and fuel treatments would follow the commercial harvest. Sanitation treatments could be implemented soon after a project decision, and are expected to continue over the timeframe of the commercial timber sale.

A burn plan would be developed prior to any prescribed burning taking place on the ground. Forest resource specialists review the burn plan to ensure consistency with the forest plan and the line officer authorizes the plan. The plan identifies burn objectives, conditions under which a burn would be allowed, and methodologies for achieving the objectives of the burn.

Post-sale Activities

The Knutson-Vandenburg (KV) Act authorizes the Forest Service to collect money from timber sales for resource enhancement, protection, and improvement work in the timber sale area. Actions proposed as KV activities for the Cold Springs project area are listed below:

- Regeneration surveys 3rd and 5th year post-harvest: Surveys would be conducted following shelterwood removal and establishment treatments to verify stocking standards have been met.
- Vegetation monitoring: Post treatment vegetation data would be collected for use in monitoring and evaluation of activities. Standard stand exam protocol would be followed for complete condition evaluation. Vegetation monitoring could be implemented on any treatment type not covered by 3rd and 5th year post-harvest regeneration surveys.
- Site preparation: Site preparation involves mechanical scarification to expose mineral soil for ponderosa pine establishment. This treatment would be identified for implementation if regeneration surveys indicate inadequate stocking.
- Noxious weed treatment and monitoring: Noxious weeds will be monitored and sprayed (as necessary) following ground-disturbing activities pursuant to design measures identified for this project to control the establishment and spread of noxious weeds.

- Road closure: Two new roads and two non-system roads converted to system roads under the Cold Springs Project would be closed upon the completion of management activities. Closure methods would be determined at the time of closure depending on site conditions. Possible methods include locked gates, boulders, dirt berms, downed trees, fences, partial obliteration, and recontouring.

Alternatives Considered but Eliminated from Detailed Study

The project interdisciplinary team considered a wide range of alternatives. Following are brief descriptions of alternatives considered but eliminated from detailed analysis.

No Road Actions

One commentor requested an alternative with reduced road management activities.

The project interdisciplinary team considered an alternative that did not include any of the road-related actions identified in the proposed action. This alternative was dismissed from detailed analysis because the road management activities in the proposed action are necessary to provide harvest access for treatments to meet the purpose and need for the project and to reduce or minimize resource damage. The use of roads for management activities is consistent with the goals and objectives outlined in the forest plan for management areas 4.1 and 5.1.

Any impacts associated with road activities are likely to be minimal in intensity of effects. The few new roads included in the proposed action were located to minimize resource conflicts. The maintenance of existing roads would likely improve drainage conditions. All road work would comply with region 2 watershed conservation practices. These measures are intended to minimize resource damage. The analysis completed for this project includes an assessment of the effects of all road activities on riparian habitat, noxious weeds, and soils. It also describes the effects of no action.

Further Reduce Stocking Levels

One commentor requested an alternative that reduced stocking levels to 40 to 60 square feet of basal area to provide maximum reduced risk of mountain pine beetle-caused losses.

The project interdisciplinary team considered an alternative that reduced stocking levels to 40 to 60 square feet of basal area, but this reduction in stocking levels was not deemed necessary to meet the purpose and need of the project. Furthermore, such an alternative would not result in desired conditions. This alternative was dismissed from detailed analysis.

Proposed treatments to 70 square feet of basal area (or less) would leave the stands stocked to provide suitable growing space for a healthy stand. The project area includes lands managed for forest wood-fiber production, and there will be periodic entries for timber harvest that can maintain stands stocked at levels suitable to maintain reduced risk of beetle infestation.

Stand stocking at 40 to 60 square feet of basal area would result in the establishment of pine regeneration. Residual trees in this particular area would likely be subject to windthrow and breakage, and the stands would have considerably low stocking levels. Thinning to low stocking levels across the landscape, compounded by the potential for breakage and windthrow, would result in the establishment of pine regeneration across 31 percent of the project area, which is not desired. The desired condition for long-term forest health includes a diversity of age classes across the project area.

Expand the Project Boundary

One commentor requested an alternative that expanded the project boundary to include additional areas in need of treatment to reduce mountain pine beetle populations and to reduce the risk of additional infestation.

The project interdisciplinary team considered an alternative that increased the size of the project; however, this alternative was eliminated from detailed study because expanding the project area would cause unacceptable delay in project planning and implementation. The delay could allow mountain pine beetle populations to increase and spread to additional forest stands.

Reestablish Ponderosa Pine stands

Two commentors requested an alternative that reestablished pine as the dominant species in seral stands. One commentor stated that allowing pine stands to convert to spruce does not follow forest plan objective 200-01.

The project interdisciplinary team considered an alternative that converts seral pine stands back to pine-dominated forest, however, this alternative was eliminated from detailed study because conversion of mixed spruce/pine stands back to pine is outside the scope of the project and does not relate to the purpose and need for the project. The project purpose and need is to decrease the risk of mountain pine beetle infestation in ponderosa pine stands within an area managed for timber production and wood products.

The project area is and will continue to be dominated by ponderosa pine stands. Transition of some mixed spruce/pine stands to spruce-dominated stands may occur; however, the extent of this transition is expected to be limited. Furthermore, heterogeneity in stand structure and vegetation types across the project area contributes to the area's resilience to mountain pine beetle attack.

The forest plan does not contain an objective numbered 200-01. An objective numbered 200-01 was included in the Phase II FEIS prepared in support of the forest plan (USDA Forest Service 2005a). This objective was adopted in the forest plan and numbered objective 239-LVD. This objective indicates that land managers on the Forest should manage for 20,000 acres of spruce across the Forest using active management to achieve multiple-use objectives.

As the discussion in the Phase II FEIS indicates, the objective is intended to favor hardwoods where spruce is encroaching upon hardwoods but to favor spruce where spruce is encroaching into pine stands, "especially where it improves connectivity between spruce stands" (USDA Forest Service 2005a, p. III-25). In working to maintain at least 20,000 acres of spruce across the Forest, the Phase II FEIS recognized that there would be losses in spruce where hardwood conversion occurred or where spruce was removed to reduce fire hazard in close proximity to structures; however, that loss was expected to be balanced by gains due to succession in other areas (USDA Forest Service 2005a, p. III-27).

Project Design Criteria

Project design criteria are listed in Table 3. These criteria were developed to reduce or eliminate adverse impacts from project activities, and are incorporated as an integrated part of the modified proposed action. Project design criteria are based upon standard practices and operating procedures that have been employed and proven effective in similar circumstances and conditions. Forest Service Manual and Handbook direction, Regional Watershed Conservation Practices (WCPs, Forest Service Handbook 2509.25), forest plan standards and guidelines, South

Dakota Best Management Practices, and other management requirements apply to the proposed activities. Management requirements such as applicable forest plan standards are repeated here only if clarification is required.

Table 3. Project design criteria

Applies To:	Measure
All Activities	<p>Brush Disposal:</p> <ul style="list-style-type: none"> • Rehabilitation of slash pile sites would include site preparation and seeding to return the sites to productivity and control the spread of noxious weeds.
All Activities	<p>Heritage Resources:</p> <ul style="list-style-type: none"> • All culturally sensitive areas, Traditional Cultural Properties, graves, potential graves and sites eligible or considered unevaluated to the National Register of Historic Places should be avoided under proposed activities with a 100-foot buffer. Further mitigations, if defined, would be identified in the project file for each property and would be required for project implementation; any properties with mitigations not identified in this proposed action would need heritage review and State Historic Preservation Office concurrence before project implementation. Heritage site locations and specific mitigations are outlined in Section 106 of the National Historic Preservation Act (1966, as amended) compliance reports, on file at the Northern Hills Ranger District. Heritage site locations are not identified in this proposed action to protect sensitive site information according to Section 304 of the National Historic Preservation Act and Section 9 of the Archaeological Resources Protection Act (1979). • In the event that culturally sensitive areas, Traditional Cultural Properties, graves, potential graves and sites eligible or considered unevaluated to the National Register of Historic Places cannot be avoided, or new heritage resources are found during implementation of the project, all activity must stop and a member of the district heritage staff must be notified to determine an appropriate course of action. Appropriate consultation with the State Historic Preservation Office, Tribal Historic Preservation Offices, and other applicable parties would take place as directed by 36 CFR 800. • Leaders of project activities described in this proposed action will review the heritage report and geospatial data for areas to protect and consult with district heritage staff on specific mitigations. Project leaders should contact district heritage staff for additional assistance in marking the sites for protection on the ground.
All Activities	<p>Improvements:</p> <ul style="list-style-type: none"> • Avoid or protect improvements such as fences; water developments; land boundary corners, posts and bearing trees; utility infrastructure; mining claim corner posts and developments. These will be shown as protected improvements on timber sale area maps. • Avoid or protect improvements under special use permit. • All recreation trails would be shown as protected improvements on timber sale maps. Project administrators would ensure protection of trails during project implementation.
All Activities	<p>Meadows:</p> <ul style="list-style-type: none"> • White spruce will not be removed from wet meadows unless they are considered a safety hazard. • Surface-disturbing activities (e.g., log skidding, location of landings, brush piling, temporary roads construction, etc.) will be avoided as much as possible in meadows. If, during implementation, activities such as these cannot be located outside of meadows, the district hydrologist, botanist, range management specialist, and wildlife biologist will be contacted prior to implementation to determine if special requirements are warranted to protect site integrity.

Table 3. Project design criteria

Applies To:	Measure
All Activities	<p>Noxious Weeds:</p> <ul style="list-style-type: none"> • Contracts and permits issued as part of this project would include measures to limit spread of noxious weeds. Where proposed activities would occur in areas infested with noxious weeds and considered to be at high risk for spread, off-road equipment associated with the activity will be washed before leaving the site to prevent spread of weeds to adjacent National Forest System and private lands. Known areas meeting these criteria will be identified by district staff before commencement of any timber sale contract associated with this project. Known weed infestations will be displayed on the timber sale map. • Where ground-disturbing activities occur in areas infested with weeds, weeds would be treated prior to project implementation, where feasible, to reduce future spread and establishment of noxious weeds. Where pre-treatment is not feasible, noxious weeds may be treated following ground-disturbing activities. • Review of the area for noxious weed infestations will continue during management activities. If new noxious weed infestations that could be spread by management activities are found during implementation, actions to minimize spread would be taken.
All Activities	<p>Public Safety:</p> <ul style="list-style-type: none"> • Appropriate signing or other cautionary measures would be implemented in conjunction with all management activities to ensure public safety. • Implementation of these measures would be the responsibility of the person initiating the action (e.g., timber purchaser, prescribed fire manager).
All Activities	<p>Range:</p> <ul style="list-style-type: none"> • Managers of vegetation treatment projects would consult with district range managers to ensure alteration of natural barriers does not allow livestock to circumvent fences.
All Activities	<p>Region 2 Sensitive Plant Species:</p> <ul style="list-style-type: none"> • Refer to the botany design criteria shapefile for identified plant habitat and to the Biological Evaluation/Specialist Report for a verbal description of plant habitat. • Any potential habitat for sensitive plant species outside of treatment units would be avoided. If that is not feasible, consult with a qualified botanist to determine whether other options exist. • Any region 2 sensitive plant or animal species or plant or animal species of local concern located after contract or permit issuance will be appropriately managed by active coordination between permittee, contractor or purchaser, Forest Service line officer, project administrator, and biologist and/or botanist.
All Activities	<p>Revegetation:</p> <ul style="list-style-type: none"> • Disturbed soil would be revegetated in a manner that optimizes plant establishment for that specific site. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and placement of weed-free mulch, as necessary. Revegetation would be initiated as soon as possible, generally not to exceed 6 months after termination of ground-disturbing activities. All disturbed soils would be revegetated with native species when available, using seed mixtures free of noxious weeds. On areas needing the immediate establishment of vegetation, non-native, non-aggressive annuals, non-aggressive perennials, or sterile perennials may be used until native perennials become established. These species can be used to prevent the spread of noxious weeds and prevent erosion. Only weed-free mulch would be used.
All Activities	<p>Scenery:</p> <ul style="list-style-type: none"> • Activity slash would be reduced to natural levels within 300 feet of U.S. Highway 85, unless not visible due to changes in topography. Slash would be treated within 1 year of harvest completion.

Table 3. Project design criteria

Applies To:	Measure
All Activities	<p>Snags and Down Logs:</p> <ul style="list-style-type: none"> • Conifer snags over 20 inches d.b.h. and those with cavities would be cut only for safety reasons. Conifer snags under 20 inches d.b.h. would be cut only for safety reasons or when necessary for construction of roads, skid trails, firelines, and log landings – Standard 2301a. • Retain all hardwood snags except for those considered a safety hazard – Standard 2301b. • Retain at least 50 linear feet per acre of coarse woody debris with a minimum diameter of 10 inches in ponderosa pine stands, and 100 linear feet per acre in white spruce stands to help retain moisture; trap soil movement; provide microsites for establishment of forbs, grasses, shrubs, and trees; and to provide habitat for wildlife – Standard 2308a. • In vegetation treatment units, one pile of woody material per 2 acres would be left to create near-ground structure for small mammal species, except within 300 feet of buildings – Standard 3117. • Any snag cut for safety reasons will be retained on site as coarse woody debris.
All Activities	<p>Soil and Water:</p> <ul style="list-style-type: none"> • Some proposed activities would take place on soils identified as having a potential for mass erosion. The following provisions, intended to minimize the amount of exposed bare soil, off-site transport, and soil displacement, are to be implemented: (1) on slopes over 30 percent, harvesting and skidding methods that minimize the amount of soil displaced into piles or windrows would be used to leave soil intact and in place; and (2) prescribed burns on slopes over 30 percent would be conducted when soil, duff, and large fuels are sufficiently moist to retain duff as ground cover for prevention of erosion. • Some proposed activities would take place on soils that are more susceptible to compaction. The following provision, intended to reduce the risk of detrimental compaction, would be implemented: Heavy equipment would avoid streams and swales (low-lying or depressed and often wet stretches of land) except to cross at designated points, build crossings, or conduct restoration, unless protected by at least 1 foot of packed snow or 2 inches of frozen soil. • To reduce potential for compaction and/or rutting, the following measure applies on all soil map units: Heavy equipment will be operated for land treatments only when soil moisture is below the plastic limit (soil moisture exceeds the plastic limit if the soil can be rolled into 3-mm threads without breaking or crumbling), the soil is protected by at least 1 foot of packed snow, or the top 2 inches of the soil are frozen (Watershed Conservation Practices Handbook management measure 13/design criteria (b)). • No wheeled or tracked equipment will be allowed within 100 feet of perennial or intermittent streams or springs. • No wheeled or tracked equipment will be allowed within 100 feet of wetlands.
All Activities	<p>Wildlife:</p> <ul style="list-style-type: none"> • Any newly discovered raptor nests, snail colonies, red-bellied snake hibernacula, or bat roosts (i.e., snags or rock formations observed being used by bats, or newly discovered mines and caves) would be evaluated by a district wildlife biologist prior to implementation to determine if special requirements are warranted to protect site integrity. These resources would be protected in accordance with forest plan standards. • To minimize disturbance to nesting goshawks, a timing restriction will apply from April 1 through August 15 within ½ mile of active nests by minimizing human-caused noise and disruption beyond that occurring at the time of nest initiation. The following activities would not occur during the timing restriction: fuel-reduction activities, cutting, skidding, yarding, decking, hauling, road construction, and other activities that may disturb nesting birds. An exception might be: hauling within ½ mile of active nest sites during the nesting season if it

Table 3. Project design criteria

Applies To:	Measure
	<p>is reasonable to assume that goshawks in the area are habituated to this type of disturbance or surveys indicate that goshawks are not nesting in the area (consult with a district wildlife biologist to determine an appropriate course of action). Specific site locations and GIS shapefile are documented in the project file – Standard 3111.</p> <ul style="list-style-type: none"> • Tree marking will not occur from April 1 through August 15 within 1/8 mile of active goshawk nests to assure that goshawks do not abandon nests. From April 1 through August 15, if crews are being aggressively watched or attacked by goshawks during marking activities, they will immediately abandon all marking efforts within ½ mile of the active goshawk nest. • Avoid creating barriers (e.g., new open roads) between red-bellied snake hibernacula and riparian areas or wetlands. There are currently no known hibernacula in the planning area. This design criterion will apply to any newly discovered hibernacula – Standard 3116. • Avoid ground disturbance within 100 feet of an opening of a natural cave – Standard 1401.
All Activities	<p>Travel Management:</p> <ul style="list-style-type: none"> • While any projects resulting from this analysis are taking place, all gates that would normally be closed will remain closed except for administrative purposes.
Timber Harvest	<p>Aspen:</p> <ul style="list-style-type: none"> • Where hardwood enhancement sites are adjacent to commercial treatment units, cut all conifers within one tree length (approximately 75 feet) of aspen stand to maintain vegetative diversity within the stand. • Conserve all live aspen with wildlife cavities (Standard 3124 and Guideline 2204) and all snags (Standard 2301b and 2305), except for those that are considered a safety hazard. • Remove all live pine and spruce from hardwood enhancement stands. Where appropriate, use tree hinging or slash techniques to deter ungulates from browsing aspen suckers. • Whenever possible, skid trails (or other surface-disturbing activities) will be placed directly adjacent to aspen stands to promote expansion of aspen clones, which are likely to benefit from openings and ground disturbance.
Timber Harvest	<p>Harvest:</p> <ul style="list-style-type: none"> • Existing pine regeneration would generally be protected in stands proposed for overstory removal harvest. Provisions related to felling, bucking, and whole-tree yarding would be included in the timber sale contract. Log-length yarding is the preferred method of timber removal. Skid trails within these stands would be approved by the sale administrator before commencement of logging. Landing locations would, where feasible, take advantage of existing openings or areas with no regeneration. • To increase the likelihood of successful conifer regeneration, stands proposed for establishment cut would be logged in the summer or early fall, where feasible, to maximize the site scarification provided by the skidding operation, provided there are no concerns related to riparian areas, noxious weeds, or sensitive plants. • Where stand variation dictates an alternative treatment to the majority treatment, this variation shall be accommodated. For example, a ¼-acre pocket of aspen within a commercial thin stand of ponderosa pine shall be cleared of conifers within and up to one tree length (approximately 75 feet) from the edge of the pocket in an effort to maintain vegetative diversity within stands.
Timber Harvest	<p>Road Restrictions:</p> <ul style="list-style-type: none"> • Timber sale units would be laid out to facilitate existing road restrictions (for example, trees around gates and other barriers would be left uncut to maintain obstructions and discourage driving around the gate or barrier).

Table 3. Project design criteria

Applies To:	Measure
<p>Timber Harvest</p>	<p>Scenery:</p> <ul style="list-style-type: none"> • Layout and marking of timber sale units would comply with forestwide marking guides in effect at the time of implementation. Visual marking guidelines (FSH 2409.12 Amendment No. r2_bh_2409.12-2008-1) would be followed for travel routes: U.S. Highway 85, National Forest System roads 231.5, 209.1, and 134.1, and recreation sites: Holey Rock Trailhead and Bratwurst Trailhead. • Where possible, treatments would be designed to reduce the chance of wind damage to residual trees. This may include retaining higher density of mature trees on exposed ridges, lee slopes, and other areas prone to high winds and heavy snow accumulation. • To reduce effects of continuously even tree spacing on wildlife and scenery, commercial thin treatments would emphasize tree health and crown size over spacing. Residual trees in shelterwood removal and establishment cut units would be variably spaced. • Skyline logging corridors would be as narrow as possible to minimize visual effects of any soil displacement. • Where existing conditions allow, treatments in forested areas adjacent to other ownership would blend into adjacent tree density conditions rather than creating strong vegetation edges. A horizontal transition zone of 2 chains (132 feet) would achieve this transition in tree density. • Within 300 feet of U.S. Highway 85, the following design criteria will be in place: (1) Skid trails will be utilized during dry or frozen conditions to minimize soil disturbance, and will be re-seeded with native grasses. These techniques have been effectively used to reduce soil displacement and speed up the re-vegetation process along these skid trails, reducing highly visual evidence of skid trails. (2) All stumps should be cut low (less than 6 inches) within this zone in the following units: 070505 53, 071205 17, 071206 5, 071301 10, 071301 16, 071302 4, 071302 11, 071302 12, 071302 69, 071205 60, 071301 6, 071301 9, 071301 100, 071302 5, 070505 49, 070505 52, 070505 58, 070505 62, 070505 72, 071205 39, 071205 84, 071206 9, 071301 20, and 071205 41. • No whole-tree harvest slash piles will be placed within 300 feet of U.S. Highway 85, National Forest System roads 231.5, 209.1, and 134.1. • Use topography and vegetation to screen log landings from view of U.S. Highway 85, National Forest System roads 231.5, 209.1, and 134.1. Once management activities are complete, rehabilitate landings by returning to original contours, scarifying to eliminate compaction (as necessary), and planting with native grass seed. If vegetation clearing is needed for log landings, shape edges to mimic natural patterns and openings. • Within 300 feet of U.S. Highway 85, National Forest System roads 231.5, 209.1, and 134.1, and Eagle Cliff non-motorized recreation trails, the following design criteria will be in place: (1) Where possible along these routes, remaining vegetation should be in a variety of sizes and spacing to maintain a more natural appearance. This technique has been very effective in maintaining a natural appearance. Locations where it was not used resulted in a “tree-farm” appearance (avoid leaving all trees same height and evenly spaced across the landscape). (2) Slash will be cleaned up to natural levels within 300 feet of these travel corridors. This can be accomplished by slash clean up (e.g., scattering and underburning, piling, and burning, or chipping) after logging. (3) Slash, once placed on the ground, needs to be treated in accordance with forest plan Guidelines 4112 and 5606. • To meet High scenic integrity objectives (SIO) in shelterwood establishment units 070505 50 and 071205 4, the following design criteria will be in place: leave a higher basal area ranging from 40-60 square feet of basal area in an irregular spacing and leave denser areas or islands of trees throughout the unit. • To meet Moderate SIO in shelterwood establishment unit 071305 5, the following

Table 3. Project design criteria

Applies To:	Measure
	design criteria will be in place: in the northern half of the unit, leave a higher basal area ranging from 40-60 square feet of basal area with irregular tree spacing.
Timber Harvest	<p>Range:</p> <ul style="list-style-type: none"> • All pasture gates would be kept closed during the grazing season (June through October). • If log hauling or movement of heavy equipment related to the proposed timber harvest causes damage to cattle guards, the timber purchaser would be responsible for repair.
Timber Harvest	<p>Region 2 Sensitive Plant Species and Species Of Local Concern:</p> <ul style="list-style-type: none"> • Occurrences of region 2 sensitive plants and plant species of local concern would be avoided during all proposed timber harvest activities. Known areas are identified in the design criteria shapefile. • Potential plant habitat would be excluded from mechanical treatment areas. Known plant habitat is identified in the design criteria shapefile. • Skid trails, temporary roads, landings, or other disturbances associated with logging activities in plant habitat would be designated in consultation with a qualified botanist. These areas are included in the design criteria shapefile. • Plant habitat outside of treatment units would be avoided unless reviewed by a qualified botanist and approved by the Line Officer. These areas are included in the design criteria shapefile.
Timber Harvest	<p>Recreation:</p> <ul style="list-style-type: none"> • Snowmobile and non-motorized recreation 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 take place at the time of timber sale appraisal and contract preparation. If conflicts appear likely between use of the trails and specific logging units or haul routes, logging would be restricted between December 1 and March 31, unless a logical and desirable alternative trail 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. • Winter operations of timber sale units that necessitate skidding across a snowmobile or non-motorized recreation 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 timber contractor.
Timber Harvest	<p>Soil and Water:</p> <ul style="list-style-type: none"> • In stands where slopes exceed 55 percent, ensure that a tree overstory component with at least an 80 basal area density remains following timber harvest and post-sale activities. If there is a need to reduce basal area density below this level, consult the district hydrologist for field verification of the site to determine further potential of slope stability impairment associated with additional levels of basal area reduction. • Skid trails and temporary roads: Place slash in a well-distributed pattern across the skid trail surface and install water bars, where necessary, following harvest activities. • When logging in previously disturbed stands, use existing skid trails and landings whenever possible. • Avoid locating any temporary roads, skid trails, or log landings within 100 feet of perennial or intermittent streams, springs, or wetlands. • Avoid conducting vegetation treatments that remove overstory trees within 50 feet of perennial or intermittent streams, springs, or wetlands. • Wheeled or tracked harvest equipment will not operate on slopes exceeding 40 percent.

Table 3. Project design criteria

Applies To:	Measure
Timber Harvest	<p>Wildlife:</p> <ul style="list-style-type: none"> • No treatments will be conducted within 500 feet of adit portal or shaft openings of mines or caves to maintain microclimate of bat hibernacula or nurseries, unless it is determined through bat surveys that the site is not bat roost habitat. Bat surveyors and bat survey protocols must be pre-approved by the district wildlife biologist and surveys must be conducted prior to implementation. The 500-foot no treatment zone may be reduced depending upon survey results and topography, and will be reviewed by a district wildlife biologist and approved by the Line Officer. Known mine site locations are documented in the project file – Standard 3207. • Known snail sites with region 2 sensitive species or species of local concern will be avoided (i.e., no vegetation treatments, no heavy equipment use, and no skid trails, landings, temporary roads, or any other activity that may compact soils or alter ground cover, moisture regimes, or litter composition). Known site locations are documented in the project file – Standard 3103. • Disturbance of newly discovered colonies of land snails would be avoided until the colonies are evaluated by a district wildlife biologist to determine if region 2 sensitive species or species of local concern are present. Appropriate buffer areas (no treatment zones) around newly discovered colonies would be recommended based on site-specific conditions and approved by the Line Officer. Avoidance zones or mitigation measures would be determined on a case-by-case basis. • In the event that a bald eagle is documented in a stand, the wildlife biologist will be notified and harvest operations will be suspended until the eagle has vacated the stand – Standard 3101d.
Timber Harvest	<p>Spruce Habitat:</p> <ul style="list-style-type: none"> • Commercial and non-commercial treatments of ponderosa pine in spruce-dominated stands will not occur except within 200 feet of buildings or where spruce is encroaching into hardwoods, so long as other identified design criteria do not apply in these areas.
Prescribed Fire	<p>Burn Plan:</p> <ul style="list-style-type: none"> • Prescribed burning would be implemented only under conditions defined in a prescribed burn plan. • In stands that have been designated as part of the suitable timber base, at least 90 percent of the trees greater than 9 inches in diameter will be retained. In other stands, at least 50 percent of the trees greater than 9 inches in diameter will be retained. • The district silviculturist will assist with the preparation of or review the final prescribed burn plan.
Prescribed Fire	<p>Improvements:</p> <ul style="list-style-type: none"> • Measures will be taken to protect utility lines and any other improvements within the burn unit during prescribed burns.
Prescribed Fire	<p>Region 2 Sensitive Plant Species:</p> <ul style="list-style-type: none"> • Control lines that disturb soil (i.e., hand lines or dozer lines) would not be located in plant habitat, unless needed to ensure safety. These areas are included in the design criteria shapefile.

Table 3. Project design criteria

Applies To:	Measure
Prescribed Fire	<p>Soil and Water:</p> <ul style="list-style-type: none"> • Prescribed burns in some sites would take place all or partly on soils with severe erosion hazard. These burns would take place only when burn severity could be kept low. • Small wetlands located in or immediately adjacent to any burn units would be excluded from areas to be burned and protected from disturbance. No active ignition would occur within the water influence zone (WIZ); fire would be allowed to creep into this zone. • Prescribed burn plans will include monitoring measures to evaluate the breakdown of hydrophobic soils, where applicable, following burn implementation.
Prescribed Fire	<p>Scenery:</p> <ul style="list-style-type: none"> • Where possible, prescribed burns adjacent to U.S. Highway 85 would be burned so that overstory trees visible from the road show as little scorch as possible.
Prescribed Fire	<p>Wildlife:</p> <ul style="list-style-type: none"> • In any given year, conduct prescribed burns on no more than 60 percent of a contiguous meadow (that is greater than 20 acres in size) to minimize impacts of prescribed fire on butterflies and ground-nesting birds. Timing restriction would apply to meadows from May 15 to August 15, to minimize impacts to ground-nesting birds. Fall burns are preferred – Standard 3125. • Prescribed burns within ½ mile of historic goshawk nests would be coordinated with the district wildlife biologist. Timing restriction would apply from April 1 through August 15, if the nests are active. • All documented land snail colonies with region 2 sensitive species or species of local concern that are in prescribed burn units would be protected by burning when snails are hibernating (i.e., when average daytime temperatures are less than 50 degrees Fahrenheit), or these colonies will be avoided. Specific site locations are documented in the project file – Standard 3103. • No fire lines or direct ignition of fire will occur on known snail colonies any time of the year. Specific site locations are documented in the project file. • During prescribed burning, protect existing guzzlers. Use whatever technique the burn boss deems appropriate (e.g., foam, black lining, wrapping, etc.), based on site conditions. • If Atlantis fritillary or regal fritillary butterflies occur in meadows that are within burn units, redesign the project to conserve important habitat components of known sightings (survey for butterflies as appropriate). No known occurrences of either species exist in proposed burn blocks. Check with the district biologist prior to burning to determine if new information indicates their presence – Standard 3105. • Prescribed burning in areas with caves or mines would be coordinated with a district wildlife biologist. Impacts to bat hibernacula would be avoided with the use of timing restrictions and/or establishing buffer zones. Specific mitigations will be determined by a district wildlife biologist and fuels specialist during burn plan development. Specific site locations are documented in the project file. This design criterion will also apply to any newly discovered hibernacula – Standard 3102.
Prescribed Fire	<p>Range:</p> <ul style="list-style-type: none"> • To avoid conflicts with grazing and to ensure that prescribed fire mitigation is implemented, prescribed fire projects will be coordinated in advance with the range management specialist.

Table 3. Project design criteria

Applies To:	Measure
Prescribed Fire	<p>Recreation:</p> <ul style="list-style-type: none"> Personnel from the South Dakota Department of Game, Fish and Parks will be notified prior to the initiation of prescribed burns if the burn unit includes or is adjacent to a designated snowmobile trail, so that trail markers may be removed or protected. Generally, slash piles will be located away from designated snowmobile or cross-country ski trails where possible. Where that is not possible and piles are located immediately adjacent to trails, piles will either not be burned between December 1 and March 31 (to prevent melting of the snow on the trail) or specific mitigation will be instituted to prevent snow melt on the trail.
Prescribed Fire	<p>Heritage:</p> <ul style="list-style-type: none"> In the event that sites are within a prescribed burn boundary, both prehistoric and historic sites would be avoided by both hand line and dozer lines. Sites with consumables, such as wood, would either be wrapped with structure protection material, or have either a wet line or hand line placed around the resource.
Transportation System	<p>Dust Control:</p> <ul style="list-style-type: none"> Dust control, if necessary, may be done with water, magnesium chloride, calcium chloride, or equivalent.
Transportation System	<p>Noxious Weeds:</p> <ul style="list-style-type: none"> District staff responsible for the noxious weed program would, in coordination with the project engineer, inspect gravel pits for noxious weed infestation before transport and use of gravel and other material. Infestations would be treated to prevent spread. District staff responsible for the noxious weed program would inspect stockpiled gravel annually for weed infestation, in coordination with the project engineer.
Transportation System	<p>Revegetation:</p> <ul style="list-style-type: none"> Timber sale roads would be seeded after construction, but before timber harvest, if any part of the gap between construction and harvest would occur between April and October. This may be accomplished under the road contract. If necessary, seeding would again occur after use of the road is complete. Seeding may be delayed until after completion of harvest if the gap between construction and harvest would be of short duration and hydrology, soils, engineering, and noxious weed specialists determine after field review that a delay would be acceptable.
Transportation System	<p>Soil and Water:</p> <ul style="list-style-type: none"> New road construction is to be designed to limit cut and fill slopes where possible, particularly when located above steep slopes. Construction of landings, roads, and tractor and skid trails would be avoided within 100 feet (or a distance equal to the mean height of mature dominant late seral vegetation, whichever is more) of perennial seeps, springs, and wetlands. If this is not possible, crossings would be constructed and restored to prevent headcutting, gullying, erosion, and sediment transport to ephemeral or perennial channels. Creation of large water-collection points, such as road ditches or excessively large water bars, would be avoided, particularly up-gradient of existing rotational site features, such as slumps and landslides. A greater frequency of water bars than that identified as the maximum spacing recommended in FSH 2509.25 for the Rocky Mountain Region is to be used. FSH 2509.25 direction disclosed that the listed spacings were maximum spacings and should be reduced if warranted by onsite factors, such as amount of road use, downslope stability, erosion, etc. Forestry Best Management Practices for South Dakota (2003) identifies suggested drainage feature spacings (p. 12) that have narrower spacings between drainage features as compared to FSH 2509.25. The 2009 Field Audit Report – Implementation Monitoring of SD Forestry Best Management Practices further supports the

Table 3. Project design criteria

Applies To:	Measure
	<p>greater need for more frequent spacing of water bars. The audit identified some areas with insufficient numbers of water bars on native surface roads. Temporary road cuts exceeding 2 feet would be avoided. If this is infeasible because of steep slopes, temporary roads would be re-contoured.</p> <ul style="list-style-type: none"> • Where feasible, existing haul roads would be reconstructed with rolling grades instead of ditches and culverts. • Water bars and sediment barriers would be placed 10 to 20 feet below water bar outlets and culvert outlets on skid trails steeper than 15 percent. • Engineering staff would consult with a forest hydrologist and fisheries biologist on design of stream crossings. Fill slopes would be protected with riprap, gabions, prompt seeding, or other measures approved by the hydrologist, fisheries biologist, or soil scientist. • Placement of structures would comply with Federal and State laws regarding construction in and near waterways, including placement of fill and measures to control sedimentation. • Generally, do not locate any new system roads or temporary within 100 feet of streams (perennial, intermittent or ephemeral), springs, or wetlands. If a stream crossing is required, ensure that it is constructed to prevent headcutting, gullying, erosion, and sediment transport to stream channels by implementing Region 2 Watershed Conservation Practices.
Transportation System	<p>Travel Management:</p> <ul style="list-style-type: none"> • In general, all newly constructed roads would be closed following construction until needed for timber sale or related activities and closed again after use. Roads needed for timber sale or related activities, but normally closed to motorized vehicles, would also be closed when not in use. • All newly constructed roads that are to be closed following use will be closed with appropriate methods, which may include: locked gates, dirt berms, boulders, downed trees, fences, or re-contouring. • Where new roads or access routes are constructed through allotment fences, temporary cattle guards or gates will be installed at the crossing point. If the road is identified for closure, immediately following completion of related timber sale activities, the fence will be returned to its original condition by the timber purchaser. Use of temporary gates or cattleguards will require adequate bracing (wood posts) placed sufficiently to support the gate and/or associated fence line. Wood posts will not be removed after timber sale activities are completed. In the event the new route is to remain open, a permanent cattleguard with bypass gate or a permanent gate, depending on site conditions, will remain in place. • Retain access routes as needed for utility line construction, reconstruction, and maintenance of existing right-of-way corridors. • Avoid or protect utility infrastructure during construction and decommissioning of roads.
Transportation System	<p>Region 2 Sensitive Plant Species:</p> <ul style="list-style-type: none"> • A botanist will work with the road engineer to determine the best placement of the proposed new road construction that will potentially cross plant habitat. These areas are included in the design criteria shapefile.
Transportation System	<p>Wildlife:</p> <ul style="list-style-type: none"> • Maintenance of existing roads in areas that pass through known snail colonies will be limited to the clearing limits (i.e., roads may be maintained to standard). If needed improvements or realignment of those areas go beyond the existing clearing limits, review and input by the district wildlife biologist would be required to ensure that snail colonies would not be impacted – Standard 3103. • Avoid constructing new roads through snail colonies. Where data suggests an overlap between new roads and known snail colonies, a wildlife biologist and the engineer, together, will determine if there are any feasible alternate road

Table 3. Project design criteria

Applies To:	Measure
	locations – Standard 3103. <ul style="list-style-type: none"> • The presence of snails in any area not previously identified will be brought to the attention of the district wildlife biologist before maintenance or construction continues.
Transportation System	Heritage: <ul style="list-style-type: none"> • Sites that currently have a native surface road running through them will have site-specific mitigations detailed in the heritage specialist report following a review by district heritage staff to determine if further consultation by the South Dakota State Historic Preservation Office, appropriate Tribal Historic Preservation Offices, and other applicable parties is necessary as directed by Section 106 of the National Historic Preservation Act 1966 (as amended).

Project Monitoring

The Northern Hills Ranger District would monitor project implementation. The timber sale administrator or other contract administrators would complete some of the project implementation monitoring. Other resource specialists would be involved in monitoring specific mitigation measures relating to their particular resource area. Specific monitoring requirements are listed below.

- Project managers will monitor revegetation of disturbed and burned areas to determine the need for additional measures and noxious weed control.
- Gravel pits and gravel stockpiles will be inspected for noxious weed infestation.
- Engineering and hydrology or soils specialists will monitor effectiveness of erosion control measures (seeding, water bars, etc.) 1 and 3 years following installation.
- Hydrology or soils staff will monitor soil compaction at a sample of timber sale landings and harvest units.
- Timber sale administrators and hydrology or soils specialists will monitor application and effectiveness of water conservation practices and best management practices.
- Reforestation surveys will be conducted in shelterwood establishment and removal harvest units to verify stocking standards have been met.
- Fuel treatment areas will be monitored to evaluate post-treatment fuel loading.
- Cultural sites will be monitored to ensure implementation of project design criteria.
- Road closures will be monitored to evaluate closure effectiveness.

Comparison of Alternatives

Table 4 compares the effects of the alternatives in summary form. The alternatives are compared by project purpose and need, and resource effects. Information in Table 4 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. The “Environmental Consequences” section of this document forms the scientific and analytical basis for this comparison and describes the effects in detail.

Table 4. Comparison of alternatives

Comparison Value	Alternative A – No Action	Alternative B – Modified Proposed Action
Project Purpose and Need		
Mountain Pine Beetle Risk in Ponderosa Pine stands	High: 4,924 acres (48%) Medium: 1,938 acres (19%) Low: 3,342 acres (33%)	High: 804 acres (8%) Medium: 3,009 acres (29%) Low: 6,392 acres (63%)
Potential Sanitation & Salvage Treatment Area to Reduce Mountain Pine Beetle Populations	0 acres	11,761 acres
Forest Diversity: Age-class	No change	360 acres shifted to young age-class (3% of project area forest) 1,290 acres in transition to young age-class (11% of project area forest) 621 acres of uneven-aged management (5% of project area forest)
Forest Diversity: Tree Species	No change	570 acres of aspen released from pine competition (5% of project area forest)
Resource Effects		
Project Area Fire Hazard Rating: percent of project area	Very High: 17% High: 42% Medium: 28% Low: 13%	Very High: 9% High: 18% Medium: 31% Low: 42%
Project Area WUI Fire Hazard Rating: percent of WUI.	Very High: 30% High: 30% Medium: 27% Low: 13%	Very High: 15% High: 12% Medium: 36% Low: 37%
Wildlife Habitat	No change in forest structural stages; excess mature forest and shortage of grass-forb, shrub-seedling and sapling pole structural stages.	Change in structural stages initiated through harvest. Shelterwood removal and establishment treatments would increase young forest structural stages and move the project area toward desired structural stages.
Fisheries	No suitable, occupied habitat; no effects	No suitable, occupied habitat; no effects
Noxious Weeds	Increase in noxious weeds due to decreases in forest canopy.	Increase in noxious weeds due to project activities.
Botanical Resources	No direct effects; potential meadow and hardwood habitat loss.	Potential loss if unknown, individual plants; no effects to viable populations. Hardwood and meadow habitat would improve.
Hydrology	No direct or indirect effects.	Short-term limited effects at stream crossings due to sedimentation. No long-term watershed or aquatic impacts.
Soils	No direct or indirect effects.	Short-term soil displacement and compaction on limited area. Mid-term (less than 10 years) soil effects on a limited area due to pile burning. No long-term direct or indirect effects to soil productivity.

Table 4. Comparison of alternatives

Comparison Value	Alternative A – No Action	Alternative B – Modified Proposed Action
Air Quality	No direct effects	Possible short-term (1-2 days) effects on a limited area (20-mile radius).
Recreation	Potential increase in hazard trees due to mountain pine beetle caused mortality	Temporary displacement of dispersed recreation activities during harvest operations. Improved visitor safety due to road maintenance, reconstruction and reduced number of hazard trees.
Scenery	No direct effects	Short-term effects to scenic resources. Effects could last up-to 3 years following the completion of activities.
Heritage	No direct effects Increased risk of cultural resource damage due to wildfire associated with high fire hazard	No adverse or negative effects. Reduced risk of cultural resource damage due to wildfire, associated with reduced fire hazard.

Environmental Consequences

Introduction

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above. Additional details regarding area conditions, analysis assumptions or methodology can be found in the individual resource reports located in the project record.

Cumulative Effects

According to the Council on Environmental Quality (NEPA) regulations “cumulative impact” is the impact on the environment which results for the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7).

The relative boundaries, and past and planned activities assessed for cumulative effects vary by resource. Each resource cumulative effects area can be different and possibly larger or smaller. Relevant cumulative effects are discussed for each resource in this section. The cumulative effects analysis for each environmental component or resource area is guided by and consistent with the Council on Environmental Quality letter “Guidance on the Consideration of Past Actions in Cumulative Effects Analysis” as of June 24, 2005. A listing of relevant related past, present and future management activities within ½ mile of the project boundary is provided in Appendix C. Sources of information for cumulative effects analysis include, but are not limited to: Forest GIS files (project GIS geodatabase:coldsprings021411), Black Hills National Forest Schedule of Proposed Actions (2011)

Forest Resources

Introduction

This section discusses the environmental consequences of the no action and modified proposed action on forest resources. It summarizes the Cold Springs Forest Vegetation Report (Orlemann 2011), which is located in the Cold Springs project file.

Spatial and Temporal Context for Effects Analysis

The baseline year used for the forest resource analysis is 2010. In this analysis, all past activities and events are reflected in the existing condition. Activities that occurred more than about 20 years prior to the baseline will not be specifically mentioned. Most long-term studies of forest vegetation condition agree that time periods from 15 to 20 years are sufficient for evaluating the long-term effect of silvicultural treatments (Hornbeck et al. 1993; Monleon et al. 1997; Zausen et al. 2005).

Likewise, in the effects discussion below, the potential effects of the Cold Springs Project on the project area vegetation will not generally be forecast beyond about 15 to 20 years. The project is designed to improve growing conditions for residual trees. It is expected that these conditions will be improved and sustained over the next 20 years, decreasing insect risk and disease impacts, and growing larger trees faster. Speculating about effects beyond about the next two decades is unlikely to provide useful information to the decision maker.

The likely cumulative effects area (CEA) will be the affected watersheds or the areas of contiguous habitat. In this case, the project area lies in portions of just one watershed, Upper Spearfish Creek, which covers a total area of approximately 41,410 acres. This will be the areal extent of the CEA for the forest vegetation effects associated with the Cold Springs Project.

No-Action Alternative

Direct and Indirect Effects

Forest Health

Insect Damage

Currently, approximately 6,800 acres (or 67 percent) of the project area pine stands have a high or moderate insect hazard rating. Coupled with the observed high beetle populations in the area, the likelihood of a continuous, widespread, epidemic-level infestation of mountain pine beetle is high (Allen 2010). If not treated, the hazard will remain high until stocking levels decrease due to mortality from mountain pine beetle activity or wildfire. In fact, studies have shown that up to 77 percent of the ponderosa pine trees in unthinned stands may be attacked by mountain pine beetle in the Black Hills (Schmid and Mata 2005). Moreover, the no-action alternative would not allow for the mountain pine beetle population reductions associated with sanitation and salvage (Samman and Logan 2000). Thus, under a policy of no action, there would be no opportunity to improve tree vigor and resistance to insects, or to remove existing infestations from project area stands, and many currently forested areas could lose most of their mature pine overstory.

Weather Damage

Under the no-action alternative, dense pine stands may be more susceptible to snow and wind damage than those that have been thinned (Shepperd and Battaglia 2002; Schubert 1974; Wonn and O'Hara 2001). Because this was not extensively observed during stand reconnaissance, however, it is not expected to be a significant problem. Moreover, the potential risk of stand damage associated with timber treatments and prescribed fire would not occur under this alternative. As a result, damage will not be addressed further in this section.

Forest Composition

Ponderosa Pine

Overall, ponderosa pine is well represented throughout the project area and its status as the dominant tree species would not be significantly impacted under the no-action alternative. It is likely, however, that, in the absence of treatment, specific sites would continue to transition from one cover type to another. Ponderosa pine would likely continue encroaching into hardwood and meadow areas, and filling in small openings in the forest canopy (Bock and Bock 1984; Fisher et al. 1987). In the densest stands, however, especially on north- and east-facing aspects, pine would slowly lose the regeneration battle to the more shade-tolerant white spruce (Shepperd and Battaglia 2002; Walker and Chapin 1986).

White Spruce

As noted above, white spruce would likely enjoy some competitive advantage under the no-action alternative. In the absence of disturbance, this may lead to some areas of pine, especially on the cooler and wetter sites, succeeding to spruce. This effect is unlikely to be significant.

Hardwoods

As the canopy closes and the conifer encroaches into other cover types under the no-action alternative, aspen and other hardwoods will diminish in numbers until natural disturbances once again open up the canopy. Within many sites, forbs and grasses in the understory will be shaded out, reducing quality of other resources such as wildlife habitat, forage, and visual aesthetics (Pase 1958).

Forest Structure

Structural stage is an important forest attribute, categorizing stands based on tree size and density. Project area structural stages are displayed by project area management area in Table 5 and Table 6. Structural stages are defined by the following conditions based on the forest plan, Phase II Amendment:

- **Structural Stage 1 (Grass/Forb):** The grass/forb stage was historically a product of fires, windthrow, or similar disturbances. This stage is dominated by grasses and forbs lasting until tree seedlings become established. Under forest management, this stage can be created through harvesting.
- **Structural Stage 2 (Shrub/Seedling):** The shrub/seedling stage consists of shrubs such as chokecherry, rose and serviceberry along with tree seedlings. A stand remains in stage 2 until tree seedlings reach 1 inch diameter at breast height (d.b.h.), which should take less than a decade.
- **Structural Stage 3 (Sapling/Pole):** The sapling/pole stage consists of trees with stems 1 to 9 inches d.b.h. This stage typically persists up to 30 years to age 70. This structural stage is divided further by percent of canopy closure. Canopy closure is less than 40 percent for 3A classifications; 3B classifications have canopy closure of 40 to less than 70 percent; and 3C is anything with greater than 70 percent canopy closure.
- **Structural Stage 4 (Mature):** The mature stage begins when trees reach the 9-inch d.b.h. class. Trees remain in this stage until they are about 160 years old. As with Structural Stage 3, understory productivity depends upon the overstory canopy cover. Less than 40 percent canopy cover is 4A; 40 percent to less than 70 percent is 4B; and greater than 70 percent canopy closure is 4C. Tree size in this stage will vary depending upon growing-site potential and density of the stand.
- **Structural Stage 5 (Late Succession):** This structural stage is characterized by very large trees (16 or more inches d.b.h.). Trees are at least 160 years old; ponderosa pine that reach this age are commonly referred to as “yellow barks.” Late seral ponderosa pine may occur in dense stands, but may also grow in the open or in “park-like” stands.

Table 5. Cold Springs pine structural stages existing condition for MA 4.1

Structural Stage	Forestwide Objectives (percent)	Percent of Existing Condition Project Area
1	5	2.1
2	5	6.9
3A	10)	3.5
3B	15	0.0
3C	5	0.0
4A	25	28.7
4B	25	47.2

Table 5. Cold Springs pine structural stages existing condition for MA 4.1

Structural Stage	Forestwide Objectives (percent)	Percent of Existing Condition Project Area
4C	5	4.6
5	5	7.0

Table 6. Cold Springs pine structural stages existing condition for MA 5.1

Structural Stage	Forestwide Objectives (percent)	Percent of Existing Condition Project Area
1	5	2.0
2	5	9.8
3A	10	1.0
3B	15	0.6
3C	5	0.3
4A	25	28.3
4B	25	44.1
4C	5	11.8
5	5	2.2

Under the no-action alternative, over-represented structural stages, such as 4A, 4B, and 4C could continue to develop, with the largest bulge, 4B, converting to 4C and 5 over time. On the other hand, the presence of outbreak levels of mountain pine beetle could cause significant mortality in the larger and older trees over a very short period of time (Negron et al. 2008). In this case, near complete mortality of the older trees will occur on up to 80 percent of structural stages 4B and 4C (dense stands with larger trees). Significant but lesser amounts of mortality would be expected in structural stage 4A due to its larger tree sizes. This high mortality will convert older stands to younger age structural stages. Adding younger structural stage stands helps to increase vegetative diversity in the area, which is currently dominated by mature pines.

Structural Stage 4 with Very Large Tree Size

The no-action alternative would not directly affect structural stage 4 stands that are rated as “very large” tree size. Indirectly, some of these stands may drop out of the classification as a result of high levels of mountain pine beetle-induced mortality. On the other hand, while the mountain pine beetle prefers larger trees (greater than 6 to 8 inches d.b.h.) over smaller trees, there is evidence that attacks on the largest trees are somewhat random and scattered, often leaving some of the larger trees unaffected (Olsen et al. 1996). Table 7 displays the percentage of structural stage 4, with very large trees size, in management areas 4.1 and 5.1.

Table 7. Structural stage 4 with very large tree size

Area	MA 4.1 Existing Condition	MA 5.1 Existing Condition
Black Hills National Forest	18% (5,664 acres)	12% (45,688 acres)
Cold Springs Project	27% (243 acres)	19% (1,447 acres)

Age Class Distribution

Under the no-action alternative, there would be no change to the current age-class distribution in the project area (see Figure 2). In the event of a significant mountain pine beetle epidemic, however, most of the older and larger trees would be killed. This would shift the distribution in the project area toward the younger age classes. The effect is similar to the structural stage discussion, above.

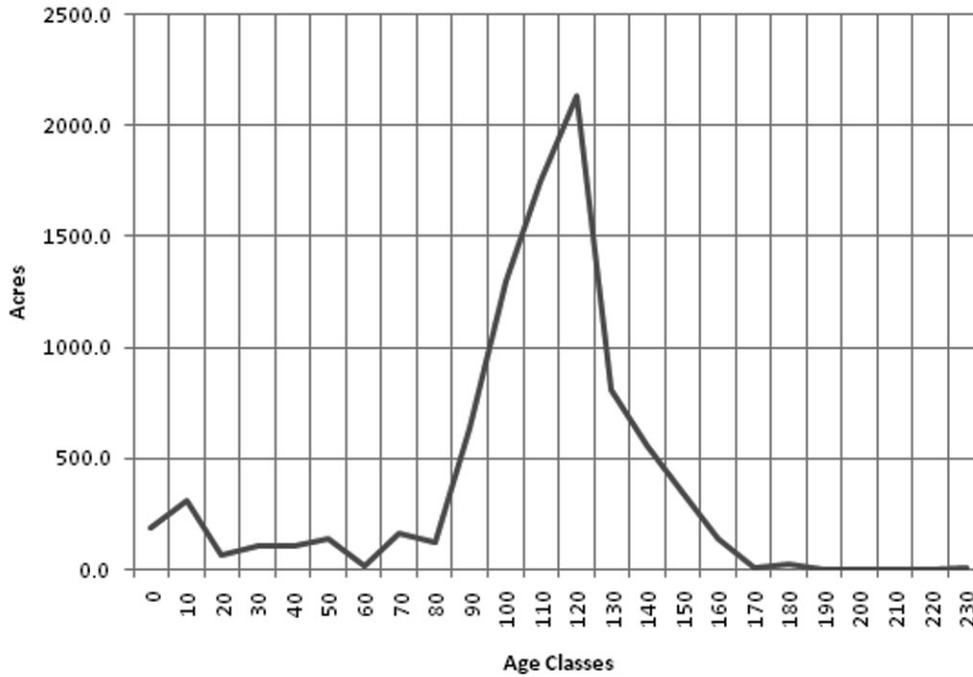


Figure 2. Cold Springs ponderosa pine age class distribution

Stocking Levels

The stocking of more than 6,000 acres of pine (or approximately 59 percent) within the project area currently exceeds the desired condition of 70 square feet of basal area. Under the no-action alternative, the effect of overstocking on project area stands would be exacerbated. These effects include reduced tree growth and vigor, as well as increased susceptibility to insect infestation and stand-replacing wildfire (Egan et al. 2010). Stands 1302-16 and 1305-5 provide good examples of the overstocked conditions, over 70 square feet of basal area, contemplated under the no-action alternative (Table 8).

Table 8. Example of overstocked stands under the no-action alternative

Stand	Size	Desired Stocking (basal area)	Current Stocking (basal area)	Stocking in 2030 (basal area)
1302-16	95 acres	70 feet or less	115 feet	157 feet
1305-5	190 acres	70 feet or less	106 feet	136 feet

Of course, as noted extensively in this section, these projections do not account for heavy mountain pine beetle mortality in the project area. In the case of an epidemic, the stands may achieve desired stocking rates through the work of the beetle. By modeling an outbreak in Forest

Vegetation Simulator⁹, the stocking in stand 1302-16 (by 2030) can be projected at 73 feet of basal area; in stand 1305-5, the number is 64. As a result, the desired condition may be attained by doing nothing. On the other, the forest plan directs managers to reduce stocking through silvicultural treatments that protect the stands from insect epidemics and provide forest products.

Snags¹⁰

The snag population in the Cold Springs project area is currently meeting forest plan objectives. The most recent data indicates the conifer stands in the project area have, on average, seven to eight hard snags per acre. In addition, forest health surveys and field reconnaissance show that recent mountain pine beetle mortality affects at least 10 percent of the pines in the project area. These recently killed trees are adding to the snag population throughout the project area. The no-action alternative will not reduce snag densities or impact snag development. As a result, snags will not be addressed further in this section.

Regeneration

Natural regeneration in the Black Hills is generally reliable, and regeneration would not be directly affected by the no-action alternative. There may, however, be an indirect risk associated with doing nothing. In the case of a stand-replacing wildfire, regeneration may be set back in some areas by the absence of a nearby seed source (Bonnet et al. 2005).

Cumulative Effects

Forest Health

Within the Cold Springs project area, at least 67 percent of the pine stands are currently rated at medium or high insect risk. Across the cumulative effects area (CEA), the figure is similar, at 67 percent. In addition, mountain pine beetle infestations have recently been observed throughout the watershed (Figure 3). As a result, the likelihood of a continuous, widespread, epidemic-level infestation of mountain pine beetle within the cumulative effects area is high (Allen 2010). Under the Cold Springs proposed treatments, thinning would improve tree vigor and resistance to insects or disease, sanitation would remove infested trees, and hardwood enhancement treatments would reduce the number of mountain pine beetle host species. Under the Cold Springs no-action alternative, however, none of these forest health treatments would be implemented. As a result, the cumulative effect of no action on insect risk, is to forego the potentially beneficial effects of forest health treatment within the project area, and to contribute to the large acreage across the cumulative effects area that is highly susceptible to a mountain pine beetle outbreak.

⁹ Forest Vegetation Simulator (FVS) is a forest vegetation modeling program (Dixon 2002)

¹⁰ A snag is a dead tree with no green needles.

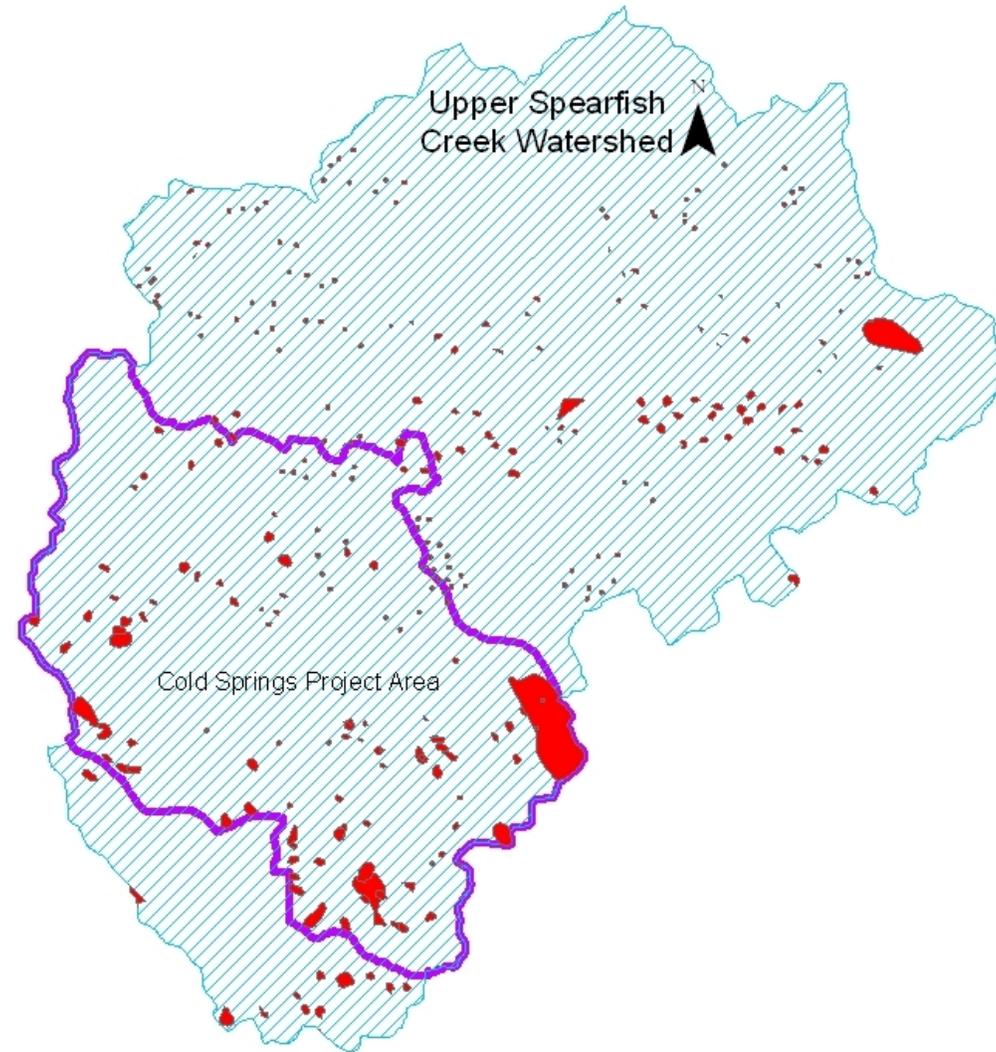


Figure 3. Locations of mountain pine beetle infestations since 2008 within the cumulative effects area for Cold Springs

Composition

Ponderosa Pine

Ponderosa pine is the dominant cover type throughout both the project area (83 percent) and the CEA (73 percent). While the long-term effect of no action might be a slight change in cover types, as noted in the discussion of direct and indirect effects, there have been sufficient treatments designed to maintain the health of pine throughout the CEA that the overall effect would be insignificant. Ponderosa pine is well represented throughout the CEA and its status as the dominant tree species would not be significantly impacted under the no-action alternative. As a result, there will be no cumulative effect to ponderosa pine composition associated with no action.

White Spruce

Across the CEA, white spruce likely enjoys a competitive advantage over ponderosa pine in the absence of treatment or other disturbance. This could lead to some areas of pine converting, over

time, to areas of spruce. In this case, however, the direct and indirect effects of no action on white spruce composition were found to be insignificant. Without direct effects, there can be no cumulative effects.

Hardwoods

The hardwood regeneration and weeding treatments planned or implemented across the CEA are designed to shift species composition away from conifers and back toward hardwoods. For the 41,410-acre Cold Springs CEA, these treatments have totaled approximately 780 acres. This is a tiny step intended to arrest the decline of hardwoods in the northern Black Hills. Under the no-action alternative for Cold Springs, this acreage total would remain unchanged. On the other hand, should the extent of the current mountain pine beetle infestation grow significantly across the CEA, the opportunities for canopy-opening disturbances that favor shade-intolerant hardwood species may increase.

Forest Structure

Across the CEA, structural stages 4B and 4C are over-represented (Table 9 and Table 10). Under the no-action alternative, these over-represented structural stages, could continue to develop, with the largest bulge, 4B, converting to 4C and 5 over time. On the other hand, as has been noted under the description of the current condition and the direct effects of no action, the presence of outbreak levels of mountain pine beetle could cause significant mortality in the larger and older trees (Figure 3). In this case, near complete mortality of the larger trees could occur on up to 80 percent of structural stages 4B and 4C (dense stands with larger trees). Significant but lesser amounts of mortality would be expected in structural stage 4A due to its larger tree sizes. This high mortality will convert older stands to younger age structural stages. Adding younger structural stage stands helps to increase vegetative diversity across the CEA, which is currently dominated by mature pines.

Table 9. Structural stages for MA 4.1 across the cumulative effects area under the no-action alternative

Structural Stage	Forestwide Objectives (percent)	CEA Under No Action (percent)
1	5	0.9
2	5	6.1
3A	10	3.2
3B	15	3.5
3C	5	3.3
4A	25	23.4
4B	25	42.5
4C	5	12.0
5	5	5.0

Table 10. Structural stages for MA 5.1 across the cumulative effects area under the no-action alternative

Structural Stage	Forestwide Objectives (percent)	CEA Under No Action (percent)
1	5	1.9
2	5	7.6
3A	10	2.3
3B	15	1.2
3C	5	1.1
4A	25	27.0
4B	25	42.5
4C	5	14.9
5	5	1.5

Ultimately, the cumulative effect of no action for Cold Springs is to contribute additional acres to the large percentage of high-risk stands across the cumulative effects area. Currently, more than 55 percent of the cumulative effects area is in structural stages 4B and 4C, which are characterized by dense stands of larger trees. These are the conditions that are most susceptible to large-scale disturbances such as insect epidemics and wildfires.

Structural Stage 4 with Very Large Tree Size

In MA 4.1, approximately 18 percent of the SS4 pine stands are rated as “very large;” for MA 5.1, the percentage is approximately 14 percent. Under the Cold Springs no-action alternative, these percentages will not be directly affected. Indirectly, some of these stands may drop out of the classification as a result of high levels of mountain pine beetle-induced mortality.

Age Class Distribution

Approximately 76 percent of the stands in the CEA for which stand age is available (approximately 34,000 acres) are 100 years of age or older. This is almost identical to the current condition within the Cold Springs project area. The distribution of age classes in the CEA ranges from 0 to 230 years, with the majority of stands in the 90- to 140-year age classes. The age class curve is a bell-shaped curve with the greatest acreage in the 100-year class (Figure 4).

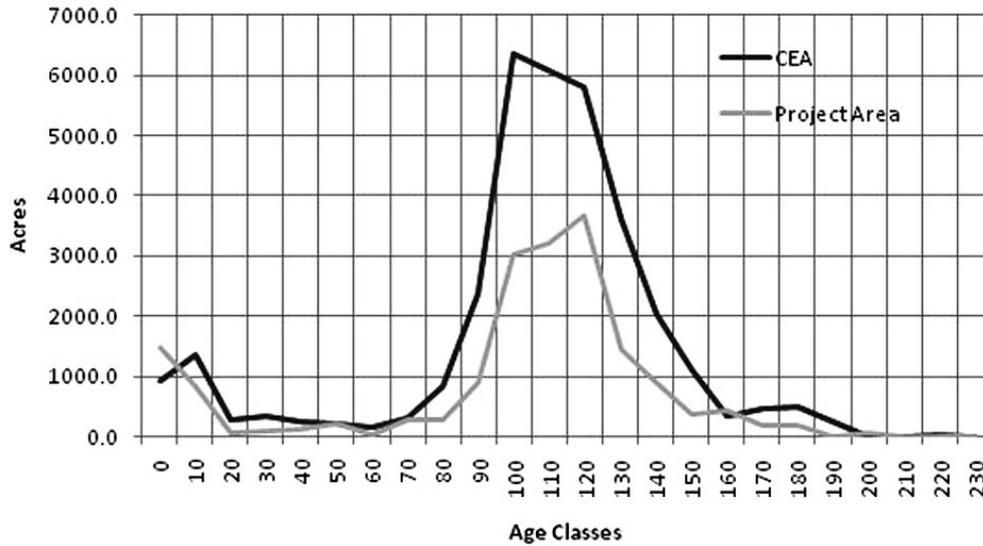


Figure 4. Cold Springs cumulative effects area age class distribution as compared to the project area

Under the no-action alternative, there would be no change to the current age class distribution throughout the CEA. In the event of a significant mountain pine beetle epidemic, however, most of the older and larger trees would be killed. This would shift the distribution in the CEA toward the younger age classes. The effect is similar to the structural stage discussion, above.

Stocking and Stand Density

Stocking Levels

As noted in the description of existing condition, many of the Cold Springs project area stands are above the desired stocking level of 70 square feet of basal area; 60 percent of them exceed 80 square feet of basal area. The situation across the CEA is similar, but slightly worse (Table 11). In fact, approximately 67 percent of stands within the CEA have stocking levels that exceed the forest plan desired condition of 70 square feet of basal area (as opposed to 59 percent of the project area).

Table 11. Comparison of percentage of project area and cumulative effects area stocking levels in square feet of basal area

Area	0 to 40 BA	40 to 80 BA	80 to 120 BA	Greater than 120 BA
Project Area	25%	16%	47%	13%
CEA	26%	10%	43%	21%

Within the CEA, other timber management activities completed in the past 5 years have effectively reduced stocking. Stands 1304-61 and 1304-62, for example, were treated with shelterwood establishment cuts under the Pond timber sale. Those stands are currently stocked (with trees larger than 5 inches d.b.h.) at 26 and 34 square feet of basal area, respectively. Many of the CEA stands that are at or below 70 square feet of basal area were treated with an establishment or overstory removal cut fairly recently. Those that have been thinned, especially

where the thinning took place more than a decade ago, are quickly returning to levels exceeding the desired 70 square feet of basal area. This is because thinning creates opportunities for increased growth immediately post-thinning (Sala et al. 2005). Stands 304-16 and 304-28, for example, were commercially thinned during the mid-1990s under the Stageyard timber sale. These stands are currently stocked at 100 and 87 square feet of basal area, respectively.

The cumulative effect of the no-action alternative under Cold Springs would be to leave project area stands above desired stocking levels (70 square feet of basal area), contributing to the overstocked condition of the entire watershed. Of course, as noted above, in the case of a mountain pine beetle epidemic, some of the CEA may achieve desired stocking rates through the work of the beetle.

Regeneration

As noted elsewhere in this report, natural regeneration in the Black Hills is generally reliable, and is not directly affected by the no-action alternative. While there may be an indirect risk regarding the effect of high-severity wildfire on regeneration associated with no action (Bonnet et al. 2005), the risk is likely to be very low (Lentile et al. 2005), and an attempt to quantify it would be highly speculative. As a result, there will be no further discussion of the cumulative effect of doing nothing on regeneration success within the CEA.

Modified Proposed Action Alternative

Direct and Indirect Effects

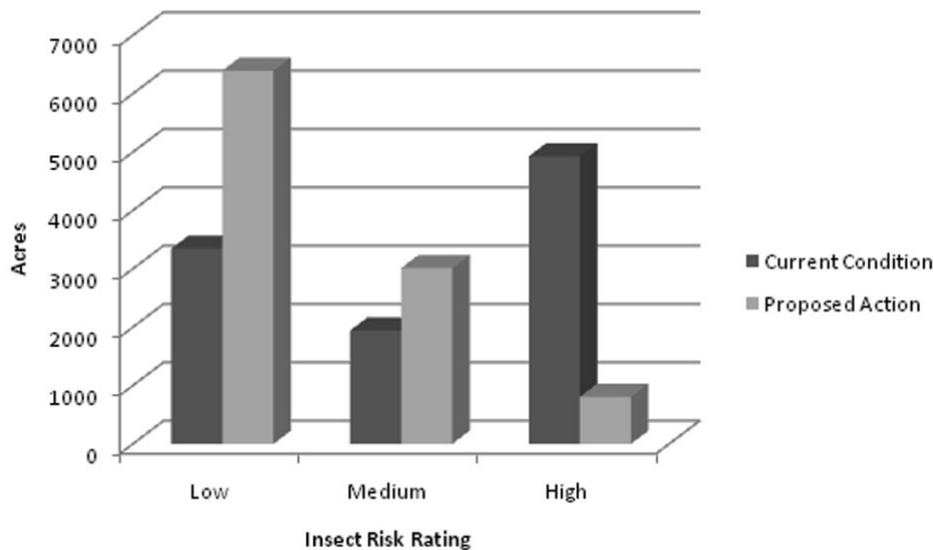
Forest Health

Insects and Disease

Thinning of forest stands can improve individual tree vigor and growth, as well as resistance to insects and disease (Amman and Logan 1998; Fettig et al. 2007; Fettig et al. 2010; Wallin et al. 2008). Thinning that opens the forest canopy may also reduce risk by altering the microclimate such that pheromone plumes are disrupted (Powell et al. 2000). As a result, forest entomologists and managers who have reviewed the Cold Springs stands, as well as those from other areas of the Black Hills have recommended silvicultural treatments to reduce insect risk (Allen 2010; Bobzien 2010). In fact, according to Schmid et al. (2007), the most important aspect of managing mature ponderosa pine stands in the Black Hills is minimizing mountain pine beetle-caused mortality through tree thinning. The approximately 4,400 acres of conifer thinning and shelterwood cuttings included in the modified proposed action would provide benefits associated with reduced competition on tree growth and vigor, while reducing the acres rated as high insect risk to fewer than 1,000 (Table 12). The resulting stands would be more resilient to future bark beetle outbreaks and would be moving toward the desired future condition (Figure 5).

Table 12. Insect risk ratings for ponderosa pine (in acres) under the proposed action

Risk Rating	Existing Condition	Proposed Action
Low	3,343 (33%)	6,392 (63%)
Medium	1,937 (19%)	3,009 (29%)
High	4,924 (48%)	804 (8%)

**Figure 5. Proposed action insect risk rating for Cold Springs pine stands as compared to the current condition**

The sanitation and salvage treatments would remove (and/or destroy) trees infested with mountain pine beetles, thereby reducing current insect populations. These techniques have been successfully used to suppress localized populations (Samman and Logan 2000). Allen and Ball (2010) concluded that removal of infested trees can help reduce local mountain pine beetle populations.

Salvage treatments involve the removal of infested trees from the stand. Objectives of this treatment are to suppress bark beetle populations in local pockets of activity and utilize the timber resource in the short period before it deteriorates (Lowell and Cahill 1996). Salvage treatments would not affect mortality rates nor would they reduce the susceptibility of stands to subsequent bark beetle attacks (Amman et al. 1985). Likewise, the proposed precommercial thinning would not influence current spruce beetle mortality rates.

Finally, the aspen release treatments would essentially eliminate any current risk from mountain pine beetle mortality with the removal of all the pine. In sum, management for aspen and structural conifer diversity would reduce the potential risk from bark beetle infestation, because dense stands of large-diameter conifers are those most susceptible to losses from beetle attacks.

Weather and Mechanical Damage

The proposed action is likely to help reduce the potential for snow and wind damage in overly dense stands by thinning to produce improved diameter growth (Wonn and O'Hara 2001).

Moreover, to ensure that treatments do not make some stands more susceptible to these damaging agents, some older, dense stands would be regenerated in two steps to give individual trees the opportunity to develop firmness. This includes the proposed 638 acres of shelterwood preparation, as well as the two-step shelterwood removals. These techniques are commonly used in the Black Hills (Boldt et al. 1983; Shepperd and Battaglia 2002).

Logging damage is generally minimized in operations on the Black Hills by the use of mechanical fellers and by careful skidding (Hartsough 2003). The project design features provide that felling and skidding are managed under the timber sale contract and approved by the Forest Service timber sale administrator. Likewise, achieving prescribed fire objectives while maintaining the health of existing trees has been extensively studied and documented for the Black Hills (Battaglia et al. 2008; Battaglia et al. 2009; Hood 2010). Moreover, the project design features ensure that prescribed fire would only be implemented under conditions defined in a burn plan. As a result, the proposed action is unlikely to have significant direct or indirect effects on tree damage.

Forest Composition

Ponderosa Pine

The modified proposed action calls for maintenance, thinning, shelterwood preparation, as well as regeneration establishment treatments in ponderosa pine. These treatments have been effective at providing for the continued presence of healthy stands of ponderosa pine in the Black Hills (Shepperd and Battaglia 2002). Implementation of the modified proposed action will not cause a significant change in the dominance of ponderosa pine cover types in the project area.

White Spruce

The inclusion of approximately 630 acres of single-tree selection in the modified proposed action is likely to favor the continued maintenance and expansion of spruce. Single-tree selection is an uneven-aged management system that promotes a variety of structural stages and compositional diversity. These treatments result in fewer canopy gaps and less mechanical disturbance than typical even-aged systems. As a result, shade-tolerant and mid-seral species such as white spruce enjoy a successional boost from these treatments (Graham and Jain 2005). On the other hand, the area proposed for these treatments is relatively small (approximately 5 percent of NFS lands within the project area), and selection cutting does provide some opportunity for ponderosa pine regeneration (Fiedler 1996). As a result, the effect of the proposed action on the areal extent of white spruce is unlikely to be significant.

Hardwoods

The release of approximately 570 acres of hardwoods (aspen/birch) from pine competition by the commercial and noncommercial removal of conifers is proposed in this alternative. Though the actual acreage of aspen will increase, it is anticipated that the increase will be less than 5 percent of the commercially treated pine acres. Consequently, no change of cover type from pine to aspen is anticipated. When applied to stands with an aspen cover type, all commercial and non-commercial pine would be removed from the stand. This will move the area toward the forest plan goal of increasing the aspen component, but it will not reach the goal of doubling the extent of aspen across the forest. The effects of this treatment will be an increase in vegetative diversity and increased vigor of hardwood communities by release from the competition of pine (Jones et al. 2005). Moreover, the project design features, such as the plan to cut and hinge all conifers within these units, will serve to protect aspen regeneration from excessive ungulate browsing.

Forest Structure

Under the modified proposed action, stand structure generally would change from a closed-canopy structure to an open-canopy structure. Approximately 3,400 acres would move from the more closed 4B and 4C structures to the open structures of 3A and 4A (Table 13 and Table 14). The 3A structure is generally created by shelterwood removal treatments, while commercial thinning and shelterwood preparation create 4A structures. These treatments are designed to reduce mountain pine beetle risk as well as fire hazard. This alternative is intermediate in its effect on moving the area toward the desired condition for structural stage; it is an improvement as compared to the no-action alternative, but it leaves a significant portion of the project area in structural stage 4A (Figure 6).

Table 13. Cold Springs pine structural stages for MA 4.1 under the proposed action

Structural Stage	Forestwide Objectives (percent)	Proposed Action (percent)
1	5	2.1
2	5	6.9
3A	10	7.2
3B	15	0.0
3C	5	0.0
4A	25	58.8
4B	25	16.6
4C	5	1.4
5	5	7.0

Table 14. Cold Springs pine structural stages for MA 5.1 under the proposed action

Structural Stage	Forestwide Objectives (percent)	Proposed Action (percent)
1	5	2.0
2	5	9.8
3A	10	3.6
3B	15	0.8
3C	5	0.3
4A	25	58.1
4B	25	20.1
4C	5	3.1
5	5	2.2

Structural stage 4A is characterized by larger trees and a more open canopy (less than 40 percent canopy closure) as compared to the other structural stages. As a result, 4A stands are generally rated at medium and low insect risk and moderate and low fire hazard, which is a significant improvement over structural stages 4B and 4C. This meets the purpose and need for this project. In addition, it is worth noting that many of the treatments are simply the first step in moving the project area toward the desired future condition. For example, treatments such as “shelterwood preparation” are designed to prepare the stand for future shelterwood treatments, which will have the effect of regenerating the stands and moving them into structures 3A and 3B. In other words, the bulge in structural stage 4A associated with the proposed action is not a static condition, but is

preparatory to moving a further percentage of the project area toward the desired future condition. Finally, the forest plan objectives are to be applied on a forestwide basis. An abundance of 4A in one small project area has a very tiny and temporary effect on the forestwide condition, which is currently close to the desired condition.

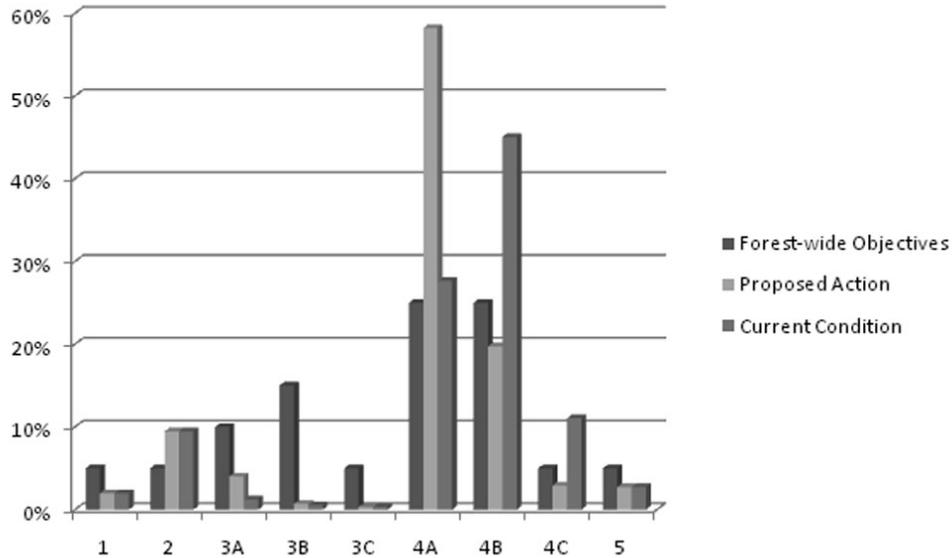


Figure 6. Proposed action structural stages for Cold Springs as compared to the current condition and the forestwide objectives

Structural Stage 4 with Very Large Tree Size

For MA 4.1 within Cold Springs, all of the stands that meet the structural stage 4 with very large tree size criteria are in structural stage 4A. As a result, these are relatively open stands of larger trees which have not been proposed for treatment under the Cold Springs Project. Because they will not be treated, the potential direct, indirect, and cumulative effects associated with MA 4.1 for structural stage 4 with very large tree size is the same as that described under the no-action alternative. The large tree objective as it relates to MA 4.1 will not be discussed further in this document.

Proposed actions in MA 5.1 structural stage 4 stands that meet the very large tree size requirement can generally be divided into two groups: First, even-aged regeneration treatments, such as shelterwood removals, and establishment cuts (especially where advanced regeneration is already present) are designed to remove the existing overstory and provide for growing space for seedlings and saplings. Where these are planned, the stands would likely no longer meet the structural stage 4 with very large tree size requirement. In addition, single-tree selection treatments, because they remove trees through all diameter ranges are likely to shift average tree diameters toward the lower size classes. The total acreage of structural stage 4 stands with very large tree sizes proposed for these treatments is 373. Second, stands that have been proposed for treatments designed to thin smaller trees and open the stand, either in preparation for shelterwood establishment or as an intermediate treatment, can be expected to retain the structural stage and large tree component required for this forest plan objective.

Finally, it should be noted that other structural stage 4 stands with “large” trees that do not currently qualify for the “very large” tree size objective might be moved into that group by treatments that thin from below and shift the composition of the stand toward trees that are 16 inches or greater. For example, stand 70503-23 is currently stocked with pine that averages 8 inches in diameter. It is proposed for treatments including a precommercial thin, as well as a commercial thinning from below. When modeled in FVS, the result is an average tree size of 15 inches, not enough to qualify as “very large,” but close enough to demonstrate that there may be a few stands that shift into the category as a result of treatment. Thus, the proposed action would result in approximately 14 percent of MA 5.1 in structural stage 4 with very large tree size, and with time, through growth, additional stands will become structural stage 4 with very large tree size (see Table 15).

Table 15. Structural stage 4 with very large tree size under the proposed action

Area	MA 5.1 Existing Condition	MA 5.1 Proposed Action
Black Hills National Forest	12% (45,688 acres)	12% (45,315 acres)
Cold Springs Project	19% (1,447 acres)	14% (1,074 acres)

Age-Class Distribution

Age-class distribution would improve in this alternative by removing the overstory on approximately 360 acres. In addition, the shelterwood establishment cuts on 1,290 acres should establish regeneration under the reserve trees, providing future young stands. In this alternative, there will be an increase in the younger, early-successional stages to better align with forest plan objectives. There will also be an increase in the sapling and pole age classes due to removal of larger and older pine to move toward forest plan structural stage objectives.

Stocking

In general, the desired condition for stocking is to have stand basal areas at or below 70 square feet per acre or less in pine stands. It is well documented that highly stocked stands are at greater risk from forest pests than those at lower stocking levels (Negron et al. 2008; Sartwell and Stevens 1975; Schmid and Mata 2005; Negron et al. 2009). More than 6,000 acres of pine (or approximately 60 percent) within the project area currently have basal areas exceeding 70 square feet of basal area. Under the proposed action, approximately 4,300 acres of these overstocked stands would be treated to reduce stocking to 70 square feet of basal area or less—thus meeting the desired condition on approximately 80 percent of the area. As an example, stands 1302-16 and 1305-5 were modeled using FVS to simulate stocking levels associated with the proposed action. For a comparison with the stocking conditions of these two stands under the no-action alternative, see Table 16.

Table 16. Example of overstocked stands under the proposed action alternative (basal area)

Stand	Size	Desired Stocking	Current Stocking	Proposed Action	Stocking 2020	Stocking 2030
1302-16	95 acres	70 feet or less	111 feet	Commercial thin to 70	84 feet	98 feet
1305-5	190 acres	70 feet or less	103 feet	Establishment cut to 30	44 feet	81 feet

Regeneration

Natural regeneration in the Black Hills is generally reliable and abundant (Boldt et al. 1983). Treatments that reduce canopy closure and disturb duff and litter layers are especially effective at providing for regeneration. Under the modified proposed action, thinning and regeneration treatments on approximately 4,400 acres would be expected to stimulate natural regeneration. This is especially true of the proposed establishment cuts (1,290 acres), which will substantially open the canopy (30 square feet of basal area) and will provide scarification to promote germination and seedling establishment. Moreover, project design features associated with the proposal specifically protect advanced regeneration and provide for site scarification through summer or early autumn logging. In addition, fuel treatments conducted after timber cutting, such as low-intensity prescribed fire, should have positive effects on natural regeneration in pine stands (Moghaddas et al. 2008; Peters and Sala 2008). Finally, monitoring of regeneration success will be completed under the Black Hills Monitoring Plan.

Snags

The modified proposed action includes sanitation and salvage of green mountain pine beetle-infested trees only. As a result, snags would not be directly affected by the proposal. Incidental removal may occur for safety purposes under the project design features, but this would not measurably reduce the current abundance of snags across the project area. Indirectly, taking actions to improve tree vigor and reduce mountain pine beetle susceptibility as proposed may reduce the future rate of snag recruitment. Because snags are, however, currently abundant at both the project and forest level, and because the mountain pine beetle epidemic is likely to continue killing trees across the forest, this potential indirect effect is not considered significant.

Cumulative Effects

Forest Health

Insects and Disease

Under the Cold Springs modified proposed action, thinning would improve tree vigor and resistance to insects or disease, sanitation and salvage would remove infested trees, and hardwood enhancement treatments would reduce the number of mountain pine beetle host species. As a result, the areal extent of stands rated as high insect risk would be reduced by approximately 4,100 acres. These improvements would provide a modest benefit across the CEA, reducing the areas rated as medium to high insect risk from 89 percent to 79 percent.

Forest Composition

Ponderosa Pine

Ponderosa pine dominates approximately 73 percent of the CEA. Many of the treatments under the modified proposed action are designed to improve the health of project area ponderosa pine stands. When added to several thousand acres of pine treatments across the CEA during the past 10 or 15 years, these treatments should have the effect of maintaining the dominance of pine throughout the area. Because implementation of the Cold Springs proposed action will not cause a significant change in the dominance of ponderosa pine cover types in the project area, there will be no cumulative effect.

White Spruce

There are approximately 5,590 acres of white spruce within the CEA, including about 850 acres in the project area. As noted in the discussion of direct and indirect effects, above, the effect of treating approximately 650 acres with single-tree selection is likely to favor white spruce slightly. The effect of the proposed action on white spruce composition has, however, been found to be insignificant. Without direct effects, there can be no cumulative effects.

Hardwoods

The hardwood regeneration and weeding treatments planned or implemented across the CEA total approximately 780 acres. Under the proposed action, Cold Springs would add approximately 630 acres, for a cumulative total of about 1,400 acres. This will move the CEA toward the forest plan goal of restoring the hardwood component, though it will not reach the goal of doubling the extent of aspen across the forest.

Forest Structure

As a direct effect of the modified proposed action, stand structures will move toward forest objectives, with the exception of structural stage 4A, which becomes increasingly over-represented in the project area. Likewise, across the CEA, the Cold Springs proposal has the effect of reducing the bulge of stands in structural stages 4B and 4C, closed-canopy stands, while increasing the proportion of 4A, open structured. As has been noted, this effect should reduce mountain pine beetle risk as well as fire hazard. It is also a temporary condition that is a step toward the desired future condition. Moreover, the effect across the CEA is essentially to provide a more balanced distribution of large tree conditions along with a modest reduction in the hazards associated with large areas of closed-canopy forests (see Table 17 and Table 18).

Table 17. Structural stages for MA 4.1 across the cumulative effects area under the proposed action alternative

Structural Stage	Forestwide Objectives (percent)	CEA Under the Proposed Action (percent)
1	5	0.9
2	5	6.1
3A	10	4.1
3B	15	3.5
3C	5	3.3
4A	25	30.3
4B	25	35.5
4C	5	11.3
5	5	5.0

Table 18. Structural stages for MA 5.1 across the cumulative effects area under the proposed action alternative

Structural Stage	Forestwide Objectives (percent)	CEA Under the Proposed Action (percent)
1	5	1.9
2	5	7.6
3A	10	3.1
3B	15	1.3
3C	5	1.1
4A	25	36.6
4B	25	34.7
4C	5	12.2
5	5	1.5

Structural Stage 4 with Very Large Tree Size

As noted above, stands across the cumulative effects area are currently meeting the forest plan goal for structural stage 4 with very large tree size. In MA 5.1, the percentage is currently approximately 14 percent. Under the Cold Springs proposed action, approximately 373 acres are proposed for treatments that would eliminate them from consideration under this objective. That reduction in acreage would change the approximate percentage in MA 5.1 across the CEA to 12 percent. As a result, it will continue to meet the forest plan objective.

Age Class Distribution

Age class distribution across the CEA will improve under the Cold Springs modified proposed action alternative by removing the overstory on approximately 360 acres within the project area. In addition, the shelterwood establishment cuts on 1,290 acres should establish regeneration under the reserve trees, providing future young stands. The cumulative effect of these changes will, however, be minor. For example, overstory removal will occur on just 1 percent of the CEA. This should be, generally, a beneficial effect in the CEA because there will be an increase in the younger, early successional stages to better align with forest plan objectives. The effect, however, will not be significant.

Stocking

As noted in the description of existing condition, many of the Cold Springs project area pine stands are in a fully stocked condition; 60 percent of them exceed 80 square feet of basal area. The situation across the CEA is similar but slightly worse; approximately 67 percent of pine stands within the CEA have stocking levels that exceed the forest plan desired condition. The cumulative effect of the proposed action alternative under Cold Springs would be to reduce the project area acreage that is stocked at levels beyond the desired condition of 70 square feet of basal area, contributing to a reduction in stocking across the CEA. This would have the effect of reducing the area of CEA pine stands that are stocked at over 70 square feet of basal area from around 64 percent of the watershed to approximately 48 percent of the watershed, moving the CEA toward the forest plan desired conditions (Table 19).

Table 19. Comparison of no-action and proposed action stocking levels across the cumulative effects area (in acres and percentages)

Action	0 to 40 basal area	40 to 80 basal area	80 to 120 basal area	Greater than 120 basal area
No	7,786 (26%)	3,111 (10%)	12,980 (43%)	6,344 (21%)
Proposed	10,191 (34%)	5,541 (18%)	9,198 (30%)	5,308 (18%)

Regeneration

Under the discussion of direct and indirect effects, above, it was noted that treatments that reduce canopy closure and disturb duff provide for abundant regeneration in the Black Hills. The cumulative effect of the Cold Springs Project would be to add approximately 4,400 treated acres to the treatment total for the CEA. While this is likely to provide some additional benefits in terms of regeneration success, the effect is relatively insignificant since natural regeneration is generally reliable and abundant throughout the Black Hills.

Summary and Comparison

The modified proposed action includes forest vegetation treatments that would reduce stocking and corresponding risk of mountain pine beetle attack across approximately 4,904 acres (40 percent of forest stands on National Forest System lands within the project area). In addition to reduced stocking, proposed treatments would increase stand age-class and species diversity, which reduces the amount of host material that would be susceptible to mountain pine beetle attack at any given time. Sanitation and salvage treatments would also decrease mountain pine beetle populations.

Insect risk for ponderosa pine stands would be reduced. Table 20 displays the existing (no-action alternative) insect risk and the insect risk following treatments under the modified proposed action.

Table 20. Insect risk ratings for ponderosa pine (in acres) under the proposed action

Risk Rating	Existing Condition	Proposed Action
Low	3,343 (33%)	6,392 (63%)
Medium	1,937 (19%)	3,009 (29%)
High	4,924 (48%)	804 (8%)

Treatments that reduce stocking would shift approximately 3,400 acres of forest from structural stages 4C and 4B to structural stage 4A or 3A.

Age class distribution would improve by removing the overstory on approximately 360 acres. In addition, the shelterwood establishment cuts on 1,290 acres should establish regeneration under the reserve trees, providing future young stands.

Approximately 570 acres of hardwoods would be released from pine competition and 630 acres of single-tree selection would favor the maintenance and expansion of white spruce.

The sanitation and salvage treatments would remove (and/or destroy) trees infested with mountain pine beetles, thereby reducing current insect populations. Sanitation and salvage treatments could take place across all project area forest stands

The modified proposed action would not directly affect project area snag numbers, with the exception of incidental removal for safety purposes.

Fire and Fuels

Introduction

This section discusses the environmental consequences of the no action and modified proposed action on project area fire hazard, fire regime and condition classes. It summarizes the Cold Springs Fire and Fuels report (Lewis 2011), which is located in the Cold Springs project file.

Fire Regime and Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

- I – 0 to 35-year frequency and low- (surface fires most common) to mixed-severity (less than 75 percent of the dominant overstory vegetation replaced);
- II – 0 to 35-year frequency and high (stand-replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- III – 35- to 100+-year frequency and mixed-severity (less than 75 percent of the dominant overstory vegetation replaced);
- IV – 35- to 100+-year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- V – 200+-year frequency and high (stand-replacement) severity.

Three Fire Condition Classes categorize and describe vegetation composition and structure conditions that currently exist inside the Fire Regime Groups. Based on the coarse-scale national data (Schmidt et al. 2002), they serve as generalized wildfire risk rankings. The risk of loss of key ecosystem components from unwanted wildland fire increases from Fire Condition Class 1 (lowest risk) to Fire Condition Class 3 (highest risk).

Condition classes are a way of categorizing how much key ecosystem components such as species composition, structural stage, and stocking level have changed in an area due to changing fire regimes.

There are three condition classes:

- Condition Class 1: Fire regimes are within an historical range and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within their historical range.
- Condition Class 2: Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased), resulting in moderate changes to one or more of the following: fire size, intensity and severity and landscape patterns. Vegetation attributes have been moderately altered from their historic range.

- Condition Class 3: Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.

Fire Regime Condition Class (FRCC) is a composite of fire regimes and condition classes stated above. As noted in the Interagency Fire Regime Condition Class (FRCC) Guidebook (2008), FRCCs are used to describe general fire regime and vegetation traits for the historical (reference) versus current periods to produce departure estimates.

The Black Hills ponderosa pine forest is recognized as classic Fire Regime 1. There are ample historic examples of the relatively frequent, low-intensity fires and the resulting vegetative structure. Historically, a given acre of forest would have burned every 10 to 40 years. With the shortest return intervals on the dryer pine sites. The Cold Springs project area is dominated by ponderosa pine sites, although there are stands that are classified as aspen, grass, and white spruce.

Fire Hazard

Fire hazard generally refers to the difficulty of controlling potential wildfire. It is commonly determined by fire behavior characteristics such as rate of spread, intensity, torching, crowning, spotting, fire persistence and by resistance-to-control.

Flame length and fire type are two important aspects of fire behavior because they determine what type of firefighting resources are needed, and what kind of resistance to control there will be. The Black Hills National Forest utilizes a matrix to designate fire hazard ratings based upon forested structural stage, species, and average tree size diameter. The forest utilizes a similar matrix to determine post-treatment fire hazard ratings based upon specific silvicultural treatments and whether additional fuel treatments such as prescribed burning follow. The rating system is a convenient way to express the overall hazard of fuels conditions in the area, taking into account the full fuels complex including surface, ladder, and canopy fuels. The nature of the rating system is such that flame length and anticipated fire type are incorporated into the rating. As such, a Low rating would mean that the anticipated fire type is surface and flame lengths are considered low.

The Wildland-Urban Interface

The wildland-urban interface (WUI) is the zone where human developments meet or intermingle with undeveloped wildlands. For the purposes of this analysis, the ½-mile buffer is regarded as lands within the designated WUI. There are 57 homes within or directly adjacent to the project area boundary. In addition, there are an additional 26 occupied structures within 2 miles of the project area.

Spatial and Temporal Context for Effects Analysis

The area considered for cumulative effects is the project boundary. This area was selected because collective activities within this area can modify fire behavior. Although the effects outside this boundary could notably influence fire behavior, the spatial magnitude (size) of this boundary was determined quite adequate from a fire management perspective. The existing condition reflects the effects of past activities, including fire suppression. Fuel models and stand conditions reflect the changes associated with activities affecting fire hazard, fire regime and condition class up to the present.

No-Action Alternative

Direct/Indirect Effects

Future fire activity and severity in the Cold Springs project area will depend on a number of interacting factors, including the amount of mortality, vegetation, environmental conditions, and the time from the mortality occurring to a fire's occurrence. The likelihood of an ignition occurring (risk) is not likely to be affected to a measurable degree between either alternative in the Cold Springs Project. Because the level of insect-caused mortality in the future is not known, the exact changes to the future fuel loading and stand structure is not a precise measurement. Therefore, projecting fire hazard for no action is based upon current conditions.

Under the no-action alternative, no activities would occur and no silvicultural or fuels reduction treatments would be implemented. There would be no treatment of surface, ladder, or canopy fuels in either the WUI or areas beyond the ½-mile designated WUI area. Based on current stand conditions, much of the area is rated as having a High or Very High fire hazard rating (see Table 21). This hazard will increase over time, with growth, due to increasing levels of surface, ladder, and canopy fuels.

Table 21. Existing project area fire hazard rating on National Forest System lands

Existing Fire Hazard		
Rating	Acres	Percent of project area
Low	1,493	13
Medium	3,460	28
High	5,222	42
Very High	2,144	17

Currently, approximately 59 percent of the project area pine stands have a High or Very High fire hazard rating (see Table 21). Under no action, there would be no opportunity to reduce the fire hazard rating as directed under forest plan objective 10-01, or in accordance with the national fire plan. There would be no removal or treatment of available fuels to reduce the fire hazard to meet this standard.

WUI areas would continue to have excess amount of areas in High to Very High fire hazard ratings (see Table 22). As such, the forest would not be responsive to the Lawrence County Community Wildfire Protection Plan, nor would it meet the direction for WUI areas under forest plan objective 10-01. Currently 60 percent of the WUI area within the Cold Springs Project is rated as having a High or Very High fire hazard rating.

Table 22. Existing project area WUI fire hazard ratings on National Forest System lands

Existing WUI Fire Hazard		
Rating	Acres	Percent of WUI
Low	154	13
Medium	323	27
High	359	30
Very High	370	30

Fire regimes have been significantly altered from their historical range within the project area. The risk of losing key ecosystem components is high. Fire history for the project area shows that fire frequencies have departed from historical frequencies by multiple return intervals. This has the potential to result in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range. With the exception of the more recent mechanical treatments, most of the project area would remain in Condition Class III. There would be no improvement in the amount of lands that are in a more resilient condition class.

Cumulative Effects

The cumulative effects area has been managed through activities such as logging, most notably from the 1990s and 2000s. Past activities include a variety of prescriptions associated with several projects such as commercial thinning and precommercial thinning. A variety of treatment methods have included mechanical piling, hand piling, and prescribed burning.

The existing condition reflects the effects of past activities, including fire suppression. Fuel models and stand conditions modeled reflect the changes associated with activities affecting fire behavior and hazard up to present.

Under the no-action alternative, the cumulative effects of past management actions and the continuation of fire suppression without management action, combined with vegetation growth and tree mortality, would result in the area trending toward increasing fire hazard.

Modified Proposed Action

Direct and Indirect Effects

The modified proposed action would reduce stocking and fuels on approximately 5,144 acres. Proposed treatment activities would reduce surface fuels, remove ladder fuels, and decrease tree crown density. Trees of commercial size would be whole-tree yarded, pile and burned at central landings. Under this alternative, post treatment conditions would result in substantially reduced fire hazard ratings over a substantial portion of the project area. Generally speaking, the treated units would have reduced fire hazard, resulting in less fire intensity, torching, and severe crown fire. The most notable change is the reduction of acres from Very High to Low.

Thinning from below would reduce the ladder fuels in ponderosa pine stands. The larger trees that remain on the site will be more resistant to fire due to decreased flame lengths from the removal of ladder fuels. The decreased density would be less likely to support running crown fires.

Mechanical whole-tree harvest removes much of the activity fuels, depositing them at central processing landings for treatment. Stands that have had whole-tree harvesting treatments have a lower fuel hazard due to reduced 3-inch and less fuel, and reduced canopy density and ladder fuels. These cutting practices also create fuel conditions suitable for conducting low-intensity prescribed burning (USDA Forest Service 1996). Commercial timber harvest utilizing whole-tree harvesting is common throughout the Black Hills and the predominant harvest method.

Lop and Scatter – Lopping and scattering may be needed to facilitate prescribed burning. Felled trees and shrubs would be limbed, lopped, and bucked using chainsaws so that slash would lie close to the ground, then the slash would be spread more or less evenly over the ground.

Slashing – This method of thinning trees and shrubs would involve the use of chainsaws to create a prescribed spacing. Given site-specific treatment needs, slashing may be required where a close spacing of remaining plants is desired and specific species are retained or removed. In the WUI defense zone space (0 to 300 feet), shrubs (juniper) would be thinned to a minimum horizontal distance between individual or small clumps of shrubs, depending upon the slope. Horizontal spacing would vary, based on shrub density and slope.

Prescribed Fire – Broadcast burn would be used to:

- minimize the potential for unwanted wildfires by reducing surface and ladder fuels and breaking up contiguous vegetation,
- help restore historic fire patterns and frequencies, and
- help improve forest health, wildlife habitat, meadows, and aspen regeneration.

Burning would be accomplished by applying low- to moderate-intensity fire using hand, mechanical, or aerial firing methods. Prescribed burning would be accomplished when conditions are favorable and risk of fire escape is low. All burning will take place under the guidelines set forth in a prescribed fire burn plan developed specifically for all burning activities within the project area. Prescribed burn plans will address parameters for weather, air quality, contingency resources, and potential escapes.

There is a large body of literature that makes the case for treating the various strata of fuels. According to Graham et al. (2004), “Qualitative observations, limited empirical data, and modeling provide the scientific basis for identifying how forest structure can be modified to reduce fire hazard and modify fire behavior. Additionally, research shows that when activities reduce surface fuels (low vegetation, woody fuel, shrub layer), those activities decrease the chances that surface fires will be able to ignite ladder fuels and canopy fuels (Weaver 1955, Cooper 1960, Biswell 1960, Biswell et al. 1973, Martin et al. 1989, Pollet and Omi 2002). The most effective strategy for reducing crown fire occurrence and severity is to (1) reduce surface fuels, (2) increase height to live crown, (3) reduce canopy bulk density, and (4) reduce continuity of the forest canopy (Van Wagner 1977, Agee 1996, Graham et al. 2004, Scott and Reinhardt 2001, Cruz et al. 2003).”

Science-based literature indicates the most appropriate fuel treatment strategy is often thinning (removing ladder fuels and decreasing crown density) followed by prescribed fire, piling and burning fuels, and mechanical treatments. These treatments would provide maximum protection from severe fires in the future.

The modified proposed action would result in a substantial reduction in the number of acres with a High or Very High fire hazard rating. Guidance under forest plan 10-01 would be met. Not only would a greater percentage of the area be moved out of the High and Very High rating category, but much of it would be moved into the Low rating. Fire hazard ratings for the project area are projected to have only 27 percent of the area in High or Very High rating, and 42 percent would be rated as Low (Table 23) The anticipated lower flame lengths and surface fire activity would mean that firefighters have a higher probability of successfully performing direct attack on the fire, thus minimizing fire size, cost, while increasing firefighter safety.

Table 23. Post-treatment fire hazard ratings for the project area

Post-Treatment Project Area Fire Hazard		
Rating	Acres	Percent of project area
Low	5,200	42
Medium	3,879	31
High	2,080	18
Very High	1,159	9

Treatment in WUI areas would meet forest plan guidance under 10-01 as well. A total of 1,205 acres would be treated within the designated WUI area. This would move the area to only 27 percent having a High to Very High rating (Table 24). This alternative reduces the number of acres in the High and Very High rating by more than half.

Table 24. Post-treatment fire hazard ratings for WUI

Post-Treatment WUI Fire Hazard		
Rating	Acres	Percent of WUI
Low	449	37
Medium	433	36
high	146	12
Very High	177	15

The changes in stand structure, density and composition as well as the reduction in fuels under this alternative would move more lands within the project to a more resilient condition class according to the guidelines given in the Forest Plan Phase II final environmental impact statement (FEIS) (table B-5). The resulting changes mean that approximately 1,289 acres would be moved to a structural stage resembling Condition Class I, and approximately 3,466 acres would resemble the stand structure associated with Condition Class II.

Cumulative Effects

The existing condition reflects the effects of past activities, including fire suppression. Fuel models and stand conditions modeled reflect the changes associated with activities affecting fire behavior and hazard up to present.

Modified proposed action treatments would reduce the effects of aggressive suppression and enhance past management effects by reducing the fuels available for burning. Previous and ongoing activities in the area have reduced the overstory fuels as well as much of the ladder fuels, thereby reducing the fire hazard rating. The reduction in crown fire potential means that a greater portion of the area would meet the Black Hills Land and Resource Management Plan objective 10-01, as well as national and local direction contained within the Lawrence County Community Wildfire Protection Plan.

Summary and Comparison

The modified proposed action reduces the area with High and Very High hazard ratings substantially. There would be 32 percent less acres in the project area with these ratings (see

Table 25). Within the WUI, there would be 33 percent less acres in the High and Very high rating (see Table 26).

The no-action alternative would not meet either national or forest direction for the treatment of fire hazard in either the WUI or for project area National Forest System lands. The modified proposed action would meet national direction as well as meeting forest direction. Not only would a substantial amount of the acres be moved out of the High and Very high category in both areas, but a large portion of that would be converted to stands that have a Low rating. The amount of acres in the low category would be increased by 29 percent in the project area (see Table 25), and by 24 percent within the WUI (see Table 26).

Table 25. Comparison of project area National Forest System land hazard ratings by alternative

Project Area acres				
Fire hazard rating	No action		Modified proposed action	
	Acres	Percent	Acres	Percent
Low	1,493	13	5,200	42
Medium	3,460	28	3,879	31
High	5,222	42	2,080	18
Very High	2,144	17	1,159	9

Table 26. Comparison of project area National Forest System land hazard ratings by alternatives for WUI

WUI acres				
Fire hazard rating	No action		Modified proposed action	
	Acres	Percent	Acres	Percent
Low	154	13	449	37
Medium	323	27	433	36
High	359	30	146	12
Very High	370	30	177	15

Wildlife

Introduction

This section discusses the environmental consequences of no action and the modified proposed action on wildlife resources. It summarizes the Cold Springs Project Wildlife Resource Report (Moser 2011b) and the Cold Springs Biological Evaluation for Wildlife and Fisheries (Moser 2011a), which are located in the Cold Springs project file.

Wildlife Habitat

No-Action Alternative

Direct and Indirect Effects

The direct effects of the no-action alternative would be minimal, as no new actions would occur. Long-term, indirect effects would vary depending on habitat type. Indirect effects would occur as a response to current conditions in the absence of active management, other than fire suppression efforts. In general, the no-action alternative would maintain existing habitat and protect biodiversity in the short term. Long term, the proportion of ponderosa pine and white spruce cover type in the Cold Springs project area would be expected to rise as these species continued to encroach into existing meadows and hardwood stands. Early-successional habitats would continue to decline as pine stands continue to progress toward later seral stages. Currently, late-successional habitat (structural stage 5) is below management objectives within the project area and forestwide. Over the next 10 to 20 years, some of the mature stands could further develop toward late-successional habitats. However, this alternative would not result in a variety of successional stages in ponderosa pine, which would reduce habitat and structural diversity and not comply with Forest objectives. Natural disturbances such as wildfire and beetle outbreak would continue to return portions of the forest in which they occur to early-successional stages. However, the no-action alternative would greatly increase the chances of high-intensity wildfire, insect, and disease events. These events could create more forest openings, favor hardwoods, and return ponderosa pine habitat to an early seral condition. Effects by project area habitat types are described in Table 27.

Table 27. No-action alternative - direct and indirect effects to habitat

Habitat Type	Direct effects for the no-action alternative	Indirect effects for the no action alternative
Ponderosa Pine	None	In the absence of active management, additional dense, late-successional stands with closed canopy would develop. The amount of snags is likely to increase with forest succession. These stands would have an increased risk of mountain pine beetle infestation and high-intensity wildfire. These events could create more forest openings, favor hardwoods, and increase early seral ponderosa pine habitat.
White Spruce	None	In the absence of active management, white spruce as a component of the ecosystem would likely continue to increase within its ecological limits.
Hardwood Communities	None	In the absence of active management, conifer encroachment would continue to reduce areas dominated by aspen. However, insect-caused mortality could increase hardwoods.
Grassland/ Meadows	None	In the absence of active management, conifer encroachment would continue to reduce meadow habitat.
Riparian/ Aquatic	None	Stream fragmentation by existing dams and roads would continue to persist. Water quality would continue to be influenced by ongoing Federal/non-Federal activities.

Cumulative Effects

A century of fire suppression has caused widespread alteration and degradation of wildlife habitat in the Black Hills (USDA Forest Service 2005a). Frequent recurring disturbances like wildfire and insects maintained a generally open, mature pine canopy with productive and diverse understory by thinning pine stands and creating open stands with abundant grasses, forbs, and shrubs in the understory (Sieg and Severson 1996). In the absence of frequent low-intensity fires, the increase in the density and canopy cover of pine stands has resulted in large, contiguous expanses of higher density trees with abundant pine regeneration and sparse understories (Parrish et al. 1996). Fire suppression has also resulted in the conversion of hardwood stands such as aspen and bur oak to pine, which has reduced diversity (Uresk and Severson 1998).

No new activities would occur under the no-action alternative, and the conditions described above would continue in the absence of active management, into the foreseeable future. The cumulative effects of no action on wildlife habitat would be similar to the indirect effects described above.

Modified Proposed Action

Direct and Indirect Effects:

The modified proposed action is designed to reduce the threatened mountain pine beetle epidemic by moving toward the Forest objectives for structural stage management. In general, there would be short-term impacts to wildlife habitat availability during treatments; however, over the long term, there would be improved diversity of habitats and improved quality of most habitats. As a result of the hardwood enhancement treatments, there would be an increase in the amount and quality of hardwood habitat (primarily aspen). Commercial and noncommercial hardwood enhancement treatments would occur on 572 acres.

There would be an increase in the diversity of understory plants within many pine stands due to reduced forest canopy cover and disturbance caused by broadcast burning and logging. Nearly 28 percent (3,541 acres) of the treatments on National Forest System (NFS) land within the project area would have a precommercial thinning and/or a broadcast burn component under this alternative. In addition, emergency sanitation and salvage harvest treatments may occur in sites with beetle infestation. Sanitation and salvage harvest would be implemented only where deemed necessary to control the spread of mountain pine beetles. These treatments would help to limit the spread of beetles and would open up these stands and result in more sunlight, moisture, and nutrients being available for understory plants including grasses, forbs, and shrubs. Inclusions of aspen, birch, and oak within these pine stands may also benefit from these treatments. Disturbance created by broadcast burning would also help stimulate the regeneration of the less shade-tolerant plant species within these stands. No new system roads would be constructed to access sanitation and salvage harvest units.

Most of the proposed treatments within the project area ponderosa pine stands would have an effect on the stand structural stage. Table 13 and Table 14 display the proportion of each structural stage in MA 5.1 and 4.1 following the treatments proposed under the proposed action alternative. Additional discussion regarding treatment effects on project area structural stages can be found in the "Forest Resources" section of this document. The modified proposed action would include an estimated 4 miles of new NFS road construction, 2.4 miles of currently unclassified roads would be added to the system, 7.8 miles of temporary roads construction, and 48.1 miles of system road reconstruction. These system roads would need to be prepared for use. Preparation could range from minimal maintenance activities to reconstruction of the road template, depending on the

current condition of the road. The loss of habitat to road construction is unknown, but Rowland et al. (2004) using elk habitat, stated that it is often estimated at 5 acres per linear mile (Rowland et al. 2004). There would likely be some effects from disturbance during project implementation. System roads that undergo pre-use maintenance or reconstruction would remain on the system and allowable uses would be determined by the forestwide travel management plan. No indirect disturbance impacts from public use of newly constructed roads are expected after the project is finished because newly constructed or temporary roads would be closed following completion of management activities. The method of closure will depend on site conditions and be determined at the time of closure. In addition, 2.3 miles of existing NFS roads are proposed for decommissioning in an effort to improve watershed conditions. Closure methods for these roads would also depend on site conditions.

Effects to riparian/aquatic habitat are summarized in Table 28. These effects are mitigated through the use of the forest plan standards and guidelines, Region 2 Watershed Conservation Practices Handbook (WCPH; Forest Service Handbook 2509.25) and South Dakota Forestry Best Management Practices (BMPs). The Handbook contains proven watershed conservation practices to protect soil, aquatic, and riparian systems. If used properly, the watershed conservation practices will meet applicable Federal and State laws and regulations, including State BMPs. A summary of the relevant WCPH direction is in the Cold Springs Project Soil and Hydrology Resource Report (Maloney 2011).

Effects to habitats due to the treatments proposed in the modified proposed action are provided in Table 28. Relevant forest plan standards and objectives are met by the use of specific design criteria applied to mitigate the impacts in the project area.

Table 28. Modified proposed action - direct and indirect effects to habitat (A: no action, B: modified proposed action)

Habitat Type	Direct Effects for Alternative B	Indirect Effects for Alternative B
Ponderosa Pine	Commercial and noncommercial treatments to approximately 5,144 acres, which includes 1,698 acres of prescribed burning. Treatments include the removal of 831 acres of mature, dense forest (4C).	Reduction of pines in structural stage 4A, and 4B and increase in structural stages 3A, 3B and 3C for both MAs, moving toward forestwide structural stage objectives. Long-term movement toward all structural stage objectives, including structural stage 5.
White Spruce	A small reduction of spruce in pine habitat as a result of pine and hardwood treatment activities. Very little active management in spruce-dominated habitat. Some treatments will occur in pine/spruce ecotones.	Overall change in acreage of spruce would be minimal. White spruce as a component of the ecosystem would likely continue to increase within its ecological limits.
Hardwood Communities	628 acres of primary and secondary treatments in aspen stands with commercial and noncommercial treatments (conifer removal) and prescribed burn.	Increase in quantity and quality of hardwood habitat due to reduced conifer competition.

Table 28. Modified proposed action - direct and indirect effects to habitat (A: no action, B: modified proposed action)

Habitat Type	Direct Effects for Alternative B	Indirect Effects for Alternative B
Grassland/ Meadows	Direct effects from prescribed burning: reduced conifers.	Enhancement of meadow habitat.
Riparian/ Aquatic	Direct effects would be limited to those incurred by new road stream crossings. Effects would include habitat loss at the crossing and short-term habitat loss in the vicinity of the road crossing during construction.	Bank stabilization may decrease and sedimentation may increase due to stream crossings (refer to Hydrology Report). There is also the potential for short-term impacts from sedimentation during treatment activities.

Cumulative Effects

Past and present actions are reflected in the existing condition. This analysis is bounded by the Northern Hills Ranger District boundary and the 15-year period required for project implementation. Relevant actions on Federal and non-Federal land assessed in the analysis are discussed below. A century of fire suppression has caused widespread alteration and degradation of wildlife habitat in the Black Hills (USDA Forest Service 2005a). Frequent recurring disturbances like fire and insects maintained a generally open, mature pine canopy with a productive and diverse understory by thinning pine stands and creating open stands with abundant grasses, forbs, and shrubs in the understory (Sieg and Severson 1996). In the absence of frequent low-intensity fires, the increase in the density and canopy cover of pine stands has resulted in large, contiguous expanses of higher density trees with abundant pine regeneration and sparse understories (Parrish et al. 1996). The action alternative is expected to offset some effects of fire suppression. The net cumulative effect is expected to offset the loss of open, mature pine habitat with a productive understory.

Fire suppression has also resulted in the conversion of hardwood stands such as aspen and bur oak to pine, which has reduced diversity (Uresk and Severson 1998). The action alternative is expected to have a positive cumulative effect on hardwood habitat which may offset some conversion to pine that has occurred as a result of fire suppression. Encroachment of pine into meadows and riparian areas has reduced grass, forb, and shrub availability. The increased biomass of pine has changed hydrologic conditions and decreased available water within the watersheds.

The project area has been logged intermittently for the last 130 years. Logging has had multiple effects on the project area. Logging has created single-story stands of mature trees and multi-level pine stands with both immature and mature pine. The Cold Springs Project would continue this condition, however, with an increase of individual tree selection treatments aimed at increasing multi-level pine stands on the District. Mixed pine-hardwood stands have also developed due to a proliferation of aspen in the understory as the mature pine canopy is removed. The Cold Springs Project is expected to reduce the incremental impacts of past sales by implementing hardwood enhancement treatments.

Invasive weeds have also spread as a result of past and ongoing harvest activities, recreational activities, and livestock grazing. Treatment of invasive weed infestations with herbicide has controlled the spread of weeds in many of these areas. The Cold Springs Project is expected to incrementally increase the spread of invasive plants, but most increases will be mitigated through post-harvest weed treatments.

Several timber sales are planned or are ongoing on the Northern Hills District. They include sales associated with various planning areas, none of which overlap with the Cold Springs project area. Treatments in these areas will primarily affect the ponderosa pine cover type, and will result in the decrease of pine cover and density throughout these project areas. Pine habitat, both mature and immature, will be decreased, forested habitat will be fragmented, and hardwood stand development, as well as grass, forbs, and shrub habitat will be encouraged and increased. These effects should be long term (more than 30 years). The Cold Springs Project is expected to have similar impacts within the Cold Springs project area, which is expected to incrementally add to these effects across the district.

Grazing has been a continuous activity in the project area for over 100 years, and is expected to continue into the foreseeable future. Historically, however, there were larger numbers of both cattle and sheep grazing in the project area. Pasture fences did not exist, so livestock were not rotated between pastures and use was season long. In some instances, livestock grazing converted native riparian plant species to bluegrass, spread noxious weeds, altered stream banks in site-specific locations, consumed water, reduced fine fuels, and reduced the diversity of plant species. As grazing practices have improved, fences have controlled livestock distribution and altered the use of specific areas. Water developments at several springs have also changed grazing patterns. These improvements in practices have generally lessened the impacts across the project area. There would be no additional incremental impacts from the Cold Springs Project.

Historic and ongoing mining, grazing, logging, recreational and road-related activities have influenced stream habitat conditions within the project area. The Cold Springs Project will not cause additional influence on stream habitat conditions.

Direct mortality from wildlife/vehicle collisions could occur in the modified proposed action. Direct mortality is expected to affect individuals and is not expected to put populations at risk. In general, the more motorized routes and motorized use in wildlife habitat, the more potential there is for wildlife/vehicle collisions. The most effects on wildlife from motorized recreation are likely to come in the form of disturbance as a result of route or area use. The miles of motorized routes and the amount of area open to motorized travel were used to evaluate the level of effects to wildlife, in general, and were analyzed recently for the forestwide travel management plan.

Motorized vehicles have damaged roads and riparian areas when conditions are wet or in cases where streams were crossed. The use of some open roads, particularly during wet periods, has also contributed to the establishment of noxious weeds, and the erosion and degradation of riparian areas due to increasing sedimentation and changes in stream morphology. Increased use by all-terrain vehicles (ATVs) can be expected, but would be focused on roads and trails designated by the forestwide travel management plan, and are likely to continue to degrade wildlife habitat both directly and due to habitat fragmentation.

Snags have been reduced within harvest units due to safety concerns for loggers and development of roads, skid trails, and other activities. The Cold Springs Project would have additive impacts if some snags are removed for safety reasons. Fuelwood gathering has decreased the number of snags, particularly adjacent to roads where the wood can more easily be hauled out. Some

incremental additive impacts are to be expected from fuelwood gathering due to greater public access, however, this project does not authorize fuelwood gathering and most new roads would be closed after project completion. Wildfires, drought, and beetle activity have increased the overall number of snags in and around the project area.

Snags can be classified as hard or soft depending on the state of decomposition. A hard snag is a dead or partially dead tree composed primarily of sound wood, particularly sound sapwood. A soft snag, usually created by mountain pine beetle infestation, is a snag composed primarily of wood in advanced stages of decay and deterioration, particularly in the sapwood (outer) portions (USDA Forest Service 1996). Lentile et al. (2000) reported that after 5 years, rapid deterioration left soft snags susceptible to high winds, with an average life expectancy of 10 years. Schmid et al. (2009) report the rate and height of breakage in mountain pine beetle-killed trees indicates that they are unlikely to persist as suitable snags for more than 5 to 10 years after infestation.

Private lands within and adjacent to the Cold Springs project area contain habitat for wildlife and; therefore, their management can have impacts on wildlife. Resource management and conservation by private citizens and companies depends on a number of factors (e.g., desired goals, market prices, development potential), making it difficult to predict future trends in private forest structure and diversity. Landowners could treat forests for lumber, which could reduce habitat for some species. Fire hazard reduction activities are likely to increase on some of these lands over the next 15 years in an effort to prevent loss of homes from wildfire, which could result in additional loss of habitat. It is assumed that urban development and other activities would continue on private lands. This would likely increase the importance of habitat located on NFS land.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) provides a list of Federally Threatened (T), Endangered (E), Proposed (P), Candidate (C) species and Nonessential/Experimental Population (XN) via their South Dakota Field Office Internet site (USFWS 2011, most recent update 21 December 2010). Listed species that occur in Lawrence County are the whooping crane (*Grus americana*) (E) and Sprague's pipet (*anthus spragueii*) (C). No known occurrences or suitable habitat for the whooping crane or Sprague's pipet occur within the Cold Springs project area or the Northern Hills Ranger District. The Forest Service has also conducted additional consultation with the USFWS (Twiss 2003). Based on past consultation and the species list, it is determined that no currently listed species with T, E, P, C, or XN status have the potential to occur within the Northern Hills Ranger District on the Black Hills National Forest, nor has "critical habitat" been designated for any T or E species on the Forest. Sprague's pipet, a grassland obligate species, is not likely to occur in the Black Hills. Therefore, no federally listed species are addressed further in this document, and there will be "no effect" to threatened and endangered species and no impact to critical habitat.

Region 2 Sensitive Species

Sensitive species (SS) are those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by "significant current or predicted downward trends in population numbers or density" or "significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution" (FSM 2670.5).

The most recent region 2 sensitive species wildlife list (FSM R-2 Supplement 2600-2009-1, effective June 9, 2009) was reviewed, and species that may occur in or near the Black Hills were identified. Table 6 in the Cold Springs Project Wildlife and Fisheries Biological Evaluation (Moser 2011a) describes the region 2 sensitive species likely to occur on the Black Hills National Forest. Although each of these species are known to or could potentially occur in or near the Black Hills, not all of them have potential to occur in the Cold Springs project area. A pre-field wildlife and fish review of the project area for all region 2 sensitive species was completed using Heritage database records, district data, literature reviews, communication with district personnel and the forest plan to identify which sensitive species should be analyzed. Table 29 summarizes effects on these species; full analysis for each species is found in the Cold Springs Project Wildlife and Fisheries Biological Evaluation, located in the Cold Springs project file.

For further information about these species and generalized analysis of landscape-scale project affects, reference the 1997 Black Hills National Forest Management Plan as amended by the Phase II Amendment, and associated biological assessment/biological evaluation (USDA Forest Service 2005a, 2005c).

Table 29. Summary of effects on region 2 sensitive wildlife and fish species by alternative (A: no action; B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects	Determination
American Marten (<i>Martes americana</i>)	A: None. B: Low potential for individual mortality. Potential den site disturbance.	A: Increased denning and foraging habitat. Increased risk of habitat loss due to wildfire. B: Reduced habitat; reduced mature ponderosa pine, coarse woody debris, and ground cover.	A: None B: Would add to reduced habitat due to management activities: reduced mature ponderosa pine, coarse woody debris, and ground cover.	A: No impact B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	A: None B: Short-term disturbance.	A: Potential habitat increase. B: Enhanced habitat for primary food source.	A: None. B: No measureable change in available habitat. Enhanced habitat for primary food source.	A: No impact. B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Black-backed Woodpecker (<i>Picoides arcticus</i>)	A: None. B: Potential nest removal.	A: Existing habitat would be maintained, and habitat may increase because of insect-caused tree mortality and high fire hazard. B: Sanitation treatments would reduce foraging habitat; potential habitat would be reduced due to reduced insect-caused	A: Would contribute to potential habitat increase. B: Would contribute to reduced potential habitat.	A and B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.

Table 29. Summary of effects on region 2 sensitive wildlife and fish species by alternative (A: no action; B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects	Determination
		tree mortality and fire hazard.		
Black Hills Redbelly Snake (<i>Storeria occipitomaculata pahasapae</i>)	A: None B: Potential individual mortality due to management activities and vehicle traffic.	A: Potential habitat impacts associated with high fire hazard and insect-caused tree mortality; positive and negative effects. B: Potential reduced prey availability. Increased hardwood habitat. Mesic habitat improved through road decommissioning.	A: Would contribute to current trend of habitat loss. B: Would contribute to increased mesic habitat and hardwood habitat.	A and B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Cooper's Mountain Snail (<i>Oreohelix strigosa cooperi</i>)	A: None B: Mortality of unknown snail colonies.	A: Habitat would increase. Potential habitat loss associated with high fire hazard. B: Reduced risk of habitat loss due to wildfire. Habitat loss due to management activities.	A: Would add to the risk of habitat loss due to wildfire. B: Would add to a decrease in habitat.	A and B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Flammulated Owl (<i>Otus flammeolus</i>)	A: None B: Low potential for individual mortality.	A: Potential increase in late-successional habitat and snags. Risk of habitat loss due to mountain pine beetle-caused tree mortality. B: Reduced preferred habitat. Incidental loss of snags. Precommercial thinning and prescribed burning would benefit foraging habitat.	A: Would add to the risk of habitat loss due to wildfire and forest insects. B: Would add to reductions of preferred habitat.	A: No impact. B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	A: None. B: Low potential for individual mortality. Potential nest removal.	A: Reduced preferred habitat; open, mature pine habitat; however, increased fire hazard and mountain pine beetle mortality could benefit habitat. B: Increased preferred habitat: open-canopied mature pine.	A: Would contribute to trend of reduced habitat; however, natural disturbances could benefit habitat. B: Would contribute to increased preferred habitat.	A and B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Northern Goshawk (<i>Accipiter gentilis</i>)	A: None. B: Low potential for individual mortality and	A: Potential loss of foraging and nesting habitat as forest density increases. Potential loss of habitat due to wildfire	A: Would contribute to potential loss of habitat due to natural disturbance: wildfire, insect-	A and B: May impact individuals, but not likely to result in a loss

Table 29. Summary of effects on region 2 sensitive wildlife and fish species by alternative (A: no action; B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects	Determination
	nest removal.	and insect-caused tree mortality. B: Loss of potential nesting habitat. Nesting disturbance during project implementation. Known nest area habitat enhancement.	caused tree mortality. B: Would contribute to decreased potential nesting habitat.	of viability in the planning area, nor cause a trend toward Federal listing.
Northern Leopard Frog (<i>Rana pipiens</i>)	A: None. B: Low potential for individual mortality due to project activities.	A: Potential habitat quality impacts associated with high fire hazard. Continued decline in hardwood and meadow habitat. B: Potential habitat disturbance or loss. Improved hardwood and meadow habitat.	A: Would contribute to decline in hardwood and meadow habitat, and habitat threats associated with wildfire B: Contributes to potential habitat disturbance or loss. Contributes to improved habitat.	A and B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Regal Fritillary (<i>Speyeria idalia</i>)	A: None B: Low potential for individual mortality due to management activities in meadows and adjacent riparian areas.	A: Reduced habitat through pine encroachment on meadows. B: Broadcast burn would maintain meadow habitat. Noxious weed spread may impact host plants.	A: Contributes to continued reduced habitat reduction. B: Contributes to maintenance and enhancement of meadow habitat.	A and B: May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward Federal listing.
Fringed Myotis (<i>Myotis thysanodes pahasapensis</i>) Townsend's Big-eared Bat (<i>Pelcotus townsendii</i>) Hoary bat (<i>Lasiurus cinereus</i>)	A: None. B: Low potential for individual mortality due to tree felling and vehicle collisions. Potential snag and roost tree loss.	A: Reduced foraging habitat through natural forest succession and growth. Increase in roosting snags. Potential habitat improvement associated with high fire hazard and beetle-caused tree mortality. B: Reduced roosting habitat. Potential habitat loss due to reduction of snags and roost trees. Foraging habitat would improve.	A; Contributes to reduced foraging habitat. Contributes to increased roosting habitat. B: Contributes to reduced roosting habitat. Contributes to increased foraging habitat.	A: No impact. B. May impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.

Management Indicator Species

Management indicator species for the Black Hills National Forest are designated in the forest plan (USDA Forest Service 2006). Although each of these species is known to or could potentially occur in or near the Black Hills National Forest, not all of them have potential to occur in the

Cold Springs project area. Table 30 summarizes the effects on these species. Full analysis is found in the Cold Springs Project Wildlife Resource Report (Moser 2011b). If a management indicator species or its habitat were not found in the project area, it was not identified for further analysis.

Table 30. Summary of effects on management indicator species by alternative (A: no action, B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects
Black-backed Woodpecker (<i>Picoides arcticus</i>)	A: None. B: Potential nest removal.	A: Existing habitat would be maintained, and habitat may increase because of insect-caused tree mortality and high fire hazard. B: Habitat would be reduced through sanitation and salvage of insect infested trees; potential habitat would be reduced due to reduced insect-caused tree mortality and fire hazard.	A: Would contribute to potential habitat increase. B: Would contribute to reduced habitat.
Brown Creeper (<i>Certhia americana</i>)	A: None B: Potential nest removal.	A: Existing habitat would remain. Potential for habitat loss due to fire or insect-caused tree mortality. B: Habitat would be reduced through timber harvest in dense mature pine stands. Broadcast burning may increase snag habitat.	A: Would contribute to an increase in habitat; however, the risk of habitat loss due to wildfire would increase. B: Would contribute to reduced habitat.
Golden-crowned Kinglet (<i>Regulus satrapa</i>)	A: None. B: Low potential for individual mortality.	A: Existing preferred (spruce-dominated) habitat would remain. B: Existing preferred habitat would remain. Reduction of potential spruce habitat through broadcast burning.	A and B: No cumulative effect because existing white spruce habitat would remain.
Ruffed Grouse (<i>Bonasa umbellus</i>)	A: None. B: Potential individual bird mortality and nest destruction.	A: Reduced aspen habitat through succession to pine. Habitat may increase due to release of aspen through wildfire or insect-caused disturbance. B: Aspen habitat maintained and increased through pine removal.	A: Would contribute to continued aspen habitat decline; however, habitat may increase. B: Would contribute to maintaining and increasing aspen habitat.
Song Sparrow (<i>Melospiza melodia</i>)	A: None. B: Low potential for individual mortality.	A: Reduced riparian habitat through conifer encroachment. B: Riparian aspen habitat would be maintained.	A: Would contribute to continued trend of habitat loss due to conifer encroachment. B: Would contribute to maintaining and increasing riparian aspen habitat.
White-tailed Deer (<i>Odocoileus virginianus</i>)	A: None. B: Low potential for individual mortality from vehicle collisions.	A: Early-seral habitat would decline; however, early-seral habitat could increase and cover habitat could decrease due to wildfire or insect-caused tree mortality. B: Increased diversity of forest structure and associated habitat: increased forage and browse production. Decreased cover habitat.	A: Would contribute to increases in cover habitat at the expense of early-seral habitat. B: Would contribute to diversity of forest structure and associated habitat.

Species of Local Concern

Species of local concern are plant, fish, and wildlife species (including subspecies or varieties) that do not meet the criteria for sensitive status. These could include species with declining trends in only a portion of region 2, or those that are important components of diversity in a local area. The local area is defined as NFS lands within the Black Hills National Forest (FSM 2620.5 Black Hills Supplement 2600-2005-1).

Analysis of project impacts on species of local concern was completed for those species that occur in the project area, or have habitat that occurs in the project area. Table 31 summarizes effects on these species. Full analysis can be found in the Cold Springs Project Wildlife Resource Report (Moser 2011b).

Table 31. Summary of effects on wildlife species of local concern by alternative (A: no action, B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects
Birds			
Black-and-White Warbler (<i>Mniotilta varia</i>)	A: None. B: Low potential for individual mortality.	A: Habitat could decrease due to pine encroachment into aspen and riparian areas. B: Low potential for disturbance during project activities. Beneficial habitat impacts due to aspen release. Broadcast burning would have short-term negative habitat impacts, however, foraging habitat would have a long-term improvement.	A: Would contribute to decreases in habitat. B: Would contribute to increased aspen habitat.
Broad-winged Hawk (<i>Buteo platypterus</i>)	A: None. B: Low potential for individual mortality and loss of unknown nests.	A: Nesting habitat would increase. Foraging habitat would decrease. Risk of habitat loss due to high fire hazard and insect-caused tree mortality. B: Nesting habitat reduced by 36 percent. Foraging habitat would remain stable or increase. Future nesting habitat would develop through thinning and burning.	A: Would contribute to potential habitat loss due to wildfire and forest insects. B: Would contribute to reduced nesting habitat.
Cooper's Hawk (<i>Accipiter cooperii</i>)	A: None. B: Low potential for individual mortality and loss of unknown nests.	A: Nesting habitat would increase. Foraging habitat would decrease. Risk of habitat loss due to high fire hazard and insect caused tree mortality. B: Nesting habitat reduced by 36 percent. Foraging habitat would remain stable or increase. Future nesting habitat would be developed through thinning and burning.	A: Would contribute to potential habitat loss due to wildfire and forest insects. B: Would contribute to reduced nesting habitat.

Table 31. Summary of effects on wildlife species of local concern by alternative (A: no action, B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects
Northern Saw-whet Owl (<i>Aegolius acadicus</i>)	A: None. B: Low potential for individual mortality.	A: Nesting habitat would increase. Roosting habitat may decline. Risk of habitat loss due to high fire hazard and insect-caused tree mortality. B: Reduced preferred nesting and breeding habitat: dense mature stands. Structural stage 5 would be maintained.	A: Would contribute to potential habitat loss due to wildfire and forest insects. B: Would contribute to reduction of preferred habitat. Would contribute to reduced risk of habitat loss due to wildfire and forest insects.
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	A; None B: Low potential for individual mortality.	A: Risk of habitat loss due to high fire hazard and insect-caused tree mortality. B: Mature, dense forest nesting and foraging habitat would decrease. Mature, open forest nesting and foraging habitat would increase. Reduced number of large-diameter trees available for future snags.	A: Would contribute to potential habitat loss due to wildfire and forest insects. B: Would contribute to a balance of habitat structural stages. Contributes to a reduced number of large-diameter trees available for future snags.
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	A: None. B: Low potential for individual mortality and loss of unknown nests.	A: Preferred nesting habitat (dense young forest) would likely increase; foraging habitat would decrease. Risk of habitat loss due to high fire hazard and insect-caused tree mortality. B: Preferred nesting habitat would increase over time; foraging habitat would remain stable.	A: Would contribute to potential habitat loss due to wildfire and forest insects. B: Would contribute to reduced nesting habitat and enhanced foraging habitat.
Mammals			
Long-eared Myotis (<i>Myotis evotis</i>) Long-legged Myotis (<i>Myotis volans</i>) Northern Myotis (<i>Myotis septentrionalis</i>) Small-footed Myotis (<i>Myotis ciliolabrum</i>)	A: None. B: Low potential for individual mortality,	A: Roost trees would increase due to insect-caused tree mortality. Foraging habitat may decrease, B: Potential loss of roost trees and snags through timber harvest and broadcast burning. Foraging habitat would improve.	A: Would contribute to increased roosting habitat, a decrease in foraging habitat. Would contribute to potential habitat loss due to wildfire. B: Would contribute to loss of roost trees and snags; would contribute to improved foraging habitat.
Meadow Jumping Mouse (<i>Zapus hudsonius</i>)	A: None. B: Low potential for individual mortality due to minimal project activity in riparian habitat.	A: Potential increase in insect-caused tree mortality and wildfire would have short-term negative impacts, but long-term benefits to habitat. B: Potential habitat loss. Timber harvest and broadcast burning	A: Would contribute to long-term habitat benefits. B: Would contribute to maintaining or enhancing habitat.

Table 31. Summary of effects on wildlife species of local concern by alternative (A: no action, B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects
		would have short-term habitat impacts, however, long-term impacts would benefit habitat.	
Northern Flying Squirrel (<i>Glaucomys sabrinus</i>)	A: None. B: Risk of individual mortality and next destruction due to timber harvest	A: Dense mature forest and late-successional forest habitat may increase; however, there is a risk of habitat loss due to insect-caused tree mortality and increased fire hazard. B: Dense mature forest habitat would decrease.	A: Would contribute to potential habitat loss due to wildfire and forest insects. B: Would contribute to decreased dense, mature forest habitat.
Invertebrates			
Atlantis Fritillary Butterfly (<i>Speyeria Atlantis pahasapa</i>) Tawny Crescent Butterfly (<i>Phyciodes batessi</i>)	A: None. B: Risk of individual mortality due to broadcast burning.	A: Meadow and hardwood habitat would continue to decline due to pine encroachment. B: Benefits to habitat include broadcast burning meadows, road decommissioning in meadow, and hardwood release.	A: Would contribute to decline in habitat. B: Would contribute to maintenance of habitat: meadows and hardwoods.
Callused Vertigo Snail (<i>Vertigo arthurii</i>) Frigid Ambersnail (<i>Catinella gelida</i>) Mystery Vertigo Snail (<i>Vertigo paradoxa</i>) Striate Disc Snail (<i>Discus shimekii</i>)	A: None. B: Risk of individual mortality to unknown snail colonies due to timber harvest, road construction and broadcast burning.	A: Habitat would continue to increase due to increased forest cover, however, there is a risk of habitat loss due to insect-caused tree mortality and increased fire hazard. B: Decreased shaded forest habitat due to timber harvest and broadcast burning.	A: Would contribute to potential habitat loss due to wildfire. B: Would contribute to decreased habitat.

Migratory Birds

Many species of migratory birds are of international concern because of naturally small ranges, loss of habitat, population declines, and other factors. Species of concern applicable to project-level conservation are identified by many sources, including: Endangered Species Act, Region 2 sensitive species list, Forest management indicator species list, United States Fish and Wildlife Service Birds of Conservation Concern (BCC) 2008 publication, (USDI Fish and Wildlife Service 2008, and the Wyoming Partners In Flight (PIF) Plan¹¹ (Nicholoff 2003). All of these sources and

¹¹ Note: South Dakota does not have a PIF plan.

their respective species of concern, except BCC and Wyoming PIF, have been examined in the Cold Springs Project Wildlife Resource Report (Moser 2011b) or the Cold Springs Project Biological Evaluation for Wildlife and Fisheries (Moser 2011a). Effects of species not addressed elsewhere are summarized in Table 32 and addressed in detail in the Cold Springs Project Wildlife Resource Report (Moser 2011b).

Table 32. Summary of effect on migratory birds by alternative (A: no action, B: modified proposed action)

Species	Direct Effects	Indirect Effects	Cumulative Effects
Golden Eagle (<i>Aquila chrysaetos</i>)	A: None. B: Potential for nest disturbance.	A: None. B: Enhanced prey/hunting habitat.	A: None. B: Would contribute to enhanced prey/hunting habitat.
Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	A: None. B: Potential for nest disturbance.	A: None. B: Project area preferred habitat would increase by 31 percent.	A: None. B: Would contribute to increased preferred habitat.
Black-billed Cuckoo (<i>Coccyzus erythrophthalmus</i>)	A: None. B: Potential for nest disturbance.	A: None. B: Increased habitat diversity.	A: None. B: Would contribute to increased habitat diversity.

Fisheries

Introduction

This section discusses the environmental consequences of the no action and modified proposed action on fisheries resources. It summarizes the Cold Springs Fisheries Report (Hirtzel 2011), which is located in the Cold Springs project file.

There are no fish-bearing streams or lakes in the Cold Springs project area (Stewart and Thilenius 1964; Ford 1988; Isaak et al. 2003; South Dakota Department of Game, Fish and Parks 2009). The headwaters of Spearfish Creek occur to the northeast and in close proximity to the project boundary. It flows intermittently across limestone outcrops south of U.S. Highway 85. A recreational fishery comprised of non-native brook trout exists in Spearfish Creek approximately 0.75 mile downstream of the Cold Springs project area where Spearfish Creek perennial surface flow emerges from a spring. Clayton Pond is a small impoundment for livestock watering that has never been stocked with fish.

There are no federally listed, proposed, or candidate species or critical habitat designated in the Cold Springs project area (USFWS 2010).

No-Action Alternative

Direct, Indirect and Cumulative Effects

There would be no direct, indirect, or cumulative effects to fisheries under this alternative because there is no suitable, occupied habitat in the project area.

Modified Proposed Action

Direct and Indirect Effects

There would be no direct effects to fisheries because no fish occur in the Cold Springs project area. There would be no short- or long-term negative indirect effects to fisheries downstream in Spearfish Creek from vegetation management activities or road construction/maintenance/use because no changes in water quality, flow regimes, sediment input, bank stability, etc., are anticipated to occur. See the hydrology analysis for additional details. Downstream recreational fishing opportunities will be maintained.

The modified proposed action would have no impact on any of the three regionally designated sensitive fish species: the finescale dace (*Phoxinus neogaeus*), the lake chub (*Couesius plumbeous*) or the mountain sucker (*Catostomus platyrhynchus*). These species are known to occur on the Black Hills National Forest; however, neither these species nor their habitats are present in the Cold Springs project area.

The mountain sucker is also designated a management indicator species on the Black Hills National Forest. This project would have no effect on the forestwide population trend of the mountain sucker because of the lack of habitat in the project area.

Cumulative Effects

Given the lack of direct or indirect effects, alternative B would not have an additive incremental impact in relation to past, present, or reasonably foreseeable actions. Subsequently, there will be no cumulative effects.

Summary and Comparison

The no-action alternative and modified proposed action would have no direct, indirect, or cumulative effects on fisheries. There are no fisheries in the project area and no effects to downstream fisheries are expected.

Botany

Introduction

This section discusses the environmental consequences of the alternatives on botanical resources and noxious weeds. It summarizes the Cold Springs Project Botany Report (Englebert 2011a), which is located in the Cold Springs project file. Specific botanical resources discussed include rare plants and their habitats (region 2 sensitive species, Black Hills plant species of local concern, and other South Dakota State-listed species) and Black Hills montane grasslands.

Region 2 sensitive species are species identified by the regional forester for which population viability is currently of concern, as evidenced by significant current or predicted downward trends in population numbers or density, or by significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (USDA Forest Service 2011). A biological evaluation was prepared to disclose the determination of effects on region 2 sensitive plant species (Englebert 2011b). That document can be found in the project record. A summary is included in this section.

Species of local concern are species that do not meet the criteria for sensitive status. These could include species with declining trends in only a portion of region 2, or those that are important components of diversity in a local area.

South Dakota State-listed species are plant species that are considered rare in the State of South Dakota. The State has identified these plants for tracking by the South Dakota Natural Heritage Program. Most of the region 2 sensitive and species of local concern are also State-listed species.

Black Hills montane grassland is a plant community type endemic to the Black Hills. It is categorized as G1 (critically imperiled) by NatureServe (NatureServe 2010). Besides being unique plant communities, Black Hills montane grasslands are often habitat for sensitive, species of local concern, and State-listed plant species.

Methodology

Region 2 Sensitive Species and Black Hills Species of Local Concern

Impacts to the sensitive plant species and plant species of local concern may be direct, such as trampling, defoliation, and mechanical damage; or more indirect such as a change in the microclimate or species composition, both of which may result in a loss of habitat. In general, direct impacts are short-term impacts, occurring immediately, while indirect impacts such as changes to the habitat occur over a longer timeframe.

A determination of effects to sensitive species has been made following the direction of Forest Service Manual 2672.4. The environmental analysis completed for the Phase II Amendment of the Black Hills National Forest Plan (USDA Forest Service 2005a) determined that the Black Hills plant species of local concern are likely to persist on the forest under the alternative that was selected for implementation. For this project, consistency with Phase II direction will determine species of local concern persistence.

Noxious Weeds

To analyze the effects of the Cold Springs Project on noxious weeds, we will consider the projected change in the rate of infestation for the proposed action. The design criteria listed in Table 3 would allow for effective management of noxious weeds throughout project implementation. These criteria meet forest plan objectives 230 and 231 as they relate to eradication, control, and prevention of noxious weeds. The effects analysis presented below assumes that relevant weed prevention practices are implemented.

Spatial and Temporal Context for Effects Analysis

The cumulative effects analysis area for the botanical resources will be the areas of potential plant habitat within the Cold Springs project area (as identified in the shapefile that can be found in the project record). For noxious weeds, the analysis area is the project area (including private inholdings). Effects outside of these areas are either minimal or cannot be tracked and defined. This analysis is bounded in time as the next 50 years, as described in the 2005 Phase II Final Environmental Impact Statement (FEIS) associated with the amendment to the Revised Forest Plan. This temporal scale is based on: (a) the biology of the species (e.g., generation time, response time to changed conditions, recolonization capability); and (b) the time needed for the overall ecosystem to respond to proposed management (USDA 2005a).

No-Action Alternative

Direct and Indirect Effects

Botanical Resources

There would be no direct effects to any botanical resources under the no-action alternative, since no management activities would occur. Ongoing activities such as recreation, fire suppression, and road maintenance would continue. Management activities analyzed under other environmental documents would continue to occur.

There is the potential for indirect effects over time as potential habitat is altered by changes in species composition. Orelmann (2011) noted that under the no-action alternative the hardwood communities and the open meadows are likely to diminish in number. This could result in a reduction in potential habitat for the region 2 sensitive and species of local concern plants that prefer these moist forested habitats and for those that prefer open grassy areas.

Noxious Weeds

Allen (2010) states that pine stands throughout the project area are susceptible to continued beetle mortality and expansion. Canopy gaps created by the death of beetle-killed trees allow light to reach the forest floor, creating opportunities for many herbaceous species, including noxious weed (Samman and Logan 2000). In areas of the project where weed species are currently present, the no-action alternative would likely result in an increase in weed populations as the canopy thins and the weeds out-compete the native vegetation. Determining the extent of increase in weed populations due to beetle infestation is difficult, but it is expected to be less than what would likely occur due to timber management activities.

Roads are a known major conduit for noxious weeds. Under the no-action alternative, closed roads in the project area would remain closed and no new construction would occur. By maintaining the current non-use of roads in the project area, noxious weed infestations are less likely to increase.

Modified Proposed Action

Direct and Indirect Effects – Botanical Resources

We have generalized the preferred habitats and grouped together the region 2 sensitive and Black Hills species of local concern plants (as shown in Table 33) to form habitat categories for analysis because effects are similar.

Table 33. Habitat generalizations

Common name	Riparian areas and moist forest (includes white spruce and hardwood sites)	Meadows and grasslands (includes montane grasslands)
Arrowleaf sweet coltsfoot	X	
Broadlipped twayblade	X	
Foxtail sedge	X	
Groucedar	X	
Highbush cranberry	X	
Iowa grapefern		X
Large round leaf orchid	X	
Leathery grapefern	X	
Narrowleaf grapefern		X
Northern hollyfern	X	
Pleated gentian	X	X
Shining willow	X	
Stiff clubmoss	X	
Yellow lady's slipper	X	

The proposed action can be deconstructed into the following management actions: mechanical removal of thinned trees (including non-commercial vegetation treatments), removal of infested trees (sanitation), removal of conifers from stands of hardwoods (hardwood enhancement), prescribed burning, prescribed burning following mechanical removal of thinned trees, and road management activities.

Effects common to all treatments and all species or habitats

The project area has been surveyed and no region 2 sensitive or species of local concern plants are known to be present, but any time there is habitat for a plant in an area, there is a chance that unknown individuals may be present. Therefore, risk cannot be completely eliminated due to the possibility of unknown individuals as well as possible mistakes from mapping inaccuracies and human error. But, with the design criteria in place, there is minimal risk of effects to rare plants and their habitat because potential plant habitat has been identified and would be avoided during mechanical treatments. There is a possibility that these treatments may have direct impacts on unknown individuals, but the risk is very low.

A potential indirect effect common to all treatments and all species is the possible change in soil moisture and hydrologic function of the area resulting from reduced vegetation via silvicultural treatments and broadcast burns. This effect is difficult to predict and quantify and could be negative or positive, depending on the magnitude and location. It is possible that an increase in available moisture could occur and that increase would improve and/or expand potential plant habitat.

Whenever the ground is disturbed, habitat degradation is possible by invasion or spread of noxious weeds resulting from adjacent or immediate disturbances (mechanical vegetation treatments and/or prescribed burning). After habitat loss, the spread of invasive species is considered the greatest threat to imperiled species in the United States (Sieg et al. 2003). Design

features incorporated into the proposed action, standards and guidelines present in Phase II of the Black Hills National Forest Land and Resource Management Plan, as amended and the Black Hills National Forest Noxious Weed Management Plan (USDA Forest Service 2003) would help reduce these indirect effects. Noxious weeds may out-compete desired plant species, and spray from herbicides used to help control weeds can also have negative effects.

Effects from mechanical treatments, all species and habitats

Any time mechanical treatment is involved, there's potential for direct impacts to unknown individual plants from machinery running through habitats and over individuals. Ground disturbance and soil compaction are also possibilities with mechanical treatments and can lead to indirect effects by altering habitat components. Effects from ground disturbance would be as discussed in the "Effects common to all treatments and all species or habitats" section (i.e., potential habitat degradation from invasive species).

Effects from sanitation and salvage treatments, all species and habitats

Sanitation and salvage treatments (removal of beetle-infested trees) have the potential to occur throughout the Cold Springs project area. Prior to implementation, resource specialists would review areas of sanitation and salvage treatment outside of harvest units to determine whether any special mitigation is needed to protect forest resources and ensure the proposals comply with forest plan direction. With such input, effects to botanical resources would be reduced or eliminated.

Any ground disturbance associated with sanitation and salvage treatments would have the same effects as those discussed in the "Effects common to all treatments and all species or habitats" section (i.e., potential habitat degradation from invasive species).

Effects from hardwood enhancement treatment, moist forest habitats

In general, hardwood communities are considered to be potential habitat for many of the region 2 sensitive and species of local concern plants (identified as moist forest habitat in Table 33). Areas within the hardwood communities with the greatest potential to harbor these plants are identified in the potential plant habitat shapefile, and thus, would be protected by design criteria. There is however, the slight risk that areas within these hardwood communities have not been identified and that unknown individuals would be directly impacted. However, in the long term, enhancement of these hardwood communities would enhance habitat for those species.

Any ground disturbance associated with hardwood enhancement treatments would have the same effects as those discussed in the "Effects common to all treatments and all species or habitats" section (i.e., potential habitat degradation from invasive species).

Effects from broadcast burning, moist forest and riparian habitats

The moist forests and riparian areas identified as potential habitat are unlikely to carry a fire during broadcast burning. The broadcast burning proposed in the Cold Springs Project would be conducted in the spring (May) and autumn (mid-September to January) to take advantage of moderate daytime temperatures and low night time temperatures, higher relative humidity, increased chance of precipitation, lower fuel temperatures, and higher fuel moisture content. Therefore, no negative impacts to the potential plant habitat are expected.

Effects from broadcast burning, meadow and grassland habitats

The potential habitat identified in site 071303-50 is a mesic meadow that is unlikely to carry a fire when burned within prescription. Therefore, no negative impacts to the potential plant habitat are expected. The uplands surrounding the mesic meadow may be potential habitat for grapeferns and moonworts (*Botrychium* species). Broadcast burning has the potential for a positive indirect effect of maintaining the open conditions these *Botrychium* species seem to prefer, with the possibility of a negative direct impact if an unknown occurrence is in the area to be treated. Dr. Donald Farrar (2004) stated that when the above-ground growth of these diminutive plants is present, a fast-moving fire may remove above-ground stem portions, but would not be expected to affect below-ground individuals or parts. In fact, the burning may release more nutrients to the soil to benefit the mycorrhizae associated with these plants, as there is often a flush of growth following fires.

Two State-listed grasses are known to occur at this site; tufted hairgrass and California oatgrass. Tufted hairgrass generally survives all but the most severe fires (Walsh 1995). It usually sprouts from the root crown after the aerial portions are burned. This area would be burned under prescription in the autumn or spring, so burning is not expected to be severe, and thus would not be detrimental to the tufted hairgrass. California oatgrass has a high fire tolerance and does not decrease in cover after burning (Lambert 2003), so prescribed burning is not expected to be detrimental to it either.

There is the risk that broadcast burning may behave differently than anticipated or result in patchy areas of higher severity burning. The possibility of escape of a broadcast burn, while greatly minimized by the precautions taken, could negatively impact potential plant habitat in a manner similar to wildfire. Small patches of higher severity burning may also occur, and could adversely impact potential plant habitat, including removal of shading overstory, disruption of soil micro-organisms, invasion of noxious weeds and/or non-native plant species, and destruction of the seed bank due to consumption or high soil temperatures.

Activities associated with broadcast burning may result in direct impacts to habitat or individuals, such as crushing or burning, but no detrimental effects are expected. In the long term, the habitat would likely be enhanced.

Effects of road management activities, all habitats or species

None of the ground-disturbing transportation actions would occur in areas identified as potential plant habitat; therefore, no direct effects are expected. Indirect effects to potential habitat include the potential for an increase in invasive species as discussed in the “Effects common to all treatments and all species/habitats” section. Another indirect effect that may occur is related to accessibility. New roads may make areas that were previously inaccessible to people and grazing animals more readily accessible, which could lead to trampling, grazing, or collection of rare plants, as well as acting as a vector for noxious weed spread.

Direct and Indirect Effects – Noxious Weeds

Noxious weed infestations are expected to increase under the modified proposed action. Skid trails, landings, burn piles, temporary roads and areas where machinery would be working all create a seedbed for noxious weeds. The potential for noxious weed establishment is even greater in disturbed areas adjacent to existing weed populations. Under this alternative, 4,904 acres have the potential for being disturbed as trees are dropped and skidded to landing decks and understory

fuels are treated. Proposed treatment would result in an estimated 147 additional acres of noxious weeds, and the transportation actions could result in an additional 17 acres of noxious weeds.

Areas proposed for broadcast burn activities could result in additional acres of infestation. Dozer line, hand lines, staging areas, and areas with mineral soil exposed are all susceptible to weed infestation. Again, these areas are even more susceptible when existing weed populations are nearby. Pre-treatment of weed infestations before broadcast burn activities reduces the risk of spread.

Equipment moving in and out of treatment and/or broadcast burn areas facilitates the establishment and spread of noxious weeds. When equipment moves into the project area from another area (especially out of state) it has high potential for carrying noxious weed seed (or plant parts) into the project area. Many new invaders, noxious weeds that are not previously known to an area, become established this way. Moving from an infested area to a weed-free area within the project area can have the same effect—spread of noxious weeds. Applying the design criteria would help reduce these risks.

A potential indirect effect of the proposed treatments is an increase in off-road motorized travel due to the expanded road system and increased accessibility resulting from the removal of trees and fuels. As off-road use increases, noxious weed spread and infestation increases.

Cumulative Effects – Botanical Resources, Noxious Weeds, Both Alternatives

Past, present, and reasonably foreseeable future activities within the project area include livestock grazing, timber harvest and thinning, motorized and non-motorized recreational use, road and trail building and maintenance, insect and disease outbreaks, fire suppression, prescribed fire, road construction, urban development (sub-dividing and development of private land), and noxious weed infestation and treatment. A list documenting past and planned future activities for the project area is included in Appendix C.

The effects of these types of activities on region 2 sensitive and species of local concern plants and their habitats and noxious weeds are as follows:

- Livestock grazing leads to biomass removal and trampling. It can lead to changes in species composition, compaction of soils, changes in fuel loading and the fire regime, downcutting of riparian areas with subsequent drying of adjacent meadows, and noxious weed invasion. Grazing animals can spread noxious weeds and transport weed seeds into new areas. Grazing impacts likely occurred within the project area in the past at intensities and frequencies greater than current or future levels. Through allotment management plans, potential future impacts to region 2 sensitive and species of local concern plant species by livestock trampling or grazing can be reduced.
- Timber harvest and thinning has led to a more open canopy with additional light reaching the forest floor (which may be beneficial or detrimental, depending on the species), soil disturbance and compaction, development of skid roads, and noxious weed invasion. Changes in forest composition, structure, and fire frequency have also occurred. Timber harvest and thinning also increase impacts from recreational activities by allowing improved access.
- Motorized and non-motorized recreational use has led to the development of non-system roads and trails, development of dispersed campsites, erosion, and the vectoring of noxious weeds in previously uninfested areas. These activities can lead to physical damage to plants and their habitats (biomass removal, vegetation compaction, and ground disturbance).

Vehicles and people help spread noxious weeds by carrying weed seeds into new areas. These impacts are controllable through area closures and travel management.

- Road and trail construction and maintenance causes soil disturbance and erosion, fragmentation and destruction of habitat, and noxious weed invasion. It also increases the impacts from recreational activities by allowing improved access.
- Insect and disease outbreaks are natural events that occur periodically, although current levels are more intense than in recent memory. Such outbreaks lead to tree mortality, creation of forest-gap habitats, opening of meadow habitats, increase of weed spread and potentially to stand-replacing fires.
- Fire suppression has led to increased fuel loading, canopy closure, and higher intensity wildfire. Fire is a natural disturbance in the ecosystem. In some areas, habitat succession and fire could possibly create or improve habitat for select plant species by opening up meadows or reducing the litter accumulation and competition from other plants. In other areas, wildfires or controlled fires would create high ground temperatures that could sterilize the soil and eliminate fungal species that are necessary for the survival of others. Fire also tends to favor post-fire germination of non-native species in environments where non-natives are abundant and/or native species are stressed.
- Urban development destroys plant habitat, fragments populations, and increases the risk of weed invasion and fire.

The actions and effects described above can be both additive and interactive to each other and to the direct and indirect effects described earlier. Current management direction is designed to eliminate or reduce negative cumulative impacts by protecting region 2 sensitive and species of local concern plants from direct and indirect impacts and to allow for the treatment of noxious weeds under the current weed management plan for the Black Hills National Forest. Because there are policies, standards, and guidelines that limit effects, the cumulative effects are not expected to contribute to any change in status or viability of region 2 sensitive and species of local concern plants. Also, the cumulative effects are not expected to contribute to an increase in any current or predicted downward trend in population numbers or density or to current or predicted downward trends in habitat capability that would reduce the existing distribution of any of the region 2 sensitive and species of local concern plant species discussed in this analysis, under either of the alternatives.

Summary and Comparison

Region 2 Sensitive Plants and Black Hills Species of Local Concern

The effects to Black Hills species of local concern and region 2 sensitive species can be summarized as:

- Under the no-action alternative, no activities would occur, thus there would be no direct effects.
- There is a potential indirect effect to both the hardwood and meadow habitats if proposed treatments do not occur. This could lead to a loss of habitat for the species that prefer hardwood and meadow habitats
- There may be habitat in the project area for all species addressed in this analysis. When habitat is present in a project area, there is always the possibility that unknown individuals are present, which management activities may directly affect.

- None of the known occurrences of arrowleaf sweet coltsfoot, broadlipped twayblade, leathery grapefern, northern hollyfern, pleated gentian, shining willow, stiff clubmoss, foxtail sedge, groundcedar, highbush cranberry, Iowa moonwort, lesser roundleaved orchid, lesser yellow lady’s slipper, and narrowleaf grapefern on the Black Hills National Forest are located within this project area and none would be disturbed by activities associated with this project. Therefore, while loss of unknown individuals may occur in this project area, the viable populations at the known occurrences would not be affected.
- Treatments within the moist forested sites and meadow areas are expected to enhance the habitat long term.
- Design criteria are in place to reduce the risk to individuals and potential habitat.
- With ground-disturbance activities, there is a chance of noxious weed infestation which can degrade habitat.

The FEIS accompanying the Phase II Amendment to the Black Hills National Forest Plan determined that the species of local concern plant species addressed in this analysis are all likely to persist on the forest under the management outlined in the forest plan (USDA Forest Service 2005a). Because this project has been determined to be consistent with the forest plan for these species, it can be determined that they would be likely to persist, relative to this project.

A biological evaluation was completed for this project and it can be found in the project record. It details the determination of effects made for all region 2 sensitive species that may have habitat in the project area (see summary of effects in Table 34). Please see the biological evaluation for details.

Table 34. Summary of effects – region 2 (R2) sensitive and Black Hills species of local concern (SOLC) plants (MII = May impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend toward Federal listing.)

Common name	Scientific name	Status	Determination of effects (R2 sensitive) or Persistence (SOLC)	
			No-action Alternative	Proposed Action Alternative
Arrowleaf sweet coltsfoot	<i>Petasites frigidus</i> var. <i>sagittatus</i>	SOLC	Likely to persist	Likely to persist
Broadlipped twayblade	<i>Listera convallarioides</i>	SOLC	Likely to persist	Likely to persist
Foxtail sedge	<i>Carex alopecoidea</i>	R2 sensitive	MII	MII
Groundcedar	<i>Lycopodium complanatum</i>	R2 sensitive	MII	MII
Highbush cranberry	<i>Viburnum opulus</i> var. <i>americanum</i>)	R2 sensitive	MII	MII
Iowa grapefern	<i>Botrychium campestre</i>	R2 sensitive	MII	MII
Leathery grapefern	<i>Botrychium multifidum</i>	SOLC	Likely to persist	Likely to persist
Lesser roundleaved orchid	<i>Platanthera orbiculata</i>	R2 sensitive	MII	MII

Table 34. Summary of effects – region 2 (R2) sensitive and Black Hills species of local concern (SOLC) plants (MII = May impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend toward Federal listing.)

Common name	Scientific name	Status	Determination of effects (R2 sensitive) or Persistence (SOLC)	
			No-action Alternative	Proposed Action Alternative
Lesser yellow lady's slipper	<i>Cypripedium parviflorum</i>	R2 sensitive	MII	MII
Narrowleaf grapefern	<i>Botrychium lineare</i>	R2 sensitive	MII	MII
Northern hollyfern	<i>Polystichum lonchitis</i>	SOLC	Likely to persist	Likely to persist
Pleated gentian	<i>Gentiana affinis</i>	SOLC	Likely to persist	Likely to persist
Shining willow	<i>Salix lasiandra</i> var. <i>caudata</i>	SOLC	Likely to persist	Likely to persist
Stiff clubmoss	<i>Lycopodium annotinum</i>	SOLC	Likely to persist	Likely to persist

Noxious Weeds

There would be an increase of approximately 150 acres of noxious weed infestation in the project area due to management activities associated with the proposed action. Weeds are also expected to increase as a result of the beetle infestation that is expected to occur under the no-action alternative. While it is difficult to quantify, it is expected that the increase in infestation under the no-action alternative would be less than that expected under the modified proposed action. Treatment of noxious weeds is expected to continue in the area as described in the Black Hills National Forest Noxious Weed Management Plan.

Hydrology and Soils

Introduction

This analysis discloses the potential effects of the alternatives on soil and water resources. It summarizes the Cold Springs Soil and Hydrology Report (Maloney 2011), which is located in the Cold Springs project file.

The majority of the project area is located within one 6th code subwatershed (6th Code HUC) – Upper Spearfish Creek (see Table 35).

Table 35. Cold Springs Project affected watersheds

HUC 6 Name	HUC 7 Code	Total Watershed Acres
Upper Spearfish Creek	10120203030101	8,672
Upper Spearfish Creek	10120203030102	8,476

The subwatersheds all have terrain that has relatively gentle slopes. Slopes are gently to occasionally moderately steep, rolling prairie grassland stringer meadows bounded by ponderosa

pine forests. Slopes in the project area mostly range between 0 to 20 percent (nearly 80 percent of the project area). Stream dissection is generally low with some moderate stream dissection occurring within the Upper Spearfish Creek and Clayton Draw.

Soils in the project area are dominated by the soil map unit 184E (Stovho-Lail-Trebor complex, 2 to 12 percent slopes) and 75E (Lail-Trebor complex, 10 to 40 percent slopes). Both of these soil map units are fairly productive and resilient. All soil units except for 187G are well suited for forestland harvesting equipment. However, soil rutting hazards are rated severe for all map units. This indicates that although soils are well suited for withstanding the impacts of forest harvesting equipment, when the soils get wet or saturated, soil rutting will occur quickly, on both harvest units and on unsurfaced roads.

The only major stream in the project area is Spearfish Creek, and all of its length within the project area is considered to be intermittent. Most of the streams in the project area are grassland swales to irregularly continuous intermittent streams with bed and bank scour. Streams tend to be grass-lined and, in many cases, are bounded by dense grass. There are 21 miles of intermittent streams and 18 miles of ephemeral streams.

There are no streams listed by the State of South Dakota as not meeting beneficial uses (fish and wildlife propagation, recreation, stock watering, and irrigation) the project area.

Spatial and Temporal Context for Effects Analysis

Analysis for effects on soils will be limited to the actual proposed vegetation, transportation and fuel treatment activity area locations.

Analysis for direct and indirect hydrology effects concentrates on the affected subwatersheds (Table 35). Cumulative effects are assessed at the scale including all affected sixth field watersheds. For the purpose of this analysis, short-term effects are considered to last no more than 3 to 5 years. Medium-term effects are those which last beyond 5 years, but less than 15 years. Any effect which has an impact on water quality, water yield, or riparian habitat that lasts longer than 15 years is considered a long-term effect.

No-Action Alternative

Direct Effects

There would be no change from the soil or water resources current condition resulting from the no-action alternative. There would be no additional impacts to soil and water resources as a result of not implementing the proposed action.

Indirect Effects

Under the no-action alternative, current management plans would continue to guide management of the project area. No fuels management activities would be implemented to accomplish project goals. Road maintenance and repair, and trail maintenance and repair would continue. This alternative would allow the project area to continue on its current trend without the proposed management actions. There would be no additional indirect effects to water, riparian, or aquatic resources.

Cumulative Effects

There would be no change from the soil or water resources current condition resulting from the no-action alternative. There would be no additional impacts to soil and water resources as a result of not implementing the proposed action. Therefore, there would be no additional cumulative effects to soil or water resources.

Modified Proposed Action

Design Features and Mitigation Measures

The project would implement project design criteria and best management practices in order to comply with forest plan requirements and other laws and regulations. Water influence zones (WIZ) are delineated for those stream reaches that have been determined perennial or intermittent under most conditions of climate or intermittent with prolonged dry season base flow sustained by groundwater storage (USDA Forest Service 2006). They have also been delineated around wetlands and springs. The WIZ for this project is a 100-foot buffer along streams, seeps, lakes, and ponds (USDA Forest Service 2006).

The modified proposed action alternative, through project design criteria, incorporates Forest Service Soil and Water Conservation Practices and Best Management Practices (WCPs/BMPs) (USDA Forest Service 2006) that are designed to protect and restore watershed resources. All of these measures included in the action alternative have evolved through extensive research and development (Burroughs and King 1989) and have been monitored and modified over several decades, with the express purpose of improving measures and making them more effective. Federal and State site evaluations of BMP control measures (Seyedbagheri 1996; USDA Forest Service 2010) have found the practices to be effective in protecting beneficial uses.

Soils - Direct and Indirect Effects

Soil Disturbance

The effects of the modified proposed action on soils are direct effects and would be limited to the vegetation and fuel treatment activity area locations. The impacts from the project activities are expected to occur from the use of ground-based mechanical equipment used for felling and yarding. Concerns regarding effects to soils are (1) surface soil displacement from log and brush skidding and the turning action of tracked ground-based equipment, and (2) the potential for the compaction of soils due to the weight and vibration of the ground-based equipment. Soil disturbance surveys were conducted to analyze and address soil displacement concerns. Soil compaction concerns were analyzed through a field (Cold Springs Soil Health Surveys 2008) and GIS review of the soil units proposed for ground-based treatment. The risk for compaction was evaluated based on the inherent physical properties of the affected soil map units and their potential for compaction (see Table 36). The expected detrimental disturbance ratio increase and post-project detrimental disturbance ratio were based on ongoing and recent past project disturbance ratios.

Table 36. Detrimental soil disturbance ratios for project area treatment types

Treatment Type Activity Area	Acres	Current Avg. Detrimental Disturbance Ratio ¹²	Expected increase in Detrimental Disturbance Ratio ¹³	Expected Total Post-Project Detrimental Disturbance Ratio
Aspen Release	572	<3%	≤1 to 5%	≤8%
Thinning, Selection and Shelterwood	3,852	<5%	≤5%	≤10%
Wildlife Timber Stand Improvement	117	<3%	≤4%	≤7%
Broadcast Burn	897	<3%	≤3 – 5%	≤5%
Pile and Burn	279	<5%	≤3%	≤11%
Slash, Pile, and Burn	494	<3%	≤1%	≤4%
Sanitation and Salvage	11,761	<3%	≤5%	<8%

The inherent resilience of the soils within the project area allow for the relatively frequent silvicultural treatment cycles. Recent monitoring of past harvest areas within the project area shows relatively minimal detrimental soil-disturbance impacts. This is mainly due to the productivity of the soils and their dry bearing strength. Grass and pine needle duff mats quickly reclaim disturbed soil areas and prevent any long-term soil resource damage. Detrimental soil-disturbance ratios exceeding 15 percent are typically considered to not be meeting standards and guidelines for the maintenance of long-term soil productivity (FSH 2509.18). None of the proposed vegetation treatments are expected to exceed the 15-percent threshold.

The new roads, temporary roads, skid trails and landings to be utilized for vegetation treatment activities were considered in conjunction with the treatment units. Temporary roads, skid trails, and landings generally produce short- to mid-term detrimental soil-disturbance impacts if they are not treated and rehabilitated. Temporary roads and landings can take up to 5 years to be rehabilitated due to access needs for post-harvest treatments. None of the proposed temporary roads cross an existing stream channel. They do cross the edges of some meadows, but in all cases are well away from WIZ. Landings would be located outside of meadows or on the margin (within the transition zone) between the grassland and forested area. However, according to soil-disturbance monitoring in the project area, the rehabilitation rates post activities are relatively rapid. Recent soil-disturbance monitoring indicates that these features are readily rehabilitated due to the local soil productivity and resilience of basal vegetation. This is most likely due to the implementation of WCPs/BMPs and the natural aggressive revegetation of ground vegetation. Therefore, the project-induced soil disturbance is assumed to be reclaimed and restored to a non-detrimental soil-disturbance condition within 5 to 10 years, as long as project design criteria and WCPs/BMPs are applied.

The impacts to soils from the current road system are primarily associated with the public using roads that are not part of the transportation system and user-defined off-highway vehicle roads and trails. The 209.3D road in Clayton Draw is currently a site where road use is creating detrimental soil disturbance conditions, as vehicles are creating ruts and small gullies in the meadow. The decommissioning of that road segment would be a net benefit in terms of the overall percentage of detrimental soil disturbance within the subwatershed. The road segment

¹² Current detrimental disturbance ratios are based on project area field data.

¹³ Expected detrimental disturbance ratios are based on monitoring of similar projects.

(FSR 232.1) that passes by Yellow Jacket Spring has problems associated with wet season travel and road surface rutting. This would be improved by maintaining the road to Forest road standards during the project.

Therefore, the direct effects are expected to be some short-term soil displacement and some slight compaction associated with skid trails. Landings and pile burning would also create isolated disturbance areas with high burn severity locations (generally between 1/10th and a quarter acre in size). These effects are expected to last short- to mid-term (less than 10 years), and are not expected to contribute to the overall long-term detrimental soil-disturbance ratio.

There would be no indirect effects from or to the soil resource. All of the effects to the soil resource are considered to be direct effects.

Long-Term Soil Productivity

There would be no direct or indirect effects to long-term soil productivity. The local soils are resilient as long as they are not impacted with ground-based equipment during wet or saturated soil conditions. Long-term soil productivity would be maintained through the implementation of project design criteria and WCPs/BMPs. Recent monitoring has shown that soil disturbance, and therefore, long-term soil productivity, are maintained within forest plan standards for disturbance.

Mass Movement

None of the soils identified in the forest plan for slope stability issues are found in the project area. There are some areas of steep slopes which may have slope instability (Slope Stability, 2008, Northern Hills District) but those areas are typically short sections of steep slopes (over 30 percent slopes). Road construction is proposed in one of those concern areas; however the road route avoids the steep sections and would not require impacting the areas of steep slope. Further, vegetation treatment units would retain a forest stocking of at least 80 square feet of basal feet on slopes greater than 55 percent. Therefore, soil stability would be maintained through the avoidance of road construction and heavy cutting on steep slopes where treatment areas have been identified as a concern for slope stability.

Hydrology- Direct and Indirect Effects

The direct effects to water quality would be limited to a very few locations and situations where roads with drivable fords cross streams. There are no proposed temporary roads or landings to be constructed within WIZ areas. The impact of the road crossings would be negligible (and more likely beneficial over time) as most of the current crossings would be maintained or upgraded to conform to WCPs/BMPs. Stream crossings for log yarding activities would be required to meet WCP/BMPs for log skidding activities. The storm-proofing of these road crossings and implementation of WCPs/BMPs are expected to minimize sediment input or disturbance to stream channels (Burroughs and King 1989). Any disturbance to a stream that might occur would be identified and rehabilitated following BMP and timber contract processes.

The Water Erosion Prediction Project (WEPP) road modeling indicates that there would not be a substantial difference in sediment delivery at road crossings from the current condition due to implementation of the modified proposed action. There are currently 70 stream crossings and the modified proposed action would not add crossings through temporary or new system road construction. Road traffic is expected to increase for limited periods of time during implementation, and potentially could increase sediment delivery; however, sediment delivery at crossings should actually stay the same or slightly decrease due to upgrades at the stream channel approaches to meet BMP guidelines (Table 37).

Table 37. Estimated sediment delivery to road crossings by alternative

Treatment Level	Tons Sediment per Year per Crossing
Alternative 1- No Action	0.1
Alternative 2- Proposed Action	0.1

There would be no direct effects to streamflow, wetlands or WIZ areas. The implementation of WIZ buffers precludes any direct effects. All effects to streamflow, wetlands, and WIZ areas are indirect effects that happen at a different time or place from the implementation of the modified proposed action.

Indirect effects to water resources and riparian areas are those effects which occur off-site (not directly on the waterbody) and do not immediately affect water quality, riparian health, or stream channels (such as is the case with the local area of a road crossing). The effects usually occur at a later time or place as a result of precipitation events and runoff (erosion from an activity unit or landing to a stream after a storm event for example).

Treatments adjacent to the WIZ usually pose the most risks for impacts to water quality, riparian health, and stream channels. Therefore, for the purposes of this project, treatment activities were delineated for locations outside of the WIZ. Effects to the WIZ would be controlled through the combined implementation of project design features and WCPs/BMPs.

As noted in the direct effects section, road crossings are the most likely locations for effects to water, riparian, and aquatic resources. There are no new or temporary roads or landings proposed in streams, wetlands or within the WIZ area. Therefore, the existing stream crossings are the locations where there is potential for an effect to stream channels or water quality. The other potential for effects to water, riparian, and aquatic resources would be from activities outside of the WIZ that could be transported downslope through the WIZ to a stream channel. Sediment delivery from upslope activities could potentially be transported through the WIZ to downslope intermittent streams. Table 38 displays the analysis of the potential for sediment delivery through the intermittent WIZ stream buffers.

Table 38. Estimated volume and risk of sediment delivery through the WIZ as a result of implementing the modified proposed action. Erosion and sedimentation estimates are based on the WEPP FuME model (Elliot et al. 1999).

Treatment Type	Tons per square mile in first year of disturbance	“Average” Annual Hillslope Sedimentation (tons per square mile per year)
Wildfire (Slopes up to 10%)	1,497.6	37.4
Wildfire (Slopes up to 20%)	2,835.0	70.9
Wildfire (Slopes up to 40%)	4,748.8	118.7
Prescribed Fire (Low Intensity- Slopes up to 10%)	76.8	0.3
Prescribed Fire (Low Intensity- Slopes up to 20%)	172.8	8.6
Prescribed Fire (Low Intensity- Slopes up to 40%)	313.6	15.7
Thinning, Selection and Shelterwood (Slopes up to 10%)	12.8	0.6
Thinning, Selection and Shelterwood (Slopes up to 20%)	25.6	1.3
Thinning, Selection and Shelterwood (Slopes up to 40%)	44.8	2.2

Table 38. Estimated volume and risk of sediment delivery through the WIZ as a result of implementing the modified proposed action. Erosion and sedimentation estimates are based on the WEPP FuME model (Elliot et al. 1999).

Treatment Type	Tons per square mile in first year of disturbance	“Average” Annual Hillslope Sedimentation (tons per square mile per year)
Access Roads (Low Traffic)	1.2 to 15	1.2 to 15
Access Roads (High Traffic)	3.2 to 15	3.2 to 15

The WEPP model was run using the WIZ buffer width (100 feet) and the road densities that are on the upper end of the range for the affected watersheds (3.6 miles per square mile vs. using 2.5 miles per square mile). By utilizing the more conservative values, the model outputs present a reasonable upper bound for impacts and sediment delivery to streams. The WEPP results for prescribed fire indicate that there is an initial potential for a slight input of sediment from the burning activities, which drops to nearly background levels within the first year. Thinning, selection and shelterwood activities and road use are not expected to deliver substantial amounts of sediment to stream channels. For example, the prescribed fire on 20-percent slopes would equate to approximately 0.25 ton per acre of sediment delivery for treated stands adjacent to streams (172.8 tons per 640 acres = 0.27 ton per acre). Thinning on 20-percent slopes would equate to approximately 0.04 ton per acre.

Stream Flow

Road drainage systems may alter a stream’s water yield. These changes occur when subsurface and surface flow is captured at road cuts and in ditches, and redirected into a channel (USDA Forest Service 1996). Roads can also direct water away from a stream (USDA Forest Service 1996). The effects of road drainage can include an increase in peak discharge, changes in the shape and timing of the hydrograph, increases in the total discharge, and potentially a decrease in water quality (USDA Forest Service 1996). However, flow regimes do not appear to be adversely affected by the dense road networks in the Black Hills. During field reviews by Forest personnel, peak flows of streams were not shown to increase due to road density (USDA Forest Service 1996). Roads are occupying areas where trees or biomass would be. This creates an opening in the forest floor and reduces the evapotranspiration rates on these areas making more water available for groundwater recharge or streamflow. Normally roads tend to change flow regimes by delivering water more quickly to streams making their peak flows higher.

Recent research indicates that effects from peak flows, although of concern, should be confined to a relatively discrete portion of the network where channel gradients are less than approximately 0.02 percent and streambeds are composed of gravel and finer material. Furthermore, data support the interpretation that if peak flow increases do occur, they can only be detected in flows of moderate frequency and magnitude. Beyond that, they are likely not detectable (Grant et al. 2008). Therefore, it is unlikely that there would be any detectable changes from the current condition resulting from either the new road construction or the vegetation treatments.

Riparian Areas and Wetlands

Those riparian areas that do exist within the project area are associated with springs and wetlands where there is enough water for riparian vegetation to thrive. These areas are scheduled to receive

a WIZ buffer of 100 feet. There would be no treatments that effect riparian vegetation with the possible exception of broadcast burning. Since broadcast burning would only be allowed to creep into wetland and spring WIZ areas, it is not foreseen that fire intensity or organic material consumption would be high. The season and timing of burning activities are designed to be implemented at a time of the year when wetland and spring areas would be moist and resistant to high-severity, high-intensity fire. Broadcast burn control lines could occur within the WIZ buffer, however they would be narrow lines (approximately 1 foot wide) constructed with hand tools. Therefore, it is not expected that there would be any measurable effect to riparian areas or wetlands, and there would be no substantial change from the current condition.

Water Influence Zones

Water influence zones would be delineated and implemented for all perennial and intermittent streams, wetlands, and springs within the project area that are adjacent to treatment activities. These WIZ areas are exclusive of ground-based treatment activities and direct lighting of broadcast burns. However, end lining, hand thinning, and broadcast fire backing into WIZ areas may occur. The instances where these exceptions would occur are expected to be few due to the lack of woody vegetation in WIZ areas and the proposed broadcast burn prescription for cool, low-severity, low-intensity burns. With the exception of some potentially slight reductions to sediment delivery resulting from road maintenance activities, it is not expected that the WIZ areas would be substantially impacted or altered from the implementation of the proposed project.

The project is affecting a very small portion of the available WIZ area within the project boundary, but of those acres, there would be a neutral effect due to the limitations on cutting riparian vegetation, ground cover maintenance standards, and road maintenance at stream crossings.

Further, improvements in road drainage and implementation of WCPs/BMPs associated with project-related road use and maintenance should decrease the overall long-term impact of sedimentation on stream channels.

Cumulative Effects

The cumulative effects area was delineated based on affected 7th Code Hydrologic Unit subwatersheds. The affected subwatersheds and their acreages are listed in Table 39.

A degree of activity within a watershed, beyond which an adverse effect might be expected, is termed a threshold of concern. Thresholds of concern for affected subwatersheds are usually developed based on a sensitivity index which includes slope, vegetative cover, geology/erosion hazard rating, and critical watershed elements (public drinking water sources, and other waterbodies highly susceptible to water quality degradation). A numeric range is supported by research and guidelines for soil disturbance, beyond which significant adverse effects in study watersheds were reported (Reid 1993). Thresholds of concern are expressed as a percentage of a watershed that is in equivalent clearcut area (ECA) (USDA Forest Service 1974, USDA Forest Service 2005) and, in this case, is 15 percent ECA within any of the affected subwatersheds. A Fifteen-percent threshold was utilized in this case as the majority of the affected watersheds are well vegetated, and underlain by geology and geomorphic processes which are relatively resilient to forest management practices. Downstream water sources in Spearfish Creek were considered and therefore the threshold was ultimately adjusted to the middle of the 14 to 18 percent range.

Cumulative watershed effects were analyzed using the equivalent clearcut area (ECA) method. The ECA model analysis is described in PNW-GTR-637 (USDA Forest Service 2005).

Cumulative watershed effects are measured using the ECA model, which generates an index of cumulative disturbance (for both soil and water resources) by considering disturbance type, extent, and recovery over time. Although the model has many limitations, it provides an index of vegetative disturbance that can be used to compare the existing condition of different watersheds, and the potential impacts among land management alternatives. It uses a clearcut acre as the basis for comparing effects of various resource management treatment activities and features. A road surface, in the context of the method, is considered to be a native surface forest road (total clearcut), bare of vegetation, severely compacted and practically impervious, that sheds water and possibly conveys some distance to all water precipitated upon it. Thinning and prescribed fire vegetation treatments are considered to be a percentage of a totally clearcut acre with some portion of the acre left in a vegetated condition but reduced in hydrologic function. Judgment of the effect of proposed actions is made in consideration of current conditions, as determined by field observations, and those environmental parameters that are deemed relevant to the response of watershed hill slopes and channels in the project area.

For the purposes of this analysis, it was assumed that all of the proposed treatment acreage would be implemented. This approach will most likely overstate the actual effects as not all acres would ultimately be treated. However, since it is essentially unknown which areas will be canceled for treatment activities, the more “conservative” approach is necessary to encompass all possible effects.

The percent ECA (Table 39) shows the relative disturbance level attributed to each watershed by resource management activities and existing conditions prior to and after the implementation of an action alternative, which is estimated here as 2011.

Implementation of the proposed action would initially increase the ECA values over the current condition beyond the threshold of concern in the short term. However, the thinning and fuel treatment generally raise the ECA values due to their broad-scale coverage. The intensity and impact of the treatments is of such a nature that they don't present a long-term impact. The resilience of the local soils and the implementation of project design criteria and BMPs will assure that ECA values and impacts to the affected subwatersheds will be within threshold of concern values within 3 to 5 years. The broadcast burning effects are, however, expected to be relatively light to moderate from a hydrologic standpoint. The broadcast burns are expected to be low-intensity over most of the proposed burn areas and hydrologic soil conditions are expected to recover to pre-fire levels relatively rapidly (within 1 to 3 years).

ECA modeling is an index of overall watershed disturbance and does not account for spatial location or mitigation factors which reduce erosion and ground disturbance. Therefore, it is not expected that the project will have a substantial impact at the watershed scale due to the relatively small additions in ECA attributable to the project activities. Although the ECA values indicate some increases over current values, the actual impacts associated with the project should be benign or slightly beneficial when considered in context of reintroducing fire into the ecosystem and the implementation of project design features and WCPs/BMPs.

Table 39. Equivalent clearcut by watershed. Note: the estimated threshold value for the affected subwatersheds is 15 percent equivalent clearcut area (ECA).

7 Code HUC Subwatershed	Acres	Threshold of concern (percent of equivalent clearcut area)	Current Condition ECA	Immediate post project ECA	3 to 5 years post project, percent
			2011	2013	2016 to 2018
10120203030101	8,672	15%	3%	17%	2%
10120203030102	8,476	15%	5%	32%	12%

Summary and Comparison

Direct effects to project area soils from implementation of the modified proposed action are expected to be short-term: soil displacement and slight compaction associated with skid trails. Pile burning would also create isolated high burn severity locations (generally less than 1/10th of an acre each). These effects are expected to last short- to mid-term (less than 10 years), and are not expected to contribute to the overall long-term detrimental soil disturbance ratio. There would be no direct or indirect effects to long-term soil productivity; long-term soil productivity would be maintained through the implementation of project design criteria and WCPs/BMPs. Soil stability would be maintained through the avoidance of road construction and heavy cutting on steep slopes where treatment areas have been identified as a concern for slope stability. The wetlands would have a WIZ buffer (100 feet) that excludes most activities. Through project activity avoidance of wetlands, the potential impacts to wetlands would be minor.

The project watersheds' existing conditions are all functioning well within their thresholds of concern, but they are not in a natural pristine condition; they are functioning in a managed system, and are therefore, functioning at risk in terms of hydrologic condition and aquatic resources. The affected watersheds are currently listed as Class 2 in the forest plan. Nevertheless, the modified proposed action itself does not increase the overall impact to watersheds and aquatic resources over the long term. Total equivalent clearcut area in both affected watersheds is under 15 percent. Based on this analysis, it is not expected that the modified proposed action would negatively impact the affected subwatersheds from their current condition.

Air Quality

Introduction

Air quality in the Black Hills area is generally excellent (USDA Forest Service 2005). The nearest area listed by the Environmental Protection Agency for non-attainment of particulate matter less than 10 microns in size (PM10) is Sheridan, Wyoming, approximately 200 miles west (i.e., upwind) of the project area (EPA 2011). South Dakota does not have any identified PM10 non-attainment areas nor are any PM2.5 non-attainment areas identified in Wyoming or South Dakota (EPA 2011).

No-Action Alternative

Direct, Indirect, and Cumulative Effects

The no-action alternative would have no immediate effects on air quality. Fire hazard would remain high across much of the project area. These conditions increase the potential for a large,

stand-replacing fire, which would be expected to generate more smoke, possibly when smoke dispersal conditions are poor, and greater negative effects on air quality than a prescribed burn.

Modified Proposed Action

Direct and Indirect Effects

The modified proposed action includes pile and broadcast burning. Smoke from burning associated with this alternative could affect air quality and human health. Effects would not be expected to extend more than about 20 miles from the burn site, based on experience with previous prescribed burns in the area. Although pile and broadcast burning would increase emissions for a few days at a time, proposed treatments are expected to decrease the potential for large, uncontrolled fires for up to 20 years. Burning would be conducted when smoke dispersal conditions are favorable to minimize negative effects on the immediate area.

Pile and broadcast burning would release carbon dioxide and other compounds into the atmosphere. Emissions of greenhouse gases, including carbon dioxide, are the main anthropogenic cause of current climate change (Seppälä et al. 2009). Forest management can enhance the capacity of forests to act as a carbon sink, but can also contribute carbon to the atmosphere (Hurteau et al. 2008). The scale of individual project contributions and effects may be negligible and impossible to measure. Changing climate could affect resources in the project area over time, especially at lower-elevation sites along the edge of the prairie. Current forest plan direction generally would provide increased resilience to such changes.

Cumulative Effects

The spatial boundary for analysis of cumulative effects on air quality is all lands in the project area. There are no large population centers within 5 miles of the proposed burn blocks, where experience shows direct and indirect effects of smoke are generally discernible. The temporal boundary extends from the initiation of each burn to the end of active burning, usually from a day to a week.

Other actions and events relevant to air quality include burning of slash at log landings (including large piles resulting from whole-tree yarding) in timber sales near the project area and on non-NFS lands, and broadcast burning elsewhere on the national forest or lands of other ownership. Burning of slash piles usually occurs in winter; in dry winters with little snow, burning may occur in many areas at once during the limited time when snow cover is available. Under these conditions, the modified proposed action could add to smoke effects of burning in adjacent areas. If burning conditions remain favorable for an extended period of time, it would be possible for proposed burns to occur around the same time as burns elsewhere on the Forest, which could result in the presence of smoke for a longer than usual period. Favorable conditions, however, generally last only a few weeks each season.

Summary and Comparison

The no-action alternative would have no immediate effects on air quality; however project area fire hazard would remain high or very high across much of the project area, increasing the risk of a large wildfire and associated smoke.

The modified proposed action includes broadcast burning and pile burning. Smoke from burning could affect air quality and human health; however, burning would be conducted when smoke dispersal conditions are favorable to minimize negative effects on the immediate area. The

timeframe for potential negative effects would be limited to the days burning is initiated and the following 1 or 2 days. Proposed treatments would decrease the potential for large, uncontrolled fires and the smoke associated with a wildfire.

Recreation

Introduction

This analysis discloses the potential effects of the alternatives on recreation resources. It summarizes the Cold Springs Recreation Resource Report (Jones 2011), which is located in the Cold Springs project file.

The project area includes a portion of the non-motorized Eagle Cliff Trail system, including two developed trail heads. Popular activities on this system include cross-country skiing and snowshoeing.

The project area is located near the heart of the Black Hills snowmobile trail system. There are approximately 16 miles of groomed snowmobile trails within the project area. A major snowmobile trail head, Trailhead Lodge, is located just outside the project boundary and the grooming hub of the trail system is based at Hardy Guard Station, just west of the project boundary.

Spatial and Temporal Context for Effects Analysis

The cumulative effects analysis area is the project area plus a 2-mile buffer around the project area. This extent is chosen because recreational uses in the project area are connected to adjacent areas (trails extend beyond the project area boundary), and events within the project area may displace use to adjacent, but reasonably nearby areas. The time period used for analysis is 10 years prior until 10 years into the future. This period of time accounts for recent impacts that have occurred along with future impacts that can reasonably be foreseen.

No-Action Alternative

Although the no-action alternative would not change current management or propose any new activities, changes would still occur through natural biological processes and human use of the area. Visitors will continue to recreate on the Forest, and access to private land would be requested.

Direct and Indirect Effects

No changes would be made to developed, dispersed recreation or travel management. The same recreational activities that are currently available in the Cold Springs project area would continue to be available under this alternative.

The number of pine trees infested and killed by mountain pine beetles is likely to continue to increase while climatic conditions and population dynamics are favorable. This would lead to increasingly unsafe conditions in recreation areas because of increased potential for falling trees. Many visitors consider beetle-killed trees unsightly, and increasing numbers of beetle-killed trees may encourage visitors to recreate in more scenic areas.

Travel management would remain the same. No new closures or openings of new areas would occur. The changes to the travel management system were made with the Travel Management Record of Decision dated March 22, 2010, and would be implemented as such.

Cumulative Effects

Hardy Guard Station, Eagle Cliff Trails, various snowmobile trails, Trailhead Lodge, and Thunderhead Episcopal Church Camp are all either Forest Service or private facilities adjacent to the project area. Cumulative effects from activities within the project area could conceivably impact these facilities. Under the no-action alternative, no thinning of ponderosa pine would occur, allowing likelihood of mountain pine beetle infestation to continue to increase. Beetle-killed trees are less aesthetically pleasing than healthy trees because they display red needles the year after mortality. The presence of mountain pine beetles in the Cold Springs project area would also increase the risk of infestation of trees outside the area, including trees around and within the listed facilities. Loss of trees immediately adjacent to or within these facilities would decrease their attractiveness to users.

As the local population increases, use of forest roads and trails will probably continue to increase. This increased use may result in increased dust, ruts, damage and vandalism if the roads and trails are not maintained at adequate levels. No improvements or closures would take place under the no-action alternative, compounding the effects of increased use.

The no-action alternative would not change the existing recreation or travel management direction for the project area, and therefore, would not contribute to cumulative effects.

Modified Proposed Action

Direct and Indirect Effects

Proposed treatments to promote healthy forests would be a benefit to the recreation program. Healthier forests are safer and provide a visually more appealing appearance for the visitor to enjoy.

All developed sites, non-motorized trails, and snowmobile trails would be protected during harvest activities. There will be no direct effects to the trail systems.

The Eagle Cliff Trails would be minimally affected. Several proposed treatment areas are adjacent to the trail. The recreation staff would work with other Forest Service timber sale administrators to provide for safety near the trail during harvesting operations. Removal of hazard trees and general maintenance along designated trails and developed recreation sites would continue. Timing restrictions would be included to have no harvesting activities adjacent to the groomed cross-country ski trails from December 1 to March 31.

Road reconstruction and maintenance activities would improve safety conditions for all users.

National Forest System Road 209.3D is a road open to highway-legal vehicles according to the motor vehicle use map, and is slated for decommissioning. A new road is proposed to be constructed east of this road. Having the road in a more sustainable location would benefit the travel system.

The Forest Service will continue to repair and maintain National Forest System roads and trails under its jurisdiction. New and existing user-created routes that are causing resource damage will be rehabilitated or removed, as funding allows. Emergency restrictions will continue to be implemented as needed, such as temporarily closing roads during wet conditions to prevent rutting and erosion or during periods of extreme fire danger. The Forest Service will continue to patrol and enforce regulations to protect road and trail surface resource, vegetation, and other

resources. This alternative will not affect State, county, or private management. Current management would continue unless changed through the travel management program.

Any effects to dispersed recreation would be temporary in nature. As the name implies, dispersed recreation can occur anywhere throughout the project area. Campers, hunters, snowmobilers, people gathering forest products, or driving for pleasure, for example, can choose to recreate in another location if management activities are currently taking place in the area they like to frequent. Recreation would be disrupted in areas of harvest activity, but would be expected to return to normal when harvesting is complete.

No changes in special use permits for outfitters or guides are anticipated under the action alternative.

Cumulative Effects

The recreation experience in Hardy Guard Station, Eagle Cliff Trails, various snowmobile trails, Trailhead Lodge, and Thunderhead Episcopal Church Camp immediately adjacent to the Cold Springs project area may benefit from proposed management activities. Thinning of ponderosa pine stands in the project area would decrease their susceptibility to mountain pine beetle infestation and the likelihood that beetles would spread to the areas.

The road improvements proposed under the Cold Springs Project, in combination with the direction contained within the travel management decision, would result in a more clearly defined, safer motorized recreation experience in the project area. Road reconstruction and maintenance would make the existing road network safer for public travel. In addition, the travel management decision would define which routes are open to travel and what types of vehicles are allowed on them. This combination of effects could also have a positive effect on non-motorized recreation in that access to recreation areas is improved and it would be clear which routes are open to motorized vehicles and which are not.

Summary and Comparison

Although visitors may be temporarily displaced during proposed harvest activities, in the long run, a healthier forest would provide a safer and more aesthetically pleasing visitor experience in comparison to the no-action alternative. The decommissioning of road 209.3D and addition of the new road would create a more sustainable route for the travel system in comparison to the no-action alternative.

Scenery

Introduction

This analysis discloses the potential effects of the alternatives on scenic resources. It summarizes the Cold Springs Project Scenery Management Resource Report (Hill 2011), which is located in the Cold Springs project file.

The project's effects on scenic integrity are addressed in this analysis. The measurement indicators for this analysis are the proposed activities' compliance with forest plan established scenic integrity objectives (SIOs) for the project area and area of treatment type in each SIO. SIOs are management objectives adopted from the scenic class values. Scenic integrity is a measure of the degree to which a landscape is visually perceived to be "complete." The highest scenic integrity ratings are given to those landscapes that have little or no deviation from the

character valued by constituents for their aesthetic appeal (USDA Forest Service 1995, 2-1). Within the Cold Springs project area, about 12 percent of the landscape is allocated as high SIO, about 35 percent is moderate SIO, and about 41 percent is low SIO. Figure 7 displays the project area SIOs in relation to the commercial treatment units. The SIOs found in the project area include:

High SIO – A scenic integrity level meaning human activities are not visually evident. Activities may only repeat attributes of form, line, color, and texture found in the existing landscape character (USDA Forest Service 2006). The valued landscape character “appears” intact or unaltered. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident (USDA Forest Service 1995).

Moderate SIO – A scenic integrity level that refers to landscapes where the valued landscape character “appears slightly altered.” Noticeable deviations must remain visually subordinate to the landscape character being viewed (USDA Forest Service 1995, 2006).

Low SIO – A scenic integrity level referring to the landscapes where the valued landscape character “appears moderately altered.” Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings, vegetative type changes, or architectural styles within or outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within (USDA Forest Service 1995, 2006).

The effects analysis will consider how each alternative meets the allocated SIOs. Effects caused by the no-action and modified proposed action alternatives were also considered in relation to the desired landscape character.

Spatial and Temporal Context for Effects Analysis

Short-term scenic effects of timber harvest and vegetation management are often the most noticeable until the growth of grasses, shrubs, and remaining trees begin to soften the effects of harvest operations. Short-term for this analysis refers to a 3- to 5-year period after all vegetation treatment and fuels reduction activities in an area are complete. Short-term effects are especially noticeable when the viewer has an up-close view of the treatment site usually in the foreground viewing distance. Long-term effects, which for this analysis is considered beyond 5 years, vary by the treatment and the logging method used. The scenic resource analysis considered the area within the project area boundary, unless otherwise noted.

Past harvest of timbered slopes is generally noticeable for 15 to 30 years, depending on treatment prescriptions, soils, aspect, and vegetative species composition. At the end of this time period, the regrowth of vegetation begins to develop characteristics of a closed canopy and the area no longer appears altered. A complete list of potential cumulative actions can be found in Appendix C. The cumulative effects analysis area is the Cold Springs project area and viewshed of U.S. Highway 85 adjacent to the project area, including lands in other ownership.

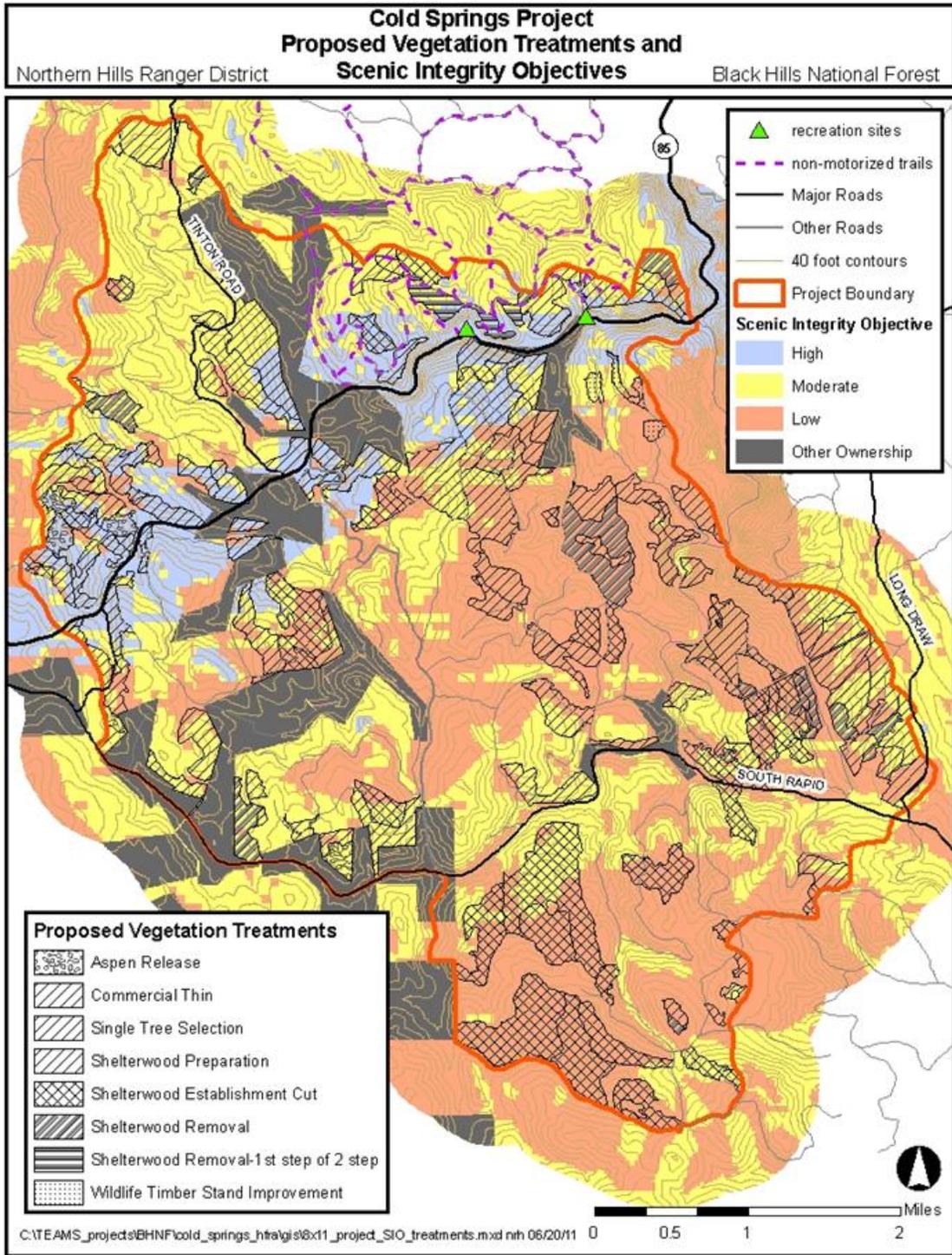


Figure 7. Cold Springs Project proposed commercial treatments and scenic integrity objectives map

No-Action Alternative

Direct and Indirect Effects

There would be no human-caused changes to the scenic quality within the project area. The no-action alternative would meet the adopted high, moderate, and low SIOs throughout the project area, as it does not create any unnaturally appearing elements of form, line, color, or texture.

Vegetation structure would change over time through natural growth, mortality and events such as wildfires, storms, and insect outbreaks. High amounts of fuels, if established, do not create visually preferred open stands with high visual access and a clear forest floor. The potential for wildfire and insect outbreaks in this alternative would be an additional risk to the stability of the scenic resources in the future. Under the no-action alternative, the natural evolution of the vegetative component of the landscape would continue to change the scenic qualities of the area over time. For example, wind storms or snow and ice storms may cause portions of the project area, particularly beetle mortality areas, to blow down or contain areas of broken-topped trees.

If the vegetation in the project area was consumed by fire, the existing landscape character would be lost until trees and understory vegetation reestablishes. If killed by wildfire, scorched timber and shrubs would alter the forested setting, changing the sense of place for visitors in the area. “In general, natural forest disturbances that result in extensive areas of dead or dying trees (Haider and Hunt 2002, Ribe 1990) such as the destruction of the forest by fire or flooding are perceived negatively (Daniel 2001; Fanariotu and Skuras 2004; Gobster 1994, 1995)” (cited in Ryan 2005, 17).

If many trees were killed by an insect outbreak at epidemic levels, the existing landscape character could also be lost until trees reestablish. Trees killed by an insect outbreak would be very noticeable in the first two years of mortality, as long as red needles persist. After needles fall to the ground, standing, dead trees appear gray in color. In most cases groups of dead trees, once needles have fallen, would remain subordinate to a surrounding landscape of green trees. However, an epidemic outbreak that kills entire stands of trees, or groups of trees larger than an acre, may start to dominate the landscape being viewed. Beetle mortality would especially dominate when a viewer has a direct view of an affected hillside for longer durations. Tops of the standing, dead trees eventually break out or entire dead trees fall to the ground. Areas with a lot of mortality often create a “jack-straw” appearance of downed logs across the forest floor as these trees fall to the ground. Large amounts of downed material, even if the cause is natural, is not a preferred visual setting (Ryan 2005).

Cumulative Effects

Because this alternative does not directly affect scenic resources, and because it does not have an additive effect to the impacts from past, present, and reasonably foreseeable activities, there are no cumulative effects for the no-action alternative.

Modified Proposed Action

Direct and Indirect Effects

Vegetation Treatments

The visual effects of tree removal, such as commercial thinning or shelterwood treatments, can vary depending on the intensity of the treatment. Stumps, slash, and edge effects of newly logged

areas or units, depending on the intensity of the treatment, can result in a forest that appears moderately altered in the short term. The contrast between harvested and unharvested areas in the short term is often quite noticeable. Reducing the amount of slash and woody debris after timber harvesting is beneficial for scenic resources, as numerous studies have found that “the public responds negatively to downed wood, slash, and other debris from timber harvesting and thinning (Arthur 1977, Echelberger 1979, Ruddell et al. 1989)” (cited in Ryan 2005, 45).

Sanitation treatments would occur within treatment units and throughout the project area at mountain pine beetle infestation locations. If many trees need to be removed either within treatment units or other parts of the project area, other management activities may become more evident. Additionally, if many trees need to be removed, areas of sanitation removal may be quite noticeable due to the textural change in the forest canopy. However, if sanitation and salvage reduces the potential of large amounts of dead trees, a more preferred scenic setting is anticipated in the long term. Prior to implementation, resource specialists would review areas of sanitation treatment outside of harvest units to determine whether any special design criteria are needed.

Commercial thinning, shelterwood preparation, and single-tree selection treatments would have similar effects on scenic resources as these treatments would achieve a stocking ranging from 60 to 80 square feet of basal area. In most areas, trees would be whole-tree logged and hauled to a landing for processing, reducing the amount of slash seen in the proposed units after harvesting. These treatment types would result in a more open appearing forest. In foreground views, this type of harvest would change the visual access into the forested stand by reducing the number of tree boles. The forest, from this viewing distance would appear more open with greater visual access into the forested stand. The reduced number of trees would allow visitors to view greater distances across the otherwise forested area and more light would reach the forest floor. In middleground views, with the thinning described above, this type of timber harvest may be noticeable as a slight change in the texture of the tree canopy. Whole-tree yarding would reduce the amount of woody debris and slash seen from concern level viewpoints. The transition zone of unit edges in the scenery project design criteria would reduce any noticeable edges between treated and non-treated areas when viewed from the middleground distance.

Shelterwood establishment cutting and shelterwood removal are the most intensive treatments in regards to scenery. These treatments would change the texture of the tree canopy dramatically, allowing more of the forest floor to be seen in these areas from both foreground and middleground views. The shape and edges of these treatment units would be more noticeable than other treatment types because more trees would be removed. These areas would appear quite open compared to the existing condition, allowing one to view much greater distances across the area. The transition zone of unit edges in the scenery project design criteria would reduce noticeable edges between treated and non-treated areas when viewed from the middleground distance. A shelterwood removal type consisting of the first step of two-step removal would resemble a shelterwood preparation cut described above.

Precommercial thinning and wildlife timber stand improvement treatments would open the tree canopy slightly changing the texture of the tree canopy as viewed from U.S. Highway 85. The effects of these thinning treatments would be naturally appearing, creating more visual access in these forested stands and allowing the viewer to view greater distances into the forested stand. Thinning that would increase tree health and vigor would move these areas toward the desired landscape character. Once slash removal is complete, it is anticipated that these activities would not be evident.

Aspen release would increase visual variety and scenic attractiveness, especially during autumn color changes.

Tree stumps have impacts to scenic resources in the short term and would be most noticeable in the immediate foreground view of the identified concern level viewpoints. Visible tree stumps from timber harvesting are generally disliked by viewers (Daniel and Boster 1976 and Ryan 2005). Project design criteria are in place to reduce the visibility of stumps and minimize their impacts. Stumps would become less visible within one to two growing seasons as grasses, forbs, and shrubs sprout new growth. Table 40 summarizes the acres of vegetation treatment by SIO.

Table 40. Acres of proposed vegetation treatments in each scenic integrity objective for the modified proposed action

Proposed vegetation treatments	Acres			
	High SIO	Moderate SIO	Low SIO	Total for treatment
Commercial vegetation treatments				
Aspen release	42	36	6	83
Commercial thin	212	656	530	1,398
Commercial thin, 50 percent canopy cover	9	12	5	25
Single-tree selection	101	123	299	523
Single-tree selection, 50 percent canopy cover	25	11	72	108
Shelterwood preparation	197	130	204	531
Shelterwood preparation, 50 percent canopy cover	0	39	68	107
Shelterwood removal	<1	127	174	301
Shelterwood removal (1 st step of 2 step)	23	33	0	56
Shelterwood establishment	44	333	913	1,290
Total commercial treatment area				4,424
Noncommercial vegetation treatments				
Aspen release (247 acres following vegetation treatment)	135	183	170	489
Precommercial thin(1,060 acres following vegetation treatment)	199	532	485	1,215
Precommercial thin and aspen release following commercial treatment	0	98	9	107
Wildlife timber stand improvement (34 acres following vegetation treatment)	6	35	76	83
Total noncommercial vegetation treatment				1,928

Note: Any slight discrepancies in totaling acreages are from rounding values in GIS.

Views from U.S. Highway 85, including Bratwurst and Holey Rock Trailheads

The foreground viewshed of U.S. Highway 85 is mostly allocated as high SIO, while most of the middleground viewshed is allocated moderate SIO. Views from the highway in the eastern portions of the project area, including the Bratwurst and Holey Rock Trailheads, are mostly limited to the highway corridor due to steep slopes and densely forested areas. Traveling farther

west, meadow openings and gentler slopes adjacent to the highway allow for longer views of the proposed treatments.

Proposed treatments occurring in the immediate foreground and foreground of U.S. Highway 85 in high SIO include: shelterwood preparation cutting, commercial thinning, single tree selection, aspen release and pre-commercial thinning. Aspen release would increase visual variety and scenic attractiveness viewed from U.S. Highway 85. The forest, as viewed from U.S. Highway 85, would appear more open with greater visual access into the forest. Where treatments are right next to the highway, visitors would be able to view greater distances across the otherwise forested area and more light would reach the forest floor. These treatments would create visually preferred settings having attributes of large trees; smooth, herbaceous ground cover; and an open midstory canopy with high visual penetration. Once all project activities are complete and with the scenery project design criteria applied, it is anticipated that project activities would not be visually evident to the visitor as viewed from U.S. Highway 85.

The first step of a two-step shelterwood removal is also proposed above Holey Rock Trailhead. A higher basal area (about 60 square feet basal area) would be retained so that this area has forested appearance although the area may appear more open and have a slightly more open canopy texture. These treatments are also located above steep slopes north of the highway and trailhead, and would not be visually evident for long durations of view.

Two treatment units of shelterwood establishment cutting are proposed in high SIO. Although these treatment units are mostly screened by topography, it is anticipated they may be seen for short durations of view. Project design criteria specific to these units include leaving more trees ranging from 40 to 60 square feet of basal area in an irregular spacing and leaving denser areas or islands of trees throughout the unit. This project design feature ensures the use of form, line, color and texture of the characteristic landscape so that deviations are not evident.

Middleground views of the proposed treatments would continue to have a forested canopy character with vegetation treatments providing a slightly more open texture to the forest canopy when viewed from U.S. Highway 85. With the scenery project design criteria applied, it is anticipated that these vegetation treatments would not be visually evident in the characteristic landscape being viewed from U.S. Highway 85.

Views from Tinton Road (NFS Road 134.1)

The foreground and middleground viewsheds of Tinton Road are mostly allocated as moderate SIO. Proposed treatments occurring in the immediate foreground and foreground of Tinton Road include: shelterwood preparation cutting, commercial thinning, single-tree selection, aspen release, and precommercial thinning. Aspen release would increase visual variety viewed from Tinton Road. Where treatments are adjacent to Tinton Road, visitors would be able to view greater distances across the otherwise forested area, and more light would reach the forest floor. These treatments would create visually preferred settings having attributes of large trees and an open midstory canopy with high visual penetration. Once all project activities are complete and with the scenery project design criteria applied, it is anticipated that project activities would not be visually evident or any noticeable deviations would remain visually subordinate to the landscape character being viewed from Tinton Road.

Views from South Rapid Road (NFS Road 231.5)

The majority of the foreground viewshed of South Rapid Road is allocated as moderate SIO with some foreground areas and most of the middleground viewshed allocated as low SIO. Most of the

views from South Rapid Road are of the foreground viewshed with limited views of the middleground viewing distance.

Proposed treatments occurring in the immediate foreground and foreground of South Rapid Road in moderate SIO include: commercial thinning, single-tree selection, wildlife timber stand improvement, aspen release, and precommercial thinning. Aspen release would increase visual variety and scenic attractiveness viewed from South Rapid Road. The forest, as viewed from South Rapid Road, would appear more open with greater visual access into the forest. Where treatments are adjacent to the road, visitors would be able to view greater distances across the otherwise forested area, and more light would reach the forest floor. These treatments would create visually preferred settings having attributes of large trees; smooth, herbaceous ground cover, and an open midstory canopy with high visual penetration. Once all project activities are complete and with the scenery project design criteria applied, it is anticipated that project activities would not be visually evident to the visitor as viewed from South Rapid Road.

Several treatment units of shelterwood removal and shelterwood establishment cutting are proposed in moderate SIO. These treatment types would open the forested setting quite noticeably when next to South Rapid Road, and would dominate the landscape if the viewer had long-duration views or was standing within the treatment unit. These treatments, when next to the road, are spaced occasionally along South Rapid Road. The spacing and scale of these treatments next to the road would limit long duration views of these treatments. The change in texture of the tree canopy would be noticeable, but with the scenery project design criteria applied and with the spacing of proposed treatments along the road, it is anticipated these activities would remain subordinate to the landscape being viewed from South Rapid Road.

Several shelterwood establishment treatments (units 071305-5, 071305-17, and 071305-4) are concentrated south of South Rapid Road and partially located in an area of moderate SIO. The change in canopy texture and scale of these units may begin to dominate the characteristic landscape if viewed. However, it is anticipated that topography south of the road would screen enough of these treatments from view that they would remain subordinate to the landscape being viewed from South Rapid Road. In any case, the project design criterion specific to unit 071305-5 includes leaving more trees in the northern half of the unit, ranging from 40 to 60 square feet of basal area with irregular tree spacing. This project design feature ensures the use of form, line, color, and texture of the characteristic landscape so that deviations in moderate SIO remain subordinate to the landscape being viewed.

Views from Long Draw Road (NFS Road 209.1)

Long Draw Road passes through the southeastern portion of the project area with foreground viewsheds allocated as moderate and low SIO. Proposed treatments occurring in the immediate foreground and foreground of Long Draw Road in moderate SIO include: commercial thinning, single-tree selection, shelterwood removal, and precommercial thinning. The forest, as viewed from Long Draw Road, would appear more open with greater visual access into the forest. Where treatments are right next to the road, visitors would be able to view greater distances across the otherwise forested area, and more light would reach the forest floor. These treatments, along with proposed broadcast burning in these units, would create visually preferred settings having attributes of large trees; smooth, herbaceous ground cover; and an open midstory canopy with high visual penetration. Once all project activities are complete and with the scenery project design criteria applied, it is anticipated that project activities would either not be evident or if noticeable, would remain visually subordinate to the landscape being viewed from Long Draw Road.

Cross-country ski trails in the area near Bratwurst and Holey Rock Trailheads

Cross-country ski trails have immediate foreground and foreground viewsheds allocated as high and moderate SIO. Views of proposed treatments from the trails would be for longer durations. Proposed treatments next to cross-country ski trails include: shelterwood establishment cutting, shelterwood removal (first step of two-step process), commercial thinning, single-tree selection, and precommercial thinning. Effects to scenery from these treatments would be similar to those described for other concern level viewpoints above, but with longer duration views.

Fuel Treatments

All proposed burning activities would have short-term effects of burned, blackened vegetation, and charred ground surfaces. Grasses and shrubs would resprout within one growing season after the burn, no longer being visually evident at that time. The proposed control line may be noticeable within the immediate foreground viewing distance from identified U.S. Highway 85, South Rapid Road, and Long Draw Road, but it is anticipated this activity would also not be visually evident after one growing season. In the long-term, burning would increase the diversity of texture, color, vegetative size classes, and distribution across the landscape. In the short and long terms, underburning often creates a smooth, herbaceous ground cover, a preferred visual setting. Less severe natural disturbances, such as low burn severity areas where understory burns but most mature trees are not killed, result in preferred forests over time (Taylor and Daniel 1984).

Concentrations of surface and ladder fuels would be hand- or machine-piled and burned. Handpiling and burning, when debris is fully consumed, is a preferred hazardous fuels treatment in visually sensitive areas such as next to private property (Ryan 2005). Scenery effects of burned ground surfaces would be limited to the pile location rather than spread throughout the unit. Handpiles would be noticeable until burned, and the burned areas may be noticeable until grasses resprout. It is anticipated the handpile burned areas would not be evident after about one growing season as these areas revegetate and the surrounding shrubs, grasses, and forbs would screen most of the burned areas from view. This activity may be seen from U.S. Highway 85, South Rapid Road, Tinton Road, and Long Draw Road. Slashing treatments are proposed in units scattered throughout the project area. The cutting of understory vegetation component would open up the stands to a more park-like vegetative mosaic and provide more visual access into forested stands, a preferred visual setting. Understory slashing would mostly be noticeable in foreground views as people would be able to view greater distances across the forested stand. This activity may be seen from U.S. Highway 85, South Rapid Road, and Tinton Road. Table 40 shows proposed fuels treatments by SIO.

Logging Removal Methods and Associated Facilities

Removal methods for vegetation treatments include ground-based and skyline systems throughout the project area.

Skyline Removal Methods

Skyline corridors have the potential to create straight lines through a normally continuous canopy of forest. Effects of skyline logging removal to scenic resources include the potential to view into the skyline corridor from nearby roads. Skyline logging removal is located in the eastern portion of the project area and would not be visible from concern level viewpoints. Up to about 14 acres could be removed by skyline systems in moderate SIO and 119 acres in low SIO.

Ground-based Removal Methods

Ground-based removal methods would take place throughout the project area. Where ground-based logging would be used to remove trees, evidence of logging would be apparent primarily in foreground views. Possible effects include skid trails, which often create lines of exposed soils across the forest floor. These effects would last for about 3 years until grasses and shrubs in the understory reestablish and lessen the effects of ground-based equipment. Some effects by ground-based harvest operations would also be softened by the proposed prescribed burning. Ground-based removal, which is proposed on about 653 acres of high SIO, about 1,660 acres of moderate SIO, and about 1,978 acres of low SIO, would not be noticeable once all project activities are complete. It is anticipated that high, moderate, and low SIOs would be met from the identified concern level viewpoints within three growing seasons of all project activities being complete.

Hauling Routes and Landings

The log hauling routes for the majority of the timber removal includes roads throughout the project area. Approximately 48 miles of roads under Forest Service jurisdiction would be used as haul routes for timber and would have pre-use maintenance or reconstruction. Road reshaping and new road surfacing would be noticeable due to the fresh, lighter colored soils which would be added or exposed. After about one to two growing seasons, these road improvements would not be visually evident.

Landings are most evident during project implementation before large piles of logs and slash are removed and immediately after project implementation until the landing is revegetated. The majority of landings would be away from view of concern level viewpoints such as U.S. Highway 85. With the scenery project design criteria applied, it is anticipated that landings would not be evident from the identified concern level viewpoints.

Temporary Road Construction

Construction of temporary roads can affect scenery by exposing light-colored soils and creating noticeable color contrasts which may be seen in foreground and middleground views. Generally temporary roads, once rehabilitated, revegetate quickly and would visually recover in the short term once rehabilitation activities are complete. Temporary roads would be located throughout the project area and not visible or readily evident from the identified concern level viewpoints.

Other Road Management Activities

Road Decommissioning

Road decommissioning activities generally have short-term effects to scenery by exposing light-colored soils which create noticeable color contrasts in foreground and middleground views. These short-term effects would visually recover quickly as the areas revegetate. The long-term effects of road decommissioning are beneficial to scenic resources by recontouring slopes to mimic natural landforms and rehabilitating and revegetating exposed soils generally visible on cut and fill slopes created during road construction. Road decommissioning would be located in the Clayton Draw area and may be noticeable from South Rapid Road for up to five growing seasons until the area revegetates.

New Road Construction

The replacement for road 209.3D would be located to the east, outside of the meadow passing through forested vegetation and in a location where proper drainage can be maintained. The new location would also allow timber harvest landings to be located in forest stands, outside of

meadows. New road construction will be noticeable by exposing light-colored soils on the new road surface and cut and fill slopes, and by potentially creating a break in the tree canopy. The new road construction near Clayton Draw is located in moderate and low SIO and has the potential to be seen by South Rapid Road. However, the new road location follows hillside contours borrowing design from the characteristic landscape. It is anticipated that once newly exposed soils fade, the road would remain subordinate to the landscape being viewed from South Rapid Road. About 1 mile of new road construction is located south of South Rapid Road and is not anticipated to be evident from this route once constructed due to topography screening from the road.

About 0.8 mile of new road construction is located in the foreground viewing distance of U.S. Highway 85. However, the new road construction is located in a forested area with higher proposed basal area and mostly screened from view by steep, roadside slopes in the eastern portion of U.S. Highway 85. A slight break in the tree canopy may be noticeable for short durations when traveling along U.S. Highway 85 by this new road construction.

Non-system to System Road Conversion

About 2.4 miles of non-system road would also be converted to system road. The routes proposed for conversion are unclassified, user-created routes or routes that were National Forest System roads, but have since been decommissioned. The road template already exists. The route would be added to the National Forest System and improved as necessary to meet Forest Service specifications. Effects to scenery would be similar to those described for road maintenance or reconstruction activities. These routes would be closed to motorized vehicle use following management activities. One route proposed for conversion can be seen in the foreground viewing distance of U.S. Highway 85 for short duration. This route does not dominate the landscape, but is noticeable as a native surface route intersecting with the highway. Since the route already exists on the ground and would be closed to motorized use following management activities, it is anticipated that the location and conversion of this road borrows from the form, line, and texture common to the existing landscape character so completely and at such a scale that conversion of this road would not be evident from U.S. Highway 85. Other routes proposed for conversion are not visible from concern level viewpoints due to topographic screening.

Cumulative Effects

Past activities have formed the current recreation opportunities and settings and most often form the viewing platform and opportunities for viewing scenery.

Cumulative effects to scenic resources in the Cold Springs project area are expected to meet the SIOs of the forest plan in the short term. In the long term, the scenic resources would have more open canopy vegetation conditions characteristic of the Mountainous/Mixed Forest Landscape Character Unit of the Laccolith Mountains. In high SIO areas, it is expected that any human activities would not be visually evident and would repeat naturally established form, line, color, and texture. In moderate SIO, it is expected that any noticeable deviations would remain visually subordinate to the landscape being viewed. In low SIO areas, any deviations present, although they may dominate the valued landscape character, would borrow valued landscape attributes of the characteristic landscape.

The proposed vegetation treatment and fuels reduction activities along with the past, present, and reasonably foreseeable future activities would result in some short-term effects to scenic resources, but would meet the designated SIOs of high, moderate, and low either at project completion or up to three growing seasons after all project activities are complete. Project design

features are in place to minimize the effects of the project on scenic resources. These short-term effects are expected until grasses, forbs, and shrubs sprout new growth after fuels reduction activities and soften the effects of the broadcast burning so that activities would either not be visually evident or, if they are evident, would be visually subordinate to the surrounding landscape. The project has been designed to meet the SIOs assigned to the project area by the Black Hills Forest Plan in the short term by applying the scenery project design criteria. In the long term, it is anticipated the stability of scenic resources would be improved by reducing the risk of mountain pine infestation and natural fuels and activity-generated slash and leads the landscape toward the desired landscape character. In the long term, the project area would be naturally appearing with visually preferred settings.

Vegetation treatments, fuels treatments, and road management treatments associated with this project, along with the past, present, and reasonably foreseeable future activities, would have no cumulative effects to scenic resources.

Summary and Comparison

Under the no-action alternative there would be no changes to scenic quality. Changes to scenery would be initiated by natural processes. If vegetation were consumed by a fire or killed by an insect outbreak, views of the area may be dominated by large amounts of dead trees, which is not part of the desired landscape character. This alternative likely results in conditions and trends that put valued scenery attributes at risk with potential indirect effects that reduce the stability of scenic resources.

The modified proposed action would create short-term effects to scenic resources while project activities are taking place and, depending on the treatments proposed in an area, for up to three growing seasons after all project activities are complete. The stability of scenic resources would be improved by reducing fuel loads and leads the landscape toward the desired landscape character. In the long term, the project area would be naturally appearing with attributes of visually preferred settings: smooth, herbaceous ground cover; an open midstory canopy with high visual penetration; and large tree promotion.

Heritage Resources

Introduction

This analysis discloses the potential effects of the alternatives on cultural resources. It summarizes the Cold Springs Project Heritage Report (Scrivner 2011), which is located in the Cold Springs project file.

Effects to cultural resources are analyzed based on potential damage or adverse effects to all cultural sites within the project boundary. All sites were assessed for possible adverse effects or damages.

Spatial and Temporal Context for Effects Analysis

The spatial context for analysis is the project area. The temporal context for effects analysis is two-fold. The immediate temporal context is essentially the direct effects that the current proposed project would have on cultural resources; that is, immediate changes to site condition or integrity, or even National Register status, as a direct result of project actions. The long-term temporal context is essentially the indirect effects that the current proposed project would have on

cultural resources, that is, long-term changes to site condition, integrity, or National Register status resulting from changes instigated by the project actions.

No-Action Alternative

Direct Effects and Indirect Effects

Under the no-action alternative no new direct effects would occur. Cultural resources would continue to be susceptible to the effects of fuel loading, increasing the risk of wildfire. Cultural resources would continue to naturally deteriorate over time. Cultural resources would continue to be threatened by natural processes (wildfire, erosion) and minimally from recreational activities that bring modern people in contact with cultural sites.

Currently, approximately 59 percent of the project area pine stands have a High or Very High fire hazard rating, and wildfire has a negative effect on cultural resources due to extreme temperatures, an inability to control the effects, and because resource inventories cannot be conducted in advance. Fire suppression activities such as bulldozer-created control lines, hand lines, and fire retardant drops all have the potential to destroy or damage cultural resources. In addition, wildfires cause erosion through vegetation-cover loss resulting in resource deterioration. Vegetation-cover loss may also inadvertently lead to increases in vandalism and looting of cultural sites as well. The high temperatures of wildfires cause rapid surface weathering of features and artifacts, accelerating loss.

Cumulative Effects

Cumulative effects to cultural resources are potential impacts on cultural sites from past, present, and foreseeable activities. Previous activities would have been mitigated via cultural resources inventory and documentation, and subsequent mitigation of adverse effects. Future activities will require cultural resource inventory prior to implementation and appropriate mitigation measures to be implemented to avoid or minimize adverse effects to National Register eligible sites.

Modified Proposed Action

The modified proposed action has the potential to adversely affect cultural resources if heritage design criteria are not implemented. Positive effects of the proposed action to heritage resources include an opportunity for the Forest to monitor eligible cultural sites, a reduction in fuel load, and the management of control lines to reduce the risk of wildfire. These actions all benefit the long-term heritage management goals of the Black Hills National Forest.

Design Criteria

Project design criteria to protect cultural resources are incorporated as an integrated part of the modified proposed action. To mitigate the potential of ground disturbance from vegetation treatments and road-related activities, all cultural resource sites will be flagged per South Dakota standards with a 30-meter buffer and avoided. Mechanical thinning and log and tree skidding will not be permitted within site boundaries. In addition, trees near the boundary of cultural resources will be felled away from sites, so that sensitive features and artifacts are not damaged by falling trees or the activity required removing them. Cultural resources that occur within planned low-intensity broadcast burn units will be similarly flagged, and avoided and buffered with a hand control line as necessary to prevent fire from spreading onto cultural sites and inadvertently causing thermal damage to artifacts or complete destruction of any wooden features or artifacts

associated with those sites. Cultural resources that occur within pile and burn units will be flagged and avoided. No pile burning will occur within site boundaries.

If these design criteria are followed, then no adverse effects are expected. However, if the scope of work changes or if any additional cultural resources are encountered during implementation of this project, then work would cease in the area and the district or forest archaeologist would be contacted. Work in that area would only resume if, and when, mitigation measures can be determined and/or re-evaluated if found to be necessary.

Direct and Indirect Effects

No adverse effects are expected due to the implementation of design criteria to project cultural resources; however direct effects could occur without design criteria. Direct effects to cultural resources are those that physically alter, damage, or destroy all or part of a resource; alter characteristics of the surrounding environment that contribute to the resource's significance; introduce visual or audible elements out of character with the property or that alters its setting; or resource neglect to the extent that it deteriorates or is destroyed (USDA Forest Service 2005: III-411). The modified proposed action has the potential to directly affect the cultural resources within the project area. Several potential impacts to cultural resources were identified including: timber harvest, the construction of new roads, and burn treatments. Direct effects of timber harvest and road construction activities are primarily through ground disturbance caused by ground machinery surface disturbance, road grading, felling trees, and skidding logs or trees. Felled trees can also damage or destroy above-ground features and historic structures. In addition, oil and fuel spills from heavy machinery can damage archaeological deposits. Burn treatments have the potential to adversely affect cultural resources by burning historic structures and damaging or destroying artifacts and features within archaeological sites.

Indirect effects under the current proposal are related primarily to reducing the risk of catastrophic wildfires in the project area. Adverse effects to cultural resources tend to be greater in wildfire situations because of extreme temperatures, an inability to control the effects, and because resource inventories cannot be conducted in advance (USDA Forest Service 2005: III-413). In addition, wildfires cause erosion through vegetation-cover loss, resulting in resource deterioration. Vegetation-cover loss may also inadvertently lead to increases in vandalism and looting of cultural sites as well. The high temperatures of wildfires cause rapid surface weathering of features and artifacts, accelerating loss.

Cumulative Effects

Cumulative effects to cultural resources are potential impacts on cultural sites from past, present, and foreseeable actions. Previous activities would have been mitigated via cultural resources inventory and documentation, and subsequent mitigation of adverse effects. Future activities will require cultural resource inventory prior to implementation and appropriate heritage design criteria to be implemented to avoid or minimize adverse effects to resources.

Summary and Comparison

In summary, the no-action alternative would have an undesired effect on cultural resources. Most significant of these is the increased risk of damage to cultural resources from wildfires resulting in artifact damage, wooden structure and feature loss, and loss of site integrity through erosion.

The modified proposed action could have both negative and positive impacts on cultural resources within the project area. However, there will be no adverse or negative effects to cultural

resources through the implementation of design criteria. The heritage project design criteria will mitigate adverse effects to cultural resources within the project area. Positive effects include reduced potential for a catastrophic wildfire that could result in thermal-damaged cultural resources, damage from suppression efforts, and increased erosion of archaeological sites.

Consultation and Coordination

Agencies and Persons Consulted

The Forest Service contacted or consulted the following individuals, Federal, State, tribes, and local agencies during the development of this environmental assessment:

Interdisciplinary Team Members:

Paul Bosworth	Black Hills National Forest, North Zone Transportation Engineer
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Glen Lewis	Forest Service TEAMS Enterprise, Fire and Fuel Specialist
Caven Maloney	Forest Service TEAMS Enterprise, Hydrologist, Soil Scientist
Janet Moser	Forest Service TEAMS Enterprise, Wildlife Biologist
John Natvig	Forest Service TEAMS Enterprise, Team Leader
Andrew Orlemann	Forest Service TEAMS Enterprise, Silviculturist
Tom Smith	Black Hills National Forest, District Range Staff

Federal, State, and Local Agencies:

Butte County Board of Commissioners

Governor Dennis Daugard, State of South Dakota

Honorable John Thune, U.S. Senate

Honorable Kirsti Noem, U.S. House of Representatives

Honorable Tim Johnson, U.S. Senate

Lawrence County Board of Commissioners

Meade County Board of Commissioners

South Dakota Department of Agriculture, Division of Resource Conservation and Forestry

South Dakota Department of Environment and Natural Resources

South Dakota Department of Game, Fish and Parks

South Dakota Department of Game, Fish and Parks; Division of Parks and Recreation

South Dakota Department of Transportation

United States Department of Agriculture, Natural Resource Conservation Service

United States Department of Interior, Bureau of Land Management

United States Department of Interior, Fish and Wildlife Service, South Dakota Field Office

Wyoming Game and Fish Department

Wyoming State Historical Preservation Office

Tribes:

Cheyenne River Sioux Tribe

Cheyenne/Arapaho Tribes of Oklahoma

Crow Creek Sioux Tribe

Eastern Shoshone Tribe

Flandreau Santee Sioux Tribe

Kiowa Ethnographic Endeavor for Preservation

Lower Brule Sioux Tribe

Mandan, Hidatsa and Arikara Nation

Northern Arapaho Tribe

Northern Cheyenne Tribe

Oglala Sioux Tribe

Rosebud Sioux Tribe

Santee Sioux Nation

Sicangu Treaty Council

Sisseton-Wahpeton Sioux Tribe

Spirit Lake Sioux Tribe

Standing Rock Sioux Tribe

Yankton Sioux Tribe

Others:

Over 170 individuals, businesses, and organizations were notified of this proposal. A complete list is located in the project file.

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Appendix A: Modified Proposed Action Unit Silviculture and Fuel Treatments

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Appendix A. Modified Proposed Action Unit Silviculture and Fuel Treatments

Table 1 lists all treatment units included in the modified proposed action. Maps displaying the treatment units are located in appendix G.

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit	Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵			
								H	M	L	
070309	96	5	5.1	NT	Rx Burn			0	5	0	
070309	97	2	5.1	NT	Rx Burn			0	1	1	
070309	99	1	5.1	NT	Rx Burn			0	0	1	
070503	23	55	5.1	CT		PCT	Tractor	0	54	1	
070503	26	11	5.1	CT			Tractor	0	11	0	
070503	117	6	5.1	CT		PCT	Tractor	0	6	0	
070503	142	13	5.1	SWEC			Tractor	0	7	7	
070505	13	33	5.1	SWR		PCT	Dec. 1 - Mar. 31	Tractor	1	28	4
070505	17	53	5.1	SWP			Tractor	25	17	11	
070505	19	21	5.1	AR		AR	Tractor	19	0	2	
070505	20	32	5.1	SWP			Tractor	9	15	8	
070505	21	30	5.1	STS		PCT	Tractor	7	10	13	
070505	22	37	5.1	SWP			Tractor	2	28	7	

¹ SWR: shelterwood removal; SWEC: shelterwood establishment cut; SWP: shelterwood preparation cut; AR: aspen release; CT: commercial thin; NT: no treatment; STS: single-tree selection; WL STS: single-tree selection with wildlife habitat design features; 50%CC: 50 percent canopy cover would be retained.

² Rx Burn: broadcast prescribed burn; Slash: fuel slashing; P&B: pile and burn

³ PCT: precommercial thin; AR: aspen release; WL TSI: wildlife timber stand improvement

⁴ The December 1 through March 31 restriction provides for snowmobile trail use on project area roads. Log hauling and road use would be restricted between December 1 and March 31, unless a logical and desirable alternative snowmobile route is identified. The April 1 through August 15 restriction protects R2 Sensitive Species wildlife habitat.

⁵ Acres by Scenic Integrity Objective (SIO); H: High SIO; M: Moderate SIO; L: Low SIO. Any slight discrepancies in totaling acreages are from rounding values in GIS.

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit	Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵			
								H	M	L	
070505	48	6	5.1	SWEC		AR		Tractor	1	3	2
070505	49	24	5.1	SWP				Tractor	20	4	0
070505	50	13	5.1	SWEC				Tractor	12	0	0
070505	52	11	5.1	SWP				Tractor	11	0	0
070505	53	17	5.1	AR		AR		Tractor	14	2	0
070505	58	30	5.1	SWP				Tractor	29	0	1
070505	62	27	5.1	SWP	Slash, P&B		Dec. 1 - Mar. 31	Tractor	17	9	1
070505	63	20	5.1	CT	Slash, P&B	AR	Dec. 1 - Mar. 31	Tractor	13	4	4
070505	72	5	5.1	SWP				Tractor	5	0	0
070505	74	6	5.1	SWP				Tractor	1	4	0
070505	78	5	5.1	SWEC		AR		Tractor	2	0	3
070505	79	31	5.1	SWP		AR		Tractor	19	6	5
070505	92	7	5.1	CT				Tractor	0	2	5
070505	94	11	5.1	SWP				Tractor	8	1	2
070505	98	14	5.1	AR		AR		Tractor	8	6	0
071203	10	5	4.1	SWR		PCT		Tractor	0	5	0
071203	67	3	4.1	SWR		PCT		Tractor	0	3	0
071203	83	4	4.1	SWR		PCT		Tractor	0	4	0
071205	4	25	4.1	SWEC				Tractor	25	0	0
071205	8	33	4.1	CT		PCT		Tractor	0	33	0
071205	14	24	4.1	SWEC				Tractor	1	23	0
071205	15	33	4.1	SWR		PCT		Tractor	6	27	0
071205	17	47	4.1	CT		PCT		Tractor	19	28	0
071205	23	40	4.1	CT		PCT		Tractor	12	29	0
071205	39	18	4.1	SWP				Tractor	18	0	0

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit		Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵		
									H	M	L
071205	41	14	4.1	SWR		PCT		Tractor	14	0	0
071205	43	9	4.1	SWR		PCT		Tractor	3	6	0
071205	47	4	4.1	SWR		PCT		Tractor	0	4	0
071205	49	10	4.1	STS		AR		Tractor	1	9	0
071205	60	25	4.1	CT_50%CC				Tractor	9	12	5
071205	61	24	4.1	SWR		PCT		Tractor	0	20	5
071205	64	9	4.1	STS		PCT, AR		Tractor	0	9	0
071205	84	11	4.1	SWP				Tractor	3	3	4
071206	4	17	4.1	SWP		AR		Tractor	0	13	3
071206	5	71	4.1	CT	Slash, P&B			Tractor	16	51	5
071206	9	26	5.1	SWP	Slash, P&B	AR		Tractor	23	3	0
071206	10	105	4.1	STS	Slash, P&B			Tractor	38	67	0
071301	5	10	5.1	CT	P&B	PCT, AR		Tractor	0	9	1
071301	6	4	5.1	STS		PCT		Tractor	2	2	0
071301	9	25	5.1	STS				Tractor	22	3	0
071301	10	6	5.1	CT				Tractor	3	3	0
071301	16	10	5.1	CT			Dec. 1 - Mar. 31	Tractor	10	0	0
071301	20	10	5.1	SWP	Slash, P&B	AR		Tractor	8	0	1
071301	25	13	5.1	NT	Rx Burn				0	0	13
071301	28	16	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	4	11
071301	29	91	5.1	SWEC	Slash, P&B		Dec. 1 - Mar. 31	Tractor	1	34	55
071301	31	47	5.1	CT		PCT	Dec. 1 - Mar. 31	Tractor	4	21	22
071301	38	48	5.1	CT	Slash, P&B		Dec. 1 - Mar. 31	Tractor	0	35	12
071301	40	21	5.1	CT	P&B	PCT	Dec. 1 - Mar. 31	Tractor	0	19	2
071301	46	16	5.1	STS	P&B	PCT		Tractor	13	0	3

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit		Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵		
									H	M	L
071301	49	12	5.1	SWEC	Slash, P&B		Dec. 1 - Mar. 31	Tractor	0	0	12
071301	55	5	5.1	CT	Slash, P&B			Tractor	0	5	0
071301	77	39	5.1	SWR	P&B	PCT		Tractor	0	37	2
071301	79	47	5.1	NT		AR			0	44	3
071301	86	11	5.1	STS		PCT		Tractor	0	11	0
071301	87	20	5.1	AR	P&B	PCT, AR		Tractor	0	19	0
071301	88	14	5.1	STS	P&B	PCT, AR		Tractor	0	9	5
071301	92	54	5.1	STS	P&B	PCT, AR		Tractor	0	52	2
071301	95	3	5.1	SWP				Tractor	0	3	0
071301	97	7	5.1	STS		PCT		Tractor	0	7	0
071301	98	33	5.1	SWEC				Tractor	0	19	14
071301	99	9	5.1	AR	Slash, P&B			Tractor	0	8	1
071301	100	20	5.1	STS		PCT		Tractor	2	15	3
071301	102	28	5.1	NT		PCT			4	7	16
071301	164	23	5.1	CT	Slash, P&B	AR		Tractor	0	9	14
071301	168	3	5.1	AR	Slash, P&B		Dec. 1 - Mar. 31	Tractor	0	0	3
071302	4	122	5.1	CT		PCT	Dec. 1 - Mar. 31	Tractor	73	31	18
071302	5	35	5.1	STS	P&B	PCT	Dec. 1 - Mar. 31	Tractor	12	23	0
071302	6	34	5.1	STS	P&B	PCT	Dec. 1 - Mar. 31	Tractor	3	9	22
071302	7	31	5.1	CT			Dec. 1 - Mar. 31	Tractor	0	10	21
071302	10	37	5.1	STS_50%CC	P&B	PCT	Dec. 1 - Mar. 31	Tractor	25	10	1
071302	11	17	5.1	CT	Slash, P&B	AR		Tractor	15	1	1
071302	12	13	5.1	CT		AR		Tractor	11	1	1
071302	15	41	5.1	SWEC	Rx Burn		Dec. 1 - Mar. 31	Tractor	2	13	27
071302	16	95	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	10	57	28

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit		Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵		
									H	M	L
071302	17	16	5.1	STS	Slash, P&B		Dec. 1 - Mar. 31	Tractor	0	0	16
071302	18	38	5.1	CT			Dec. 1 - Mar. 31	Tractor	0	0	38
071302	19	88	5.1	CT			Dec. 1 - Mar. 31	Tractor	0	24	64
071302	21	6	5.1	SWEC	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	0	6
071302	22	28	5.1	NT	Rx Burn				0	1	28
071302	26	17	5.1	NT	Rx Burn				0	0	17
071302	30	25	5.1	CT			Dec. 1 - Mar. 31	Tractor	0	0	25
071302	31	106	5.1	NT		AR			0	16	91
071302	36	49	5.1	STS			Dec. 1 - Mar. 31	Tractor	0	44	5
071302	40	50	5.1	SWP_50%CC			Dec. 1 - Mar. 31	Tractor	0	22	28
071302	42	25	5.1	NT	Rx Burn				0	0	25
071302	43	25	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	25
071302	46	9	5.1	NT	Rx Burn				0	7	2
071302	47	26	5.1	STS		PCT	Dec. 1 - Mar. 31	Tractor	0	8	18
071302	48	17	5.1	STS_50%CC		PCT	Dec. 1 - Mar. 31	Tractor	0	0	17
071302	52	16	5.1	STS			Dec. 1 - Mar. 31	Tractor	0	0	16
071302	53	16	5.1	CT			Dec. 1 - Mar. 31	Tractor	0	0	16
071302	52	3	5.1	AR	Slash, P&B		Dec. 1 - Mar. 31	Tractor	3	0	0
071302	69	37	5.1	CT			Dec. 1 - Mar. 31	Tractor	28	9	0
071303	2	9	5.1	NT		WL TSI	Apr. 1 - Aug. 15		2	7	0
071303	6	10	5.1	WL STS		WL TSI	Dec. 1 - Aug. 15	Tractor	2	5	3
071303	10	35	5.1	STS_50%CC		PCT	Dec. 1 - Mar. 31	Tractor	0	0	35
071303	11	20	5.1	STS_50%CC		PCT	Dec. 1 - Mar. 31	Tractor	0	0	20
071303	12	13	5.1	SWP_50%CC			Dec. 1 - Mar. 31	Tractor	0	1	12
071303	14	115	5.1	SWR	Rx Burn	PCT	Dec. 1 - Mar. 31	Tractor	0	0	115

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit	Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵			
								H	M	L	
071303	19	30	5.1	NT		WL TSI	Apr. 1 - Aug. 15		0	0	30
071303	21	29	5.1	NT		WL TSI	Apr. 1 - Aug. 15		2	10	17
071303	26	33	5.1	SWP		PCT	Dec. 1 - Mar. 31	Tractor	0	0	33
071303	28	21	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	21
071303	32	12	5.1	CT	Slash, P&B		Dec. 1 - Mar. 31	Tractor	0	2	11
071303	33	14	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	0	14
071303	36	15	5.1	NT		WL TSI	Apr. 1 - Aug. 15		0	2	13
071303	38	3	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	0	3
071303	46	10	5.1	WL STS		WL TSI	Dec. 1 - Aug. 15	Tractor	0	10	0
071303	50	43	5.1	NT	Rx Burn				0	0	43
071303	57	9	5.1	WL STS		WL TSI	Dec. 1 - Aug. 15	Tractor	0	0	9
071303	78	31	5.1	CT			Dec. 1 - Mar. 31	Skyline	0	1	30
071303	79	5	5.1	WL STS		WL TSI	Dec. 1 - Aug. 15	Tractor	0	0	5
071304	14	16	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	4	12
071304	28	47	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	16	31
071304	29	37	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	19	18
071304	30	56	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	36	21
071304	33	6	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	6
071304	34	23	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	0	23
071304	35	61	5.1	SWP			Dec. 1 - Mar. 31	skyline	0	0	61
071304	37	43	5.1	NT	Rx Burn				0	7	37
071304	39	41	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	31	10
071304	40	50	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	29	21
071304	42	8	5.1	STS		PCT	Dec. 1 - Mar. 31	Tractor	0	3	5
071304	43	17	5.1	SWR		PCT	Dec. 1 - Mar. 31	Tractor	0	10	6

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit	Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵			
								H	M	L	
071304	44	15	5.1	SWR	Rx Burn	PCT	Dec. 1 - Mar. 31	Tractor	0	11	4
071304	46	21	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	7	14
071304	47	16	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	11	5
071304	48	33	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	4	29
071304	50	15	5.1	NT	Rx Burn				0	14	1
071304	52	14	5.1	SWR		PCT	Dec. 1 - Mar. 31	Tractor	0	0	14
071304	53	15	5.1	SWR		PCT	Dec. 1 - Mar. 31	Tractor	0	1	13
071304	54	32	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	4	27
071304	56	5	5.1	SWR		PCT	Dec. 1 - Mar. 31	Tractor	0	0	5
071304	57	12	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	0	12
071304	59	11	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	0	11
071304	60	17	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	12	4
071304	64	4	5.1	SWR		PCT	Dec. 1 - Mar. 31	Tractor	0	2	2
071304	65	47	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	17	31
071304	68	33	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	6	27
071304	70	10	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	10	0
071304	73	26	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	15	11
071304	89	3	5.1	NT	Rx Burn				0	0	3
071304	90	17	5.1	NT	Rx Burn				0	1	16
071304	91	4	5.1	NT	Rx Burn				0	0	3
071304	92	34	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	34	0
071304	94	13	5.1	NT	Rx Burn				0	4	10
071304	95	1	5.1	SWP_50%CC			Dec. 1 - Mar. 31	Tractor	0	0	1
071304	97	10	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	10
071304	98	10	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	10

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit	Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵			
								H	M	L	
071304	100	13	5.1	CT	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	1	11
071305	4	70	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	17	53
071305	5	190	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	101	89
071305	7	9	5.1	NT		AR			0	0	9
071305	9	147	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	1	146
071305	12	46	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	46
071305	15	52	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	2	50
071305	17	62	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	6	56
071305	19	14	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	1	14
071305	24	88	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	88
071305	25	4	5.1	NT		AR			0	1	3
071306	18	8	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	8
071306	42	127	5.1	NT		PCT			0	45	82
071306	47	4	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	2	2
071306	48	4	5.1	SWP_50%CC			Dec. 1 - Mar. 31	Tractor	0	1	3
071306	55	5	5.1	SWP_50%CC			Dec. 1 - Mar. 31	Tractor	0	0	5
071306	57	31	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	26	5
071306	72	57	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	3	53
071306	77	7	5.1	SWP			Dec. 1 - Mar. 31	Tractor	0	0	7
071306	79	9	5.1	SWEC			Dec. 1 - Mar. 31	Tractor	0	0	9
071306	82	35	5.1	SWP_50%CC			Dec. 1 - Mar. 31	Tractor	0	16	19
071308	8	9	5.1	CT			Dec. 1 - Mar. 31	Tractor	0	0	9
071308	43	19	5.1	SWEC		AR	Dec. 1 - Mar. 31	Tractor	0	18	1
071308	45	15	5.1	NT		AR			0	10	5
071308	60	7	5.1	SWEC	Rx Burn		Dec. 1 - Mar. 31	Tractor	0	6	1

Table 1. Cold Springs modified proposed action treatment units

Treatment Unit		Acres	Management Area	Commercial ¹ Treatment	Fuel Treatment ²	Non-commercial Vegetation Treatment ³	Restriction ⁴	Logging System	Acres by SIO ⁵		
									H	M	L
<i>071308</i>	<i>63</i>	5	5.1	SWR		PCT	Dec. 1 - Mar. 31	Tractor	0	0	5

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Appendix B: Scoping Comments and Comment Disposition

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Appendix B. Cold Springs Scoping Comments

Table 1. Letter number and scoping respondent

List of Respondents to Comment Period	
Letter #	Agency, Organization, Business, or Individual
1	Alan Michalewicz, Black Hills Electrical Coop
2	Mark Young, Black Hills Power
3	Tina Canova
4	Philip and Louise Poehlman
5	Richard Sorensen
6	Elizabeth and Jerry Strong
7	Dennis Bucher
8	John S. Persell, Biodiversity Conservation Alliance; Nancy Hilding, Prairie Hills Audubon Society; Jonathan B. Ratner, Western Watersheds Project; Wendy Roth; Dick Artley
9	Carson Engelskirger, Black Hills Forest Resource Association
10	Dennis Daugaard, Governor, State of South Dakota
11	Daryl D. Johnson, Lawrence County Commissioners
12	James R. Nelson, Spearfish Canyon Homeowners Association
13	Paul Pierson, Neiman Timber Company
14	Douglas Hofer, Director, Parks and Recreation Division, South Dakota Department of Game, Fish and Parks

Table 2. Grouped comments, comment source, and response

Comments by subject	Source Code
Analysis request	8.4, 8.20, 8.22, 8.23, 13.8
Hydrology	8.21
Project management	12.7, 12.8
Project management; alternatives	8.2, 8.3
Project management; follow-up	3.3, 6.2, 9.14, 11.16, 13.15
Project management; implementation	1.1
Project management; implementation date	3.2, 6.1, 12.6, 12.10, 13.13
Project management; silviculture	9.4, 9.5
Project management; silviculture and wildlife	10.4
Proposed action; additional treatments within the project area	9.2, 9.6, 9.9, 9.10, 9.11, 10.1, 11.2, 11.3, 11.5, 11.6, 11.11, 11.15, 12.4, 13.6, 13.3, 13.7, 13.9, 13.10, 13.11, 13.12
Proposed action; additional treatment area, outside the project area	11.7, 11.8
Proposed action; botany	11.4
Proposed action; efficacy of treatments	8.5, 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 8.12
Proposed action; fuel treatments	2.2, 6.1, 9.13, 11.9, 11.13, 11.14
Proposed action; purpose and need	12.3
Proposed action; roads	8.19
Proposed action, sanitation	12.5
Proposed action; silviculture	9.8, 9.12, 10.2, 11.10, 13.8
Proposed action, silviculture and wildlife	10.4
Proposed action; snowmobile trails	13.14 14.1, 14.2
Silviculture; beetle risk rating	9.3, 9.7, 11.2, 13.4, 13.5
Statement of support	2.1, 3.1, 4.1, 5.1, 7.1, 9.1, 11.1, 12.2, 12.9, 13.2, 14.3
Wildlife	8.4, 8.15, 8.16
Wildlife; goshawk	8.17
Wildlife; late-successional habitat	8.18
Wildlife; population viability	8.13, 8.14

Table 3. Scoping comments listed by respondent

Respondent #1, Alan Michalewicz, Black Hills Electrical Coop		
#	Comment	Comment Analysis and FS Response
1.1	<p>After reviewing the Cold Springs Project in detail, it appears that Black Hills Electric Cooperative has existing distribution electric lines located within a few of the ‘Pile and Burn’ areas of this project. We would prefer to work with your marking crews prior to removal as we may prefer to have additional trees removed for safety reasons along our right of way. I can make our employees available on very short notice to meet on site and evaluate these areas.</p> <p>Additionally BHEC will participate in cutting down any trees adjacent to our lines that your crews or your contracted crews don’t feel comfortable falling. Please contact me if you have any questions. Thank you</p>	<p>Northern Hills Ranger District staff implementing the project would contact the Black Hills Electrical Cooperative to coordinate tree removal in close proximity to electric lines.</p>

Respondent #2, Mark Young, Black Hills Power		
#	Comment	Comment Analysis and FS Response
2.1	<p>I believe the proposed action in the Cold Springs Project area is necessary to address the Mtn Pine beetle problem. The proposed action plan & vegetation treatments seem to meet industry accepted actions to address the problem.</p>	<p>Statement of support</p>
2.2	<p>My only objection is in regards to the “Proposed Fuel Treatments.”</p> <p>Broadcast Prescribed Burning is a well accepted method for Ponderosa pine forests & perfectly acceptable. However, I am opposed to “pile and burn” methods. This creates excessive air pollution, extra man hours, damage to surrounding trees & soil, & unnecessary time delays. To me the immediate solution is to have the debris chipped & scattered on-site while the gathering of debris is taking place. The use of “self-propelled tracked chippers” that have low ground pressure & easy access into wooded area even with difficult terrain is the better option. This puts the bio material back into the soil, reduces erosion potential, & is visually appealing.</p> <p>I hope you consider this methodology in your planning. Even if you do not, I fully support the need for action as proposed.</p>	<p>Fuel treatment options, including mastication, were considered during development of the proposed action. Piling and burning is less expensive than mastication or chipping, and would meet fuel treatment objectives.</p>

Respondent #3, Tina Canova		
#	Comment	Comment Analysis and FS Response
3.1	Thank you for sending the Cold Springs Project proposal paper. I've seen the devastation caused by the Mountain Pine Beetles in land near Custer State Park and I applaud your efforts to stop the epidemic.	Statement of support
3.2	Just two questions: 1- Is there a proposed time line? I saw the start could be Fall 2011.	Timber sales are scheduled for fiscal year 2013 and could be sold as early as October 2012. Sale preparation (unit layout and timber marking) could begin in 2011. Sanitation/salvage treatments could begin after a final decision is made.
3.3	2- As a private land owner in the area, should I take similar actions? For example, I have mixed stands of Aspen on my property and I would be interested in the vegetation treatments such as Aspen release. My property is in the southern portion of the project area (SE1/4 NE1/4 lying S of South Rapid Creek Road and East of Boles Canyon Road). Only about 20 acres, but every little bit helps! Thanks again for your efforts to eradicate the devastation caused by the Mountain Pine Beetle.	District staff contacted Ms. Canova and provided information regarding forest management assistance.

Respondent #4, Philip and Louise Poehman		
#	Comment	Comment Analysis and FS Response
4.1	I would like to comment positively to the proposed Cold Springs Project. I encourage you to take aggressive, rapid and unrelenting action to control the infestation of the mountain pine beetle. Although we don't own property within the proposed Cold Spring Project area we do own adjacent property. We have seen a dramatic increase in affected trees on our property and have taken actions similar to those proposed in your Cold Springs Project with encouraging results. We strongly support any and all preventive measures on the adjacent national forest.	Statement of support

Respondent #5: Richard Sorensen		
#	Comment	Comment Analysis and FS Response
5.1	Go ahead, thin and cut some trees.	Statement of support

Respondent #6: Elizabeth and Jerry Strong		
#	Comment	Comment Analysis and FS Response
6.1	We are reacting to the Cold Springs Project. It is a good idea to actively attend to the beetle project in the area designated by the project outline we received. We certainly hope that the project will be initiated early this spring as it is what we would call a day late and a dollar short. As property owners, we cut 30 of our infested green standing trees, but it is disheartening to know that a few short feet away our neighbor (United States National Forest) has not cut any infested trees nor removed any of the obviously dead trees which are numerous. We further hope that the project will not only thin the trees, but make a concerted effort to remove the brown dead trees and the green infested trees that will be brown dead trees by the summer of 2012.	<p>Timber sales are scheduled for fiscal year 2013 and could be sold as early as October 2012. Sale preparation (unit layout and timber marking) could begin in 2011. Sanitation/salvage treatments could begin after a final decision is made.</p> <p>The proposed action includes sanitation and salvage. These treatments would cut and remove or cut and treat trees that are currently infested with mountain pine beetle.</p> <p>Fuel treatments are planned in proximity to private lands within the project boundary.</p>
6.2	We know that piling and burning the trees is imperative in disposing of the pine beetles, but it has been difficult to get burn permits through the current system. We do not live on our property full time and only have a telephone not the internet. The permits are readily available on-line, but it is very difficult to talk to anyone about getting a permit. It would be beneficial if the permits in the wintertime when there is plenty of snow were good for a week instead of a few days. We stopped in the Spearfish district office to see what we could do, but we were sent out the door with unanswered questions. We are trying our best to be a part of the solution; it would be nice if the government agencies, yours and Weed and Pest would be more expedient in helping with the problem.	<p>Permits for burning on private land are beyond the scope of this project. Permits are issued by the State of South Dakota.</p> <p>District staff contacted the Strongs and provided information regarding forest management assistance.</p>

Respondent #7: Dennis Bucher		
#	Comment	Comment Analysis and FS Response
7.1	I fully support the proposed project as the owner of private land located within the boundaries of the project area. The Mountain Pine Beetle epidemic urgently needs to be addressed.	Statement of support

Respondent #8: John S. Persell, Biodiversity Conservation Alliance; Nancy Hilding, Prairie Hills Audubon Society; Jonathan B. Ratner, Western Watersheds Project; Wendy Roth; Dick Artley		
#	Comment	Comment Analysis and FS Response
8.1	<p>I. The U.S. Forest Service (USFS) must complete an environmental impact statement analyzing the effects the Cold Springs Project will have on the area in question. Under NEPA, USFS must complete an environmental impact statement (EIS) for all major federal actions significantly affecting the human environment. The BHNH webpage indicates USFS only intends to complete an environmental assessment (EA) for the Cold Springs Project. An EA, rather than an EIS, is only appropriate if USFS is unsure whether the impacts of an action will be significant or not. Here, where the agency has proposed actions across 12,300 acres of National Forest System lands and 1,700 acres of private lands, the impacts of vegetation treatments, sanitation, road management activities, and activity and wildland fuel treatments will undoubtedly be significant to the acres within the project area, as well as the acres surrounding the project area, and the cumulative impacts to the Forest as a whole in terms of habitat corridors, connectivity, and fragmentation will be significant as well. An EA will not provide the appropriate level of analysis for such a large affected area. A probing, in-depth EIS is the proper mechanism by which the agency should consider the effects of this proposed project on species, recreation, and forest health. Other units of the National Forest System in the Rocky Mountain Region have completed environmental impact statements for much smaller project areas with fewer proposed management activities, rendering USFS' choice here to only complete an EA immediately suspect. The agency ventures into arbitrary and capricious territory if it opts not to complete an EIS for such a large area, especially given the high number of miles on which proposed road management activities will occur across the project area.</p>	<p>The purpose of an EA is to: (1) Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact. (FSH 1909.15, 41.1). An EIS may be prepared if a FONSI cannot be prepared because the proposed action may have a significant effect on the environment.</p>
8.2	<p>II. USFS should consider a reasonable range of alternatives.</p> <p>Under NEPA, federal agencies must consider a reasonable range of alternatives that meet the purpose of and need for actions when analyzing environmental impacts associated with proposed projects. <i>Colorado Envtl. Coal. v. Dombeck</i>, 185 F.3d 1162, 1174 (10th Cir. 1999). Federal agencies cannot “defin[e] the objectives of their actions in terms so unreasonably narrow that they can be accomplished by only one alternative (i.e., the applicant’s proposed project).” Id.</p> <p>USFS proposes the Cold Springs Project under the authority of the Healthy Forests Restoration Act (HFRA). Although the agency has avoided considering more than the proposed action alternative and a “no action” alternative for HFRA projects in the past, there is no justification for this other than that the statute in question apparently allows such minimal consideration of alternatives. Furthermore, HFRA stipulates that one additional action alternative shall be developed and evaluated if it is proposed during scoping, and if it meets the purpose and need for the project. Here, USFS very narrowly defined the purpose of this project as solely aimed at “decreas[ing] the risk of mountain pine beetle infestation in ponderosa pine stands within an area managed for timber production and wood products.” Further, USFS asserted the project is necessary “because mountain pine beetle infestation is increasing within the project area and vicinity.”</p>	<p>The EA includes a modified proposed action and no-action alternatives. Four alternatives were considered but dismissed from detailed analysis. These are discussed in the EA. No specific number of alternatives is required or prescribed (36CFR220.7(b)(2)).</p>

Respondent #8: John S. Persell, Biodiversity Conservation Alliance; Nancy Hilding, Prairie Hills Audubon Society; Jonathan B. Ratner, Western Watersheds Project; Wendy Roth; Dick Artley

#	Comment	Comment Analysis and FS Response
8.3	<p>We propose that the agency consider an alternative that, while still reducing the risk of further mountain pine beetle infestation, aims to avoid further habitat fragmentation and strategically maintains and develops areas of habitat corridors and connectivity. Trees infested with mountain pine beetles continue to provide habitat for many species even after they die and fall, and USFS should consider an alternative that embraces this reality and allows for some areas to not be so heavily treated and continue to allow an endemic level of mountain pine beetle infestation. Just because the area is “managed for timber production and wood products” does not mean USFS does not have the discretion or authority to allow some trees or stands of trees in the area to not be ultimately harvested and instead remain as habitat in a variety of forms, living or dead.</p> <p>Of course, we recognize that any action alternative we propose during this scoping period will undoubtedly be dismissed by USFS as not meeting the very narrowly defined purpose and need crafted by the agency. Although USFS asserts this is acceptable under HFRA’s NEPA avoidance provisions, we contend this violates the spirit and intent of NEPA, allows the agency to avoid considering methods and measures that might promote habitat conservation, and ultimately amounts to a loss of public credibility on the part of the agency. Consideration of only one action alternative strongly indicates the agency’s predisposition toward that alternative, and provides no points of contrast or comparison from which USFS can make its ultimate decision whether to authorize the project as proposed. Instead, the agency will only have one set of impacts before it in terms of acres treated, board feet harvested, roads constructed and reconstructed, habitat destroyed, watersheds degraded, noxious weeds introduced, etc. In order to provide the agency with a better picture of the ultimate impacts of its proposed actions, we ask that USFS consider at least one other action alternative that integrates habitat conservation measures into the management activities aimed at reducing mountain pine beetle infestation.</p>	<p>The proposed action was designed to retain habitat for wildlife and plants. The modified proposed action includes habitat conservation measures for pine marten and goshawks. Project design measures have been incorporated into the proposed action to minimize project effects on wildlife, Region 2 sensitive species, and species of local concern. The proposed action includes stands with no harvest to retain habitat for plants and wildlife. Treatments have also been modified to retain habitat and project design features are included to provide habitat protection.</p> <p>The modified proposed action included consideration of high-value marten habitat. Marten habitat corridors would remain untreated, or high levels of canopy cover would remain.</p> <p>Endemic levels of mountain pine beetles would continue to persist in the project area. Mountain pine beetles would not be irradiated.</p> <p>Pine stands within the project area have experienced approximately 11 percent mortality due to mountain pine beetles over the past 3 years. These dead trees (snags) would remain standing unless removed due to safety concerns. Project design features include measures to protect and retain snags. Project sanitation/salvage targets trees infested with mountain pine beetles.</p> <p>The impacts of the modified proposed action and alternatives on wildlife and plants will be disclosed in the EA analysis.</p>

Respondent #8: John S. Persell, Biodiversity Conservation Alliance; Nancy Hilding, Prairie Hills Audubon Society; Jonathan B. Ratner, Western Watersheds Project; Wendy Roth; Dick Artley		
#	Comment	Comment Analysis and FS Response
8.4	USFS must also acknowledge that impacts to wildlife and plant species and their habitats and viability will be a significant issue that warrants detailed consideration in light of the proposed activities and adverse effects. Wildlife and plant habitat and viability are never irrelevant to or beyond the scope of proposed actions within the National Forest System, as the “diversity” mandate from NFMA is applicable to every project.	<p>The impacts of the modified proposed action and alternatives on wildlife and plants are disclosed in the EA analysis.</p> <p>The Forest Service has established direction in the Forest Service Manual to guide habitat management for proposed, endangered, threatened, and sensitive species. This process ensures that these species receive full consideration in the decision-making process. Biological evaluations have been prepared to disclose the determination of effects on Region 2 sensitive species. The Black Hills National Forest has also identified species of local concern, which are species that do not meet the criteria for sensitive status, yet are important components of diversity within the Black Hills National Forest. (FSM 2620.5 Black Hills Supplement 2600-2005-1). Forest Service Manual 2622.01 directs us to consider species of local concern during project design and to evaluate the effects to the species from alternatives considered through the National Environmental Policy Act (NEPA) process. In addition, the botany specialist’s report addresses any effects to South Dakota State-listed species (plants considered to be rare in South Dakota) that are known to occur in the project area.</p>
8.5	III. The Cold Springs Project “Purpose and Need” is premised on questionable theories about combating mountain pine beetle infestation through logging. USFS proposes the Cold Springs Project under the authority of the Healthy Forests Restoration Act, legislation enacted to “expedite the approval of hazardous fuel reduction and forest health restoration projects.” HFRA itself is inherently flawed and based on public fear of insects and fire stoked by timber industry lobbyists. USFS justifies the Cold Springs Project by asserting that logging will reduce the spread of mountain pine beetles. This premise is not supported by conclusive science.	<p>The modified proposed action is based on Forest Plan direction. Forest Plan Goal 10 states “<i>the susceptibility of vegetation to stand-replacing fire and outbreaks of insect and disease pests will be reduced through vegetation management practices that promote vigorous, productive, resilient and diverse ecosystems</i> (Forest Plan, pg. I-35). Forest Plan objective 10-07: <i>Where outbreaks of mountain pine beetle could present risks to management objectives for ponderosa pine, reduce acreage of ponderosa-pine stands that are in medium or high risk for infestation.</i></p>

Respondent #8: John S. Persell, Biodiversity Conservation Alliance; Nancy Hilding, Prairie Hills Audubon Society; Jonathan B. Ratner, Western Watersheds Project; Wendy Roth; Dick Artley		
#	Comment	Comment Analysis and FS Response
		<p>Silviculture treatments in the modified proposed action are consistent with the Forest Plan (II-25).</p> <p>Research that has taken place on the Black Hills National Forest indicates that partial cutting can minimize mountain pine beetle in ponderosa pine stands (Schmid et al. 2007).</p> <p>Additional studies on the effectiveness of silviculture treatments are documented in <i>The effectiveness of vegetation management practices for prevention and control of bark beetle infestations in coniferous forests of the western and southern United States</i> (Fettig et al. 2007).</p> <p>The project silvicultural report discusses the effectiveness of proposed treatments in regard to mountain pine beetle-caused mortality and populations. The report includes scientific references.</p>
8.6	<p>In testimony before U.S. House of Representative Subcommittees on the current mountain pine beetle outbreak just a year ago, Rocky Mountain Regional Forester Rick Cables stated, "It is clear that we can't stop this current infestation. Thinning stands has proved ineffective." Statement of Rick Cables, Regional Forester, Rocky Mountain Region, available at http://www.nwc.cog.co.us/docs/cbbc/rick_cables_USFS_testimony_061609.pdf. By premising yet another project on combating beetle infestation, USFS apparently deems its own Regional Forester's testimony to be inaccurate, but provides no conclusive evidence logging will stop beetles' spread. In fact, the more large trees are removed, the more smaller trees will likely be infested. USFS owes the public an explanation why, in the face of such clear statements from the Regional Forester, it continues to proceed with projects based on an assumption that cutting down trees will actually reduce the beetle infestation. In the face of a plethora of science questioning the efficacy of logging to stop the beetles' spread, USFS owes the public and is required under NEPA and NFMA to demonstrate a science-based rationale for such projects, explaining why opposing science does not apply to the facts at hand. See Black et al., <i>Insects and Roadless Forests: A Scientific Review of Causes, Consequences and Management Alternatives</i>, available at http://www.xerces.org/wp-content/uploads/2010/03/insects-and-roadless-forests1.pdf (the report is based on years of field research and a comprehensive scientific literature review). Although USFS has previously dismissed the Black report as inapplicable to the Black Hills because it focused on roadless forests in Colorado, the agency must clarify why the report is completely inapplicable or if any of it has some applicability to the Black Hills at all. Is it because the report discussed lodgepole pine? Because the elevation is different in the Black Hills?</p>	<p>Rocky Mountain Regional Forester Rick Cables' statement is in reference to "the outbreak in northern Colorado and Southern Wyoming..." and is in regard to lodgepole pine forests (pages 5 and 6). The Cold Springs Project is located in the Black Hills National Forest, located in South Dakota and northeastern Wyoming. Stands in the Cold Springs project area currently infested with mountain pine beetle are comprised of primarily ponderosa pine.</p> <p>The modified proposed action could be effectively implemented due to project area topography and the existing infrastructure associated with timber harvest and log processing. Most of the project area can be logged with conventional ground-based harvest equipment, which can be readily moved from area to area. There is a system of forest roads across much of the project area that would allow for harvest access. Logging contractors are readily available in the Black Hills area, and local mills have the capacity to process</p>

Respondent #8: John S. Persell, Biodiversity Conservation Alliance; Nancy Hilding, Prairie Hills Audubon Society; Jonathan B. Ratner, Western Watersheds Project; Wendy Roth; Dick Artley		
#	Comment	Comment Analysis and FS Response
	Because the beetles are somehow different there? What other factors does the agency use to dismiss this report? Again, is there absolutely no portion of the report that has any applicability to the Black Hills?	<p>the infested logs and kill the beetles.</p> <p>See the response to 8.5</p> <p>The paper by Black and others (2010) is “specifically” about lodgepole and spruce-fir in “roadless areas” in “Colorado” (page 1). Black and others feel that large areas of mechanical treatments in lodgepole pine in Inventoried Roadless Areas in Colorado are unwise. This does not constitute science opposed to treatments proposed for managed stands of ponderosa pine in South Dakota. The Black authors go on to note that “[s]everal studies across the west have shown that thinning reduces the amount of mortality caused by mountain pine beetle in ponderosa pine stands...”(page 14). The idea that thinning managed ponderosa pine stands increases tree vigor and reduces stand susceptibility to mountain pine beetle is not disputed by silvicultural practitioners or researchers.</p>
8.7	Regional Forester Rick Cables asserts USFS has changed its “focus from prevention to reducing risks to public safety and infrastructure.” Statement of Rick Cables. The authors of Insects and Roadless Forests similarly suggest USFS funds would be better used by mitigating risks around buildings and communities, not needlessly logging far from such infrastructure. “Overall,” the authors conclude, “it is going to be much less expensive, more effective and less damaging to focus fire-hazard reduction efforts [in response to beetle outbreaks] around 5 communities and homes than it would be to try to make a wholesale modification of forest structure over large landscapes.” See Black et al. page 22.	<p>The modified proposed action is based on Forest Plan direction. The Forest Plan provides guidance for all resource management activities on the Black Hills National Forest (USDA Forest Service 2006).</p> <p>Regional Forester Rick Cables’ statement is in reference to “the outbreak in northern Colorado and southern Wyoming...” and is in regard to lodgepole pine forests (pages 5 and 6).</p> <p>The primary purpose of the Cold Springs Project is to decrease the risk of mountain pine beetle infestation in ponderosa pine stands, not fire hazard reduction.</p>

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8.8	USFS must take a complete hard look at the efficacy of logging to combat mountain pine beetle infestation, and must consider and respond to the best available science and responsible opposing science regarding the efficacy of logging to combat mountain pine beetle infestation in a manner available to the entire public (i.e., in the final statement itself). USFS cannot authorize a project based on such a questionable purpose and need, unless it adjusts the project to legitimately protect public safety and infrastructure solely within the wildland-urban interface.	Please see the response to comments 8.5 and 8.6.
8.9	IV. Scientific literature does not conclusively demonstrate logging will effectively decrease the spread of mountain pine beetles in the project area. In objecting to a different HFRA project in the Northern Hills Ranger District, BCA commented on the DEIS that Rick Cables, Regional Forester for Region 2 of the U.S. Forest Service, testified before U.S. House of Representatives Subcommittees that “[t]hinning stands has proved ineffective” to stop the current infestation of mountain pine beetles. Nautilus FEIS, Appendix E, page E-8. USFS responded to BCA’s comments by asserting we took the Regional Forester’s testimony out of context, and that it only applies to Colorado. Id, page E-9. USFS has previously asserted this to BCA, arguing the situation is different in the Black Hills, despite the pine beetles already having reached “epidemic levels.” Id. If the beetles are at epidemic levels in the Nautilus Project area, are the beetles at epidemic levels in the Cold Springs Project area? What constitutes an epidemic level? If the beetles are already at epidemic levels, they have logically already infested the trees. But USFS goes on to claim “the evidence is clear that thinning ponderosa pine, which is dominant in the Black Hills, ahead of beetle infestation is effective.” Id. If there are already epidemic levels of mountain pine beetles in the Northern Hills, USFS is not authorizing thinning “ahead of beetle infestation” so as to be effective. The Cold Springs Project scoping notice indicates that “field surveys in the fall of 2010 indicate mountain pine beetle-caused mortality is spreading and most project area pine stands have some level of infestation....” If there is already some level of infestation, is not USFS contradicting previous statements about the efficacy of combating mountain pine beetle infestation through logging?	<p>Please see the response to comments 8.5 and 8.6.</p> <p>The mountain pine beetle infestation in the project area is growing (Allen 2010). Field review in the fall of 2010 indicated approximately 11 percent of the project area pine trees have been killed over the past 3 years. Green trees remain that could become infested.</p> <p>The Cold Springs modified proposed action includes direct methods to decrease mountain pine beetle populations (sanitation), and stand treatments that reduce stocking to maintain a healthy population of trees.</p>
8.10	Plus, the scientific literature USFS refers to in its response to our Nautilus Project comments, Shepperd and Battaglia 2002, does not provide “evidence” that makes it “clear that thinning ponderosa pine” will be effective if there is in fact an epidemic of mountain pine beetles in the Black Hills. Instead, Shepperd and Battaglia say that “[s]everal silvicultural activities can be used to minimize the chance that endemic mountain pine beetle populations may become epidemic.” Shepperd and Battaglia, Ecology, Silviculture, and Management of Black Hills Ponderosa Pine, page 22 (USFS 2002) (emphasis added). The authors further state, “[o]ne key to inhibiting epidemic mountain pine beetle populations is to maintain a healthy population of trees that can resist mountain pine beetle attack.” Id. (emphasis added).	<p>Research that has taken place on the Black Hills National Forest indicates that partial cutting can minimize mountain pine beetle in ponderosa pine stands (Schmid et al 2007).</p> <p>Additional studies on the effectiveness of silviculture treatments are documented in <i>The effectiveness of vegetation management practices for prevention and control of bark beetle infestations in coniferous forests of the western and southern United States</i> (Fettig et. al. 2007).</p> <p>The Cold Springs modified proposed action includes direct methods to decrease mountain pine</p>

Respondent #8: John S. Persell, Biodiversity Conservation Alliance; Nancy Hilding, Prairie Hills Audubon Society; Jonathan B. Ratner, Western Watersheds Project; Wendy Roth; Dick Artley		
#	Comment	Comment Analysis and FS Response
		beetle populations (sanitation), and stand treatments that reduce stocking to maintain a healthy population of trees.
8.11	<p>According to USFS itself in its response to our Nautilus Project comments, the conditions in the Black Hills have passed the point to “epidemic.” Nautilus FEIS, Appendix E, page E-9. Shepperd and Battaglia describe “endemic” mountain pine beetle populations as those that kill less than one tree per acre per year. Shepperd and Battaglia, page 17. The authors do not expressly define “epidemic” populations, but describe various thresholds that could be considered. Id., page 22. Regardless, the suggestions in the authors’ paper are aimed at inhibiting epidemic levels, which USFS concedes have already been reached in the nearby Nautilus Project area. Thus, the burden is again on USFS to show why the Regional Forester’s testimony is completely inapplicable to the Black Hills and the Cold Springs Project area. Mere geography does not definitively make science inapplicable to another area. Further, if ponderosa pine is so vastly different in how it responds to mountain pine beetles and can be managed to reduce infestation, USFS has not publicly provided science to show this.</p> <p>USFS later contended in its response that BCA’s cited science, Insects and Roadless Forests, supports the purpose and need for the Nautilus Project. Nautilus FEIS, Appendix E, page E-9. At one point the authors of that paper state that “if a bark beetle infestation is relatively small and concentrated in a limited area, it may be feasible to reduce the population growth by removing infested trees from a forest stand or thinning a stand to reduce stress on trees.” Id. However, the Cold Springs Project will result in the treatment of at least 5,000 acres of vegetation. How can 5,000 acres be considered relatively small and concentrated to a limited area? Relative to what, the entire Forest? 5,000 acres is over eight square miles. The entire project area is 14,000 acres, over 23 square miles. By USFS’ admission, the infestation is at epidemic levels Forest-wide. See Nautilus FEIS, Appendix E, page E-9. Neither eight square miles nor 23 square miles is a “relatively small” or “limited area” without a comparison against some other applicable size figure, which cannot be the entire Forest if an epidemic exists across it. Any broader size figure would clearly encompass scales beyond the Black et al. paper’s scope.</p>	<p>Please see the response to comment 8.5.</p> <p>Mountain pine beetle infestation in the project area is growing (Allen 2010). Field review in the fall of 2010 indicated approximately 11 percent of the project area pine trees have been killed over the past 3 years.</p>
8.12	<p>Further, available science shows that “once bark beetles reach epidemic levels and cause extensive tree mortality,” which USFS has conceded is occurring in the Black Hills, “treatments aimed at reducing densities of the beetles are futile.” Black, S.H., Logging to Control Insects: The Science and Myths Behind Managing Forest Insect “Pests”: A Synthesis of Independently Reviewed Research, page 6 (quoting Wood et al. (1985)), available at http://www.xerces.org/wp-content/uploads/2008/10/logging_to_control_insects.pdf (last visited Feb. 7, 2011).</p>	<p>Field surveys were conducted in the project area to assess the forest insect conditions. This is a new epidemic, and beetle populations are building. Sanitation treatments would reduce the beetle population.</p> <p>Sanitation can be an effective treatment in the project area due to project area topography and the existing infrastructure associated with timber harvest and log processing. Most of the project area can be logged with conventional ground-</p>

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		<p>based harvest equipment, which can be readily moved from area to area. There is a system of forest roads across much of the project area that would allow for harvest access. Logging contractors are readily available in the Black Hills area, and local mills have the capacity to process the infested logs and kill the beetles.</p> <p>The information provided on pages 6 and 7 (Wood et al.) discusses the effectiveness of direct control as a stand alone treatment. The Cold Springs proposed action includes both direct control methods (sanitation) to reduce beetle populations and treatments to reduce beetle habitat.</p> <p>Black's document was reviewed. Black cites Wilson and Celaya 1998, who conclude "<i>In the long term, preventive strategies are most effective in reducing tree losses. Unacceptable losses can be avoided in most cases by maintaining thrifty, vigorous trees. Thinning dense stands of ponderosa pine so that crowns are no longer touching, will relieve competitive stress among the remaining trees, making them less susceptible to attack.</i>" Information cited in Black's document supports the project proposed action.</p>
8.13	<p>V. The Cold Springs Project must ensure viable populations of wildlife on the Black Hills National Forest.</p> <p>NFMA requires the Secretary of Agriculture to promulgate forest planning regulations that "specif[y] guidelines for land management plans . . . [to] provide for diversity of plant and animal communities based on the suitability and capability of the specific land area." 16 U.S.C. § 1604(g)(3)(B) (2010). To meet this statutory requirement, the 1982 planning regulations under which the 1997 Revised Black Hills National Forest Plan and Phase II Amendment were developed direct USFS to manage habitat "to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." 36 C.F.R. § 219.19 (1999). The provision goes on to define a "viable population . . . as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area." <i>Id.</i> To accomplish this, USFS must provide habitat "to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that</p>	<p>The transition language in the 2000 planning rule and interpretive rules explain that the 1982 rule is not in effect. Projects such as this must be developed considering the best available science, and must be consistent with the Forest Plan. (74 FR 67073). The Forest Plan manages wildlife by managing for wildlife habitat, not specific population levels. The Cold Springs modified proposed action implements direction found in the Forest Plan.</p>

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	<p>those individuals can interact with others in the planning area.” Id.</p> <p>Furthermore, § 219.19(a)(1) requires USFS to identify and select as management indicator species (MIS) “certain vertebrate and/or invertebrate species present in the area” in order to monitor the “effects of management activities.” Following such selection based on appropriate criteria, USFS must monitor population trends of MIS and determine relationships to habitat changes. 36 C.F.R. § 219.19(a)(6). Also, “[p]lanning alternatives shall be stated and evaluated in terms of both amount and quality of habitat and of animal population trends of [MIS].” 36 C.F.R. § 219.19(a)(2) (emphasis added). The 1982 planning regulations have never been overturned by a federal court, a notable indication they legally satisfy Congress’ intent in enacting NFMA.</p> <p>The 1982 planning regulations require that “[p]opulation trends of the management indicator species . . . be monitored and relationships to habitat changes determined” in order to satisfy NFMA. 36 C.F.R. § 219.19(a)(6) (1999). USFS must conduct “inventories” that “include quantitative data making possible the evaluation of diversity in terms of its prior and present conditions.” Id. § 219.26. USFS “must evaluate planning alternatives for projects that affect the selected management indicator species ‘in terms of both amount and quality of habitat and of animal population trends of the management indicator species.’” <i>Forest Guardians v. U.S. Forest Serv.</i>, Civ. No. 00-714 JP/KPM-ACE (D. N.M. 2001) (quoting 36 C.F.R. § 219.19(a)(2) (1999)). This stems from the prescription that forest plans must contain “[m]onitoring and evaluation requirements that will provide a basis for periodic determination and evaluation of the effects of management practices.” 36 C.F.R. § 219.11(d) (1999).</p> <p>USFS has also previously asserted against BCA that the 1982 NFMA planning regulations do not apply to projects implemented under the 1997 BHNH Plan, despite precedent to the contrary from the Tenth Circuit Court of Appeals, the District Court for the District of Colorado, and other federal jurisdictions. In <i>Utah Environmental Congress v. Bosworth</i>, the Tenth Circuit noted preliminarily that “[i]ndividual projects must comply the NFMA’s enacting regulations.” <i>Utah Environmental Congress v. Bosworth</i>, 372 F.3d 1219, 1221 (10th Cir. 2004) (citing 16 U.S.C. 1604(i)). The Tenth Circuit further held that 36 C.F.R. § 219.19 (1999), which governs USFS actions relating to wildlife viability and MIS, applies to the authorization of site-specific projects. <i>Utah Environmental Congress</i>, 372 F.3d at 1224-25. Site-specific projects must comply with forest plans, which must comply with planning regulations, which must comply with NFMA, the Tenth Circuit reasoned. Id. Following this logic, each tier of national forest management must comply with every higher tier, and the Tenth Circuit applied § 219.19 to a site-specific project. Under Tenth Circuit precedent, § 219.19 applies to the Cold Springs Project.</p>	
8.14	<p>Similarly, the District Court for the District of Colorado held “that unless it is technically infeasible and not cost-effective, the Forest Service has an obligation to collect and analyze quantitative population data, both actual and trend, for MIS.” <i>Colorado Wild v. U.S. Forest Serv.</i>, Civ. No. 03-Z-2592 (PAC) (D. Colo. 2004). The court reiterated “this requirement applies at both the forest-plan level and the project level.” Id. Other district courts agree “[t]he unambiguous language of the</p>	Please see the response to 8.13.

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	<p>MIS regulations requires collection of population data.” <i>Sierra Club v. Glickman</i>, 974 F. Supp. 905, 936 (E.D. Tex. 1997). Under both binding and persuasive precedent, § 219.19 applies to the Cold Springs Project.</p> <p>USFS must provide any exact figures collected regarding wildlife in the Cold Springs Project area, so the general public cannot determine population levels absent perhaps a Freedom of Information Act request. Wildlife populations are subject to fluctuations and some data may quickly become obsolete. Relying on data collected over half a decade ago fails to satisfy the purpose of having MIS. MIS essentially serve as proxies for other species that occupy similar habitat ecosystems. Without actual, current population data or viability calculations, this proxy purpose offers no way to confirm compliance with NFMA’s diversity mandate.</p> <p>Some courts prohibit using a habitat-as-proxy (“proxy-on-proxy approach”) except “where both the Forest Service’s knowledge of what quality and quantity of habitat is necessary to support the species and the Forest Service’s method for measuring the existing amount of that habitat are reasonably reliable and accurate.” <i>Native Ecosystems Council v. Tidwell</i>, Civ. No. 06-35890 3718-19 (D. D.C. 2010) (citing <i>Native Ecosystems Council v. U.S. Forest Serv.</i>, 428 F.3d 1233, 1250 (9th Cir. 2005)). In order for the proxy-on-proxy approach to pass judicial muster, it must “reasonably ensure[] that the proxy results mirror reality.” <i>Native Ecosystems Council</i>, Civ. No. 06-35890, 3719 (citing <i>Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.</i>, 378 F.3d 1059, 1066 (9th Cir. 2004)). Other courts (notably in the Tenth Circuit) prohibit the use of “habitat trend data” as a proxy for population inventories outright, based on the plain language of the 1982 regulations. <i>Forest Guardians v. U.S. Forest Serv.</i>, Civ. No. 00-714 JP/KPM-ACE (D. N.M. 2001); <i>Sierra Club v. Martin</i>, 168 F.3d 1, 6 (11th Cir. 1999). Without baseline data and non-obsolete on-the-ground monitoring, USFS cannot show compliance with NFMA’s diversity mandate or implementing regulations, let alone NEPA’s “hard look” requirement. Neither will USFS have honored its own policies.</p> <p>In the context of the Cold Springs Project, USFS must demonstrate how this site-specific project actually contributes to the maintenance of viable populations, through both localized population monitoring and habitat connectivity emphasis beyond the arbitrary boundaries of a project’s scale. According to the study by Traill et al., <i>Pragmatic population viability targets in a rapidly changing world</i>, <i>Biol. Conserv.</i> (2009), “conservationists often manage below a biologically reasonable extinction threshold.” “[M]ost populations presently exist as fragmented sub-populations within a larger meta-population,” the authors acknowledge, and this reality rings especially true for the BHNF. <i>Id.</i> Thus, “successful conservation depend[s] on genetic exchange among units to maintain high genetic diversity.” <i>Id.</i></p> <p>A separate study defined “a minimum viable population size as one with a 99% probability of persistence for 40 generations.” Reed, D.H., et al., <i>Estimates of minimum viable population sizes for vertebrates and factors influencing those estimates</i>, <i>Biol. Conserv.</i> 113 (2003) 23-34. The authors of this study “estimate[d] that in order to ensure long-term persistence of vertebrate</p>	

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	<p>populations, sufficient habitat must be conserved to allow for approximately 7000 breeding age adults.” Id. at 30. The authors acknowledge the problems with managing for such large populations, as “continuous blocks of land capable of supporting populations of 7000 large vertebrates, especially carnivores, is not available.” Id. at 31. “Thus,” the authors recognize, “the need to coordinate networks of smaller populations to ensure viable populations through the use of corridors, or managed immigration, should be a high priority.”Id.</p> <p>USFS must clarify how the agency, through the Cold Springs Project, intends to provide corridors or allow for managed migration to accommodate viability on the larger temporal and spatial scale. Population viability analysis may not be an exact science, but it “is the method that most capably brings all the factors considered important to population persistence under one umbrella.” Id. Merely tiering back to the flawed Phase II Amendment blatantly avoids assessing the current situation and planning accordingly to account for all factors involved in wildlife viability.</p> <p>No matter how USFS tries to avoid the viability and MIS standards of the 1982 regulations, the terminology and purpose of these concepts pervades throughout each tier of resource management for the National Forest System, and USFS has not satisfactorily addressed how it intends to comply with its obligations to viability in general and MIS for the Cold Springs Project. USFS must respond to and correct its inadequacies based on the above-mentioned case law, statutory and regulatory provisions, and scientific studies. The public demands and the law requires (via NFMA, NEPA, the Administrative Procedure Act, etc.) intellectual honesty and transparency from USFS, not mere lip service to wildlife viability and MIS that avoids making reasoned decisions supported by and directly citing evidence fully disclosed in the environmental impact statement.</p>	
8.15	<p>VI. USFS must provide adequate protections to MIS, Region 2 Sensitive Species, and Species of Local Concern.</p> <p>If USFS authorizes the Cold Springs Project, adequate measures must be included in the Record of Decision that protect MIS, Region 2 Sensitive Species, and Species of Local Concern. Maintenance, conservation and/or enhancement of habitat for these species must be quantified for the public in the EIS so that it is clear the agency is actually managing the project area in order to maintain viable populations of these native species.</p>	<p>The impacts of the modified proposed action on wildlife and plants are disclosed in the EA.</p>

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8.16	Mountain pine beetle-infested and killed trees provide valuable habitat for many of these species, so the retention of snags and coarse woody debris should be prioritized. If snags will be cut for safety reasons, explanation of such safety reasons should be provided. In some instances, USFS has asserted that the enhancement of foraging habitat somehow counteracts a loss of nesting habitat for certain species. USFS should provide quantifiable data showing how that all balances out, because it is not at all clear how the agency is weighing the relative value of foraging habitat against nesting habitat. In other words, how does USFS compare acres or square or cubic footage of foraging habitat against the number of trees or acres providing nesting habitat in reaching its decision that habitat for northern goshawk will be conserved or enhanced?	The Cold Springs modified proposed action is designed to meet Forest Plan direction, including direction regarding snags. Analysis of the impacts of project activities on species that rely on snag habitat is included in the EA.
8.17	If there are active or inactive northern goshawk or other raptor nests in the project area, they should be thoroughly documented and avoided so as not to further diminish those species' nesting opportunities.	The modified proposed action is designed to comply with forest plan standards regarding goshawks. The EA includes analysis of the impact of the modified proposed actions on goshawks.
8.18	Further, old growth forest and snags should be retained, as these habitat types are already incredibly rare across the Forest and provide critically important features for a number of at-risk species. USFS should provide the public with a map showing where it considers old growth forest to be present in the project area and surrounding vicinity.	The modified proposed action would retain old-growth forest. Structural stage 5 stands are identified in the project vegetation database. A map of structural stage 5 stands is included in the EA. Snag retention measures are included in project design. The proposed action is consistent with forest plan direction for snag retention.
8.19	VII. USFS must decrease the number of miles of road management activities associated with the Cold Springs Project. Despite the over-abundance of roads in the project area, and the BHNF's mindbogglingly higher actual route density than any other National Forest System unit in Region 2, USFS proposes an incredible 63.9 miles of road work through the Cold Springs Project. In analyzing other projects, USFS has acknowledged that "[m]otorized vehicles have damaged roads and riparian areas when conditions are wet or in cases where streams were crossed," and further seems to resign itself to the fact that "[i]ncreased use by all-terrain vehicles (ATVs) can be expected . . . and are likely to continue to degrade wildlife habitat both directly and due to habitat fragmentation." Nautilus DEIS, page 103. "The use of some open roads . . . has also contributed to the establishment of noxious weeds, and the erosion and degradation of riparian areas due to increasing sedimentation and changes in stream morphology." Id. Still, the Cold Springs Project actually proposes to convert 2.4 miles of "non-system" roads (i.e., most likely illegal ATV user-made) into system roads, without any assurances the 10 roads have any sort of ecologically-sound engineering qualities that support such conversion. Instead of eliminating these destructive routes, USFS instead basically pats unlawful Forest users on the back and thanks them for providing environmentally degrading routes. Although "newly constructed roads and converted National Forest System roads would be	The road management activities in the modified proposed action are necessary to provide harvest access, and reduce or minimize resource damage. The majority of the road work is road reconstruction or pre-use maintenance (48 miles). Reconstruction and pre-use maintenance would improve or re-establish drainage to reduce erosion. The total miles of transportation activities includes 2.3 miles of decommissioning. Four miles of existing system road would be re-located; an existing system would be moved out of a draw bottom. A transportation engineer and hydrologist are involved in project development to assure road locations. The impacts of proposed road activities are

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	closed to motorized vehicle traffic following completion of management activities,” USFS has previously implied that ATV damage “can be expected” to continue indefinitely, despite such “closures.” Nautilus DEIS, page 103.	included in project analysis.
8.20	USFS must show how these newly constructed, reconstructed, and converted roads relate to the recently issued Travel Management Plan and corresponding questions about total route miles, route density, soundscape impacts, enforcement and monitoring concerns, habitat fragmentation, and wildlife disturbance and mortality concerns (in particular to SOLC snail species and meadow jumping mouse).	Proposed road actions are consistent with the March 2010 Black Hills National Forest Travel Management Plan (TMP). The March 2010 decision does not preclude future project-specific proposed construction, removal, or reconstruction of system roads and trails. Impacts of the proposed road actions are included in the EA analysis.
8.21	Furthermore, USFS must show how many miles of roads it will construct, reconstruct, or convert in the water influence zone, and demonstrate compliance with Standard 1301 of the Forest Plan, which “allow[s] only those actions that maintain or improve long-term stream health and riparian ecosystem condition” in the WIZ. USFS must clarify how many stream crossings are associated with these road management activities. A stream crossing, by definition, implicates the water influence zone (i.e., within 100 feet of a perennial or intermittent stream, lake, or wetland), and by agency admission, will “destroy the riparian area in the immediate area.” Nautilus DEIS, page 159.	Impacts of the modified proposed action on water resources are disclosed in the EA. The hydrology section in the EA includes an analysis of road activities within the Water Influence Zone (WIZ). Specifically, the analysis tracks the increase or decrease in road miles within the WIZ by road activity (construction, reconstruction, or decommission). The EA analysis includes an assessment of the potential impacts to streams and water quality based on those road activities within WIZ areas.
8.22	USFS must take a true hard look at the impacts these roads will have on quiet recreation, illegal route use, habitat fragmentation, erosion and water quality, wildlife disturbance and direct mortality (especially local science regarding elk susceptibility to vehicle collisions and avoidance of roads), relation to and compliance with the TMP, achievement of route density goals, and the agency should include a comparison of local route density to that regionally and nationally across the National Forest System. USFS must thoughtfully address compliance concerns with Standard 1301 and remove routes that do not “maintain or improve long-term stream health and riparian ecosystem condition.” USFS should also provide a fen inventory, maps showing the location of wetlands, and maps showing perennial, intermittent, and ephemeral stream locations so the public can effectively comment on the proposed project.	The EA includes analysis of the effects of the modified proposed action on a variety of forest resources including vegetation, botanical resources, wildlife, fire and fuels, scenery, heritage resources, recreation, rangeland, weeds, and water resources.
8.23	VIII. USFS should provide the names of and maps showing other authorized, proposed, and in-development projects adjacent to and in the vicinity of the Cold Springs Project area from the last 15 years. The cumulative effects of a project such as this warrant serious consideration in the NEPA analysis. USFS should provide the public with maps showing the names and locations of other timber harvest and forest management activities authorized in the last 15 years that overlap,	The cumulative effects of past actions were considered in the effects analysis of the modified proposed action. The EA includes appendices with maps and tables of past and planned activities.

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	lie adjacent to, or within a two-mile vicinity of the outer boundaries of the Cold Springs Project area. Such maps should include any projects authorized under categorical exclusions. This will help both the agency and the public get a better idea of the cumulative effects of management activities over the recent past on the surrounding landscape. If USFS refuses to provide the maps requested in this paragraph or any preceding paragraph, despite having access to GIS data and tools and project files that the public does not have, the agency must clearly state why it declines to do so.	

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9.1	We would like to applaud the US Forest Service for utilizing HFRA Authorities on this project. This type of use is both appropriate and necessary and the Cold Springs Project falls well within the HFRA guidelines. Also of note, the potential for this project to be effective in combating the current epidemic appears to be closer in line with the purpose and need for than other projects in the past. While not perfect, we feel it is a good start, and with some modifications, the project has the potential to positively impact the landscape and those who have a vested interest in mitigating this epidemic.	Statement of support

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9.2	<p>The purpose and need for this project highlight the single largest concern for the Black Hills – mountain pine beetles. The Black Hills National Forest has proclaimed many times over the past year, that the mountain pine beetles are the number one priority for the forest. Ironically, we tend to agree and support this statement, much the same as all the user groups, interested parties, and general public that live, work and recreate in this forest. We would like to see this priority carried out and followed throughout the Cold Springs Project. In his paper entitled “The Influence of Partial Cutting on Mountain Pine Beetle-caused Tree Mortality in Black Hills Ponderosa Pine Stands”, Schmid outlines exactly this strategy as he writes:</p> <p><i>“The most important aspect of managing mature PP stands on the BHNF is minimizing MPB-caused mortality. If forest managers are to achieve long-term multiple objectives, managers need to assume that minimization of MPB-caused mortality is the primary objective in stands where incipient epidemic MPB populations arise and should temporarily relegate other objectives to secondary status until the immediate threat from epidemic MPB populations has been eliminated. While this approach may be contrary to the principle of multiple use and many objectives within the BHNF Plan, it is essential to achieving many of the Plan’s long-term multiple objectives. Allowing MPB populations to expand beyond the incipient stage will prevent achievement of most other management objectives.”</i></p> <p>It should be easy to rationalize this type of approach throughout the Cold Springs project. We already know what will happen to these stands if we leave them untreated. Most of the concerns such as goshawk, martens, and sensitive plants will be negatively impacted in a beetle ravaged forest. We do not have the luxury of disposable habitat for these concerns.</p>	<p>The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands.</p>
9.3	<p>Assigning Insect Risk Ratings</p> <p>An initial observation that we have is that the current extent of mountain pine beetles within the project is understated. The 2010 Aerial Insect and Disease Surveys were used and we acknowledge this. However, this survey is a crude gauge to point out where the insect activity is. Through observation on the ground and from the aerial photos, there are a number of stands that have advanced stages of infestation that have been omitted and deferred from treatment or that have not been assigned a high risk rating.</p> <ul style="list-style-type: none"> •One example of this, stands 071205_25, 071205_23, and 071205_60 are all 4B stands and have all been identified as “high risk” to insects, yet directly across the road, stands 071303_55, 071303_56, and 071303_81 are all 4B stands yet have not received a “high risk” insect rating. Why were these stands not identified as such? •This lack of consistency, while evident throughout the project, can be highlighted in the southern portion of the project. Here there are numerous 4B & 4C stands, some of which have been identified as “high risk” and but many that have not. Why are these inconsistencies observed? Is a 4B structural stage the threshold for a stand to have high insect risk rating assigned? <p>We would recommend the Cold Springs team go back through and reanalyze the current insect</p>	<p>Forest stands were field reviewed in the fall of 2010. In some cases stands had been treated after stand exam was completed in 2008, and mountain pine beetle risk was revised based on current stand structure, average stand diameter at breast height (DBH), and stand density.</p> <p>The risk rating is based on a rating system is documented in R2 Forest Health Management, Rocky Mountain Region, Mountain Pine Beetle Management Guide. The risk rating system can also be viewed in the Black Hills National Forest Phase II FEIS table 3-56.</p> <p>The risk rating of the units in question are consistent with table 3-56. 071303-55, 56, and 81 have a forest cover type of white spruce; 071205-23, 25, and 60 have a forest cover type of ponderosa pine.</p>

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	<p>risk ratings that were assigned to the stands. We would also like clarification on the above mentioned questions.</p>	<p>The risk rating system is based on average tree diameter, stand density and structure. Single-storied pine stands with an average DBH greater than 10 inches DBH rate as medium or high risk; stands with less than 120 square feet basal area (BA) are medium risk and 120 BA and greater are high risk. A 30 BA ponderosa pine stand with an average diameter of 12 inches would rate medium risk.</p> <p>Hazard ratings give an indication of the stands that are most likely to have initial beetle infestations. The risk rating system gives no indication of current beetle infestation (Allen 2010).</p> <p>Stand treatments are developed by a silviculturist and based on more factors than just insect risk.</p> <p>Treatments are proposed in stands 071205-23 and 071205-60. No treatment is planned in 071205-25 due to ground conditions that do not permit the operation of harvest equipment.</p>
9.4	<p>Current Structural Stages</p> <p>Upon further analysis of many of the stands within the project boundary, it appears that many of them are typed for structural stages incorrectly. Largely, many of the stands are typed 4A, which consist of trees greater than 9" with 0-40% canopy cover. The aerial photos clearly show the canopy cover in these stands of question are nearly closed and interconnected.</p> <p>To highlight this please look at stands 071206_8, 07505_60, 071205_42, 071303_13, 071302_44, and 071303_41 as examples. All of these stands are typed SS 4A yet appear to be more in line with a 4B or 4C stands. The crowns are closed and interconnected. Furthermore, many of these stands are experiencing infestation and have numerous redtops throughout. While a 4A stand is not exempt from becoming infested, the amount and number of dead/dying trees leads us to believe these stands are denser than your inventory.</p> <p>We would strongly urge the US Forest Service to go back and review many of the stands that are typed incorrectly and consider commercial treatments in them to align with the Purpose and Need for the Cold Springs Project.</p>	<p>The project-level vegetation database has been reviewed for accuracy. Project forest stands were field reviewed in the fall of 2010 and revisions were based on field review. Stands with treatment since the 2008 stand exam were updated.</p> <p>Information on the noted stands from fall 2010 field notes and project-level Region 2 veg:</p> <p><i>071206-08: This is a stand of approximately 40 BA of ponderosa pine sawtimber over pine regeneration and the pine regeneration is not fully stocked. (The structural stage is correct.)</i></p> <p><i>071206-27: Recent shelterwood seedcut to 30 BA with aspen release. (The structural stage is correct.)</i></p> <p><i>071205-42: 48 BA PP>9 inches DBH, 78 BA total, 35 percent average maximum density. (The</i></p>

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		<p>structural stage is correct.)</p> <p><i>071303-13: even-aged ponderosa pine, recently thinned; 15 percent AMD, 35 BA.</i> (The structural stage is correct.)</p> <p>The comment does not indicate the year the aerial photos were taken.</p>
9.5	<p>Commercial Treatments</p> <p>We feel that using the current data at hand, the NHRD did a good job of assigning commercial treatments to high risk stands. However, given what appears to be incorrectly typed structural stages for stands and the inaccuracy of insect “risk ratings” that were assigned to other stands, we feel there are more stands to conduct commercial treatments in. We would hope the Cold Springs team would go through and take a second look at some of these concerns and apply the necessary commercial treatments to effectively reduce the risk of further infestation.</p>	<p>Project area forest stands were field reviewed in the fall of 2010. Treatments are based on field review and stand data.</p> <p>The project-level vegetation database was reviewed for accuracy and revised to accurately represent existing conditions.</p> <p>The proposed action has been revised. Project stands were reviewed and 6 additional stands, approximately 166 acres, would be treated in the modified proposed action.</p>
9.6	<p>Another concern we have is the inconsistent use of commercial treatments on high risk stands. Some identified high risk stands have treatments and other identified high risk stands don't have treatments. We realize there are some rare occasions where stands are deferred from treatment, but unless there is a specific reason for these “untreated” high risk stands, we would strongly urge you to reconsider treating these high risk stands. Again, we reemphasize the Forest’s commitment to making pine beetles the number one priority. In the DEIS we would like to see a list of all stands that will not receive treatment and the reason for each stand.</p>	<p>The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands.</p> <p>The project record includes stand diagnosis information as well as a list of stands and a brief rationale for no-treatment.</p>

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9.7	<p>After looking at the attribute tables provided, it appears that several of the stands have been assigned new insect risk ratings. How were these new risk ratings derived? We are assuming that stands that had some type of prior treatment in them were candidates for this update – evident by the slash piles and landings in these stands. Is this assumption correct? While we agree that this is a logical step in keeping the information as current as possible, we are concerned that some of these stands were assigned a low risk rating even though the current risk appears to be higher than that.</p> <p>A few stands that highlight this potential error include 170505-73, 071301015, 071303_85 & 071301-31. Most of these stands have visual indications of being infested, yet they were assigned a low risk rating. We would ask the Cold Springs team to go through and reaffirm all stands that originally were "high" risk and are now "low" risk are accurately represented and also consider assigning commercial treatments to mitigate infestation where necessary. Could you please report the results of this in the DEIS (29 stands)?</p>	<p>Forest stands were field reviewed in the fall of 2010. In some cases, stands had been treated after the stand exam was completed in 2008, and mountain pine beetle risk was revised based on current stand structure, average stand DBH, and stand density. The revised risk rating was based on a rating system documented in R2 Forest Health Management , Rocky Mountain Region, Mountain Pine Beetle Management Guide. The risk rating system can also be viewed in the Black Hills National Forest Phase II FEIS table 3-56.</p> <p>The risk rating system is based on average tree diameter, stand density and structure. Single-storied pine stands with an average DBH greater than 10 inches DBH rate as medium or high risk; stands with less than 120 BA are medium risk and 120 BA and greater are high risk. A 30 BA ponderosa pine stand with an average diameter of 12 inches would rate medium risk.</p> <p>Stand treatments are developed by a silviculturist and based on more factors than just insect risk.</p> <p>Revising the insect risk rating system is beyond the scope of this project.</p>
9.8	<p>In the Cold Springs scoping documents there is a description of 386 acres of shelterwood removal acres. We would recommend that these units be dropped from treatment in this project. Generally speaking, these stands are at low risk of infestation because of the spacing of these 'seed trees.' We need to focus our resources and efforts on addressing at-risk stands. Again, the purpose and need focuses on reducing mountain pine beetles, the BHNF is setting this as their primary goal, and we feel that to fully address this priority, these stands should be omitted from treatment in this planning project.</p>	<p>The proposed action, as described in the scoping document, includes shelterwood removal to complete the transition of several stands to young forest. This would increase the mix of age classes and reduce the amount of susceptible host forest. Increasing the diversity of age classes would improve long-term forest health.</p>

Respondent #9: Carson Engelskirger, Black Hills Forest Resource Association		
#	Comment	Comment Analysis and FS Response
9.9	We feel many of the other commercial treatments are adequate and much needed. We would like to see these be implemented on the ground, along with additional commercial treatments in at-risk stands. Currently only 1/3 of the project is slated for commercial treatments, which we feel, does not go far enough in addressing the current pine beetle epidemic.	The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands.
9.10	<p>Goshawks</p> <p>While there are no active goshawk nests within the project boundary, there are two just outside the eastern edge of the project. Again, we are offering the same comments in regards to Goshawks that we have submitted many times before. Why are there no commercial treatments that reduce insect infestation risk? Nearly every stand around the nests are 4B & 4C, which in other parts of the project, seem to have been assigned treatments, yet when they are overlapped by the 'half-mile buffers' associated with goshawk nesting sites, treatments are omitted. Why is this? Rich Reynolds and Russ Graham, the two prominent goshawk researchers in the country, have outlined numerous reasons as to why these stands need treated, yet the NHRD has ignored these. Why is the research outlined by these two researchers ignored and what is the rationale in doing so? The Black Hills National Forest have distributed a memo dated June 25, 2010 and a white paper clarifying management direction in regards to goshawks dated October 5, 2006, yet the NHRD is ignoring the direction indicated in both of these documents. Why is the district ignoring these and what is the rationale behind this?</p> <p>We recognize that wildlife treatments have been assigned to four stands in the vicinity. All of these stands are 4C and the treatments are precommercial in nature. How is this going to reduce stocking levels and susceptibility of further infestation? We strongly urge you to reconsider doing commercial treatments to save these stands and ensure these nests are able to persist beyond the current epidemic. This would be consistent with the purpose and need for the Cold Springs project. We would appreciate a thorough and adequate response to these questions.</p>	<p>The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands.</p> <p>The project record includes stand diagnosis information as well as a list of stands and a brief rationale for no-treatment. The project area contains about 118 acres identified as goshawk nesting habitat. Twenty acres have been identified for commercial treatment intended to enhance goshawk nesting habitat, and 73 acres have been identified for non-commercial treatment intended to enhance goshawk nesting habitat.</p> <p>In addition, the modified proposed action includes sanitation and salvage treatments to reduce the population of mountain pine beetles.</p>
9.11	<p>Late Succession</p> <p>While not mentioned in the scoping comments, we would not support omitting stands from treatment for the purpose of attaining SS 5. The level of infestation is too great throughout the project and these stands would most likely have a poor chance of avoiding infestation.</p>	The Cold Springs project did not include movement toward forest plan objectives for structure stage as part of the purpose of and need for action. No stands were specifically omitted for treatment because they are in a late successional structure stage.

Respondent #9: Carson Engelskirger, Black Hills Forest Resource Association		
#	Comment	Comment Analysis and FS Response
9.12	<p>Sanitation</p> <p>We support the NHRD in mentioning a sanitation provision. We feel this is very important and much needed given the current epidemic. We would suggest that the term “salvage harvest” be removed in the DEIS and replaced with “sanitation treatments.” Salvage is not interchangeable with sanitation and may create issues down the road in implementing sanitation efforts.</p>	<p>Please see Forest Plan Glossary page 60 for definitions of salvage and sanitation. The treatment terms included in the proposed action are consistent with the forest plan. Salvage harvest would provide an economical method for sanitation treatment and the commercial value of the infested logs would be recovered.</p>
9.13	<p>Prescribed Burning</p> <p>We support the 1,698 acres of prescribed burning proposed in the Cold Springs project. We appreciate that 85% of the proposed burning would happen following vegetation treatments. Whenever possible, we would like to see even more prescribed burning follow mechanical treatments. We would also offer the following recommendations to be incorporated in future direction of the Cold Springs project.</p> <ol style="list-style-type: none"> 1) Map of where the 1,698 acres is likely to be proposed. 2) Mortality limits of 10% or less in stands. 3) Salvage clause allowing for the option of quick and efficient salvage of saleable timber in areas exceeding the set mortality limits, or if the prescribed burn does get away. 4) Burn objectives. 5) We strongly urge prescribed burning to be done in stands that have had mechanical treatments prior to burning. 6) We caution the US Forest Service in burning following precommercial thinnings where the slash is left on the forest floor. We would recommend burning in this scenario only in cases where the slash is minimal or the stand densities are low enough that the residual stand will not be damaged and the prescribed burn will be of low intensity. 7) We do not support the use of prescribed burning to reduce pine beetle risk of infestation in stands. 	<p>Maps of the modified proposed action fuel treatments are available in the EA.</p> <p>Project design features have been incorporated into the modified proposed action: prescribed burning would be implemented only under conditions defined in a prescribed burn plan. The burn plan will include burn objectives. In stands that have been designated as part of the suitable timber base, at least 90 percent of the trees greater than 9 inches in diameter will be retained. In other stands, at least 50 percent of the trees greater than 9 inches in diameter will be retained .</p> <p>Prescribed burning under a burn plan with objectives to minimize overstory mortality should preclude the need for post-burn salvage harvest.</p> <p>Prescribed burning and precommercial thinning is proposed in 2 units, 071304-44 and 071303-14. Burn plan objectives will include the retention of trees to meet forest plan stocking requirements.</p> <p>This project does not include prescribed burning to reduce pine beetle risk of infestation.</p>

Respondent #9: Carson Engelskirger, Black Hills Forest Resource Association		
#	Comment	Comment Analysis and FS Response
9.14	We would like to thank the NHRD for the opportunity to comment on the Cold Springs project and look forward to working with them throughout the life of the project. We would also like to be contacted by the NHRD to discuss our scoping comments and discuss our concerns in creating an effective DEIS. Would you please contact us once you have reviewed our comments?	The District provided a scoping comment period. This comment period provided those interested in or affected by this proposal an opportunity to make their concerns known prior to a decision by the Responsible Official. Written, facsimile, hand-delivered, and electronic comments concerning this action were accepted for 30 calendar days following publication of this notice in the <i>Rapid City Journal</i> . Those who provided timely written comments will be eligible to formally object to the decision pursuant to regulations at 36 CFR 218.

Respondent #10: Dennis Daugaard, Governor, State of South Dakota		
#	Comment	Comment Analysis and FS Response
10.1	<p>1. You have indicated that the primary purpose of the project is to decrease the risk of mountain pine beetle infestations in ponderosa pine stands within the project area. You indicate that 48 percent of the pine stands in the project area have a high risk of mountain pine beetle infestation, and another 18 percent have a moderate level of risk. Since the project area is approximately 12,300 acres in size and 11,800 acres are covered with ponderosa pine forests, it is reasonable to assume that 66 percent (48 + 18) of the forested acreage, 7,788 acres, is very susceptible to mountain pine beetle infestation. Your plan indicates that you will treat or “reduce stocking and corresponding risk” on 4,458 forested acres. This only treats 57 percent of susceptible forest stands in the project area. We do not believe that this will provide adequate protection against the mountain pine beetle; and, it will allow mountain pine beetle to spread into the area even if all the actions you propose are carried out. Therefore, we recommend treating a larger percentage of susceptible forest stands in the project area.</p>	<p>The effectiveness of the treatments in reducing susceptibility to mountain pine beetle-caused losses is discussed in the EA.</p> <p>The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands.</p> <p>The project record contains stand diagnosis information and includes a list of stands and a brief rationale for no-treatment.</p> <p>The modified proposed action includes sanitation and salvage treatments to reduce the population of mountain pine beetles.</p>
10.2	<p>2. You indicate that, “post treatment stands densities would be 60-80 square feet of basal area ... ” However, you also indicate that, “recent research indicates the lower the residual stocking, the greater the reduction in mountain pine beetle-caused mortality ... ” We believe that the current research is correct. Consequently, we believe your residual forest stand stocking levels will not adequately protect those forest stands against heavy mountain pine beetle infestations. Therefore, we recommend that these forest stands be reduced to a residual stocking level of 40-60 square feet of basal to provide maximum protection.</p>	<p>An alternative to the proposed action with further reduced stocking levels was considered but eliminated from detailed study.</p> <p>Post-treatment stand densities would be 70 BA or less, except where higher levels are needed to maintain canopy closure for wildlife habitat.</p> <p>Post-treatment thinning densities less than 60 BA are not included in the modified proposed action. Stocking at 70 BA is approximately 30 percent AMD and well below the point of full site occupancy (approximately 40 percent AMD). Trees should not be in competition for water and nutrients.</p> <p>Thinning to 60 BA or lower would result in the establishment of pine regeneration. Long-term management goals to reduce susceptibility to mountain pine beetle risk include managing for a diversity of age classes across the project area. The modified proposed action includes 1,290</p>

Respondent #10: Dennis Daugaard, Governor, State of South Dakota		
#	Comment	Comment Analysis and FS Response
		<p>acres of shelterwood establishment harvest. This treatment would initiate regeneration across approximately 10 percent of the project area's forest stands. These treatments, combined with past shelterwood removal, would establish a diversity of age classes across the project area.</p> <p>Thinning and shelterwood preparation cut to a low basal area (60 BA or less), combined with shelterwood establishment cuts would result in regeneration establishment across approximately 31 percent of the ponderosa pine stands. This would not provide a balance of age classes. The project area's current mountain pine beetle infestation is exacerbated by a large number of ponderosa pine sawtimber stands of similar age class.</p> <p>Thinning a stand with high stocking (approximately 120 BA or greater) to a low stocking (40 to 60 BA) can increase the stand susceptibility to breakage and windthrow. Dense stands typically have high height:diameter ratios due to competition, and the trees do not have the bole and root systems to withstand the wind when opened up, and many of the residual trees are likely to be uprooted, broken or bent (Shepperd and Battaglia 2002). The project area is located high in the Black Hills near O'Neil Pass and trees are subject to high winds and crown snow loads.</p> <p>The project area is within forest plan management areas 4.1 and 5.1, which are managed for forest products, among other things. Periodic re-entry for timber harvest is expected in these areas and harvest on a periodic basis can maintain stocking at levels where trees are not in competition for nutrients. It is not necessary to thin the stands to a low basal area to maintain the stands with reduced mountain pine beetle risk over a long period of</p>

Respondent #10: Dennis Daugaard, Governor, State of South Dakota		
#	Comment	Comment Analysis and FS Response
		<p>time.</p> <p>Sawtimber stands at 40 BA are stocked at less than 20 percent AMD. A site is considered fully occupied when the stocking level reaches approximately 40 percent AMD.</p>
10.3	<p>3. We recommend you work closely with state and county mountain pine beetle suppression efforts that may overlap the project area. And, it is imperative that you work closely with private landowners within the project area to assure them that mountain pine beetle infested trees close to their lands are cut and treated in an aggressive and timely manner. This will go a long way to sooth concerned private landowners adjacent to Forest Service lands.</p>	<p>Members of the project interdisciplinary team and Northern Hills Ranger District staff have met with the Lawrence County Commissioners and the Lawrence County Timber Committee. Project scoping documents have been sent to private land owners within and adjacent to the project area; and they were invited to a public meeting on January 26, 2011, to discuss the project.</p> <p>Sanitation treatments are included in the proposed action.</p>
10.4	<p>4. Your proposed plan indicates that you intend to retain "irregularly shaped clumps of large-diameter trees" in some areas to create an uneven-age stand structure. We are concerned that these clumps of large diameter trees would be ideal places for mountain pine beetle infestations within treated forest stands. Therefore, we recommend that the residual basal area within these clumps of large trees be reduced. We recommend no greater than 40 square feet of basal area.</p>	<p>The modified proposed action includes sanitation and salvage treatments to reduce mountain pine beetle populations. The stands would be monitored for mountain pine beetle infestation and proposed treatments could remove or treat the beetle-infested trees.</p> <p>A treatment that reduces stocking to 40 square feet of basal area would result in the establishment of regeneration. This is not the desired treatment in stands managed for goshawk habitat.</p>

Respondent #11: Daryl D. Johnson, Lawrence County Commissioners		
#	Comment	Comment Analysis and FS Response
11.1	<p>First, we would like to thank you, Glenn and Jackie for meeting with the Lawrence County Timber Committee on Feb. 8. It was very informative. The discussion and comments were very helpful to both parties in being able to understand each others concerns and issues. In addition we also appreciate your team's cooperation and timeliness in responding to our requests for information.</p> <p>We applaud the USFS' use of the Healthy Forest Restoration Act to plan this project. This will help expedite the NEPA process in areas where treatments need to be applied as soon as possible. We hope the timber sales that come out of this project are destined to be sold at the start of your fiscal year 2012.</p>	Statement of support
11.2	<p>We agree with the USFS that the primary purpose and need for this project is to decrease the risk of mountain pine beetle. The BHNF, Forest Supervisor has repeatedly stated that taking care of the current mountain pine beetle infestation is the number one forest' management priority. We heartily agree and think it is important the USFS' removal of all of the mountain pine beetle infested trees be a high priority within this project. Overall, we believe your team has done a good job in reducing the mountain pine risk in this project area by treating over 80% of the mpb high risk stands. This should help reduce the risk to most of the project area. There is a great opportunity to improve on your proposal. This can be accomplished by treating the rest of the high risk stands to the extent that they can feasibly be accessed. Some of these untreated stands were initially proposed for treatment but then dropped due to goshawk, pine marten and potential plant habitat concerns. Many of these stands have significant incipient bug populations. Schmid and others in RMRS-RP-68 "The Influence of Partial Cutting on Mountain Pine Beetle-caused Tree Mortality in Black Hills Ponderosa Pine Stands" state that "The most important aspect of managing mature PP stands on the BHNF is minimizing MPB-caused mortality. If forest managers are to achieve long-term multiple objectives, managers need to assume that minimization of MPB-caused mortality is the primary objective in stands where incipient epidemic MPB populations arise and should temporarily relegate other objectives to secondary status until the immediate threat from epidemic MPB populations has been eliminated."</p> <p>We have listed some of the stands that we believe need to be commercially treated during this management entry.</p> <p>0713030021 0713030019 0713060021 0712050006 0713050015 0713060074 0713060079 0713050011 0712050016 0712050025 0712050081 0713050002 0705050051 0713010028 0713060016 0713040084 0713060039 0713030044 0713030004 0713010012 0705050055 0713020069 0713010034 0713040099 0713020065 0713010095 0712050044 0713080042 0713030038 0713060010 0705050009 0713030074 0713050020 0713050018 0713050006</p>	<p>The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands.</p> <p>The EA appendix E includes a list of stands, and a brief rationale for no-treatment. Additional stand diagnosis information is located in the project record.</p> <p>The modified proposed action includes sanitation and salvage treatments to reduce the population of mountain pine beetles.</p>

Respondent #11: Daryl D. Johnson, Lawrence County Commissioners		
#	Comment	Comment Analysis and FS Response
	0713050001 0713030045 0713030022 0713030021	
11.3	We are especially concerned about the high risk stands that have been dropped from being commercially treated due to goshawk concerns. After discussions with Richard Reynolds and in reviewing the recommendations of RM-17 and the recommendations of the BBNF wildlife biologist, we believe that the goshawk management approach to this area is too conservative especially in light of the amount of no treatment proposed in the adjoining West Rim project and the amount of mpb infestation in the area. We urge to you to reconsider treating those stands that were dropped from treatment.	Please see the response to comment 9.10.
11.4	During our discussion, it was mentioned that the plant biologist is not concerned about having infested trees in areas set aside for sensitive plants or potential plant habitat. We fervently disagree with this management approach. While the infested trees may not threaten the plant habitat, which could be questionable, allowing these infested trees to infest other areas does not adhere to the purpose and need of the project and also to the Forest Supervisor's direction.	<p>The modified proposed action includes sanitation to treat or remove mountain pine beetle-infested trees.</p> <p>Prior to implementation, resource specialists would review areas of sanitation treatment outside of harvest units to determine whether any special design criteria are needed to protect forest resources and ensure the proposals comply with forest plan direction.</p> <p>The project botanist assisted in the development of the proposed action to assure protection for plants and plant habitat is appropriate.</p> <p>In general, sensitive plant habitats in the project area include moist paper birch and birch/aspen stands, moist spruce stands, open grassy areas, riparian areas, and other sites where additional water is present. These are not areas that are usually infested by mountain pine beetle. If infestations are found in areas delineated as potential plant habitat, those trees could be removed with the sanitation treatment described in the proposed action.....“Areas of sanitation treatment outside of harvest units would be field reviewed by resource specialists prior to implementation to determine whether any special design criteria are needed to protect forest resources and ensure the proposals comply with Forest Plan direction.”</p>

Respondent #11: Daryl D. Johnson, Lawrence County Commissioners		
#	Comment	Comment Analysis and FS Response
11.5	We would also like to have your team review some of the low risk stands that have significant mpb infestation that should have a higher risk that are not being treated. 0713050006 0713080040	Please see the response to comment 11.1.
11.6	As we evaluate this project it is very important to understand the impact mountain pine beetle is causing on other areas of the BHNF, like the adjacent Rifle Pit area. Most of the highly stocked stands that have been left untreated where there are incipient mountain pine beetle populations end up being deforested from mountain pine beetle. Rifle Pit project is prime example. The bottom line is when there are epidemic levels of mountain pine beetle you cannot leave high risk stands untreated especially if there are already mountain pine infestations occurring within those stands.	Please see the response to comment 11.2.
11.7	Lawrence County is also very concerned about the amount of deforestation that is occurring north of Highway 85 in the Rifle Pit country. This mountain pine beetle infestation has been going on for at least 5 years and has killed thousands of trees. Unless the USFS has other plans, we would encourage the USFS to enlarge this project to encompass this area. Many of the areas that are being severely impacted are areas that were left out of the Rifle Pit timber sale.	An alternative to the proposed action that expands the project area was considered. The alternative was eliminated from detailed study because expanding the project area would cause unacceptable delay in project planning and implementation. The delay could allow mountain pine beetle populations to increase and spread to additional forest stands.
11.8	We are also concerned about the area just across the district line that is between the McInerny Timber Sale and the Cold Springs project. This area has a significant number of mountain pine beetles and is not scheduled for treatment by the BHNF in the next 5 years. For some reason it was not included in the Norwood project and is now isolated and untreated. We would recommend the Northern Hills District and Hell Canyon District join together and enlarge the Cold Springs project to include this area.	Please see the response to comment 11.7.
11.9	We would also ask that you increase the amount of fuel treatments near any private land and structures. There are several stands (07130600 21, 07130600 39, 07130100 31) with high wildfire intensity/severity risk ratings next to private land that are not being treated. In addition to being rated as very high for fire hazard, these stands presently contain incipient mountain pine beetle infestations and have high mountain pine beetle risk.	The modified proposed action includes the treatment of 071301-31. The proposed treatment is commercial thinning to 70 BA followed by precommercial thinning to complete the prescription. Stands 071306-21 and 39 were field reviewed. Commercial timber harvest of these stands would be difficult due to steep slopes and the location of private land (where landings would be needed). The stands also include protected plant habitat. The forest plan includes direction to concern or enhance habitat for Region 2 sensitive species and species of local concern. The proposed action was modified in response to this comment.
11.10	We recommend the USFS completely disclose to the public the peril of leaving high risk stands	Rocky Mountain Region Forest Health

Respondent #11: Daryl D. Johnson, Lawrence County Commissioners		
#	Comment	Comment Analysis and FS Response
	not treated. These risks have been understated repeatedly in past projects. There are plenty of examples that show what happens to highly stocked stands with incipient mountain pine beetle infestations that are left untreated. We urge the ID Team to use Rocky Mountain entomologist to evaluate and make recommendations for managing this project's ponderosa pine stands.	Management staff have been consulted in conjunction with the preparation of this project. Kurt Allen's project report and management recommendations are available in the project file. The effects of the no-action alternative are discussed in the EA.
11.11	We applaud the USFS for proposing a sanitation provision in this project, but we are concerned with how the sanitation provision is implemented. As evidenced in other projects, there are limitations to implementing the sanitation provision. The purchaser has limited ability to identify infested trees and the USFS has limited personnel to identify and mark infested trees. With looming budget cuts, it makes more sense to propose some types of treatments through most of the medium and high risk stands which will then require the purchaser to actually cover more of the project area. The ultimate goal is to rid the project of epidemic levels of mountain pine beetle and to reduce the risk of future outbreaks.	Please see the response to comment 11.2.
11.12	<p>From reviewing R2 veg. layer, it appears that much of the stand information does not reflect the actual vegetative conditions. We appreciate your efforts to reclassify the mountain pine beetle risk in stands that were previously treated under the Power Timber Sale but we are concerned that there are many stands currently listed with medium risk actually having low risk. We understand that the current risk rating system causes this problem but it makes a mockery of the risk classification when there are stands with 30 basal area of large trees that are mixed with aspen rated the same as highly stocked stands of POL and some small saw timber. We understand that this is outside of the scope of Cold Springs project to change this rating system but we encourage you to talk with the appropriate experts to consider modifying this rating system.</p> <p>Medium risk stands that have low risk that should be reclassified: 0705050068 0705030127 0712060001 0712060012 0705030115 0705030112 0705050096 0705050010 0705050016 0705050076 0705050070 0713010012 0713010034 0713010044 0713010032 0713010095 0713010082 0713010080 0713020070 0713020035 0713060038 0713060046 0713080025 0713050014 0713060013 0713040087</p>	<p>Forest stands were field reviewed in the fall of 2010. In some cases, stands had been treated after stand exam was completed in 2008, and mountain pine beetle risk was revised based on current stand structure, average stand DBH, and stand density. The revised risk rating was based on a rating system documented in R2 Forest Health Management , Rocky Mountain Region, Mountain Pine Beetle Management Guide. The risk rating system can also be viewed in the Black Hills National Forest Phase II FEIS table 3-56.</p> <p>The risk rating system is based on average tree diameter, stand density and structure. Single-storied pine stands with an average DBH greater than 10 inches DBH rate as medium or high risk; stands with less than 120 BA are medium risk and 120 BA and greater are high risk. A 30 BA ponderosa pine stand with an average diameter of 12 inches would rate medium risk.</p> <p>Please see the response to comment 9.3 for additional discussion regarding the risk rating system.</p> <p>Stand treatments are developed by a silviculturist</p>

Respondent #11: Daryl D. Johnson, Lawrence County Commissioners		
#	Comment	Comment Analysis and FS Response
		and based on more factors than just insect risk. Revising the insect risk rating system is outside the scope of this project.
11.13	We recommend the USFS propose prescribe burning to reduce the common juniper. The common juniper in these stands has a very high fuel risk that needs to be recognized. Reducing this fuel type near private lands would significantly decrease the susceptibility of fast moving and intense ground fire.	The modified proposed action includes broadcast burning across 897 acres. There has been considerable recent past or planned burning within the project area; since 2001 approximately 3,008 acres have been burned or are planned for burning (District FACTS data). The proposed action was revised to include slashing, or slashing, piling and burning of common juniper where needed to decrease fuels in close proximity to private lands.
11.14	We would also like to see the Northern Hills District to not only reduce the conifer competition in aspen stands but also treat these stands to stimulate aspen regeneration. Prescribe burning could be an excellent tool along with patch clear cutting.	The modified proposed action includes broadcast burning across 897 acres. There are inclusions of aspen within these burn areas, and burning would stimulate aspen regeneration. Treatments in the proposed action include aspen release, to maintain aspen as the dominant species on sites and as inclusions within pine stands. These actions would maintain project area tree species diversity. Treatment to regenerate aspen is not part of the project purpose and need.
11.15	In our discussions, you mentioned that spruce climaxing of seral pine stands was becoming a problem. We agree. Past treatments of seral pine stands that did not include removing the abundant young spruce in the understory has contributed greatly to this phenomenon. Now mountain pine beetle infestation in these mixed stands is taking care of most of the remaining pine. Allowing these pine stands to convert to spruce does not follow Forest Plan Objective 200-01. When treating these pine stands we encourage the USFS to cut all commercial sized spruce and then follow up the commercial treatments by masticating the larger sub' merchantable spruce and then prescribe burning to kill all of the small spruce.	The project interdisciplinary team considered an alternative that converts seral pine stands back to pine-dominated forest, however, this alternative was eliminated from detailed study because conversion of mixed spruce/pine stands back to pine is outside the scope of the project and does not relate to the purpose and need for the project. The project purpose and need is to decrease the risk of mountain pine beetle infestation in ponderosa pine stands within an area managed for timber production and wood products. The project area is and will continue to be

Respondent #11: Daryl D. Johnson, Lawrence County Commissioners		
#	Comment	Comment Analysis and FS Response
		<p>dominated by ponderosa pine stands. Transition of some mixed spruce/pine stands to spruce-dominated stands may occur; however, the extent of this transition is expected to be limited. Furthermore, heterogeneity in stand structure and vegetation types across the project area contributes to the area's resilience to mountain pine beetle attack.</p> <p>The forest plan does not contain an objective numbered 200-01. An objective numbered 200-01 was included in the Phase II FEIS prepared in support of the forest plan (USDA Forest Service 2005). This objective was adopted in the forest plan and numbered objective 239-LVD. This objective indicates that land managers on the Forest should manage for 20,000 acres of spruce across the Forest using active management to achieve multiple-use objectives.</p> <p>As the discussion in the Phase II FEIS indicates, the objective is intended to favor hardwoods where spruce is encroaching upon hardwoods but to favor spruce where spruce is encroaching into pine stands, "especially where it improves connectivity between spruce stands" (USDA Forest Service 2005, p. III-25). In working to maintain at least 20,000 acres of spruce across the Forest, the Phase II FEIS recognized that there would be losses in spruce where hardwood conversion occurred or where spruce was removed to reduce fire hazard in close proximity to structures; however, that loss was expected to be balanced by gains due to succession in other areas (USDA Forest Service 2005, p. III-27).</p>

Respondent #11: Daryl D. Johnson, Lawrence County Commissioners		
#	Comment	Comment Analysis and FS Response
11.16	We appreciate your teams efforts in making this a well thought out and effective project that will meet the purpose and need. Lawrence County believes we can help the USFS to achieve this and would like to meet with you in a couple of weeks to review our recommendations.	The District provided a scoping comment period. This comment period provided those interested in or affected by this proposal an opportunity to make their concerns known prior to a decision by the Responsible Official. Written, facsimile, hand-delivered, and electronic comments concerning this action were accepted for 30 calendar days following publication of this notice in the <i>Rapid City Journal</i> . Those who provided timely written comments will be eligible to formally object to the decision pursuant to regulations at 36 CFR 218.

Respondent #12: James R. Nelson, Spearfish Canyon Homeowners Association		
#	Comment	Comment Analysis and FS Response
12.1	The following comments are submitted in behalf of the Spearfish Canyon Homeowners Association(SCOA) for which I serve as President, Board of Directors, SCOA. These comments are a result of SCOA' s past and continuing participation in reviewing and commenting on BHNH projects of the past few years for improving the health of the BHNH. The comments also result from continuing coordination with the Lawrence County Timber Committee, and thus leave some of the more specific comments on the Proposed Vegetation Treatments, pages 5 through 7 of the project plan. to the Timber Committee response. As a general comment, SCOA has been supportive of BHNH plans and projects to improve/maintain the health of the forest here, and we are mindful of the many constraints that affect the timing, scope and locations of your successive efforts.	Introduction paragraph.
12.2	With respect to the Cold Springs Project, let me first say that we were pleasantly surprised and highly supportive of the fact that this is the first project plan we have seen for the Northern Hills where it clearly states the first priority and focus of this plan is on the pine beetle infestation. We believe this is appropriate and, while fuels reduction and related overall goals for the Black Hills Forest need continued, long term activities to attain those goals. current first priority emphasis must be on controlling and reducing the spread of the beetle infestations.	Statement of support.
12.3	With this priority in mind, we would recommend the project plan make this even more clear by restating both the Introduction and Purpose ad Need for Action paragraphs, the latter stating that "the project qualifies for expedited vegetation management under Section 102(1)(4) of the Healthy Forest Restoration Act", as stated on page 3. We believe the purpose should be ... "The purpose of this project is to accelerate the arrest of the current mountain pine beetle infestation in ponderosa pine stands, and to reduce the risk of spreading infestations within this project area and to/from those adjacent to the area." This statement should then be justified by the quoted statement referencing the Healthy Forest Act, Section 102(1)(4).	The Northern Hills District Ranger reviewed the proposed change to the proposed action purpose and need. The project purpose and need will not be changed.
12.4	In the recent years and in past comments of SCOA and the Lawrence County Timber Committee on projects such as Telegraph, Steamboat, etc., we have consistently emphasized this need for focus on beetle control and reducing the risk of spreading infestations as of first priority versus the more general, fundamental goal of fuels reduction at this time. Words and statements do matter to BHNH personnel as well as to us. It takes time and consistent emphasis to make this point to all concerned. Although fuels reduction, forest diversity, etc., remain important, until this current major infestation of the beetle in the Black Hills is arrested, controlled, "runs its course", etc., we believe "battling the beetle" should be the clearly stated first priority. This priority would then provide a basis for addressing some of the constraints we know you have. For instance, the Goshawk nests that are near the Cold Springs project (I understand they are also along the common boundary with the adjacent West Rim project area), the constraints on treating areas that are potential Pine Marten habitats, etc., are constraints that should be examined from the aspect of whether that habitat will survive the beetle infestations if not treated. We believe some of the current constraints should be examined with this current environment in	The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands. The EA appendix E includes a list of stands, and a brief rationale for no-treatment. Additional stand diagnosis information is located in the project record. The modified proposed action includes sanitation

Respondent #12: James R. Nelson, Spearfish Canyon Homeowners Association		
#	Comment	Comment Analysis and FS Response
	mind, rather than just from the Black Hills Forest Plan and USFS or other agency directives which may be restrictive to what needs to be done on an accelerated basis. Relief from some constraints may be possible which could significantly reduce beetle damage and spread.	and salvage treatments to reduce the population of mountain pine beetles.
12.5	SCOA was happy to learn that the proposed treatments in this project area includes the ability to use sanitation harvesting widely within the area, with the further flexibility to apply this treatment to all pine stands in the project, including those over and above the proposed treatment areas (potentially all 5947 acres of pine stands in the project area, rather than just to the 4924 acres planned for treatment). We hope this flexibility is used to aggressively go after beetle-infested pines which are not now identified, but may be existent, may appear as new infestations before the project activity begins in 2012, or may appear later in the life of the program.	Sanitation treatment could proceed after a decision notice.
12.6	We are hopeful that the timeline for this project, done under an EA approach will allow accelerated review, approval and activities as early as 2012. The project plan as described notes most project area pine stands have some level of infestation, with stands averaging 11% beetle-caused overstory mortality, which indicates a growing infestation versus that mortality seen in 2009. My own personal flights over this area in December, 2010, indicated to me that 11% overstory mortality is conservative, and my subjective estimate would be closer to 20-25%. In any case, this project needs to get underway with treatment activities beginning as soon as possible, because areas of infestation are large and expanding.	Timber sales are scheduled for fiscal year 2013 and could be sold as early as October 2012. Sale preparation (unit layout and timber marking) could begin in 2011. Sanitation/salvage treatments could begin after a final decision is made.
12.7	We believe it would be helpful to include as part of this and subsequent plans, a description, where applicable, of the status of adjacent BHNF projects with evidence that the planning for this project is well integrated with the plans/treatments/constraints of adjacent projects such that the overall strategy and tactics of each have been considered for most effective integration of activities and resources. For instance, in this Cold Springs project, what are/might be the interrelated goals and treatments for West Rim(power?) that were considered in developing this project plan?, and did those considerations lead to changes/alterations/refinements of the planning for this project?, or for West Rim? It would help understand the BHNF overall strategy/tactics, which are most likely dynamic as challenges like the pine beetle infestation appears and thus to understand how the BHNF is responding.	Appendix C of the EA includes a list and maps of past, ongoing, and reasonably foreseeable actions within the project vicinity. The cumulative effects of past, ongoing, and reasonably foreseeable actions within the project vicinity were considered during project analysis. Projects on the Black Hills National Forest are developed to achieve goals and objectives listed in the Black Hills National Forest Land and Resource Management Plan.
12.8	As noted earlier in this letter, SCOA has coordinated with the Lawrence County Timber Committee and agrees to that Committee's comments to this plan, especially with respect to specific comments on the vegetation treatments.	The comments from the Lawrence County and the corresponding comment analysis are listed in under Respondent #11.
12.9	We thank you for the opportunity to comment on this plan. We are in general agreement with the plan and would urge its initiation on an accelerated basis, since the beetle infestation will expand even further in this area (and probably adjacent areas) until arrested and controlled by aggressive treatments.	Statement of support

Respondent #12: James R. Nelson, Spearfish Canyon Homeowners Association		
#	Comment	Comment Analysis and FS Response
12.10	<p>As a final comment, SCOA would recommend this project be initiated in priority ahead of the Steamboat Project, for which we recently provided comment. We believe Steamboat is a worthwhile project, but again, in the current environment of beetle infestations in the BHNF, the situation is much more severe in the Cold Springs Project area than that existing in the Steamboat Project area. Accelerated activities to control the spread of the beetles where they are, while reducing the risk of spread to adjacent areas should be the priority in 2011 and in the next few years, with more typical fuels reduction and forest diversity a lesser priority until this infestation "runs its course" or noticeably eases.</p>	<p>Timber sales are scheduled for fiscal year 2013 and could be sold as early as October 2012. Sale preparation (unit layout and timber marking) could begin in 2011. Sanitation/salvage treatments could begin after a final decision is made.</p>

Respondent #13: Paul Pierson, Neiman Timber Company		
#	Comment	Comment Analysis and FS Response
13.1	Neiman Timber Company would like to thank you for the opportunity to comment on the project. We would also like to thank you for your timeliness in providing the requested information for us to analyze the project.	Introduction
13.2	<p>SUPPORT: Neiman Timber Company supports the following aspects of the project:</p> <ul style="list-style-type: none"> • The purpose and need for the Cold Springs project. • The use of the Healthy Forest Restoration Act (HFRA) to achieve the purpose and need for this project. • Although we were unable to review all silvicultural prescriptions, the ID team has done a very good job prescribing the appropriate treatment for the stand conditions. • Treating approximately 80% of the high insect risk stands is a step in the right direction for controlling the MPB epidemic. • Identifying 3 suitable Goshawk nest areas and 3 replacement nest areas as described in RM-217. • Assessing a new insect risk level for the project area. • Utilizing skyline yarding equipment to access difficult terrain. • Using a combination of commercial, pre-commercial, and RX burning to achieve desired forest conditions. • Sanitation Provision <ul style="list-style-type: none"> ○ We support the whole project being open for sanitation harvests. 	Statement of support
13.3	<p>IMPROVEMENTS AND RECOMMENDATIONS:</p> <p>We agree with the statement made by Black Hills National Forest Supervisor that controlling the MPBs is the top priority for the forest. Although this project takes large strides towards this goal we are concerned that its short failings indicate that it is still not the top priority for the NHRD. In the research paper by Schmid, "The Influence of Partial Cutting on Mountain Pine Beetle-caused Tree Mortality in Black Hills Ponderosa Pine Stands" a strategy is provided for achieving this goal as it relates to other objectives: "The most important aspect of managing mature PP stands on the BHNF is minimizing MPB-caused mortality. If forest managers are to achieve long-term multiple objectives, managers need to assume that minimization of MPB-caused mortality is the primary objective in stands where incipient epidemic MPB populations arise and should temporarily relegate other objectives to secondary status until the immediate threat from epidemic MPB populations has been eliminated. While this approach may be contrary to the principle of multiple use and many objectives within the BHNF Plan, it is essential to achieving many of the Plan's long-term multiple objectives. Allowing MPB populations to expand beyond the incipient stage will prevent</p>	<p>The project interdisciplinary team reviewed the ponderosa pine stands at medium or high risk of mountain pine beetle infestation that were not included for commercial treatment in the original proposed action. The team identified six additional stands in which commercial treatment could be applied to reduce the risk of mountain pine beetle infestation. The proposed action was modified to include treatment of these stands.</p> <p>The project record contains stand diagnosis information and a list of stands, and a brief rationale for no-treatment.</p> <p>The modified proposed action includes sanitation and salvage treatments to reduce the</p>

Respondent #13: Paul Pierson, Neiman Timber Company		
#	Comment	Comment Analysis and FS Response
	achievement of most other management objectives." Given that the purpose and need of this project is to decrease the risk of MPB infestation and this is also the top priority of the BHNF, we provide the following recommendations to fully achieve this goal:	population of mountain pine beetles.
13.4	<ul style="list-style-type: none"> • Insect Risk Rating <ul style="list-style-type: none"> ○ We support the NHRD assessing new insect risk ratings; we question how these new ratings are assigned. Is it based on past management activities or field verifications or both? We ask that this process be described. ○ Revamp the insect rating system. • We see the medium risk rating includes stands that range in TPP _BA 5" and larger from 104 BA/a down to 0 BA/a. This makes it difficult to analyze what treatments are necessary. 	<p>Forest stands were field reviewed in the fall of 2010. In some cases, stands had been treated after stand exam was completed in 2008, and mountain pine beetle risk was revised based on current stand structure, average stand DBH, and stand density. The revised risk rating was based on a rating system documented in R2 Forest Health Management , Rocky Mountain Region, Mountain Pine Beetle Management Guide. The risk rating system can also be viewed in the Black Hills National Forest Phase II FEIS table 3-56.</p> <p>The risk rating system is based on average tree diameter, stand density and structure. Single-storied pine stands with an average DBH greater than 10 inches DBH rate as medium or high risk; stands with less than 120 BA are medium risk and 120 BA and greater are high risk. A 30 BA ponderosa pine stand with an average diameter of 12 inches would rate medium risk.</p> <p>Please see the response to comment #9.3 for additional discussion regarding the risk rating system.</p> <p>Stand risk rating, and a discussion of the risk rating is included in the project silviculture report.</p> <p>Stand treatments are developed by a silviculturist and based on more factors than just insect risk.</p> <p>Revising the insect risk rating system is outside the scope of this project.</p>
13.5	<ul style="list-style-type: none"> • We are also concerned that stands currently dominated by white spruce generally receive a lower insect risk due to the lower densities of ponderosa pine and are deferred from treatment. It is critical to realize that the mature pine in these stands is at high risk to MPB and treatments 	<p>The hazard rating system was developed primarily for ponderosa pine stands (Schmid et al. 1994). Single-storied stands receive a higher</p>

Respondent #13: Paul Pierson, Neiman Timber Company		
#	Comment	Comment Analysis and FS Response
	are needed to reclaim these stands as pine stands before the MPB kills all the pine (Le. veg. link: 0713050006).	risk rating than two-storied stands (USDA Forest Service 2000). The modified proposed action includes sanitation and salvage treatments to reduce the population of mountain pine beetles.
13.6	<ul style="list-style-type: none"> • Climaxing White Spruce Stands <ul style="list-style-type: none"> ○ We encourage using commercial, pre-commercial, and RX burning as tools to eliminate climaxing white spruce from seral ponderosa pine stands. 	See response to comment 11.15.
13.7	<ul style="list-style-type: none"> • Landscape level treatments <ul style="list-style-type: none"> ○ Treating 80% of the identified high risk stands is commendable when compared to past projects. We recommend the FS treat 100% of the high MPB risk stands and all medium and low risk stands that have MPB infestation. With the MPB populations at epidemic levels within and surrounding the project, choosing to not treat a high insect risk stand will likely result in the loss of the stand. It is crucial to remember that the MPB does not just attack a single stand and then stop; they move out and infest other stands. Untreated, high insect risk stands create conditions for the MPB populations to grow to levels such that they will infest nearby medium and low risk stands. 	Please see the response to comment 13.3.
13.8	<ul style="list-style-type: none"> ○ When looking at the impacts that the proposed actions will have on various resources, the FS must disclose and analyze the reasons and effects that no treatment will have on the resources given the MPB population. 	The EA includes analysis of a no-action alternative.
13.9	We again disagree with the decision to use potential suitable plant habitat, goshawk habitat, and intermittent stream courses as reasons to not access the high insect risk stands. There is nothing in the Forest Plan, SD BMPs, or state regulations that restrict all operations in these areas. We urge the FS to reconsider high insect risk stands for treatment that were dropped due to these various resource concerns. We are not asking for everything to be thinned to a 60 BA/acre, but rather to commercially treat all these stands to meet an acceptable desired condition while reducing the insect risk and sanitizing the stand. Timber harvesting should not be viewed as a threat to these resources, but as a tool to maintain, protect, and enhance these resources.	Please see the response to comment 13.3.
13.10	As stated earlier, we approve of the nest area designations made for the goshawk. In order to protect the two habitats for nesting areas, active management is needed. There is no sense in designating suitable and replacement nest sites only to walk away from them and leave them to the MPB. I have attached two maps for your consideration. Map 1 shows the proposed commercial treatments in the Goshawk area. Map 2 shows our proposed commercial treatments in the Goshawk area.	Please see the response to comment 13.3.

Respondent #13: Paul Pierson, Neiman Timber Company		
#	Comment	Comment Analysis and FS Response
13.11	Medium Risk stands need to be treated. According to the information in your attribute files, approximately 80% of medium insect risk stands that have not had past treatments will not receive treatments under this project. Many of these stands have MPB present or are likely to become infested if not treated.	Please see the response to comment 13.3.
13.12	Sanitation is a great tool to have when reacting to MPB infestations. It is, however, limited by either a purchaser's ability to identify and treat stands that are in close proximity to their operations at any given time, and/or by the FS personnel's availability to identify and mark the infested area. Due to these limitations, we again recommend proposing commercial treatments in as many high and medium insect risk stands as possible so they are guaranteed to be treated.	Please see the response to comment 13.3.
13.13	We encourage the NHRD to advertise the sales as early as possible to allow treatments to begin before winter restrictions apply.	Timber sales are scheduled for fiscal year 2013 and could be sold as early as October 2012. Sale preparation (unit layout and timber marking) could begin in 2011. Sanitation/salvage treatments could begin after a final decision is made.
13.14	We encourage the NHRD to work with the state to reroute or close snowmobile and ski trails prior to sale advertisement.	<p>Staff on the Northern Hills Ranger District would work with the State regarding snowmobile and ski trails.</p> <p>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 take place at the time of timber sale appraisal and contract preparation. If conflicts appear likely between use of the snowmobile trails and specific logging units or haul routes, logging would be restricted 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.</p> <p>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</p>

Respondent #13: Paul Pierson, Neiman Timber Company		
#	Comment	Comment Analysis and FS Response
		only at locations approved by the sale administrator and with proper cautionary signing installed by the timber contractor.
13.15	We would again like to thank you for the opportunity to provide comments on the Cold Spring project. You have put together a very good project for addressing the MPB and we hope our comments will aid you in developing the best possible project to meet the purpose and need. Please contact us to schedule a meeting to discuss our comments and recommendations once you have had time to review them.	The District provided a scoping comment period. This comment period provided those interested in or affected by this proposal an opportunity to make their concerns known prior to a decision by the Responsible Official. Written, facsimile, hand-delivered, and electronic comments concerning this action were accepted for 30 calendar days following publication of this notice in the <i>Rapid City Journal</i> . Those who provided timely written comments will be eligible to formally object to the decision pursuant to regulations at 36 CFR 218.

Respondent #14: Douglas Hofer, Director, Parks and Recreation Division, South Dakota Department of Game, Fish and Parks		
#	Comment	Comment Analysis and FS Response
14.1	<p>This letter represents our comments in reply to the Cold Springs Project Area, in the Northern Hills Ranger District of the Black Hills National Forest.</p> <p>This project encompasses the Hardy Guard Station, which is the headquarters for the Black Hills snowmobile program, and is very important in maintaining the high traffic from snowmobiles and groomers in and out of this area. Due to private land in many meadows, topography, and conflict with existing roads, moving snowmobile trails can be expensive, time consuming, and complicated. We understand removing trees infested with mountain pine beetles is a high priority and without these logging efforts the health of the forest would continue to decline. We strongly encourage the Northern Hills Ranger District, our Division of Parks & Recreation, and the logging industry to work together throughout planning process of this project. Working together, the goals of this project can be accomplished' while minimizing the number of miles of snowmobile trails impacted.</p>	Please see the response to comment 13.14.
14.2	<p>The following specific actions would be most helpful in the implementation of the Cold Springs Project in regards to maintaining the snowmobile trail system in this area:</p> <p>A defined and complete map of logging activity occurring during winter months should be submitted to the SD Black Hills Trails office by August 15th annually. This would allow adequate time for new trail markers and changes to the publication of the SD Snowmobile Trails Map.</p> <p>Trail signs and markers need to be protected during harvest activities.</p> <p>Coordination between the SD Trails office and the US Forest Service Snowmobile Trails Coordinator needs to occur prior to August 15th to plan accordingly.</p> <p>Signing of harvest activities should be placed at trailheads, bulletin boards, and trail intersections to ensure public safety.</p>	<p>The timber purchaser would be requested to submit a winter operating plan by June 1st. District staff would meet with South Dakota snowmobile trail staff to coordinate harvest activity. Logging units or haul routes would be restricted between December 1 and March 31, unless a logical and desirable alternative snowmobile route is identified.</p> <p>Snowmobile trails would be shown as improvements on timber sale area maps and protected during harvest operations.</p> <p>Signing for public safety is included as part of the proposed action.</p>
14.3	<p>Thank you for the opportunity to comment and please feel free to contact the Black Hills Trails Office anytime at 584-3896, and thank you for the strong initiative to protect the health of the Black Hills National Forest.</p>	Statement of support

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Appendix C: Past, Present and Reasonably Foreseeable Management Activities

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Appendix C. Past, Present and Reasonably Foreseeable Management Activities

The Cold Springs Project Area contains portions of five different grazing allotments and approximately 1,575 acres of primary grazing area. The allotments are summarized in Table 1, and additional details follow. The project area contains 23 spring developments, 1 guzzler, and 12 ponds or reservoirs used in the management of livestock grazing.

Table 1. Grazing allotments within the Cold Springs project area

Allotment Name	Total Size (Acres)	Acres within the Project Area	Proportion of Allotment within the Project Area
Deadman	2,679	1,871	70%
Griffith	5,705	4,953	87%
Little Spearfish	9,180	1,340	15%
Wildcat	17,099	895	5%
Wolff	22,230	2,563	12%

Deadman Allotment

The Deadman Allotment is 2,679 acres in size. There are 1,871 acres of this allotment within the project area. Portions of 2 separate pastures associated with the Deadman Allotment overlap the Cold Springs project area: the East Pasture and the West Pasture. There are currently 2 grazing permittees that graze 159 cow/calf pairs from June 16 through October 1 in a 2-pasture deferred-rotation grazing system.

Griffith Allotment

The Griffith Allotment is 5,705 acres in size. There are 4,953 acres of the allotment within the project area. Portions of 5 separate pastures associated with the Griffith Allotment overlap the project area: the East Yearling, West Yearling, Moses, Arnold, and Yellow Jacket Pastures. Currently there is one permittee that grazes 140 cow/calf pairs and 60 yearlings from June 16 through October 15 in a 5-pasture deferred-rotation grazing system.

Little Spearfish Allotment

The Little Spearfish Allotment is 9,180 acres in size. There are 1,340 acres of the allotment within the project area. Portions of 6 separate pastures associated with the Little Spearfish Allotment overlap the project area: the O'neil, Dry Gulch, Tornado, Valley, Shirley, and Tom Spring Pastures. Currently there is one permittee that grazes 330 cow/calf pairs and 14 bulls from June 11 through September 30 in an 8-pasture rest-rotation grazing system.

Wildcat Allotment

The Wildcat Allotment is 17,100 acres in size. There are 895 acres of the allotment within the project area. The Clayton Pasture is the only pasture in this allotment that overlaps the Cold Springs project area. Currently there is one permittee that grazes 184 cow/calf pairs from June 15 through October 15 in a 3-pasture deferred-rotation grazing system.

Wolff Allotment

The Wolff Allotment consists of 22,230 acres. About 2,563 acres fall within the Cold Springs Project Area boundary. The Clayton Draw Pasture is the only pasture in this allotment that overlaps the Cold Springs project area. Currently there are two permittees that graze 364 cow/calf pairs from June 1 through October 15 in a 7-pasture deferred-rotation grazing system.

Additional past, present and reasonably foreseeable activities within the project area and within a one-half-mile vicinity include:

- Powerline right-of-way maintenance
- Travel management and road maintenance
- Gravel extraction
- Firewood cutting
- Non-motorized recreation associated with the Eagle Cliff trail system
- Motorized recreation including snowmobiles and ATVs
- Dispersed recreation
- Special use recreation: fly fishing, snowmobile trail use, Eagle Cliff trail use
- Fire suppression
- Noxious weed control: monitoring of noxious weeds, prevention and control measures.
- Private land vegetation and fuel management

Table 2 summarizes the area of past, planned, and on-going vegetation and fuel management activities within ½ mile of the project boundary. Summarized treatments include: fuel treatments, commercial harvest, and non-commercial vegetation treatments. Treatments are summarized by the year of accomplishment. The information was derived from the district FACTS (GIS) database.

Table 2 includes the following commercial timber sales (contract award year): Beaver (1993), Big Mac (2001), Brahma (1995), Crowley (1991), Elk Mountain, Geranium (2007), Hellsgate (1994), Hip (2011), Keough (1997), McInerny (2007), Mellow (1991), Merow (1986), O’Neil (1990), Pond (1996), Power (1995, 2005), Power Pole (2006), Raddick (2010), Revell, Rifle (1992), Rifle Pit (2006), Short Draw, Stove Hole, Timex (1984), Yellow (1989), June, Deadman.

Table 2. Summarized timber harvest, non-commercial vegetation treatments, and fuel treatments within one-half mile of the project boundary

Year Accomplished	Fuel Treatments (Acres)			Commercial Timber Treatments (Acres)								Non-commercial Vegetation Activities (Acres)						
	Burn	Pile Burn	Misc Fuel	Meadow Enhance	Thin	S W Estab & Seed Cut	S W Removal	Selection	Hard-wood Release	San & Salv	Special	Tree Plant	Site Prep	TSI	Hard-wood Release	Aspen Regen	Meadow Enhance	Line Total
FACTS Activity Codes	1111, 1112, 1113	1130	1152, 1153, 1154, 1160, 1180	2400	4220, 4121	4131, 4194	4141, 4142, 4143	4151, 4152	4211	4230	4240	4441	4490, 4494	4511, 4521	6102	6104, 6107	6131	
1969	0		0	0	0	0	0	0				32	0	0		0		32
1977	0		0	0	0	0	0	0		19			0	0		0		19
1980	0		0	0	0	0	0	0					0	0		75		75
1981	0		0	0	0	0	0	0					0	0		407		407
1982	0		0	0	0	0	0	0					0	787		0		787
1983	0		0	0	0	0	0	0					0	824		0		824
1984	0		0	0	510	0	0	0					0	1,112		15		1,637
1985	38		0	0	106	0	0	0			30		0	100		0		274
1986	0		0	0	1,669	194	12	0			23		0	0		14		1,912
1987	0		0	0	212	0	0	0			25		0	0		8		245
1988	0	535	37	0	14	0	0	0					0	467		52		1,105
1989	0		0	56	1,335	267	25	115			295		0	224		22		2,339
1990	0	19	42	28	428	71	0	0			140		31	519		129		1,407
1991	0	201	0	0	0	363	0	0					161	317		48		1,090

Year Accomplished	Fuel Treatments (Acres)			Commercial Timber Treatments (Acres)								Non-commercial Vegetation Activities (Acres)						
	Burn	Pile Burn	Misc Fuel	Meadow Enhance	Thin	S W Estab & Seed Cut	S W Removal	Selection	Hard-wood Release	San & Salv	Special	Tree Plant	Site Prep	TSI	Hard-wood Release	Aspen Regen	Meadow Enhance	Line Total
1992	0	110	0	22	754	877	65	0			28		45	580		0		2,481
1993	0	37	0	42	0	0	0	0					100	0		50	42	271
1994	0		0	0	0	0	0	0					0	0		35		35
1995	0	9	0	0	66	86	0	185			77		0	0		0		423
1996	0		0	0	360	149	29	397			27		0	26		0		988
1997	0	78	0	0	141	53	127	282			132		0	290		0		1,103
1998	0		0	0	322	169	0	0			521		0	80		0		1,092
1999	0	41	0	0	27	0	24	0					0	0		0		92
2000	0	2	0	0	0	0	0	0					0	197	22	22		243
2001	0		0	0	127	20	0	0					0	0		0		147
2002	0		0	62	147	11	56	51					0	39		0	62	428
2003	0		0	9	149	0	85	0					0	16		0	9	268
2004	215		0	0	41	133	65	0					0	349		0		803
2005	0		0	0	608	66	608	0					0	29	58	38		1,407
2006	0	34	0	156	1,587	279	1,282	0					0	657	94	78	140	4,307
2007	0	624	164	48	0	597	0	0					0	853		0	48	2,334
2008	0	284	224	0	356	163	0	0	67				0	516		0		1,610
2009	0	2,786	597	71	0	0	0	0					0	383		0	71	3,908
2010	0	14	6	0	0	0	0	0					0	1,002	56	0		1,078
2011	0		0	0	156	823	0	0					0	0		0		979
Planned	8,357	603	475	400	2,880	172	677	0	14	19	1,298	32	240	7,591	195	351	381	22,336
Grand Total	8,607	5,377	1,545	894	11,995	4,493	3,055	1,030	81	19	1,298	32	577	1,6958	425	1,344	753	58,486

Appendix D: Silviculture Findings of Compliance with Laws, Regulations, and Policy

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Appendix D. Silviculture Findings of Compliance with Laws, Regulations, and Policy

Because this project involves vegetative management treatments, compliance with the timber harvest provisions of the National Forest Management Act (NFMA) is required. Additional information regarding compliance with NFMA can be found in the Cold Springs Forest Vegetation Report (Orlemann 2011), which is located in the Cold Springs project file.

16 U.S.C. 1604 (g)(3)(E)

Under 16 U.S.C. 1604 (g)(3)(E), a responsible official may authorize site-specific projects and activities on National Forest System (NFS) lands to harvest timber only where:

1. Soil, slope, or other watershed conditions will not be irreversibly damaged (16 U.S.C. 1604 (g)(3)(E)(i)).

Response: Best management practices implemented in project design and contract initiation are effective in minimizing impacts to site productivity and conserving soil and water resources. These are discussed in the Soils and Hydrology report. Contract clauses will be used that implement best management practices, such as directional felling, designated skid trails, endlining, etc. There has been no finding of irreversible damage to soils, slopes, or other watershed conditions from proposed treatments.

2. There is assurance that the lands can be adequately restocked within five years after final regeneration (16 U.S.C. 1604 (g)(3)(E)(ii)).

Response: Research and experience indicate that the shelterwood method should be the primary regeneration method, and that it is ideally suited and widely applicable in the Black Hills. Restocking of lands in the Black Hills is generally abundant and prompt (Boldt and others 1983). Shelterwood removal cuts under this project are planned for stands that have abundant regeneration.

3. Protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment where harvests are likely to seriously and adversely affect water conditions or fish habitat (16 U.S.C. 1604 (g)(3)(E)(iii)).

Response: Analysis of the proposed action shows that effects to water quality and fish habitat would be negligible due to the implementation of the required best management practices. Best management practices provide protection for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water. There has been no finding that project activities are likely to seriously and adversely affect water conditions or fish habitat through changes in water temperatures, blockages of water courses, or deposits of sediment. (See hydrologist specialist report.)

4. The harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber (16 U.S.C. 1604 (g)(3)(E)(iv)).

Response: Proposed harvest systems for the Cold Springs Project include shelterwood (even-aged) and single-tree selection (uneven-aged) which are acceptable systems under the Forest Plan (II-25). Research and past experience has shown the shelterwood method to be the most reliable

in managing forest stands on the Black Hills (Shepperd and Battaglia 2002). The selection systems proposed are intended to meet habitat requirements, such as uneven-aged structures. In neither case has the system been chosen for the greatest dollar return or timber output.

16 U.S.C. 1604 (g)(3)(F)

Under 16 U.S.C. 1604 (g)(3)(F), a responsible official may authorize site-specific projects and activities on NFS lands using clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber as a cutting method only where:

1. For clearcutting, it is determined to be the optimum method; for other methods it is determined to be appropriate and meets the objectives and requirements of the applicable land management plan (16 U.S.C. 1604 (g)(3)(F)(i)).

Response: Shelterwood regeneration harvests are appropriate for meeting the objectives and requirements of the Black Hills Forest Plan. Shelterwood removals will be used as specified in the Black Hills FEIS, Phase II Amendment Chapter II, pg. 26.

2. The interdisciplinary review has been completed and the potential environmental, biological, aesthetic, engineering, and economic impacts on each advertised sale area have been assessed, as well as the consistency of the sale with the multiple use of the general area (16 U.S.C. 1604 (g)(3)(F)(ii)).

Response: The Cold Springs Environmental Assessment and decision notice constitute the interdisciplinary review of the potential environmental, biological, aesthetic, engineering, and economic impacts. The project is consistent with the multiple uses of the general area.

3. Cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain (16 U.S.C. 1604 (g)(3)(F)(iii)).

Response: The proposed treatment areas are located within the natural terrain features of the project area and generally follow natural stand boundaries.

4. There are established according to geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal: Provided, that such limits shall not apply to the size of areas harvested because of natural catastrophic conditions such as fire, insect and disease attack, or windstorm (16 U.S.C. 1604 (g)(3)(F)(iv)).

Response: Maximum size limits for areas to be treated with regeneration harvests are established by the Black Hills Forest Plan (Forest Plan II-17: Standard 2101). The Cold Springs proposed action does not include regeneration harvest that will create openings in excess of 40 acres. All areas proposed for shelterwood removal are fully stocked with pine regeneration and would not be considered openings; they would be considered structural stage 2 or 3 after treatment.

5. Such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, and the regeneration of the timber resource (16 U.S.C. 1604 (g)(3)(F)(v)).

Response: The effects on each resource are disclosed in the Cold Springs Environmental Assessment and decision notice. Effects of implementing the regeneration harvests proposed by the project are consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, as well as the regeneration of the timber resource.

16 U.S.C. 1604 (m)

Under 16 U.S.C. 1604 (m), the Secretary shall establish:

Standards to insure that, prior to harvest, stands of trees throughout the National Forest System shall generally have reached the culmination of mean annual increment of growth (calculated on the basis of cubic measurement or other methods of calculation at the discretion of the Secretary): Provided, That these standards shall not preclude the use of sound silvicultural practices, such as thinning or other stand improvement measures: Provided further, That these standards shall not preclude the Secretary from salvage or sanitation harvesting of timber stands which are substantially damaged by fire, windthrow or other catastrophe, or which are in imminent danger from insect or disease attack; and(16 U.S.C. 1604 (m)(1)).

[E]xceptions to these standards for the harvest of particular species of trees in management units after consideration has been given to the multiple uses of the forest including, but not limited to, recreation, wildlife habitat, and range and after completion of public participation processes utilizing the procedures of subsection (d) of this section (16 U.S.C. 1604 (m)(2)).

Response: Under the Black Hills Forest Plan, this requirement is met by ensuring that “[r]egeneration harvests of even-aged timber stands should not be undertaken until the stands have generally reached (or surpassed 95 percent of the) culmination of the mean annual increment measured in cubic feet.” (See, Forest Plan, II-26.) Moreover, the requirement does not apply to many of the treatments proposed for Cold Springs. For example, much of the thinning and hardwood release is excepted from the requirement because they are “sound silvicultural practices, such as thinning or other stand improvement” under 16 U.S.C. 1604(m)(1) or would meet Forest Plan multiple-use objectives to maintain landscape vegetation diversity under 16 U.S.C. 1604(m)(2). In addition, none of the salvage or sanitation activities are included.

Even-aged harvests, on the other hand, including clearcuts and shelterwood harvests are required to meet the culmination of the mean annual increment (CMAI) standard. It is the accepted practice in the forestry profession to apply the CMAI standard to the timing of the regeneration step of even-aged harvests. For a two-step shelterwood, the determination is made at the establishment step, and not the overstory removal step. In the case of Cold Springs, 33 stands, totaling approximately 1,200 acres, have been proposed for shelterwood establishment cutting. It is these treatments that must be checked for CMAI.

Stand age at CMAI will vary depending on site quality, forest type, management intensities and utilization standards, but various analyses indicate that it generally will occur for most sawtimber stands in the Black Hills between 80 and 120 years, depending on site index. The applicable site index curves are found in Figure 1. Table 1 shows that all of the stands proposed for shelterwood establishment treatments have met the CMAI requirement.

I certify that stands receiving harvest treatments that are not exceptions to 16 U.S.C. 1604(m) have met the culmination of mean annual increment.

Findings prepared by:



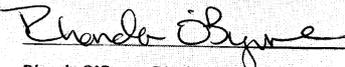
Andrew Orlemann, Forester

Findings reviewed by:



John Natvig, Region II Certified Silviculturist

Findings accepted by:



Rhonda O'Byrne, District Ranger

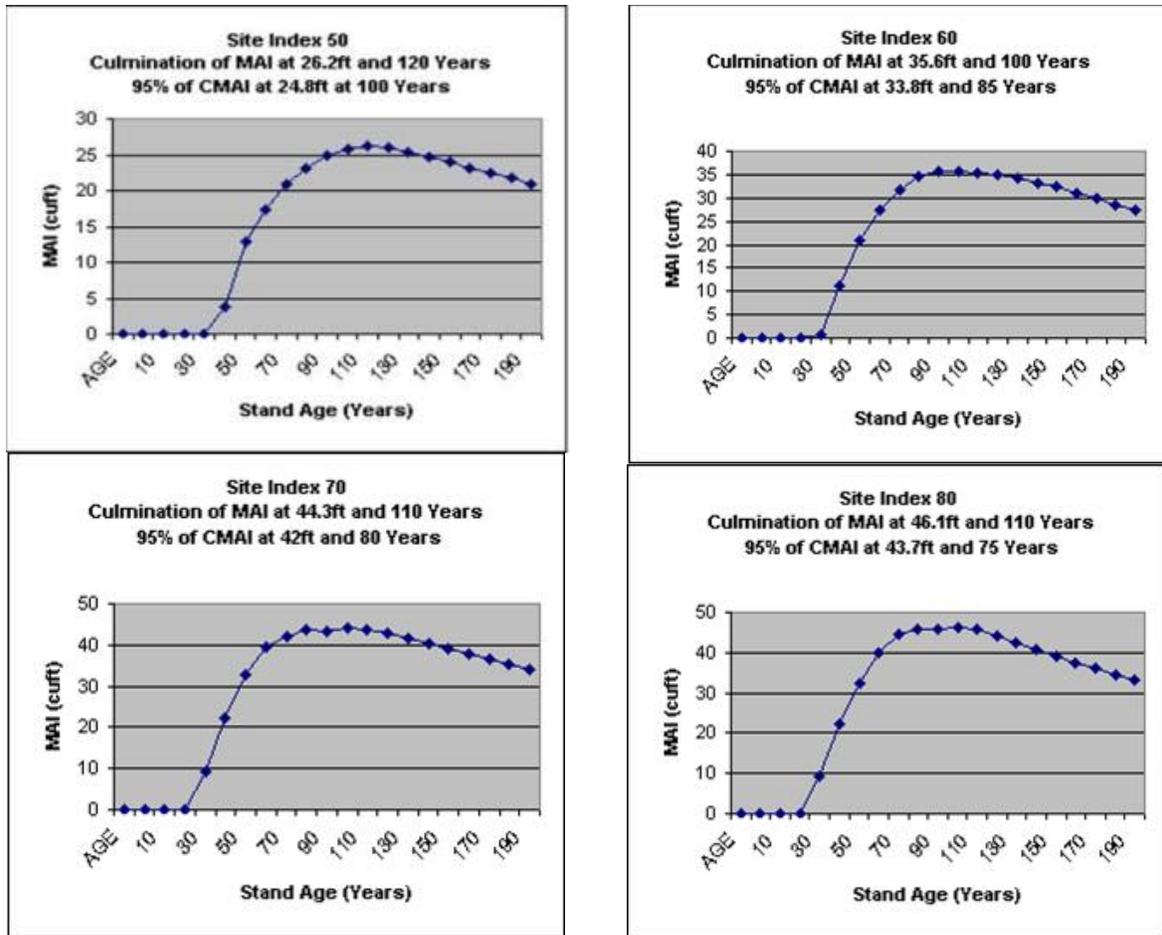


Figure 1. Site index and mean annual increment curves for the Black Hills

Table 1. Stands proposed for shelterwood establishment as compared to 95 percent of the culmination of the mean annual increment

Partition	Stand	Site Index	95% CMAI	Stand Age	Meets Requirement
070503	142	62	85	120	y
070505	48	68	80	84	y
070505	50	64	85	116	y
070505	78	66	80	100	y
071205	4	66	80	137	y
071205	14	70	80	101	y
071301	29	70	80	121	y
071301	49	69	80	108	y
071301	98	60	85	116	y
071302	15	59	85	115	y
071302	21	55	100	138	y
071302	43	60	85	114	y
071303	28	63	85	85	y
071304	33	48	100	117	y
071304	54	66	80	98	y
071304	65	69	80	104	y
071304	68	68	80	121	y
071304	70	65	85	113	y
071304	73	65	85	103	y
071304	97	61	85	117	y
071304	98	75	80	98	y
071305	4	62	85	111	y
071305	5	64	85	118	y
071305	9	54	100	125	y
071305	12	65	85	115	y
071305	17	57	85	119	y
071305	19	64	85	128	y
071305	24	54	100	117	y
071306	18	54	100	123	y
071306	57	66	80	120	y
071306	72	63	85	96	y
071308	43	57	85	104	y
071308	60	52	100	112	y

Appendix E: Silvicultural Stand Diagnosis—No Treatment Rationale

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Appendix E. Silvicultural Stand Diagnosis—No Treatment Rationale¹

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
070309	84	5.9	NT			Marked for timber sale.
070309	96	5.3	NT	Rx Burn		Marked for timber sale.
070309	97	2.2	NT	Rx Burn		Marked for timber sale.
070309	99	1.2	NT	Rx Burn		Marked for timber sale.
070503	24	42.4	NT			Not over stocked, no treatment needed.
070503	25	42.8	NT			Aspen, low insect risk rating.
070503	27	14.7	NT			Not over stocked, no treatment needed.
070503	28	19.8	NT			Not over stocked, no treatment needed.
070503	29	25.1	NT			Not over stocked, no treatment needed.
070503	94	8.3	NT			Not over stocked, no treatment needed.
070503	95	27.2	NT			Not over stocked, no treatment needed.
070503	96	6.9	NT			Not over stocked, no treatment needed.
070503	99	22.2	NT			Not over stocked, no treatment needed.
070503	102	53.4	NT			Not over stocked, no treatment needed.
070503	103	47.9	NT			Aspen, low insect risk rating.
070503	111	5.1	NT			Not over stocked, no treatment needed.
070503	112	9.6	NT			Not over stocked, no treatment needed.
070503	113	2.8	NT			Not over stocked, no treatment needed.
070503	115	4.5	NT			Not over stocked, no treatment needed.
070503	116	14.0	NT			Aspen, low insect risk rating.
070503	127	19.2	NT			Not over stocked, no treatment needed.
070503	130	2.3	NT			Recently treated.
070503	132	5.7	NT			Recently treated.
070503	141	5.8	NT			Recently treated.
070503	143	5.7	NT			Not over stocked, no treatment needed.
070503	144	13.7	NT			Not over stocked, no treatment needed.
070503	145	10.3	NT			Not over stocked, no treatment needed.
070505	7	46.5	NT			Not over stocked, no treatment needed.
070505	8	31.2	NT			Aspen, low insect risk rating.
070505	9	18.5	NT			Not over stocked, no treatment needed.
070505	10	13.8	NT			Not over stocked, no treatment needed.
070505	11	11.5	NT			Aspen, low insect risk rating.

¹ Orlemann, Andrew. 2011. *Cold Springs Vegetation Management Project Forest Vegetation Report*. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Black Hills National Forest Northern Hills Ranger District Office, Spearfish, SD. 109 p.

² NT, no commercial timber harvest planned

³ Rx Burn: broadcast prescribed burn

⁴ PCT: precommercial thin; AR: aspen release; WL TSI: wildlife timber stand improvement

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
070505	16	17.8	NT			Not over stocked, no treatment needed.
070505	18	17.2	NT			Not over stocked, no treatment needed.
070505	46	22.8	NT			Aspen, low insect risk rating.
070505	47	10.4	NT			Not over stocked, no treatment needed.
070505	51	17.1	NT			Eleven acres of this stand is TES ⁵ plant habitat.
070505	54	26.2	NT			Grass cover type.
070505	55	26.5	NT			Old pine along the highway, 70 percent hardwoods.
070505	56	3.9	NT			Small stand of old pine along the highway.
070505	57	52.6	NT			Aspen, low insect risk rating.
070505	60	11.6	NT			Not over stocked, no treatment needed.
070505	61	6.1	NT			Not over stocked, no treatment needed.
070505	64	25.0	NT			Aspen, low insect risk rating.
070505	65	56.7	NT			Not over stocked, no treatment needed.
070505	66	19.4	NT			Aspen, low insect risk rating.
070505	67	30.4	NT			Not over stocked, no treatment needed.
070505	68	10.9	NT			Not over stocked, no treatment needed.
070505	70	14.1	NT			Not over stocked, no treatment needed.
070505	71	8.9	NT			Not over stocked, no treatment needed.
070505	73	32.3	NT			Recently treated.
070505	75	30.0	NT			Not over stocked, no treatment needed.
070505	76	31.8	NT			Aspen, low insect risk rating.
070505	80	11.5	NT			Recently treated.
070505	81	1.0	NT			Aspen, low insect risk rating.
070505	91	4.5	NT			Recently treated.
070505	93	9.3	NT			Not over stocked, no treatment needed.
070505	95	13.7	NT			Not over stocked, no treatment needed.
070505	96	27.9	NT			Not over stocked, no treatment needed.
070505	97	5.2	NT			Aspen, low insect risk rating.
070505	99	16.6	NT			Aspen, low insect risk rating.
071203	9	39.6	NT			Not over stocked, no treatment needed.
071203	32	6.1	NT			Not over stocked, no treatment needed.
071203	65	4.7	NT			Not over stocked, no treatment needed.
071205	2	47.9	NT			Recently treated.
071205	3	13.0	NT			Not over stocked, no treatment needed.
071205	5	24.4	NT			Steep, rock ledges, site conditions and location prohibit tractor and skyline harvest operations.
071205	6	12.8	NT			Steep, rock ledges. Ten acres of this stand is TES plant habitat.
071205	7	73.9	NT			Not over stocked, no treatment needed.

⁵ TES: Threatened, endangered or Region 2 sensitive species

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
071205	16	15.9	NT			Very steep, over highway, ski trail in it.
071205	24	22.6	NT			Grass cover type.
071205	25	29.7	NT			Very steep, over highway.
071205	29	6.7	NT			Grass cover type.
071205	36	47.7	NT			Recently treated.
071205	37	7.5	NT			Grass cover type.
071205	38	32.1	NT			Recently treated.
071205	40	3.0	NT			Grass cover type.
071205	42	16.2	NT			Not over stocked, no treatment needed.
071205	44	23.1	NT			Steep, ledgy. Stand has been identified as an important connective corridor for marten. Per Forest Plan Standard 3215, canopy closure of at least 50 percent is to be maintained. Stand conditions indicate that commercial treatment would not maintain 50 percent canopy closure (44% AMD ⁶).
071205	45	21.8	NT			Recently treated.
071205	55	19.9	NT			Not over stocked, no treatment needed.
071205	57	55.2	NT			Recently treated.
071205	81	18.4	NT			Very steep, never treated, along highway.
071205	82	6.2	NT			Very steep, never treated, ski trail switchback.
071205	83	3.5	NT			Steep, rock ledges, no treatment needed (4A, 23% AMD).
071206	1	10.5	NT			Not over stocked, no treatment needed.
071206	2	26.2	NT			Recently treated.
071206	3	28.5	NT			Grass cover type.
071206	6	17.6	NT			Grass cover type.
071206	7	3.9	NT			Grass cover type.
071206	8	17.5	NT			Not over stocked, no treatment needed.
071206	11	5.8	NT			Not over stocked, no treatment needed.
071206	12	17.8	NT			Not over stocked, no treatment needed.
071206	14	13.1	NT			Not over stocked, no treatment needed.
071206	27	15.7	NT			Recently treated.
071301	3	22.4	NT			Not over stocked, no treatment needed.
071301	7	7.0	NT			Aspen, low insect risk rating.
071301	8	9.5	NT			Grass cover type.
071301	11	17.6	NT			Grass cover type.
071301	12	35.5	NT			Ninety percent hardwoods.
071301	13	12.1	NT			Recently treated.
071301	14	6.6	NT			Not over stocked, no treatment needed.
071301	15	46.3	NT			Recently treated.

⁶ AMD: average maximum density

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
071301	17	79.7	NT			Recently treated.
071301	18	7.8	NT			Grass cover type.
071301	21	20.5	NT			Recently treated.
071301	22	21.9	NT			Recently treated.
071301	23	35.0	NT			Recently treated.
071301	24	21.2	NT			Recently treated.
071301	25	13.3	NT	Rx Burn		Recently treated.
071301	26	139.2	NT			Recently treated.
071301	27	28.7	NT			Recently treated.
071301	30	28.8	NT			Recently treated.
071301	32	7.4	NT			Not over stocked, no treatment needed.
071301	33	13.9	NT			Recently treated.
071301	34	30.2	NT			Ninety percent hardwoods.
071301	35	67.3	NT			Recently treated.
071301	36	21.7	NT			Recently treated.
071301	37	10.3	NT			Grass cover type.
071301	39	4.0	NT			Grass cover type.
071301	41	61.3	NT		AR	Recently treated.
071301	44	5.3	NT			Recently treated.
071301	45	30.2	NT			Not over stocked, no treatment needed.
071301	47	5.7	NT			Recently treated.
071301	48	2.0	NT			Not over stocked, no treatment needed.
071301	50	12.4	NT			Recently treated.
071301	51	10.2	NT			Recently treated.
071301	52	41.3	NT			Not over stocked, no treatment needed.
071301	54	5.5	NT			Aspen, low insect risk rating.
071301	56	3.3	NT			Not over stocked, no treatment needed.
071301	57	1.3	NT			Very small steep old pine.
071301	75	9.9	NT			Recently treated.
071301	76	23.2	NT			Not over stocked, no treatment needed.
071301	78	49.4	NT			Recently treated.
071301	79	46.5	NT		AR	Not over stocked, no treatment needed.
071301	80	15.1	NT			Not over stocked, no treatment needed.
071301	81	67.6	NT			Recently treated.
071301	82	82.6	NT			Not over stocked, no treatment needed.
071301	83	5.7	NT			Aspen, low insect risk rating.
071301	89	36.7	NT			Not over stocked, no treatment needed.
071301	90	37.6	NT			Recently treated.
071301	91	16.8	NT			Recently treated.
071301	93	1.7	NT			Aspen, low insect risk rating.
071301	94	2.4	NT			Aspen, low insect risk rating.
071301	96	8.7	NT			Aspen, low insect risk rating.

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
071301	102	27.9	NT		PCT	Recently treated.
071301	163	3.7	NT			Recently treated.
071301	165	21.6	NT			Recently treated.
071301	167	2.1	NT			Not over stocked, no treatment needed.
071301	169	7.6	NT			Recently treated.
071301	170	3.9	NT			Grass cover type.
071301	171	13.2	NT			Recently treated.
071301	172	9.4	NT			Recently treated.
071301	174	5.6	NT			Aspen, low insect risk rating.
071301	175	8.5	NT			Not over stocked, no treatment needed.
071302	1	63.4	NT			Spruce cover type, marten corridor.
071302	2	73.0	NT			Recently treated.
071302	3	5.2	NT			Grass cover type.
071302	8	140.8	NT			Recently treated.
071302	9	11.4	NT			Not over stocked, no treatment needed.
071302	13	42.2	NT			Grass cover type.
071302	14	24.1	NT			Recently treated.
071302	20	67.8	NT			Spruce cover type, marten corridor.
071302	22	28.3	NT	Rx Burn		Grass cover type.
071302	23	6.1	NT			Spruce cover type, marten corridor.
071302	24	4.0	NT			Grass cover type.
071302	25	45.8	NT			Not over stocked, no treatment needed.
071302	26	17.1	NT	Rx Burn		Recently treated.
071302	27	47.3	NT			Not over stocked, no treatment needed.
071302	28	5.7	NT			Spruce cover type, marten corridor.
071302	29	21.1	NT			Recently treated.
071302	31	106.2	NT		AR	Not over stocked, no treatment needed.
071302	32	38.1	NT			Not over stocked, no treatment needed.
071302	33	141.0	NT			Recently treated.
071302	34	117.3	NT			Not over stocked, no treatment needed.
071302	35	11.8	NT			Ninety percent hardwoods.
071302	37	15.0	NT			Spruce cover type, marten corridor.
071302	38	79.2	NT			Not over stocked, no treatment needed.
071302	39	67.2	NT			Recently treated.
071302	42	24.8	NT	Rx Burn		Grass cover type.
071302	44	50.5	NT			Spruce cover type, marten corridor.
071302	45	21.8	NT			Grass cover type.
071302	46	8.7	NT	Rx Burn		Not over stocked, no treatment needed.
071302	49	59.7	NT			Recently treated.
071302	50	79.6	NT			Recently treated.
071302	51	13.3	NT			Not over stocked, no treatment needed.
071302	54	2.8	NT			Grass cover type.

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
071302	62	10.7	NT			Not over stocked, no treatment needed.
071302	63	14.8	NT			Recently treated.
071302	64	25.5	NT			Recently treated.
071302	65	5.4	NT			Not over stocked, no treatment needed.
071302	66	1.0	NT			One isolated acre; excluded from previous treatments.
071302	67	5.0	NT			Not over stocked, no treatment needed.
071302	68	12.2	NT			Recently treated.
071302	70	46.0	NT			Not over stocked, no treatment needed.
071303	1	8.8	NT			Recently treated.
071303	2	9.3	NT		WL TSI	Spruce cover type, marten corridor.
071303	3	10.0	NT			Grass cover type.
071303	4	26.9	NT			Not over stocked, no treatment needed.
071303	5	34.2	NT			Recently treated.
071303	8	4.9	NT			Recently treated.
071303	9	41.4	NT			Recently treated.
071303	13	63.9	NT			Recently treated.
071303	19	29.5	NT		WL TSI	Noncommercial goshawk habitat enhancement.
071303	20	14.6	NT			Recently treated.
071303	21	28.7	NT		WL TSI	Noncommercial goshawk habitat enhancement.
071303	22	29.3	NT			Goshawk habitat stand.
071303	23	33.4	NT			Recently treated.
071303	24	7.2	NT			Grass cover type.
071303	27	35.3	NT			Recently treated.
071303	29	48.8	NT			Recently treated.
071303	30	6.8	NT			Small, steep stand. Stand has also been identified as an important connective corridor for marten.
071303	31	50.7	NT			Not over stocked, no treatment needed.
071303	34	11.3	NT			Recently treated.
071303	35	2.6	NT			Recently treated.
071303	36	15.0	NT		WL TSI	Noncommercial goshawk habitat enhancement.
071303	39	4.5	NT			Recently treated.
071303	40	2.8	NT			Grass cover type.
071303	41	14.0	NT			Spruce cover type, marten corridor.
071303	42	23.7	NT			Not over stocked, no treatment needed.
071303	43	4.5	NT			Recently treated.
071303	44	9.3	NT			Goshawk habitat nest area.
071303	45	6.9	NT			Spruce cover type, marten corridor.
071303	50	43.5	NT	Rx Burn		Grass cover type.
071303	54	3.2	NT			Grass cover type.

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
071303	55	26.9	NT			Spruce cover type, marten corridor.
071303	56	14.8	NT			Spruce cover type, marten corridor.
071303	61	1.3	NT			Grass cover type.
071303	62	2.9	NT			Grass cover type.
071303	74	1.2	NT			One isolated acre; excluded from previous treatments.
071303	76	0.7	NT			One isolated acre; excluded from previous treatments.
071303	77	1.1	NT			One isolated acre; excluded from previous treatments.
071303	80	7.2	NT			Recently treated.
071303	81	6.0	NT			Spruce cover type, marten corridor.
071303	82	14.7	NT			Recently treated.
071303	83	2.4	NT			Not over stocked, no treatment needed.
071303	84	1.1	NT			Not over stocked, no treatment needed.
071303	85	6.9	NT			Recently treated.
071304	15	6.6	NT			Not over stocked, no treatment needed.
071304	17	6.5	NT			Recently treated.
071304	18	17.4	NT			Recently treated.
071304	32	20.9	NT			Recently treated.
071304	36	57.2	NT			Recently treated.
071304	37	43.2	NT	Rx Burn		Grass cover type.
071304	45	3.9	NT			Not over stocked, no treatment needed.
071304	50	15.3	NT	Rx Burn		Spruce cover type, marten corridor.
071304	51	36.1	NT			Recently treated.
071304	55	22.5	NT			Recently treated.
071304	58	16.0	NT			Recently treated.
071304	61	47.1	NT			Not over stocked, no treatment needed.
071304	62	38.6	NT			Recently treated.
071304	63	7.8	NT			Steep old pine.
071304	66	12.6	NT			Recently treated.
071304	67	4.8	NT			Not over stocked, no treatment needed.
071304	71	6.2	NT			Non-forest land.
071304	72	25.3	NT			Recently treated.
071304	74	29.0	NT			Recently treated.
071304	83	3.8	NT			Grass cover type.
071304	84	20.0	NT			Very steep; never treated.
071304	85	6.8	NT			Recently treated.
071304	86	23.5	NT			Grass cover type.
071304	87	3.1	NT			Recently treated.
071304	88	4.4	NT			Recently treated.
071304	89	3.0	NT	Rx Burn		Small, steep stand, no treatment needed (SS1).

Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
071304	90	17.1	NT	Rx Burn		Spruce cover type, marten corridor.
071304	91	3.8	NT	Rx Burn		Not over stocked, no treatment needed.
071304	93	6.8	NT			Spruce cover type, marten corridor.
071304	94	13.5	NT	Rx Burn		Grass cover type.
071304	99	9.0	NT			Six acres of this small stand is TES plant habitat
071304	103	9.5	NT			Recently treated.
071304	104	2.2	NT			Two acres, steep, rock ledges.
071304	105	8.7	NT			Recently treated.
071305	1	73.8	NT			Spruce cover type, marten corridor.
071305	2	70.4	NT			Steep, never been treated, TES plant habitat, logging inoperable.
071305	3	8.7	NT			Grass cover type.
071305	6	83.5	NT			Spruce cover type, marten corridor.
071305	7	9.1	NT		AR	Spruce cover type, marten corridor.
071305	8	70.4	NT			Recently treated.
071305	10	13.6	NT			Grass cover type.
071305	11	20.5	NT			Not over stocked, no treatment needed.
071305	13	36.1	NT			Spruce cover type, marten corridor.
071305	14	36.9	NT			Not over stocked, no treatment needed.
071305	16	16.1	NT			Recently treated.
071305	18	77.8	NT			Stand has been identified as an important connective corridor for marten. Per Forest Plan Standard 3215, canopy closure of at least 50 percent is to be maintained. Stand conditions indicate that commercial treatment would not maintain 50 percent canopy closure, no treatment needed (4A, 36% AMD)
071305	20	6.7	NT			Spruce cover type, marten corridor.
071305	21	31.5	NT			Spruce cover type, marten corridor.
071305	22	4.9	NT			Not over stocked, no treatment needed.
071305	23	6.7	NT			Not over stocked, no treatment needed.
071305	25	3.6	NT		AR	Aspen, low insect risk rating.
071306	2	18.1	NT			Grass cover type.
071306	10	32.6	NT			Stand has been identified as an important connective corridor for marten. Per Forest Plan Standard 3215, canopy closure of at least 50 percent is to be maintained. Stand conditions indicate that commercial treatment would not maintain 50 percent canopy closure, no treatment needed (4A, 34% AMD)
071306	11	62.9	NT			Spruce cover type, marten corridor.
071306	12	8.9	NT			Not over stocked, no treatment needed.
071306	13	18.1	NT			Not over stocked, no treatment needed.
071306	14	25.2	NT			Not over stocked, no treatment needed.

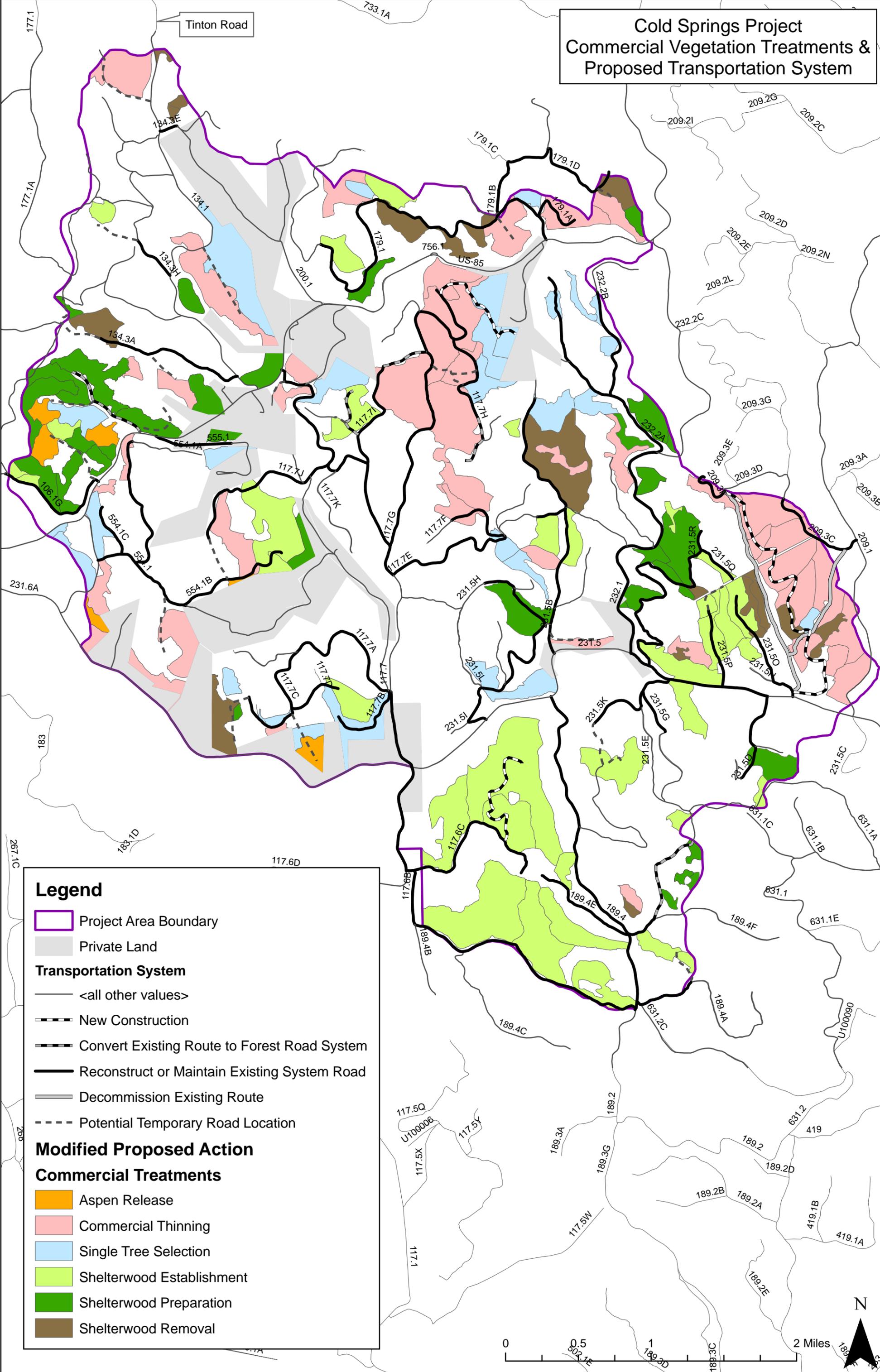
Partition	Poly_ID	Acres	Proposed ²	Fuels ³	Other ⁴	No Treatment Rationale
071306	15	39.5	NT			Spruce cover type, marten corridor.
071306	16	39.4	NT			Stand has been identified as an important connective corridor for marten and provides habitat for late-successional dependent species.
071306	17	34.0	NT			Not over stocked, no treatment needed.
071306	21	27.1	NT			Very steep, never treated. Approximately 8 acres of this stand is TES plant habitat.
071306	38	80.6	NT			Not over stocked, no treatment needed.
071306	39	43.6	NT			Steep, never treated, TES plant habitat, marten corridor.
071306	40	40.5	NT			Recently treated.
071306	41	83.5	NT			Very steep; never treated.
071306	42	127.4	NT		PCT	Recently treated.
071306	43	23.0	NT			Recently treated.
071306	44	94.9	NT			Recently treated.
071306	45	30.1	NT			Recently treated.
071306	46	20.2	NT			Not over stocked, no treatment needed.
071306	49	16.4	NT			Recently treated.
071306	56	10.2	NT			Stand has been identified as an important connective corridor for marten. Per Forest Plan Standard 3215, canopy closure of at least 50 percent is to be maintained. Stand conditions indicate that commercial treatment would not maintain 50 percent canopy closure, no treatment needed (4A, 22% AMD).
071306	58	47.0	NT			Spruce cover type, marten corridor.
071306	59	15.1	NT			Recently treated.
071306	60	8.5	NT			Grass cover type.
071306	61	13.7	NT			Grass cover type.
071306	70	8.3	NT			Spruce cover type, marten corridor.
071306	73	3.4	NT			Not over stocked, no treatment needed.
071306	74	29.3	NT			Very steep; never treated.
071306	76	9.2	NT			Not over stocked, no treatment needed.
071306	78	2.0	NT			Two acres, steep, rock ledges, inoperable.
071306	85	1.4	NT			Not over stocked, no treatment needed.
071308	7	7.0	NT			Spruce cover type, marten corridor.
071308	9	5.1	NT			Aspen, low insect risk rating.
071308	10	18.1	NT			Spruce cover type, marten corridor.
071308	20	27.4	NT			Aspen, low insect risk rating.
071308	21	11.2	NT			Spruce cover type, marten corridor.
071308	25	8.1	NT			Spruce cover type, marten corridor.
071308	29	30.2	NT			Not over stocked, no treatment needed.
071308	40	31.0	NT			Spruce cover type, marten corridor.

Partition	Poly_ID	Acres	Proposed²	Fuels³	Other⁴	No Treatment Rationale
071308	41	15.3	NT			Recently treated.
071308	42	75.6	NT			Not over stocked, no treatment needed.
071308	44	25.9	NT			Spruce cover type, marten corridor.
071308	45	15.2	NT		AR	Spruce cover type, marten corridor.
071308	59	5.6	NT			Spruce cover type, marten corridor.

Appendix F: Maps

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Cold Springs Project Commercial Vegetation Treatments & Proposed Transportation System

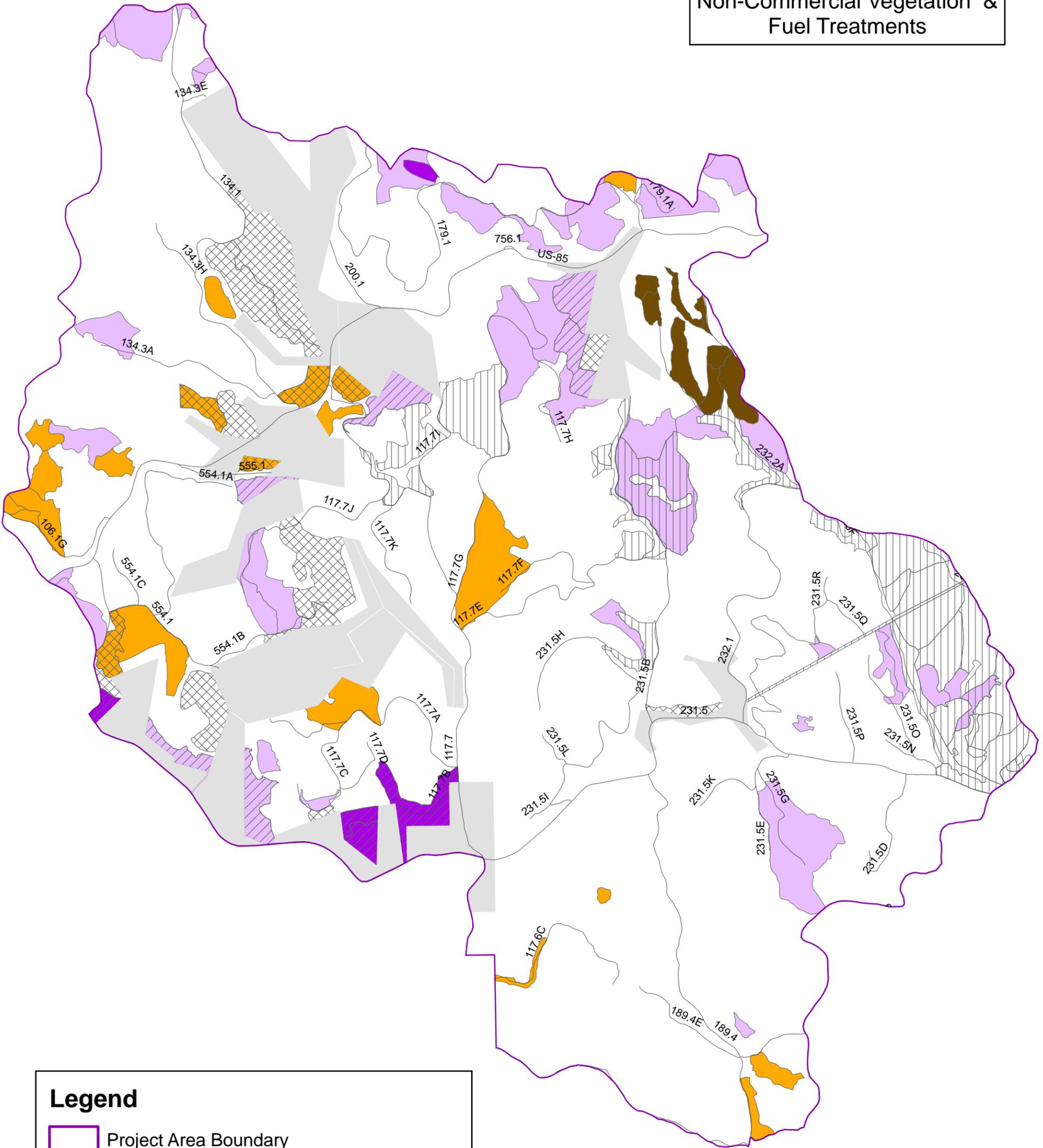


Legend

- Project Area Boundary
- Private Land
- Transportation System**
- <all other values>
- New Construction
- Convert Existing Route to Forest Road System
- Reconstruct or Maintain Existing System Road
- Decommission Existing Route
- Potential Temporary Road Location
- Modified Proposed Action**
- Commercial Treatments**
- Aspen Release
- Commercial Thinning
- Single Tree Selection
- Shelterwood Establishment
- Shelterwood Preparation
- Shelterwood Removal



Cold Springs Project
Non-Commercial Vegetation &
Fuel Treatments



Legend

-  Project Area Boundary
-  Private Land

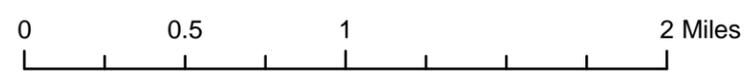
Modified Proposed Action

Non-Commercial Treatments

-  Aspen Release
-  Pre-Commercial Thinning
-  Pre-Commercial Thinning & Aspen Release
-  Wildlife Timber Stand Improvement

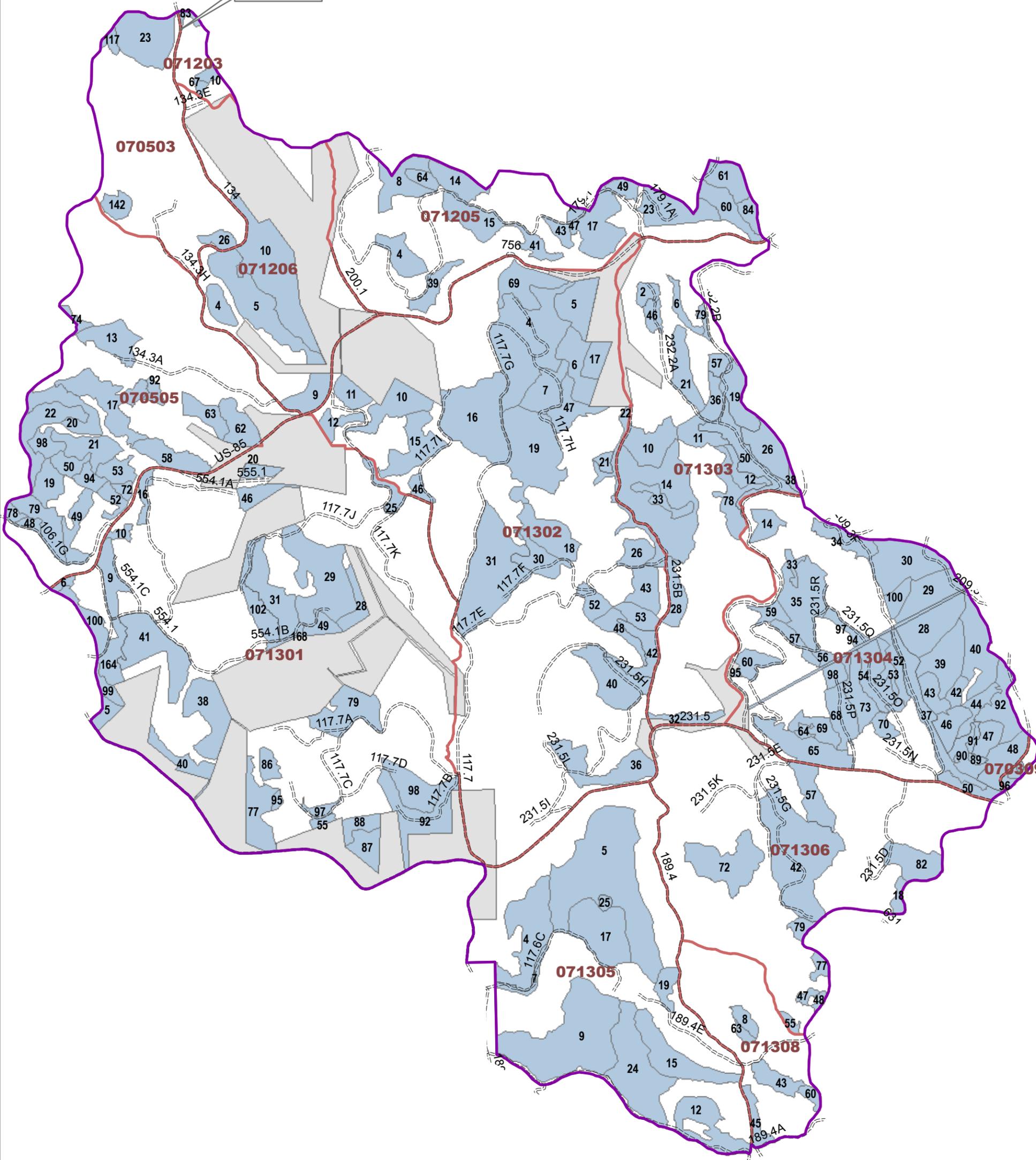
Fuel Treatments

-  Pile & Burn
-  Broadcast Burn
-  Slash, Pile, and Burn



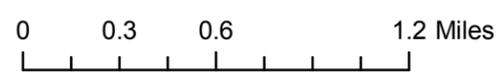
Cold Springs Project
Proposed Vegetation Treatments by
Partition and Poly ID

Tinton Road

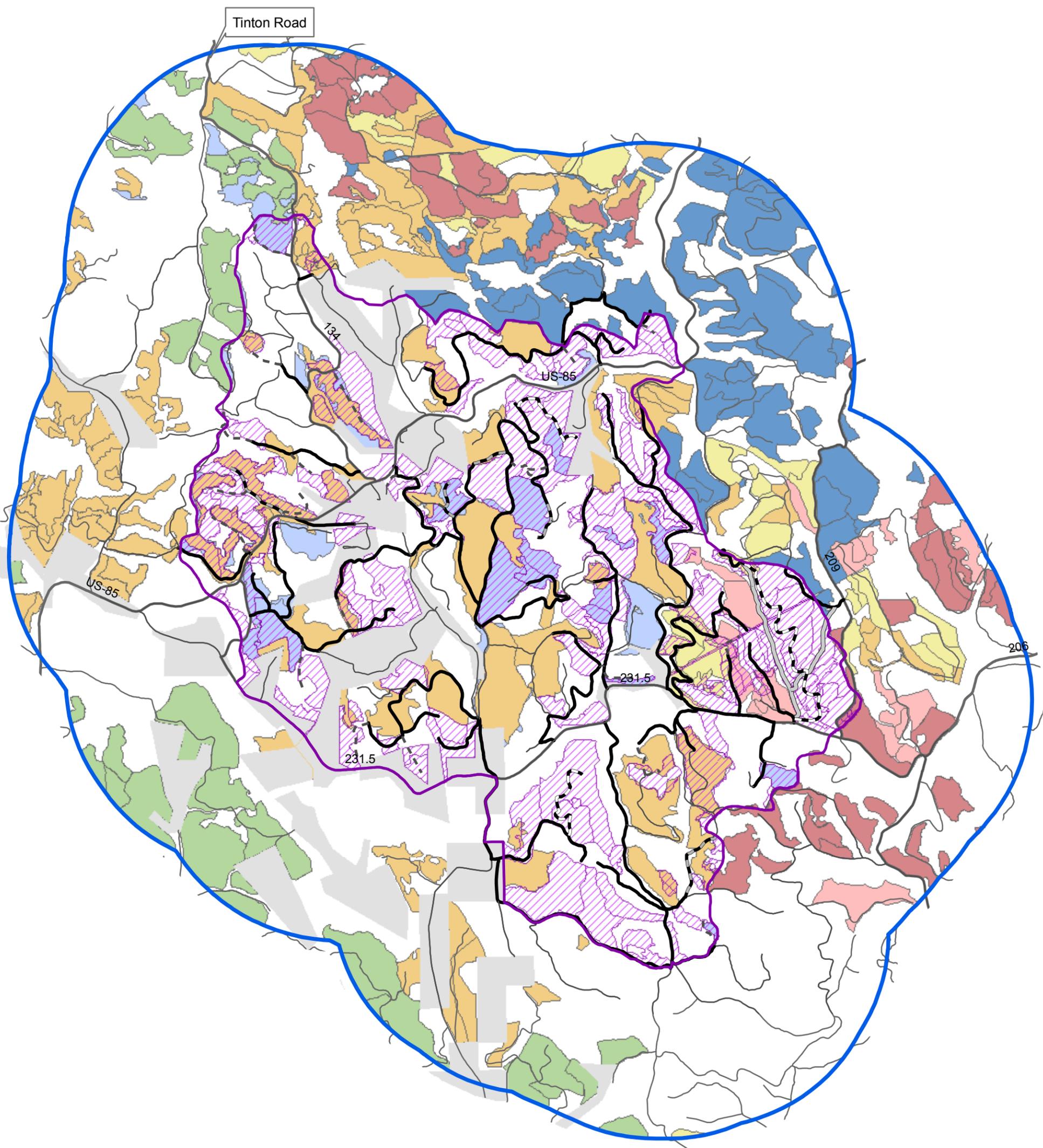


Legend

- Project Area Boundary
- Private Land
- Partition
- Modified Proposed Action with Poly ID

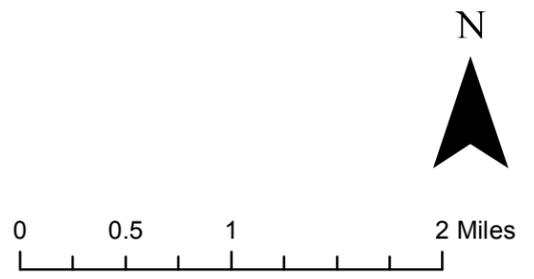


Cold Springs Project
Past and Planned
Commercial Timber Harvest

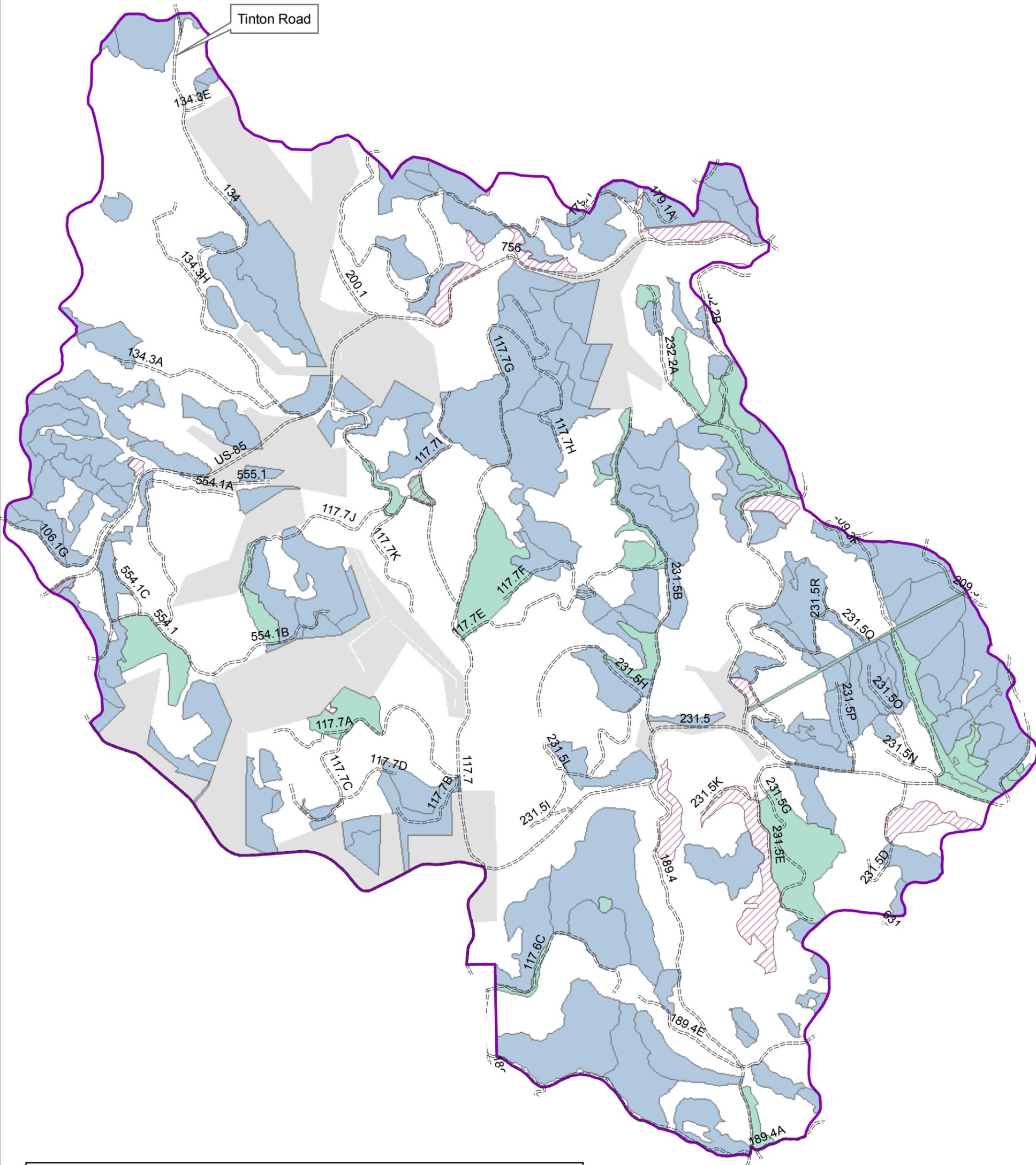


Legend

 Project Area Boundary	Planned Commercial Timber Harvest
 Cold Springs 1.5 Mile Buffer	Fiscal Year of Decision
 Private Land	 2005 - 2006
 Modified Proposed Action	 2007 - 2008
Transportation System	Accomplished Commercial Timber Harvest
 Other	Fiscal Year Accomplished
 New Construction	 2001 - 2002
 Convert Existing Route to Forest Road System	 2003 - 2004
 Reconstruct or Maintain Existing System Road	 2005 - 2006
 Decommission Existing Route	 2007 - 2008
 Potential Temporary Road Location	 2009 - 2011



Cold Springs Project
Proposed Vegetation Treatments &
Habitat Structure Stage 5



Legend

- Project Area Boundary
- Private Land
- Habitat Structure Stage 5
- Modified Proposed Action Commercial Treatments
- Modified Proposed Action Non-Commercial and Fuels Treatments

