

Rattlesnake II Vegetation Treatment Project
Predecisional Environmental Assessment

Shoshone National Forest
Wapiti Ranger District
Park County, Wyoming

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Lead Agency: USDA Forest Service

Responsible Official: Brent L. Larson, District Ranger
Shoshone National Forest
Wapiti Ranger District
203A Yellowstone Ave.
Cody, WY 82414-9313
307.527.6921

For Further Information: Marty Sharp, NEPA Coordinator (address/phone above)

This document is available on the Internet:

<http://www.fs.fed.us/r2/shoshone/forestmgmt/nepa/projectinfo.htm>

Abstract. This Environmental Assessment (EA) is a public document that will provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact. The proposed action is to harvest, in three units, approximately 133 acres of timber to increase vegetation diversity, reduce susceptibility to insects and disease, reestablish meadows, enhance aspen regeneration, and increase forage. There are three alternatives: Alternative 1 (no action), Alternative 2 (winter/spring operation), and Alternative 3 (summer operation). Proposed activities would occur in the Rattlesnake Creek drainage, approximately 15 miles west-northwest of Cody, Wyoming.

The due date for comments is April 5, 2002.

Reviewers should provide the Forest Service with their comments during the review period of the EA. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the Decision Notice, thus avoiding undue delay in the decision making process.

Comments received in response to this solicitation, including names and addresses of those who comment, will be considered part of the public record on this proposed action, and will be available for public inspection. Comments submitted anonymously will be accepted and considered; however, those who submit only anonymous comments will not have standing to appeal the subsequent decision under 36 CFR Part 215. Additionally, pursuant to 7 CFR 1.27 (d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The Forest Service will inform the requester of the agency's decision regarding the request for confidentiality, and where the request is denied, the agency will return the submission and notify the requester that the comments may be resubmitted with or without name and address within 10 days.

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Chapter 1 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction and Project Location

The Shoshone National Forest (SNF) is initiating this proposal as part of Land and Resource Management Plan (Forest Plan) implementation. This environmental assessment (EA) discloses the environmental consequences of implementing a vegetative treatment project using timber harvest to move vegetation, wildlife habitat, and long-term forest health and diversity toward the desired future condition. The project is known as the Rattlesnake II Vegetation Treatment Project. This is not a decision document. The responsible official will document his or her decision in a separate Decision Notice.

This environmental analysis (EA) is tiered to the following documents.

The 1986 Land and Resource Management Plan for the Shoshone National Forest.

- The Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for the Shoshone National Forest Plan (USDA Forest Service 1986). The Plan prescribes standards and guidelines, which form the basis for how projects are to be implemented to meet the management emphasis for an area, and to mitigate associated impacts.
- The Plan (as amended) recalculates the allowable sale quantity (ASQ) for timber in the 1994 Allowable Sale Quantity FEIS.
- Oil and Gas Leasing EIS and Record of Decision (ROD 1995).

Tiering is in accordance with CEQ regulations (40 CFR 1502.20 and 1508.28), which allow the responsible official to focus on site-specific issues that are within the scope of a broader plan, program, or analysis that is already approved. All documents are incorporated by reference in this document, and can be reviewed upon request at the District or Supervisor's Office in Cody, Wyoming.

Documented analyses in the Forest Plan FEIS have been referenced rather than repeated as much as possible. Chapter III of the Forest Plan contains general direction and standards and guides for project implementation. The SNF Forest Plan is implemented under requirements of the Forest and Renewable Resource Planning Act of 1974 (RPA, P.L. 93-378) and the National Forest Management Act of 1976 (NFMA, P.L. 94-588).

Detailed information that supports the analyses presented in this document is contained in the project file located at the Wapiti Range District Office, 203A Yellowstone Ave., Cody, WY 82414.

1.2 Location

The project area is located in the Rattlesnake Creek drainage, a tributary to the North Fork of the Shoshone River, approximately 15 miles west-northwest of Cody in northwest Wyoming (*see* Figure 1). The project is located on the SNF in the Wapiti Ranger District. Access is by Forest Service Road Number 402, which crosses private land to reach the project site. The legal description of the project area is portions of Sections 28, 29, 32, and 33, T54N, R104W, 6th PM, Park County.

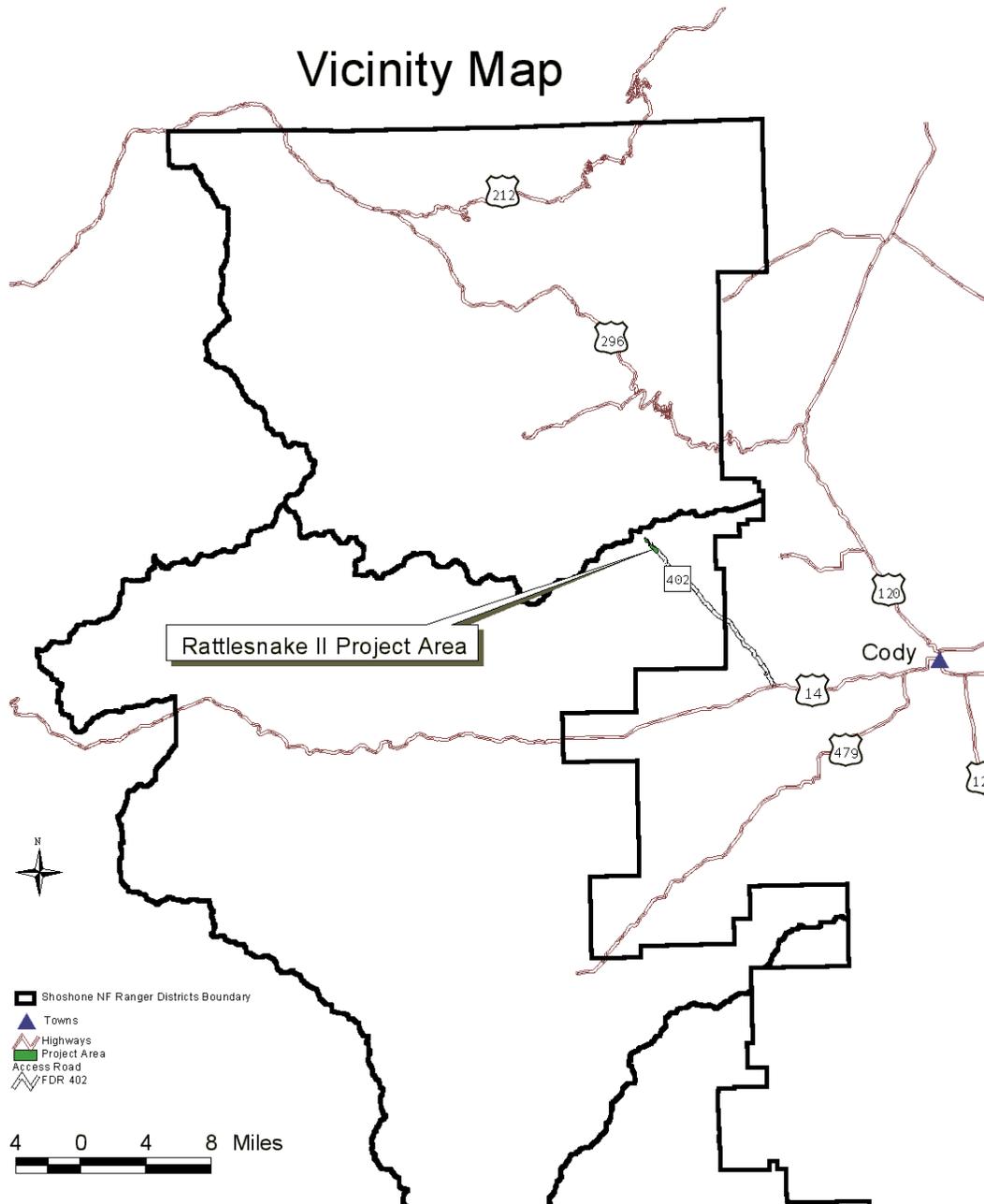


Figure 1

The Rattlesnake II Vegetation Manipulation Project is located approximately 15 miles west-northwest of Cody, WY.

The effects analysis area for the majority of the resource analysis is from where Rattlesnake Creek first flows onto private property upstream to the watershed divide. This area, which is the headwaters for Rattlesnake Creek, consists of 2,604 acres or 10.5% of the entire Rattlesnake Creek watershed. The project area is 133 acres of National Forest System lands (5% of the analysis area); only 80 acres (3% of the analysis area) are targeted for treatment¹. For aquatic biological resources, the entire Rattlesnake Creek watershed (24,964 acres), of which the 133-acre project area is 0.5%, is used as the effects analysis area.

1.3 Management Areas

The Rattlesnake Creek II proposed action occurs within the 3A management area (MA), which emphasizes semi-primitive, non-motorized recreation. Also, MA 4D where the management emphasis is on aspen management (page III-153) and MA 9A is on riparian management (page III-207) apply.

Forest Plan direction for MA 3A is (page III-132):

“Management emphasis is for semiprimitive nonmotorized [sic] recreation in both roaded and unroaded areas. Recreation opportunities such as hiking, horseback riding, hunting, cross-country skiing, etc. are available. Seasonal or permanent restrictions on human use may be applied to provide seclusion for wildlife such as nesting for raptorial birds, big game rearing areas, and mammals (mountain lion, wolverine, etc. with large home ranges). Visual resources are managed so that management activities are not visually evident or remain visually subordinate.

Investments in compatible resource uses such as livestock grazing, mineral exploration and development, etc., occur, but roads are closed to public use. Commercial and noncommercial tree harvest occurs. The harvest method by forest cover type is clearcutting in aspen and lodgepole pine; shelterwood in lodgepole pine, Englemann spruce-subalpine fir and mixed conifers; and selection in all-age stands of Englemann spruce-subalpine fir.”

Forest Plan direction for MA 4D states:

“Management emphasis is on maintaining and improving aspen sites. Other tree species, if present, are de-emphasized. Aspen is managed to produce wildlife habitat, wood products, visual quality, and plant and animal diversity. On larger areas, a variety of aspen stand ages, sizes, shapes and interspersion are maintained. Both commercial and noncommercial treatments are applied. Even-aged management is practiced and is achieved by clearcutting. Diversity objectives are achieved by varying the size, age, shape and interspersion of individual stands. Management activities in foreground and middleground are dominant, but harmonize and blend with the natural setting. Individual treatments generally are smaller than 40 acres. Livestock grazing can occur, but is subordinate to wildlife needs and required protection of young aspen needed for regeneration.”

Forest Plan direction for MA 9A states:

“Emphasis is on the management of all of the component ecosystems of riparian areas. These components include the aquatic ecosystem, the riparian ecosystem (characterized by distinct vegetation), and adjacent ecosystems that remain within approximately 100 feet measured horizontally from both edges of all perennial streams and from the shores of lakes and other still water bodies. All of the components are managed together as a land unit comprising an integrated riparian area, and not as separate components.

¹ Treatment acreage amounts are \pm 10%.

The goals of management are to provide healthy, self-perpetuating plant communities, meet water quality standards, provide habitats for viable populations of wildlife and fish, and provide stable stream channels and still water body shorelines. The aquatic ecosystem may contain fisheries habitat improvement and channel stabilization facilities that harmonize with the visual setting and maintain or improve wildlife or fish habitat requirements. The linear nature of streamside riparian areas permits programming of management activities, which are not visually evident or are visually subordinate. Forest riparian ecosystems are treated to improve wildlife and fish habitat diversity through specified silvicultural objectives. Both commercial and noncommercial vegetation treatments are used to achieve multi-resource benefits. Clearcutting is used to regenerate aspen clones. Other forest cover types are treated with either small group or single tree selection methods.

Livestock grazing is a level that will assure maintenance of the vigor and regenerative capacity of the riparian plant communities. Vehicular travel is limited on roads and trails at times when the ecosystems would be unacceptably damaged. Developed recreation facility construction for overnight use is prohibited with the 100-year floodplain.

The management area over which this prescription is to be applied will also be affected by several management activities in the forest-wide direction. Most notable is the direction involving upland zones, in the water resource improvement and maintenance management activity, and elsewhere.”

The ID team reviewed the management area designations and found them appropriate.

1.4 The Purpose of and Need for Action

The proposed action is based on a comparison of desired conditions, as outlined in the Forest Plan, and existing conditions. This section reviews these site-specific comparisons and defines the purpose and need for action in the project area.

1.4.1 Forest Plan Direction vs. Existing Conditions

Forest Plan Direction. *Maintain and improve aspen sites (page III-153).*

Improve tree age class and species diversity to benefit forest health, recreation experiences, visual quality, and wildlife habitat (page III-8).

Maintain or improve the quality of habitat in winter range on the Forest (page III-8).

Existing Condition. Due to succession and lack of disturbances like fire and vegetative treatment the project area is now dominated by Douglas-fir stands. A key component for wildlife habitat and diversity, aspen has declined over the decades due to development of denser, taller and older conifer overstories. In the project area, aspen has declined to sparse, scattered clones and on many sites it has disappeared altogether. A number of small shrub/grass/forbs communities occur as small meadows in the project area. These have been altered by conifer succession, resulting in a decrease in cover and a change in function (from grazing habitat providing big game forage to young conifer forest). There is a small amount of lodgepole pine intermixed in the area. In mixed conifer stands, Douglas-fir trees will continue to dominate with the potential for lodgepole pine to continue to decline and eventually disappear. A minor component of Englemann spruce/subalpine fir exists in scattered locations.

Opportunity. An opportunity exists to enhance the occurrence of aspen/shrub habitat in this area by removing conifer succession in and around remnant aspen patches to allow existing aspen suckers to develop and dominate the site, increasing diversity. An opportunity also exists to improve forage production; the assumption is that aspen, shrub, forbs, and grass

species in the area would respond favorably to harvest activities by resprouting and regeneration resulting in increased diversity and higher quality and quantity big game forage.

An opportunity exists to treat the conifer stands to favor the lodgepole pine so that the stands can be maintained into the future for increased vegetative diversity. This will include the release of existing, desirable lodgepole pine or the encouragement of lodgepole pine regeneration. To promote regeneration, some soil scarification may need to take place, especially in the dryer, southern aspects.

Forest Plan Direction. *Implement an integrated pest management program to prevent and control insect infestations and disease (page III-8).*

Improve the health and vigor of vegetation types outside wilderness and selected types in wilderness where necessary (page III-6).

Reduce damages by insect, disease, and other Forest pests to acceptable levels through integrated management of vegetation (page III-10).

Reduce the accumulation of natural fuels (page III-8).

Existing Condition. Large, older Douglas-fir stands are the prime target for beetle infestation because of their size and age. There is potential for insect mortality in forested stands due to host specific insect infestation in adjacent stands.

Opportunity. An opportunity exists to treat some of the older, larger conifers (primarily Douglas-fir) to create a mosaic pattern of stands with varying age classes; such a mosaic would improve overall forest health and resiliency. A mosaic pattern of various age classes avoids the situation where the entire project area is susceptible to insect infestation at the same time. In addition, healthier stands would result in lower natural fuel levels.

Forest Plan Direction. *Manage the timber resources on lands suitable for timber management to provide sawtimber, roundwood, and firewood to meet resource management objectives (page III-8).*

Existing Condition. Commercial timber types within the identified suited timber base as well as outside the suited timber are present. They are at risk due to the insect and disease infestation and will lose economic value over time.

Opportunity. In the process of treating stands to meet other resource objectives there exists the opportunity to provide varied wood products for local economic benefits before merchantable timber value is lost. If timber is infested by insects and allowed to remain in place, it declines in quality every year to the point it is no longer merchantable.

Forest Plan Direction. *Develop a transportation system that meets land and resource management needs at lowest cost and least disturbance to the environment (III-10).*

Implement travel management practices, including both seasonal and permanent closures, to protect road and trail investment (III-10).

Manage motorized travel on roads, trails and snow to protect land and resource values at lowest cost and with minimum of regulations (III-10).

Existing Condition. Road 402 has three unarmored stream crossings and a need to improve the grade and drainage in several locations. The road is not closed as identified in the Forest Plan 3A management direction.

Opportunity. As part of project implementation, 2000-2500 feet of Road 402 would be relocated to improve grade and drainage concerns and the three fords would be armored to

improve watershed conditions. Road 402 could be closed to public access to meet management area direction.

1.4.2 Purpose and Need

Based on review of the site-specific conditions and needs described above, the decision maker has chosen to address the following project goals in management of this area.

- Manage Douglas-fir stands and increase other conifer species and aspen to restore diverse wildlife habitat while providing more insect and disease resistance and ecologically sustainable forest structures.
- Manage disturbance dependent plant communities, such as aspen/shrub habitats, to maintain and enhance their occurrence in this landscape and improve vegetation diversity where it is being changed by conifer succession.
- Provide wood products to facilitate vegetation management goals while providing wood products, jobs, and local economic stability.
- Provide appropriate road and access management to the project area.
- Other Forest Plan goals and objectives such as those associated with water quality and heritage resources would be met through the implementation of standards and guidelines.

1.5 Proposed Action

A proposed action is defined early in the project-level planning process. This serves as a starting point for the ID Team, and gives the public and other agencies specific information on which to focus comments. Using these comments (*see* discussion of Issues later in this chapter), and information from preliminary analysis, the ID Team then identifies significant issues and develops alternatives to the proposed action. The proposed action and alternatives are discussed in detail in Chapter 2.

Within the 133-acre project area, approximately 80 acres would be harvested. This harvest would produce 300-450 thousand board feet (MBF) of timber. The 80 acres would be treated with shelterwood, selection and aspen regeneration clearcuts to increase vegetation diversity and reduce conifer stands susceptibility to insect and disease infestation. Unit A (approximately 34 acres) would be treated for release/regeneration of lodgepole pine and removal of large diameter Douglas-fir that are most susceptible to insect and disease infestation. Unit B is 89 acres; approximately 46 acres would be treated to re-establish meadows being lost to encroachment, enhance aspen regeneration through conifer removal, and restore a park-like Douglas-fir stand to increase forage available for wildlife. An approximate ten-acre unit (Unit C) would be treated through timber harvest for conifer encroachment/aspen regeneration, when adequate snow depth or frozen ground conditions are present.

Geographical Information Systems and other data and product accuracy may vary; therefore, the acreages used in the description of the proposed action and the alternatives may vary by +/- 10% and this possible variance in acreage was considered in the effects analysis.

Direct Actions. Project activities associated with this proposed action include:

Design and implement appropriate harvest and treatment methods during the specified season for insect and disease prevention (primarily the vulnerable older Douglas-fir) to enhance forest health. An emphasis would be given to areas where there would be improved diversity in structure, species, and age classes.

Mechanically removing conifers to:

- Promote suckering and revegetation of aspen patches.

- Increase species diversity, primarily by releasing existing, desirable lodgepole pine and regenerating lodgepole pine, to enhance habitat diversity for associated wildlife species.
- Enlarge small meadows within timbered areas to enhance forage production as well as to maintain the integrity of the meadow type.
- Favor shrub and deciduous species within riparian areas as a means of increasing diversity as well as enhancing the buffering function.

Road 402 would be physically closed with a locked gate on National Forest System land at the north end of the private land inholding (T54N, R104w, Sec. 33). The road would be closed to general public use. Motorized administrative use is allowed, as long-term access and the presence of the road is needed for timber and forest health issues such as insect and disease, motorized access for fuels reduction, prescribed burning and fire suppression, range administration and range project maintenance, wildlife and other multiple uses in the area.

The road would be maintained to standard. There would be no net increase in roads (Forest Plan amendment based upon the Oil and Gas Leasing EIS/ROD). Road closure and restrictions would be implemented as described above. The project would involve reconstruction of 2000-2500 feet of road to improve grade and drainage. Unarmored fords would be eliminated, as each of the three stream crossing fords would be armored as part of the project design and implementation. Consultation with the Forest engineer would be required.

Mechanically pile and burn or jackpot burn slash on the treated acres in the late fall or winter.

Connected Actions. Project activities connected with the proposed action include:

Per project design/mitigation measures, closely manage grazing by commercial livestock in treated aspen stands until regeneration is six feet tall. Where there has been manipulation to induce aspen regeneration, do not allow aspen seedlings to be grazed by livestock more than one out of three years (page III-155). Additional measures include: 1) If overuse of aspen regeneration by livestock becomes a problem, treated areas would be fenced following sale closure. 2) Following post-sale monitoring, regeneration of aspens by cutting of mature stems would be implemented if the desired release of aspens were not realized.

Grazing permittees, special-use permit holders, and other agency personnel would need to obtain an authorization from the Forest Supervisor (III-89) for motorized access on FSR 402 where it is located on the Forest. Access permission off-Forest would be a continuation of the existing situation, that is, permission is needed from the landowner, as no public right-of-way exists.

The abandoned portion of the road resulting from relocation would have the surface ripped to reduce compaction.

1.6 Issues

1.6.1 Public Involvement

Scoping was conducted to identify the issues and seek input relevant to this proposal. On April 13, 2001, a scoping letter describing the project proposal was sent to over 200 individuals, groups, private landowners, organizations, and Indian tribes to notify them of the proposal and that we would appreciate their views. The U.S. Fish and Wildlife Service and Wyoming Game and Fish received a copy of the scoping and were asked to provide comments. Comments were carefully considered and the results of scoping are documented in the project file.

Results of the scoping were that 12 letters, inquiries, phone calls, or e-mails were received. Comments were supportive of the proposal. The *Cody Enterprise* wrote an article in response to

the scoping statement. The correspondence is retained in the project file, along with a listing of names and addresses. All comments received through scoping and the public involvement processes were used in developing the issues and alternatives, which directed the analysis process. An ID Team of resource specialists provided input and reviewed the project proposal and participated in issue identification and alternative formulation.

Comments from the scoping can be summarized as these preliminary, general issues/concerns:

- Consider the presence of crucial winter/yearlong range for elk (Clark's Fork herd) and deer (Upper Shoshone herd) and road/access management
- Consider the presence of prescribed burns and timber harvest in adjacent stands in the drainage (cumulative actions)
- Consider spring grizzly bear use in the area and workers-in-grizzly-habitat stipulation
- Rest treated areas from livestock in project treatment areas
- Manage cultural resources in accordance with Section 106 of the National Historic Preservation Act and Advisory Council Regulations 36 CFR Part 800.

In the scoping notice for this project an effort was made to elicit specific comments, additional information and concerns, in accordance with NEPA regulations (40 CFR 1500.4[I]) to facilitate the determination of significant issues. The entire body of comment was scrutinized to determine the "significant environmental issues deserving of study" relative to the proposed actions, and to "de-emphasize insignificant issues" (40 CFR 1500.4[g]). The purpose of this determination is to sharply define the issues and present a clear basis of choice for the decision maker. Significant issues are those that provide a basis for alternatives to the proposed action.

Comments identified during scoping were evaluated against the following criteria to determine whether the concern would be a significant issue in the analysis process.

- Has the concern been addressed in a previous site-specific analysis, such as in a previous Environmental Impact Statement or through legislative action?
- Is the concern relevant to and within the scope of the decision being made and does it pertain directly to the proposed action?
- Can the concern be resolved through mitigation (avoiding, minimizing, rectifying, reducing or eliminating, or compensating for the proposed impact) in one or more of the alternatives?
- Can the issue be resolved through project design in one or more of the alternatives?

1.6.2 Significant Issues

Based on the evaluation of preliminary issues by the ID Team, the following issue was identified as requiring alternative development in addition to the proposed action. Issues are points of unanswered questions or unresolved conflict(s) with the proposed action identified during scoping efforts.

Issue 1 – Project Timing. Consider timing the project to reduce grizzly/human conflicts, limit disturbance of habitat during critical wildlife periods, and limit conflicts/coordination concerns with access through private property. The rationale for considering timing as a significant issue is that the project could be implemented during different seasons. This clearly led to the formulation of alternatives and the analysis of trade-offs associated with the contrasting alternatives. Concerns

over spring grizzly bear use, elk calving, and wet spring conditions were considered by the ID Team and in the analysis.

The alternatives will include project design criteria to minimize resource concerns and restrictions for access/road management to address concerns regarding crucial winter range for elk and deer and spring grizzly bear use. A workers-in-grizzly-habitat stipulation is incorporated as a project design criteria.

1.6.3 Other Issues and Concerns

In addition to the issue described above, public and internal scoping identified other concerns or potential issues. These concerns and issues were deemed important considerations in project design and analysis, but the ID Team concluded they were either were not present, not affected, outside the scope of analysis or would not require additional alternative development. They are discussed in the document because there was public or agency interest in the resource, but in lesser detail than the significant issue. The level of detail is commensurate with the amount of information necessary to understand the effects of the action(s). Specific project design criteria are identified to address forest health, heritage resources, watershed (soil and water), roadless areas, and grazing/regeneration concerns.

Heritage Resources. The rationale for not considering Heritage Resources as a significant issue is that the project would be implemented according to project design criteria and in compliance with applicable laws, thus adequately addressing impacts or concerns that would raise heritage resources to the level of a major issue.

Watershed Impacts. The rationale for not considering soil, water, and fisheries as a significant issue is that the project will include design criteria that have been proven to conserve these resources. References include:

- Mandatory Best Management Practices (BMPs) found at 33 CFR 323.4²
- State of Wyoming Best Management Practices for Silviculture³
- Soil and water conservation practices in Forest Service Handbook 2509.25
- Standards and guidelines in the Shoshone National Forest Land and Resource Management Plan (page III-70-73)

Inventoried Roadless Area. The rationale for not considering roadless areas and designated wilderness as a major issue is that the project would not enter any roadless area or designated wilderness, thus any impact or concern does not exist.

² 33 CFR 323.4 BMPs may be viewed at <http://www.nwo.usace.army.mil/html/od-rwy/33CFR323.htm#323.4>

³ Silviculture BMPs may be viewed in pdf format at <http://deq.state.wy.us/wqd/watershed/00413-doc.pdf>

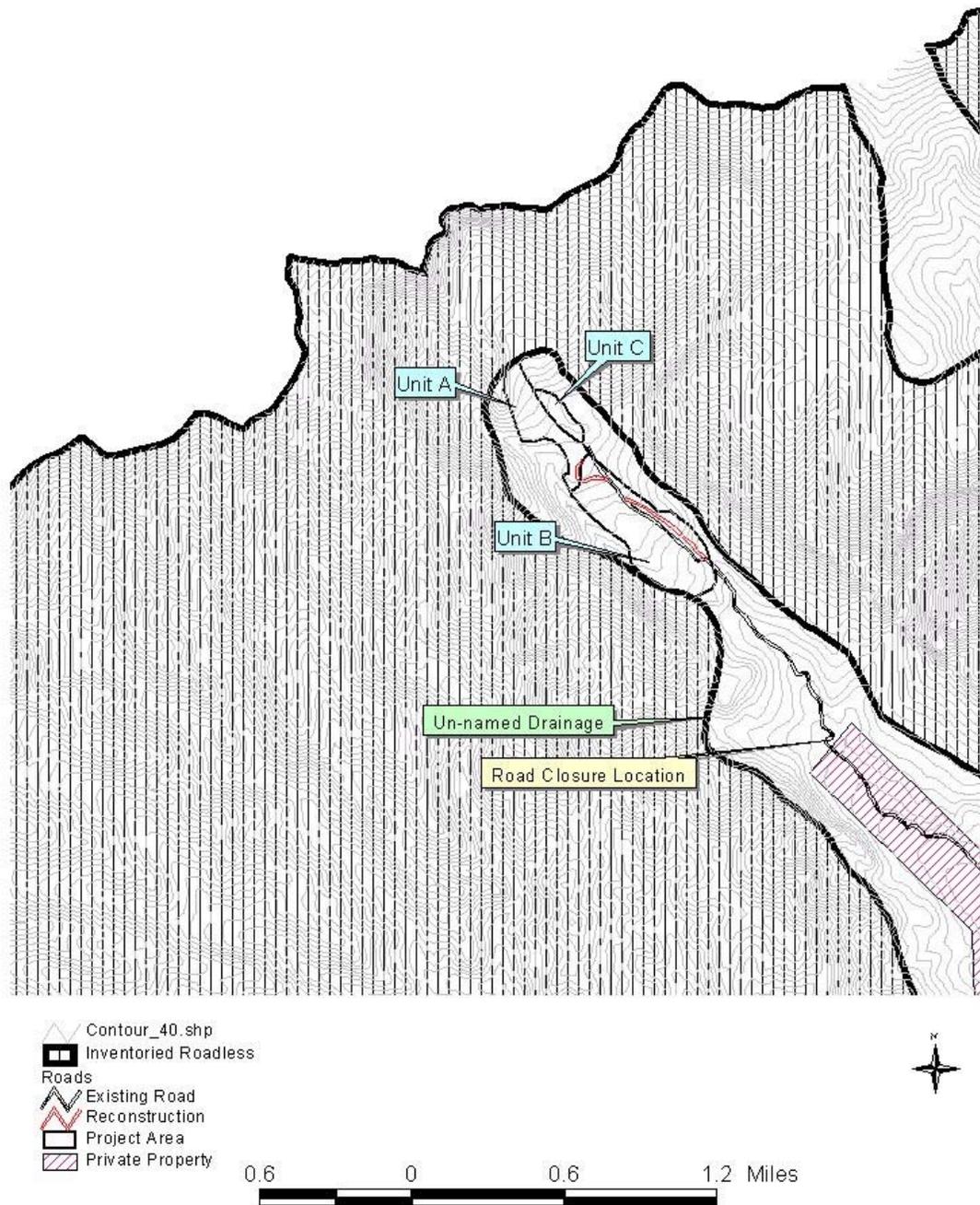


Figure 2
Inventoried roadless areas in relation to the project area.

Protection of Deciduous Species Regeneration from Livestock Grazing. The rationale for not considering commercial livestock grazing as a significant issue is that the project would be implemented according to project design criteria and standards and guidelines in the Forest Plan. General direction and standards and guidelines for range resource management in terms of aspen require:

- Forest Plan Direction: Closely manage grazing by domestic stock in treated aspen stands until regeneration is six feet tall (page III-153, 155).
- Standards and Guidelines: Where there has been manipulation to induce aspen regeneration, do not allow aspen seedlings to be grazed by livestock more than one out of three years (page III-153, 155).

Commercial livestock grazing is discussed in the document; grazing by wild ungulates will be discussed in Chapter 3.

Socio-economics. The rationale for not considering socio-economics as a significant issue is that the social and economic concerns relative to the project are typical of general trends occurring in much of the western United States. Issues revolving around access, private lands and ownership rights, regulation, resource impacts, multiple use, growth and development, economic dependency, county and local jurisdiction, and others could enter the discussion. However, any resolution of these issues is beyond the scope of the analysis for a single, small timber sale. Locally, support for this project was identified during scoping.

The scale of this project is such that there would be no measurable impact on social or economic systems in Park County, Wyoming. The discussion of economic and social effects is tiered to the Forest Plan, as amended by the Allowable Sale Quantity EIS and Record of Decision (ROD).

Vegetation/Forest Health. The rationale for not considering forest health and vegetation diversity as a significant issue is that the proposed action and alternatives address the concerns and no points of unresolved conflict (significant issues) were identified.

Visual Resources. The rationale for not considering visual resources as a significant issue is that the project would be implemented according to project design criteria (Appendix C) and standards and guidelines in the Forest Plan for MA 3A (pages III-132, 133) and 4D (pages III-153). Primarily, this would include direction to manage activities so that they are not visually evident or remain visually subordinate. Management activities in the foreground and middle ground are dominant, but remain harmonic and blend with the natural setting. Individual treatments are smaller than 40 acres.

1.7 Decision To Be Made

An EA is not a decision document. The purpose of this document is to disclose the effects and consequences of the proposed action and alternative and to solicit public input. The responsible line officer will make a decision based on consideration of the purpose and need for the project, the effects of the alternatives, and public involvement.

The Responsible Official, District Ranger Brent Larson, must decide whether or not to implement the proposed action, alternatives to the proposed action, or the no action alternative. The decision will be documented in a Decision Notice that will be issued no sooner than 30 days after the EA is distributed for public review and comment. Decisions to be made for this project are:

- Whether to implement a vegetation manipulation project as proposed or modified in the Rattlesnake II project area at this time. If so, where?
- Should road system management be implemented on the identified portion of FSR 402?

- Whether to prepare an Environmental Impact Statement.

1.8 Regulatory Requirements and Other Environmental Documents

Applicable plans and decisions of other agencies were reviewed and considered in respect to the proposed action (Grizzly Bear Recovery Plan, Lynx Conservation Strategy, etc). No known permits from other agencies are required for the proposed action. The coordination and consultation section is found in Appendix B.

Any treatment of noxious weeds is already covered under the existing SNF Noxious Weed Treatment Plan/EA.

The Forest Service's primary statutory duties, authorities, and legal requirements/responsibilities that relate to this proposal are summarized below.

1.8.1 Watershed Conservation

Forest Service watershed conservation is based on law that sets a consistent land-and-water stewardship vision. These laws direct Forest Service actions to protect watersheds through sound management. Representative laws particular to the proposed action are the Organic Administration Act of 1897, the Multiple Use-Sustained Yield Act of 1960, the Endangered Species Act of 1973, the National Forest Management Act of 1976, the Federal Land Policy and Management Act of 1976, and the Clean Water Act of 1977.

In particular, the Clean Water Act mandates the Forest Service to comply with water quality laws and rules, and control non-point source pollution. To that end, the Shoshone National Forest incorporates design criteria and monitoring into its timber sales. References include:

- Mandatory Best Management Practices (BMPs) found at 33 CFR 323.4
- State of Wyoming Best Management Practices for Silviculture
- Soil and water conservation practices in Forest Service Handbook 2509.25
- Standards and guidelines in the Shoshone National Forest Land and Resource Management Plan

1.8.2 National Forest Management Act (NFMA)

This EA and proposed action are tiered to the 36 Code of Federal Regulations (CFR) for National Forest Management Act (NFMA) consistency. All management prescriptions for resource protection shall be consistent with the relative resource values involved, minimize serious or long-lasting hazards from flood, wind, wildfire, erosion, or other natural physical forces unless these are specifically excepted, as in wilderness (36 CFR 219.27).

The proposed action and action alternatives were developed to move towards desired conditions for the initial treatment in the analysis area, as directed in the Forest Plan, while pursuing project goals and objectives. The proposed action and action alternatives would employ design features and mitigation measures to keep sediment and other resource impacts from activities to a minimum.

NFMA implementing regulations at 36 CFR 219.27 (C)(1) establish exceptions for harvest of timber from unsuitable lands. All recovery of forest products proposed in this analysis (from unsuitable lands) is designed to meet resource objectives (wildlife habitat, diversity, forage) other than timber production, and is therefore consistent with NFMA established exceptions.

Lands classified as suitable for timber production will be scheduled for one, three and (if necessary) five-year regeneration surveys to assure meeting the five-year NFMA standard for regeneration. Where even-aged vegetation management is used (i.e. clearcut or shelterwood) to treat vegetation, after the final cut regeneration surveys would be scheduled for the first, third, and fifth year.

NFMA Findings. The National Forest Management Act and implementing regulations require specific findings to be made when implementing the Forest Plan. In deciding on proposed management, the following findings must be made and documented.

Vegetation Manipulation-Provision to alter vegetation [Section 6 (g)(3)(F)(i)]. The proposed vegetation management (timber harvest) complies with this requirement and would occur on lands identified in the Shoshone Forest Plan as both suitable and unsuitable for timber production. If the units respond to treatment as prescribed, there would be no need to plant trees.

Silvicultural Practices-Provision Pertaining to Silvicultural Practices [Section 6 (g)(3)(F)(i)]. Silvicultural practices are part of the project and commercial timber harvest would occur. Timber harvest, even-aged logging practices and timber harvest transportation systems are part of the purpose and need for this project. NFMA requires that “for clearcutting, it is determined to be the optimum method. . . .to meet the objectives and requirements of the relevant land management plan.” Clearcutting is generally considered the primary option for harvest and regenerating aspen in the Rocky Mountain Region and is consistent with the direction in the Shoshone Forest Plan, which specifies clearcutting for aspen in management areas 3A, management areas 4D and management areas 9A.

Clearcutting aspen in the Rattlesnake II area would effectively address a number of concerns, while meeting project goals and Forest Plan direction. It is anticipated to yield the greatest number of seedlings per acre following harvest, maximize growth and vigor of aspen in the new stand, and set back conifer-succession processes that could eventually lead to a loss of aspen in this area. This is based on experience with other aspen stands in similar areas treated in this manner on the Shoshone National Forest. In addition, by removing diseased aspen trees, the potential for diseased aspen or defective growing stock to develop in the new area would be minimized.

Forest Plan Consistency. The Shoshone National Forest Plan, FEIS, and Record of Decision have been referenced in this EA and Forest Plan direction tiered to by specific page numbers. NFMA and NEPA provide general land management and environmental analysis direction and were followed in EA preparation.

Resource Protection, Riparian Areas, Soil and Water, and Diversity. The project was developed with resource protection in mind to minimize effects on water quality, wildlife and fish habitat, regeneration of desired tree species, forage production, recreation uses, aesthetic values, and other resource yields. Forest Plan objectives and standards, together with resource mitigation measures and project design, provide guidance to achieve desired effects of maintaining or enhancing resources. This resource protection and environmental analysis is integrated throughout the EA document and would be carried forth into contract provisions and project implementation on the ground.

1.8.3 Heritage Resources Regulatory Framework

The following laws and regulations direct the management of heritage resources on the National Forest System: The National Historic Preservation Act, The Antiquities Act, The Archaeological Resources Protection Act, The Native American Graves Protection and Repatriation Act, and the American Indian Religious Freedom Act.

National Historic Preservation Act. The Wyoming State Historic Preservation Office (SHPO) has been notified of the project and the required coordination with the SHPO was completed. A Class III (100%) cultural resource inventory of all areas proposed for ground disturbing activities was completed, as well as the cultural resource documentation called for in 36 CFR Part 800. A concurrence letter from the SHPO is located in the project file. The Forest would comply with all aspects of the National Historic Preservation Act and should an action alternative be selected, any sites found during implementation would be protected and SHPO consulted.

Tribal Consultation. One letter was received from the Nez Perce Tribe, Director of Cultural Resource Program, requesting that a cultural resource and historic survey of project areas be completed to identify any potential effects. A second letter was received from the Crow Tribal Council that stressed their desire to be consulted about any development or disturbance and requesting that sacred sites be protected and preserved.

1.8.4 Endangered Species Act and Sensitive Species

If necessary, a biological assessment (BA) addressing potential effects on all proposed and listed species with known or potential habitat within the project area, and a biological evaluation (BE) for sensitive species will be completed.

1.8.5 Environmental Justice

Presidential Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was issued in February 1994. This directed federal agencies to consider, as part of the NEPA analysis process, how their proposed actions or projects might affect human health and environmental conditions on minority and/or low-income communities.

Two fundamental questions are posed by the CEQ (Council of Environmental Quality) to help agencies address these and related factors: 1) “Does the potentially affected community include minority and/or low-income populations?” and, 2) “Are the environmental impacts likely to fall disproportionately on minority and/or low-income members of the community and/or tribal resources?”

In answering the first question we used 1990 census data to examine the minority and low-income populations in Park County, the county where the proposed action occurs. The minority populations for Park County represent less than 2.5% of the total population for the county. This compares to 5.8% minority populations for the whole of Wyoming. CEQ guidance identifies a minority population as one where either: a) the minority population of the affected area exceeds 50 percent or b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population. For this analysis the affected area is identified as Park County and the state of Wyoming is used as the geographic reference for the general population. Park County meets neither of the above conditions, so there are no minority populations identified.

The percentage of persons below the poverty level for Park County is 9.5 percent as compared to 11.9 percent for Wyoming. Those persons are generally dispersed throughout Park County and there are no specific communities that are predominately low income. For this analysis no low-income populations were identified.

Given that no minority or low-income populations are identified in the affected area there is no disproportionate effect from any alternative on such populations regarding environmental justice concerns or factors.

2.1 Introduction

This chapter describes a range of alternatives, including the no action alternative and two action alternatives. This chapter also includes a comparative summary of the environmental effects of the alternatives. They were developed in response to the purpose and need, public input from scoping, ID Team review, and the identified significant issue.

The action alternatives were formulated by the ID Team to be responsive to the issue identified during the scoping, and to partially or fully meet the purpose and need defined in Chapter 1. These alternatives represent a reasonable range of actions to address the significant issue identified during analysis. The alternatives are designed to be consistent with the Forest Plan and Forest Service law, regulation, and policy.

2.2 Development of Alternatives

The ID Team provided input and review to aid in development of the proposed action and action alternatives, ensuring consistency with project objectives and compliance with the Forest Plan direction. Comments received during scoping were considered for possible development of additional alternatives. Five possible action alternatives were considered but dropped from further consideration as summarized below. One issue (Timing) was identified that led to the formulation of another action alternative.

2.3 Alternatives Consider But Not Analyzed in Detail

Helicopter logging: This alternative was eliminated from analysis because it is not economically feasible because of the low volume proposed for harvest and current timber values.

Treatment by prescribed fire: This alternative would not meet the purpose and need. Prescribed fire is not an appropriate method for treating encroaching conifers in this project. Further, it would not provide commercial products, and would result in additional stress to trees, which would make them more susceptible to insect and disease infestations.

Slashing conifer encroachment: This alternative would not meet the purpose and need of the project, especially concerning removing the large Douglas-fir susceptible to beetle infestation.

Treatment in roadless areas: The project is designed to remain outside the Trout Creek roadless area (RARE II #2044) and the North Absaroka Wilderness; therefore no alternatives that entered the roadless area were analyzed.

Fall operations: A fall operating season was eliminated so that conflict between hunters and treatment operations was minimized.

2.4 Alternatives Considered And Analyzed in Detail

A brief discussion of the similarities and minor differences between the no action alternative and the action alternatives follows.

Seasons of Operation. Because of timing constraints with other resource values, the ID Team attempted, through project planning and design, to develop a schedule that would minimize conflicts with other resources to the extent possible (grizzly bears, hunting season, private land activities, big game winter range). Some level of concern or conflict was identified for any season

or period of operation. The seasonal window for operation will be a winter/spring season for Alternative 2 and summer only under Alternative 3.

2.4.1 Alternative 1 – No Action

Alternative 1 is the no action alternative. NEPA procedural regulations require the Forest Service to identify the no action alternative and use it as a baseline for comparing the environmental consequences of the other alternatives (40 CFR 1502.14(d), and Forest Service Handbook 1909.15, 14.1, 23.1).

Current, ongoing management such as fire suppression, grazing administration for commercial livestock, and weed control would continue at present levels.

2.4.2 Alternative 2 – Proposed Action: Winter/Spring Harvest Operation

Alternative 2 is the proposed action as developed and refined from the initial proposal in the scoping statement. In response to the purpose and need and Issue 1 (Timing), this alternative is based on a winter/spring harvesting operation, where treatments (timber harvest and removal) would be conducted immediately after the closing of big game season in the area (early to mid-January) until June 1. Minor road reconstruction would occur during the summer when soil conditions are favorable.

Within the 133-acre project area, approximately 80 acres would be harvested⁴. This harvest would produce 300-450 thousand board feet (MBF) of timber. The 80 acres would be treated with shelterwood, selection and aspen regeneration clearcuts to increase vegetation diversity and reduce conifer stands susceptibility to insect and disease infestation. Unit A (approximately 34 acres) would be treated for release/regeneration of lodgepole pine and removal of large diameter Douglas-fir that are most susceptible to insect and disease infestation. Unit B is 89 acres; approximately 46 acres would be treated to re-establish meadows being lost to encroachment, enhance aspen regeneration through conifer removal, and restore a park-like Douglas-fir stand to increase forage available for wildlife. An approximate ten-acre unit (Unit C) would be treated through timber harvest for conifer encroachment/aspen regeneration, when adequate snow depth or frozen ground conditions are present.

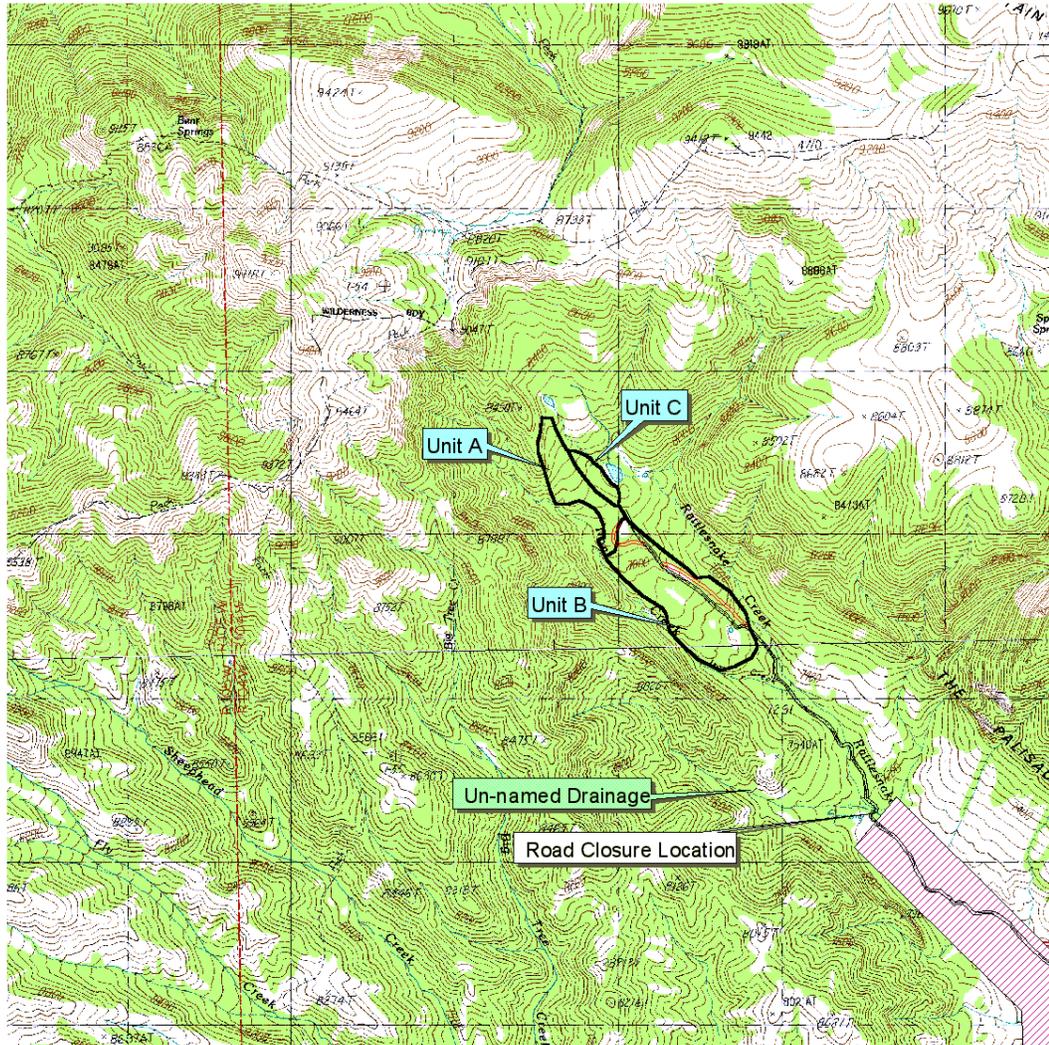
Approximately 2000-2500 feet of FSR 402 would be reconstructed to improve favorable grade and drainage.

2.4.3 Alternative 3 – Summer Operation

In response to the purpose and need and Issue 1 (Timing), Alternative 3 is based on a summer operation, where treatments (timber harvest and removal) would be conducted between July 1 and September 30.

Forested cover treatments would be the same as Alternative 2, except an approximate ten-acre unit (Unit C) would not be treated through timber harvest for conifer encroachment/aspen regeneration because moist soils in the area dictate entry only when frozen ground exists in the winter.

⁴ Treatment acreage amounts are \pm 10%.



Project Area Map

- Roads
-  Existing Road
 -  Reconstruction
 -  Project Area
 -  Private Property



C WD 2/1/02

Figure 3

Unit A is approximately 89 acres, Unit B approximately 34 acres, and Unit C approximately 10 acres.

2.4.4 Features Common to the Action Alternatives

Project Design Criteria and Project Implementation. The analysis documented in this EA discloses the possible beneficial or adverse impacts that may occur from implementing the actions proposed under each alternative. Measures to mitigate or reduce these impacts were identified during the project planning (as project design features) or defined during the analysis of effects summarized in this document (as mitigation measures). Project design features and mitigation measures are guided by Forest Plan direction, research and monitoring studies, and state and federal laws and regulations (including those previously described in Chapter 1).

The project design criteria are found in Appendix C. The design criteria/mitigation measures in this appendix are integral to the project.

The ID Team examined potential effects of the proposed action and alternatives. Members of the ID Team made a field reconnaissance of the project area on June 29, 2001. Subsequent visits to the site were made by specialists to gather needed information.

Vegetation Cover Types and Treatment. The following brief discussion of cover types for Douglas-fir, lodgepole pine, limber pine, aspen, mountain big sagebrush, and harvest methods/treatments apply to both action alternatives. The special wood product removal discussion also applies to both action alternatives.

For the Douglas-fir cover type (Unit B), merchantable timber would be removed by commercial timber harvest through shelterwood, selection, or individual tree selection prescriptions (Plan page III-132).

Where remnant aspen cover type exists within Units A, B, and C, merchantable timber would be removed by commercial timber harvest to encourage aspen release. This would occur where conifers are encroaching in aspen clones. Per Forest Plan direction, the harvest method would be small clearcuts (one to five acres). Following post-sale monitoring, regeneration of aspen clones by cutting of mature stems would be implemented if the desired release of aspens were not realized from the removal of encroachment. General direction and standards and guidelines for range resource management in terms of aspen require close management of grazing by domestic stock in treated aspen stands until regeneration is six feet tall. Where there has been manipulation to induce aspen regeneration, do not allow aspen seedlings to be grazed by livestock more than one out of three years (page III-155)

For the sagebrush cover type (Unit B), merchantable and non-merchantable limber pine, and Douglas-fir would be cut in an effort to return the acreage to an earlier seral stage. Merchantable products would be removed in conjunction with the commercial timber sale. Non-merchantable material would be treated on-site.

For the lodgepole pine cover type (Units A, B, and C), merchantable timber would be removed by commercial timber harvest through shelterwood, group selection, or individual tree selection prescriptions.

Non-merchantable timber and special wood products would also be removed from the three units. This material, which includes commercial green/dead firewood, fence material, furniture roundwood, Christmas trees, and other materials, would be treated using small sale permits, K-V (product sale collection) funded service contracts, or force account labor (Forest Service crews).

Outputs from harvest could include a variety of wood products, including merchantable saw logs (>7 inches), products other than logs (POL, 5 inches-6.9 inches), commercial fuelwood, and possibly Christmas trees. Removal of encroaching six- to fifteen-foot conifers that are suitable for

Christmas trees would be accomplished through Forest Service crews, K-V funding, civic organizations such as the Boy Scouts or conservation groups, or a commercial Christmas tree contractor.

2.5 Monitoring and Evaluation

Monitoring assesses whether the project was implemented as designed and whether it accomplished the project goals and objectives. During implementation, the timber sale administrator would monitor the project. The project area would be monitored to determine the effectiveness of project design features and/or mitigation, the effects of management activities on various resources, and the overall rate of recovery. Resource specialists would conduct monitoring related to their particular resources. Specific monitoring is identified below:

- **Regeneration Monitoring:** Silvicultural prescriptions will be developed on a site-specific stand basis. These site-specific prescriptions will be developed to implement the line officers selected alternative for the project. These prescriptions will contain regeneration monitoring requirements. After the final cut, where even-aged vegetation management is used (i.e. clearcut or shelterwood) to treat vegetation, regeneration surveys would be scheduled for the first, third, and fifth year.
- **Noxious Weeds Monitoring:** For up to five years after completion of the project, areas would be monitored for the presence of newly invading exotic species and to evaluate the effectiveness of any treatments or protection measures.
- **Range Monitoring:** The project area would be monitored for compliance with the rest period, and appropriate measures, e.g., electric fences, implemented to keep livestock out of treatment areas. If it is determined, following monitoring, that cattle are damaging regeneration in aspen treatment units even with electric fences, additional measures to meet aspen regeneration standards and guidelines would be implemented.
- **Soil Monitoring:** Effects on compaction, displacement, and organic matter would be monitored during project implementation. If effects were occurring that are either unexpected or more severe than anticipated, the moisture criteria would be altered to limit effects to within soil quality standards (FSH 2509.18. FSM 2554). Additionally, harvesting activities would be suspended until appropriate conditions exist.
- **Wildlife Monitoring:** If aspen regeneration is not sufficient, cutting of mature aspen stems may be required to regenerate aspen clones.

2.6 Summary Comparison of Alternatives

This section presents a comparative summary of the principal resource elements and activities, environmental effects, and responses to objectives associated with the alternatives considered in detail. The effects are summarized from Chapter 3, which should be consulted for a full understanding of these and other environmental consequences.

Resource Elements	Alternative 1 - No Action	Alternative 2 - Winter/Spring	Alternative 3 - Summer
Vegetation management and trends (forest health, diversity [structural, age-class, species], stand density, canopy closure)	<p>Vegetation change would result only from uninterrupted natural succession processes. The area would tend toward more homogeneous stand structures and there would be a loss of species and structural diversity.</p> <p>Vegetation trends: 1) increasing stand density and associated susceptibility for insects and fuel loading, 2) less species diversity and less productive understory vegetation, 3) more vertical and horizontal fuel continuity, 4) increasing canopy closure, resulting in loss of ground cover, vigor, and productivity of grasses and other herbaceous plants, 5) less age-structure diversity.</p>	<p>Vegetation treatment would occur to enhance diversity, wildlife habitat, aspen/deciduous species and forage. There would be an increase in structural, age-class, and species diversity.</p> <p>Vegetation trends: Increased species diversity, more productive understory, reduced vertical and horizontal fuel continuity, reduced stand density/canopy closure, more age-class diversity.</p>	Same as Alternative 2, except treatment of 10 acres in Unit C for aspen regeneration, forage, and diversity would not occur.
Sensitive plants/weeds	Noxious weeds would increase slightly and no weed treatment would occur. No management effects would occur to sensitive plants.	A slight increase in weeds would occur due to ground disturbance. Follow-up weed treatment would be implemented as needed. A small population of Absaroka goldenweed may be impacted during project activities; an increase in suitable habitat would result by creating additional openings.	Same as Alternative 2.

Resource Elements	Alternative 1 - No Action	Alternative 2 - Winter/Spring	Alternative 3 - Summer
<p>Aspen and disturbance-dependent tree species distribution, structural and age-class diversity.</p> <p>Mixed conifer stand composition and tree health and vigor.</p>	<p>Without any disturbance events, aspen and deciduous species would decline and eventually be dominated by conifers.</p> <p>In mixed conifer, Douglas-fir will continue to dominate with the potential for lodgepole pine and aspen to disappear. Competitive stress conditions would increase, causing a decline in tree health and vigor and increased susceptibility to insects and disease. Species that need disturbance to regenerate (lodgepole pine, aspen, and to a lesser degree, Douglas-fir) would decline.</p>	<p>Aspen would be regenerated by small clearcuts (Plan page III-132), increasing structural and age-class diversity. Following post-sale monitoring, regeneration of aspen clones via cutting of mature stems would be implemented if the desired release of aspen were not realized. Where treatments occur, there would be an increase in the composition of disturbance-dependent species.</p> <p>Manage grazing in treated aspen stands to ensure sprouting and sprout survival.</p> <p>Increase of lodgepole pine and maintain diversity of species. Overstory trees not harvested would have increased growth and vigor.</p>	<p>Same as Alternative 2, but treatment of 10 acres of aspen in Unit C would not be regenerated by clearcutting to increase structural and age-class diversity.</p>
<p>Big game forage production</p>	<p>Continued decreases in amount of forage production in mixed conifer stands and shrub/grasslands due to increasing canopy closure and encroachment by conifers.</p>	<p>Increased forage quality and quantity in mixed conifer stands and shrub/grasslands. There would be an increase in edge in aspen harvest areas and an increase in early-successional grass/forbs habitat. Foraging for big game would increase in aspen clearcut areas.</p>	<p>Same as Alternative 2, minus the 10 acres in Unit C.</p>

Resource Elements	Alternative 1 - No Action	Alternative 2 - Winter/Spring	Alternative 3 - Summer
Wildlife habitat	No management actions for habitat capability and effectiveness improvement.	Implement actions to enhance diversity, wildlife habitat capability/effectiveness, and aspen/deciduous species. Small openings and aspen clearcuts would increase early-successional structural stages.	Same as Alternative 2, minus 10 acres in Unit C.
Dispersed recreation/visuals	No change or impact on dispersed recreation or visuals.	Avoidance of conflicts with summer operations of private landowner in the area. Log truck traffic would occur at a time of low traffic volume. In the short-term, minor alteration of scenery due to evidence of skid trails and more open appearing forests from logging. Over time, little evidence of harvest, and aspen scenery would increase	Some conflict with summer operations of private landowner in the area and increased traffic including log truck traffic. In the short-term, minor alteration of scenery due to evidence of skid trails and more open appearing forests from logging. Over time, little evidence of harvest, and aspen scenery would increase.
Road management	No change or impact to the road system.	Road closed, administrative and authorized use only.	Road closed, administrative and authorized use only.
Forest health	The potential for epidemic insect infestations, wildfires, and loss of wildlife habitat diversity increases substantially without management actions. Continued abundance of mature and older forest habitat. Small and decreasing amount of early-successional habitat.	Reduces the risks and hazards associated with insects, disease, and fire, as well as enhances fire suppression capability by reducing stand densities. Overstory trees not harvested would have increased growth and vigor.	Same as Alternative 2.

Resource Elements	Alternative 1 - No Action	Alternative 2 - Winter/Spring	Alternative 3 - Summer
Wildlife displacement	No change in species displacement	Management activities would temporarily displace species from treated areas. Species would return following cessation of activities. Effect would be greatest in the winter to elk and deer wintering in the area and to spring bear use and elk calving.	Management activities would temporarily displace species from treated areas. Species would return following cessation of activities. Effect would be less because of the summer operating season.
Output of Forest Products/Economics	No	Yes, 300-450 mbf.	Yes, 250-400 mbf.

Chapter 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction and Analysis Area

Both the affected environment and environmental consequences (effects analysis) are included in this chapter. Only the resources determined to be affected are identified and analyzed. The level of detail is commensurate with the amount of information necessary to understand the effects of the action(s). The effects discussions presented in this chapter are summaries of information from the ID Team resource specialists and their meeting participation and input into the document. The summaries focus on the resource issue and project goals disclosed in Chapter 1.

3.1.1 Scope of the Analysis

The project area is 133 acres. The elevation of the project area is approximately 7,800-8,000 feet.

The analysis area for vegetation/forest health, sensitive plant species, noxious weeds, soil and water resources, range, wildlife, and the road system is 2,604 acres, beginning where Rattlesnake Creek first flows onto private property upstream to the watershed divide (upper portion of the Rattlesnake Creek watershed). This area, which is the headwaters for Rattlesnake Creek, consists of 2,604 acres or 10.5% of the entire Rattlesnake Creek watershed.

For aquatic biology resources, the analysis area is the entire Rattlesnake Creek watershed (24,964 acres). For socio-economics, Park County serves as the analysis area.

The temporal scope or scale for the analysis is 10 years; however, the temporal scope or scale from a forestry/timber perspective is very long-term, with the rotational period to grow and harvest trees being at least 120 years.

3.1.2 Past, Present, and Reasonably Foreseeable Future Actions

In the next 10 years, we anticipate the following federal and private land activities or actions may occur in the analysis area and/or surrounding area. Cumulative effects result from previous logging, prescribed burning, past and present fire suppression, roads, insect and disease infestations, past and current grazing, along with the effects from the action alternatives. These past actions and reasonably foreseeable actions were used to evaluate cumulative effects. They apply to each of the different resource headings, but are described once here rather than repeated for each heading.

Past and Present Actions. Over the past 100 years, livestock grazing has occurred in the analysis area. The watershed has had some level of harvest activity such as firewood or house log removal over the last 100 years. Since 1998, approximately 1,500 acres of natural fuels have been treated within the watershed using broadcast prescribed fire and timber harvesting methods.

Previous activities in the Rattlesnake Creek drainage (both private and public land) within the past several decades have resulted in changes to the mosaic pattern of vegetation types and age classes due to the prescribed burning and silvicultural treatments. Livestock numbers have been

significantly reduced during the past several decades, and enhanced range systems and range improvements have occurred.

Recently, approximately 40 acres (1.5%) of the analysis area were harvested during a timber sale entry in 1999. The sale involved 500 ccf or approximately 250 mbf of Douglas-fir (live and dead) and other marked conifer sawtimber and 200 cords of commercial firewood. The sale treatment was individual tree selection and group shelterwood in three small units. The sale occurred within management area 5A. The location is immediately south of the proposed action for Rattlesnake II and involved portions of Sec. 29, 32 and 33 in T54N, R104W, 6th PM.

Future Actions. There is one term grazing permit(s) authorized in the project area, so continued livestock grazing at or near current levels within the Forest Service allotment is expected to continue once aspen regeneration reaches six feet. Grazing on private lands and other federal lands would continue.

- Continued vegetation management for fuels, monitoring, prescribed fire, and fire suppression on federal and other ownership.
- The ignition and growth of wildland fires, and suppression actions taken by crews and equipment.
- Slow increase in noxious weeds and need for noxious weed management activities. Weed control efforts are stipulated under the action alternatives, but not necessarily under the no action alternative.
- Subdivision or development of private land is not anticipated.
- There will be continued agricultural use and diversions/ditches to irrigate private land.

3.2 Forest Health

3.2.1 Existing Condition

Vegetation. Past activities helped to shape the existing vegetation composition and structure. Fire and insects/disease are the principal natural sources of disturbance. Successions, commodity uses (especially timber harvest and commercial grazing), insects and disease, wildlife (such as beaver and big game browsing) are processes that have shaped the existing condition. Ecological succession is the dominant process on this landscape, moving vegetation communities toward late seral stages and increased stand density and fuel loading. Fire is a process that could cause vegetation community change.

Over the last 90+ years, fire suppression changed the landscape from one dominated by mature, open park-like stands to one dominated by over mature, overstocked, multi-layered Douglas-fir stands. Because of continuous fuels and ladder fuels, these stands have the potential to burn as crown fires if ignited during a dry season with windy conditions. In addition, fire suppression has increased stand density and physiological stress for the Douglas-fir in this area and reduced stand and landscape diversity. The approximate, existing species composition is shown in Figure 4.

Species	Percentage
Douglas-fir	74%
Spruce/fir	5%
Lodgepole	8%
Limber pine	1%
Aspen	1%
Sagebrush	11%

Figure 4

Existing Vegetation Conditions. Approximate species composition within the 2,604-acre analysis area.

Aspen (*Populus tremuloides*) is a minor type in the Absaroka Mountain Range portion of the SNF, generally comprising less than 4-5% of the forested vegetation. In the analysis area, aspen stands are old and decadent and conifers have developed in height and density so the aspen is rapidly declining. Being shade-intolerant, aspen will not be able to remain on sites dominated by conifers for many more years. Aspen is extremely important to many wildlife species, including the Forest management indicator species blue grouse and ruffed grouse that are highly dependent on multi-storied aspen, shrub types, and riparian habitat.

Within the treatment area, aspen is the principal riparian/deciduous tree component with some mixture of willow and is heavily dominated by conifers. About 26 acres of aspen communities exist in the analysis area, providing important winter habitat for moose and to a lesser extent for elk. Moose, elk, and livestock graze most of the aspen stands; these aspen stands are in a decadent condition due to conifer encroachment and ungulate browsing, and are in danger of extirpation.

Potential Vegetation. Potential vegetation types (habitat types) are used to designate sites with similar environmental and biotic conditions. They are an expression of the biotic potential of a site, regardless of the current successional vegetation that might be occupying the site. The interactions of the site with the local climate influence the potential vegetation the site can support.

The primary upland forest vegetation types within the project area include the Douglas fir /Idaho fescue, Douglas-fir/snowberry, limber pine/Idaho fescue, Engelmann spruce/horsetail, and Engelmann spruce/common juniper habitat types (Steele et al. 1983)⁵.

The primary non-forest vegetation type is mountain big sagebrush/Idaho fescue habitat type (Tweit and Houston 1980)⁶. Within the immediate project area this type has a limited extent and is being replaced by Douglas-fir and limber pine.

Forest Insects and Disease. The Forest Plan stresses utilizing principles of integrated pest and vegetation management to prevent or reduce serious, long lasting hazards and damage from pest organisms (pages III-6, 8, 10, 97).

Douglas-fir beetle (*Dendroctonus pseudotsugae*) infestations frequently result from disturbance events that create large volumes of weakened Douglas-fir trees. In 1988, extensive wildfires occurred in Yellowstone National Park and the SNF. Populations of Douglas-fir beetle increased in fire-scorched trees caused by the wildfires. Subsequent generations of the beetles moved from these injured trees to the undamaged trees in neighboring stands on the SNF. This outbreak has

⁵ Douglas-fir (*Pseudotsuga menziesii*), Idaho fescue (*Festuca idahoensis*), snowberry (*Symphoricarpos albus*), limber pine (*Pinus flexilis*), Engelmann spruce (*Picea engelmannii*), horsetail (*Equisetum arvense*), common juniper (*Juniperus communis*)

⁶ mountain big sagebrush (*Artemisia tridentate ssp. vaseyana*)

now moved and is concentrated along the North Fork of the Shoshone River watershed. Beetle populations continue to build and continued high levels of mortality can be expected along the North Fork drainage (Allen, 2002).

The Douglas-fir bark beetle infests and kills Douglas-fir trees, resulting in the loss of forest overstory and increases in the amount of dead material (fuel loading). Trees at high-risk for infestation are 16 inches or more in diameter (12 inches or more in heavily infested areas), mature or over mature, or occur in high-density stands containing a high percentage of Douglas-fir in the overstory. Much of the analysis area exhibits these high-risk characteristics; the insect infestation has, or has the potential to, moved into the decadent, mature trees. Therefore, the entire Douglas-fir stand is highly susceptible to epidemic levels of beetle infestation, stress, and mortality. This tree mortality contributes to the growing concern of excessive fuel build-up and the increased potential of a stand replacement fire.

Douglas-fir beetle presents the most serious pest hazard within the analysis area, but other insect and disease problems are also contributing to the high mortality of large trees, e.g., mountain pine beetle in lodgepole pine and limber pine, Englemann spruce bark beetle, and Ips beetle. Limber pine also has a high occurrence of white pine blister rust in the analysis area.

In summary, the project area is highly susceptible to insect and disease infestations, based on the insect infestations at epidemic levels in other parts of the North Fork Shoshone River drainage.

Diversity. Structural stages are the physical development stages (tree age class) of a forest stand. Currently, the majority of forest vegetation in the 2,604-acre analysis area (49%) is in the mature forest structural stage. Figure 5 summarizes the existing structural stages (age classes) in the analysis area.

Structural Stages	Percentage
Grass/forb	31%
Shrub/seedling	8%
Seedling/sapling	0%
Young/mid-age	0%
Mature Forest	50%
Old Growth	11%
TOTAL	100%

Figure 5

Old growth in the timber stands in the analysis area varies in age, ranging from 200 to 275 years. The variation in age can be attributed to past silvicultural treatments and past fire suppression. Suppression has contributed to a predominance of mature/old growth and lack of seedlings/saplings.

3.2.2 Effects on Forest Health

Effects of Alternative 1 on Forest Health. Natural successional processes would continue to occur slowly, including changes to age class structure, aspen, and other diversity components such as meadows and riparian areas. Wildfires would continue to be suppressed. Fuels reduction and insect infestation reduction would not occur.

Current trends and processes would continue, most noticeably a continued increase in insect and disease infestation and the buildup of fuels over the long-term that would contribute to possible

large, uncontrollable wildfires. Existing heavy fuels in the form of down and dead vegetation and increased forest density, involving more continuous canopies, surface fuels, and ladder fuels would remain or increase over time.

Aspen would continue to be lost to increasing conifer encroachment or a large wildfire event. The majority of aspen in the area would be in a mature/old growth form with very little suckering occurring. Stands would continue to deteriorate and be lost as available habitat.

Conifer communities would continue to increase in cover at the expense of rangelands, aspen/shrub habitats, and wildlife forage. Composition of mixed-conifer stands would continue to be dominated by Douglas-fir. In the long term, lodgepole pine would disappear from stands. The potential for insect and disease disturbances would continue to increase steadily, as would the potential for wildfire. Available forage for livestock and other large ungulates would decrease as succession increases conifer cover and forest density.

Effects of Alternatives 2 and 3 on Forest Health. Vegetation manipulation through treatments would occur to enhance diversity, wildlife habitat, aspen, and deciduous species. Where treatments occur, the primary effects can be summarized as:

- An increase in, structural, age-class, and species diversity would result, especially in the composition of disturbance-dependent species.
- Increase in grasses and herbaceous cover would increase winter range forage quality and quantity in mixed conifer stands and shrub/grassland. There would be an increase in edge in aspen harvest areas and an increase in early-successional grass-forbs habitat. Foraging for big game would increase in aspen clearcut areas.
- Early-successional structural stages would increase in small openings and aspen clearcuts created.
- Reduced risk and hazard associated with insects, disease, and fire, as well as enhancing fire suppression capability by reducing stand densities.
- Reduced stand density and canopy closure allowing for a more productive and diverse understory.
- Reduced vertical and horizontal fuel continuity.
- Vegetation changes would improve habitat for wildlife species preferring more open, less dense stands.
- Timing was a consideration in terms of effects to vegetation. Under Alternative 2, the project would have greater benefits to diversity since Unit C (10 acres) would be treated during the winter under frozen/snow-covered ground conditions for aspen regeneration. Under Alternative 3, Unit C would not be treated. Since operations occur in the summer under Alternative 3, more soil scarification may take place resulting in increased lodgepole regeneration in treatment areas.

In Unit A, tree regeneration in the Englemann spruce/juniper habitat type should be a mixture of Engelmann spruce and lodgepole pine with Douglas-fir being a minor component. Understory vegetation is sparse; with stand opening, it can be expected there would be an increase in ross sedge, heartleaf arnica, weedy milkvetch, and a slight increase of common juniper. Tree regeneration would be the dominant site component after five years.

The treatment in Unit B would open up the Douglas-fir and limber pine types and remove encroaching trees in the mountain big sagebrush/Idaho fescue type. The sage openings would respond with an increase of Idaho fescue, junegrass, bluegrass spp, bluebunch wheatgrass, and

king fescue. The stands that are currently closed would respond with gradual increases in Idaho fescue, king fescue, junegrass, mountain sagebrush, and snowberry.

In Unit C, the response to treatment would be increases of aspen, scouler willow, and booth willow. The primary conifer regeneration would be Engelmann spruce.

Forest Insects and Disease. The potential for epidemic insect infestations, wildfires, and loss of habitat diversity decreases with the implementation of the action alternatives and the treatment to remove conifers that are the most susceptible to infestation. Management actions would help maintain insect and disease infestations at an endemic level.

Diversity. Mature (50%) and old growth forests (11%) make up 61% of the analysis area.

A long-term beneficial effect of the proposed treatments would be one of creating a mosaic of different successional stages within the upper Rattlesnake Creek project area, thus increasing diversity. Overall, the action alternatives would have a considerable positive effect on the continued existence of aspen and lodgepole pine in the analysis area.

The Forest Plan (page III-19-20) direction included in the project design would meet the following requirements for diversity:

- Maintain or establish a minimum of 20 percent of the forested area within the analysis area to provide vertical diversity. By harvesting some of the older trees and promoting growth of new conifer seedlings and increased aspen growth, vertical diversity would be increased as required by Forest Plan direction and would move vegetation toward the desired condition.
- Maintain or establish a minimum of 30% of the forested area within the analysis area to provide horizontal diversity. By increasing meadows and removing conifer from aspens and meadows, horizontal diversity would be increased as required by Forest Plan direction and would move vegetation toward the desired condition.
- In forested areas, maintain at least 5% in grass/forb stages and at least 10% of the conifer potential natural vegetation in old growth that occurs in 30-acre or larger patches. The grass/forb age class would increase after treatment and move vegetation toward the desired condition. Old growth would be maintained above the 10% old growth and 30-acre size as required by Forest Plan direction and project design criteria.
- In forested areas, create or modify created openings so they have natural appearing shapes. Per project design criteria, the shape, size, and location of all treatments would imitate natural patterns in the characteristic landscape. The treatment units would follow natural stand boundaries and old meadows to enhance aspen sites; therefore, the openings would resemble natural patterns and meet Forest Plan direction for diversity and visual resources.
- The effects to snags and down woody material would be mitigated by Forest Plan direction included in the project design: Within harvest units, leave six to 10 snags per 10 acres, eight inches or more diameter at breast height (dbh), where available for wildlife trees. Retain in clumps if possible. Within harvest units, retain a minimum 50 linear feet of dead/down logs per acre that is more than 10 inches dbh (page III-20). This direction for snags is currently being met in the analysis area and would continue to be met considering the small size of treatment areas and the abundant snags and down woody material immediately adjacent to the treatment areas.

Structural Stages (age classes)	Existing %	% After Treatment
Grass/forb	31.0%	33.2%
Shrub/seedling	8.0%	8.0%
Seedling/sapling	0.0%	0.0%
Young/mid-age	0.0%	0.0%
Mature Forest	50.0%	48.2%
Old Growth	11.0%	10.6%
TOTAL	100%	100%

Figure 6

The expected change from existing age classes to post-treatment age classes.

Under the action alternatives, the extent of late seral and mid seral forest habitats would decrease, and the distribution of early-seral habitats would increase; aspen would benefit by opening up sites where conifers have encroached and suppressed former aspen stands and deciduous vegetation. This vegetation management would improve structural, age-class, and species diversity and distribution.

Without disturbance to create young age classes, especially in aspen/shrub communities, the diverse patterns on the landscape would continue to decrease and may eventually disappear. The action alternatives would open areas to increased sunlight and ground temperatures, thus creating a semi-open patchwork of conifer, aspen, shrub land, and grassland.

Old growth is an important component of diversity and would not be reduced below Forest Plan standards. The amount of old growth is not a limiting factor in the analysis area. Treatment would reduce stand density and increase residual tree growth. Treatment under the action alternatives increases the ability for the trees to resist beetle infestation and reduces the susceptibility of the stands to beetle population buildups. There would be a reduction in the long-term risk of large scale, high-intensity fire. The treatment would reduce fuel loading and make fuels less continuous, which would reduce the severity and extent of wildfires. In the long-term, this would increase the old-growth present in the analysis area.

Snags are also an important component of diversity and would not be reduced below Forest Plan standards within the analysis area.

3.2.3 Cumulative Effects on Forest Health

This section discloses past, present, and reasonably foreseeable effects from federal and private land activities in the analysis area over the next 10 years.

Insects and disease would be a concern now and into the future. Since Douglas-fir beetle attacks are most successful in unmanaged, overstocked stands that contain a high percentage of large diameter Douglas-fir, silvicultural treatments that alter these stands conditions would reduce a stand's susceptibility to attack and potential widespread damage. Silvicultural treatments are used in stands that have not been affected or may have minor infestations to reduce susceptibility to attack. It should be part of an ongoing vegetation management program to help increase the health of stands by decreasing their vulnerability to any insects and diseases, not just Douglas-fir beetle (Allen, 2002).

The likelihood of a wildfire becoming a stand-replacing fire is dependent on numerous factors such as fuel moisture content, weather conditions, topography, fuel loading, stand density, and the presence of multiple vegetation layers that provide ladder fuels. Management of the last three factors, as in the action alternatives, can greatly influence fire severity and intensity. If not managed, over time the increases in understory species and fuel loads can lead to uncharacteristically intense wildfires. The action alternatives would reduce vertical and horizontal fuel continuity, and in combination with past activities such as prescribed burning and timber harvest, fuel loading, stand density, and ladder fuels contribute to the reduced likelihood of large, intense wildfires.

3.3 Watershed Resources (Soil and Water)

The analysis of effects on watershed resources focuses on four general areas:

- Soil Productivity (soil erosion, soil compaction and rutting hazard, soil health and long-term productivity, soil fertility, regeneration hazard)
- Geologic Hazard (landslides)
- Aquatic Ecosystems (sediment, bed/bank stability, flow regimes, temperature/oxygen, water purity, aquatic life, aquatic management indicator species)
- Special Areas (riparian ecosystems, wetlands, floodplains)

3.3.1 Existing Conditions

Geographic Setting and Geologic Hazard. The geographic setting places this area in the Yellowstone Highlands section (M331) and on the eastern edge of the Absaroka subsection (M331A) (McNab, 1994; Houston 1999). Primary formations within the vicinity of the project area include the Madison Limestone, Cathedral Cliffs, and Wapiti. The Wyoming Geologic Survey has mapped the geologic hazards on the Forest (Case 1989). Immediately to the east of the project area a multi-flow landslide is mapped; only Unit C occurs in this landslide.

Soils. The project area is within the boundaries of the Shoshone National Forest Soil Survey (Area 656). This survey is in the process of being correlated by the NRCS. Map units 102, 202, 211, 225, 244, 180, and 181 are found in and surrounding the project area. Soils within the project area are from the Mollisol, Inceptisol, and Alfisol soil orders. Mapping unit descriptions and interpretations can be found in the project records and as part of the evolving National Resources Conservation Service's NASIS soils database.

Field review determined that three major soils dominate the project area. Unit A is predominately the Needleton soil that classifies as a Loamy-skeletal, mixed, superactive Eutric Haplocryalfs. Management considerations include an erodable surface, low bearing strength, and surface compaction hazards.

Unit B is predominately the Thornburgh soil that classifies as Loamy-skeletal, mixed, superactive Ustic Haplocryolls. Management considerations include an erodable surface soil and moderate bearing strength.

Unit C has both Needleton and an unnamed wetland soil that classifies as Cryaquoll. Management considerations include erodable surfaces, high water table, windthrow hazards, compaction hazards, and low bearing strengths.

Watershed. The Wyoming Department of Environmental Quality classifies Rattlesnake Creek as 2AB. Class 2AB waters are those known to support, or have the potential to support, game fish populations or spawning and nursery areas at least seasonally. They also are presumed to have

sufficient water quality and quantity to support drinking water supplies and are thus protected for that use. Additionally, they are protected for non-game fisheries, fish consumption, aquatic life other than fish, primary contact recreation, wildlife, industry, agriculture, and scenic value uses.

Iron Creek is classified as a 3B water. Class 3B waters are not known to support fish populations or drinking water supplies nor are such uses believed to be attainable. However, they do have sufficient hydrology to normally support and sustain communities of aquatic life including invertebrates, amphibians, or other flora and fauna at some stage of their life cycles. Uses designated include aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value.

Upstream of the Iron Creek confluence, Rattlesnake Creek has an ephemeral flow regime. Iron Creek has an intermittent/perennial regime depending upon yearly precipitation. Thus, Rattlesnake Creek becomes an intermittent to perennial regime below the Iron Creek confluence. Due to lack of streamflow at the time of field reviews (late in 2001) only qualitative assessments of stream and watershed health were made; information from the reviews follows.

There is one small irrigation water diversion within the analysis area, located on an unnamed stream directly north of the private property, which is used to irrigate pastureland on the private property.

Past timber harvest in the analysis area has not caused detrimental erosion, sedimentation or compaction, and did not remove excessive ground cover, organic matter or nutrients from the sites.

Ungulate grazing occurs in portions of the analysis area. Monitoring indicates some wet meadow/wetland areas receive heavy pressure in certain years and that noxious weed invasion is occurring as a result. Grazing pressure is also heavy along the unnamed stream mentioned above, resulting in trampled banks and sedimentation.

FSR 402 traverses the lower and middle portions of the analysis area. This road crosses Rattlesnake Creek two times and Iron Creek one time. All three crossings are unarmored fords that contribute minor amounts of sediment to the creeks. At some point in the distant past a former, but now abandoned, crossing of Rattlesnake Creek plugged causing streamflow to erode around the obstruction. Yearly flows have since cut into the alluvium, resulting in a new, deeply incised channel for hundreds of feet. In the process of forming this new channel, the down cutting intercepted the above-mentioned unnamed stream and shortened its length by a few hundred feet. This unnamed stream is eroding vertically and laterally in an upstream direction, resulting in bank erosion and dewatering of the riparian bottom.

Fisheries. A fisheries is not present in the upper portion of the Rattlesnake Creek (analysis area) due to its intermittent nature and the dewatering from irrigation downstream along the majority of Rattlesnake Creek. Although Iron Creek can flow year round, we observed no fish during an ocular survey in October 2001. Two ponds (about one acre each) are present in the analysis area. They are located in wet, rolling unstable topography. These ponds are fairly shallow; they have not had and currently do not have the potential to support a fishery.

Off-Forest, valley bottom streams begin to meander and collect enough flow to provide suitable fish habitat at times in certain areas of Rattlesnake Creek. The Wyoming Game and Fish Department found a very limited brook trout fishery in the middle reaches and no year round fishery in the lower reaches of Rattlesnake Creek due primarily to dewatering. At times, spring spawning fish from Buffalo Bill Reservoir including cutthroat, rainbow, and rainbow/cutthroat trout hybrids use the lower reaches of Rattlesnake Creek for spawning but this rarely results in recruitment due to dewatering before the fry emerge from the gravels in the late summer.

3.3.2 Effects on Watershed Resources

Effects of Alternative 1 on Watershed Resources. Minor concerns with erosion and sediment delivery at the unarmored fords on FSR 402 would continue. Opportunities to relieve grazing pressure and its effects on wet meadows/wetlands, bank erosion, and sediment delivery would be foregone since upland forage conditions would not be improved. The potential for negative effects on watershed, aquatic biota, and soil resources from a catastrophic wildfire would continue.

Effects of Alternatives 2 and 3 on Watershed Resources

Sediment, Bed/Bank Stability, Flow Regimes. Most sediment delivered to streams comes from a source zone along streams whose width depends on topography, soils, and ground cover. Connected disturbed areas like roads and other disturbed soils near streams can deliver sediment during runoff events. Excessive sediment deposits in streambeds can harm aquatic plants, insect populations, and fish production.

Bed and bank stability can be damaged from trampling by animals and humans, vehicle impact, degraded bank vegetation, or excessive flow augmentations. Streams can be made wider and shallower, pools and overhanging banks can be destroyed, and much sediment can be added to streams.

Flow regimes can be altered by major changes in cover type or ground cover, dense road networks, or water projects. Water temperature and chemistry, sediment transport, aquatic habitats, and aquatic life cycles can be degraded.

Neither action alternative would have significant negative effects on sediment, bed/bank stability, or flow regimes. Iron and Rattlesnake Creeks are adequately buffered from proposed harvest units and road reconstruction activities. In the short-term, minor sedimentation would occur during road relocation and improvements of the fords. In the long-term, existing minor sedimentation from the unarmored fords would be eliminated, as each ford would be armored. Both action alternatives could result in improved bank stability and reduced sedimentation along the heavily grazed portion of the unnamed stream because upland forage conditions would be improved.

Both action alternatives were formulated based on the identified issue (timing of the project implementation); project design is such that operations cannot proceed if unacceptable impacts would occur to soil and water (such as excessively wet conditions).

Temperature/Oxygen, Water Purity. Summer water temperature is increased, and winter water temperature is decreased, by removing shade, reducing flows, or damaging banks so streams are wider and shallower. Dissolved oxygen is usually reduced when summer water temperature is increased. Such impacts impair or destroy the suitability of water bodies for aquatic biota.

Water purity can be degraded by placing concentrated pollutant sources near water bodies, applying harmful chemicals in or near water bodies, or intercepting hazardous rock strata by roads. Degraded water purity can impair or destroy use of the water by aquatic biota and humans.

Neither action alternative would have effects on temperature/oxygen, water purity or State beneficial uses as Iron and Rattlesnake Creeks are adequately buffered from proposed harvest units. No concentrated pollutant sources or harmful chemicals would be used in or near water bodies and FSR 402 does not and would not intercept hazardous rock strata.

The existing irrigation diversion, due to its location, would not be affected by this project.

Aquatic Life. Aquatic life can be degraded by migration barriers, changed flow regimes, riparian damage, or big sediment/chemical loads.

Under both action alternatives, no new stream crossings would be constructed. Changes to flow regimes are not expected. Increased sediment or chemical loading is not expected.

Aquatic Management Indicator Species (MIS). Aquatic species can decline from sensitive, to threatened, to endangered, to extinct. Predation, competition, harvest, or habitat damage may cause listing or loss of species.

Yellowstone cutthroat trout is a Region 2 sensitive fish species. No year round suitable stream habitat is found on Rattlesnake or Iron Creeks. Very limited suitable fish habitat is found off-Forest on Rattlesnake Creek where only brook trout have been found. Cutthroat from Buffalo Bill Reservoir that may use the very lower reaches of Rattlesnake Creek for spawning are hybridized from past stocking practices. No natural reproduction occurs in the lower drainage due to dewatering. Any stream impacts from either action alternative are expected to be insignificant to any fish species that use Rattlesnake Creek.

In the current Forest Plan, game trout were selected as the indicator species for aquatic habitat. Since no suitable habitat exists within the analysis area, there are no effects on aquatic MIS.

Riparian Ecosystems, Wetlands, Floodplains. Riparian ecosystems provide shade, bank stability, fish cover, and woody debris to aquatic ecosystems. They also provide key wildlife habitat, migration corridors, sediment storage and release, and surface-ground water interactions. Composition and structure of riparian vegetation can be changed by actions that remove certain species and age classes.

Wetlands control runoff and water quality, recharge ground water, and provide special habitats. Actions that may alter their ground cover, soil structure, water budgets, drainage patterns, and long-term plant composition can impair these values.

Floodplains are natural escape areas for floods that temper stages and velocities.

Neither action alternative would adversely affect riparian habitat. For both action alternatives, short-term and long-term adverse effects to riparian habitat are expected to be insignificant due to buffering along the streams, limited riparian timber treatments, and mitigation. Project design to protect aspen and deciduous species from livestock grazing until aspen reach a six-foot sapling height (MA 4D) and for aspen seedlings, cattle grazing is allowed no more than one out of three years by Forest Plan standards and guidelines (page III-155).

Long-term benefits include a more diverse riparian habitat including a better mix of seral stages. Timber treatments in the drainage would help reduce the possibility of a catastrophic wildfire that could adversely affect riparian habitat and the fauna and flora that use it.

Neither action alternative would adversely affect wetlands due to proposed project design/mitigation and timing. Positive effects would occur under both alternatives due to enhancement activities. Neither action alternative would adversely affect floodplains.

Soil Health and Long-Term Productivity. Regional guidelines for protecting the soil resource (FSH 2509.18-92-1) state that no more than 15% of an area will be left in a detrimentally compacted, displaced, puddled, severely burned, and/or eroded condition. This is obtainable through the project timing and the project design/mitigation measures for the project implementation (Appendix C).

Soil Compaction and Rutting Hazards. Soil compaction and rutting hazards are slight to moderate and can be avoided by restricting activities to periods of low soil moisture or when the ground is frozen (NRCS 1997; R2 Soils Group, 1999). Timing and project design were considerations for the project. Under Alternative 2, Units A and B would be harvested at a time of moderate to low soil moisture conditions per project design/mitigation measures. Unit C would be harvested when

soils are frozen. Under Alternative 3, Units A and B would be harvested during the dry summer season with project design/mitigation measures in place to protect soils if soils become too wet.

The primary soils in the project units are Thornburgh (Unit B) and Needleton soils (Unit A and C); both have loamy surface textures and are considered well drained. Both soils can have problems with compaction, displacement, and puddling. However, when soil conditions are above the plastic limits, or during low soil moisture conditions, or frozen, effects of these properties should be minimal within the sale area. Unit C has areas interspersed with wet soils. These soils would be harvested when the surface is dry or frozen to avoid displacement and puddling.

Approved skid trails and temporary roads would be located to minimize short-term detrimental conditions such as rutting, and long-term detrimental conditions, such as compaction, at less than 15%.

Following harvest operations, project design includes the requirement that skid trails and landings would be reclaimed by removing berms, covering with slash, installing waterbars, and seeding if necessary.

Soil Fertility. Soil productivity depends on organic matter and nutrients. Soil productivity can be degraded if humus and topsoil, or even excess leaves and limbs, are taken offsite. In Units A, B and C under the action alternatives, coarse woody debris would be left at the rate of 12 to 15 tons/acre. This material would provide source material for decomposition. The treatment in Unit B would create a more open woodland. Excess woody material would be removed or burned. Soils in this type are mollisols with a dark surface, indicating a condition that at one time had a grassland or shrubland appearance. The loss of woody debris should not affect future grass and shrubland site productivity.

Soil Heating. At all landings, activity slash would be required to be piled for future burning. Activity fuels within Units A, B, and C would be lopped and scattered to less than 24 inches in height; where concentrations exceed 15 to 20 tons/acre jackpot burning would be utilized to reduce fuel loading.

Alternatives 2 and 3 would have low intensity jackpot burning only in limited areas of high slash concentrations. This activity would lead to a flush release of nitrogen that would be rapidly used by new plant growth. However, some of this rapid release would be in a volatile state and lost in the atmosphere while the rest may become mobile in the soil, moving offsite. The movement offsite would be minimal given the low severity of the jackpot burning. The ground cover left in the action alternatives is estimated at >60%. Slash piles would be located near landings and burned.

Soil Erosion. Erosion hazard is slight on 0-14% slopes, moderate on 15-35% slopes, and high on slopes greater than 35% (NRCS 1997). For the action alternatives surface erosion amounts would be minimal until forest cover or grassland cover is reestablished. Using the Water Erosion Prediction Project (WEPP) model (Elliott, 2000), the amount of on site erosion for both alternatives has been calculated. The WEPP model is a complex computer program that describes the processes that lead to erosion. These processes include infiltration, runoff, soil detachment, transport, deposition, plant growth, and residue decomposition. The model daily calculates the soil water content in multiple layers and plant growth/decomposition. However, it must be noted that WEPP is only a model and it is only a comparison tool. Proportions rather than exact amounts should be compared.

WEPP estimated values were found to be less than 1 tons/acre. To put this data in perspective, 1/10 of an inch of soil lost over an acre is estimated at 16 tons/acre. The actual model data can be found in the project files. It is estimated after five years with adequate tree regeneration the surface erosion rate would be negligible. If the jackpot burning results in a severe fire, surface

erosion would still be less than 1 tons/acre. Implementation of project design criteria in Appendix C would minimize the potential erosion predicted above.

Regeneration Hazard. Seedling mortality refers to the probability of the death of naturally occurring or planted tree seedlings, as influenced by kinds of soil or topographic conditions. Seedling mortality is caused mainly by too much water (soil wetness) or too little water (soil droughtiness). Soils within the project have a low to moderate risk of seedling mortality. Unit A would meet the five-year regeneration standards. Unit C would have aspen and conifer regeneration.

Landslides. Only Unit C would have possible minor, small-scale soil movement due to the nature of the existing landslide topography, loss of vegetation, and subsequent increases in soil moisture. This should be offset by the benefit of an increase in aspen, willow, and grass/sedge species. No roads are present or planned in Unit C. Mitigation measures restrict timber harvest activities on steep slopes and reduce the risk and effects from any potential slope failures or initiation of small slides. The ten-acre treatment in Unit C is not of sufficient magnitude or intensity, considering that this is <0.5 of the analysis area, to activate a large earthflow.

3.3.3 Cumulative Effects on Watershed Resources

Numerous factors particularly related to watershed cumulative effects analyses were considered. These factors include:

- Additive effects of past, present, and reasonably foreseeable activities
- Location of proposed disturbances relative to sensitive areas and degraded systems
- Timing, severity, and duration of disturbances and their effects
- Effects on state-classified beneficial uses of water
- Effects on stream health and aquatic life limiting factors
- Overall effects on functions of the riparian network
- Long-term soil productivity
- Use of this project to correct existing watershed condition concerns

In addition to these considerations, it is widely recognized that watersheds experience periodic disturbance events that vary in size, duration, intensity, and frequency. Because these events are random, some level of risk is implied when implementing a management project. This risk is a product of event probability and its consequences. To account for this risk a storm with reasonable probability of occurring is considered during project design. For this analysis, that storm is the 10-year, 24-hour event.

Both action alternatives (Alternatives 2 and 3) carry the risk of contributing to watershed cumulative effects because road reconstruction and harvest-related ground disturbance would occur. Exhaustive analyses of the action alternatives demonstrate management requirements and mitigation measures factored into the design to provide adequate control to reduce potential direct and indirect effects to a level of insignificance. Thus, any contribution to cumulative effects, up to the design storm, have either been eliminated or adequately mitigated. Therefore, neither action alternative is expected to contribute to watershed cumulative effects.

Past prescribed burning and timber harvest in the analysis area have not caused detrimental erosion, sedimentation or compaction, and did not remove excessive ground cover, organic matter or nutrients from the sites. Grazing management would continue under Forest Plan direction and standards and guidelines. An allotment management plan (AMP) for the Rattlesnake Allotment is

scheduled for completion in 2003, when any adjustments to grazing could be re-examined. Noxious weeds would be monitored and treated as needed. In the past, the unarmored fords on the creeks and poor road location caused minor sedimentation; this would be minimized in the future through the project actions. Past actions and present conditions that increase the sedimentation that is occurring would continue under no action. Sedimentation would decrease under the cumulative beneficial effects of either action alternative that armor stream crossings, relocate poor road locations, and implement BMPs for forestry and soil and water conservation.

Past and present conditions that have lead to the down cutting of the previously mentioned unnamed stream would continue under the no action alternative and the action alternatives.

3.4 Heritage Resources

3.4.1 Existing Condition

Livestock grazing, recreation, minor timber harvest, and road building have occurred in portions of the project area. A Class III cultural resources inventory of the project area was completed in the fall of 2001. No cultural resource sites were located.

3.4.2 Effects on Heritage Resources

No direct effects would result from implementation of any alternative. New sites discovered during the course of project implementation would be protected from ground disturbance while on-site evaluations of their significance and treatment are made in consultation with the SHPO.

3.4.3 Cumulative Effects on Heritage Resources

There would be no effects to the heritage resources from any alternative.

3.5 Transportation System

3.5.1 Existing Condition

FSR 402 provides access for range management, noxious weed treatments, recreation, private land/agriculture-ranch access, forest products removal, fire suppression, and fuel management activities.

It is designated a Level 2 road, which describes a road that is typically not passable in a conventional passenger sedan. Maintenance is conducted at a minimal level.

3.5.2 Effects on the Transportation System

Effects of Alternative 1 on the Transportation System. From the Forest boundary, the road has no access restrictions. The portion of FSR 402 that is within the analysis area would continue to be managed as a Level 2 road with three substandard fords.

Effects of Alternatives 2 and 3 on the Transportation System. Portions of this road (2000-2500 feet) would be reconstructed to standard through minor relocation, where necessary and appropriate, with the addition of three armored fords, to improve the grade and drainage and protect watershed conditions. The portion of road abandoned due to relocation would be ripped and waterbarred to reduce surface compaction. These actions would improve overall soil and water conditions in the project area.

Following the project, access to FSR 402 would be restricted year round with a locked gate on Forest Service system land at the north end of the private land inholding (T54N, R104w, Sec. 33).

The road would be closed to motorized public use. Motorized administrative use would be allowed, as long-term access and the presence of the road is needed for timber and forest health issues such as insect and disease, fuels reduction, prescribed burning and fire suppression, range administration and range project maintenance, wildlife, and other multiple-uses in the area.

Grazing permittees, special-use permit holders, and other agency personnel would need to obtain an authorization from the appropriate level line officer for motorized access on FSR 402 where it is located on the Forest. Public access off-Forest would be a continuation of the existing situation, that is, permission is needed from the landowner, as no public right-of-way exists.

This road closure would affect about 1.5 miles of low standard road and improve wildlife habitat effectiveness and semi-primitive non-motorized recreation while still allowing resource management activities and authorized uses. Access to private land inholdings would remain open.

3.5.3 Cumulative Effects on the Transportation System

No cumulative effects on transportation were identified during the analysis.

3.6 Socio-Economic

3.6.1 Existing Condition

Over the past 90+ years, livestock grazing has occurred in the analysis area. There is one term grazing permit(s) authorized in the project area. A small timber sale occurred in 1999, along with about 200 cords of commercial firewood

3.6.2 Effects on Socio-Economics

Effects of Alternative 1 on Socio-Economics. No wood products would be supplied, and no local benefits from the sale of wood products would be realized.

Effects of Alternatives 2 and 3 on Socio-Economics. In Alternative 2, the winter/spring operation would lessen impacts to agricultural and recreation uses on adjoining private land and the use of FSR 402 on private land (traffic and noise). Wintering wildlife would be affected as described in the wildlife section. In Alternative 3, a trade-off exists and wildlife would be less disrupted but a greater effect to the summer operation of the neighboring Mooncrest Ranch would occur, primarily to agricultural use, private land recreation use, and increased traffic, noise and dust on the road.

Selection of either Alternative 2 or 3 would require that an access agreement across private land between the Shoshone National Forest and the Mooncrest Ranch be negotiated. The private landowner's preference for when access to the project area occurs may affect which alternative and season of use is can be implemented.

Commercial timber harvest contributes to the local economy and provides a commodity. The proposed actions would contribute to the local economy and local forest products industry by producing forest products and employment and through procurement of services and products associated with project implementation. The level of sawtimber harvest is small, designed with multiple use objectives in mind rather than volume as the primary objective.

The livestock operator and livestock grazing within the project areas would be affected by proposed management activities; a temporary decrease in available range would result by restricting cattle access to the treated areas while aspen regeneration takes place. Livestock grazing would need to be coordinated to protect project areas from livestock damage following treatment.

The effect to commercial livestock grazing in treated aspen stands is that areas would be managed until aspen regeneration is six feet tall. To comply with the Forest Plan standards and guidelines, where there has been manipulation to induce aspen regeneration, do not allow aspen seedlings to be grazed by livestock more than one out of three years. Structural range improvement locations are known and would be avoided, therefore no damage to these types of improvements are projected.

Figure 7 below summarizes the results of the financial analysis conducted by alternative for the proposed silvicultural treatments. Quantifying resources that are not typically valued in terms of dollars can be misleading due to the difficulty in assigning monetary value to resources such as wildlife, vegetation diversity, scenic quality, watershed condition, and recreation opportunities. For this reason these resource values were not quantified in terms of dollar values and were not included in an economic efficiency analysis.

	Alternative 1	Alternative 2	Alternative 3
Present Value benefits	0	\$70,048.66	\$67,819.61
Present Value costs	-\$4,465.60	\$29,704.43	\$29,704.43
Net Present Value	-\$4,465.60	\$40,344.23	\$38,115.18
B/C Ratio	N/A	2.36	2.28

Figure 7

Financial analysis by alternative.

The analysis of strictly revenues and costs for Alternatives 2 and 3 reveals a positive present net value and associated benefit/cost (B/C) ratio. From a strictly financial perspective Alternative 2 is a slightly better choice than Alternative 3. All costs are deemed necessary and appropriate to move the vegetation in the analysis area toward the project goals using silvicultural treatments while taking into consideration necessary design criteria and mitigation.

3.6.3 Cumulative Effects on Socio-Economics

This section discloses past, present, and reasonably foreseeable effects from federal and private land activities in the analysis area over the next ten years. The past, present, and future actions, including the proposed action, would have the cumulative beneficial effects of increased forage for wildlife and the resultant increase in elk and deer (hunting and wildlife viewing opportunities), long-term increase of forage, and forest products made available for the local community. Adjoining private land uses such as ranching, irrigation for agriculture, and recreation would not be adversely affected. Given that no minority or low-income populations are identified in the affected area there is no disproportionate effect from any alternative on such populations regarding environmental justice concerns or factors.

3.7 Visual Resources

3.7.1 Existing Condition

The natural-appearing characteristic landscape includes spruce/fir, aspen, Douglas-fir and lodgepole pine forests, shrublands, and grass meadows. The analysis area has been slightly modified by human activities such as prescribed burning, timber management, roads, recreation, and livestock grazing for decades. Natural events of wildfires, winds, insects and disease also have played a part in shaping the landscape.

3.7.2 Effects on Visual Resources

Under Alternative 1, there would be no indirect and direct effects, as there would be no treatments. Only the forces of natural events could change the visual landscape.

Under the action alternatives, project implementation would not exceed Forest Plan standards by ensuring that management activities are not visually evident or they remain visually subordinate. The shape, size, and location of all harvest activities shall be designed to imitate natural patterns in the characteristic landscape.

By minimizing slash piles, skid trails, and landings, visual quality objectives would comply with the Forest Plan. Skid trails and temporary roads would be returned to near natural conditions to remain visually subordinate.

3.7.3 Cumulative Effects on Visual Resources

Management activities were reviewed for cumulative effects on visual resources. Considered in concert the past, present, and future activities help to define the future environment of the treatment and analysis area. Cumulative effects would be negligible for all alternatives. In the long-term, the proposed action alternative would meet the visual quality objective of remaining visually subordinate (page III-132).

3.8 Wildlife Resources

The US Fish and Wildlife Service has identified two endangered species, three threatened species, one proposed species, and one experimental population that is to be managed the same as a proposed species, which may possibly occur on the SNF. No proposed or critical habitat for any of these species has been designated within the analysis area. The Endangered Species Act requires evaluation of potential effects of actions on listed and proposed species and designated and proposed critical habitat, and a determination as to the effects of the action.

Region 2 of the Forest Service has designated some species of wildlife as sensitive, thus requiring an in-depth look during project design and analysis. There are 38 species listed on the R-2 sensitive species list that may possibly occur on the SNF. Forest Service Manual direction requires a review of all actions and the potential effects of the actions on wildlife species designated by Region 2 as sensitive on the Shoshone.

Seventeen wildlife species, in addition to game trout, were selected during the forest planning process to be management indicators. The management indicators species (MIS) for the SNF include five featured species that are hunted, five recovery species, and seven ecological indicator species. Methods used to select indicator species or groups of species are explained in detail in the planning records for the Forest's Land and Resource Management Plan. Those MIS (or their habitat) that may be affected by this proposal were evaluated relative to the effects of this action and will be addressed in this document.

Habitat requirements for all proposed, listed, sensitive, and MIS were a major consideration in the formulation and project design of this proposal. The scope of this wildlife analysis was limited to those listed, sensitive, and management indicator species, or their habitat that may be potentially affected by this action. The analysis is based on estimating the effects of changes in vegetation type, timber age classes, community composition, and yearlong suitability of habitat related to the mobility of potentially affected species. Analysis of effects and a determination of the effects of the action on each species (or group of species when habitat requirements are similar) are included. This analysis focused on identified issues in the context of this direction.

A preliminary analysis of all proposed, listed, Region 2 sensitive, and Forest Plan indicator species (MIS) and their habitat requirements was completed for this proposal, and documented in the Wildlife and Botanical Report, which is contained in the project file. This preliminary analysis determined which wildlife and plant species or their habitats were likely to be present within the proposed project area, and which species or groups of species should be carried further in the analysis process. All species were reviewed, and all were considered for evaluation relative to this project; however those species outside of any effects of the proposal either geographically or biologically were eliminated from further evaluation.

Those species on which this proposal would have no effect, their status, and the reason they were eliminated from further evaluation or discussion are shown in figure 8.

Species	Status	Reason for elimination from further evaluation
Black-footed ferret (<i>Mustela nigripes</i>)	Endangered MIS	No suitable habitat
Mountain plover (<i>Charadrius montanus</i>)	Proposed	No suitable habitat
Whooping crane (<i>Grus americana</i>)	Endangered	No suitable habitat
Peregrine falcon (<i>Falco peregrinus</i>)	Sensitive	Habitat (cliffs) not affected
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Threatened MIS	No suitable habitat
Merlin (<i>Falco columbarius</i>)	Sensitive	No suitable habitat
Ferruginous hawk (<i>Buteo regalis</i>)	Sensitive	No suitable habitat
Osprey (<i>Pandion haliaetus</i>)	Sensitive	No suitable habitat
Fringed myotis (<i>Plecotus thsanodes</i>)	Sensitive	Habitat (caves) not affected
Townsend's big-eared bat (<i>Plecotus townsendii</i>)	Sensitive	Habitat (caves) not affected
Spotted bat (<i>Euderma maculatum</i>)	Sensitive	No suitable habitat
Dwarf shrew (<i>Sorex nanus</i>)	Sensitive	No suitable habitat
Water vole (<i>Microtus richardsoni</i>)	Sensitive	No suitable habitat
Allen's thirteen-lined ground squirrel (<i>Spermophilus tridecemlineatus alleni</i>)	Sensitive	No suitable habitat
Common loon (<i>Gavia immer</i>)	Sensitive	No suitable habitat
Trumpeter swan (<i>Cygnus buccinator</i>)	Sensitive	No suitable habitat
Harlequin duck (<i>Histrionicus histrionicus</i>)	Sensitive	No suitable habitat
Long-billed curlew (<i>Numenius americanus</i>)	Sensitive	No suitable habitat
Upland sandpiper (<i>Bartramia loicauda</i>)	Sensitive	No suitable habitat
Black tern (<i>Chlidonias niger</i>)	Sensitive	No suitable habitat
Sandhill crane (<i>Grus canadensis</i>)	Sensitive	No suitable habitat
Burrowing owl (<i>Athene cunicularia</i>)	Sensitive	No suitable habitat

Species	Status	Reason for elimination from further evaluation
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Sensitive	No suitable habitat
Yellowbilled cuckoo (<i>Coccyzus americanus</i>)	Sensitive	No suitable habitat
Lewis' woodpecker (<i>Melanerpes lewis</i>)	Sensitive	No suitable habitat
Baird's sparrow (<i>Ammodramus airdii</i>)	Sensitive	No suitable habitat
Fox sparrow (<i>Passerella iliaca</i>)	Sensitive	Habitat (sage/riparian) not affected
Brewers sparrow (<i>Spizella breweri</i>)	MIS	Habitat (sagebrush) not affected
Bighorn sheep (<i>Ovis Canadensis</i>)	MIS	Outside range of normal occurrence, incidental use may occur
Mountain goat (<i>Oreamnos Americana</i>)	MIS	No suitable habitat
Beaver (<i>Castor canadensis</i>)	MIS	Insufficient amount of suitable habitat

Figure 8

Because of the potential effects of this project on big-game habitat, potential spring grizzly habitat, and aspen/deciduous plant communities, the following discussion will focus on grizzly, elk, and ruffed grouse. Grizzly will be analyzed relative to timing of activities during the spring period and potential enhancement of habitat value and habitat effectiveness. Elk will be analyzed in-depth relative to the potential effects of this proposal on winter range, spring birthing range, and the timing of this management action relative to their use of the analysis area during these periods. The effects of this proposal will be analyzed in-depth relative to ruffed grouse, as it is an indicator for aspen communities, and aspen enhancement is one of the primary objectives of this proposal.

3.8.1 Grizzly Bears

The grizzly bear was identified during scoping as a species of concern regarding this proposal. The grizzly bear is a listed threatened species as well as a Forest management indicator species (recovery species). The major concern relative to this project and grizzly use relates to timing of treatment activities, especially during the spring period.

Existing Condition. The project area lies outside of the recovery area and grizzly use occurs only occasionally. Outside the recovery area, consideration for grizzly bears and their habitat in other resource related decisions is not directed.

Habitat enhancement to encourage additional grizzly use is not a goal in the project area because of its close proximity to the Mooncrest Ranch headquarters, however this action, in order to attain other resource objectives, will likely result in long-term habitat enhancement for the bear.

Grizzly/human conflict minimization is a high priority management consideration throughout the North Zone of the Forest even outside of the recovery area. This includes the Rattlesnake Creek area, and as such all contracts, permits, and operating plans will contain conditions requiring proper storage of attractants, training relating to working in bear country for all personnel, and temporary cessation of activity if grizzly/human conflicts occur.

Early vegetation green-up occurs in the Rattlesnake Creek area, thus providing some potential habitat important to bears during the critical spring period, as major food sources are available. Bear distribution is most limited during the spring period, and protein rich foods are needed in early spring when bears emerge from denning, in order to put weight on and for lactating females with cubs. Succulent vegetation, carrion, and elk calves provide the major protein sources for bears in spring and early summer, and this analysis area contains these food sources.

All major protein areas (winter range/birthing areas) for grizzly, as presently mapped for the grizzly bear cumulative effects model, are outside of but immediately adjacent to the proposed treatment area. However, the treatment area is used incidentally by big game during both the winter and spring periods, and setting succession back would encourage much more use of the area. Over one-half of the Rattlesnake watershed provides the potential for supplemental ungulate protein food for grizzly bears.

In order for grizzly bears to persist in a given area, the habitat must provide the elements required for their survival. All bear habitat within the study area is rated according to relative habitat value and habitat effectiveness. Seasonal habitat values are presently low to moderate within the analysis area; however, there are opportunities within the treatment area to enhance these values to some degree.

Secure habitat values and seasonal habitat effectiveness values are low to moderate in the treatment area, due primarily to human activities associated with adjacent private land activities and the open road.

Even though the proposed project area is outside the recovery area, design criteria (conservation measures and mitigation measures) contained in the Grizzly Bear Guidelines, Grizzly Bear Recovery Plan, the SNF Forest Plan, and closure orders were integrated up-front in the design of this proposal to the extent that they did not conflict with the stated objectives of the proposal. This was done to comply with the intent of regulations and plans to implement conservation measures that benefit the bear when opportunities exist. Such up-front design allows implementation of and compliance with these design criteria such that the proposal will likely benefit and contribute to the conservation of the grizzly bear in the long-term, and adverse effects are minimized to the degree that the project will not likely adversely affect the grizzly bear in the short-term.

Effects on Grizzly Bears. Design criteria to minimize potential adverse effects on grizzly bears were integrated into design of the project for both action alternatives, and would be included as conditions in any associated contracts and operating plans as necessary and appropriate.

- Activity would be limited in time by contract (three years).
- No public access would be allowed during treatment.
- No logging camps would be allowed within the treatment area.
- A security area in excess of 5000 acres would be maintained adjacent to the project (upper Rattlesnake and Robbers Roost Creek area).
- The timber sale contract would include a clause providing for temporary cessation of activities, if needed, to resolve potential or existing grizzly/human conflict(s).
- Food and garbage storage orders would be adhered to. Crews would be required to have available bear proof containers for storage of attractants such as lunches, garbage, and beverages, and would be required to remove attractants from the work area each day.

- All crews would be trained in measures to minimize grizzly/human conflicts as well as proper attractant storage, bear behavior, recommended human behavior in conflict situations, and the use of bear repellent spray.

Effects of Alternative 1 on Grizzly Bears. Natural processes and disturbances would continue to affect grizzly habitat within the project area. The shrub/grass foraging areas and aspen and willow stands would continue to decrease as conifers colonize them. This is expected to reduce the availability of forage for elk and other big game during the wintering and spring birthing periods as conifer colonization steadily reduces the sagebrush/grassland habitats. This loss of habitat diversity and foraging areas would result in less use by big game, and thus result in a decrease in habitat value due to loss of potential prey for the grizzly bear.

Effects of Alternative 2 on Grizzly Bears. The project area would be largely unavailable to bears during the critical spring period. Use of the treatment area (habitat effectiveness) would likely decrease as disturbance related to treatment activities would temporarily displace any individual bears using the area. Although effects would be expected to be adverse on some individuals, they would most likely be insignificant (immeasurable). No permanent displacement would be anticipated.

As spring habitat is much more limited than summer habitat, bear use is more likely to be concentrated in the treatment area during this spring period than in other periods. Therefore, this alternative has the highest potential for having bears frequenting the treatment area, the highest risk of temporarily displacing bears, and the highest probability for grizzly/human encounters. However, as the treatment area is not high quality habitat, bear use is infrequent, and grizzly/human conflict prevention measures are in place, the potential for adversely affecting grizzly bears is negligible.

Because conflict prevention and resolution measures are part of the proposal, no acclimation of bears to human food would be expected in the short-term, and no mortality of bears would be expected.

Potential beneficial effects on habitat effectiveness (bear use of the area) would likely occur due to access restriction. Design criteria to minimize disturbance and enhance habitat effectiveness from vehicle intrusions in the long-term would be:

- All public motorized vehicle access would be restricted after completion of the project, and motorized administrative access would be limited during critical periods (spring and fall) to 14 days per year.
- Strips and patches of forested area would be left untreated to assure adequate cover and corridor linkage for security and movement.
- The road entrance would be designed for effective closure upon completion of sale activity.

Potential beneficial effects on habitat value would likely occur over the long-term due to favoring of vegetation types, seral stages, and vegetative patterns favorable to grizzly bear prey, as well as protecting linkage and enhancing interspersions of types relative to the daily cruising radius of individual bears. This alternative would also benefit the bear in the long-term due to restrictions on motorized use.

Alternative 2, may effect, but is not likely to adversely affect the grizzly bear or its habitat. The rationale for this determination is that the design criteria (conservation measures and mitigation measures) contained in the Grizzly Guidelines and Grizzly Bear Recovery Plan, which were incorporated into the programmatic SNF Forest Plan and described above in the effects section,

were integrated as an integral part of the design of this alternative in order to achieve the enhancement intent of Section (a)(1) of the Endangered Species Act.

Effects of Alternative 3 on Grizzly Bears. The effects of this alternative on grizzly bear are the same as in Alternative 2 with the following exception. Because treatment activity would occur only during the summer with this alternative, there would be no short-term effect of temporarily displacing bears during the critical spring period as might occur in Alternative 2. There would however be some slight likelihood of displacement of bears during the summer period, however effects of this temporary displacement are negligible. Overall, this alternative has less potential for disturbing and displacing individual grizzly bears than Alternative 2.

Alternative 3, may effect, but is not likely to adversely affect the grizzly bear or its habitat. The reasoning for this determination is that the design criteria (conservation measures and mitigation measures) contained in the Grizzly Guidelines and Grizzly Bear Recovery Plan, which were incorporated into the programmatic SNF Forest Plan and described above in the effects section, were integrated as an integral part of the design of this alternative in order to achieve the enhancement intent of Section (a)(1) of the Endangered Species Act.

3.8.2 Elk

Existing Condition. Elk (*Cervus canadensis*) is a featured species MIS due to its commonly hunted status. It is the primary species that has relevance to this decision, and whose winter/birthing habitat would be enhanced with this proposal. The project area is presently not designated as crucial wintering habitat or primary birthing area and the area is presently marginal for such use because of the lack of forage due to advancing succession. However, the area is immediately adjacent to both wintering and birthing areas and does receive occasional use during the winter and spring periods. If succession were to be set back and forage components were to be enhanced in the project area, habitat value would be enhanced, as additional quality habitat for both wintering and birthing would be provided.

Effects on Elk. Design criteria to minimize potential adverse effects on elk were integrated into design of the project for both action alternatives, and would be included as conditions in any associated contracts and operating plans as necessary and appropriate.

- Activity would be limited in time by contract (three years).
- No public access would be allowed during treatment.
- No logging camps would be allowed within the treatment area.
- A security area in excess of 5000 acres would be maintained adjacent to the project (upper Rattlesnake and Robbers Roost Creek area).

Effects of Alternative 1 on Elk. Natural processes and disturbances would continue to affect elk habitat within the project area. The shrub/grass foraging areas and aspen and willow stands would continue to decrease as conifers colonize them, until such time as major disturbance such as wildfire occurs, thus setting back succession. This trend is expected to reduce the availability of forage for elk and other big game during the wintering and spring birthing periods as conifer colonization steadily reduces the sagebrush/grassland habitats. This loss of habitat diversity and foraging areas would result in loss of habitat value and less use by elk.

Effects of Alternative 2 on Elk. The timing of treatment is of major concern relative to this project. This alternative does provide for treatment activity during both the wintering period and spring birthing period for elk. This alternative calls for habitat enhancement in Unit C. Because of the wet conditions, the only option for enhancing aspen in Unit C is to do so during the winter period when the ground is frozen.

Because of the increased human activity, elk would likely be disturbed and temporarily displaced during the spring and winter periods. Therefore the treatment area and areas immediately adjacent to roads (within ¼ mile) would be largely unavailable to elk during project activities. However, due to the activity associated with long-term existing ranching activities in the area, the elk are somewhat acclimated to human activities, and displacement is expected to be minimal. In addition, there are areas in the immediate vicinity where the elk could relocate that contain adequate forage and would not result in conflicts with other activities.

Potential beneficial effects on habitat value would likely occur due to favoring vegetation types, seral stages, and vegetative patterns favorable to elk, as well as providing linkage and enhanced interspersions of types relative to the daily cruising radius of individual elk during the critical winter and spring period. Adequate timber stands would be left untreated, and these in conjunction with the varied terrain would provide adequate long-term thermal cover for elk and other big game species.

Potential beneficial effects on elk use of the area (habitat effectiveness) would likely occur due to access restriction. Hiding cover is a concept of consideration relative to motorized intrusions during critical seasonal periods and during hunting season in the area. Hiding cover is not of major concern relative to this project as sufficient timber stands would be left untreated to provide adequate hiding cover, areas along streams are not being treated, and motorized access would be very limited in the project area after treatment.

Design criteria to minimize disturbance and enhance habitat effectiveness over the long-term from vehicle intrusions would be:

- All public motorized vehicle access would be restricted after completion of the project, and motorized administrative access would be limited during critical periods (spring and fall) to 14 days per year.
- Strips and patches of forested area would be left untreated to assure adequate cover and corridor linkage for security and movement.
- The road entrance would be designed for effective closure upon completion of sale activity.

During the period of operations, short-term direct effects due to temporary disturbance or displacement would be expected to be adverse on some individuals, but most would most likely be insignificant (immeasurable). No permanent displacement would be anticipated. No measurable effects would be anticipated on productivity and recruitment of elk because they are somewhat acclimated to human activity, and any displacement that occurs would move elk to other adjacent secure areas having sufficient forage for survival.

As deciduous vegetation and earlier succession habitats would be enhanced, long-term effects on habitat would be beneficial. There would be no measurable effects on elk population trends with implementation of this alternative.

Effects of Alternative 3 on Elk. Effects of this alternative are similar to Alternative 2 with the following exception. As this alternative allows treatment only during the summer period, there is no potential for adverse short-term effects relative to disturbance and displacement of elk during the critical wintering and birthing periods. As deciduous vegetation and earlier succession habitats would be enhanced, long-term effects on habitat would be beneficial. The amount of habitat enhancement would be 10 acres less than in Alternative 2 because Unit C would not be enhanced. There would be no measurable effects on elk population trends with implementation of this alternative.

3.8.3 Ruffed Grouse

Existing Condition. The ruffed grouse (*Bonasa umbellus*) is a Forest Plan MIS and is present on the Forest in very small numbers. It is dependent on a mosaic of aspen stands of differing seral stages for food and shelter needs, and is found only where larger acreages of aspen exist. The aspen type is very limited within the project area, and the few existing stands are older age-classes and most are heavily encroached due to advancing succession. Due to the old age structure of most stands in the project area, it is presently poor quality habitat for grouse. It is not known if ruffed grouse actually use the area at present due to its marginal status. However, opportunities do exist for enhancing the amount and quality of potential grouse habitat by manipulation of vegetation to enhance aspen.

Effects of Alternative 1 on Ruffed Grouse. Natural processes and disturbances would continue to affect grouse habitat within the project area. The aspen and other deciduous types would continue to decrease as conifers colonize them, until disturbance from wildfire occurs. Until major disturbance occurs, aspen clones would continue to age and die due to apical dominance, thus eliminating essential habitat components for aspen related species such as ruffed grouse.

Effects of Alternative 2 on Ruffed Grouse. As ruffed grouse are directly dependent on differing seral stages of aspen for survival, this alternative would provide the greatest amount of habitat for the grouse as it enhances the highest amount of aspen habitat (15 acres). The only short-term adverse effects may be displacement of individuals, if they do still exist in the area. The long-term indirect benefits of this alternative would be an increase in the amount and structure of aspen, the enhancement of interspersions of types, and an increase in the amount and number of vegetative edges.

Effects of Alternative 3 on Ruffed Grouse. The potential beneficial effects of aspen treatment on ruffed grouse habitat by this alternative are expected to be significantly less than with Alternative 2. The 10 acres of aspen in Unit C cannot be accessed during the summer period due to wet conditions, and only the five acres of aspen in Unit B would be enhanced.

3.8.4 Other Wildlife Species

Amphibian Group.

<u>Species</u>	<u>Status</u>
Tiger salamander (<i>Ambystoma tigrinum</i>)	Sensitive
Boreal western toad (<i>Bufo boreas</i>)	Sensitive
Northern leopard frog (<i>Rana pipens</i>)	Sensitive
Columbia spotted frog (<i>Rana luteiventris</i>)	Sensitive

Potential wetland habitat does exist in and adjacent to the pond in the project area for these sensitive species. However, such habitat would not be disturbed with any of the alternatives. The area adjacent to the pond would not be entered in Alternatives 1 and 3, and Alternative 2 allows entry only during the winter period when the ground is frozen and these species are deep underground in hibernation. Therefore, there would be no effect on these species or their habitat by implementing any of the alternatives.

Mature and Old Growth Forest Bird Group.

<u>Species</u>	<u>Status</u>
Hairy woodpecker (<i>Dendrocopos villosus</i>)	MIS
Goshawk (<i>Accipiter gentiles</i>)	MIS, sensitive
Boreal owl (<i>Aegolius funereus</i>)	Sensitive
Black-backed woodpecker (<i>Picoides arcticus</i>)	Sensitive
Northern three-toed woodpecker (<i>Picoides tridactylus</i>)	Sensitive
Golden crowned kinglet (<i>Regulus satrapa</i>)	Sensitive
Pygmy nuthatch (<i>Sitta pygmaea</i>)	Sensitive
Olive-sided flycatcher (<i>Contopus borealis</i>)	Sensitive

The project area does contain some mature forest, however vertical structure, canopy cover, numbers of large snags, horizontal structure near the ground, and dead/down are very limited due to the extremely dry site conditions. Adjacent areas within the drainage do contain some high quality mature and old growth stands that compose approximately 12% of the analysis area.

The mature stands in the treatment area are primarily older age class Douglas-fir stands with an open understory. Most of the treatment area is located on the transition zone between the sagebrush grasslands and coniferous timber. Due to the poor quality of old growth, and the lack of quality components relative to both horizontal and vertical structure within those older stands, the existing quality of habitat for these species is poor. Because of small amount of habitat being treated, the poor quality habitat, and the resultant low levels of use by these bird species, this action may impact individuals but not populations within this group. Alternative 2 would have the greatest potential for impacting individuals, as treatment occurs during the spring nesting period and displacement, nest abandonment, and nest destruction could possibly occur. Alternative 3 would result in less effect on this bird group since there is no treatment during the spring nesting period and temporary displacement of individuals would likely be the worst-case scenario. Neither alternative is likely to cause a trend to federal listing or a loss of viability of any of the species.

Mature and Old Growth Forest Mammal Group.

<u>Species</u>	<u>Status</u>
Marten (<i>Martes americana</i>)	MIS, sensitive
Fisher (<i>Martes pennanti</i>)	Sensitive
Wolverine (<i>Gulo gulo</i>)	Sensitive

A small amount of potential habitat does exist in the analysis area for pine marten, fisher, and wolverine. All of these sensitive species are generally forest dwelling species requiring some complex, large physical structures commonly associated with mesic (requiring moderate moisture) late-succession forest; all avoid large open areas such as large meadows or clearcuts.

Physical structure of the forest appears to be more important than species composition of the vegetation, and while suitable habitat is not necessarily old growth, there is little question that some preferred components are representative of old-growth structures. Such forest structure can be characterized by a diversity of tree sizes and shapes, light gaps and associated understory vegetation, snags, fallen trees and limbs, and limbs and other shrubby vegetation close to the

ground. There appears to be a preference and a need for structure near the ground, especially during the winter.

Stands in which dens of marten, fisher, and to a lesser extent wolverine have been found are characterized by downfall, snags, large trees, hollow trees and stumps. Until more definitive information on habitat of these carnivores becomes available, it appears that denning habitat can be provided by preserving and recruiting large snags, decadent broken-top trees, and downfall as potential components of structural diversity necessary for den sites in closed-canopy forests.

The pine marten, a Forest MIS for late succession coniferous forest, prefers habitat that includes some late succession stands of mesic coniferous forest in contiguous blocks with a high degree of canopy closure; a large amount of dead, down and decaying woody material; and a complex physical structure near the ground. No surveys have been conducted for the marten in the area, however it is unlikely that pine marten use the proposed treatment area due to the lack of structure they require.

Habitat requirements for the fisher, a sensitive species, include late succession coniferous forests with high canopy closure during the warmer seasons, and young to mature forests in the winter.

Only two historical records of fisher are known on the Shoshone National Forest. Several fishers have been recorded in the northeast portion of Yellowstone National Park. Given this, it is unlikely but possible that the fisher could use the treatment area. Again, poor composition and near-ground structure offer little quality habitat, and any use would likely be only incidental.

No surveys have been conducted for another sensitive species, the wolverine, in the North Fork drainage. Two wolverines were observed in Sunlight Basin in the fall of 1986, and another in 2002 on the Beartooth Plateau, which are more than 10 miles from the project area. Wolverines could use suitable habitat in the North Fork area (Luce, personal comm. 1996). Preferred habitat is generally high altitudes during the summer and lower elevation forested areas during the winter period. Wolverines appear to be very intolerant of human activity, and there is human activity throughout the analysis area most of the year.

Late seral Douglas-fir forests dominate the proposed treatment area. Pine marten, fisher, and wolverine, which require large blocks of undisturbed late seral, forested habitat to accommodate their home range sizes, could use the area on an incidental basis. However due to its poor quality relative to structure, dry conditions, and the noticeable absence of snowshoe hare, grouse, and other small mammals to supply these predators with a broad prey base, use by these species is unlikely.

Because of poor quality habitat and the resultant low levels of use by these small forest carnivores, this action may temporarily impact individuals within this group, but is not likely to cause a trend to federal listing or a loss of viability of any of the species.

Canada Lynx. The lynx (*Lynx canadensis*) is a listed threatened species. Special designated habitat for the lynx is termed potential habitat as per the 2000 Lynx Conservation Assessment and Strategy, and was delineated for the Shoshone Forest in 2000. Potential habitat was mapped and stored in the Shoshone Forest GIS database. The analysis area is not within a lynx analysis unit (LAU) (USDI USFWS Canada Lynx Conservation Assessment and Strategy) and does not appear to contain high quality habitat. The amount of timberland is limited and horizontal structure within the timbered areas is minimal. As the treatment area contains few habitat components that qualify as suitable lynx habitat, any use of the area by lynx would most likely be incidental, and therefore this action may affect, but is not likely to adversely affect the lynx or its habitat.

Gray Wolf. The gray wolf (*Canis lupus*), a MIS, which is formally listed as threatened, was reclassified as non-essential, experimental in the Yellowstone area with the publication of the

Final Rules in the Federal Register (November 22, 1994; Vol. 59, No. 244). The species was reintroduced in the Yellowstone National Park area in 1995, and as a non-essential experimental population is managed as a proposed species. This designation provides greater flexibility in the management of wolves and allows greater accommodation in land use activities. Since it is an experimental population and six breeding pairs have been established, no land use restrictions may be employed on National Forest System lands, as wolf population growth rates have remained positive toward population recovery levels (50 CFR Part 17.84(xii)(4)).

The gray wolf does use the analysis area, which has resulted in control actions because of depredation on domestic livestock and domestic dogs. Either action alternative would likely displace the wolf during treatment activity, but would be beneficial to the wolf in the long-term due to enhancement of conditions for the deer and elk, the major prey species. Therefore, this action is not likely to jeopardize the wolf, or adversely modify proposed critical habitat.

Mule Deer. The mule deer (*Odocoileus hemionus*) is a featured species of Forest Plan MIS as it is a commonly hunted species. Mule deer use early succession habitat and are common in both the analysis area and the project area. As habitat relationships are very similar to elk, it will be assumed that the effects of this project on deer will be the same as for elk.

Moose. The moose (*Alces alces*) is a featured species of Forest Plan MIS as it is a commonly hunted species. It is dependent on vegetation generally associated with riparian and other wetland types (i.e. willow), in conjunction with deciduous types and moist spruce-fir types. It is a browser, using primarily deciduous vegetation throughout the year, and fir during harsh winter conditions. Moose use of the project area is incidental at present due to the limited amount of riparian and deciduous types, as well as the dry site conditions. Either action alternative could temporarily displace individuals during treatment, but would enhance habitat conditions for moose in the long-term by increasing the amount of aspen browse. Alternative 2 has a greater potential for impact than Alternative 3 because most activity occurs during the wintering period and the spring birthing period. Due to the minimal amount of use of the project area by moose, and the small amount of habitat affected, there would be no measurable effects on moose population trends with any of the alternatives.

Blue Grouse. The blue grouse (*Dendragapus obscurus*) is a Forest Plan MIS. It requires a mosaic of vegetation types ranging from coniferous forest and deciduous vegetation to riparian habitat during different periods throughout the year. Blue grouse likely use a portion of the project area during portions of the year. Either action alternative could cause temporary displacement during treatment activities. However, as Alternative 2 occurs during the spring nesting period, disturbance during this period could disrupt courtship displays or cause nest abandonment. Alternative 3 would cause only temporary displacement as it occurs in summer. As deciduous vegetation and earlier succession habitats would be enhanced with either action alternative, long-term effects on habitat would be beneficial. There would be no measurable effects on blue grouse population trends with any of the alternatives.

3.8.5 Cumulative Effects on Wildlife

This section discloses the summation of cumulative effects from past and present activities, effects of the action alternatives, as well as effects of reasonably foreseeable activities that are likely to occur on federal, state, and private land within the analysis area over the next ten years. Cumulative effects are primarily a result of previous logging, roading, prescribed burning, fire suppression activities, insect and disease infestations, grazing, recreation uses, along with the effects from the action alternatives and any projects likely to occur in the near future.

Cumulative impacts from previous activities in the Rattlesnake drainage (both private and public land) within the past several decades have generally been beneficial to most all wildlife species.

A more desirable mosaic pattern of vegetation types and age classes has occurred due to the prescribed burning and silvicultural treatments. Livestock numbers have been significantly reduced during the past several decades, and enhanced range systems and range improvements have occurred. This has been very beneficial to early succession species, foraging species, and species requiring a diversity of habitats.

The effects of either of the action alternatives, when added to past and planned actions would only contribute to the cumulative beneficial effects over a landscape of enhancing structural diversity, improving forage availability, and decreasing road densities. The effects of this project when added to the effects of past and future projects, contributes to a long-term sustainable mosaic pattern of vegetation over the landscape that is beneficial to most all wildlife species including the species of concern for this project (grizzly, elk, and grouse).

3.9 Sensitive Plant Species/Noxious Weeds

3.9.1 Existing Condition

Noxious Weeds. Canada thistle was found in the analysis area in swales within the landslide topography of Unit C. It has the potential to spread into disturbed sites such as slash piles and landings. A small population of musk thistle was found at the south end of the analysis area along side the road. FSR 402 leading up to the analysis area is currently free of noxious weeds. A draft 2000 USFS Region 1 weed risk assessment rating was used to address potential spread, consequences, and adverse effects, and overall the project area has a low to low- moderate rating. Known infestations of noxious weeds are monitored and treated as needed.

Sensitive Plants. Sensitive plant populations have not been mapped/identified within the proposed analysis area according to the Wyoming Natural Diversity Database (WYNDD, 2002). However, a small population of a few individuals of Absaroka goldenweed was found in a sagebrush meadow along the existing project area road. The location is a forest opening that may be affected by road reconstruction.

Large populations of Hall's fescue, shoshonea, and goldenweed are found east of the project area on the flanks of Rattlesnake Mountain (WYNDD, 2002). These plants occur in grasslands, open woodlands, and shrublands with calcareous soils.

Figure 9 lists the sensitive plant species on the SNF. There are three known populations or individuals of sensitive plant species in the analysis area. The species most generally occur in the higher elevations, sparsely vegetated rocky ridge tops, talus slopes, or wet montane or alpine meadows. The analysis area does contain these some of these habitat conditions.

A discussion of the existing condition of sensitive plants in the area can be found in the *Biological Assessment for Sensitive Plants for the Rattlesnake II Vegetation Management Project*, located in the project file.

Scientific Name	Common Name	Is Habitat Present in the Analysis Area? (Habitat type)
<i>Agoseris lackschewitzii</i>	Pink agoseris	No (wet montane and subalpine meadows)
<i>Amerorchis rotundifolia</i>	Round-leaved orchid	No (known only from Clarks Fork Valley in Wyoming)
<i>Arctostaphylos rubra</i>	Red manzanita	No (known only from the Swamp Lake area in Park County)
<i>Botrychium ascendens</i>	Upward-lobe moonwort	Unlikely (based on habitat where known populations occur)
<i>Carex livida</i>	Livid sedge	No (floating mats, bogs, and fens)
<i>Descurainia torulosa</i>	Wyoming tansymustard	No (sparsely vegetated sandy slopes at base of cliffs)
<i>Festuca hallii</i>	Hall's fescue	Yes (montane meadows, usually on calcareous soils)
<i>Ipomopsis spicata</i> spp. <i>Robruthii</i>	Kirkpatrick ipomopsis	Possibly (high elevation sandy to rocky volcanic scree, rocky slopes, tundra, or meadows)
<i>Lesquerella fremontii</i>	Fremont bladderpod	No (southeastern Wind River Range in rocky limestone slopes and ridges)
<i>Muhlenbergia glomerata</i>	Marsh muhly	No (known only from Swamp Lake area in Park County)
<i>Parrya nudicaulis</i>	Naked-stemmed parrya	No (steep, alpine talus slopes, often on limestone substrates)
<i>Primula eqaliksensis</i>	Greenland primrose	No (based on habitat where other populations occur)
<i>Pyrrocoma carthamoides</i> var. <i>subsquarrous</i>	Absaroka goldenweed	Yes (open meadows, slopes and ridges on sandstone, limestone, or volcanic substrates)
<i>Salix myrtilifolia</i> var. <i>myrtilifolia</i>	Myrtleleaf willow	No (known only from the Swamp Lake area in Park County)
<i>Scirpus rollandii</i>	Pygmy bulrush	No (montane bogs, wet meadows, and edges of small pools influenced by limestone)
<i>Shoshonea pulvinata</i>	Shoshonea	Yes (shallow, stony calcareous soils of exposed limestone outcrops, ridgetops, and talus slopes)
<i>Townsendia condensata</i> var. <i>anomala</i>	North Fork Easter daisy	No (sparsely vegetated rocky slopes and ridges)

Figure 9

Sensitive Plants on the Shoshone National Forest. Shading designates the species with habitat present in the analysis area.

3.9.2 Effects on Sensitive Plants and Noxious Weeds

Effects of Alternative 1 on Sensitive Plants and Noxious Weeds. No management effects would occur to sensitive plants/weeds.

Effects of Alternatives 2 and 3 on Sensitive Plants and Noxious Weeds. Approximately 17 plant species that have been designated regionally sensitive are known or suspected to occur on the Forest. A review of the habitat requirements of those species in relation to the habitats that would be affected by project activities was made in Figure 9. It was concluded that no impact would

result from timber harvest activities on most of these species because they are generally not found in areas where harvest activities would occur. Although three species may be found in the analysis area, only Absaroka goldenweed occurs in the project area.

A small population of the Absaroka goldenweed exists in proximity to FSR 402 and a few individual plants may be lost during project activities; however, an increase in suitable habitat for the Absaroka goldenweed would result due to the creation of additional openings in Unit B. The determination is that the no action alternative and the action alternatives may impact individuals but are not likely to cause a trend to federal listing or loss of viability of sensitive plants.

For the action alternatives, a slight increase in weeds would occur due to ground disturbance and vehicles. Existing populations, such as Canadian thistle, are the most likely to increase slightly and the potential is highest in Unit C. Monitoring of the project area would occur with follow-up weed treatment implemented as needed. Treatments would be in accordance with the existing noxious weed EA for the SNF.

3.9.3 Cumulative Effects on Sensitive Plant Species and Noxious Weeds

This section discloses past, present, and reasonably foreseeable effects from federal and private land activities in the analysis area over the next 10 years.

Cumulative effects come from previous logging, roading, prescribed burning, past and present fire suppression, past and current grazing, vehicle traffic and recreation uses, along with the effects from the action alternatives. Considered in concert, the past, present, and future activities do not carry a substantial risk of cumulative effects to sensitive plant species from the acreage being treated.

A small increase in weeds such as Canada thistle is likely due to soil disturbance, especially in Unit C. The winter operation stipulated in Unit C would minimize soil disturbance and reduce the risk of weed spread to a negligible level. Considering the small percentages of the analysis area involved with treatment areas, this planned action combined with past actions would result in a small increase in weeds. Overall, the potential weed spread, consequences, and adverse effects, for the analysis area has a low to low- moderate rating. Therefore, future actions to monitor and treat weeds would be adequate to address the slight risk of weed infestation.

3.10 Irreversible and Irrecoverable Commitments of Resources

The effects analysis discussed in this chapter did not identify any irreversible or irretrievable commitment of resources. The ID Team identified no site-specific adverse effects that cannot be avoided or mitigated.

Appendix A Preparers

The following Interdisciplinary (ID) team members provided information on the project:

Core ID Team

Monte Barker	North Zone Wildlife Biologist, Shoshone National Forest
Greg Bevenger	Forest Hydrologist, Shoshone National Forest
Clint Dawson	North Zone Fire Management Officer, Shoshone National Forest
Susie Douglas	Writer-editor, Shoshone National Forest
Dennis Eckardt	Timber Management Officer, Shoshone National Forest
Dennis Gross	North Zone Forester, Shoshone National Forest
Kent Houston	Soils, Botany, Ecology, Invasive Plants, Sensitive Plants-Shoshone NF
Allen Madril	Forest Archaeologist, Shoshone National Forest
Marty Sharp	North Zone NEPA Coordinator, Shoshone National For

Extended ID Team

Joe Hicks	Range - North Zone Rangeland Management Specialist, Shoshone NF
Mary Ritz	North Zone Rangeland Management Specialist, Shoshone National Forest
Ray Zubik	Fisheries Biologist, Shoshone National Forest

Appendix B Coordination and Consultation

All comments received through scoping and the public involvement processes were addressed in developing the issues and alternatives, which directed the analysis process. The scoping statement and mailing list are located in the project file.

Members of the public and organized groups who commented during the initial scoping:

Executive Director, Wyoming Wildlife Federation, PO Box 106, Cheyenne, WY 82002

Meredith Taylor, Wyoming Outdoor Council, 6360 Hwy 26, Dubois, WY 82513

Bertie Newton, 110 Crandall Dr., Powell, WY 82435

Cody Lumber, Inc., PO Box 757, Cody, WY 82414

Dick Scott, 2514 Central Ave., Cody, WY 82414

D.A. McQueen, PO Box 86, Thermopolis, WY 82443

Donald Tolman, 372 Tolman Road, Powell, WY 82435

Agencies who commented during the initial scoping period:

WY Office of Federal Land Policy, Herschler Building, 1 West, 122 West 25th St., Cheyenne, WY 82002-0660

WY Department of State Parks & Cultural Resources State Historic Preservation Office

WY Game and Fish Department

Tribes who commented during the scoping period:

Vera Sonneck, Cultural Resource Program, Nez Perce Tribe, PO Box 365, Lapwai, Idaho 83540

Members of the public, agencies and tribes who were consulted or sent the predecisional EA and/or commented during the 30-day predecisional comment period:

Cultural Affairs Department, Crow Tribal Council, PO Box 159, Crow Agency, MT 59022

Park County Commissioners, 1002 Sheridan Ave. Cody, WY 82414

Carol Kruse, Planning Consultant, WY Office of Federal Land Policy

WY Department of State Parks & Cultural Resources State Historic Preservation Office

WY Game and Fish Department, Headquarters, Cheyenne, WY

U.S. Fish and Wildlife Service, Michael Long, Field Supervisor, Ecological Services, 4000 Airport Parkway, Cheyenne, Wyoming 82001

U.S. Fish and Wildlife Service, Terry Root, PO Box 518, Cody, WY 82414

Bureau of Land Management, Cody Field Office, PO Box 518, Cody, WY 82414

Rick Brasher, PO Box 2465, Cody, WY 82414

Bob Model, Mooncrest Ranch, 69 Rattlesnake Creek Rd. Cody, WY 82414

Richard and Craig Geving, c/o Mooncrest Ranch, 69 Rattlesnake Creek Rd, Cody, WY 82414

Appendix C Project Design Criteria

Integrated Analysis and ID Team. This appendix contains design criteria used by the interdisciplinary team to maximize enhancement of resources while minimizing adverse environmental effects on the quality of the human environment. An interdisciplinary team of professional resource specialists designed and would administer the project. All actions were evaluated for conformance with the Forest Plan standard and guidelines. Forest-wide standards and guidelines from the Forest Plan apply when implementing activities; not all of these standards and guidelines are repeated in this document. These criteria were developed to reduce impacts to an insignificant level when implementing project activities. They have demonstrated effectiveness, lack controversy, and are specific, measurable, and enforceable.

The following project design criteria (mitigation measures) apply to both action alternatives unless otherwise noted. These must be incorporated into the project design as well as integrated into permits, contracts, operating plans, and project preparation/administrative procedures if compliance with the intent is to be assured. Project design would prevent, eliminate, or minimize impacts of the selected action alternative and would be implemented as follows:

Road Management Common to Both Action Alternatives. Forest Service Road 402 would be used to access the project area. This road would be reconstructed to standard through minor relocation, where necessary and appropriate, to improve the grade and drainage. Following the project the upper portion of FSR 402 will be managed as described below.

Road 402 will be physically closed with a locked gate on Forest Service land at the north end of the private land (T54N, R104w, Sec. 33). The road will be closed to general public use. Motorized administrative use is allowed, as long-term access and the presence of the road is needed for timber and forest health issues such as insect and disease; motorized access for fuels reduction, prescribed burning and fire suppression, range administration and range project maintenance, wildlife and other multiple-uses in the area. Grazing permittees, special-use permit holders and other agency personnel would need to obtain an authorization from the appropriate level line officer for motorized access on FSR 402 where it is located on the forest. Access permission off Forest would be a continuation of the existing situation, that is, permission is needed from the landowner, as no public right-of-way exists. 

No roadless areas would be entered under either alternative.

Harvest/Treatment Methods Common to Both Action Alternatives. Harvest would be by ground based logging systems (i.e. skidders, tracked vehicles, or other mechanized harvesting equipment).

This action would result in an average output of approximately 2000-3000 board feet per acre or 300 to 450 mbf of various wood products. Both action alternatives prescribe vegetative treatment of commercial timber types within identified suited timber base as well as outside the suited timber base. Both alternatives include harvest of dead and live trees.

Approved skid trails or temporary roads would be utilized during treatment. Use of any temporary roads would be limited to the contractor only, and only during the period of operations. All temporary roads would be obliterated through the timber sale contract immediately after having served their purpose for treatment and enhancements. Logs would be skidded or taken to a central collection point and removed by logging trucks to an off-Forest mill location.

Commercial timber products would be harvested under the terms and conditions of a three-year Forest Service timber sale contract, although it would most likely be completed in less than two years.

Silvicultural treatments would be designed to reduce risks associated with insects and disease and to combat infestations. Timber sale design, including road and skid trail layout, is guided by Forest Direction and Management area prescriptions of the Forest Plan [FP-II-91]. Site-specific determinations of silvicultural options were made by field examination and diagnosis. Detailed site prescriptions will be prepared following a decision to implement any actions that manipulate forest vegetation.

If overuse of deciduous regeneration by livestock becomes a problem, treated areas will be fenced following sale closure.

Either through force account (Forest Service) crews or K-V funding contracts would be utilized to cut and treat non-merchantable conifers where designated to enhance diversity features such as aspen, deciduous/riparian species, and interior meadows.

Activity Fuels Treatment Common to Both Action Alternatives. At all landings, the timber sale purchaser would be required to pile activity slash for future burning. Activity fuels within harvest units will be lopped and scattered to less than 24-inches in height and where concentrations exceed 15-20 tons/acre jackpot burning will be utilized to reduce fuel loading.

Cultural Resources. To ensure cultural resource protection, complete a Class III (100%) survey and follow all laws, regulations, and policies relative to cultural resources and historic surveys of project areas. New sites discovered during the course of project implementation would be protected from ground disturbance while on-site evaluations of their significance and treatment are made in consultation with the SHPO.

Forestry/Timber.

Best Management Practices. (see Watershed).

Contract Period. (see above Harvest/Treatment Methods.)

Operating Season and Winter Logging. The operating season would vary based on the selected alternative. Winter logging is prescribed in a designated area where frozen or snow covered ground is needed to limit resource damage.

Vegetation Management. No forest openings larger than 40 acres would occur to maintain cover and habitat effectiveness, visual resources, and NFMA compliance.

Skidding. Skid distances would be increased to the degree reasonable to minimize constructing new temporary roads or spurs. Skidding will take place when soil is dry or frozen when possible and skid trails will be returned to as near as natural condition as possible to limit resource damage.

Following harvest operations, skid trails and landings would be reclaimed if necessary by removing berms, covering with slash, installing water bars, and seeding to protect soil and water resources.

Diversity. Forest Plan direction and standards and guidelines for vertical and structural diversity included in the project design are:

- Maintain or establish a minimum of 20% of the forested area within a unit to provide vertical diversity.
- Maintain or establish a minimum of 30% of the forested area within a unit to provide horizontal diversity.
- In forested areas of a unit, maintain at least 5% in grass/forb stages and at least 10% of the conifer potential natural vegetation in old growth that occurs in 30 acre or larger patches.

- In forested units, create or modify created openings so they have natural appearing shapes.
- Maximum of individual treated areas is 500 acres.

Snags and Down Woody Material. The effects to snags and down woody material would be mitigated by the Forest Plan direction included in the project design: Within harvest units, leave six to 10 snags per 10 acres, eight inches or more dbh, where available for wildlife trees. Retain in clumps if possible. Within harvest units, retain a minimum 50 linear feet of dead/down logs per acre that is more than 10 inches dbh [FP-III-20].

Old Growth. To comply with the Forest Plan and project design, old growth would be maintained at least 5% in grass/forb stages and at least 10% of the conifer potential natural vegetation type in old growth [FP-III-19]

Douglas-fir. For the Douglas-fir cover type and mixed conifers (Unit A), merchantable timber would be removed by commercial timber harvest through shelterwood or selection to achieve multi-resource benefits (FP-III-132). Emphasize lodgepole pine and the other minor conifer species by applying the appropriate silvicultural methods to favor these species and maintain or enhance diversity.

Lodgepole Pine. For the lodgepole pine in mixed conifers, merchantable timber would be removed by commercial timber harvest through small clearcut, shelterwood, or selection prescriptions (FP-III-132) to maintain lodgepole pine because of its importance to diversity.

Aspen. Where remnant aspen cover type exists within Units A, B and C, merchantable timber would be removed by commercial timber harvest to encourage aspen release. This would occur where conifers are encroaching in aspen clones. Per Forest Plan direction, the harvest method would be small clearcuts (FP III-132). Following post-sale monitoring, regeneration of aspen clones via cutting of mature stems would be implemented if the desired release of aspens were not realized.

Sagebrush. For the sagebrush cover type, merchantable and non-merchantable limber pine and Douglas-fir will be cut in an effort to return the acreage to an earlier seral stage. Merchantable products will be removed in conjunction with the commercial timber sale. Non-merchantable material will be treated on-site.

Grizzly Bear (Management Situation Area 5).

The project area does contain limited habitat for the grizzly bear, and use is incidental during the spring and fall periods. Existing data indicate that this project area contains mostly marginal habitat, although seasonal essential spring food sources in the form of ungulate carrion, birthing big game, and limited amounts of riparian vegetation do occur in the project area.

Even though this area is outside the recovery area, the proposed action while meeting other objectives will likely have beneficial indirect effects in the long-term for the bear. As big game winter/spring range is being improved, habitat for bear during the spring season will be enhanced due to the increased availability of ungulate carrion and elk calves. In addition, the permanent road restriction will provide more secure habitat for the bear thus enhancing habitat effectiveness yearlong.

Forage availability for elk during the wintering and birthing periods would be enhanced if the forage increase would be allocated to wildlife. In addition, the permanent road restriction will provide more secure habitat for the elk thus enhancing habitat effectiveness yearlong.

The following project design criteria were formulated in order to maintain a sufficient amount of habitat to support and maintain grizzly that do use the area, and enhance for the long-term,

favorable and “sustainable habitat conditions” for conservation of the grizzly bear relative to this proposal. Design criteria to maximize potential beneficial effects on a “sustainable” basis would be:

Restrict all motorized access except for “essential” administrative use. Total administrative use by motorized vehicles should not exceed 14 days during the critical spring and fall periods. Restricting administrative use reduces the possibility of habituation of bears to roads, and reduces the displacement of bears from habitat because of random or periodic disturbance.

Favor minority deciduous browse and shrub species (aspen, willow, birch, alder, etc.) wherever it exists in the treatment area to provide habitat components for potential prey species, as well as providing food sources directly (e.g. berries associated with some shrubs), and emphasizing areas that provide succulent vegetative species. Apply harvest prescriptions that favor increasing the amount of aspen type, increasing the number of aspen seral stages, and regeneration (dense sprouting) of aspen for prey species such as elk and deer. Treatments that result in dense regeneration would likely to enhance habitat for potential prey of grizzly.

Favor a variety of vegetative types, seral stages, and patch sizes interspersed throughout the treatment area to provide a mosaic pattern of vegetation and habitats over the landscape. This provides a sustainable source of differing habitat niches for a wide variety of potential prey species as well as providing a diversity of habitat for the bear. Such a mosaic pattern appears to be beneficial to most all species including the grizzly, as it provides for biodiversity.

Provide for adequate linkage corridors throughout the treatment area, and to adjacent areas of habitat, to provide security for movement as well as access to many types and seral stages, including riparian corridors, ridge systems, and major saddles.

Provide an adequate amount of potential foraging habitat in the short-term, by maintaining a variety of types and seral stages interspersed through the area. Assure potential foraging habitat is sustainable in the future by providing a variety of forest types and age classes, scattered throughout the landscape.

Design criteria to minimize potential adverse effects that were integrated into design of the project, and would be included as conditions in any associated contracts and operating plans as necessary and appropriate are:

- Activity would be limited in time by contract (3 years)
- Activity would be concentrated by area due to scheduling of treatment units
- No public access would be allowed during treatment
- No logging camps would be allowed within the treatment area
- A security area in excess of 5000 acres would be maintained adjacent to the project (upper Rattlesnake and Robbers Roost Creek area).
- The timber sale contract would include a clause providing for temporary cessation of activities, if needed, to resolve potential or existing grizzly/human conflict(s).
- Food and garbage storage orders would be adhered to. Crews would be required to have available bear proof containers for storage of attractants such as lunches, garbage, and beverages; and would be required to remove attractants from the work area each day.
- All crews would be trained in measures to minimize grizzly/human conflicts as well as proper attractant storage, bear behavior, recommended human behavior in conflict situations, and the use of bear repellent spray.

- During project implementation and the short-term, strips and patches of forested area would be left untreated to assure adequate cover and corridor linkage for security and movement
- Scheduling project activities and work areas to when/where such work activities and human disturbance would have minimal impact to grizzly.
- After completion of the project, restricting all public motorized vehicle access in the area, and limiting and scheduling motorized administrative access during critical periods (spring and fall) to 14 days per year.

Designing the road entrance for effective closure upon completion of sale activity.

Grizzly/human conflicts. Include appropriate contract provisions to ensure protection of T&E, proposed and FS sensitive species, including a workers-in-grizzly habitat stipulation. Timber sale operators and their employees will be informed of possible risks any time they are working in grizzly country.

The grizzly bear special order [(Authority 36 CFR 261.50(a&b)] relating to handling and storage of food and other attractants will apply to all timber sale contracts and persons acting on their behalf.

Logging camps. No logging camps for timber sale operations will be permitted in the project area.

Cessation of Activities. The timber sale contract will provide for cessation of activities, if needed, to resolve potential grizzly/human conflicts.

Attractants. Food and garbage storage orders would be adhered to. Crews would be required to have available bear resistant containers for storage of attractants such as lunches, garbage and beverages; and would be required to remove garbage and attractants from the work area each day.

Training. All crews would be trained in measures to minimize grizzly/human conflicts as well as proper attractant storage, bear behavior, recommended human behavior in conflict situations, and the use of bear repellent spray by the timber sale administrator or persons acting on their behalf.

Road Management. There will be no net increase in roads (Forest Plan amendment based upon the Oil and Gas Leasing EIS/ROD). Road closure and restrictions will be implemented as described above in road management common to both action alternatives. The project would involve reconstruction of 2000-2500 feet of road to improve grade and drainage. Unarmored fords would be eliminated, as each of the three stream crossing fords would be armored. Consultation with the Forest engineer would be required. A Roads Analysis Process (RAP) was completed to determine the future management needs for the road.

On roads that are closed to public motorized use, it is recommended that administrative use be limited. Total administrative use by motorized vehicles would be restricted to one or two periods that together should not exceed 14 days during critical periods. Restricting administrative use reduces the possibility of displacement of wildlife from habitat because of random or periodic disturbance.

Visuals. Manage visual resources so that management activities are not visually evident or remain visually subordinate. The shape, size, and location of all harvest activities shall be designed to imitate natural patterns in the characteristic landscape.

Slash piles, skid trails, and landings will be minimized where possible to reduce negative visual impacts.

Skid trails and temporary roads will be returned to as near natural condition as possible to remain visually subordinate

Roadless and Wilderness. To maintain wilderness characteristics, the project is designed to remain outside the Trout Creek roadless area (RARE II #2044) and the North Absaroka Wilderness.

Weeds. To minimize soil disturbance and integrate weed prevention and management in all vegetation projects, a noxious weed evaluation was conducted on the project area prior to implementation. Areas with current noxious weeds would be pre-treated or evaluated and treated after project implementation.

Coordination. Notify range allotment permittees of upcoming timber harvest activity. The standards and guidelines for aspen regeneration (FP.111-155) would be implemented. Salting shall occur away from harvest units. Require that the integrity of existing fences and gates be maintained during harvest activities and beyond; any fence in disrepair or damaged by the activities should be repaired or reconstructed with K-V, range, or multi-resource funding in a timely matter. Project design for range resource management in terms of treated aspen require:

- Closely manage grazing by domestic stock in treated aspen stands until regeneration is six feet tall. Where there has been manipulation to induce aspen regeneration, do not allow aspen seedlings to be grazed by livestock more than one out of three years.

Sensitive Plants. To ensure sensitive plant species, any areas with threatened, endangered, sensitive or rare plants or animals discovered during project layout or implementation would be examined by the appropriate specialist(s) and requisite action taken.

Silviculture Best Management Practices-Wyoming Nonpoint Source Management Plan (Final, March 1997). Applicable practices, as determined by IDT members, shall be implemented as part of this project. These practices will result in maintaining existing beneficial uses of water resources, and reduce adverse effects and water quality degradation to a level of non-significance.

Watershed Conservation Practices Handbook-FSH 2509.25-2001. Applicable practices, as determined by IDT members, shall be implemented as part of this project. These practices are proven ways, using current knowledge and technology, to meet Forest Plan standards and reduce adverse effects and water quality degradation to a level of non-significance.

Marking. The treatment area would be marked to meet objectives, and marking guidelines would be very specific in order to assure attainment of objectives of the selected alternative. Marking of aspen and deciduous tree regeneration areas and interior meadows would be completed by a journey level wildlife biologist.

Snags and Down Woody Material. Within harvest units, leave six to 10 snags per 10 acres, eight inches or more dbh, where available for wildlife trees based on Forest Plan direction. Retain in clumps if possible. Within harvest units, retain a minimum 50 linear feet of dead/down logs per acre that is more than 10 inches dbh [FP-III-20]. Timber sale contract provisions will be used to protect snags.

Nest Trees. Protect nesting raptors by disallowing management activities within 300 feet of a nest tree from May 1 to July 31 [FP-III-53].

Winter Range. All treatments would be completed in a manner that improves or maintains crucial winter range quality and quantity for wildlife forage and improves the diversity of late vegetative types by setting back succession, especially in dense conifer stands.

Forage. In dense conifer stands, treatment would consist of conifer removal to create openings or enhance interior meadows for increased forage production for big game species.

Cover. Ensure that sufficient timber remains in the area to provide big game thermal and security cover by maintaining small, mosaic patterns for all treatments.

Fuels. Reduce or otherwise treat activity fuels so the potential intensity of an area will not exceed 400 BTU's/sec/ft. on 90% of the days during regular fire season or break up continuous fuel concentrations exceeding the above standard into manageable units with fire breaks or fire lanes.

Appendix D Literature Review

Literature Reviewed/Cited: References, Contacts, and Data Sources-Wildlife and Fisheries (a complete list is located in the project file)

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