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Final Environmental Impact Statement

Aspen Range Timber Sale and Vegetation Treatment:

Soda Springs Ranger District, Caribou-Targhee National Forest
Caribou County, Idaho

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Aspen Range Timber Sale and Vegetation Treatment
Final Environmental Impact Statement
Caribou County, Idaho
March 2008

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Abstract: The Final Environmental Impact Statement (FEIS) documents the analysis of the proposed Aspen Range Timber Sale. Four action alternatives evaluated a combination of mechanical timber harvest, prescribed fire and transportation improvements for the 12,000 acre project area. The no action alternative was also analyzed. Design features have been incorporated in the alternatives to reduce impacts to resources.

The legal description for the proposal is T. 8 S., R. 43 E., sections 27, 28, 29, 30, 31, 32, 33 and 34. T. 9 S., R.43 E., sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,17 and 18 of the Boise Meridian, Caribou County.

The preferred alternative is Alternative 5. Alternative 5 meets the purpose and need for saw log production, aspen restoration, stand structure and composition, fire intensity, and improvements to the transportation system.

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SUMMARY

INTRODUCTION
The Soda Springs Ranger District of the Caribou-Targhee National Forest proposes to treat approximately 1,541 acres of aspen, conifer, and small openings of non-forested lands within the 12,000 acre project area with a combination of mechanical timber harvest and prescribed fire. The project area is located within the Trail Canyon, Wood Canyon, and Johnson Creek drainages. The legal description for this proposal is T. 8 S., R. 43 E., sections 27, 28, 29, 30, 31, 32, 33 and 34. T. 9 S., R.43 E., sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,17 and 18 of the Boise Meridian, Caribou County.

PROPOSED ACTION (Chapter I)
The proposal would treat forested and non-forested vegetation with the use of mechanical and prescribed burning treatments to change species composition, density, structure, and expected fire intensity.

- Within the project area, a combination of management activities would occur on **1,541** acres. A total of **881** acres of Douglas-fir, aspen/Douglas-fir and lodgepole pine stands would be tractor harvested using a variety of silviculture prescriptions. The harvest volume is anticipated to be about **5.5** million board feet from two timber sales.

- Prescribed fire would occur on approximately **1,332** acres of forested and non forested cover types to increase early seral vegetation communities and reduce fuel loads in the **12,000** acre project area. Inventoried Roadless areas would not be entered.

- A constructed **1/4** mile fuelbreak along the northwest forest boundary of the project area would meander across the north edge of the **56** acre stand using as many natural openings and barriers as possible

- Approximately **2.1** miles of existing system roads are proposed for realignment and about **5.1** miles of constructed temporary road would be required for harvest activities.
  - All constructed temporary roads and old road segments that have been replaced with new alignment would be fully obliterated.
  - Road segments that are currently managed as a multiple use trails would be retained. About **7.8** miles of unnecessary roads would be obliterated.
  - Road obliteration would consist of recontouring slopes, channels and incorporating debris across the prism followed by seeding with the appropriate native mix.
- Prescribed fire would occur on approximately **1,332** acres of forested and non forested cover types to increase early seral vegetation communities and reduce

fuel loads in the **12,000** acre project area. Inventoried Roadless areas would not be entered.

Need for Purposed Action

The Purpose and Need for the proposed action is to:

- Release aspen from competing conifer and convert vegetation to early seral species.
- Reduce conifer stand densities to improve vigor.
- Emphasize the production of timber within the land capability and capacity as outlined for lands within 5.2 Forest Vegetation Management Prescription. (RFP 4-72)
- Reduce expected fire intensity in the project area and stands bordering residential homes/cabins along the northwest forest boundary of the Trail Canyon area.
- Reduce erosion impacts and maintenance on roads in project area.

Objective of Proposed Action

The specific objectives of this proposed action are:

- Maintain and enhance aspen within the project area. **Indicator:** The number of acres with aspen as a stand component changed from mature/old to seedling/sapling structure class.

- Move the forested age class structure towards the desired future condition (DFC) by decreasing the percentage of mature/old and increasing the seedling/sapling stage. **Indicator:** Percentage of acres in seedling/sapling, young/mid, and mature/old stages relative to the DFCs.

- Develop conditions that minimize undesirable wildfire effects and increase firefighter and public safety by reducing fire intensity by reducing ladder fuels, reducing crown bulk density, and change ground fuels. **Indicator:** Percentage of acres with a change in fire intensity (flame lengths, torching index, and crowning index) within the project area.

- Capture the economic value of the timber from acres assigned the prescription 5.2, Forest Vegetation Management, through timber harvest. **Indicator:** MMBF (Million board feet) harvested.

- Improve the transportation system in the project area that responds to resource, economic, and social needs. Improvements would be commensurate with the revenues generated by the sale of sawtimber from the project area. **Indicator:** Miles of road improvements.

Identification of Issues
Information gathered from public and internal scoping was analyzed to determine if any concerns were raised relevant to the decision to be made. The interdisciplinary team reviewed each comment/concern and categorized them into one of the following:

Issues
Three issues were identified that generated alternatives, new roads, Goshawk and transportation. Listed below are the concern statements for the issues.

No New Roads

- The issue of temporary road construction necessary for the purpose of accessing timber stands proposed for harvest would create adverse impacts to water quality, hydrologic function of the watershed, wildlife habitat and security, and noxious weed invasion. **Indicator:** Miles of temporary and system road realignment.

Goshawk

- The issue of commercial timber harvest within active Goshawk nesting territories. The proposed action would also create larger than forty acre openings using mechanically harvested regeneration silvicultural systems within the post fledging and foraging areas. The proposed action could affect the Goshawk and/or Goshawk habitat. **Indicator:** RFP Goshawk standards and guidelines followed.

Transportation

- The issue of deteriorated soft ground road conditions and the cost of construction to facilitate haul truck traffic on State and private sections of the Johnson Creek Road (20126). At least one mile would require construction of raised road base, surface improvements and three cattle guards to accommodate various ownerships. The IDT generated an alternative to address the road condition on private property. A description of the alternative is described in chapter 2, Alternatives Considered in Detail. **Indicator:** Estimated cost of road improvements on non Forest Service Lands.

Effects to be Analyzed (other relevant resources)
Many comments requested that a variety of resource concerns be fully analyzed and disclosed in the environmental document. These comments were combined into similar categories and will be discussed in Chapter 3. The categories were: 1) Vegetation 2) Hydrology 3) Soils 4) Wildlife 5) Fisheries 6) Road Management 7) Economics 8) Air Quality 9) Visuals 10) Threatened, Endangered, and Sensitive Plants 11) Range Management 12) Heritage Resources 13) Recreation 14) Tribal Treaty Rights.

ALTERNATIVES CONSIDERED IN DETAIL (Chapter II)

This section describes the alternatives considered in detail.

Table S- 1: Summary of activities proposed for each alternative.

Activities	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
Silviculture Treatments	**Acres**	**Acres**	**Acres**	**Acres**	**Acres**
Tractor Harvest & Prescribed Burn		672	200	385	385
Tractor Harvest		153	32	40	32
Fuelbreak (Mechanical /Handpile)		56	56	56	56
Precommercial Thinning		0	100	100	100
Prescribed Burn (No Harvest)		660	646	800	814
Total Harvest	**0**	**881**	**288**	**481**	**473**
Total Acres Treated	**0**	**1,541**	**1034**	**1,381**	**1,387**
% of Project Area Treated	**0%**	**13%**	**9%**	**12%**	**12%**
Transportation	**Miles**	**Miles**	**Miles**	**Miles**	**Miles**
Road Realignment (New Construction)	0	2.1	0	2.0	4.5
Temporary Road (New Construction) (1)	0	5.1	0	2.3	2.3
Prehaul Maintenance	0	6.2	1.6	2.9	3.6
Reconstruction	0	2.4	3.0	2.1	0.8
Reconstruction/Close	0	2.6	0.6	1.3	1.4
Reconstruction/Obliterate (2)	0	0.6	0.2	0.2	0.2
Old Alignment Obliteration (3)	0	2.1	0	1.8	4.4
Total Obliteration (Includes 1+2+3)	0	7.8	0.2	4.3	6.9
Open Road at Completion	**28.9**	**28.9**	**28.9**	**29.1**	**29.1**
Open Trail at Completion	**18**	**18**	**18**	**18**	**18**

- All acreages and mileages disclosed in this document are approximate. Every effort was made to create GIS coverage's of the proposed activities that were as close to what would be implemented as possible. However, final locations of the proposed activities will be determined at the time of implementation.

Alternative 1 - No Action

This alternative provides a baseline against which impacts of the various action alternatives can be measured and compared. Under this alternative, none of the specific management activities proposed in this document would occur. Ongoing activities such as grazing, recreation (hunting, OHV use, etc.), public firewood gathering, fire suppression, normal road maintenance, special uses and existing road management closures would continue at current levels. Management activities proposed by other environmental documents may still occur.

Alternative 2 – Proposed Action

Alternative 2 proposes to tractor harvest 881 acres of Douglas-fir, aspen/Douglas-fir and lodgepole pine stands using a variety of silvicultural prescriptions. The harvest would be followed by 1,332 acres of prescribed fire to increase aspen cover types and reduce fuel loads in the 12,000 acre analysis area. The harvest volume is anticipated to be about 5.5 million board feet from two timber sales. This alternative was designed to address forest vegetation condition and improvements to the transportation system. All design features that have been listed in section 2.6 Management Practices will be included in this

alternative. Proposed activities are designed to comply with the Revised Forest Plan standards and guidelines. Standards and guidelines for **Goshawk Habitat** and **Hydrological Disturbance** would be exceeded in this alternative. The proposed action alternative would also need approval from the Regional Forester in order to meet the 40 acre maximum mechanical opening standard for forested vegetation (RFP 3-45). Portions within the Johnson Creek drainage of alternative 2 would not take place until a right of way across private property for the Johnson Creek road # 126 is secured. Currently the right of way is not valid.

Alternative 3 – No New Roads
Alternative 3 proposes to tractor harvest approximately 288 stand acres, followed by 846 acres of prescribed fire to increase aspen cover types and reduce fuel loads in the 12,000 acre analysis area. The harvest volume is anticipated to be about 2 million board feet from two timber sales. While similar to the Proposed Action, this alternative proposes no new roads and follows the Revised Forest Plan Goshawk Habitat standards and guidelines. The alternative was developed in response to the public's concerns regarding the effects of new road construction and regeneration harvesting systems. All design features that have been listed in section 2.6 Management Practices will be included in this alternative. Proposed activities are designed to comply with the Revised Forest Plan standards and guidelines. Portions within the Johnson Creek drainage of alternative 3 would not take place until a right of way across private property for the Johnson Creek road # 126 is secured. Currently the right of way is not valid.

Alternative 4 – Reduced Roads
Alternative 4 proposes to tractor harvest approximately 481 stand acres followed by 1,185 acres of prescribed fire within the project area. The harvest volume is anticipated to be about 3.5 million board feet from two timber sales. While similar to the Proposed Action, this alternative proposes reduced road construction and follows the Revised Forest Plan Goshawk Habitat standards and guidelines. The alternative was developed in response to the public's concerns regarding the effects of new road construction and regeneration harvesting systems. All design features that have been listed in section 2.6 Management Practices will be included in this alternative. Proposed activities are designed to comply with the Revised Forest Plan standards and guidelines. Portions within the Johnson Creek drainage of alternative 4 would not take place until a right of way across private property for the Johnson Creek road # 126 is secured. Currently the right of way is not valid.

Alternative 5 – Preferred Alternative
Alternative 5 proposes to tractor harvest approximately 473 stand acres followed by 1,199 acres of prescribed fire within the project area. The harvest volume is anticipated to be about 3.0-3.5 million board feet from two timber sales. While similar to alternative 4, this alternative proposes removing additional miles of road from riparian areas with realignment. The alternative was developed in response to public concerns of problematic roads segments within riparian areas that were only partially addressed in Alternative 4 of the DEIS. Other internal concerns such as lack of legal right of way and the cost of road reconstruction to facilitate haul trucks on private ground were also taken

into consideration for the development of alternative 5. All design features that have been listed in section 2.6 Management Practices will be included in this alternative. Proposed activities are designed to comply with the Revised Forest Plan standards and guidelines including Goshawk Habitat.

ENVIRONMENTAL CONSEQUENCES (Chapter IV)

This section summarizes the information from Chapter III: Affected Environment, and Chapter IV: Environmental Consequences, and displays the environmental effects, and project outputs. A comparative summary of the project activities and environmental outputs and effects on the resources or issues of concern associated with each of the alternatives are presented in the following tables.

Table S- 2: Project Purpose and Need Indicators, Summary Comparison of Alternatives

Purpose and Need Indicators			Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
Forest Condition Indicators							
Acres of aspen treated within the project area			0	1,038 acres or 14%	623 acres or 8%	833 acres or 11%	861 acres or 11%
Post Treatment Project Area Stand Structure Percentage.	SS[1]	DFC-10-40%	3%	17%	11%	14%	14%
	YM[2]	DFC-20-50%	16%	14%	15%	14%	14%
	MO[3]	DFC-20-50%	81%	69%	73%	72%	72%
Percent of acres with a change in fire intensity			0%	13%	9%	12%	12%
Timber Production Need Indicator							
ASQ Estimates (Million Board Feet)			0	4.5-5.5	1.5-2.0	3.0-3.5	3.0-3.5
Transportation Need Indicator							
Miles of road improvements.			0	2.1	0	2.0	4.5

[1] SS – seedling/sapling. [2] YM – young/mid. [3] MO – Mature/Old.

Table S- 3: Issues Indicators, Summary Comparison of Alternatives

Issues	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
No New Roads Indicators					
Miles of temporary road construction	0	5.1	0	2.3	2.3
Miles of Road realignment	0	2.1	0	2.0	4.5
Goshawk Indicator					
RFP Goshawk Standards & Guidelines Followed	yes	no	yes	yes	yes
Transportation Indicator					
Estimated cost of road improvements on Non-Forest Service Lands	$0	$82,500	$82,500	$82,500	$0

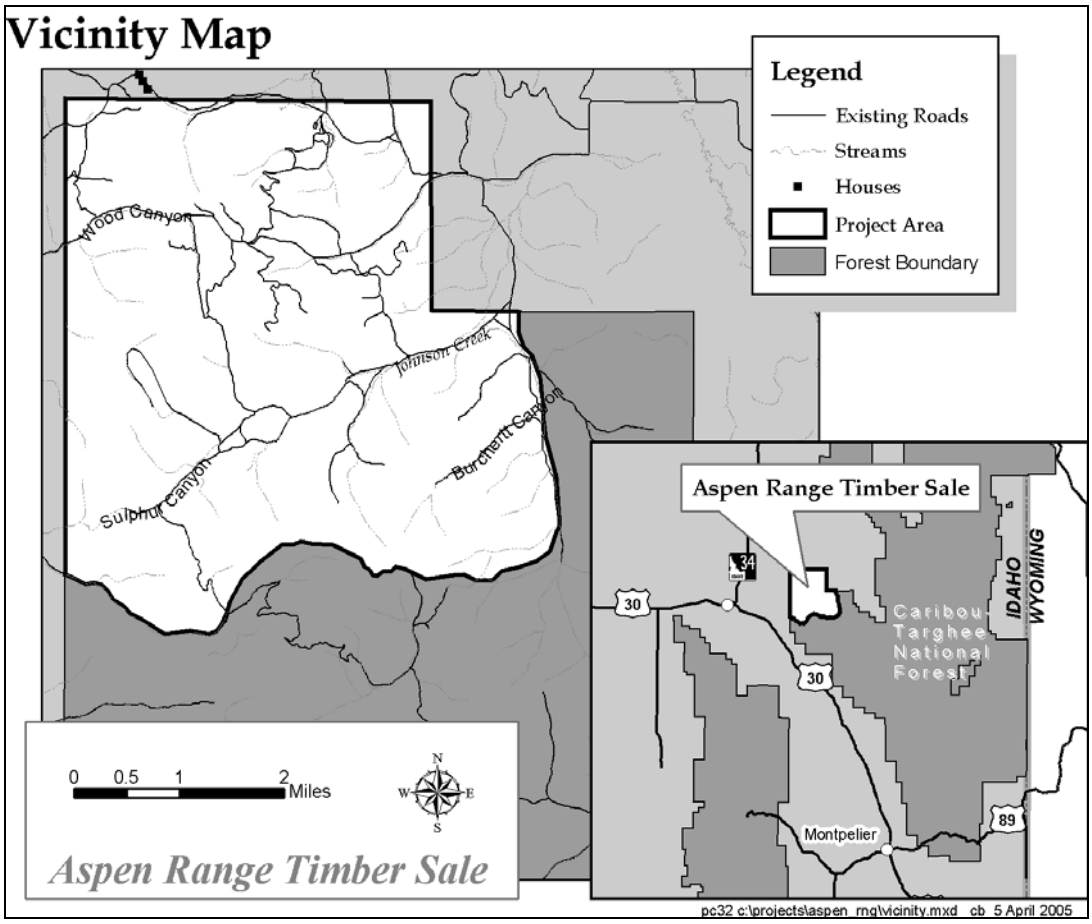
Table S- 4: Effects to be analyzed, Summary Comparison of Alternatives

Resource		Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
Hydrology Indicator						
% Hydrological Disturbance						
Wood Canyon Huc-6th		5%	20%	19%	19%	19%
Sulphur Canyon Huc-6th		1%	2%	1%	1%	1%
Trail Creek Huc-6th		7%	42%	23%	26%	26%
Johnson Creek Huc-6th		7%	10%	9%	10%	11%
Miles of road removed from AIZ & upland areas						
Removed from AIZ at project end		0	0.5	0.03	0.4	1.5
Removed from upland areas at project end		0	1.5	0.2	0.3	0.4
Soils Indicators						
% Soil Detrimental Disturbance		Within RFP Guidelines <15%				
Wildlife Indicator						
Acres with human disturbance, wolverine/Lynx/Gray Wolf		0	1,541	1,034	1,381	1,387
Goshawk Nest Area 261 Acres	% Non Stocked/seedling [0%]	0%	>0%	0%	0%	0%
	% Saplings [0%]	0%	0%	0%	0%	0%
	% Pole [0%]	0%	0%	0%	0%	0%
	% Old / Mature [100%]	100%	<100%	100%	100%	100%
Goshawk Post Fledging 450 Acres	% Non Stocked/seedling [≤ 20%]	0%	-- %	0%	0%	0%
	% Saplings [≤ 20%]	8%	-- %	8%	8%	8%
	% Pole [≤ 20%]	18%	-- %	18%	18%	18%
	% Old / Mature [≥ 40%]	70%	-- %	70%	70%	70%
Goshawk Foraging Area 6,949 acres	% Non Stocked/seedling [≤ 25%]	0%	-- %	9%	12%	13%
	% Saplings [≤ 25%]	3%	-- %	3%	3%	3%
	% Pole [≤ 25%]	17%	-- %	15%	14%	14%
	% Old / Mature [≥ 30%]	80%	-- %	73%	71%	70%
7,660 acres	Created Openings > 40 acres	0	7	0	0	0
% Forest Owls (Flammulated, Boreal, Great Gray) > 40 %		81%	69%	74%	72%	72%
Acres snags (Three-toes Woodpeckers / Bats)		6,167	5,029	5,581	5,390	5,394
% Winter Forage, Sharp-tailed grouse > 80 %		100%	89%	93%	90%	90%
% Sagebrush mature overstory, Sage-grouse > 80%		100%	95%	95%	92%	92%
Big Game Cover : Forage ratio, 40 : 60		66:34	56:44	60:40	58:42	60:40
Acres treated / Aspen Restoration / Mule Deer Initiative		0	1,041	625	834	862
Air Quality Indicator						
National Ambient Air Quality Standards (Smoke Emissions)		Within NAAQS	Within NAAQS	Within NAAQS	Within NAAQS	Within NAAQS
Visuals Indicator						
VQO - Partial Retention		Meeting RFP Guidelines				
VQO - Modification						

I. PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The Soda Springs Ranger District of the Caribou-Targhee National Forest proposes to treat approximately 1,541 acres of aspen, conifer, and small openings of non-forested lands within the 12,000 acre project area with a combination of mechanical timber harvest and prescribed fire. The project area is located within the Trail Canyon, Wood Canyon, and Johnson Creek drainages. The legal description for this proposal is T. 8 S., R. 43 E., sections 27, 28, 29, 30, 31, 32, 33 and 34. T. 9 S., R.43 E., sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,17 and 18 of the Boise Meridian, Caribou County.



1.2 Document Structure

The Forest Service has prepared this Environmental Impact Statement in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Impact Statement discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters:

- *Chapter 1. Purpose and Need for Action:* Chapter 1 includes information on the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Chapter 2. Alternatives, including the Proposed Action:* Chapter 2 provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. Alternatives were developed based on relevant issues raised by the public and other agencies. The discussion also includes design features common to the action alternatives. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Chapter 3. Affected Environment:* Chapter 3 summarizes the current conditions of the environment in and adjacent to the Project Area likely to be affected by the alternatives are described in this chapter
- *Chapter 4. Environmental Consequences:* Chapter 4 describes the environmental effects of implementing the proposed action and other alternatives. The analysis is organized by resource area.
- *Chapter 5. Consultation and Coordination:* Chapter 5 provides a list of preparers and agencies consulted during the development of the environmental impact statement.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental impact statement.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at Soda Springs Ranger District.

1.3 Proposed Action

This section will provide a short summary of activities proposed for the *Aspen Range Timber Sale/Vegetation Treatment*. A more detailed description of the proposed action is presented in Chapter II: Alternatives.

The proposal would treat forested and nonforested vegetation with the use of mechanical and prescribed burning treatments to change species composition, density, structure, and expected fire intensity.

- Within the project area, a combination of management activities would occur on **1,541** acres. A total of **881** acres of Douglas-fir, aspen/Douglas-fir and lodgepole pine stands would be tractor harvested using a variety of silviculture prescriptions. The harvest volume is anticipated to be about **5.5** million board feet from two timber sales.

- Prescribed fire would occur on approximately **1,332** acres of forested and non forested cover types to increase early seral vegetation communities and reduce fuel loads in the **12,000** acre project area. Inventoried Roadless areas would not be entered.

- A constructed **1/4** mile fuelbreak along the northwest forest boundary of the project area would meander across the north edge of the **56** acre stand using as many natural openings and barriers as possible

- Approximately **2.1** miles of existing system roads are proposed for realignment and about **5.1** miles of constructed temporary road would be required for harvest activities.
  - All constructed temporary roads and old road segments that have been replaced with new alignment would be fully obliterated.
  - Road segments that are currently managed as a multiple use trails would be retained. About **7.8** miles of unnecessary roads would be obliterated.
  - Road obliteration would consist of recontouring slopes, channels and incorporating debris across the prism followed by seeding with the appropriate native mix.

1.4 Need for Proposed Action

The Purpose and Need for the proposed action is to:

- Release aspen from competing conifer and convert vegetation to early seral species.
- Reduce conifer stand densities to improve vigor.
- Emphasize the production of timber within the land capability and capacity as outlined for lands within 5.2 Forest Vegetation Management Prescription. (RFP 4-72)
- Reduce expected fire intensity in the project area and stands bordering residential homes/cabins along the northwest forest boundary of the Trail Canyon area.
- Reduce erosion impacts and maintenance on roads in project area.

1.4.1 Forest Condition - Stand Composition, Density, and Structure Need

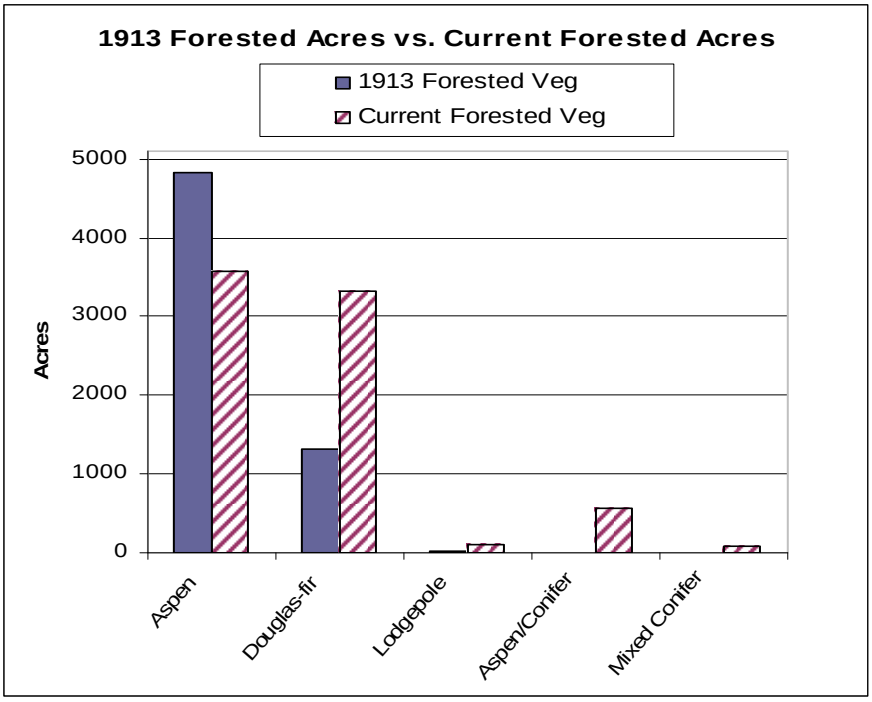
There is a need to reduce stand density, convert plant communities to early seral, and move structural stages closer to the Desired Future Condition (DFC) to improve long-term forest condition. As documented in the Soda/Montpelier Front Ecological Assessment for Vegetation and Hydrology (USDA 2002), many aspen stands in the analysis area are succeeding or already have succeeded to shade tolerant conifer species. The Assessment estimates that conifers now dominate 25 percent of the stands that would be primarily aspen cover types in historic fire disturbance regimes.

Conifer cover types have gained considerable acres from the aspen cover types through the process of vegetation succession over the past century. A high percentage of stands now dominated by Douglas fir have either a minor component of residual aspen or skeletons of

aspen in the form of down woody debris. Any evidence of aspen within a stand of conifer indicates that an aspen cover type once occupied that place in the landscape (Bartos and Campbell 1998).

Data from project area stand exam (2002) and the Soda Front analysis indicate forest succession in the absence of fire is allowing dense, small-diameter stands of Douglas fir to occupy sites where historically light intensity fires would have reduced densities. Fire return intervals now average well over 100 years, with increasing susceptibility to stand replacement fires. Ladder fuels exist where plant succession has led to dense regeneration of Douglas fir under existing canopies.

Figure 1.4-1: Forested Acres (1913) vs. Current Forested Acres. During the last 85 years within the project analysis area aspen has declined 31% or 1,246 acres not counting the 515 acres that is moving to conifer but is currently classified as aspen/conifer.



1.4.2 Forest Condition – Wildfire Effects Need

Within the project area, various levels of succession to conifer have occurred in a landscape that was historically dominated by aspen. The combination of dead and down fuels and dense multi-layered stands increases the risk that a fire will move from the forest floor to tree crowns. As a result, the accumulation of biomass (both standing and down woody material) is setting the stage for a potentially intense and severe stand replacing fire. Effective suppression of this type of fire and defense of private property in the area may be beyond the capabilities of firefighter forces. This situation compromises the safety of firefighters and the public if a wildland fire would start in or near the project area.

1.4.3 Timber Production Need

There is a need to capture the value of the timber that is assigned the prescription of Forest Vegetation Management in the RFP. The emphasis in this prescription is on scheduled wood-fiber production, timber growth, and yield while maintaining or restoring forested ecosystem processes and functions to more closely resemble historical ranges of variability with consideration for long-term forest resilience. These forested lands are included in the suitable timber base and contribute to the Allowable Sale Quantity (ASQ). Forested lands with this designation are to be managed to emphasize the cost-effective production of timber within the lands capability and capacity (RFP 4-71-74).

1.4.4 Transportation Condition - Reduce Maintenance and Sedimentation Need

There is a need to decrease on-going erosion damage, road maintenance costs and to provide safe access for motorized use including harvest activities. The nature of the roads in the project area include: poorly located pioneered, poorly located constructed and properly constructed gravel surface roads. The majority of the roads are native surface with poorly located sections that create erosion damage and excessive maintenance. The hauling of logs across some of these roads could also create resource problems.

1.5 Objective of the Proposed Action

The specific objectives of this proposed action are:

- Maintain and enhance aspen within the project area. **Indicator:** The number of acres with aspen as a stand component changed from mature/old to seedling/sapling structure class.

- Move the forested age class structure towards the desired future condition (DFC) by decreasing the percentage of mature/old and increasing the seedling/sapling stage. **Indicator:** Percentage of acres in seedling/sapling, young/mid, and mature/old stages relative to the DFCs.

- Develop conditions that minimize undesirable wildfire effects and increase firefighter and public safety by reducing fire intensity by reducing ladder fuels, reducing crown bulk density, and change ground fuels. **Indicator:** Percentage of acres with a change in fire intensity (flame lengths, torching index, and crowning index) within the project area.

- Capture the economic value of the timber from acres assigned the prescription 5.2, Forest Vegetation Management, through timber harvest. **Indicator:** MMBF (Million board feet) harvested.

- Improve the transportation system in the project area that responds to resource, economic, and social needs. Improvements would be commensurate with the revenues generated by the sale of sawtimber from the project area. **Indicator:** Miles of road improvements.

1.6 Revised Caribou Forest Plan Direction (RFP)

The Forest Plan establishes long-term management direction for the Forest and contains management standards to achieve forest-wide multiple-use goals and objectives. Ecological subsection and management prescriptions were also established based on ecological units and management themes. Each subsection and associated management prescription has specific goals, objectives, standards, and guidelines that supplement forest-wide standards listed in the Forest Plan.

The Forest Plan Standards and Guidelines noted below are not comprehensive, but those that address the project purpose and need statements, relevant issues, and management actions, including: timber harvest, silviculture treatments, transportation and fuels management are summarized below.

Forest-Wide Guidance

Timber Management (RFP 3-44)

- Design timber management projects to simulate natural patch sizes and shapes, connectivity, and species composition and age-class diversity in accordance with silvicultural prescriptions.
- The silvicultural system used on managed timberlands should allow for control of pests, animal damage, including livestock, and vegetation competition to promote regeneration and tree growth at optimum levels.
- When feasible and appropriate, use prescribed burning to dispose of slash to reduce fire hazard and to promote seedbeds for natural regeneration.
- A full compliment of harvest systems and techniques may be used across the Forest unless specifically prohibited or limited by individual prescription direction.

Soils (RFP 3-6&7)

- Reduce soil erosion to less than the soil loss tolerance limits on lands disturbed by management activities within one growing season after disturbance.
- Sustain site productivity by providing the minimum amounts of woody residue greater than or equal to 3 inches in diameter dispersed on the site as outlined in Table 3-1, RFP 3-7. These do not apply within a 300-foot corridor on either side of roads designated as open on the most current version of the Travel Plan.
- Resource developments and utilization should be restricted to lands identified in the Soil Resource Inventory as being capable of sustaining such impacts.
- Maintain ground cover, microbiotic crusts, and fine organic matter that would protect the soil from erosion in excess of soil loss tolerance limits and provide nutrient cycling.
- Detrimental soil disturbance such as compaction, erosion, puddling, displacement,

and severely burned soils caused by management practices should be limited or mitigated to meet long-term soil productivity goals.

Fire (RFP 3-4)

- All fires shall be suppressed if they are in areas not covered by a pre-approved fire management plan.
- When developing vegetation treatment projects, give priority to those reducing fuels in the wildland/urban interface. Strive to move vegetation currently in Fire Condition Class 3 to Condition Classes 1 and 2.

Watershed and Riparian Resources (RFP 3-15 & 16)

- Not more than 30 percent of any of the principal watershed and/or their subwatersheds (6th HUC) should be in a hydrologically disturbed condition at any one time.

Vegetation (RFP 3-19 & 20)

- Manage to reduce the decline of aspen and promote aspen regeneration and establishment. Provide protection from grazing where needed and consistent with management objectives.
- Focus treatments on aspen clones, which are at the greatest risk of conversion to conifer.
- For aspen and conifer types, acres classified as mature and old growth should be in blocks over 200 acres in size unless the natural patch size is smaller.
- Use methods of vegetation treatment that emulate natural disturbance and secessional processes.
- Vegetation manipulation may include mechanical treatments, chemical treatments, commercial or non-commercial timber harvest of wood products, prescribed fire, wildfire for resource benefit, or other appropriate methods. Manipulations should emphasize ecological and multiple use outcomes over being "above cost".
- Wood fiber should be utilized consistent with ecosystem management and multiple use goals.

Noxious Weeds (RFP 3-21)

- Monitor disturbed areas, such as landings, skid trails, roads, mines, burned areas, etc., for noxious weeds or invasive species and treat where necessary and funding availability.
- Evaluate the potential for invasion by noxious weeds into proposed vegetation units and modify units or mitigate where necessary.

Transportation (RFP 3-37)

- Roads analysis (currently in Part 212 of Title 36 of the Code of Federal Regulations) shall be used to inform road management decisions, including; construction, reconstruction, or obliteration of roads.
- Roads identified as unneeded in a roads analysis should be decommissioned, stabilized and returned to production.
- Minimize construction of new transportation routes, evaluate existing routes, and reconstruct or relocate those routes not meeting management goals.

- Design and construct roads to a standard appropriate to their intended use, considering safety, cost, and resource impacts, emphasizing protection of water quality.
- Surface gravel should be placed on roads where necessary to reduce rutting, surface erosion and to reduce maintenance costs.

Air Quality (RFP 3-8)

- Follow visibility and clearing index guidelines when implementing management practices such as prescribed burning.
- Ensure treatments using prescribed fire are consistent with EPA's Interim Air Quality Policy on Wildland and Prescribed Fires, or more current direction.

Plant Species Diversity (RFP 3-22)

- Where practical, disturbed sites should be allowed to revegetate naturally where the seed source and soil conditions are favorable and noxious weeds are not expected to be a problem.

Recreation (RFP 3-40)

- Projects should be planned and implemented to meet the Recreational Opportunity Spectrum (ROS) as depicted on the Forest ROS map.

Scenic Resources (RFP 3-40)

- Until the Scenery Management System is fully implemented, projects should be planned and implemented to meet the VQOs as displayed in the Forest VQO map.

Heritage Resources (RFP 3-41)

- Cultural resource inventories shall be conducted in consultation with the Idaho State Historical Preservation Office.

Goshawk Habitat (RFP 3-30)

- The management standards and guidelines in Table 3.5 apply to all forest types within active and historic goshawk nesting territories.

Ecological Subsection

The Aspen Range Timber Sale/Vegetation Treatment falls within the Preuss Ridges and Hills Subsection (M331Df) ecological subsection (RFP 4-12). Through prescription area application, the following will be emphasized within this subsection. This does not preclude other activities but with limited resources, management would be focused in these areas.

- Retention of large security areas for wildlife.
- Linkage habitat between the Caribou and the Bridger-Teton NF.
- Restoration and protection of Bonneville cutthroat trout habitat, particularly on the east side of the subsection
- Restoration of deteriorated rangelands
- Management of phosphate reserves and forested vegetation.

Management Prescription

Management prescriptions, a set of management practices, are applied to a specific area of land to attain multiple-use and other goals and objectives. The purpose of management prescriptions is to provide a basis for consistently displaying management direction on Forest Service administered lands. Management prescriptions in the Forest Plan are intended to provide a general sense of the management direction or treatment of the land where each prescription is applied. They identify the emphasis and focus of multiple-use management activities in a specific area; however, **emphasis**, as used in this context, is defined as a focus or a highlight and does not necessarily mean exclusive use.

Prescription 5.2 – Forest Vegetation Management (RFP 4-71to 4-74): The emphasis in this prescription area is on scheduled wood-fiber production, timber growth, and yield while maintaining or restoring forested ecosystem processes and functions to more closely resemble historical ranges of variability with consideration for long-term forest resilience. Goods and services are provided within the productive capacity of the land. The quantity of goods and services produced may or may not fully meet demand. Amenity values are provided for. Investments made in these areas for timber production, such as road systems and silvicultural improvements and the value of the timber for wood production, receive consideration prior to the use of fire.

Lands in this prescription are included in the suitable timber base and contribute to the Allowable Sale Quantity (ASQ). These lands are managed to emphasize the cost-effective production of timber within its land capability and capacity. Further, where aspen exists on suitable timberland, it will be maintained at the current level on the landscape (RFP 4-72).

Prescription 2.7.1 – Elk and Deer Winter Range Critical (RFP 4-42 to 4-43):
This management prescription emphasizes management actions and resource conditions that provide quality elk and deer winter range habitat. Habitats are managed for multiple land use benefits, to the extent these land uses are compatible with maintaining or improving elk and deer winter range.

These areas are critical deer and/or elk winter ranges where available forage and winter security is emphasized. They represent the winter range areas that contribute to a population's ability to maintain itself over the long term. Their importance is due to a variety of factors, including: the number of wintering animals; proximity to threatened winter ranges; or being used by populations not meeting Department of Fish and Game objectives.

Livestock grazing, timber management, recreation, and other resource management activities can occur as long as desired vegetation and security conditions are being maintained.

1.7 Decision To Be Made

The Forest Supervisor will make decisions based on consideration of project alternatives, the effects analysis, information in the project file and public comments.

Decisions to be made for this project are:

- Should resource management activities, including: timber harvest, noncommercial thinning, prescribed fire and road relocation be implemented in the Aspen Range project area at this time?

If so:

- Where within the project area should these activities occur?
- What type and mix of timber harvest systems, timber stand treatments, and prescribed fire should be used on Forest Service managed lands?
- What design features, mitigation measures, and monitoring should be applied to the project?

1.8 Public Involvement

Public involvement in this project began in the winter of 2002 when the *Aspen Range Timber Sale/Vegetation treatment* was included in the Forest's NEPA Quarterly. The project has appeared quarterly in the schedule since that issue. In February of 2002, an Idaho Fish and Game Coordination meeting was held where this project along with other were discussed.

On March 11, 2003, a scoping letter detailing a proposed action was mailed to approximately 118 individuals and organizations that had previously indicated an interest in receiving notification of proposed activities on the Soda Springs Ranger District. News articles concerning this project were published in the Caribou Sun (March 9, 2003), Casper Star Tribute (March 19, 2003), Idaho State Journal (March 19, 2003), and USA Today (March 20, 2003). The scoping letter was also mailed on March 18, 2003 to approximately eight adjacent landowners. Comments were received from seven individuals, organized groups, companies, adjacent landowners, and public agencies. A Notice of Intent (NOI) to prepare an Environment Impact Statement (EIS) was published in the Federal Register May 12, 2003.

The Aspen Range Timber Sale and Vegetation Treatment Draft Environment Impact Statement (DEIS), Notice of Availability (NOA) was published on 5/22/05. Five comment letters were received from individuals, organized groups, and public agencies addressing content of the DEIS. The Legal Notice for the DEIS was published in The Idaho State Journal on 5/29/2005.

1.9 Issues Identification

Information gathered from public and internal scoping was analyzed to determine if any concerns were raised relevant to the decision to be made. The interdisciplinary team reviewed each comment/concern and categorized them into one of the following:

1.9.1 Issues

Three issues were identified that generated alternatives, new roads, Goshawk and transportation. Listed below are the concern statements for the issues.

No New Roads

- The issue of temporary road construction necessary for the purpose of accessing timber stands proposed for harvest would create adverse impacts to water quality, hydrologic function of the watershed, wildlife habitat and security, and noxious weed invasion. **Indicator:** Miles of temporary and system road realignment.

Goshawk

- The issue of commercial timber harvest within active Goshawk nesting territories. The proposed action would also create larger than forty acre openings using mechanically harvested regeneration silvicultural systems within the post fledging and foraging areas. The proposed action could affect the Goshawk and/or Goshawk habitat. **Indicator:** RFP Goshawk standards and guidelines followed.

Transportation

- The issue of deteriorated soft ground road conditions and the cost of construction to facilitate haul truck traffic on State and private sections of the Johnson Creek Road (20126). At least one mile would require construction of raised road base, surface improvements and three cattle guards to accommodate various ownerships. The IDT generated an alternative to address the road condition on private property. A description of the alternative is described in chapter 2, Alternatives Considered in Detail. **Indicator:** Estimated cost of road improvements on non Forest Service Lands.

1.9.2 Effects to be Analyzed (other relevant resources)

Many comments requested that a variety of resource concerns be fully analyzed and disclosed in the environmental document. These comments were combined into similar categories and will be discussed in Chapter 3. The categories were: 1) Vegetation 2) Hydrology 3) Soils 4) Wildlife 5) Fisheries 6) Road Management 7) Economics 8) Air Quality 9) Visuals 10) Threatened, Endangered, and Sensitive Plants 11) Range Management 12) Heritage Resources 13) Recreation 14) Tribal Treaty Rights.

1.9.3 Beyond the Scope

The following concerns are outside the scope of the proposed action; already decided by law, regulation, Forest Plan, or other higher level decisions; irrelevant to the decision to be made, or conjectural and not supported by scientific or factual evidence. The concern statements and rationale for beyond the scope are discussed below.

- **OHV use of the project area**

Rationale: The decision was made in the Revised Forest Plan, which placed summer motorized recreation use as open to cross country travel in the area. The Caribou Travel Management Plan (signed 11/07/2005) identifies roads and trails that are designated open to summer motorized use.

- **The Forest should make every effort to work with and educate the owners to design a plan to decrease the vulnerability of their home and cabins to fire.**

Rationale: The decision to be made is whether management activities should occur in the project area. Currently, the Forest and other agencies have implemented a national educational program to educate the public on design to decrease the fire vulnerability of their home and cabins.

- **I do not support logging for commercial interest.**

Rationale: Forest Plan allows commercial logging, as part of multiple use mandates. In addition, the No-action Alternative analyzes the effect of no logging.

- **The project also needs to detail in what places and under what situation wild fire will be allowed to burn**.

Rationale: The decision was made in the Revised Forest Plan – all fires shall be suppressed if they are not in areas covered by pre-approved fire management plans (RFP 3-4). The project area is not covered by a pre-approved fire management plan.

II.ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes the No Action Alternative, the Proposed Action and three additional action alternatives that the interdisciplinary team developed and studied in detail. It also briefly describes the alternatives not studied in detail.

In addition to describing the alternatives, this chapter presents a comparative summary of the alternatives based on the information and analysis presented in Chapter III Affected Environment and Chapter IV Environmental Consequences.

2.1 History and Process Used to Formulate the Alternatives

An array of alternatives were developed to provide the decision maker a reasonable range of options to lessen or eliminate unresolved conflicts or issues for which no design feature of the proposed action could be modified to address. The Proposed Action is the initial formulation of the project that was subject to internal and public review and comment. The No Action Alternative is required by regulation and provides a baseline for analysis. Four additional action alternatives were developed to address concerns identified through the scoping, IDT review process and DEIS response comments.

2.2 Best Available Science

What constitutes best available science might vary over time and across scientific disciplines. As a general matter this NEPA document will show consideration for the best available science, scientific integrity of discussions and analysis of the project. The Aspen Range Timber Sale and Vegetation Treatment identifies analysis methods used, references scientific sources and discloses incomplete or unavailable information. The project record references all scientific information considered: papers, reports, literature reviews, results of ground based observations, etc.

2.3 Decision Criteria

As with most land management decisions, the overall goal is to optimize the achievement of the identified project objectives, while avoiding substantial adverse impacts to other resource values. With this overall goal in mind, the decision maker has identified the following criteria on which a decision choice between the alternatives would be based.

- The degree to which each of the alternatives maintains or enhances aspen.
  Indicator: The number of acres with aspen as a stand component changed from mature/old to seedling/sapling structure class.

- The degree to which each of the alternatives meets the DFC for forested vegetation. **Indicator:** Percentage of acres in seedling/sapling, young/mid, and mature/old classes relative to the DFC.
- The degree to which each of the alternatives reduces undesirable wildfire effects and increases firefighter and public safety. **Indicator:** Percentage of acres with a change in fire intensity (flame lengths, torching index, and crowning index) within the project area.
- The degree to which each of the alternatives captures the economic value of the timber from acres assigned the prescription 5.2, Forest Vegetation Management. **Indicator:** Millions of board feet (MMBF) harvested.
- The degree to which each of the alternatives improves the Forest transportation system within the project area. **Indicator:** Number of miles of road improvements.
- The degree to which each alternative removes problematic roads segments within aquatic influence zone (AIZ). **Indicator**: Miles of roads removed from AIZ.

2.4 Alternatives Considered but Eliminated from Detail Study

External publics and the Interdisciplinary Team (IDT) proposed other approaches or alternatives to accomplish the project objectives. Alternatives were evaluated by the IDT, but eliminated from detailed study, due to not fully meeting the project purpose and need, or other management constraints. Each alternative considered, and the reasons for elimination from detailed study, are discussed below.

2.4.1 Prescribed Burn

An alternative was proposed to use prescribed fire as the primary tool to reduce fuels and to regenerate aspen within the project area. This alternative would regenerate aspen, reduce stand densities, and reduce expected fire intensity within the project area. It would not reduce sediment and maintenance on roads in the project area and would not capture the value of the timber that is assigned the prescription of Forest Vegetation Management in the RFP. This alternative does not fully meet the stated purpose and need.

2.4.2 Herbicide Spraying

An alternative was proposed to use herbicide to regenerate aspen. This alternative would regenerate aspen within the project area. It would not reduce sediment and maintenance on roads, reduce stand densities, reduce expected fire intensity, and would not capture the value of the timber that is assigned the prescription of Forest Vegetation Management in the RFP. This alternative does not fully meet the stated purpose and need.

2.4.3 Use Helicopter or Skyline logging systems instead of Tractor based logging

An alternative was suggested to harvest timber from the project area using helicopters and/or skyline cable systems. All stands considered for logging are located on terrain that can be tractor logged within the standards and guidelines of the RFP.

2.5 Alternatives Considered in Detail

This section describes the alternatives considered in detail.

Table 2.5-1 summarizes activities proposed for each alternative. Detailed maps that display location of the activities for each alternative can be found for each alternative later in this chapter.

Table 2.5-1: Summary of activities proposed for each alternative.

Activities	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
Silviculture Treatments	**Acres**	**Acres**	**Acres**	**Acres**	**Acres**
Tractor Harvest & Prescribed Burn		672	200	385	385
Tractor Harvest		153	32	40	32
Fuelbreak (Mechanical /Handpile)		56	56	56	56
Precommercial Thinning		0	100	100	100
Prescribed Burn (No Harvest)		660	646	800	814
Total Harvest	**0**	**881**	**288**	**481**	**473**
Total Acres Treated	**0**	**1,541**	**1034**	**1,381**	**1,387**
% of Project Area Treated	**0%**	**13%**	**9%**	**12%**	**12%**
Transportation	**Miles**	**Miles**	**Miles**	**Miles**	**Miles**
Road Realignment (New Construction)	0	2.1	0	2.0	4.5
Temporary Road (New Construction) (1)	0	5.1	0	2.3	2.3
Prehaul Maintenance	0	6.2	1.6	2.9	3.6
Reconstruction	0	2.4	3.0	2.1	0.8
Reconstruction/Close	0	2.6	0.6	1.3	1.4
Reconstruction/Obliterate (2)	0	0.6	0.2	0.2	0.2
Old Alignment Obliteration (3)	0	2.1	0	1.8	4.4
Total Obliteration (Includes 1+2+3)	0	7.8	0.2	4.3	6.9
Open Road at Completion	**28.9**	**28.9**	**28.9**	**29.1**	**29.1**
Open Trail at Completion	**18**	**18**	**18**	**18**	**18**

✷ All acreages and mileages disclosed in this document are approximate. Every effort was made to create GIS coverage's of the proposed activities that were as close to what would be implemented as possible. However, final locations of the proposed activities will be determined at the time of implementation.

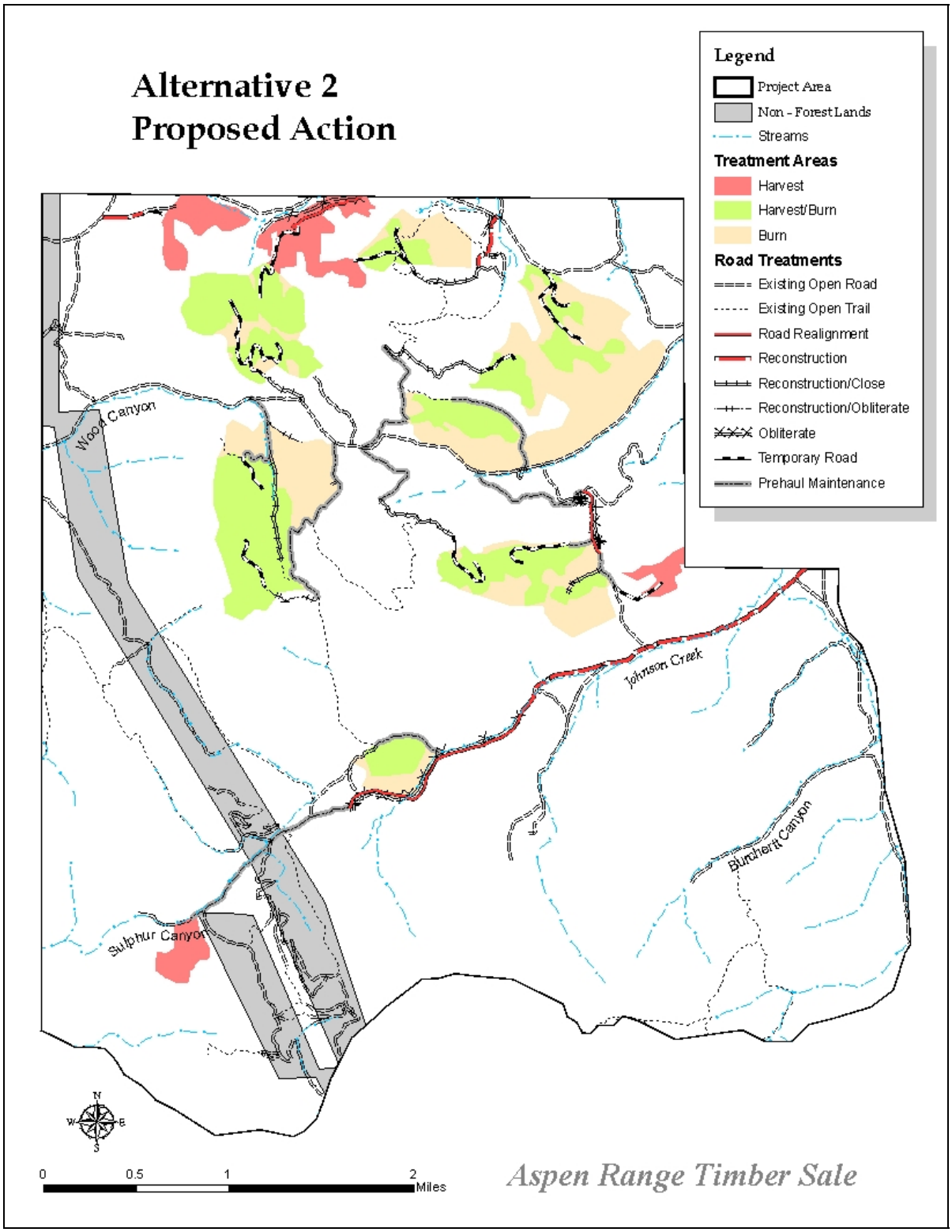
All action alternatives were designed with treatment blocks that are as practical and as cost efficient as possible. Isolated stands that would have to be lined on all sides to burn were not proposed for treatment. In the alternatives that use commercial timber harvest the harvest units and the lines constructed as part of the timber sale activities were used to create defensible burn blocks. Existing fire barriers such as roads, trails, and drainages were also considered when designing the prescription blocks. In other words, these action alternatives are the interdisciplinary team's best effort at designing alternatives that can be implemented and are cost efficient.

2.5.1 Alternative 1 – No Action

This alternative provides a baseline against which impacts of the various action alternatives can be measured and compared. Under this alternative, none of the specific management activities proposed in this document would occur. Ongoing activities such as grazing, recreation (hunting, OHV use, etc.), public firewood gathering, fire suppression, normal road maintenance, special uses and existing road management closures would continue at current levels. Management activities proposed by other environmental documents may still occur.

2.5.2 Alternative 2 – Proposed Action

Figure 2.5-1: Alternative 2



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Alternative 2 proposes to tractor harvest **881** acres of Douglas-fir, aspen/Douglas-fir and lodgepole pine stands using a variety of silvicultural prescriptions. The harvest would be followed by 1,332 acres of prescribed fire to increase aspen cover types and reduce fuel loads in the 12,000 acre analysis area. The harvest volume is anticipated to be about 5.5 million board feet from two timber sales. Proposed activities may not occur on every acre within individual stands, but for analysis and reporting purposes the stand acreage will be assumed treated.

The alternative was designed to address forest vegetation condition and concerns. Timber stands that qualified as suitable for timber production and could contribute to ASQ (allowable sale quantity) were proposed for harvest.

Activities	Alt. 2 Proposed Action
Silviculture Treatments	**Acres**
Tractor Harvest & Prescribed Burn	672
Tractor Harvest	153
Fuelbreak (Mechanical /Handpile)	56
Precommercial Thinning	0
Prescribed Burn (Not Harvested)	660
Total Harvest	**881**
Total Acres Treated	**1,541**
% of Project Area Treated	**13%**
Transportation	**Miles**
Road Realignment (New Construction)	2.1
Temporary Road (New Construction) (1)	5.1
Prehaul Maintenance	6.2
Reconstruction	2.4
Reconstruction/Close	2.6
Reconstruction/Obliterate (2)	0.6
Old Alignment Obliteration (3)	2.1
Total Obliteration (Includes 1+2+3)	7.8
Open Road at Completion	28.9
Open Trail at Completion	18

All design features that have been listed in section 2.6 Management Practices will be included in this alternative. Proposed activities are designed to comply with the Revised Forest Plan standards and guidelines. Standards and Guidelines for **Goshawk Habitat** and **Hydrological Disturbance** would be exceeded in this alternative. The proposed action alternative would also need approval from the Regional Forester in order to meet the 40 acre maximum mechanical opening standard for forested vegetation (RFP 3-45). Portions within the Johnson Creek drainage of alternative 2 would not take place until a right of way across private property for the Johnson Creek road # 126 is secured. Currently the right of way is not valid.

Timber Harvest and Silvicultural Treatments

Irregular shelterwood/aspen regeneration silvicultural treatments are proposed for 589 acres. The emphasis of the prescription is to release aspen stands from competing conifer, and convert treatment areas back to early seral species. The prescription would provide flexibility for aspen clone regeneration, snag preservation, remnant Douglas-fir retention, and remnant replacement in situations of Douglas-fir bark beetle mortality. Prescribed fire for fuels treatment and site preparation would be used on 564 acres of this prescription to simulate the natural disturbance for aspen regeneration. The exception to

the irregular shelterwood/aspen regeneration prescription is a 25 acre unit that borders the Forest Boundary and would be mechanically treated without burning. Larger units would utilize coarse woody debris as barriers to increase the success of aspen regeneration by having better dispersion of wild and domestic browsing/grazing animals across treated areas. Temporarily fencing portions of treated areas may be required to ensure regeneration.

Stand improving **commercial thinnings and shelterwoods** are planned for 197 acres. The objective of the treatment is to reduce stand densities by removing the suppressed and intermediate trees (lower crown classes) to provide crown spacing and reduce tree to tree competition for residual dominant trees. Natural regeneration would occur over time but is not immediately necessary to meet Revised Forest Plan stocking standards because of residual leave trees. Mechanical fuels treatment (piling) would take place in the 50 acres of shelterwood prescription stands closest to the archery range and a 39 acre stand in Middle Sulfur Canyon. Prescribed broadcast fire would be used for site preparation and fuel treatment on the remaining 108 acres.

A quarter mile **fuelbreak** along the northwest forest boundary of the analysis area would be constructed across the north edge of the 56 acre stand using as many natural openings and barriers as possible. The objective is to reduce fuel loads by removing standing dead, down dead, small diameter trees, dense brush and provide crown spacing between mature trees. The remaining stand would be **commercially thinned** to reduce stand densities by removing suppressed and intermediate trees (lower crown classes) to provide crown spacing and reduce tree to tree competition for residual dominant trees. Pockets of small-diameter (sapling) conifer encountered within the stand/fuelbreak would be thinned to 14 to 20 foot spacing, and pruned to remove ladder fuels. Heavy equipment would only be used on ground less than 40 percent slope. Merchantable logs on feasible tractor ground would be skidded up hill to a landing. All un-merchantable material would be hand or machine piled and burned in the fall following substantial snow accumulation. Work in the riparian area would be completed by hand with chainsaws. The stand is not proposed for broadcast burning and would be logged in early winter.

A **seedtree/improvement cut** is proposed for a 39 acre lodgepole stand in the archery range area (this area is under special use permit to the Caribou Archers). The intent is to reduce competition and regenerate portions of the stand with early seral species. Seedtrees would provide natural regeneration in areas of stand decline and the improvement cut to ensure visual protection along the archery range corridor. Site preparation and fuels treatment (piling) would be mechanical.

Prescribed broadcast fire is planned for 1,332 acres of harvest units, rangelands and un-harvested stands. The objective of the prescribed fire is to convert vegetation to early seral condition and reduce fuel loads. Standing dead and cull green material is expected to replace down dead woody debris consumed by the burn. Forested stands that are not planned for harvest would account for about 457 acres incorporating as much of the aspen clone as possible. Fragments of rangelands accounting for 203 acres would be included in the boundaries for resource, economic, and containment reasons. It is

important to note that the prescribed fire is not intended to burn through every acre within the burn boundaries. Pockets, islands and stands will be firelined and excluded from prescribed fire to insure a mosaic landscape pattern. Firelines would be mechanically constructed using as many natural openings, ridge tops, roads, and terrain barriers as possible. The stands adjacent to the archery range and residential area would be mechanically treated. Generally the window for burning in this area is late spring and early fall depending on weather patterns.

Transportation

Approximately 2.1 miles of existing old system roads (20574, 20126 & 20297) are proposed for realignment**.** The objective of road realignment is to facilitate harvest equipment, provide quality public access while decreasing erosion damage and maintenance costs. Locations and length are approximate for analysis purposes. Exact locations will be determined during project implementation. The old system road segments replaced with new alignment would be fully obliterated at project end.

Harvest Activities would require approximately 5.1 miles of new temporary road construction. Locations and amounts shown for temporary roads are approximate for analysis purposes. Exact locations will be determined during project implementation. All constructed new temporary roads segments would be fully obliterated with a thumb bucket excavator at project end.

Approximately 2.4 miles of existing open road would be reconstructed and 0.6 miles of existing closed road would be reconstructed and obliterated after the project was completed. Reconstruction and close designation would occur on 2.6 miles of existing system road currently managed as closed road. Reconstruction involves one or more of the following: culvert installation, shaping for proper drainage, minor realignments, and adding gravel where needed. Roads with a reconstruct and obliterated designation would be closed to motorized access at project completion. Roads with a reconstruct and closed designation would be closed to full sized vehicles retaining the current designation as a motorized trail following project completion.

Pre-haul maintenance for approximately 6.2 miles would be required in the timber sale contract. The maintenance would include pulling ditches, blading and shaping the road surface, spot graveling, cleaning culverts and repairing drainage structures.

Road obliteration would consist of recontouring slopes, channels and incorporating debris across the prism followed by seeding with the appropriate native mix. Total road obliteration at project end is approximately 7.8 miles. Open roads and trails account for approximately 47 miles in the project area. Non forest system routes (private land inholdings) account for about 9.5 miles.

See **Figure 2.5-1: Alternative 2** for locations of the proposed treatments.

2.5.3 Alternative 3 – No New Roads

Alternative 3 proposes to tractor harvest approximately **288** stand acres, followed by 846 acres of prescribed fire to increase aspen cover types and reduce fuel loads in the 12,000 acre analysis area. The harvest volume is anticipated to be about 2 million board feet from two timber sales. Proposed activities may not occur on every acre within the stand, but for analysis and reporting purposes the stand acreage will be assumed treated.

Activities	Alt. 3 No New Roads
Silviculture Treatments	**Acres**
Tractor Harvest & Prescribed Burn	200
Tractor Harvest	32
Fuelbreak (Mechanical /Handpile)	56
Precommercial Thinning	100
Prescribed Burn (Not Harvested)	646
Total Harvest	**288**
Total Acres Treated	**1034**
% of Project Area Treated	**9%**
Transportation	**Miles**
Road Realignment (New Construction)	0
Temporary Road (New Construction) (1)	0
Prehaul Maintenance	1.6
Reconstruction	3.0
Reconstruction/Close	0.6
Reconstruction/Obliterate (2)	0.2
Old Alignment Obliteration (3)	0
Total Obliteration (Includes 1+2+3)	0.2
Open Road at Completion	28.9
Open Trail at Completion	18

While similar to the Proposed Action, this alternative proposes no new roads. The alternative was developed in response to the public's concerns regarding the effects of new road construction and regeneration harvesting systems. Timber stands that qualified as suitable for timber production and that could contribute to ASQ (allowable sale quantity) were proposed for harvest.

All design features that have been listed in section 2.6 Management Practices will be included in this alternative. Proposed activities are designed to comply with the Revised Forest Plan Standards and Guidelines including goshawk habitat. Portions within the Johnson Creek drainage of alternative 3 would not take place until a right of way across private property for the Johnson Creek road # 126 is secured. Currently the right of way is not valid.

Timber Harvest and Silvicultural Treatments

Aspen regeneration/commercial thin silvicultural treatments are proposed for approximately 190 acres. The emphasis of the prescription is to release aspen stands from competing conifer, and convert treatment areas back to early seral species. The prescription would provide flexibility for aspen clone regeneration, snag preservation, remnant Douglas-fir retention, and remnant replacement in situations of Douglas-fir bark beetle mortality. Prescribed fire for fuels treatment and site preparation would be used to simulate the natural disturbance for aspen regeneration. Mechanical Site preparation would be used on about 7 acres of the prescription. Larger units would utilize coarse woody debris as barriers, to increase the success of aspen regeneration by having better

dispersion of wild and domestic browsing/grazing animals across treated areas. Temporarily fencing portions of treated areas may be required to ensure regeneration.

Stand improving **commercial thinnings** are planned for about 42 acres. The objective of the treatment is to reduce stand densities by removing suppressed and intermediate trees (lower crown classes) to provide crown spacing and reduce tree to tree competition for residual dominant trees. Natural regeneration would occur over time but is not immediately necessary to meet Revised Forest Plan stocking standards because of residual leave trees. Mechanical fuels treatment (piling) would take place on one unit (25 acres) near the archery range. Approximately 17 acres in the Wood Canyon area would be incorporated with prescribed fire. All 42 acres of the prescription fuels treatment would be whole tree yarded during the harvest to reduce fuel loads and or reduce residual damage during mechanical piling.

A quarter mile **fuelbreak** along the northwest forest boundary of the analysis area would be constructed across the north edge of the 56 acre stand using as many natural openings and barriers as possible. The objective is to reduce fuel loads by removing standing dead, down dead, small diameter trees, dense brush, and provide crown spacing between mature trees. The remaining stand would be **commercially thinned** to reduce stand densities by removing suppressed and intermediate trees (lower crown classes) to provide crown spacing and reduce tree to tree competition for residual dominant trees. Pockets of small-diameter (sapling) conifer encountered within the stand/fuelbreak would be thinned to 14 to 20 foot spacing, and pruned to remove ladder fuels. Heavy equipment would be used on ground less than 40 percent slope. Merchantable logs on feasible tractor ground would be skidded up hill to a landing. All unmerchantable material would be hand or machine piled and burned in the fall following substantial snow accumulation. Work in the riparian area would be completed by hand with chainsaws. The stand is not proposed for broadcast burning and would be logged in early winter.

Prescribed broadcast fire is planned for 846 acres of harvest units, rangelands and un-harvested stands. The objective of the prescribed fire is to convert vegetation to early seral condition and reduce fuel loads. Standing dead and cull green material is expected to replace down dead woody debris consumed by the burn. Forested stands that are not planned for harvest would account for about 437 acres incorporating as much of the aspen clone as possible. Fragments of rangelands accounting for 209 acres would be included in the boundaries for resource, economic, and containment reasons. It is important to note that the prescribed fire is not intended to burn through every acre within the burn boundaries. Pockets, islands and stands will be firelined and excluded from prescribed fire to insure a mosaic landscape pattern. Firelines would be mechanically constructed using as many natural openings, ridge tops, roads, and terrain barriers as possible. The stands adjacent to the archery range and residential area would be mechanically treated. Generally the window for burning in this area is late spring and early fall depending on weather patterns.

Pre-commercial thinning and noncommercial thinning treatments would occur manually (chainsaw) on approximately 100 acres of overstocked plantations to reduce

tree to tree competition and ladder fuels treatment around the archery range. The per-commercial thinning would also allow for species selection, individual tree dominance and growth rates to be in line with site potential.

Transportation

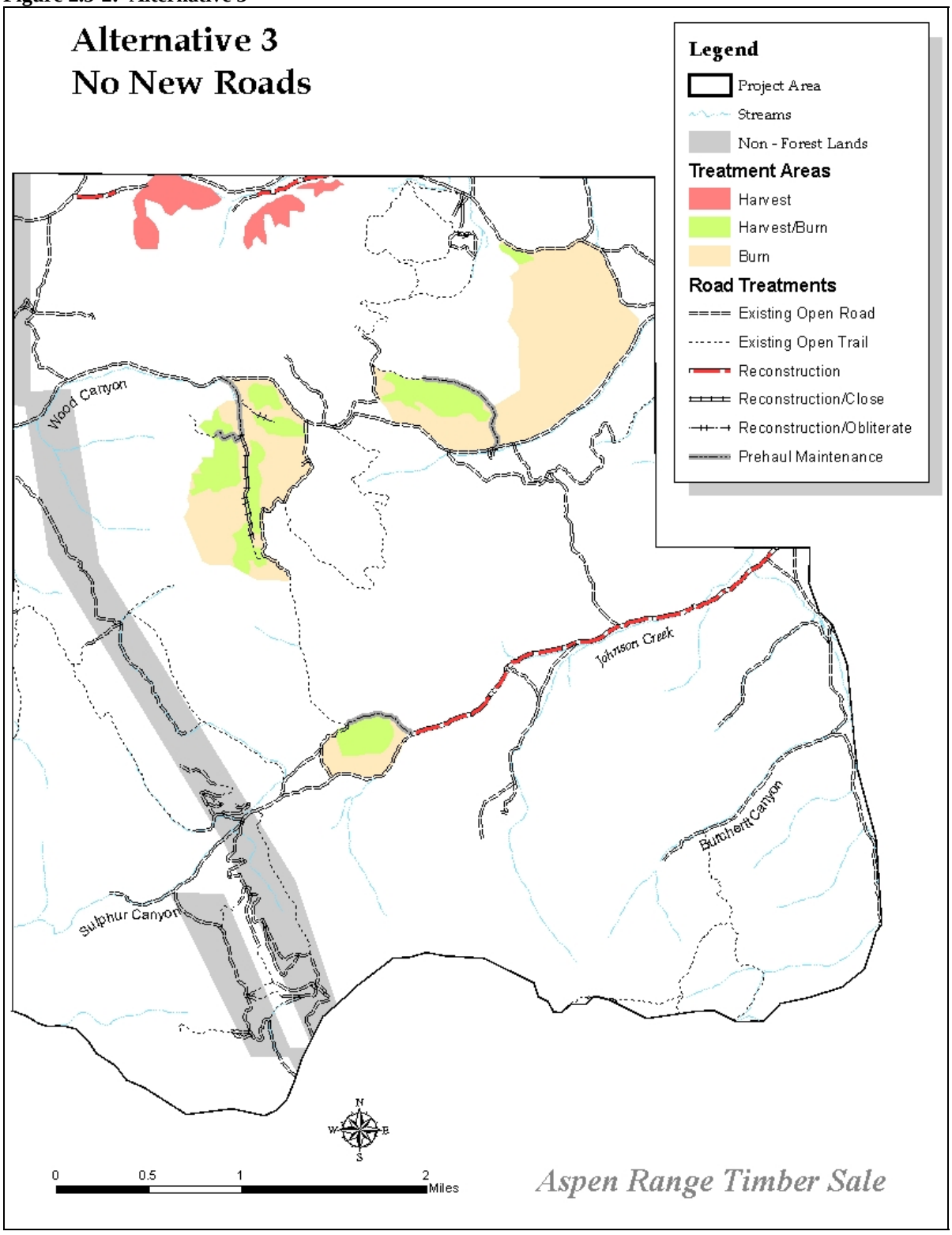
Road realignment or temporary road construction would **not** occur under this alternative. Harvest Activities would require approximately 3.0 miles of reconstruction of existing open road and 0.2 miles of existing closed road would be reconstructed and obliterated after the project was completed. Reconstruction and close designation would occur on 0.6 miles of existing system road currently managed as closed road. Reconstruction involves one or more of the following: culvert installation, shaping for proper drainage, minor realignments, and adding gravel where needed. Roads with a reconstruct and obliterated designation would be closed to motorized access at project completion. Roads with a reconstruct and closed designation would be closed to full sized vehicles retaining the current designation as a motorized trail following project completion.

Pre-haul maintenance for approximately 1.6 miles would be required in the timber sale contract. The maintenance would include pulling ditches, blading and shaping the road surface, spot graveling, cleaning culverts and repairing drainage structures.

Road obliteration would consist of re-contouring slopes, channels and incorporating debris across the prism followed by seeding with the appropriate native mix. Total road obliteration is approximately 0.2 miles. Open roads and system trails account for approximately 47 miles in the project area. Non forest system routes (private land inholdings) account for about 9.5 miles.

See **Figure 2.5-2: Alternative 3** for locations of the proposed treatments.

Figure 2.5-2: Alternative 3



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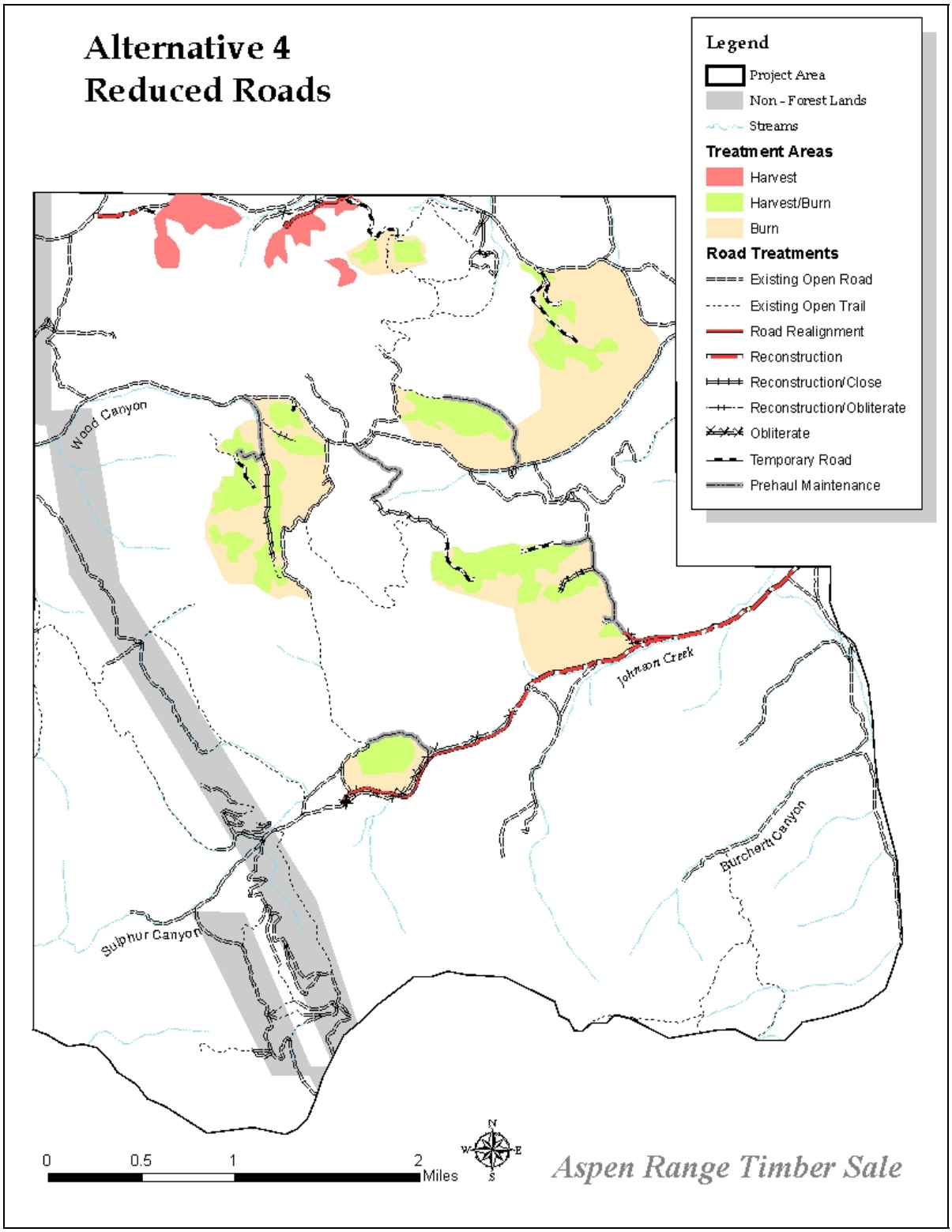
2.5.4 Alternative 4 – Reduced Roads

Figure 2.5-3: Alternative 4



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Alternative 4 proposes to tractor harvest approximately **481** stand acres followed by 1,185 acres of prescribed fire within the project area. The harvest volume is anticipated to be about 3.5 million board feet from two timber sales. Proposed activities may not occur on every acre within the stand, but for analysis and reporting purposes the stand acreage will be assumed treated.

Activities	Alt.4 Reduced Roads
Silvicultural Treatments	**Acres**
Tractor Harvest & Prescribed Burn	385
Tractor Harvest	40
Fuelbreak (Mechanical /Handpile)	56
Precommercial Thinning	100
Prescribed Burn (Not Harvested)	800
Total Harvest	**481**
Total Acres Treated	**1,381**
% of Project Area Treated	**12%**
Transportation	**Miles**
Road Realignment (New Construction)	2.0
Temporary Road (New Construction) (1)	2.3
Prehaul Maintenance	2.9
Reconstruction	2.1
Reconstruction/Close	1.3
Reconstruction/Obliterate (2)	0.2
Old Alignment Obliteration (3)	1.8
Total Obliteration (Includes 1+2+3)	4.3
Open Road at Completion	29.1
Open Trail at Completion	18

While similar to the Proposed Action, this alternative proposes reduced road construction. The alternative was developed in response to the public's concerns regarding the effects of new road construction and regeneration harvesting systems. Timber stands that qualified as suitable for timber production and that could contribute to ASQ (allowable sale quantity) were proposed for harvest.

All design features that have been listed in section 2.6 Management Practices will be included in this alternative. Proposed activities are designed to comply with the Revised Forest Plan Standards and Guidelines including goshawk habitat. Portions within the Johnson Creek drainage of alternative 4 would not take place until a right of way across private property for the Johnson Creek road # 126 is secured. Currently the right of way is not valid.

Timber Harvest and Silvicultural Treatments

Aspen regeneration/commercial thin silvicultural treatments are proposed for 361 acres. The emphasis of the prescription is to release aspen stands from competing conifer, and convert treatment areas back to early seral species. The prescription would provide flexibility for aspen clone regeneration, snag preservation, remnant Douglas-fir retention, and remnant replacement in situations of Douglas-fir bark beetle mortality. Prescribed fire for fuels treatment and site preparation would be used on 354 acres to simulate the natural disturbance for aspen vegetative reproduction by suckering. The exception to the prescription is a 7 acre unit that would not be economically feasible for burning because of the small acreage and would be mechanically treated. Larger units that utilize coarse woody debris as barriers increase the success of aspen regeneration by having better dispersion of wild and domestic browsing/grazing animals

across treated areas. Temporarily fencing portions of treated areas may be required to ensure regeneration.

Stand improving **commercial thinnings** are planned for 65 acres. The objective of the treatment is to reduce stand densities by removing suppressed and intermediate trees (lower crown classes) to provide crown spacing and reduce tree to tree competition for residual dominant trees. Natural regeneration would occur over time but is not immediately necessary to meet Revised Forest Plan stocking standards because of residual leave trees. Mechanical fuels treatment (piling) would take place on two units (34 acres) near the archery range. Approximately 31 acres in the Wood Canyon area would be incorporated with prescribed fire. All 65 acres of the prescription fuels treatment would be whole tree yarded during the harvest to reduce fuel loads and or reduce residual damage during mechanical piling.

A quarter mile **fuelbreak** along the northwest forest boundary of the analysis area would be constructed across the north edge of the 56 acre stand using as many natural openings and barriers as possible. The objective is to reduce fuel loads by removing standing dead, down dead, small diameter trees, dense brush, and provide crown spacing between mature trees. The remaining stand would be **commercially thinned** to reduce stand densities by removing suppressed and intermediate trees to provide crown spacing and growing room (15-30 foot spacing) for residual dominant trees. Pockets of small-diameter (sapling) conifer encountered within the stand/fuelbreak would be thinned to 14 to 20 foot spacing, and pruned to remove ladder fuels. Heavy equipment would only be used on ground less than 40 percent slope. Merchantable logs within the fuelbreak on feasible tractor ground would be skidded up hill to a landing. All unmerchantable material would be hand or machine piled and burned in the fall following substantial snow accumulation. Work in the riparian area would be completed by hand with chainsaws. The stand is not proposed for broadcast burning and would be logged in early winter.

Prescribed broadcast fire is planned for 1,185 acres of harvest units, rangelands and un-harvested stands. The objective of the prescribed fire is to convert vegetation to early seral condition and reduce fuel loads. Standing dead and cull green material is expected to replace down dead woody debris consumed by the burn. Forested stands that are not planned for harvest would account for about 474 acres incorporating as much of the aspen clone as possible. Fragments of rangelands accounting for 326 acres would be included in the boundaries for resource, economic, and containment reasons. It is important to note that the prescribed fire is not intended to burn through every acre within the burn boundaries. Pockets, islands and stands will be firelined and excluded from prescribed fire to insure a mosaic landscape pattern. Firelines would be mechanically constructed using as many natural openings, ridge tops, roads, and terrain barriers as possible. The stands adjacent to the archery range and residential area would be mechanically treated. Generally the window for burning in this area is late spring and early fall depending on weather patterns.

Pre-commercial thinning and noncommercial thinning treatments would occur manually (chainsaw) on approximately **100** acres of overstocked plantations to reduce tree to tree competition and ladder fuels treatment around the archery range. The per-

commercial thinning would also allow for species selection, individual tree dominance and growth rates to be in line with site potential.

Transportation

Approximately 2.0 miles of existing old system roads (20574, 20126 & 20297) are proposed for realignment**.** The objective of road realignment is to facilitate harvest equipment, provide quality public access while decreasing erosion damage and maintenance costs. Locations and length are approximate for analysis purposes. Exact locations will be determined during project implementation. The old system road segments replaced with new alignment would be fully obliterated at project end.

Harvest Activities would require approximately 2.3 miles of new temporary road construction. Locations and amounts shown for temporary roads are approximate for analysis purposes. Exact locations will be determined during project implementation. All constructed new temporary roads segments would be fully obliterated with a thumb bucket excavator at project end.

Approximately 2.1 miles of existing open road would be reconstructed and 0.2 miles of existing closed road would be reconstructed and obliterated after the project was completed. Reconstruction and close designation would occur on 1.3 miles of existing system road currently managed as closed road. Reconstruction involves one or more of the following: culvert installation, shaping for proper drainage, minor realignments, and adding gravel where needed. Roads with a reconstruct and obliterated designation would be closed to motorized access at project completion. Roads with a reconstruct and closed designation would be closed to full sized vehicles retaining the current designation as a motorized trail following project completion.

Pre-haul maintenance for approximately 2.9 miles would be required in the timber sale contract. The maintenance would include pulling ditches, blading and shaping the road surface, spot graveling, cleaning culverts and repairing drainage structures.

Road obliteration would consist of recontouring slopes, channels and incorporating debris across the prism followed by seeding with the appropriate native mix. Total road obliteration at project end is approximately 4.3 miles. Open roads and trails account for approximately 47 miles in the project area. Non forest system routes (private land inholdings) account for about 9.5 miles.

Recreation

The archery range access road number 20297 and parking area would be relocated 300 feet away from the stream on the bench to the south complying with the Revised Forest Plan standards and guidelines. The new parking area would be about ¾ of an acre in size, utilizing the landing area from the adjacent harvest unit and have a small day use area including picnic tables and a vault toilet. The new parking area and access road would be surfaced with gravel.

See **Figure 2.5-3: Alternative 4** for locations of the proposed treatments.

2.5.5 Alternative 5 – Preferred Alternative

Alternative 5 proposes to tractor harvest approximately **473** stand acres followed by 1,199 acres of prescribed fire within the project area. The harvest volume is anticipated to be about 3.0-3.5 million board feet from two timber sales. Proposed activities may not occur on every acre within the stand, but for analysis and reporting purposes the stand acreage will be assumed treated.

Activities	Alt. 5 Preferred Alternative
Silviculture Treatments	**Acres**
Tractor Harvest & Prescribed Burn	385
Tractor Harvest	32
Fuelbreak (Mechanical /Handpile)	56
Precommercial Thinning	100
Prescribed Burn (No Harvest)	814
Total Harvest	**473**
Total Acres Treated	**1,387**
% of Project Area Treated	**12%**
Transportation	**Miles**
Road Realignment (New Construction)	4.5
Temporary Road (New Construction) (1)	2.3
Prehaul Maintenance	3.6
Reconstruction	0.8
Reconstruction/Close	1.4
Reconstruction/Obliterate (2)	0.2
Old Alignment Obliteration (3)	4.4
Total Obliteration (Includes 1+2+3)	6.9
Open Road at Completion	29.1
Open Trail at Completion	18

While similar to alternative 4, this alternative proposes removing additional miles of road from riparian areas with realignment. The alternative was developed in response to public concerns of problematic roads segments within riparian areas that were only partially addressed in Alternative 4 of the DEIS. Other internal concerns such as lack of legal right of way and the cost of road reconstruction to facilitate haul trucks on private ground were also taken into consideration for the development of alternative 5. Timber stands that qualified as suitable for timber production and that could contribute to ASQ (allowable sale quantity) were proposed for harvest.

All design features that have been listed in section 2.6 Management Practices will be included in this alternative. Proposed activities are designed to comply with the Revised Forest Plan Standards and Guidelines including goshawk habitat. The alternative provides for legal transportation access into the Johnson Creek drainage.

Timber Harvest and Silvicultural Treatments

Aspen regeneration/commercial thin silvicultural treatments are proposed for 375 acres. The emphasis of the prescription is to release aspen stands from competing conifer, and convert treatment areas back to early seral species. The prescription would provide flexibility for aspen clone regeneration, snag preservation, remnant Douglas-fir retention, and remnant replacement in situations of Douglas-fir bark beetle mortality. Prescribed fire for fuels treatment and site preparation would be used on 368 acres to simulate the natural disturbance for aspen vegetative reproduction by suckering. The exception to the prescription is 7 acres near the archery range that would not be feasible for burning and would be mechanically treated.

Larger units that utilize coarse woody debris as barriers increase the success of aspen regeneration by having better dispersion of wild and domestic browsing/grazing animals across treated areas. Temporarily fencing portions of treated areas may be required to ensure regeneration.

Stand improving **commercial thinnings** are planned for 42 acres. The objective of the treatment is to reduce stand densities by removing suppressed and intermediate trees (lower crown classes) to provide crown spacing and reduce tree to tree competition for residual dominant trees. Natural regeneration would occur over time but is not immediately necessary to meet Revised Forest Plan stocking standards because of residual leave trees. Mechanical fuels treatment (piling) would take place on one unit (25 acres) near the archery range. Approximately 17 acres in the Wood Canyon area would be incorporated with prescribed fire. All 42 acres of the prescription fuels treatment would be whole tree yarded during the harvest to reduce fuel loads and or reduce residual damage during mechanical piling.

A quarter mile **fuelbreak** along the northwest forest boundary of the analysis area would be constructed across the north edge of the 56 acre stand using as many natural openings and barriers as possible. The objective is to reduce fuel loads by removing standing dead, down dead, small diameter trees, dense brush, and provide crown spacing between mature trees. The remaining stand would be **commercially thinned** to reduce stand densities by removing suppressed and intermediate trees to provide crown spacing and growing room (15-30 foot spacing) for residual dominant trees. Pockets of small-diameter (sapling) conifer encountered within the stand/fuelbreak would be thinned to 14 to 20 foot spacing, and pruned to remove ladder fuels. Heavy equipment would only be used on ground less than 40 percent slope. Merchantable logs within the fuelbreak on feasible tractor ground would be skidded up hill to a landing. All unmerchantable material would be hand or machine piled and burned in the fall following substantial snow accumulation. Work in the riparian area would be completed by hand with chainsaws. The stand is not proposed for broadcast burning.

Prescribed broadcast fire is planned for 1,199 acres of harvest units, rangelands and un-harvested stands. The objective of the prescribed fire is to convert vegetation to early seral condition and reduce fuel loads. Standing dead and cull green material is expected to replace down dead woody debris consumed by the burn. Forested stands that are not planned for harvest would account for about 488 acres incorporating as much of the aspen clone as possible. Fragments of rangelands accounting for 326 acres would be included in the boundaries for resource, economic, and containment reasons. It is important to note that the prescribed fire is not intended to burn through every acre within the burn boundaries. Pockets, islands and stands will be firelined and excluded from prescribed fire to insure a mosaic landscape pattern. Firelines would be mechanically constructed using as many natural openings, ridge tops, roads, and terrain barriers as possible. The stands adjacent to the archery range and residential area would be mechanically treated. Generally the window for burning in this area is late spring and early fall depending on weather patterns.

Pre-commercial thinning and noncommercial thinning treatments would occur manually (chainsaw) on approximately **100** acres of overstocked plantations to reduce

tree to tree competition and ladder fuels treatment around the archery range. The per-commercial thinning would also allow for species selection, individual tree dominance and growth rates to be in line with site potential.

Transportation

Approximately 4.5 miles of existing old system roads (20574, 20126 & 20297) are proposed for realignment**.** The objective of road realignment is to facilitate harvest equipment, provide quality public access while decreasing erosion damage and maintenance costs. Locations and length are approximate for analysis purposes. Exact locations will be determined during project implementation. The old system road segments replaced with new alignment would be fully obliterated at project end.

Harvest Activities would require approximately 2.3 miles of new temporary road construction. Locations and amounts shown for temporary roads are approximate for analysis purposes. Exact locations will be determined during project implementation. All constructed new temporary roads segments would be fully obliterated with a thumb bucket excavator at project end.

Approximately 0.8 miles of existing open road would be reconstructed and 0.2 miles of existing closed road would be reconstructed and obliterated after the project was completed. Reconstruction and close designation would occur on 1.4 miles of existing system road currently managed as closed road. Reconstruction involves one or more of the following: culvert installation, shaping for proper drainage, minor realignments, and adding gravel where needed. Roads with a reconstruct and obliterated designation would be closed to motorized access at project completion. Roads with a reconstruct and closed designation would be closed to full sized vehicles retaining the current designation as a motorized trail following project completion.

Pre-haul maintenance for approximately 3.6 miles would be required in the timber sale contract. The maintenance would include pulling ditches, blading and shaping the road surface, spot graveling, cleaning culverts and repairing drainage structures.

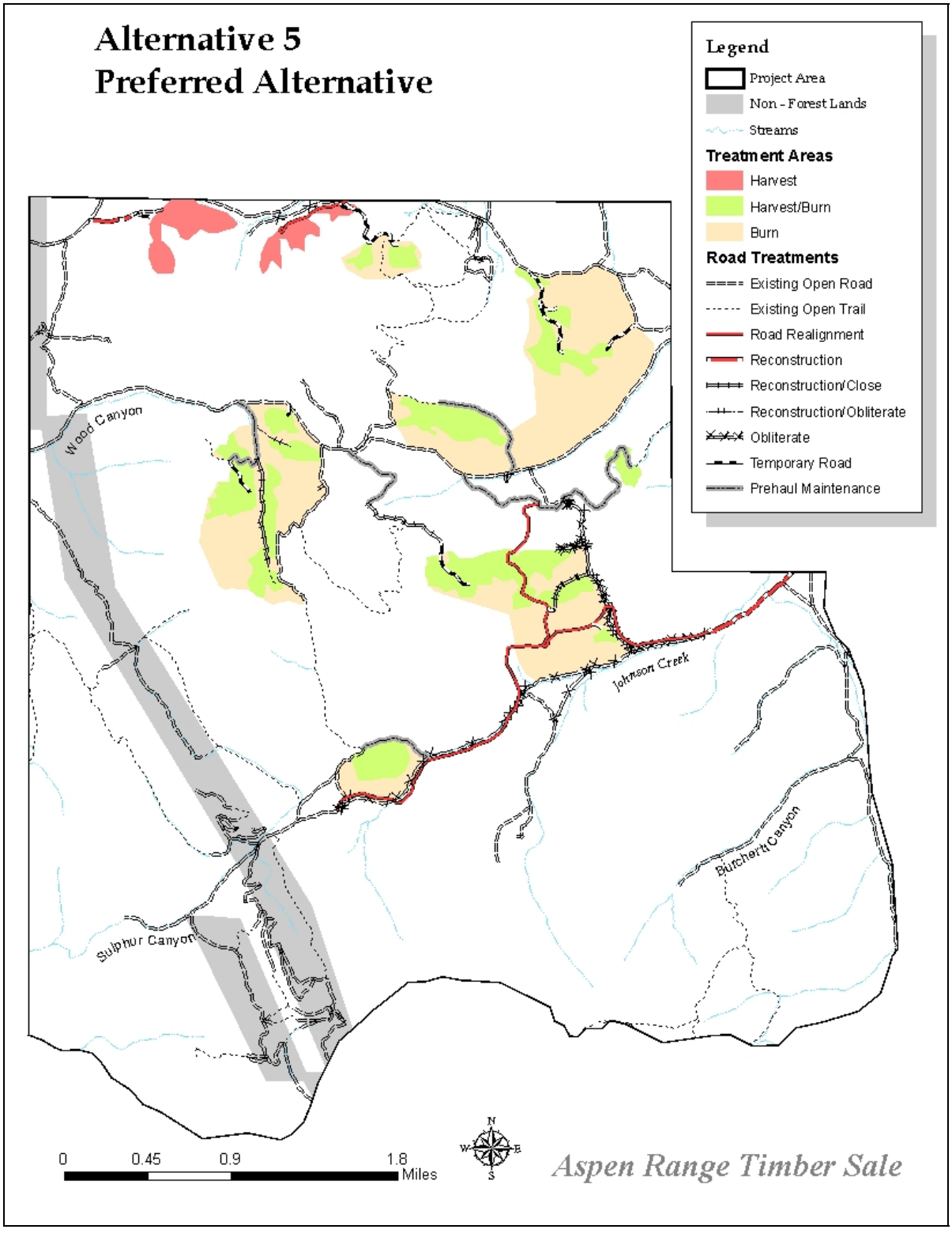
Road obliteration would consist of recontouring slopes, channels and incorporating debris across the prism followed by seeding with the appropriate native mix. Total road obliteration at project end is approximately 6.9 miles. Open roads and trails account for approximately 47 miles in the project area. Non forest system routes (private land inholdings) account for about 9.5 miles.

Recreation

The archery range access road number 20297 and parking area would be relocated 300 feet away from the stream on the bench to the south complying with the Revised Forest Plan standards and guidelines. The new parking area would be about ¾ of an acre in size, utilizing the landing area from the adjacent harvest unit and have a small day use area including picnic tables and a vault toilet. The new parking area and access road would be surfaced with gravel.

See **Figure 2.5-4: Alternative 5** for locations of the proposed treatments.

Figure 2.5-4: Alternative 5



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2.6 Management Practices

Design Features Common To All Action Alternatives

Forested Vegetation

- Gopher/rodent control, if needed to insure meeting minimum Forest Plan stocking rates.
- Insect and diseases control, if needed to insure meeting minimum Forest Plan stocking rates.
- All commercial logging units would be yarded with ground based equipment such as rubber tired skidders and other tracked equipment.
- Monitoring for Revised Forest Plan reforestation Minimum Stocking Guidelines will be conducted with Type II exams at third and fifth years following harvest. Site specific silvicultural prescriptions for aspen could prescribe differing numbers of aspen per acre than the Revised Forest Plan states and be considered successful.
- Fencing of regeneration will be an acceptable means to protect seedlings and control livestock use within treatment units if monitoring shows a need. Site visits for plantation protection will monitor regeneration and any grazing effects upon seedlings

Noxious Weeds

- To minimize the spread of noxious weeds, the purchaser would be required under standard contract provision CT 6.35 to clean all logging and construction equipment that operates off-road prior to entry on the sale area.
- Enforce compliance of the Special Order Occupancy and Use on National Forest System Lands in the States of Montana and Idaho. Compliance with this order by forest visitors and permittees would ensure that hay, straw, or mulch used on Forest Service lands would be certified as being noxious weed free.
- Monitor noxious weed populations as part of livestock compliance checking and by the gathering of stand exam data. Since livestock compliance checking would occur regularly during the growing season, this would be a good time to monitor noxious weed populations. If noxious weeds were discovered, they would be treated.

Hydrology/Soils

- Soil and Water Conservation Practices (Region 1/Region 4 Forest Service Handbook 2509.22, 5/88) would be followed for this project.
- Soil disturbance monitoring will occur prior to closing the sale to ensure design features are adequate to meet Regional Soil standards and guidelines (FSH 2509.18, R-4 supplement r4_2509.18_2002-1) and RFP standards and guidelines in representative activity areas.
- To sustain site productivity in forested communities within the project area, provide the following minimum amount of woody residue $\geq$ 3 inches in diameter dispersed on the site (RFP 3-7).

Woody Residue	Forest Habitat Types
10-15 tons per acre	Douglas-fir/mountain sweetroot Subalpine fir/mountain maple
15-20 tons per acre	Subalpine fir/mountain sweetroot

- Use Idaho Forest Practices Act (IFPA) Best Management Practices (BMP's) to control erosion from timber sale areas, skid trails and access roads. The use of IFPA BMP's is required under a Memorandum of Understanding with the State of Idaho for all silvicultural activities.
- To ensure long-term soil productivity, temporary roads, primary skid trails, and landings that have adverse soil compaction will be ripped, seeded, and/or covered with slash once harvest operations are completed.
- To reduce accelerated erosion from roads and to restore site productivity, restore productivity of old road prisms that are decommissioned or relocated by applying appropriate measures such as deep ripping, appropriate water erosion control structures, covering with slash, seeding, replacing soils from berms, and effective closure.
- To reduce erosion from roads and skid trails, apply "Guides for Controlling Sediment from Secondary Logging Roads" by P.E. Packer (1977) when designing drainage features for all temporary road construction and skid trails.
- All fish bearing streams would be protected by a 300 foot (600 feet, including both sides of the stream channel) undisturbed buffer strip.
- All non-fish bearing permanently flowing streams would be protected by a 150 feet slope (300 feet, including both sides of the stream channel) undisturbed buffer strip.
- All seasonally flowing or intermittent streams, wetlands less than 1 acre would be protected by a fifty foot undisturbed buffer strip.

Operating Season

- In order to provide for the groomed snowmobile routes beyond the Trail Canyon parking lot, snow plowing would not extend past December 1st.

Visual Quality Objectives

- To help achieve the VQO of Partial Retention, harvest units will be designed with irregular boundaries, and islands of "leave" trees.

Wildlife

- A Goshawk survey would be conducted every year until sale preparation is completed.
- Flammulated owl nests would be protected if found (CNF RFP S&G).
- Large cavity snags and raptor nests would be protected, if possible.
- Provide for 80% sharp-tailed grouse winter forage within a four square mile area.
- Follow the snag guidelines in the Caribou Revised Forest Plan.
- Follow big game guidelines in the Caribou Revised Forest Plan when leaving vegetation buffers around elk wallows (RFP 3-31).

- Biological Assessments or Evaluations and mitigation will be implemented as required by the Endangered Species Act and agreements with the United States Fish & Wildlife Service. Consultation with U.S. Fish and Wildlife Service is an on-going activity. The occurrence of a wolf, bald eagle, lynx, or a new listed or proposed species in the project area could change project operations.

Prescribed Fire (Broadcast)

- Prior to burning activities, a burn plan will be prepared and authorized by the District Ranger. This plan discusses lighting and holding strategies, contingency plans, equipment needs, personnel required, fire behavior predictions, a smoke prediction model, wild land fuel loads and model, and a range of weather conditions that guide the timing of the prescribed burn. Although the District Ranger has final approval authority for the burn plan, the Prescribed Fire Burn Boss has the responsibility to make the on-site, tactical, and the "go, no-go" decision. The Burn Boss ensures that all prescription, staffing, equipment, and other plan specifications are met before, during, and after the burn. Prescribed fire plans cannot be implemented when prescriptive elements have been exceeded.

- Existing roads, natural fuel breaks, and constructed fire lines would be used as control lines. Fireline construction would occur outside cultural site boundaries. Constructed firelines would have erosion control structures (waterbars), installed at locations that would potentially cause erosion. Firelines that could create motorized access would either be obliterated or camouflaged after use.
- In order to meet air quality standards, the burn plan will be developed to comply with air quality regulations, and each firing operation must be approved by the Montana/Idaho Smoke Monitoring Unit to insure compliance and mitigate cumulative effects.
- Design broadcast burns to prevent excessive temperatures and loss of nutrients from volatilization (Region 1/Region 4 Soil and Water Conservation Practices Handbook, FSH 2509.22, 5/88, Practice 18.03).
- To limit impacts from the burn, the duff layer should have moisture content greater than 30 percent.
- Do not ignite within the aquatic influence zones (however, fire may creep into the bottom in isolated locations). The expectation is that this practice would both maintain ground cover and provide sediment filtration. The width of this zone is fifty feet, which exceeds the state requirement of thirty feet (IDPA 20, Title 02, Chapter 01, 58.d).
- To help achieve the VQO of Partial Retention, burning activities should avoid straight control lines that will line up with viewing corridors. Creating burned area patch sizes and configurations that are not predictable patterns.

Livestock Grazing

- The project area would be rested from livestock grazing for two growing seasons after implementing the burning activities. After that time, the burned areas would be evaluated for the return of livestock. The evaluation criteria are: recovery of residue plants, regeneration of desirable plant species, and accumulation of litter for soil stability (Rangeland Specialists Report).

Design Feature to Alternative 4 and 5

- A small day use area including parking area, picnic tables and a vault toilet would be included in Alternative 4 and 5.

2.7 Mitigation Measures

Mitigation measures relevant to resources in this document are included in the project design.

2.8 Monitoring Activities

The following activities would serve to monitor implementation and effects **of all action Alternatives**.

- Sale Administrators would monitor for compliance with the Timber Sale Contract.
- Forest Engineers would monitor road construction and reconstruction activities.
- District Reforestation Forester would conduct regeneration surveys to document compliance with NFMA requirement of reforestation within five years.
- The Forest Hydrologist will conduct a BMP and Implementation Review at least once during the life of the project.
- District weed control crew personnel will monitor for and treat noxious weeds.
- Wildlife Biologist would annually conduct a goshawk survey up to project implementation.
- The Soil Scientist and Fuels Specialist will evaluate fire intensity to determine impacts on soil quality and measure extent of severely burned soils.
- Soil Scientist will monitor detrimental soil disturbance prior to and before the sale closes to insure adequate design features have occurred to limit detrimental soil disturbance to Soil Quality guideline and Revised Forest Plan direction in harvest units.
- The Soil Scientist, Sale Administer, and Fuels Specialist will monitor amounts of coarse woody residue greater than 3 inches in diameter that remains on the treatment units after timber harvest activities and prescribed burning is completed to insure that adequate organic material will be in place for future decomposition, nutrient cycling, and sustained soil productivity.
- District Range personnel will monitor vegetation condition to determine the return of livestock.

2.9 Comparison of Effects and Outputs by Alternative

This section summarizes the information from Chapter III: Affected Environment, and Chapter IV: Environmental Consequences, and displays the environmental effects, and project outputs. A comparative summary of the project activities and environmental outputs and effects on the resources or issues of concern associated with each of the alternatives are presented in the following tables.

Table 2.9-1: Project Purpose and Need Indicators, Summary Comparison of Alternatives

Purpose and Need Indicators			Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
Forest Condition Indicators							
Approximate Aspen Acres Treated Within The Project Area Forested Vegetation			0	1041 acres or 14 %	625acres or 8%	834 acres or 11%	862 acres or 11%
Post Treatment Project Area Stand Structure Percentage.	SS[1]	DFC-10-40%	3%	17%	11%	14%	14%
	YM[2]	DFC-20-50%	16%	14%	15%	14%	14%
	MO[3]	DFC-20-50%	81%	69%	73%	72%	72%
Percent of acres with a change in fire intensity			0%	13%	9%	12%	12%
Timber Production Need Indicator							
ASQ Estimates (Million Board Feet)			0	4.5-5.5	1.5-2.0	3.0-3.5	3.0-3.5
Transportation Need Indicator							
Miles of road improvements.			0	2.1	0	2.0	4.5

[1] SS – seedling/sapling. [2] YM – young/mid. [3] MO – Mature/Old.

Table 2.9-2: Issues Indicators, Summary Comparison of Alternatives

Issues	Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
No New Roads Indicators					
Miles of temporary road construction	0	5.1	0	2.3	2.3
Miles of Road realignment	0	2.1	0	2.0	4.5
Goshawk Indicator					
RFP Goshawk Standards & Guidelines Followed	yes	no	yes	yes	yes
Transportation Indicator					
Estimated cost of road improvements on Non-Forest Service Lands	$0	$82,500	$82,500	$82,500	$0

Table 2.9-3: Effects to be analyzed, Summary Comparison of Alternatives

Resource		Alt. 1 No Action	Alt. 2 Proposed Action	Alt. 3 No New Roads	Alt. 4 Reduced Roads	Alt. 5 Preferred Alternative
Hydrology Indicator						
% Hydrological Disturbance						
Wood Canyon Huc-6th		5%	20%	19%	19%	19%
Sulphur Canyon Huc-6th		1%	2%	1%	1%	1%
Trail Creek Huc-6th		7%	42%	23%	26%	26%
Johnson Creek Huc-6th		7%	10%	9%	10%	11%
Miles of road removed from AIZ & upland areas						
Removed from AIZ at project end		0	0.5	0.03	0.4	1.5
Removed from upland areas at project end		0	1.5	0.2	0.3	0.4
Soils Indicators						
% Soil Detrimental Disturbance		Within RFP Guidelines <15%				
Wildlife Indicator						
Acres with human disturbance, wolverine/Lynx/Gray Wolf		0	1,541	1,034	1,381	1,387
Goshawk Nest Area 261 Acres	% Non Stocked/seedling [0%]	0%	>0%	0%	0%	0%
	% Saplings [0%]	0%	0%	0%	0%	0%
	% Pole [0%]	0%	0%	0%	0%	0%
	% Old / Mature [100%]	100%	<100%	100%	100%	100%
Goshawk Post Fledging 450 Acres	% Non Stocked/seedling [≤ 20%]	0%	-- %	0%	0%	0%
	% Saplings [≤ 20%]	8%	-- %	8%	8%	8%
	% Pole [≤ 20%]	18%	-- %	18%	18%	18%
	% Old / Mature [≥ 40%]	70%	-- %	70%	70%	70%
Goshawk Foraging Area 6,949 acres	% Non Stocked/seedling [≤ 25%]	0%	-- %	9%	12%	13%
	% Saplings [≤ 25%]	3%	-- %	3%	3%	3%
	% Pole [≤ 25%]	17%	-- %	15%	14%	14%
	% Old / Mature [≥ 30%]	80%	-- %	73%	71%	70%
7,660 acres	Created Openings > 40 acres	0	7	0	0	0
% Forest Owls (Flammulated, Boreal, Great Gray) > 40 %		81%	69%	74%	72%	72%
Acres snags (Three-toes Woodpeckers / Bats)		6,167	5,029	5,581	5,390	5,394
% Winter Forage, Sharp-tailed grouse > 80 %		100%	89%	93%	90%	90%
% Sagebrush mature overstory, Sage-grouse > 80%		100%	95%	95%	92%	92%
Big Game Cover : Forage ratio, 40 : 60		66:34	56:44	60:40	58:42	60:40
Acres treated / Aspen Restoration / Mule Deer Initiative		0	1,041	625	834	862
Air Quality Indicator						
National Ambient Air Quality Standards (Smoke Emissions)		Within NAAQS	Within NAAQS	Within NAAQS	Within NAAQS	Within NAAQS
Visuals Indicator						
VQO - Partial Retention		Meeting RFP Guidelines				
VQO - Modification						

III. AFFECTED ENVIRONMENT

Summaries of the current conditions of the environment in and adjacent to the Project Area likely to be affected by the alternatives are described in this chapter. Unless specifically stated otherwise, additional information is contained in the project record.

3.1 Vegetation

Analysis Methods:

- A combination of common stand exam data, walk through assessments, aerial photo interpretation, large scale GIS coverage's and local knowledge were used to populate the GIS stand coverage used in this analysis. The vegetation within the analysis area was characterized into two general vegetation community types, Forested, and Non-Forested. The Non-Forested communities are very briefly described below for context; but will not be carried forward in this document. The Forested Community is described in more detail since it is the main community that will be affected.
- Vegetation data collected from project area stand exams (2002) in conjunction with the Soda/Montpelier Front Ecological Assessment was summarized and compared to cover type maps from 1913 and Desired Future Conditions (DFC) outlined in the Revised Forest Plan (RFP) using GIS, spreadsheets, and databases.

Analysis Area: The proposed Aspen Range project area represents Mill Fork of Trail Canyon, Wood Canyon, Johnson Creek, North, Middle and South Sulphur Canyons within the National Forest boundaries. The **project area** falls completely or partially within four HUC's (hydrologic unit codes) at the fifth order stream level. Therefore, vegetation will be addressed at two different scales in this section, the **project area** and the landscape. The **landscape analysis area** is defined as the Wood Canyon, Sulphur Canyon, Trail Canyon and Johnson Creek HUC's at the fifth order stream level within the National Forest boundaries. The **project area** will be the primary analysis unit for affects.

3.1.1 Forest Structure at the Landscape Analysis Scale

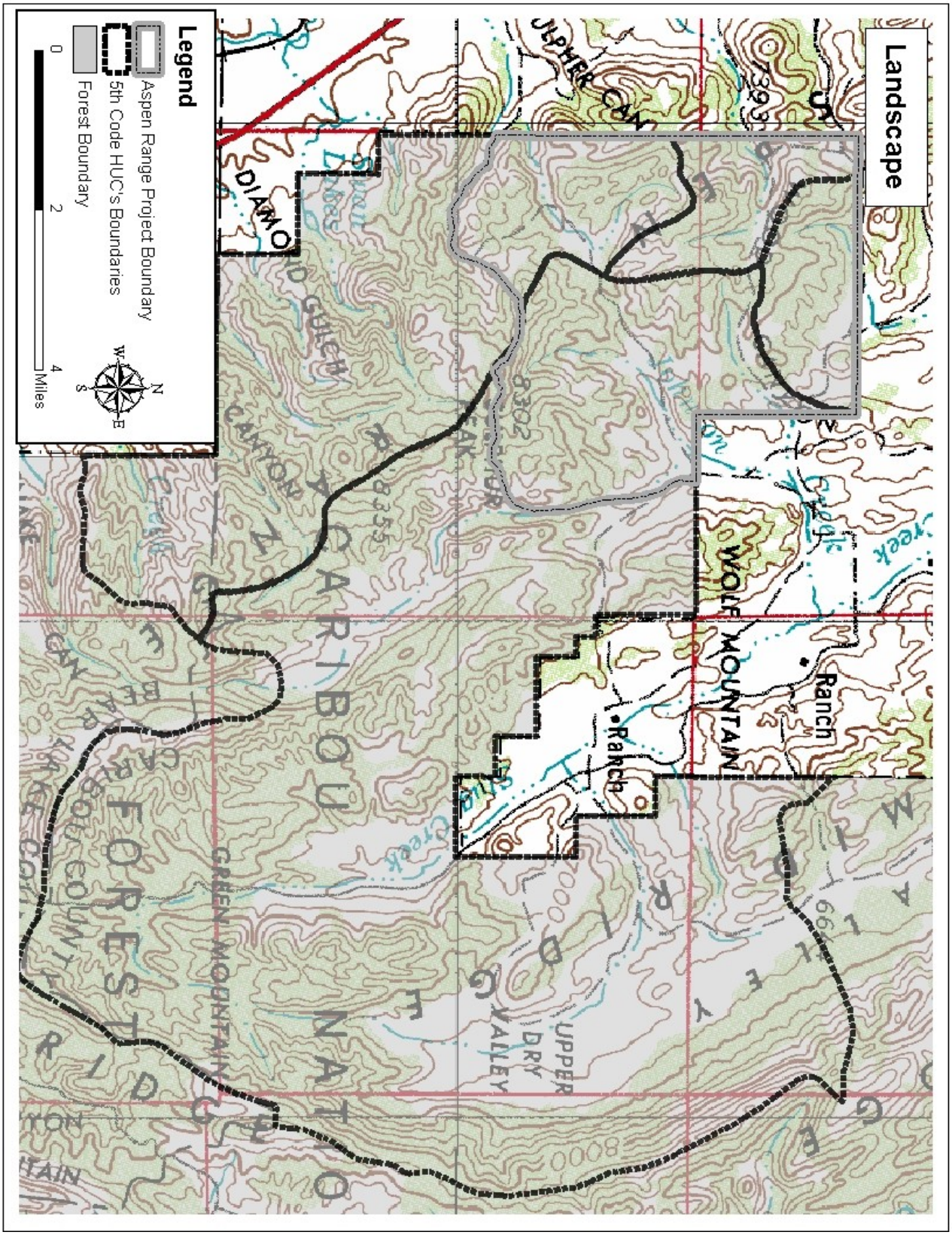
At the landscape scale, a balance of age/structure classes is highly desirable. An imbalance in structural classes can put the landscape at risk and reduces its resilience to catastrophic events. *The Caribou National Forest and Surrounding Area Sub-Regional Assessment of Properly Functioning Condition* pointed out that a balance of structure classes was highly desirable (USDA 1996). The Revised Caribou N.F. Forest Plan (RFP) incorporated this idea and adopted desired future conditions (DFC) related to ranges of

structure and even carried it to the point that it set goals for mature/old at the forest scale (30 to 40% for conifer and 20 to 30% for aspen). Forest structure within the Landscape Analysis area is currently outside the desired conditions set in the RFP. The forested landscape as a whole exceeds 90% mature/old, weighted by species and acres. Past timber harvest has contributed some structural diversity to project area accounting for the slightly lower percentage in the mature/old structure and slightly higher percentage in the seedling/sapling classes in conifer. Harvest activities have been concentrated in the Douglas-fir and mixed conifer types. The majority of the regenerated harvest units will move into the young/mid class within five years.

Table 3.1-1: Current landscape assessment of cover types structures compared to the desired range.

Structure	Condition	Seedling/Sapling	Young/Mid	Mature/Old
Aspen	Desired	20 - 40%	20 - 40%	20 - 40%
	Current	2%	5%	94%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Aspen/Conifer	Desired	20 - 40%	20 - 40%	20 - 40%
	Current	<1%	4%	96%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Douglas-fir	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	3%	6%	91%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Lodgepole	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	27%	3%	70%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Mixed Conifer	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	<1%	<1%	100%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*

Figure 3.1-1: Project Area Boundary within Landscape Area Boundary.



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3.1.2 Forest Structure, at the Project Area Scale

Forest structure in the project area is currently out of balance. Across all cover types the mature/old class is currently at 80% and is over represented. The young/mid class is under represented in all cover types except aspen/conifer and the seedling/sapling class is under represented in all cover types except lodgepole. The mixed conifer cover type accounts for less then 1 percent of the project area. Past timber harvest has contributed some structural diversity to project area accounting for the slightly lower percentage in the mature/old structure and slightly higher percentage in the lodgepole seedling/sapling classes. Harvest activities have been concentrated in the Douglas-fir and mixed conifer types. The majority of the regenerated harvest units will move into the young/mid class within five to ten years (See **Table 3.1-2**).

Table 3.1-2:Current project area assessment of cover types structures compared to the desired range.

Structure	Condition	Seedling/Sapling	Young/Mid	Mature/Old
Aspen	Desired	20 - 40%	20 - 40%	20 - 40%
	Current	3%	15%	82%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Aspen/Conifer	Desired	20 - 40%	20 - 40%	20 - 40%
	Current	2%	25%	73%
	Assessment	Less than DFC*	DFC*	Above DFC*
Douglas-fir	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	1%	17%	82%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Lodgepole	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	54%	0%	46%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Mixed Conifer	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	0%	0%	100%
	Assessment	DFC*	Less than DFC*	Above DFC*

- DFC = Desired Condition

Structure within the project area was assigned to each stand and analyzed based on the definitions and terminology outlined in the structure white paper that will be applied to this project (located in the project file).

3.1.3 Project Area Cover Types

The project area was selected from the north half of the Soda/Montpelier Front Ecological Assessment because the assessment validated that aspen cover types were being encroached by conifer cover types. The vegetation data used for the Soda/Montpelier Assessment was delineated on aerial photos then digitized on to GIS and ground verified in the field the following summer. Additional data was collected for the Aspen Range project to populate the GIS stand coverage with stand level vegetation data collected from common stand exam in specific treatment areas.

Non-Forested

Approximately **4,321** acres or 36% of the project area can be characterized as non-forested vegetation (NFV). For the purpose of analysis, non-forested vegetation was classified into five general cover types, which are listed in **Table 3.1-3**.

Table 3.1-3: Non-Forested cover types

Cover Type	Acreage (% NFV)
Sagebrush/Grass	4,085 acres (94%)
Mahogany/Juniper	84 acres (2%)
Mountain Brush	105 acres (2%)
Riparian/Water	47 acres (1%)

Forested

Approximately **7,660** acres or 64% of the project area can be characterized as forested vegetation (FV) and the forested vegetation can best be described as slightly aspen dominated. For the purpose of analysis forested vegetation within the analysis area has been broken into five cover types: aspen, aspen/conifer, Douglas-fir, lodgepole, and mixed conifer. Refer to **Table 3.1-4** and **Figure 3.1-2**.

Table 3.1-4: Forest cover types within the project area.

Cover Type (% of FV)	Description
Aspen (46%) 3,545 acres	Quaking aspen is the dominant tree in this type. Aspen can vary from an early seral to persistent seral species. Quaking aspen is very shade intolerant and regenerates almost exclusively by sprouting from the roots of parent trees following a disturbance. Douglas-fir or subalpine fir are the typical conifer climax species associated with this type, climax depends on the habitat type. Historically, non-lethal fires at lower elevations, and stand replacement fires at higher elevations, allowed regeneration of aspen and maintained patterns and composition. Quaking aspen also supports a very productive herbaceous understory, which provides forage and habitat for a diverse array of wildlife, livestock and human values.
Aspen/Conifer (7%) 515 acres	Quaking aspen and a conifer species (Douglas-fir, lodgepole pine and sub-alpine fir) or a mix of species co-dominates the site. Douglas-fir or subalpine fir are the conifer climax species associated with this type, which is climax depends on the site conditions.
Douglas-fir (43%) 3,322 acres	Rocky Mountain Douglas-fir is the dominant tree in this cover type, its successional role varies from early seral to mid seral to climax depending on the site. Quaking aspen and subalpine fir are often associated with this type. On the very driest sites curlleaf mountain mahogany and limber pine may also be associated with this type.
Lodgepole (3%) 208 acres	Lodgepole pine is the dominant tree in this cover type. Lodgepole pine is a pioneer species that requires a disturbance that exposes bare mineral soil to regenerate. Because lodgepole is shade intolerant, it serves as the seral species with subalpine fir being the climax species on these sites. Aspen and Douglas-fir may be found as a minor component of the type. As this type moves toward climax conditions, it changes type to a mixed conifer type.
Mixed Conifer (1%) 71 acres	Stands that currently have a mix of conifer species or are currently dominated by subalpine fir have been included in this type. In this type subalpine fir is the dominant climax species with occasional Engelmann spruce. Aspen, lodgepole pine, and Douglas-fir often occur in various ratios in the seral to late seral stages.

Figure 3.1-2: Current Cover Types within the Project Area

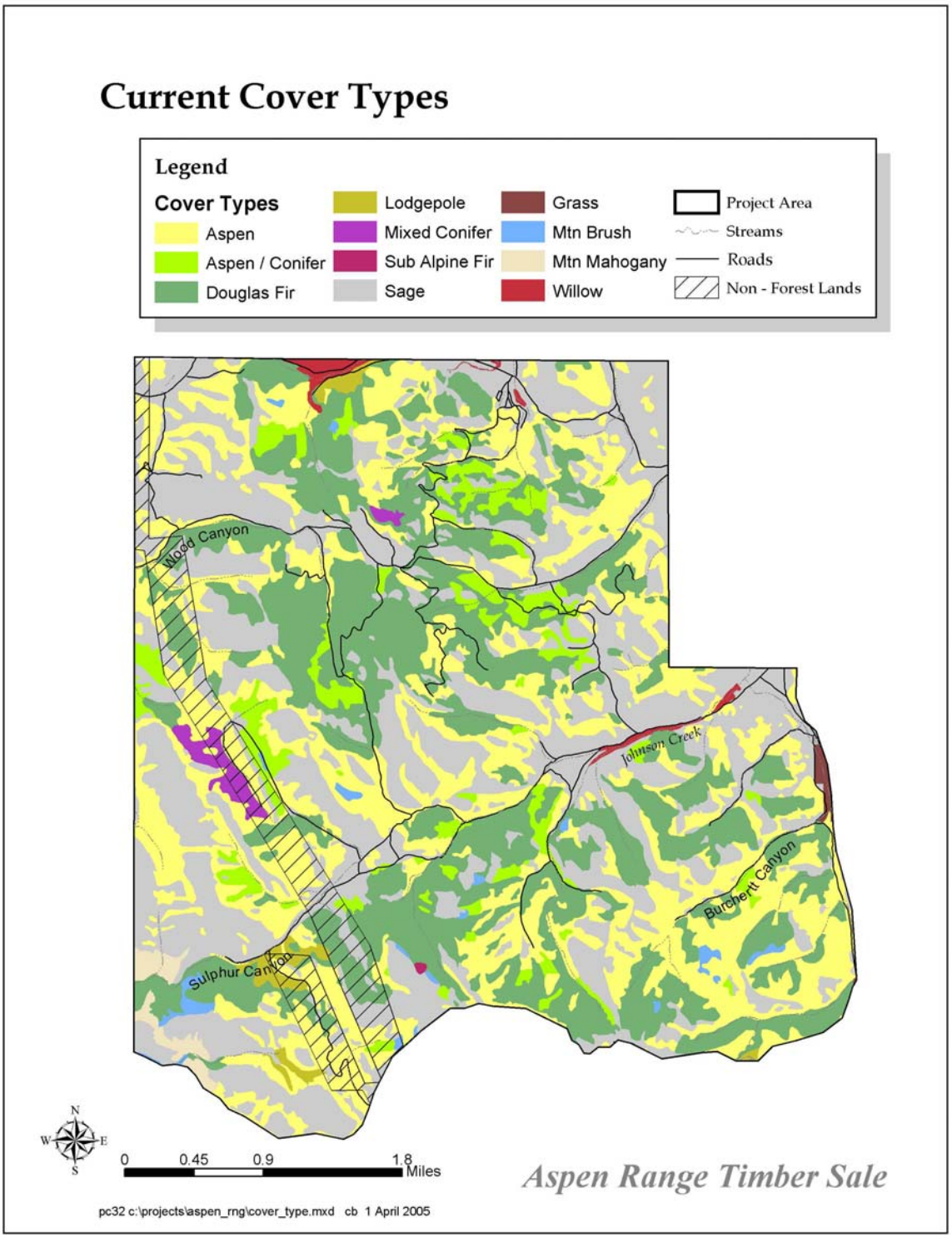

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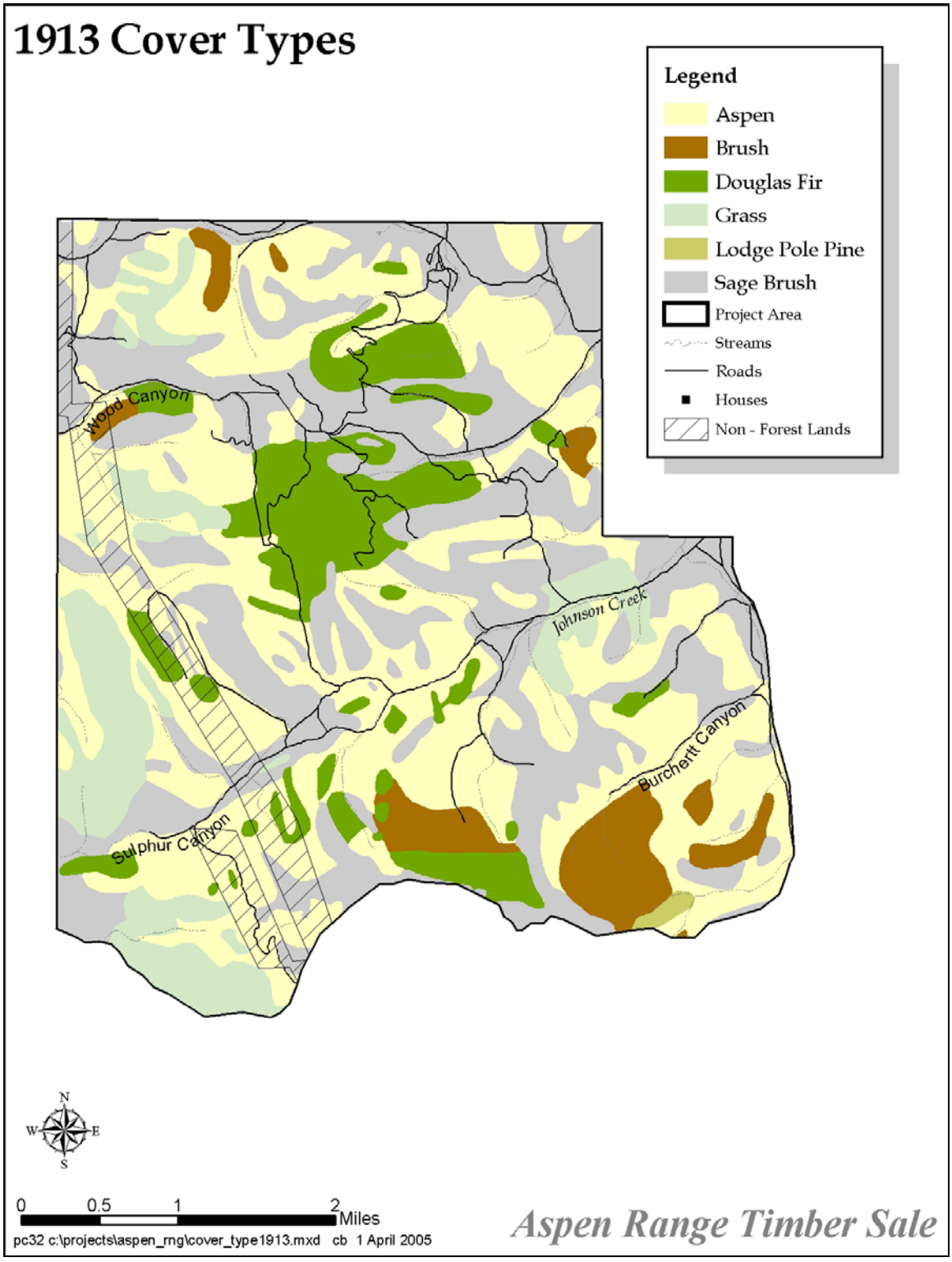
Figure 3.1-3: 1913 Cover Types



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Aspen Assessment

Quaking aspen dominated stands are distributed widely throughout the project area, occupying 46% of the forest land base. Average old age trees vary from 60 to 120 years. Aspen cover-types occupy a substantial portion of the land base in the assessment area. Based on a dominance of greater than 60% aspen within a delineated stand, approximately 3600 acres were classified as aspen in the project area.

In the year 1913 a vegetation inventory map of the Johnson Creek area was constructed by the Forest Service (Refer to **Figure 3.1-3**). The map is simple in that it only dealt with major cover types such as conifer, aspen and sage. The map was rediscovered during the mid 1990's and digitized on to GIS. Comparing vegetation maps on GIS from 1913 data and the most current GIS inventory of Soda Front, the loss of aspen acres is clearly visible even with the 1913 data being very general. Air Photos taken during the 1950's and 60's compared to current photos shows the loss of aspen as well.

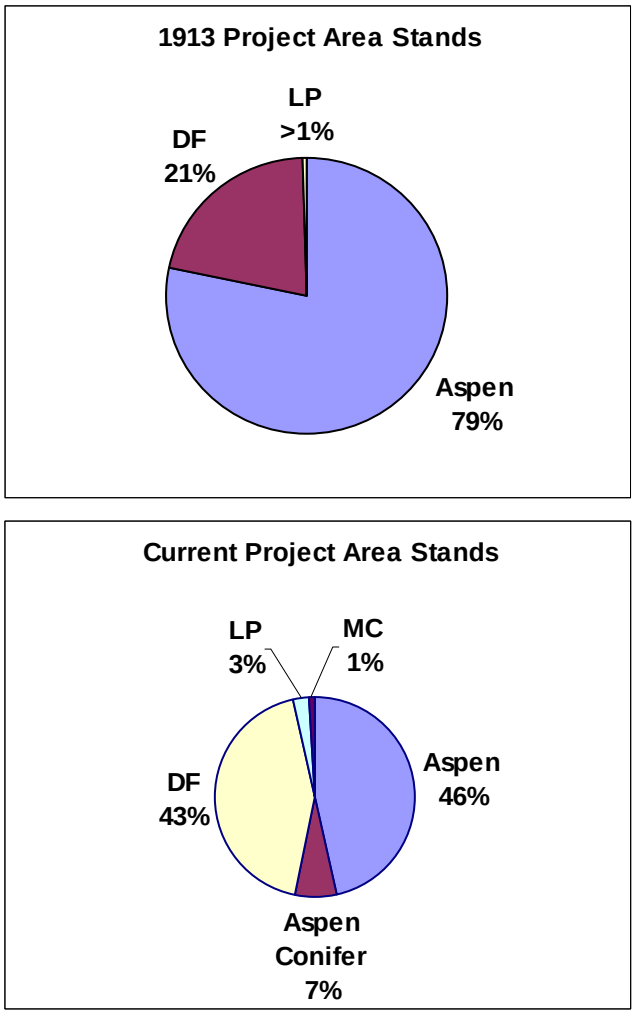

Figure 3.1-4: 1913 cover types vs. current cover types expressed in percentages.

The presence of decadent aspen in the conifer stands suggests aspen types historically occupied a greater portion of the area and/or were present within mixed stands to a greater percent. Analysis of the project area show aspen stands have been reduced by about 31 % (1,246 acres) while conifer acres have increased over 2,000 acres (22%) since 1913. Refer to **Figure 3.1-4**.

Figure 3.1-5: The primary harvest prescription for most of the timber sales in the project area is Shelterwood at 484 acres, followed by 133 acres of clearcut and 24 acres of clearcut with reserve trees. All 133 acres of the Wood Canyon Timber Sale in 1964 was planted in 1973 with lodgepole pine. Overtime aspen regeneration has filled in the open spaces between conifer trees exceeding Forest Plan stocking standards for clearcut units.

3.1.4 Forest Disturbance Regime at the Project Scale

Insects & Disease as a Disturbance Agent

Insects and diseases that cause mortality in trees are agents of disturbance. Native insects and disease are a part of the forested ecosystem. They naturally cycle from endemic or low levels to epidemic or extremely high levels. Natural cycles vary from regular to highly irregular depending on the insect or disease. Extent or damage caused also is highly variable. At endemic levels, they can cause structural and species composition changes at the stand or smaller scale, at epidemic levels they cause changes at the stand and in some cases at the landscape scale. The main insects that are capable of creating large-scale disturbance within the analysis area are bark beetles (Douglas-fir bark beetle). Other insects such as spruce budworm, and tussock moth could create small-scale disturbance or can be contributing factors to a larger disturbance. A suite of rots that affect aspen are the most common diseases. These diseases do not create large-scale disturbances, but could be contributing factors to a larger disturbance.

Growth rates decrease as trees reach maturity, the slower the growth rate the greater risk to insects and disease that cause mortality. The current percentage of forest in the mature structural class makes the area high risk to wide scale insect epidemic for all conifer cover types. This risk is currently very evident in the Douglas-fir and mixed conifer cover types where Douglas –fir Beetle (*Dendroctonus pseudotsugae)* is very active. Over the last decade its level has increased dramatically. Given the current beetle level and the condition of the stands (age and size) the potential to lose nearly all larger diameter Douglas-fir from these sites is very high. In some stand this has all ready occurred. If

the activity continues, species composition will be pushed further toward subalpine fir. If this occurs in the next ten years is difficult to predict due to the stochastic nature of the insect population; however, it is clear that the Douglas-fir is at risk within the analysis area.

Fire as a Disturbance Agent

Historically, fire was an integral and significant disturbance factor within the project area. In the pre-settlement era, wildfires burned under a variety of regimes depending on environmental and site conditions. Fire scars are present on older trees throughout the project area, multiple fire scars on some remnant trees support the characterization of a fire dominated disturbance regime in many of the stands. The sites that do not show fire scars can most likely be dated back to the last large pre-settlement fire that initiated the new stand that currently dominates the site or to some other type of large scale disturbance such as a Macro-burst.

Fire's role as a disturbance agent can best be described by historic fire regimes and frequencies. During 1994, Barrett conducted fire history studies within the Aspen Range for his report on "Fire Regimes on the Caribou National Forest." Barrett's report provides a fairly good estimate of both fire regimes and frequencies that can be made for this area. This is outlined in the table below.

Table 3.1-5: Fire Frequency and Regime

Vegetation Type	Frequency / Regime	Reference Condition	Current Condition	Comments
Aspen	Frequency	16–97 Ave 45 yrs	~110 Years	More than twice the average, outside range
	Regime	Mixed to Lethal	Mixed to Lethal	Average patch size has likely increased
Douglas-fir	Frequency	16 –66 Ave 41 yrs	~110 Years	More than twice the average, outside range
	Regime	Non-lethal to Mixed	Mixed to Lethal	Average patch size has likely increased
Lodgepole & Mixed Conifer	Frequency	29 –97 Ave 54 yrs	~110 Years	Approx. twice the average, at upper edge of the range
	Regime	Mixed to Lethal	Lethal	May have lost the mixed, fires likely all lethal.

Fire frequency within the project area is outside of reference condition primarily due to two management activities, grazing, and fire suppression. Early grazing levels directly impacted fire frequency on non-forested communities. The impact on non-forested communities by grazing had an indirect impact on forested types; it served as a means of fire control. During the early years of the Forest Service, while permitted grazing limits were at their peak, very little fine fuel was available in the non-forested communities. This kept the fires that did occur small. As permitted animal numbers went down, the range conditions began to improve. Fire suppression techniques also improved. The Forest Service became highly effective at suppressing fire post World War II. Fires that had been controlled indirectly by the lack of fine fuel could be controlled by the direct will of man. Available records from 1980 to present indicate that 3 fires have been

suppressed within the project area for <1 acre. Of the fires, one was human caused and two fires where lightning caused. Suppression has affected fire frequency within the analysis area; this has allowed fuels to build up to higher than normal levels. The combination of early grazing and fire suppression has shifted the average regime from mixed to lethal. If a large fire were to occur within the landscape it would be more severe than in pre-settlement times.

3.1.5 Fire Behavior

Analysis Area: The areas within the project area where harvesting and burning would occur.

Analysis Method: The Forest Vegetation Simulator (FVS) and the Fire and Fuels Extension (FFE) were the principal computer models used to estimate stand conditions and the potential fire behavior and effects for each alternative. Using 2002 stand exam data, representative stands were chosen for the fuelbreak, harvest, harvest and burn, and prescribed burn prescription areas. The stands where incorporated into FVS to model existing and future (ten years) stand conditions if no action was taken. The proposed treatments for each prescription area were applied in FVS to the existing stand conditions, and then the stand conditions were projected ten years into the future.

The Fire and Fuels Extension (FFE) to the FVS was used to predict potential fire behavior characteristics based on a wildland fire burning in 90th percentile weather conditions. Fire behavior was modeled for the No Action Alternative in 2005, and for the FVS projected stand condition in year 2015. For the Action Alternatives, fire behavior was modeled in 2015 after the proposed treatments were applied to the existing stand conditions.

It is important to note that this model cannot predict probability of a fire or simulate fire spread, but predicts the likely fire behavior characteristics and fire effects resulting from a wildland fire burning in the FVS simulated stand condition under 90th percentile weather conditions.

Existing Condition

The predicted fire type in 2005 for prescription areas 1, 2, 4, and 5 is a surface fire (Refer to **Table 3.1-6**). Current fire intensity (flame lengths) is an average of 2 feet. Fire personnel using handtools can generally attack a fire with this intensity at the fire head or flanks (Fireline Handbook 1998).

The predicted fire type in 2005 for prescription area 3 is a passive crown fire. This type of fire is the result of the 90th percentile windspeed being greater than the torching index and less than the crowning index. Current fire intensity is 12 feet for this prescription area. This stage of a crown fire reinforces the spread of the fire, but the main fire spread is still dependent upon surface fire behavior. If the surface fire behavior were to decrease, the level of passive crown fire would also decrease. A fire with this intensity and type is too intense for direct attack by persons using handtools. Handline cannot be

relied on to hold the fire; equipment such as dozers, engines, and retardant aircraft can be effective (Fireline Handbook 1998).

Table 3.1-6: Fire Behavior Predictions.

Prescription Areas	Category	Flame length (Ft)	Torching Index (Mi/Hr)	Crowning Index (Mi/Hr)	Canopy Base Height (Ft)	Potential Mortality (% BA)	Canopy Bulk Density (kg/m^3)
		2005	2005	2005	2005	2005	2005
1	Fuelbreak	2	318	27	33	19%	.071
2	Harvest	2	149	18	16	28%	.117
3	Harvest & Burn	12	10	25	2	98%	.076
4	Prescribed Burn[1]	2	93	10	12	22%	.268
5	Prescribed Burn[2]	2	193	23	22	27%	.087

[1] This stand is only proposed for treatment in Alternative 2.

[2] This stand is proposed to be prescribed burn in Alternative 3 & 4, in Alternative 2 this stand's prescription is harvest & burn.

Table 3.1-7: Predicted Fire Types.

Prescription Areas	Fire Type
	2005
1	Surface
2	Surface
3	Passive
4	Surface
5	Surface

3.1.6 Fire Regime and Condition Class

Fire Regime and Condition class was assessed using a method described by Wendel Hann (2004) and outlined in the *FRCC Guidebook* (2004) for mapping fire regime condition class at the watershed and project level. The assessment determined that the Aspen Range project area had a natural fire regime of "*III – Infrequent Mixed and Surface*" and a condition class of "*2 Moderate Departure form natural conditions.*" The table below shows the condition class for vegetation and fuels and frequency and severity for the forested portion of the landscape. The forested landscape was divided into two classes or potential natural vegetation groups (PNVG) based on the apparent natural disturbance regimes. One of the PNVG used was *Douglas-fir Interior Rocky Mountains (DFIR2)* described in the FRCC guidebook and the FRCC website. Currently there is not a PNVG for Aspen; local knowledge and information in the RFP was used to determine the PNVG for Aspen. The PNVG's were modified slightly to reflect the information in Barrett's 1994 Fire regime report on the Caribou National Forest.

Table 3.1-8: PNVG Condition Class.

PNVG (% of project area)	Veg-Fuel Condition Class	Frequency-Severity Condition Class	PNVG Condition Class
Aspen (30%)	2	2	2
DFIR2 (34%)	2	2	2
Project Area	**2**	**2**	**2**

The overall FRCC departure score was 52, which is in the middle of the range for fire regime condition class (FRCC) 2 (34-66%). FRCC 2 means vegetation composition, structure, and fuels have moderate departure from the natural regime and predispose the system to risk of loss of key ecosystem components. In this landscape the score was driven by both the departure in the vegetation/fuels composition and structure and frequency/severity departure.

3.1.7 Noxious Weeds

Noxious weeds occur within the project area as relatively small, scattered infestations. Noxious weeds, although not a cover type, are noteworthy due to the continuing problem they represent. The District has an active noxious weed treatment program. The project area is part of an Integrated Weed Management Area as described in the Caribou-Targhee Weed Management Strategy (2000) and also is included in the Highlands Cooperative Weed Management Area.

Noxious weeds found within the project area could include yellow toadflax (*Linaria vulgaris*), leafy spurge (*Euphorbia esula*), whitetop (*Cardaria draba*), spotted knapweed (*Centaurea maculosa*), canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*) and dyer's woad (*Isatis tinctoria*). The Caribou National Forest Noxious Weed Strategy (1996) and Caribou-Targhee Noxious Weed Strategy (2000) include strategies for reducing these and other noxious weeds.

3.1.8 Summary of Vegetation Condition at the Project Scale

What does the above information tell us about the vegetation of this project area? It is mature, dense, and the species composition is trending towards climax. A landscape in this condition can be considered at moderate risk to loss of key ecosystem components. The lack of diversity in structure created by the lack of past disturbance creates a landscape that is susceptible to uncharacteristic wildfire, insects, disease, and wind events. It also creates a landscape that is less resilient to those types of events. Noxious weeds are not currently affecting the function of the ecosystem.

3.2 Hydrology

Analysis Methods: In 2003 and 2004, the project hydrologist walked all wetlands, drainages mapped by USGS as perennial and intermittent streams and most other mapped ephemeral draws within the project area. Areas where roads were in the AIZ were given particular attention. The purpose of these visits was to determine: (1) existing stream, wetland, and road conditions and affects, (2) stream, wetland and watershed sensitivities, (3) adequacy of existing road-stream buffers, (4) potential project effects, and (5) discover, assess and prioritize opportunities for improving watershed condition and/or identify key sites for road realignment and improvements in drainage design.

The Forest's GIS system was used to calculate percent hydrologic disturbed area to compare compliance with the Forest Plan guideline. Misalignments in mapping of HUC boundaries were found in USGS data were judged to be too small to substantially influence the analysis because only a few very small, intermittent channels were affected. GIS output was then interpreted along with field data to evaluate stream, wetland and watershed function. No one indicator was used as an absolute measure of project effects.

3.2.1 Water Quality Regulatory Framework and Practices

A matrix of beneficial uses that have been identified by the Idaho Department of Environmental Quality (IDEQ) in the project area are given in table **Error! Reference source not found.**

Table 3.2-1: Identified beneficial uses.

Stream Reach	CWB	SS	PCR	SCR	DWS	AWS	IWS	WH	AE
Johnson Creek	E	E		X		DE	DE	D	D
Sulphur Creek	E			X		DE	D	D	D
Trail Creek	E			X	X	DE	D	D	D
Wood Cyn	E			X		DE	D	D	D

Key: E = Existing; D = Designated; DE =Designated and Existing; X = Not Assessed. CWB = Cold Water Biota; SS = Salmonid Spawning; PCR = Primary Contact Recreation; SCR = Secondary Contact Recreation; DWS = Domestic Water Supply; AWS = Agricultural Water Supply; IWS = Industrial Water Supply; WH = Wildlife Habitat; AE = Aesthetics

3.2.2 Water Quality Limited Stream Segments (303(d))

Section 303(d) of the Federal Clean Water Act covers the protection of beneficial uses of surface waters. **Table 3.2-2** lists data on Middle and South Sulphur Canyon as Water Quality Limited streams in the project, direct, and cumulative effects areas according to the IDEQ 2005 report documenting beneficial use impairment.

Table 3.2-2: Water Quality Limited (303d) Status of Sulphur Canyon

Reach	Miles perennial in direct effects area	Failing beneficial use(s)	Cause
M. Sulphur Cyn	0	CB	U
S. Sulphur Cyn	3.2		

CB = Cold Water Biota; U = Unknown or as yet undetermined.

3.2.3 Stream Conditions

Explanation of Proper Functioning Condition Class Ratings

There are up to five rating classes used for rating the functionality of streams and their riparian areas that have been used on the Forest. "Proper Functioning Condition" class (PFC) is used to indicate that the stream has enough of its natural protecting attributes to be able to withstand a flood without suffering substantial damage. However, it does not indicate that it is pristine, nor is there a rating for pristine condition. "Functional at Risk High" (FARH) indicates that the stream is functioning properly, but that there is a minor problem within the watershed that makes the stream susceptible to degradation. "Functional at Risk Moderate" (FARM) indicates that the stream is mid scale, with a moderate risk of degradation. "Functioning at Risk Low" (FARL) indicates a stream is functioning properly, but factors are present in the watershed that could easily cause the system to be degraded to Non functional. "Non functional" means that vegetation, landform and or energy dissipaters such as large woody debris are clearly not adequate to provide for system protection or function. They may also be at great risk of further degradation, and may be having a negative impact on the stream reaches below them.

Johnson Creek

Johnson Creek is a northeast flowing stream tributary of Slug Creek. At one time it may have had a low flow surface connection to Slug Creek, but at present there is no connection readily visible, as it disappears into plowed fields on private ground in the Slug Creek valley floor, influenced by irrigation diversions. The creek is rated as FARM.

There are two perennial reaches on Johnson Creek. Perennial flow in the upper reach begins a short distance above the uppermost crossing, near where the road, 20126 first enters the AIZ (T09S R43E Sec 8 NE). No flow measurement was made, but visually estimated at the upper crossing at 0.1 cfs or less. Below the upper crossing, the valley floor is flat from side to side forming a narrow strip only slightly wider than the road. For the first hundred feet or so below the upper crossing, there is a weakly defined channel along the north side of the valley bottom and some riparian vegetation along it. Below this point, the channel flow disappears entirely, and (in the late spring of 2004) flows first becomes diffuse on the surface and then subterranean. However, moist spots are still present on the valley floor, indicating that some subterranean flow is in the sediment near the surface. Most likely there was a channel present at one time in this area, but the construction and maintenance of the road completely destabilized and/or covered the channel and killed off the bounding riparian vegetation through repeated blading of the road. As there is no evidence of channel or coarse re-worked channel materials, the stream in this reach is at best Nonfunctional, but was not rated as such

because there is at present no evidence of a channel remaining to rate. The lack of a stable channel means that when higher flows occur such as during snowmelt, surface flow continues down the valley beyond the end of the remaining channel, and fine-grained material is eroded from the valley bottom in that stretch and carried farther down the valley. About one mile below the upper crossing, there is a sizable constructed detention basin, whose purpose, being so large and so close to the perennial portion of the channel appears to be capturing the sediment blowouts from above produced by high flows.

There are also two crossings of the drainage bottom in the ephemeral middle section of the Creek. There is no identifiable channel in this section of Johnson Creek, though a previous episode of downcutting is evident, with a mostly recovered gully in this section.

Perennial flow in the lower reach originates from springs in the upper reaches of the southern (left hand) fork of Johnson Creek (T09S R43E Sec 9 E). Portions of the south fork are stabilized by beaver dams that have been in the same location so long that the dams have been completely colonized and armored by willows. The south fork joins the mainstem of Johnson Creek about 0.5 miles below the large detention basin. The lower reach is perennial for about one mile, becoming intermittent near the Forest boundary. The channel bottom in the lower perennial reach below where the south fork joins the main valley is dominated by fine sediment, most likely at least in part supplied by blowouts in the upper reaches that were carried down the valley before the detention basin was constructed to capture them. Road 20126 is within 20 feet of the channel in several spots, with a short, steep slope between the road and channel, as the road is built on a narrow terrace above the streambank. At several spots, the road has formed wallows up to 1' deep and 40' long that fill with road drainage after rains. The ponds that form can persist for over a week due to the fine-grained soils present. When these wallows contain water, passing vehicles push pulses of sediment-laden water out of them and into the creek. About 0.2 miles below where the south fork comes in, 20574 intersects 20126, coming straight down a steep hillside consisting of fine-grained material. The road down the hillside is eroding severely, and the eroded sediment appears to be entering Johnson Creek (T09S R43E Sec 3 NW). There are no activities proposed in any of the sub-drainages south of Johnson Creek or of Dry Fork Creek, so no analysis of these areas was done.

Sulphur Creek Drainage

Middle Sulphur Creek drains to the west in the western part of the project area. The reach that is adjacent to 20126 and a proposed harvest unit (T09S R43E Sec 7 SE) appears to be ephemeral to marginally intermittent flow regime, with only a rather weakly formed channel. The channel is highly sinuous, but has no riparian vegetation due to the infrequency of flow. A short distance downstream of the harvest unit, the gradient increases drastically, and the channel becomes a steep cascade in a narrow canyon. Middle and South Sulphur join below the mountain front near the warm springs about 2 miles west of the proposed harvest unit and about 1 mile below the Forest boundary. In the headwaters of Sulphur Creek on the Forest, only parts of South Sulphur Creek and its tributaries are perennial, and they are only perennial in the upper reaches,

with the South Fork becoming intermittent before reaching the Forest boundary. South Sulphur Creek is on the EPA approved (final) 2002 303d list, but no pollutant is identified by DEQ in the report. Though South Sulphur forms the southern boundary of the project, no disturbance activities are proposed within that drainage, nor is hauling proposed on the road. South Sulphur functionality is rated at FARM. One perennial tributary to South Sulphur is in the project area, all but the lowest few hundred feet is on a private minerals holding and is paralleled by 20126. Sulphur Creek (Sulpher Canyon) is on the EPA approved (final) 2002 303d list, but no pollutant is identified by DEQ in the report.

Trail Creek

The two westernmost of the three forks of Trail Creek in the project area are perennial and the creek is tributary to the Blackfoot River, joining it about 4 miles north of the project area. The westernmost fork of the creek on the Forest was rated FARH in 2004, downgraded from the previous PFC rating due to excessive sediment from the Archery Range road (20297) and infestations of Canada thistle in the reach east of the Archery Range

The westernmost fork is perennial and originates at two springs north and south of the archery range. The spring to the north is near a house that is on the Forest boundary, the AIZ below that spring is mostly willows, but has abundant large woody debris stabilizing the channel in the steep valleys segment below the spring (T08S R43E Sec 30 NE & 29 NW). The other spring is to the east and south of the archery range (T08S R43E Sec 29 NW). The AIZ below the eastern spring has abundant riparian vegetation that alternates between dense woody riparian, consisting mostly willows and woody/herbaceous mix, but has thick infestations of Canada thistle in places. The AIZ from the eastern spring is just north of the archery range road, and is a dense thicket of woody riparian vegetation. The road to the Archery Range is in and along the edge of riparian vegetation along the southern bank. The road is native surfaced of fine grained material, developing severe ruts when wet. There is a short, moderate slope between the road and the stream in the vicinity of the archery range, so that sediment yielded from the road can easily be carried to the channel. There are several spots wallowed out up to a foot in depth near the archery range. At that point the road is within 30 feet or so of the creek, so that when wet, runoff flows to the wallow spot and vehicles passing through push a pulse of sediment-laden water down the slope from the road into the stream.

The other westernmost fork is only marginally perennial. In summer it is reduced to ponds of standing water behind beaver dams where it passes just east of the warming hut (T08S R43E Sec 28 NE) along the Mill Fork Rd about 0.5 miles northwest of the intersection with Wood Cyn Rd.

The middle fork is perennial and yields the most flow. The fork originates at a group of three springs in a small bowl-shaped depression (T08S R43E Sec 28 NW). The bottom of the depression is hummocky, possibly indicating that the valley was formed or enlarged by slumping from the surrounding slopes. The channel exits the spring's area in

a narrow, deep channel in a narrow valley with abundant, though short beaver dams. This fork is very stable and would be rated at PFC if rated separately.

Wood Canyon
Wood canyon is a west and north flowing stream that is perennial in some reaches and intermittent to ephemeral in others. There is no evident surface connection to the Bear River, the channel disappears below the Forest in the farm fields west of (below) the mouth of the canyon. The upper reach in the project area flows in a northward direction bounded by mostly woody riparian vegetation and is in a forested area. There is a motorized trail within 10-20 feet of the channel, which parallels along most of the reach. The trail was originally a road open to full-sized vehicles and only closed to them in the recent past. The berm to prevent full-size vehicle access has degraded and it appears that full-size vehicles can and may be using the lower portions of the trail. The stream functionality is rated as FARM. The channel bottom is very soft in many places, indicating that it probably receives excess sediment, most likely eroded from the trail. The stream turns westward where it meets Wood Canyon Road about a thousand feet below where it exits the trees, and is closely paralleled by current or abandoned road prisms all the way down to the canyon mouth. About 0.3 miles down the canyon, the stream becomes intermittent, and then ephemeral for about 0.2 miles, lacking evidence of flow (little to no high water marks) in the drainage bottom. The lack of well defined channel may be due to encroachment or displacement by road construction in the narrow canyon. The current prism of 20125 is up to 75 feet (slope distance) away from the channel in places, particularly on the steepest pitch, but sections of abandoned road prism immediately near the creek exist. Below where the stream turns west and parallels 20125, it becomes intermittent to marginally perennial, becoming intermittent to perennial again down near the Forest boundary. Just above the boundary, several hundred feet of the channel were straightened to make way for the road, which caused the channel to adjust downward about 2-4 feet for a distance of about 200 feet below the straightened reach. That segment of channel adjustment ends just before the creek reaches the Forest boundary.

3.2.4 Existing Hydrologic Disturbed Area

Existing hydrologic disturbance acres shown included **ALL** previous known timber harvest activities going back to 1984, even though in some cases the older sales may have already recovered hydrologically. Past harvest contributes the majority to all but the Sulpher Creek drainage, which has no harvested acres that are considered hydrologically disturbed. Livestock improvements are included, but are very limited in number because the only livestock grazing is by sheep. Recreation and minerals exploration also contribute to disturbance, but even when combined with livestock grazing, the total is less then 10% to the total disturbance. Roads and trails contribute the second most percent disturbed area, except Sulpher Creek, where they contribute the most. **Table 3.2-3** shows the hydrologic disturbance existing condition for each HUC-6 being at or below 7% disturbed, which is less than one quarter recommended in the Forest Guideline.
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Table 3.2-3: Existing Hydrologic Disturbance by HUC-6

HUC-6 & Major Streams	Disturbed acres	Acres on Forest	% HUC-6 on Forest	% Forest Disturbed
160102010101 (Wood, Trail Cyns)	101	1,938	4	5%
160102010202 (Sulphur Cyn)	53	3,875	59	1%
170402071003 (Trail Cr)	133	1,943	20	7%
170402071302 (Johnson Cr)	753	11,418	83	7%

3.3 Soils

Analysis Method: To determine existing condition, field reconnaissance, stand exams 2003, soil characteristics and interpretations from the Soil Survey of the Caribou National Forest (USDA-FS, 1990), the Water Erosion Prediction Project (WEPP) model, and acres of detrimental soil disturbance were used.

Analysis Area: The analysis area for determining the effects of the proposed action and alternatives on soils are the proposed treatment units as defined in FSH 2509.18, R4-2002-1.

3.3.1 Existing Soil Disturbances

Soils were examined in past timber cutting units to determine the existing condition and productivity characteristics, as well as validate information from stand exam plots for ground cover and duff/woody debris information (Field Notes 2007). Using the Rocky Mountain Research Station methodology, units were transected statistically to determine woody debris, cover and detrimental soils disturbance.

Existing soil disturbances in the proposed project area were also documented by site specific field visits using a soil condition monitoring form and soil profile descriptions. Detrimental soil disturbance related to activities involving past timber harvest, livestock (sheep) grazing, dispersed recreation, including off road vehicle use and firewood collection were observed and documented.

The Soil Specialist Report in the project file has a detailed discussion on all existing soil disturbances within the project area. These disturbances are displayed in the figure and summarized in the table below.

Figure 3.3-1: Existing Disturbances within the Aspen Range Project Area

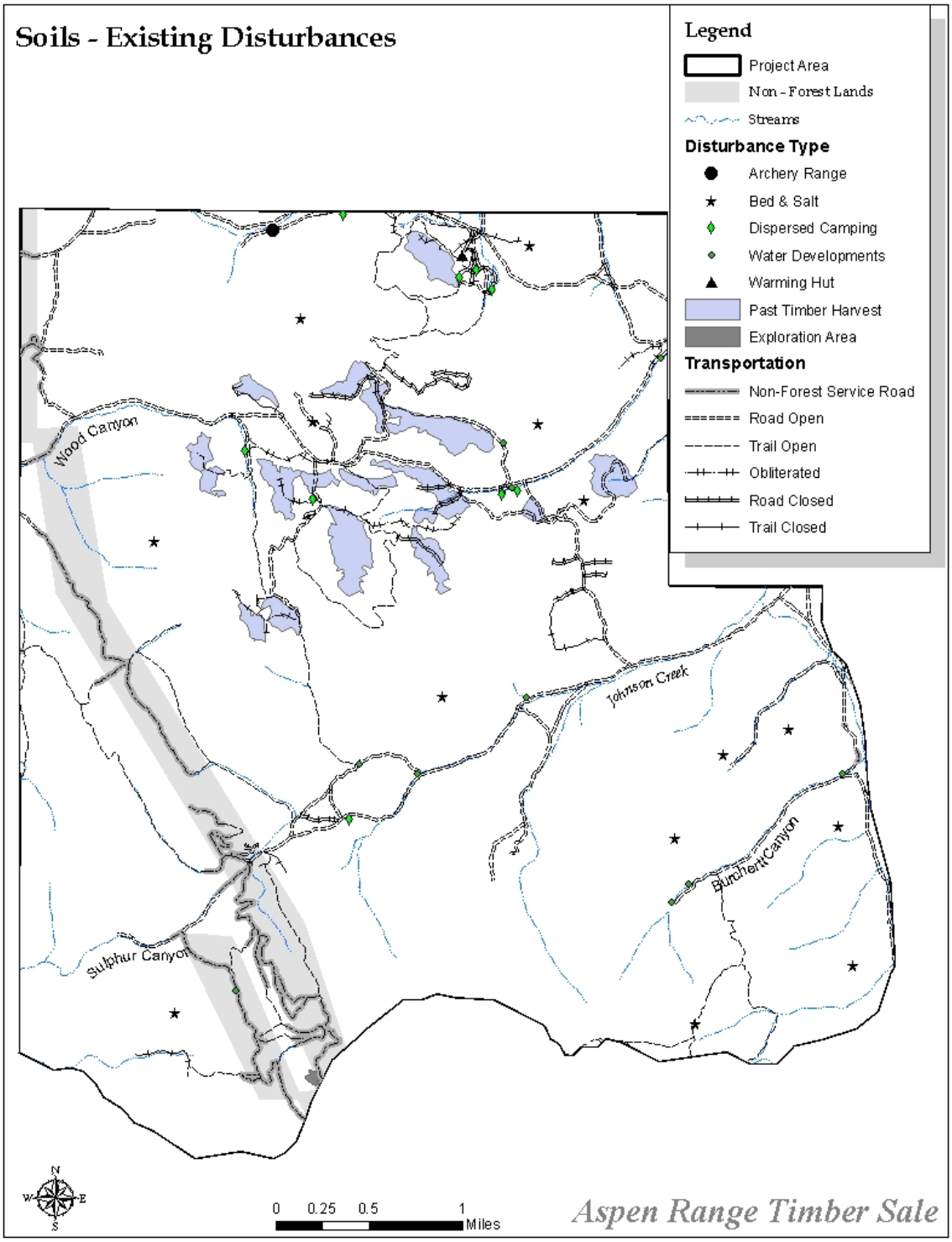


Table 3.3-1: **Summary of Existing Detrimental Disturbances within the project area.**

Disturbance Agent	Acres of Existing Disturbance Alt. 1
Archery Range Disturbance	2
Past Timber Harvest (1984 – 1997)	23
Sheep Bedding, Salt Grounds, Holding	12
Sheep Water Pond Developments	14
Dispersed Campgrounds	5
User Defined (Off System) Roads & Trails	31
Total	**87**

3.3.2 Soil Productivity

Soils in the Aspen Range analysis area developed from sedimentary parent materials and have a moderate to high yield capability class for timber production (50 to 85 cubic feet per acre per year; USDA 1990). Dominant characteristics that indicate the productive nature of soils found in the Aspen Range are soil depths which mostly very deep (greater than 60 inches) to bedrock. Soils that were found in the units generally have a dark surface horizon at least 9 inches deep and are characterized by relatively high organic matter content and a high base saturation over 50%. Soils with an increasing component of clay below the A horizons that increase water holding capacity were also observed. These soils are commonly found in a forested setting in this area.

Most units in the analysis area have abundant amounts of fine organic matter and woody residue on the soil surface for nutrient cycling. Regeneration of conifers on previously harvested units within the analysis area is vigorous and indicates that soils are capable of sustaining timber production and harvest activities (timber suitability analysis for the RFP).

Landforms in the analysis area have been mapped as stable, unstable, marginally unstable and marginally stable (Caribou Soil Survey 1990). No activities will occur on areas that are rated unstable. Previous harvest activities that have occurred on these landforms have not cause any landslides or mass instability in the past. No evidence of active mass movement was documented during field surveys in the analysis area. In addition, soil examinations in all activity areas in the analysis area verified soil properties are suitable for timber management. The following table displays all of the known existing detrimentally disturbed acres in the analysis area based on the no action alternative.

3.4 Wildlife

The Forest provides a wide variety of diverse habitats for approximately 334 species of terrestrial vertebrate wildlife known or suspected to occur on the forest. Habitats can be broadly classified as forested, rangeland, and riparian cover types. Within these types reside several wildlife species of management concern. The wildlife species of concern for this project are divided into five groups: Threatened and Endangered Species, Sensitive Species identified by the Regional Forester, Management Indicator Species (MIS) identified in the Caribou National Forest Revised Forest Plan (CNF RFP), Migratory Land Birds identified by Idaho Partners in Flight, and Big Game (mule deer and elk). The wildlife table in Chapter 4 notes the species considered in the analysis and the species to be considered further. NOTE: A discrepancy of one acre or one percent between text or table is due to rounding up or down.

- A Goshawk survey would be conducted every year until sale preparation is completed.
- Flammulated owl nests would be protected if found (CNF RFP S&G).
- Large cavity snags and raptor nests would be protected, if possible.
- Provide for 80 percent sharp-tailed grouse winter forage within a four square mile area from known leks.
- Follow the snag guidelines in the Caribou Revised Forest Plan.
- Follow big game guidelines in the Caribou Revised Forest Plan when leaving vegetation buffers around elk wallows (RFP 3-31).
- Biological Assessments will be prepared as required by the Endangered Species Act and agreements with the United States Fish & Wildlife Service.

Analysis Methods: Survey data, known locations (USDA, 2006a Wildlife Map), aerial photos, elevation, soil substrates, known habitat types, and field reconnaissance of the project and surrounding areas have been used to determine the existing condition. Acres discussed are generated from GIS calculations used in the vegetation section. Vegetation habitat is inferring suitable wildlife habitat. The Biological Evaluation (BE), Biological Assessment (BA), and Wildlife Reports will be part of the Project Record.

Analysis Area: The 11,981 acre project area is used for the vegetation section is used to display acres of suitable habitat available for each wildlife species analyzed within the landscape. Potential species occurrence is based on habitat within the project area. Because the RFP identifies three use areas for goshawk the acres for each area are also shown. The acres shown for the goshawk foraging area represent the entire landscape, the RFP requires a minimum of 6,000 acre for the territory. Potential species occurrence was based on habitat within the 11,981 analysis area. Neighboring suitable habitat is used to determine potential occupancy of forest carnivores that migrate long distances

3.4.1 Threatened and Endangered Species

The following Threatened and Endangered Species are considered for the Soda Springs Ranger District, Caribou-Targhee National Forest USFWS (2007). This project was discussed and preliminary determinations made at the Section 7 streamlining meeting with the USFWS on March 12, 2004. In 2007, when the bald eagle was delisted, it became a Forest Service Sensitive Species.

Bald Eagle – The project area does not provide nesting or winter habitat. A determination of "*no effect"* was given because suitable nesting or winter habitat (large trees and snags near large bodies of water) (GYBEWG 1996) are not in or near the project area. The bald eagle, now a sensitive species, will not be analyzed further.

Gray Wolf – The project area is within the Yellowstone experimental/non-essential (XN) population area. Because all conditions required in the final rules (USFWS 1994) for the XN population of gray wolves are being met, the gray wolf was given a "*not likely to jeopardize the continued existence.*" The USFWS agreed with the NLJ determination in the streamlining meeting. Because it is treated the same as a "*no effect",* the gray wolf will not be analyzed further.

Canada Lynx – The project area is within the linkage area for lynx. Because none of the alternatives would change linkage habitat (Ruediger et al. 2000), a determination of "*no effect"* was given. The Canada lynx will not be analyzed further.

3.4.2 Sensitive Species

The Regional Forester identifies Sensitive Species when population viability is a concern for species as evidenced by current or expected downward trends in population numbers and/or habitat. The following species have been identified for the Caribou National Forest.

Spotted Bat (*Euderma maculatum*) – The spotted bat roosts in cracks and crevices on limestone or sandstone cliffs. There have been no confirmed sightings of this bat in Southeast Idaho (Miller and others 2005, 45). Because steep cliff faces are not present in the analysis area, and there would be no disturbance or destruction to cliffs, this species will not be analyzed further.

Townsend's (Western) Big-Eared Bat (*Corynorhinus townsendii*) – There are no known caves or underground mines in the area. Snags that may occur in forested project areas could be used as roosting sites. Project activities would impact snags directly. Snags are limited to the amount of recent insect mortality and many older snags have fallen over. Dead trees near road are also removed for firewood.

Pygmy Rabbit (*Brachylagus idahoensis*) – Suitable habitat is dense stands of big sagebrush growing in deep, loose sediment. In Idaho, they are closely associated with large stands of tall, dense sagebrush (usually basin big sagebrush) with a high percent of woody cover. Basin big sagebrush is typically found in valley bottoms. Sagebrush

canopy cover in the project area that may be impacted is not suitable habitat. A habitat type conversion would not occur with this project. This vegetation treatment would not impact pygmy rabbit habitat and this species will not be analyzed further.

Wolverine (G*ulo gulo*) – The project area contains suitable wolverine foraging habitat and occupancy is considered possible based on sightings of wolverines in southeast Idaho (Inman et al. 2004). Denning in or near the project area is not expected because large rock outcroppings and talus slopes at higher elevations are not found in the project area. Because project activities would not occur in the winter, and treatment units are not located in typical denning habitat there would be no disturbance to wolverines in the winter including denning and denning habitat. CNF RFP guideline (USDA 2003b, 3-33) Restrict intrusive human disturbance within one mile around known active den sites, March 1 to May 15 would be met because there are no known active den sites. Carrion would continue to be available. Human disturbance from project activities may disrupt or displace wolverines traveling in and through the area.

Trumpeter swan (*Cygnus buccinator*) – Suitable nesting habitat (marshes, lakes, still water, or rivers with dense aquatic plant/invertebrates, and tall emergent vegetation) is not found within or near the project area, so the trumpeter swan will not be analyzed further.

Harlequin Duck (*Histrionicus histrionicus*) – Perennial streams that may provide suitable habitat are not found in the project area. Harlequin duck habitat is on the northeast of the Soda Springs district; and the project area is south of the southern edge of their range. Harlequin ducks will not be analyzed further.

Peregrine Falcon (*Falco peregrinus anatum*) – An active eyrie is located 11 miles west of the project area. Because eyrie and prey associated with the riparian areas, is not in or near the project area and logging is not associated with impacting peregrine falcons, this species will not be analyzed further.

Northern Goshawk (*Accipiter gentilis*) – Within the project area there is goshawk nesting and foraging habitat available. Approximately 6,167 acres or 81 percent of the forested stands in the analysis area are mature or old. Goshawks use mature dense forest stands for nesting and the majority of their prey also use mature dense forests (Reynolds 1992, Graham and others 1999, RFP). The forested habitat in the analysis area provides suitable habitat for one (6,000+ acre) goshawk territory (RFP S&Gs). There is one known goshawk territory in the project area, with one active nest (field survey 2007) and one alternate nest site. Forested stands within the project area have been assigned to one of the following four categories: nest area, alternate nest area, post-fledging family area (PFA), and foraging area. Theses categorize are all within the RFP standards and guidelines for goshawk. Surveys would continue through the sale preparation phase to verify the location of any new alternate nest sites. Refer to Appendix A, Figure 6 for a display of the Goshawk Nesting Territory.

Columbian Sharp-Tailed Grouse (*Tympanuchus phasianellus columbianus*) – Nesting habitat occurs at lower elevations outside the project area (IDFG 2004b). Birds can travel 4 to 12 miles in the winter searching for food. Mature chokecherry, serviceberry, and aspen in the project area may be used as winter foraging habitat. Ulliman and others (1998) recommends that 80 percent be available for wintering grouse. There have been no recent (within 7 years) disturbances creating early seral forage reducing available winter forage. All 4,165 acres of mountain brush (chokecherry), along with young, middle age, mature, and old aspen and aspen/conifer cover types in the project area providing winter foraging habitat for sharp-tailed grouse.

Greater Sage -grouse (*Centrocercus urophasianus*) –Suitable habitat is found in foothills, plains, and mountain slopes where sagebrush is present, or in a mixture of sagebrush, meadows, and aspen in close proximity (Connelly et al. 2000). Known leks are three to four miles east of the project area (IDFG 2004a). Grouse have not been seen in the project area. Because birds migrate 2-11 miles from leks, sagebrush stands in natural openings in the project area may provide foraging habitat. The project area contains 4,085 acres of sagebrush that may provide brood rearing habitat. Sagebrush treatments are not proposed but brush may be burned due to its proximity to forested habitat. No more than 20 percent of sagebrush habitat should be treated within a 20 year period. Vegetation disturbances in May and early June can impact sage grouse.

Great Gray Owl (*Strix nebulosa*) – Suitable nesting habitat (abandoned raptor nests or the top of a broken tree) occurs in mature and old forest types on 6,167 acres (81%) in the forested project area, along with small mammals used as prey (Hayward 1994). A great gray owl has been sighted in the project area. Occupancy is expected in or near the project area but a nest has not been found. At least 40 percent of the mature/old forest habitat should be maintained for owls.

Flammulated Owl (*Otus flammeolus*) – Suitable nesting (tree cavities) and foraging habitat (insects in an open stand of trees) occurs in mature and old forest stands (Hayward 1994) on 6,167 acres (81%) in the forested project area. One owl responded to a call-back vocalization survey but no nests have been found during field visits.

Boreal Owl (*Aegolius funereus*) – Suitable nesting habitat (tree cavities in mature forest with a high density of large trees) occurs in forest stands (Hayward 1994) in the project area, along with small mammals used as prey. The project area provides 6,167 acres (81%) of mature and old forest stands that is suitable nesting and foraging habitat. Winter owl surveys did not locate a boreal owl in the project area.

Three-Toed Woodpecker (*Picoides tridactylus*) – The project area contains suitable nesting (12” snags) and foraging habitat (bark beetle larvae in recently killed trees). There is potential for suitable foraging habitat within 6,167 acres (81%) in mature and old foreste stands in the forested project area. Pockets of recent conifer mortality are improving foraging opportunities (USDA 2003a, 3-222).

Columbia Spotted Frog (*Rana luteiventris*) – Montane wetland habitat (usually near springs, seeps or perennial streams) is found in the project area. The species has not been found on the Caribou NF, and southeast Idaho is not identified as part of the predicted range of the spotted frog (USDA 2003). Suitable habitat is found in the project area, but the project area is outside expected range and will not be analyzed further.

3.4.3 Management Indicator Species

MIS for Revised Forest Plan are: Goshawk, Columbian sharp-tailed grouse, and sage-grouse (see Sensitive Species section). Meeting Revised Forest Plan (2003) Standards and Guidelines is the unit of measure for MIS.

3.4.4 Migratory Birds

Migratory Birds – Priority A Habitats identified in the Coordinated Implementation Plan for Bird Conservation in Idaho (IWJV 2005, 16-20) are: Riparian, Wetlands, Sagebrush / Salt Desert Shrub, and Aspen Woodlands. Priority B Habitats include: Low Elevation Mixed Conifer, High Elevation Mixed Conifer (Spruce-Fir Forests), Grassland, Juniper / Pinyon Pine / Mountain Mahogany, Mountain Brush/Shrubland, and Agricultural. Priority C Habitats are: Cliffs/rock outcrops/talus, Alpine, and Lodgepole Pine. The statewide goal is to protect, maintain, enhance and/or restore these bird habitats. This plan identifies goals by prioritized "Bird Habitat Conservation Areas." None of the BHCAs targeted in the State of Idaho as needing improvement are found on the Caribou NF. In general, the impacts of forest dwelling sensitive bird species will be used to identify impacts of migratory birds. (See Hydrology and Fisheries sections for additional information on riparian and non-riverine wetland habitats.)

Riparian (Includes Riparian Woodland, Riparian Herbaceous, and Riparian Shrubland habitats combined.)**:** Stream bank vegetation is found along perennial streams in the project area. Willows, cottonwood, and aspen are sustaining growth and reaching maturity.

Wetland (Includes Wet Meadow/Marsh, Other Wetland habitats, and Water combined)**:** Beaver ponds, springs, seeps, and livestock water developments are available for bird use in the project area.

Sagebrush / Salt Desert Shrub (Includes Sagebrush Steppe and Greasewood/Saltbush habitats combined)**:** Sagebrush is found as individual plants in forest openings, as part of the mountain brush habitats, or in larger stands along the foothills usually at or near the forest boundary. These stands are at the higher elevation of the "Sagebrush Steppe and Greasewood/Saltbush habitats." See sage-grouse section above. Greaswood/Saltbrush habitats do not occur in the project area and will not be discussed.

Aspen Woodland: Aspen is found throughout the project area. Aspen stands are decreasing due to conifer encroachment. Aspen is successfully regenerating in the project after disturbances and is not suppressed by ungulate herbivory.

Low Elevation Mixed Conifer: Douglas-fir is found in the project area. There are large remnant mature trees that are being encroached by younger Douglas-fir. Mature Douglas-fir are being killed by bark beetles.

High Elevation Mixed Conifer (Spruce-Fir Forests) and Lodgepole Pine: These forest types are found in the project area.

Mountain Brush/Shrubland: Mountain brush is found in the project area.

Grassland, Juniper / Pinyon Pine / Mountain Mahogany, Agricultural, Cliffs/rock outcrops/talus, and Alpine: Project activities would not impact these habitats or priority bird species tied to these types of habitats and will not be analyzed in Chapter 4.

3.4.5 Big Game

Mule Deer and Elk – The project area contains summer and fall foraging habitat and winter range (RFP 2003). There would not be any planned activity in big game winter range habitat, prescription area 2.7 in the Forest Plan. The forage:cover ratio in the project area is 34:66. There is 4,132 acres (34%) of forage vegetation: grass, sagebrush, and early/mid seral mountain shrub and mountain brush, and early seral (nonstocked & seedlings) forested vegetation. Mature mountain shrub and mountain brush along with sapling, young, middle aged, mature, and old forest habitat provided hiding cover on 7,850 acres (66%). Aspen restoration on public lands is one component of the 2004 IDFG Mule Deer Initiative (IDFG 2005b) to reduce the long-term decline in mule deer numbers. Reducing conifer in aspen stands would help meet this IDFG Initiative.

3.5 Fisheries

Analysis Method: Maps of the project and analysis areas were reviewed to identify perennial and intermittent streams, and springs. Forest Service files were searched for survey data. Fisheries information was requested from the Idaho Department of Fish & Game (IDFG) and Idaho Department of Environmental Quality (IDEQ). Follow-up electrofishing surveys by the Forest Service were performed on Trail Creek and its Cold Springs tributary, and visual surveys were conducted on Wood Canyon and Johnson Creeks. These investigations occurred in 2003 during the period 5 May to 25 September.

Analysis Area: The analysis area for fish and other aquatic resources is the Trail Creek, Johnson Creek, Wood Canyon Creek, and Dry Fork drainages, from headwater tributaries down to the bottom of each stream. The project area is basically the portion of these drainages on the Forest.

Trail Creek, a tributary to Trail Creek originating at Cold Springs, Johnson Creek, and Wood Canyon Creek are the perennial streams in the project area. Trail Creek enters the Blackfoot River at the base of the analysis area. Johnson and Wood Canyon creeks may have been historically connected to perennial streams but now apparently end at irrigation diversions or ponds at the base of the analysis area.

Populations of Yellowstone cutthroat trout (YCT), brook trout, sculpin, and dace may occur in Trail Creek, brook trout exist in its Cold Springs tributary, and rainbow trout are seasonally stocked into some ponds in the Trail Creek drainage. The Forest fish biologist indicated that he had no record of surveys on Trail Creek (James Capurso, personal communication). The Idaho Department of Fish and Game (IDFG) did not have information on wild fish populations in the drainage but reported that it stocks catchable-size rainbow trout (about 95% triploid) into the ponds (Regional Fisheries Manager Dick Scully, personal communication). The Idaho Department of Environmental Quality (IDEQ) reported that it electrofished Trail Creek in 1999 and found cutthroat trout, brook trout, sculpin, and dace (Dave Hull, personal communication). Fish were not found in Trail Creek during the Forest's follow-up survey in August 2003 but electrofishing at the location chosen near the headwaters was difficult and ineffective due to beaver dams and thick willows. Brook trout were collected at that time in the Cold Springs tributary to Trail Creek.

Trail Creek on the Forest has low water flows but is a large enough stream to support fish because of beaver dams. It was impossible to determine average stream width in August 2003 because beaver ponds and thick willow growth made access difficult. The stream was at least 50 feet wide in some areas, had a maximum depth of at least 3 feet, low gradient, excellent amount of overhead cover (75-100%), well-vegetated banks, little bank disturbance, and high level of substrate sedimentation (75-100%). Because of silt-filled substrate, which is normal where streams are comprised of beaver ponds but allows little or no fish reproduction, the fish population in Trail Creek may depend on immigration of individuals from the Blackfoot River downstream. A road paralleling the upper segment of Trail Creek is in close proximity to the stream and was identified as a source of sediment.

The Cold Springs tributary to Trail Creek has higher water flow than Trail Creek above its confluence. This tributary in August 2003 had numerous beaver dams, an average width of about 8 feet, maximum width of about 20 feet, average depth of 2-3 feet, low to moderate gradient, good amount of overhead cover (50-75%), well-vegetated banks, little bank disturbance, and fairly high level of substrate sedimentation (50-75%). Because of silt-filled substrate, which is normal where streams are comprised of beaver dams but allows little or no fish reproduction, the fish population in the stream may depend on immigration of individuals from downstream waters. Only two fish, both adult brook trout, were collected while electrofishing the entire stream. Minor road impacts on this stream were noted at two crossings.

Johnson Creek apparently contains a self-sustaining population of brook trout. This was the only fish species found in Johnson Creek during a Forest electrofishing survey in July 2000. The IDFG and IDEQ reported no fisheries information on this stream. It is likely that Johnson Creek historically contained YCT before it lost its connection with other perennial waters and brook trout were introduced. Future use of the stream by YCT is not a reasonably foreseeable future event.

Johnson Creek is a small, spring-fed stream. In July 2000, flows capable of supporting of a fish population were present only below a point about 1 mile above the Forest boundary. The stream consisted of low-gradient riffles and shallow pools. The banks were covered with thick willows and dogwoods. Undercut banks, rootwads, and dense riparian vegetation provided excellent cover for fish. The unsurfaced road paralleling the stream was identified as a source of sediment. In one area, a high level of substrate sedimentation (75-100%) was noted. Near the lower end of the Forest, and below the Forest boundary, grazing impacts were noted including short understory vegetation and trampled, unstable banks. In May 2003, similar conditions were observed regarding road and grazing impacts on the stream.

Wood Canyon Creek is apparently fishless. No fish were found during a Forest visual survey in September 2003. The stream was too small to electrofish. The IDFG and IDEQ reported no fisheries information on this stream. The stream probably never supported a fish population due to its small size. Now disconnected from other perennial streams, future use of the stream by fish is not a reasonably foreseeable future event.

In September 2003, a middle segment of Wood Canyon Creek was dry. Above this segment, the stream had average widths of 1.5-2.8 feet, average depths of 0.5-1.0 inch, maximum pool depth of 6 inches, low gradient, good to excellent amount of overhead cover (50-100% of stream shaded), stable to unstable banks, silt-filled substrate (75-100%), and zero to few macroinvertebrates. Below the middle segment, the stream had an average width of 1.5 feet, average depth of 2.5 inches, maximum depth of 4 inches, higher gradient, entrenched channel, poor amount of overhead cover (0-25% of stream shaded), well-vegetated lower banks, moderate to high level of upper bank disturbance, gravel substrate, and abundant macroinvertebrates. Roads in Wood Canyon parallel the stream within the AIZ along most or all of its entire length and, along with bank disturbance from animals, were identified as a source of sediment into the stream.

3.6 Transportation and Access

Analysis Method: The Road Analysis for the Caribou National Forest, Roads Analysis for the Aspen Range Timber Sale, engineer plans, Corporate GIS Database (Jan, 01 2005) road and trail inventory, and field observations.

Analysis Area: The *Analysis Area* for roads and trails is the project area. This *Analysis Area* was chosen because the roads within this area will be impacted by project activities and managed after activities have been completed.

All roads that provide access to the project area are described in this section; all area-based information is based on the roads within the project boundary. Corporate GIS Database layers, other available map data, and site visits were used to compile a project level GIS cover of the roads for this analysis. This GIS coverage is available in the project record. This cover was also used for the roads analysis.

3.6.1 Transportation

The transportation system required for this project is mostly existing and in place. However, some roads need to be relocated and some temporary roads will need to be constructed and decommissioned as indicated on the maps in Chapter II. The system roads in this area receive moderate recreation use with some noted below receiving additional pressures.

Table 3.6-1 Project area roads. The roads that access the project area are described below.

Road	Description
20124 Trail Canyon	This road is under Caribou County Jurisdiction and maintained at a level 5 for the first 6.1 miles, and level 3 to the east for the last 6.0 miles. Only 2.76 miles are on forest service land. This road receives considerable recreation use up to the archery range road # 20297 and the warming shelter about a mile before the intersection with road # 20126. It serves as the main access road for private and state land north and east of the forest.
20124A	Unclassified road that spurs off of road # 20124 identified with alpha numeric subclass {A} and have the corresponding mileage [0.42].
20125 Wood Canyon	This road is under Caribou County Jurisdiction and maintained at a level 3 across forest service land. There is no action recommended for this road.
20125 Spurs	There are eight unclassified roads that originate from road # 20125 and have been identified with alpha-numeric subclasses {A,B} and have the corresponding mileage [0.42, and 0.37].
20126 Sulphur Canyon	This road provides less direct access to the sale area but serves access to several lease claims and private in-holding within the project area. As a whole, this road is in poor condition and requires many improvements to address resource and safety issues. Jurisdiction is shared between County, Forest Service, and Private and maintained at a level 2.
20130 Big Basin	This road is about 1.9 miles long and provides access to a private in-holding and mine leases. Jurisdiction is shared between Forest Service and Private and maintained at a level 2. There is no action recommended for this road.
20176 Johnson Creek	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides access to a mine lease from road # 20126. There is no action recommended for this road.
20178 Burchertt	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It

Springs	provides access to a mine lease from road # 20130. There is no action recommended for this road.
20201 Aspen Ridge	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides access between roads 20126 and 20125 and accesses several cutting units on the top half. This lower road section is in poor condition for passenger vehicle travel. Travel Management Plan, signed 11/05, designated the lower half as a motorized trail and will restrict full size vehicle use.
20201B	Unclassified road that originate from road # 20201 and have been identified with alpha-numeric subclasses {B} and have the corresponding mileage [0.44].
20297EX Trail Archery Range	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides recreation access to the archery range. This road is poorly located and should be relocated away from the nearby stream.
20572	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides access from 20126 to 20201 and provides access to a cutting unit.
20574 Wood Sulphur	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides access from 20126 to 20125 and access to several cutting unit. Both junctions of this road are very steep and would not accommodate the limitations of logging trucks or any standard 2 wheel drive pickup and should be reconstructed to accommodate such traffic.
20898	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides access from 20126 to 20201 and parallels 20126. Although it has a different number, this road is the main connection for road 20201 from 20126.
20900	This road is under Forest Service Jurisdiction and is at a maintenance level 1. It is accessed by road # 20125.
20901	This road is under Forest Service Jurisdiction and is at a maintenance level 1. It provides access from 20125 to 20902 and parallels a cutting unit. This road is not maintained and will need initial maintenance prior to use.
20902 Wood Canyon North	This road is under Forest Service Jurisdiction and is at a maintenance level 1. It provides access from 20125 to 20124 and accesses several cutting units. This road is not maintained and will need initial maintenance prior to use.
21232	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It is accessed by road # 20900 and provides access to a cutting unit. This road is not maintained and will need initial maintenance prior to use.
21234	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides access from 20125 to 20201 and accesses several cutting units. There is no action recommended for this road.
21234B	Unclassified road that originate from road # 21234 and has been identified with alpha-numeric subclasses {B} and has the corresponding mileage [0.43].
21235	This road is under Forest Service Jurisdiction and is at a maintenance level 2. It provides a short cut from 20125 to 20574. There is no action recommended for this road.

3.6.2 Access

The project area is within Revised Caribou National Forest Management Plan (RFP) allowable travel route densities. The RFP closed the majority of the forest and part of this project area to unregulated cross-country motorized travel. It also set allowable open motorized route densities by management prescription area. The signed Travel Management Plan closed the remaining portion with the selected alternative (excluding snowmobiles). As stated earlier in this document the project is within two prescription areas 2.7.1 and 5.2. According to the RFP the allowable motorized density for 2.7.1(d) is 1.5 miles/sq.mile, with a current motorized density of 2.1 miles/sq.mile. Within the project area the motorized density for this prescription area is higher because the GIS analysis for road density split the polygon into two pieces due to a private inholding and skewed the results. There have not been any new roads constructed within the winter range polygon in the project area and if the polygon was analyzed as it is in the RFP it would be **1.3 miles/sq mile**. Prescription area 5.2(c,f) is currently the only area on the forest that does not have motorized density restrictions. Although, the scope of this project is not to treat the prescription areas motorized density, it will result in a net reduction. The current status of the roads in the project area is summarized in

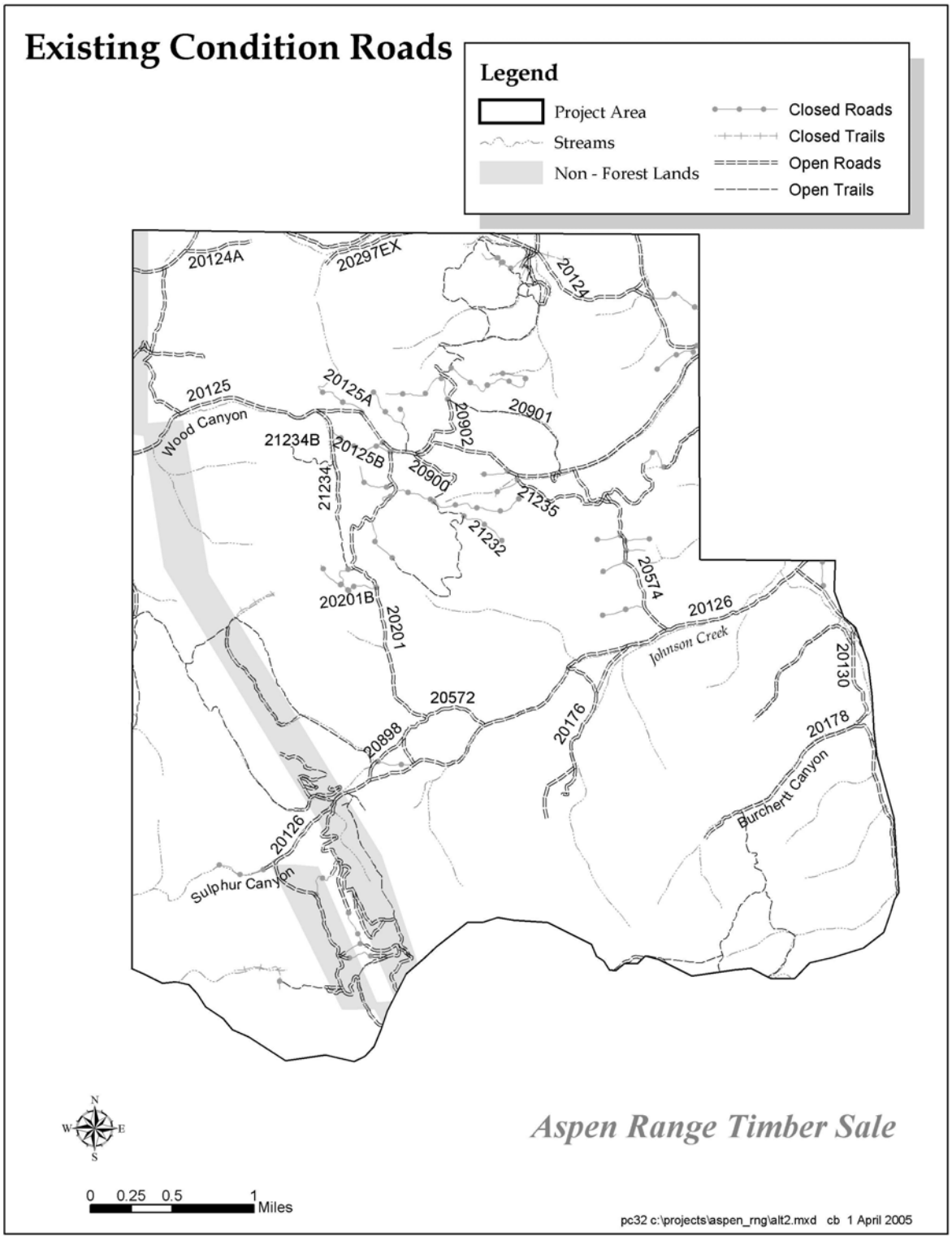
Table 3.6-1 and **Figure 3.6-1**. A summary of miles and motorized densities is portrayed in

Table 3.6-2 below. A full analysis of the current status can be found in the Aspen Range Timber Sale Roads Analysis in the project file.

Table 3.6-2 Access/Road Status. Numbers below are for the 17.37 square mile project area only and are broken down by Forest Plan prescription block.

Status	Miles				Miles/Sq Mile		
	R_x 5.2 (c,f)	**R_x 2.7.1 (d)**	**Total Miles**		**R_x 5.2 (c,f)**	**R_x 2.7.1 (d)**	**Total**
Square Miles	**13.6**	**3.8**	**17.4**	R_x Allowable Miles/Sq Mile	**none**	**1.5**	
Open	39.2	7.7	**46.9**		2.9	**2.0**	**4.9**
Closed	8.9	0.4	9.3		0.7	0.09	0.7
Total	**48.1**	**8.0**	**56.1**		**3.5**	**2.1**	**5.6**

Figure 3.6-1: Existing Roads and Trails



3.7 Timber Production

Approximately 72% of the project area is in Forest Plan Prescription Area 5.2. The emphasis of this prescription is scheduled wood-fiber production, timber growth, and yield while maintaining or restoring ecosystem process and function to more closely resemble historical ranges of variability. Goods and services are to be provided within the productive capacity of the land. All conifer cover types in this prescription contribute to the RFP calculated ASQ (Allowable Sale Quantity). One of the goals of this prescription is that "lands will be managed to emphasize the cost effective production of timber" in other words produce timber sales from these lands. The majority of forested cover types within the project area is included in the RFP ASQ acres therefore available timber on these acres should be managed to make timber sales available for local economic benefit.

3.8 Air Quality

Analysis Method: USFS R1/R4 NEPA evaluation procedures for prescribed fire projects (Acheson et. al., 2000)

Analysis Area: The analysis area for Air Quality is the Montana/Idaho Airshed number twenty.

The Caribou-Targhee National Forest is part of the Montana/Idaho Airshed group. The purpose of this group is to manage and minimize cumulative smoke air quality impacts from prescribed burning. Accumulation of smoke from controlled burning is limited through scientific monitoring of weather conditions and formal coordination of burns. The Missoula Monitoring Unit issues daily decisions, which can restrict burning when atmospheric conditions are not conducive to good smoke dispersion (http://www.smokemu.org).

The project area is within Montana/Idaho airshed number 20. The nearest non-attainment area is Pocatello, Idaho for PM_{10} (~60 miles to the northwest). The project area and the entire Caribou National Forest is a class II airshed. The proposed project is approximately 70 miles southwest of Grand Teton National Park and 80 miles west to southwest of Bridger Wilderness area. All burning must be permitted through the Montana/Idaho State Air Shed Group Smoke Management Plan. Local sensitive areas near the proposed project area are the City of Soda Springs and outlying residences.

Air quality within the project is good with very limited local emission sources and consistent wind dispersion. Existing sources of emissions in the local area include industry, farm equipment, road dust, passenger vehicles and residential wood burning. Emissions are limited with occasional local visible sources of impairment surrounding Monsanto and Agrium plant sites. Wind dispersion throughout the entire project area is robust, with no local visible inversions or localized concentrations of emissions. For additional information on current air quality, please refer to the state of Idaho, Department of Environmental Quality website (http://www2.state.id.us/deq/).

3.9 Visuals

Analysis Methods: The Scenery of the project area was assessed through past site visits, the Visual Quality Objectives, VQOs, set in the Forest Plan and the FS Handbook for Scenery Management.

Analysis Area: Four separate Visual Quality Objectives prescription areas within the project area.

The western half of the project area has a prescription of Partial Retention (PR), further qualified as Middle Ground (distance zones) with a Sensitivity Level of 2 (views are from existing travel ways as opposed to from the air or from unusual observer positions) and Quality or Scenic Attractiveness of "C" - Indistinctive. This is because the bulk of the landscape is visible from the US Highway 30 view corridor. This comes from overlaying the VQO map over the land map and observing that the line delineating the two VQO designations is the top of the Aspen Range. Everything on the aspect facing Highway 30 is PR and everything on the back side of the ridge from Highway 30 is Modification (M). US Highway 30 is a heavily used corridor that provides high quality scenic experiences. A prominent ridge blocks all of the project area from the Highway 30 view corridor.

A small portion of the project area has a prescription of Modification, further qualified as Foreground with a Sensitivity Level of 2 and a Quality of "C". This prescription area is immediately south of the private homes near the Archery range.

The middle of the project area has a prescription of Modification, further qualified as Middle Ground with a Sensitivity Level of 2 and a Quality of "C".

The eastern 1/3 of the project area has a prescription of Modification, further qualified as Middle Ground with a Sensitivity Level of 2 and a Quality of "B" - Common.

By definition the VQO's in the project area are currently met. The Partial Retention and Modification areas both show some evidence of human activities. These would include open public roads, exploration roads, old logging, and ATV trails in the Partial Retention prescription area and a warming shelter, roads, trails and archery range in the Modification prescription area. Activities in both areas appear subordinate to the character of the landscape, therefore the existing condition for the entire project area meets the more stringent definition of Partial Retention. There are natural appearing openings in the area and changes of vegetation type and structure.

3.10 Rare Plants

Analysis Methods: Location of known populations, habitat requirements, and field observations in the project area.

Analysis Area: The *Analysis Area* is the project area with emphasis on the treatment units.

There are no T & E plants identified on the Soda Springs RD. There are three Sensitive Plant Species identified by the Regional Forester that may be of concern on the Caribou National Forest.

Starveling milkvetch *(Astragalus jejunus var. jejunus)* – is found on the Twin Creek Limestone formation. Twin Creek limestone is not found in the project area and this *Astragalus* will not be analyzed further.

Payson's bladderpod *(Lesquerella paysonii*) – The one known population of Payson's bladderpod on the Caribou National Forest is on Caribou Mountain associated with open gravelly sites on exposed ridges and gravelly openings at elevations 9,200-9,803 feet. The project area does not contain potentially suitable habitat, is outside the known or suspected distribution range of the species, and will not be analyzed further.

Cache beardtongue *(Penstemon compactus)* – is found on St. Charles limestone, Garden City limestone, or Fish Haven dolomite between 8,800-9,300 feet elevation on the Bear River Range. Plants are not expected to occur in or near the project area and they will not be analyzed further.

3.11 Rangeland Management

Analysis Method: Data from the Caribou Revised Forest Plan, maps of the project areas and observations made in the field are the *Analysis Methods*.

Analysis Area: The portions of the Johnson Creek and North Sulphur Sheep Allotments that are within the project area.

There are two allotments that are included in the Aspen Range Project, Johnson Creek and North Sulphur. Both the Johnson Creek and North Sulphur allotments are sheep allotments. Term grazing permits for these allotments authorizes sheep grazing from 6/16-9/5. For more allotment information see the following table.

The Revised Caribou National Forest Plan provides direction for livestock use in the project area. The decision was made to restricted livestock grazing following burning activities – *before seed set of the second growing season or until objectives of the treatment are achieved* (RFP 3-42). Impacts from livestock on other resources in the project area are documented in Chapter III and IV. Livestock use and management within the project area is not expected to change due to the proposed activities. Range management will not be analyzed further.

3.12 Heritage Resources

Analysis Methods: For the purpose of this analysis the Caribou Forest Heritage Resources project and site records were used to determine previous heritage resources analysis and where archaeological and historic resources locations are presently known. On-site pedestrian survey and archaeological testing was conducted in high site probability areas.

Analysis Area: Cultural resource surveys were done on each of the ground disturbing sites within the project area.

Archaeological investigations, including a class I records search and class III intensive pedestrian survey, have been completed throughout the project area. As a result of these investigations, no significant cultural resources or historical resources were found within the project area. The Idaho State Historic Preservation Office (SHPO) has been consulted and has concurred with these findings. Survey report, including the letter documenting SHPO concurrence, is located in the project file and in the Caribou-Targhee National Forest Heritage Resources master file.

If any cultural resources are encountered during the course of the project, then the Forest Archaeologist will be notified immediately and all project ground disturbing activities will cease in that area until the Forest Archaeologist takes appropriate action in consultation with the Idaho SHPO. This resource will not be considered further.

3.13 Recreation

Analysis Methods: Data from the Caribou Revised Forest Plan and observations made in the field are the Analysis Methods.

Analysis Area: The Analysis Area is the project area.

Hunting
Big game hunting is popular during the fall months. The entire Soda Springs Ranger District is located within Game Management Unit 76. Hunting begins in late August with archery season and ends in mid November.

Camping
Dispersed camping sites are common along the Wood Canyon/Trail Canyon travel corridors within the project area. The majority of campers are from the surrounding counties enjoying weekend stay on the Forest. During the start of big game hunting season demographics change and all camping spots are full until November.

Snowmobiling
Snow machining is popular within the project area. Mill Fork of Trail Canyon road 20124 is a groomed Snowmobile route with a warming hut adjacent to the parking lot. All the other routes in the project area are non-groomed.

Skiing/Snowshoeing
Crosscountry skiing and snowshoeing was popular in the area when funding was available to groom and maintain trails. Though user numbers are down, the area still has several marked routes closed to snowmobiles that extend to the top of Wood Canyon and loop back to the warming hut.

ATV
The project area that is mapped as 5.2 and is no longer open to crosscountry motorized travel with the alternative selected in the Travel Management Plan. About 47 miles of existing roads and trails can be used by off road vehicles during summer and fall, with use peaking during the big game hunting seasons.

Archery Range
The archery range is under a special use permit to the Caribou Field Archers, a group based out of Soda Springs that uses the area for target practice and archery competition meets. The archery range has limited parking, a small gathering area and a poorly constructed access road that doesn't properly drain leaving it with deep standing puddles for most of the summer. Improvements to the area are needed to comply with Forest Standards and Guidelines.

Other Recreation Activities
Sight seeing, berry picking and mountain biking occur in incidental amounts.

3.14 Tribal Treaty Rights

Analysis Method: Consultation specific to the Shoshone – Bannock Tribes conducted in 2004 and 2005 where this project was discussed in detail.

Analysis Area: The analysis area is the project area.

The Shoshone-Bannock Tribes are headquartered at the Fort Hall Reservation, in southeast Idaho. The current reservation boundary encompasses about 544,000 acres of land along the Snake River. The original reservation totaled over 1.8 million acres but due to the expansion of white settlers, Congress required the Tribes to cede much of this land. The Tribes have retained grazing rights on those ceded lands. Much of the Westside District of the Caribou-Targhee National Forest is in those ceded lands. The Fort Bridger Treaty established off-reservation treaty rights on all unoccupied lands. These rights include hunting, fishing, gathering, and other practices such as trade. While the Treaty itself only specifies hunting, the lawsuit "State of Idaho v. Tinno" established that any rights not specifically given up in the Treaty were, in fact, reserved by the Tribes. Further, the Shoshone language uses the same verbs for hunt, fish and gather so it is assumed that the Indians expected to retain rights for all practices (Smoak 2004, From a presentation at the Shoshone-Bannock Tribes, 1868 Fort Bridger Treaty Rights Seminar: April 12-13, 2004).

The Caribou-Targhee is also part of the ancestral homeland of the Northwest Band of the Shoshoni. In their 1863 Treaty they assented to the Fort Bridger Treaty. Chief Pokatello

claimed the area from Raft River to the Portneuf for himself and his people (Treaty with the Shoshoni-Northwestern Bands, July 30, 1863). Thus, tribal members of the Northwest Band also have rights to hunt, fish, and gather on all unoccupied lands of the United States.

Prior to white settlement of the west, the Shoshone and Bannock peoples were comprised of many smaller nomadic bands inhabiting a vast area of the west. Their aboriginal territory includes six states and ranged north into Canada and south to Mexico. The bands were generally extended family groups who moved across the western landscape hunting, fishing and gathering with the changing seasons. The Fort Hall area was a traditional wintering area for many of the bands. In addition to digging camas bulbs, many bands met on the Camas Prairie for trade events each spring. The Caribou-Targhee National Forest and Curlew National Grassland were an integral part of the Shoshone Bannock Tribes ancestral lands.

Few "traditional use sites" have been documented through consultation with the Tribes. This is due mostly to privacy issues. For this analysis, we assume that the National Forest System lands were, and are, used for traditional practices such as hunting, fishing, and gathering. We also assume that tribal members utilize the Caribou-Targhee and Curlew Grassland for traditional activities such as ceremonies and religious practices. To protect the privacy of the Tribes, these activities will be discussed and analyzed in general terms. The following information is from "Shoshone-Bannock Tribes" published by the Shoshone-Bannock Tribal Cultural Committee and Tribal Elders.

> *"Spirituality and religious ceremonies have always played a significant role in Indian cultures. Natural resources played an integral part of these ceremonies. Items such as sweet sage and tobacco made from a variety of plants were and are used in ceremonies. The Indians gathered many plants for medicinal purposes, including chokecherry, sagebrush, and peppermint. A myriad of other plants were gathered for food and to provide shelter. Rocks and clays were also used for ceremonies, ornamentation and shelter. Some bands inhabiting the upper Snake region were known as the "sheepeaters" since bighorn sheep were a staple of their diet. Buffalo, elk, deer and moose were also hunted and used by the aboriginal people. The Shoshone and Bannock bands also relied on upland game birds and small mammals. Salmon fishing was an integral part of aboriginal culture. Geyers, thermal pools and other water features were also utilized heavily by the Shoshone-Bannock Tribes."*

These activities are still practiced today across the Forest and Grassland although the extent of those activities is unknown. Many tribal members hunt, fish and gather for subsistence and to maintain their traditional way of life. Forest Service managers have a responsibility to insure that the resources continue to support these traditional tribal uses.

IV. ENVIRONMENTAL CONSEQUENCES

Environmental effects that would occur relative to the implementation of any alternative presented in Chapter II are disclosed in this chapter. Unless specifically stated otherwise, additional information is contained in the planning record. Environmental consequences are described in terms of direct, indirect, or cumulative effects. Direct effects are those that are caused by the action and occur at the same time and place. Indirect effects are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable. Cumulative effects are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

For each resource, an indicator was selected by the appropriate specialist to measure the direct, indirect, and cumulative impact for each alternative. Only this indicator will be discussed in the section below.

4.1 Cumulative Effects Activities

Cumulative effects are discussed and evaluated for each resource section where appropriate. The following is a list of all past, present, and future activities that may have potential for cumulative effects for the Aspen Range Timber Sale environmental consequences analysis.

4.1.1 Past & Present Activities

Mining

- A large patented mining claim (private land) 805 acres within the project area is not expected to become active in the next 10 years. Exploration roads on the tract have been accounted for as “non forest system roads “and have been added to the project area disturbed cumulative effects analysis in the project area. In addition to the patented ground the project area has 640 acres of known phosphate leasing areas (KPLA’s) on National Forest.

Range Improvements

- Within the project area, there are 2 troughs and 9 water ponds.

Recreation

- Big game hunting is popular during the fall months. Hunting begins in late August with the archery season and ends in mid November.
- Dispersed camping sites are found inside the project area.
- Snow machining is popular within the project area. Mill Fork of Trail Canyon road 20124 is a groomed Snowmobile route with a warming hut adjacent to the parking lot.
- The roads and trails are also used by off road vehicles, mostly during the big game hunting season.
- The archery range is under a special use permit to the Caribou Field Archers, a group based out of Soda Springs
- The area has several marked routes closed to snowmobiles that extend to the top of Wood Canyon and loop back to the warming hut for crosscountry skiers and snowshoers.
- Sight seeing, berry picking and mountain biking occur in incidental amounts.

Noxious Weeds

- Noxious weed invasion, carried by wind, humans, machinery, and animals has occurred. The Highlands Cooperative Weed Management Group is established within the project area, and weeds will continue to be treated.

Roads

- Roads within the project area receive nearly year round use, uses include: recreation, snowmobiling, hunting, and administrative uses.

Wildfire Suppression

- Wildfire suppression has been an ongoing activity. From 1980 – present, there have been a total of 3 known fires burning approximately 1acre in the project area. Of the fires one was human caused, and two fires where lightning caused.

Timber Sales and Firewood Gathering

- Commercial wood cutting has been on going since the time of settlement. The first record of a commercial timber sale was the Wood Canyon Timber Sale (133 acres) in 1964, followed by Wood Canyon II (179 acres) in 1976, Wood Canyon Thinning (278 acres) in 1984, Wood Canyon III (24 acres) in 1987 and Trail Canyon (27 acres) in 1997.
- Firewood gathering has occurred from settlement times until the present.

Caribou Revised Forest Plan

- The Record of Decision was signed on 19 February 2003.

4.1.2 Future Activities

Vegetation Management and Firewood Gathering

- Silvicultural treatments may occur in the project area to further regenerate aspen, primarily south of Johnson creek as needed. Currently nothing is planned.
- Firewood gathering will continue to occur.

Wildfire Suppression

- The project area was analyzed for Wildland Fire Use and concluded that all future wildfires will be suppressed within the project area.

Rangeland Management

- Livestock grazing (sheep allotments) will continue to graze within the project area

Travel Plan

- Completion of the Caribou National Forest Travel Plan 11/7/2005

Recreation

- All stated recreation activities stated in Chapter III would continue.

Mining

- Mining within the project and or landscape analysis area may occur in the future at some time. Currently no plans for mining operations have been submitted.

There are no other known future foreseeable actions in the project area.

4.2 Forested Vegetation

Cumulative Effects Analysis Area: Is the Landscape Analysis Area defined as the Wood Canyon, Sulphur Canyon, Trail Canyon and Johnson Creek Hydrologic Unit Code (HUC's) at the fifth order stream level within the National Forest boundaries. Individual watersheds are analyzed in the cumulative effects by alternative to illustrate structural change.

Within the range of alternatives the Proposed Action would provide the maximum change in structure following implementation taking into account all proposed "post harvest" activities.

Stand structure and cover types were collected during the Soda/Montpelier Front Ecological Analysis and further refined for the project area with Common Stand Exam. The project area information is located in Direct and Indirect Effects by alternative.

The landscape analysis area outside the project area was analyzed using the GIS Revised Forest Plan vegetation layer taking into account past harvest structure changes. All project forested vegetation information can be found in the project file.

Alternative 1 (No Action

Direct and Indirect Effects

Under the No-action alternative, none of the proposed activities described in any of the action alternatives would occur. Current uses, activities, and processes (fire suppression, silvicultural activities, grazing, recreation, forest succession, etc.) would continue. Douglas-fir and subalpine fir would continue to encroach on remaining intolerant aspen stands. Aspen stands provide favorable seed beds and broken sun light conditions for the establishment of competing conifer trees. After the establishment of conifer within the aspen conifer thrive eventually overtopping the aspen, voiding aspen of sunlight. In the absence of disturbance stand densities increase, tree to tree competition become a major factor as older less vigorous large diameter trees begin to compete with the understory of younger vigorous trees for water and nutrients. The increase in stand density increases the risk for insect, disease, and wildfire. Additionally, there would be a loss of future silvicultural restoration options within the project area, due to the loss of seral species vigor and numbers.

Cumulative Effects

The current imbalance in structural diversity would continue as the majority of the stands within the analysis area are in the mature class. The current seedling/saplings structure class that represents 5% of the landscape forested vegetation will move into the young/mid structure in the next 5-10 years. The No Action alternative would not add diversity to the landscape.

Alternative 1 Current Landscape structure class				
Watershed 5th Code HUC's	**SS** DFC 10-40%	**YM** DFC 20-50%	**M** DFC 20-50%	**Total Acres**
Wood Canyon	**1%**	**16%**	**83%**	**1,182**
Sulphur Canyon	**4%**	**1%**	**94%**	**7,193**
Trail Canyon	**6%**	**16%**	**78%**	**1,310**
Johnson Creek	**5%**	**4%**	**91%**	**23,999**
Total	**5%**	**4%**	**91%**	**33,684**

SS-seedling/sapling**. YM**-young/mid**. M**-mature.

Alternative 2 (Proposed Action)

Direct and Indirect Effects

Within the proposed action alternative, all of the activities described for the alternative in Chapter II would occur in addition to current uses, activities and processes.

Purpose and Need Indicators			**Alternative 2 Proposed Action**	
Forest Condition Indicators				
Approximate Aspen Acres Treated Within The **Project Area** Forested Vegetation.			**1039** acres or **14 %**	
Project Area Stand Structure Percentages, **Current** and **Project End** Projection.	**Structure**	**Forest Plan**	**Current**	**Projected**
	SS	DFC-10-40%	**3%**	**17%**
	YM	DFC-20-50%	**16%**	**14%**
	MO	DFC-20-50%	**81%**	**69%**
Volume Estimates (Million Board Feet)			**4.5-5.5**	

Landscape stand structure, aspen cover types and species composition diversity would be increased. The current imbalance in structural diversity would be shifted toward desired future conditions (DFC). Removing competing conifer in conjunction with prescribed

fire would increase aspen suckering and set back the rate of vegetative succession (Shepperd 2001). The new growth of aspen would initially fit in the seedling structure stage, but within a relatively short time (approximately ten years) they would move into the sapling growth stage. The untreated stands within the analysis area would continue to move through the mature stage with a few stands beginning to approach the old structure stage. Approximately all of the existing plantations would grow enough to move into the young/mid stage. The combination of natural succession and proposed activities would create a landscape that is more structurally diverse and closer to DFC.

The proposed action would treat 1,541 acres within the project area, of that 1,330 acres would be forested and 211 acres would be non-forested (mountain brush and sagebrush). Within the forested portion, approximately 1,041 acres would be treated for aspen regeneration moving from the young/mid and mature/old structural group to the seedling/sapling group. Approximately 289 acres would be harvested to reduce stand density by primarily removing suppressed and intermediate trees. The majority of the treatments in the 211 acres of non-forested are discontinuous patches of mountain brush and sagebrush that have been included in the treatment area so that safe defendable fire breaks can be located on existing roads.

Treatment under the proposed action would shift the seedling/sapling stand structures in to DFC. Stand structures in the young/mid category would move slightly lower in percentage away from DFC because it is difficult to create or retain mid succession with disturbance, particularly fire. The proposed treatment would lower the percentage of mature/old stand structures, but would not meet Forest Plan DFC.

Future silvicultural restoration options within the project area would be more diverse under this alternative than it would with no action.

The proposed treatment would yield about 4.5-5.5 million board feet that would contribute to the Caribou-Targhee National Forest ASQ (allowable sale quantity).

Cumulative Effects

With the exception of fire suppression, none of the past, present or future activities listed in 4.1.1 and 4.1.2 will affect forested vegetation structure, age class or species composition. Future activities such as firewood gathering, all season recreation, livestock grazing and fire suppression will continue.

Alternative 2 Landscape structure class at project end				
Watershed 5th Code HUC's	**SS** DFC 10-40%	**YM** DFC 20-50%	**M** DFC 20-50%	**Total Acres**
Wood Canyon	**27%**	**9%**	**64%**	**1,182**
Sulphur Canyon	**5%**	**1%**	**94%**	**7,193**
Trail Canyon	**38%**	**14%**	**49%**	**1,310**
Johnson Creek	**6%**	**4%**	**90%**	**23,999**
Total	**8%**	**4%**	**89%**	**33,684**

The effects of past activities on forest structure are reflected in the project area and landscape tables under alternative 2. Following project completion the Trail Canyon watershed forest structure percentages would fall within DFC, Wood Canyon moves

closer to DFC. The forest structure in Johnson Creek and Sulphur Canyon watersheds change very little. The lack of forest structure diversity, in conjunction with cumulative effects from fire suppression may create a need for future silvicultural restoration to further reduce the mature/old structure and provide new seedling/sapling structure.

Alternative 3

Direct and Indirect Effects

The effects to vegetation in alternative 3 are similar to Proposed Action but include fewer acres and no conifer regeneration silvicultural harvest systems.

Purpose and Need Indicators			**Alternative 3**	
Forest Condition Indicators				
Approximate Aspen Acres Treated Within The Project Area Forested Vegetation.			**625** acres or **8 %**	
Project Area Stand Structure Percentages, **Current** and **Project End** Projection.	**Structure**	**Forest Plan**	**Current**	**Projected**
	SS	DFC-10-40%	**3%**	**11%**
	YM	DFC-20-50%	**16%**	**15%**
	MO	DFC-20-50%	**81%**	**73%**
Volume Estimates (Million Board Feet)			**1.5-2.0**	

Alternative 3 would treat 934 acres within the project area, of that 722 acres would be forested and 210 acres would be non-forested (mountain brush and sagebrush). Within the forested portion, approximately 625 acres would be treated for aspen regeneration moving from the mature/old structural group to the seedling/sapling group. Approximately 97 acres would be harvested to reduce stand density by primarily removing suppressed and intermediate trees. Pre-commercial thinning of prior harvest units in the project area would account for 100 acres of non-commercial density related management. The majority of the treatments in the 210 acres of non-forested are discontinuous patches of mountain brush and sagebrush that have been included in the treatment area so that safe defendable fire breaks can be located on existing roads.

Treatments in this alternative would shift stand structures more in range with DFC but none of the three structure categories would meet Forest Plan DFC.

Future silvicultural restoration options within the project area would be more diverse under this alternative than it would with no action.

The proposed treatment would yield about 1.5-2.0 million board feet that would contribute to the Caribou-Targhee National Forest ASQ (allowable sale quantity).

Cumulative Effects

With the exception of fire suppression, none of the past, present or future activities listed in 4.1.1 and 4.1.2 will affect forested vegetation structure, age class or species composition. Future activities such as firewood gathering, all season recreation, livestock grazing and fire suppression will continue.

Alternative 3 Landscape structure class at project end				
Watershed 5th Code HUC's	**SS** DFC 10-40%	**YM** DFC 20-50%	**M** DFC 20-50%	**Total Acres**
Wood Canyon	**26%**	**14%**	**65%**	**1,182**
Sulphur Canyon	**4%**	**2%**	**94%**	**7,193**
Trail Canyon	**20%**	**14%**	**66%**	**1,310**
Johnson Creek	**5%**	**4%**	**91%**	**23,999**
Total	**6%**	**4%**	**90%**	**33,684**

The effects of past activities on forest structure are reflected in the project area and landscape tables under alternative 3. Following project completion the Trail Canyon and Wood Canyon watershed forest structure percentages would move closer to DFC. The forest structure in Johnson Creek and Sulphur Canyon watersheds change very little. The lack of forest structure diversity, in conjunction with cumulative effects from fire suppression may create a need for future silvicultural restoration to further reduce the mature/old structure and provide new seedling/sapling structure.

Alternative 4

Direct and Indirect Effects

The effects to vegetation in alternative 4 are similar to Proposed Action but include fewer acres and no conifer regeneration silvicultural harvest systems.

Purpose and Need Indicators			**Alternative 4**	
Forest Condition Indicators				
Approximate Aspen Acres Treated Within The Project Area Forested Vegetation.			**832** acres or **11 %**	
Project Area Stand Structure Percentages, **Current** and **Project End** Projection.	**Structure**	**Forest Plan**	**Current**	**Projected**
	SS	DFC-10-40%	**3%**	**14%**
	YM	DFC-20-50%	**16%**	**14%**
	MO	DFC-20-50%	**81%**	**72%**
Volume Estimates (Million Board Feet)			**3.0-3.5**	

Alternative 4 would treat 1,281 acres within the project area, of that 954 acres would be forested and 327 acres would be non-forested (mountain brush and sagebrush). Within the forested portion, approximately 834 acres would be treated for aspen regeneration moving from the mature/old structural group to the seedling/sapling group. Approximately 120 acres would be harvested to reduce stand density by primarily removing suppressed and intermediate trees. Pre-commercial thinning of prior harvest units in the project area would account for 100 acres of non-commercial density related management. The majority of the treatments in the 327 acres of non-forested are discontinuous patches of mountain brush and sagebrush that have been included in the treatment area so that safe defendable fire breaks can be located on existing roads.

Treatments under this alternative would shift the seedling/sapling stand structures into DFC. Stand structures in the young/mid and mature/old would shift more in range with DFC, but would not meet Forest Plan DFC.

Future silvicultural restoration options within the project area would be more diverse under this alternative than it would with no action.

The proposed treatment would yield about 3.0-3.5 million board feet that would contribute to the Caribou-Targhee National Forest ASQ (allowable sale quantity).

Cumulative Effects

With the exception of fire suppression, none of the past, present or future activities listed in 4.1.1 and 4.1.2 will affect forested vegetation structure, age class or species composition. Future activities such as firewood gathering, all season recreation, livestock grazing and fire suppression will continue.

Alternative 4 Landscape structure class at project end				
Watershed 5th Code HUC's	**SS** DFC 10-40%	**YM** DFC 20-50%	**M** DFC 20-50%	**Total Acres**
Wood Canyon	**26%**	**14%**	**65%**	**1,182**
Sulphur Canyon	**4%**	**1%**	**94%**	**7,193**
Trail Canyon	**23%**	**14%**	**63%**	**1,310**
Johnson Creek	**6%**	**4%**	**90%**	**23,999**
Total	**7%**	**4%**	**89%**	**33,684**

The effects of past activities on forest structure are reflected in the project area and landscape tables under alternative 4. Following project completion the Trail Canyon and Wood Canyon watershed forest structure percentages would move close to DFC. The forest structure in Johnson Creek and Sulphur Canyon watersheds change very little. The lack of forest structure diversity, in conjunction with cumulative effects from fire suppression may create a need for future silvicultural restoration to further reduce the mature/old structure and provide new seedling/sapling structure.

Alternative 5

Direct and Indirect Effects

The effects to vegetation in alternative 5 are similar to Proposed Action but include fewer acres and no conifer regeneration silvicultural harvest systems.

Purpose and Need Indicators			**Alternative 5**	
Forest Condition Indicators				
Approximate Aspen Acres Treated Within The Project Area Forested Vegetation.			**860** acres or **11 %**	
Project Area Stand Structure Percentages, **Current** and **Project End** Projection.	**Structure**	**Forest Plan**	**Current**	**Projected**
	SS	DFC-10-40%	**3%**	**14%**
	YM	DFC-20-50%	**16%**	**14%**
	MO	DFC-20-50%	**81%**	**72%**
Volume Estimates (Million Board Feet)			**3.0-3.5**	

Alternative 5 would treat 1,287 acres within the project area, of that 960 acres would be forested and 327 acres would be non-forested (mountain brush and sagebrush). Within

the forested portion, approximately 862 acres would be treated for aspen regeneration moving from the mature/old structural group to the seedling/sapling group. Approximately 98 acres would be harvested to reduce stand density by primarily removing suppressed and intermediate trees. Pre-commercial thinning of prior harvest units in the project area would account for 100 acres of non-commercial density related management. The majority of the treatments in the 327 acres of non-forested are discontinuous patches of mountain brush and sagebrush that have been included in the treatment area so that safe defendable fire breaks can be located on existing roads.

Treatments under this alternative would shift the seedling/sapling stand structures into DFC. Stand structures in the young/mid and mature/old would shift more in range with DFC, but would not meet Forest Plan DFC.

Future silvicultural restoration options within the project area would be more diverse under this alternative than it would with no action.

The proposed treatment would yield about 3.0-3.5 million board feet that would contribute to the Caribou-Targhee National Forest ASQ (allowable sale quantity).

Cumulative Effects

With the exception of fire suppression, none of the past, present or future activities listed in 4.1.1 and 4.1.2 will affect forested vegetation structure, age class or species composition. Future activities such as firewood gathering, all season recreation, livestock grazing and fire suppression will continue.

Alternative 5 Landscape structure class at project end				
Watershed 5th Code HUC's	**SS** DFC 10-40%	**YM** DFC 20-50%	**M** DFC 20-50%	**Total Acres**
Wood Canyon	**26%**	**14%**	**65%**	**1,182**
Sulphur Canyon	**4%**	**2%**	**94%**	**7,193**
Trail Canyon	**23%**	**14%**	**63%**	**1,310**
Johnson Creek	**6%**	**4%**	**90%**	**23,999**
Total	**7%**	**4%**	**89%**	**33,684**

The effects of past activities on forest structure are reflected in the project area and landscape tables under alternative 5. Following project completion the Trail Canyon and Wood Canyon watershed forest structure percentages would move close to DFC. The forest structure in Johnson Creek and Sulphur Canyon watersheds change very little. The lack of forest structure diversity, in conjunction with cumulative effects from fire suppression may create a need for future silvicultural restoration to further reduce the mature/old structure and provide new seedling/sapling structure.

4.2.1 Noxious Weeds

Cumulative Effects Analysis Area: The analysis area for cumulative effects is the project area.

Alternative 1

Direct, Indirect, and Cumulative Effects

Treatment and eradication of noxious weeds would continue as mandated by The Caribou National Forest Noxious Weed strategy (EA, 1996).

Ground disturbing activities would not occur under the No Action Alternative, decreasing opportunity for noxious weed establishment. Potential introduction of noxious weeds in new locations always exists by the many vectors available for seed dispersal.

Alternatives 2, 3, 4 and 5

Direct and Indirect Effects

Alternative 2 has the greatest potential for an increase of noxious weeds due to the number of acres treated and the amount of roadwork, followed by Alternative 4 and then Alternative 3. Observations of harvest units indicate that invasion of noxious weeds occurs approximately two growing seasons after sale activities are complete. The noxious weed most likely to increase is Canada thistle. The potential exists for invasion by other noxious weeds within the project area.

Treatment of noxious weeds is included in the project design for all action alternatives and should not present an adverse effect to the rangeland resource.

Cumulative Effects

For Alternatives 2, 3, 4 and 5

Past and present soil and vegetative disturbances within the project area have contributed to the establishment and expansion of existing noxious weed. Livestock grazing and recreational activities would continue in the project area. There are no future foreseeable actions that would increase noxious weed populations in the project area.

4.3 Fire Behavior

Cumulative Effects Analysis Area: The cumulative effects analysis area is the project area.

Alternative 1 – No Action

Direct and Indirect Effects

In the No Action alternative, none of the stands within the project area will be treated. A future wildland fire occurring in the project area is predicted to have a higher intensity.

The predicted fire intensity for 2015 is more intense than the existing condition, especially in prescription area 5. The reason for this increase in prescription area 5 is the way FFE models canopy fuels (canopy bulk density and canopy base height). Trees less than six feet tall are not included in the canopy fuels calculation because they are

assumed to be apart of the surface fuel complex. Trees over 6 feet tall may contribute to canopy fuels between the ground and 6 foot, so it is possible to have canopy base heights of less than 6 feet (FFE User Guide). In the existing condition, the layer of subalpine fir that occurs under a majority of the stand was less than 6 feet and did not influence canopy base heights or canopy bulk density. Within the next 10 years, the FVS-FFE predicts that a majority of this carpet would be tall enough to contribute to the canopy fuels. This contribution increases canopy bulk density and lowers the canopy base height, which in turn lowers the torching and crowning indexes to a point where passive crown fires occur within two of the prescription areas. Refer to **Table** 4.3-1 and **Table 4.3-2**.

In prescription areas 1, 2, 4 the predicted existing and future torching indexes are considerably high. The stands that were selected to represent these prescription areas are mature Douglas-fir with surface fuels and canopy base heights high enough that a surface fire is not expected to ignite the crown layer. However the crowning indexes within these stands is low enough that if a crown fire from adjacent stands entered this stand, a crown fire could be sustained with the appropriate wind.

For all prescription areas an increase in fire behavior is predicted in the future. Fire intensity (flame lengths) ranged from 2 to 23 feet. Passive fire types are too intense for direct attack by persons using handtools because spotting and major runs are common. Control efforts at the head of the fire are probably ineffective, and handling cannot be relied upon to hold the fire. Equipment such as dozers and engines become ineffective when flame lengths exceed approximately 11 feet (Fireline Handbook, 1998).

Table 4.3-1: Fire Behavior Predictions

Prescription Areas	Flame length (Ft)		Torching Index (Mi/Hr)		Crowning Index (Mi/Hr)		Canopy Base Height (Ft)		Potential Mortality (% BA)		Canopy Bulk Density (kg/m^3)	
	2005	2015	2005	2015	2005	2015	2005	2015	2005	2015	2005	2015
1	2	3	318	275	27	26	33	39	19%	30%	.071	.075
2	2	3	149	137	18	18	16	20	28%	35%	.117	.124
3	12	23	10	15	25	21	2	3	98%	99%	.076	.095
4	2	3	93	75	10	14	12	15	22%	26%	.268	.170
5	2	18	193	12	23	23	22	3	27%	98%	.087	.086

Table 4.3-2: Predicted Fire Types

Prescription Areas	Fire Type	
	2005	2015
1	Surface	Surface
2	Surface	Surface
3	Passive	Passive
4	Surface	Surface
5	Surface	Passive

Cumulative Effects
Fire intensity within the project area would continue to increase over time. The expected intensity would increase the resistance to control of a future wildland fire, and may be beyond the capabilities of firefighting forces. The threat to the private property would increase, and the safety of firefighters and the public within the project area would decrease. All future wildfires will be suppressed because of the proximity to private land and the timber management prescription (5.2).

Alternative 2 – Proposed Action
Direct and Indirect Effects
In Alternative 2, approximately 1,541 acres or 13% of the project area will be treated with a combination of mechanical and prescribed fire treatments. The overall effect of the treatments will be to reduce expected fire intensity from a future wildland fire burning in 90th percentile weather conditions. Fire behavior predictions for the prescription areas following treatment indicate a reduction in fire behavior. In the short term, there will be an increase in fuel loads within all prescription areas until the burning/piling activities are completed (2 to 3 years). The fire type for all prescription areas following treatment is a surface fire.

Within the project area, the amount of fine fuels (grass &forbs) would increase due to the reduction in ladder fuels and stand densities (more sunlight to the forest floor). Windspeeds at eye-level would also increase due to the reduction in tree canopies that downgrade wind speeds. This may enhance the rate a fire may spread, but the resistant to suppression efforts would be less than the existing and future conditions since fire is not likely to transition into the crowns.

Table 4.3-3: Fire Behavior Predictions

Prescription Areas	Category	Flame length (Ft)	Torching Index (Mi/Hr)	Crowning Index (Mi/Hr)	Canopy Base Height (Ft)	Potential Mortality (% BA)	Canopy Bulk Density (kg/m^3)
		2015	2015	2015	2015	2015	2015
1	Fuelbreak	1	417	46	42	17%	.033
2	Harvest	2	156	33	20	21%	.054
3	Harvest & Burn	2	189	59	24	17%	.023
4	Prescribed Burn[1]	1	147	15	15	11%	.155
5	Harvest & Burn[2]	2	241	66	33	16%	.020

[1] This stand is only proposed for treatment in Alternative 2.
[2] This stand is proposed to be prescribed burn in Alternative 3 & 4, in Alternative 2 this stand's prescription is harvest & burn. The fire behavior predictions in the table above are for a harvest & burn treatment. The fire behavior figures will only show the predicted fire behavior results for this stand for a prescribed burn treatment.

Table 4.3-4: Predicted Fire Types after Action

Prescription Areas	Category	2015
1	Fuelbreak	Surface
2	Harvest	Surface
3	Harvest & Burn	Surface
4	Prescribed Burn	Surface
5	Harvest & Burn	Surface

Prescription Area 1 - Fuelbreak

The objective of these prescription areas is to reduce expected fire intensity by reducing ladder fuels, rearranging ground fuels, and decreasing canopy bulk density.

Reducing ladder fuels, rearranging surface fuels by piling or spreading, and reducing stand density, would all reduce expected fire intensity. The flame lengths, torching and crowning indexes, canopy base heights, and canopy bulk density are all predicted to be lower than the existing and future conditions.

The reduction of ladder fuels and stand density would raise canopy base heights and decrease canopy bulk density. This would increase the windspeed needed for a fire to move from the surface to the crowns (torching and crowning indexes). The rearranging of surface fuels by piling or spreading would decrease surface fuel loads, thereby further reducing the potential for fire to move vertically into the overstory.

The fire type in this prescription area is predicted to be surface fire. Fire personnel using handtools can generally attack a fire with this intensity at the fire head or flanks (Fireline Handbook, 1998).

The effectiveness of this shaded fuelbreak is predicted to last for ten years (2013). After that period, management action would be needed to maintain the effectiveness of the shaded fuelbreak.

Prescription Area 2, 3, 4, & 5

The objective of these prescription areas is to increase the percentage of early seral species within the project area and not to reduce expected fire intensity. However, since these prescription areas make up approximately 94% of the total acres treated, fire behavior will be affected. All the proposed activities will contribute to reduce potential fire behavior of a potential wildland fire burning in 90^{th} percentile weather conditions.

The proposed treatments will reduce stand density and eliminate ladder fuels, raising canopy base heights and decreasing canopy bulk density. This would raise the windspeed needed for a fire to move from the surface to the crowns (torching and crowning indexes). The rearranging of surface fuels by broadcast burning would decrease surface fuel loads, thereby further reducing the potential for fire to move vertically into the overstory.

The fire type in these prescription areas is predicted to be surface fires. Fire personnel using handtools can generally attack a fire with this intensity at the fire head or flanks (Fireline Handbook, 1998).

Fire intensity within the project area would decrease within the next tens years. The expected intensity would decrease the resistance to control of a future wildland fire, and be within the capabilities of firefighting forces. Safety of firefighters and the public within the project area would increase.

It is important to note that private land is outside the jurisdiction for land management by the Forest Service. The project area proposed for fuels reduction treatment is located exclusively on national forest land and adjacent to private land. The proposed fuels reduction treatments would not affect the ability of an individual residential structure within the private inholding to survive a wildland fire, but would reduce the overall threat of a fast-moving wildland fire from burning into the inholding. Treatment of fuels on private land in close proximity to residential structures remains the sole responsibility of the private landowner. The proposed fuels reduction treatments would promote fuel conditions that result in lower fire intensity and less resistance to suppression control efforts.

Cumulative Effects
None of the past, present, or foreseeable activities listed at the beginning of this chapter are expected to effect fire behavior in the project area except for fire suppression. All wildfires within the project area would be fully suppressed due to the proximately to private land and the RFP prescription area (5.2) goals and objective. In the future live and dead fuels would continue to build up outside of the project area which would slowly decrease the benefits of this action.

Alternative 3
Direct and Indirect Effects
This alternative's effects to fire behavior are very similar to the Proposed Action but on fewer acres.

Alternative 3 would treat approximately 9% of the project area. The stand adjacent to the private property would still receive treatment. The harvest, harvest and burn, and prescribed burn treatments would occur over fewer acres than the proposed action. Fire behavior modeling for the treated areas indicates that there would be a reduction in fire intensity in the event of a future wildfire. Refer to the figure listed below.

Table 4.3-5: Fire Behavior Predictions after Action

Prescription Area	Category	Flame length (Ft)	Torching Index (Mi/Hr)	Crowning Index (Mi/Hr)	Canopy Base Height (Ft)	Potential Mortality (% BA)	Canopy Bulk Density (kg/m^3)
		2015	2015	2015	2015	2015	2015
5	Prescribed Burn[2]	2	185	24	24	15%	.082

[2] This stand is proposed to be prescribed burn in Alternative 3 & 4, in Alternative 2 this stand's prescription is harvest & burn. The resulting fire type is a surface fire.

Cumulative Effects
See cumulative effects under alternative 2.

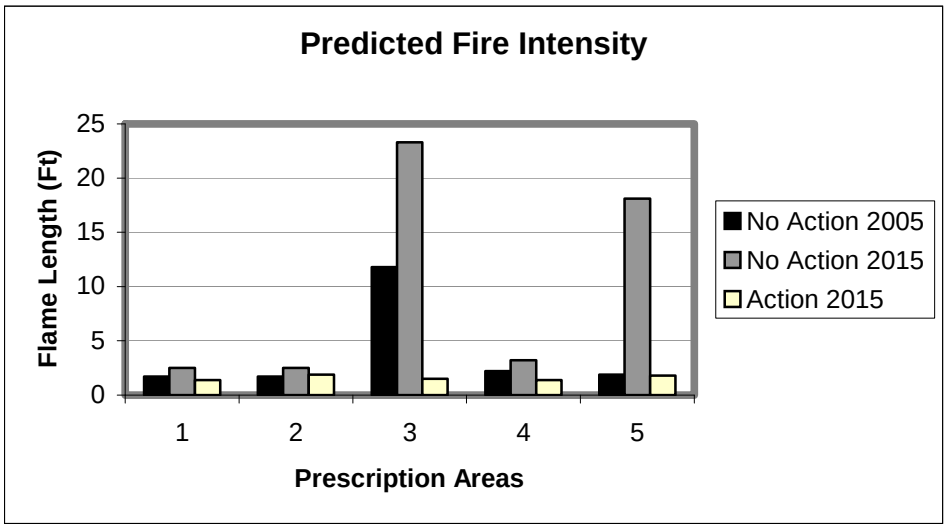
Alternative 4
Direct and Indirect Effects
Alternative 4 would treat approximately 12% of the project area. The stand adjacent to the private property would still receive treatment. The harvest, harvest and burn, and prescribed burn treatments would occur over fewer acres than the proposed action. Fire behavior modeling for the treated areas indicates a reduction in fire intensity in the event of a future wildfire. The expected intensity would decrease the resistance to control of a future wildland fire and maybe within the capabilities of firefighting forces. Safety of firefighters and the public within the project area would increase. Refer to figure below

Cumulative Effects
See cumulative effects under alternative 2.

Alternative 5
Direct and Indirect Effects
See direct and indirect effects under alternative 4

Cumulative Effects
See cumulative effects under alternative 2.

Figure 4.3-1: Predicted Fire Intensity from a 90th Percentile Wildland Fire.



4.4 Hydrology

Cumulative Effects Analysis Area: is the Landscape Analysis Area defined as the Wood Canyon, Sulphur Canyon, Trail Canyon and Johnson Creek Hydrologic Unit Code (HUC's) at the fifth order stream level within the National Forest boundaries. Each watershed in the analysis area is individual analyzed for cumulative effects by alternative.

Johnson Creek Cumulative Effects Area: This comprises the majority of the eastern portion of the project area and consists of the entire Johnson Creek watershed down to where the channel disappears. This occurs where Johnson Creek passes through privately owned, more intensively used agricultural areas below the Forest in farm fields northeast of the project area before reaching Slug Creek. This drainage is part of the Blackfoot HUC-4 subbasin. Historically Johnson Creek may have been connected to Slug Creek, but diversions currently prevent a continuous connection.

Trail Creek Cumulative Effects Area: This is in the northernmost portion of the project area and contains the entire Trail Creek watershed, most of which is below the Forest. The outlet point of this watershed is where Trail Creek passes through privately owned, more intensively used agricultural areas below the Forest and discharges into the Blackfoot River, about 4 miles north of the project area. This drainage is part of the Blackfoot HUC-4 subbasin.

Sulphur Creek Cumulative Effects Area: This cumulative effects area includes all of the Sulphur Creek drainage, which is in the western portion of the project area. The downstream end is where Sulphur Creek passes through privately owned, more intensively used agricultural areas below the Forest and the channel disappears into farm fields before reaching the Bear River about 4 miles southwest of the project area. It is part of the Bear Lake HUC-4 subbasin.

Wood Canyon Cumulative Effects Area: This includes part of the northwestern portion of the project area and comprises the Wood Canyon watershed. The outlet point of this watershed is where Wood Canyon passes through privately owned, more intensively used agricultural areas and the channel disappears into farm fields before reaching the Bear River about 2 miles west of the project area. This drainage is part of the Bear Lake HUC-4 subbasin.

Effects of Alternative 1

There would be no increase in hydrologic disturbance, because no timber harvest or road construction would occur. As shown in chapter 3, there is currently 6.5% or less hydrologic disturbance in the HUC-6 watersheds, less than one quarter of the 30% guideline of the Forest Plan. Direct and cumulative effects areas currently meet this guideline and no actions would take place to affect that. Most of the current hydrologic disturbance is due to previous harvesting activities, so that the percent hydrologically disturbed area is expected to decrease as vegetation continues to mature.

There would be no change in the amount of road miles in AIZs and uplands, no reconstruction and no guarantee of maintenance, though there would be no increase of road traffic either. Johnson Creek would continue to be affected by sediment and disturbance from adjoining road 20126. Trail Creek would continue to be affected by elevated sediment from the archery road (20297), because alternative 1 is the no an action alternative, it ranks lowest out of 5 with no benefit to hydrology.

Effects Common to Alternatives 2, 3, 4, and 5
Direct and Indirect Effects

Hydrologic Disturbance
Direct and cumulative hydrologic disturbance for the portion of the HUC-6 watersheds on the Forest for each alternative are shown in Table 4.4-1. Planned acres of harvest, and areas burned after harvest are used presuming a 100% of the area is affected for the calculation of disturbance. The disturbance calculations also includes acres of prescribed burning, using an 80% burn percentage for the burn only (no pre-harvest) acreage.

Table 4.4-1: Percent Total Hydrologic Disturbance of HUC-6* by Alternative

HUC-6 & Major Streams	Alt 2		Alt 3		Alt 4		Alt 5	
	Direct	Cuml.	Direct	Cuml.	Direct	Cuml.	Direct	Cuml.
160102010101 Wood Cyn	15%	20%	14%	19%	14%	19%	14%	19%
160102010202 Sulphur	1%	2%	0%	1%	0%	1%	0%	1%
170402071003 Trail Cr	35%	42%	16%	23%	19%	26%	19%	26%
170402071302 Johnson Cr	4%	10%	2%	9%	4%	10%	4%	11%

*These values do not include the part of the HUC below the Forest Boundary

Effects of Timber Harvest
Timber harvesting and associated roads, landings, and skid trails can have hydrologic consequences on the watershed. Roads can adversely impact forest soil productivity by directly reducing the productive area and by causing accelerated soil erosion. Timber harvesting activities can reduce surface cover and compact the soil, leading to increased runoff and erosion potentials (Elliot *et al* 1999). However, when mandatory agency and state BMPs are properly implemented, experience shows that timber harvesting, in general, does not substantially alter hydrologic conductivity or erosion/sediment within the Caribou/Targhee National Forest. Reviews of timber sale operations have been ongoing on the Caribou/Targhee National Forest since 1991. Review of the vast majority of the operations has found no visible signs of substantial downstream sediment or any visible signs of increased runoff that has induced channel adjustments.

Disturbances in AIZs
All disturbances within any protective boundary widths (AIZs) of streams or wetlands would be limited to obliteration of existing routes, realigning portions of routes so that they exit the AIZ, realigning stream crossings to reduce their effects, improvements in surfacing and drainage and maintenance, graveling of eroding areas or improvement of drainage design of existing roads. While this work could result in short-term (<2 year)

increases in sediment, it would be more than offset by reductions in sediment in the medium to long term (> 10 year) by improving their design. Burroughs (1989) indicates that 6" of gravel surfacing of native surfaced roads can reduce sediment by 70 percent over a five month period, even with heavy rainfall. Use of BMPs would minimize the amount and magnitude of the disturbance for all activities and potential for moving soils into stream channels during road maintenance and construction of improvements.

Effects of Roads

Miles of permanent road realignment, reconstruction, obliteration and temporary road construction are displayed in Table 4.4-2. Roads that would be closed to public use are included as existing roads in the after-project values even though they would in actuality be converted to motorized trails rather than kept as roads.

Poorly constructed roads can have negative long-term effects on watershed health. Effects can be greatly reduced if densities are kept low, construction and maintenance BMPs are followed, and roads are located away from water so that hydrologic effects are minimized. For roads in AIZs, effects to streams are gradational based on distance. This means that a road that is 10' away from water has the potential to be much more injurious to a stream than one that is 140' away. Therefore moving roads away from live water, but still in the AIZ can reduce the effects and achieve direct AIZ improvement. All of the construction for road realignment in this project is in or leading directly toward upland areas that are drier, more easily drained and less likely to affect streams. Road decommissioning can have adverse short to medium term effects. The effects are generally far outweighed by the long term benefits to aquatic areas gained by moving the roads. Road reconstruction in the same alignment within AIZs yields some reduction in sediment by improving drainage and removing ruts, though the improvements may not be as great as with relocation within and are even less than removing them entirely outside AIZs. Graveling short lengths of road reduces sediment and would occur at stream crossings and at selected locations where sediment delivery is a problem. Several opportunities to make changes to benefit watershed health are listed, but other maintenance on existing roads or work to bring them to design standard may be added or exchanged to maximize benefit. Temporary roads would be obliterated following vegetation treatments and therefore they produce only short to medium term negative effects to watershed health, and the effects are generally less than a permanent road in the same location due to the lesser disturbance their construction entails. Temporary roads would be obliterated before any long term effects would be expected to occur.

Table 4.4-2: Hydrology – Road Summary (all values miles).

Road category	Alt 2	Alt 3	Alt 4	Alt 5
Net Reduction (AIZ)	0.5	0.1	0.3	1.5
Net Reduction (uplands)	1.5	0.2	0.4	0.4
Realign (still in AIZ)	1.0	0.0	1.1	1.6
Realign (to uplands)	1.1	0.0	0.8	2.9
Reconstruct in place (AIZ)	4.3	4.0	3.4	2.1
Reconstruct in place (uplands)	6.9	1.3	2.9	3.8
Obliterate alignment (AIZ)	1.4	0.0	1.4	3.0
Obliterate alignment (uplands)	0.7	0.2	0.6	1.7
Temp (AIZ)	0.0	0.0	0.1	0.0
Temp (uplands)	5.1	0.0	2.2	2.3

Effects of Stream Crossings

Stream and wet area crossings have the potential to contribute substantial quantities of sediment to streams or affect watershed health. The only proposed removal or replacement of vehicular stream and wet area crossings are on Johnson Creek and two intermittent to ephemeral tributaries. One relocation on the mainstem is a part of moving the road completely out of the AIZ in the lower section for alternative 5, and the other on the mainstem is to minimize the length of the road close to the creek in the upper section (steep valley sides prohibit moving it completely out of the AIZ) for alternatives 2, 4, & 5. The new lower crossing would be located in an intermittent to ephemeral reach of the mainstem creek that may only be wet from time to time. The upper crossing change would be of the upper perennial reach. The realignment of a crossing of one tributary of Johnson Creek to the north of the main channel (in the SE ¼ of sec 33, T8S, 43E) may occur under alternatives 2 & 5. This one would be on 20574 where the existing road would be moved out of a drainage bottom where it is eroding and possibly also moving the crossing as well. The last proposed crossing would be of an intermittent channel (in the NE ¼ of sec 4, T9S, 43E) as part of the movement of the road completely out of the AIZ of the perennial mainstem. However, unanticipated crossings of wet areas are possible because the hydrologic field work for this project was mostly carried out during dry years (2002 & 2003). Proposed road construction could conceivably encounter wet areas that were not apparent at the time of initial field visits. During implementation, additional field visits would be made as needed to re-assess additional wet areas that may appear. All stream and wet area crossings would be constructed to minimize soil and water resource impacts while considering all design criteria and will follow all applicable BMPs and design criteria design criteria from the Forest Plan and the regional Soil and Water Conservation Practices Handbook (USDA-FS, 1988). In particular, native surfaced crossings, if appropriate, would have abundant drainage structures constructed so as to minimize the length of road that could drain sediment to the stream. All non-permanent crossings and replaced permanent crossings would be fully reclaimed in accordance with all established BMPs. Experience shows that proper implementation of BMPs effectively reduces sediment contribution at crossings to a minimal amount. Reclamation of old crossings would include re-compaction of affected streambanks to approximate appropriate adjacent streambanks as directed by the soil scientist and/or

hydrologist so as to reduce sediment while still providing for suitable growth conditions for effective revegetation.

Sediment

Sediment is usually considered to be the greatest pollutant to waters from silvicultural activities, much of it coming from road construction activities and native surfaced roads (Furniss, et al 1991). Graveled roads can also be a sediment source, but yields are far less per mile (Burroughs, 1989). Sediment delivered to streams from roads has been shown to increase with increases in traffic (Reid, 1984). Sediment from roads is often much greater than sediment from all other land management activities combined, including timber harvest skidding and yarding (Furniss, et al 1991). Research on BMPs has shown that they can greatly reduce or eliminate sediment yield from harvesting and skidding operations (Seyedbagheri, 1996).

The second most likely source of sediment to streams is mechanical disturbance of soils in harvest units, but only if protective widths along streams are not sufficient. Streambank disturbance can sometimes be another source if removal of vegetation and soil compaction is so extensive as to cause substantially increased streamflows. The activities proposed under alternatives 2, 3, 4 and 5 would disturb and displace some soils in harvest units, which would initially increase potential soil erosion within the harvesting units. Research and experience shows that erosion rates fall back to natural levels once ground cover is re-established, usually within 7 years following harvesting (Cline, 1981). This includes erosion from tree harvesting, skid trails, landings and road construction. Ketcheson and Megahan (1996) observed that about 70% of the total erosion occurred during the first year after disturbance. They also observed that non-channelized sediment moved a maximum of 275 meters (900 feet) through a filtering medium of undisturbed vegetation, with most sediment being trapped within 100 meters (330 feet). Soil displacement associated with harvesting activities would only occur in upland areas within units, on skid trails, and associated with temporary road construction in the project area. Disturbance in AIZs would also occur from improvements and/or obliteration of sections of the roads that are already within the AIZs. Use of BMPs would minimize the amount and magnitude of the soil disturbance for all activities.

Medium to long-term sediment would be reduced by relocation of segments of road in the AIZ of Trail Creek and Johnson Creek, and spot surfacing in various locations. Substantial potential benefit in sediment reduction is likely from the opportunity to relocate the section of the archery range road out of the AIZ. The upper section of Johnson Creek road that may be moved is currently nearly in the bottom of the creek channel. It is impossible to properly drain a road that forms a drainage bottom, because the road is the drainage. Roads so located are always more expensive to maintain, because saturation and erosion of the road surface is inevitable and impossible to reduce substantially as long as they remain there. The relocation of the Johnson Creek road out of the drainage bottom would also reduce maintenance costs for that road, and increase road usability and possibly safety as well by reducing the potential for slippery conditions on a road that has a grade of up to 8%. Channel stability would be greatly enhanced.

Worker access and hauling of logs from cutting units will result in minor increases in forest road traffic in the project and cumulative effects areas. This temporary, minor increase in traffic probably will not cause measurable increases in sediment. On the ground analysis of road conditions where they closely parallel creeks will be taken during implementation to identify the worst sediment problems and plan the most effective and cost efficient improvements. Drainage improvements would be chosen to better diffuse road runoff onto the buffer between live water and the road, which would help reduce channelized flow of road drainage across the buffer. Belt (1992), reports that channelized flow is the most frequent cause of failure of protective widths to protect streams. Spot graveling would also be done in some locations to reduce the sediment supply where drainage improvements alone would not be fully effective.

While this work and dust from haul trucks could result in short-term (<2 year) increases in sediment, it would be more than offset by reductions in sediment in the medium to long term (>10 year) resulting from the road improvements under any of the action alternatives.

Effects of Alternative 2

Hydrologic Disturbance

Cumulative hydrologic disturbance would increase from 7% to 42% in the Trail Creek HUC-6, 1% to 2% in Sulphur Canyon HUC-6, 5 to 20% in the Wood Canyon HUC-6 and 7% to 13% in the Johnson Creek HUC-6 after the project. The disturbed area would only increase 1% in Sulphur Creek, the 303d listed stream. For the Trail Creek HUC-6 only it would exceed the 30% guideline of the Forest Plan. In this specific case, the following hydrologic considerations may be considered mitigating circumstances:

- This number includes prescribed fire acres on the same basis as other activities. If prescribed burn acres were wholly excluded from the calculation, the cumulative hydrologic disturbance for Trail Creek would only be 32%.
- The high percentage of disturbance in the Trail Creek watershed is based on only using the 20 percent of the HUC-6 watershed within the Forest boundary, which skews the percentage of the watershed being disturbed upward. If considered in the context of the whole HUC-6 watershed, the proposed disturbance would affect only 7.3 percent of the watershed. Though no detailed data on disturbances for the portion of the HUC not on the Forest is available, only a few roads, fences, ranch buildings and a small mine are visible on the digital orthophoto quads for the watershed. The visual scarring from disturbances clearly occupies less than 30% or even 3% of those lands.
- The total acreage of disturbance proposed is well within the expected disturbance realm from what would occur from a major fire in this area. Therefore disturbances that may occur to the channel would be within the expected realm of behavior for the watershed, and do not represent an affect that is outside what nature periodically would produce.
- The 30% guideline was established in major part to protect the channel from damage that can be associated with excessive watershed alterations if channel conditions are

unstable. Trail Creek has stable channels with adequate riparian vegetation, an active beaver population and excellent floodplain connectivity.

- Much of the burn area, which represents more than 300 of the 500 acres to be disturbed in that watershed, is expected to regenerate aspen that historically occupies this area. Aspen, because it regenerates as suckers from existing rootstock, tends to recover from hydrologic disturbance much faster than do local conifer species, (which sprout from seed). In this area, aspen is usually observed to grow to at least 3 feet in 1-2 years, 6 feet in less than 5 years.
- The 30% guideline is only the *threshold of measurable change* in water yield, not the level at which channel affects are sure to occur. The level of hydrologic disturbance at which increases in water yield would trigger effects is expected to be higher than 30 percent.

Road work

A net overall reduction of about 0.5 miles of roads in AIZs and 1.5 miles in uplands would occur within the project area. Based on these reductions, it would give the second most reduction of road mileage in AIZs (high benefit) behind alternative 5, and the greatest reduction of roads in upland areas (moderate benefit). A total of 1.6 miles (including the 0.5 miles proposed to be moved out of AIZs) would be moved farther away from streams, thereby reducing their effects and improving AIZ conditions. A total of about 1.4 miles total of existing alignment would be obliterated in AIZs and 0.7 miles in upland areas. Individually, these changes are as follows: About 0.4 miles of the archery range road (20297) would be moved south, outside the AIZ of Trail Creek, with the new segment to replace it being about 200 feet to the south and about the same length. About 0.9 miles of the upper part of Johnson Creek road (20126) would be moved farther away from the creek, though due to steep sides of the canyon, cost considerations and slope disturbance/stability factors make location within the AIZ a practical necessity. The new alignment is about 100' or more away from the channel and many feet vertically above it. This movement of the road is essential to allow re-establishment of a visible channel, and perennial flow may also be re-established. About 0.4 miles of 20574 along the north bank of Johnson Creek would be realigned out of the current location, partly in drainage bottoms where gullying of the roadbed is progressing, particularly where it crosses an intermittent tributary to Johnson Creek. All of the road realignment would contribute to watershed health by having their drainage design improved so that drainage water from them is dispersed more widely, reducing channelized flow and thereby substantially decreasing sediment delivery to streams.

This alternative proposes minor reconstruction of about 1.5 miles within AIZs and about 4.7 miles in upland areas. Major reconstruction would occur on about 1.9 miles in AIZs and 0.5 miles in upland areas. Of those totals, about 0.9 miles in AIZs and 1.7 miles in upland areas would be closed to full-size vehicles, but be open to motorized trail use after the project is completed. Road reconstruction within AIZs yields some reduction in sediment by improving drainage and removing ruts, though the improvements may not be as great or long term as with relocation outside the AIZ. Roads classified as "closed" are included as existing roads in the after-project values even though they would in actuality

be converted to motorized trails rather than kept as roads. About 5.0 miles of temporary roads in upland areas and 0.1 miles in AIZs are proposed.

Summary of Alternative 2 Benefits and Effects
By harvesting the most timber, this alternative would result in the most road traffic. However, the volume even under this most ambitious harvesting proposal is small at about 5.5 million board feet, which translates to about 1100 full haul truck loads. There would only be a minor amount of hauling on a short (about 0.5 mile) segment of road 20126 where it parallels the marginally perennial part of middle fork of Sulphur Canyon Creek. Hauling would be east to Johnson Creek. Even when combined with supporting traffic, the overall traffic increase represents only a minor increase and is of short term duration. The long term benefits of the combination of reduction of total road miles, road realignment away from streams, reconstruction and maintenance are far greater than the effects of the increased traffic, temporary and permanent road construction, timber harvest and prescribed burning. This alternative is expected to yield slightly less benefit than alternative 4 (ranked 3rd of 5) due to the higher level of temporary roads authorized in this alternative. It does not reduce AIZ road miles nearly as much as alternative 5, even though it reduces upland miles much more than 5.

Effects of Alternative 3

Hydrologic Disturbance
Cumulative hydrologic disturbance would increase from 7% to 23% in the Trail Creek HUC-6, no change in the Sulphur Canyon HUC-6, 4% to 19% in the Wood Canyon HUC-6 and 7% to 9% in the Johnson Creek HUC-6 after the project. All of the HUC-6s would continue to comply with the Forest guideline of 30% percent maximum hydrologic disturbance and remain below the hydrologic disturbance threshold for measurable water yield increase.

Road work
No realignment of roads is proposed, however 0.3 miles of existing road would be obliterated in AIZs and about 0.4 miles in upland areas. Based on the limited scope of road work to reduce sediment, this alternative would yield the smallest improvement in reduction of road miles for both roads in AIZs and uplands of all the action alternatives.

This alternative proposes minor reconstruction on about 1 mile within AIZs and about 0.7 miles in upland areas. Major reconstruction would occur on about 3 miles in AIZs and 0.6 miles in upland areas. Of the major reconstruction, about 0.4 miles in AIZs and 0.4 miles in upland areas would be closed to full-size vehicles, but open to motorized trail use after the project is completed. As a part of the major reconstruction, about 0.4 miles of the archery range road (20297) would be graveled in the existing alignment in the AIZ of Trail Creek. This would reduce somewhat the sediment delivery by passing vehicles for the short to medium term. Spot graveling of roads would occur elsewhere at stream crossings and at some locations where roads are close to streams and sediment delivery is a problem. This would reduce sediment to streams at those points and reduce maintenance in those locations. However, the reductions in sediment would be less than

and of shorter duration than those achieved by realigning roads farther away from streams. This alternative would show only modest reductions in sediment compared to the other action alternatives, and they would not be as long lasting as the other action alternatives that provide for permanent movement of problem roads. About 0.2 miles of temp road would be constructed in upland areas one very short segment of about 0.03 miles (160 feet) in an AIZ.

Summary of Alternative 3 Benefits and Effects

By harvesting the least timber, this alternative would result in the least road traffic. The volume under this alternative is about 2 million board feet, which translates to about 400 full haul truck loads. Even when combined with supporting traffic, it represents a minor increase in traffic and is of short term duration. No hauling is anticipated in or through the Sulphur Canyon Watershed. The medium term benefits combination of road reconstruction, maintenance and obliteration are still greater than the short term effects of increased traffic, road work, timber harvest and prescribed burning. However, as there are essentially no long term benefits due to the lower amount of road reduction and realignment, this alternative is the next least beneficial to hydrology (ranked 4th out of 5).

Effects of Alternative 4

Hydrologic Disturbance

If implemented, this alternative would increase cumulative hydrologic disturbance from 7% to 26% in the Trail Creek HUC-6, no increase in the Sulphur Canyon HUC-6, from 7% to 19% in the Wood Canyon HUC-6 and 7% to 10% in the Johnson Creek HUC-6. All of the HUC-6s would continue to comply with the Forest guideline of 30% percent maximum hydrologic disturbance and remain below the hydrologic disturbance threshold for measurable water yield increase.

Road Work

A net reduction of 0.4 miles of roads in AIZs and 0.3 miles in upland areas would occur. A total of about 1.4 miles of existing alignment would be obliterated in AIZs and 0.4 miles in upland areas. About 0.4 miles of the archery range road (20297) would be moved south, outside the AIZ of Trail Creek, the same as for alt 2. In addition to the 0.9 miles of the Johnson Creek road (20126) to be moved under alternative 2, the intersection of 20126 and the Johnson Creek to Wood Creek road (20574) would be realigned so that drainage from the lower few hundred feet of 20574 would no longer drain directly into Johnson Creek as it does now. About 0.4 miles of 20574 between Johnson Creek and Wood Canyon roads would be realigned out of the current location. Though most of the mileage of the three roads to be moved under this alternative would be relocated still within the AIZ, sediment problems from them would be reduced, because the roads would be much further away.

This alternative proposes minor reconstruction on about 1.1 miles within AIZs and about 1.8 miles in upland areas. Major reconstruction would occur on about 2.3 miles in AIZs and 1.1 miles in upland areas. Of those totals, about 0.6 miles in AIZs and 0.7 miles in upland areas would be left closed to full-size vehicles, but open to motorized trail use after the project is completed. Road reconstruction within AIZs yields some reduction in sediment by improving drainage and removing ruts, though the improvements may not be as great as with relocation entirely outside the AIZ. About 2.2 miles of temporary roads would be constructed in upland areas and 0.1 miles in AIZs under this alternative.

Summary of Alternative 4 Benefits and Effects

The volume under this alternative is about 3.5 million board feet, which translates to about 700 full haul truck loads. Even when combined with supporting traffic, it represents only a minor increase and is of only short term duration. No hauling is anticipated in or through the Sulphur Canyon Watershed. The medium and long term benefits of the reduction of road miles, road realignment away from streams, reconstruction and maintenance are far greater than the effects of the increased traffic, temporary and permanent road construction, timber harvest and prescribed burning. This alternative would be about the same benefit as alternative 5 to all watersheds except Johnson Creek, where alternative 5 is more beneficial due to the much greater decrease in roads in the AIZ of Johnson Creek. Therefore it is ranked second (ranked 2nd of 5) in benefits of all alternatives.

Effects of Alternative 5

Hydrologic Disturbance

Under this alternative, cumulative hydrologic disturbance would increase from 7% to 26% in the Trail Creek HUC-6, no change in the Sulphur Canyon HUC-6, from 7% to 19% in the Wood Canyon HUC-6 and 7% to 11% in the Johnson Creek HUC-6 after the project completion. All of the HUC-6s would continue to comply with the Forest guideline of 30% percent maximum hydrologic disturbance and remain below the hydrologic disturbance threshold for measurable water yield increase.

Road Work

The net reduction of 1.5 miles of roads in AIZs (high benefit) and 0.4 miles in upland areas (moderate benefit) planned would give this alternative the greatest reduction of open road in AIZs, and reduction of miles in upland areas. Total reduction would be second only to alternative 2, with total mileage reduction being only 0.1 miles less. A total of about 3.0 miles of existing alignment would be obliterated in AIZs and 1.4 miles in upland areas. By moving the most roads out of AIZs, this alternative would give the greatest long term reduction of sediment to area streams, more than any other alternative. The benefits would be far greater over the long term than the short term increase in sediment that would be expected from road obliteration, surfacing, reconstruction and all other ground disturbing project activities associated with the proposed timber harvesting and burning.

Though most of the mileage of the three roads to be moved under this alternative would be relocated still within the AIZ, sediment problems from them would be reduced, because the roads would be much further away. All of the road realignment would contribute to watershed health by having their drainage design improved so that drainage water from them is dispersed more widely.

This alternative proposes minor reconstruction on about 1.0 miles within AIZs and about 1.6 miles in upland areas. Major reconstruction would occur on about 1.1 miles in AIZs and 1.1 miles in upland areas. Of those totals, about 0.6 miles in AIZs and 0.8 miles in upland areas would be left closed to full-size vehicles, but open to motorized trail use after the project is completed. This alternative has less road reconstruction than alternative 4, because some of those roads are moved out of the AIZ instead of reconstructed in place. About 2.2 miles of temporary roads would be constructed in upland areas under this alternative.

Summary of Alternative 5 Benefits and Effects

The volume under this alternative is about 3.5 million board feet, which translates to about 700 full haul truck loads. Even when combined with supporting traffic, it represents only a minor increase and is of only short term duration. No hauling is anticipated in or through the Sulphur Canyon Watershed. The medium and long term benefits of the reduction of road miles, road realignment away from streams, reconstruction and maintenance are far greater than the effects of the increased traffic, temporary and permanent road construction, timber harvest and prescribed burning. This alternative would be about the same benefit as alternative 4 to all watersheds except Johnson Creek, where it is the most beneficial by moving by far the most miles out of the AIZ, and in particular to the AIZ of the lower perennial reach. Overall, it is the most beneficial (ranked 1st of 5) of all action alternatives to hydrology.

4.5 Soils

Cumulative Effects Analysis Area: The scale of the analysis for direct and indirect effects on soils is the activity areas (harvest and prescribed burn units) as directed by the R4 Soil Quality Standards and Guides (FSH 2509.18, R-4 supplement r4_2509.18-2002-1). The scale of the analysis for soils cumulative effects is also the activity areas within the boundary of the Aspen Range Timber Sale/Vegetation Management area (approximately 12,000 acres).

Short term effects are defined as being six years or less after soil disturbing activity occurs. Erosion rates would be reduced substantially the first year after disturbance once erosion control and project design features are applied to the skid trails, temporary roads and landings described in Chapter 2. Within four to six years after disturbance, armoring and vegetative growth should reduce erosion rates to near background levels (Cline et al 1980). Long-term effects are considered to be greater than six years.

Soils Indicators Percent of activity area that remains detrimentally disturbed (detrimentally compacted, puddled, displaced and/or severely burned) after project is completed and project design features are applied.

Alternative 1

Direct and Indirect Effects

Timber harvest and burning activities would not occur in Alternative 1 and would not affect the soil resource within proposed activity areas. Current disturbances would continue in the proposed activity areas such as firewood collection, livestock grazing and recreation use. See Chapter 3 for current disturbances.

Cumulative Effects

No cumulative effects on the soil resource would occur with this alternative because no treatment activities would occur. Activities that are currently allowed within the analysis area that may cause soil disturbance to increase over the long-term include livestock grazing and water developments, firewood gathering, and dispersed recreation. These activities have varying degrees of soil disturbance (Meeuwig et al., 1975; Page-Dumroese, 1996). Soil disturbance from livestock grazing is dependant on many variables such as soil texture, and livestock use concentration and duration (Scholl, 1989).

Existing disturbances are estimated to be about 87 acres within the analysis area (Chapter 3). An increase in pioneered trails by OHV's is likely to occur over time. Wildfires will continue to be suppressed, however, any escaped wildfires are likely to create disturbance where soils are severely burned.

No irreversible commitments to the soil resource have been identified for this alternative. In the short term, irretrievable commitments are the ongoing loss in site productivity on the 85 acres described in the existing conditions. In the long term, the 23 acres due to past harvest are expected to return to full productivity as soil compaction is reduce by frost heaving and root action. No additional acres are expected to lose site productivity except where unauthorized OHV travel and dispersed recreation may occur. No additional soil resource commitment (area permanently taken out of production for roads, facilities, etc. would occur under this alternative).

Alternative 2

Direct and Indirect Effects

Timber harvest is proposed on 881 acres. The alternative proposes to use dry-season, ground-based harvest methods with design features that would minimize soil disturbance within harvest units. The alternative includes 1,332 acres of prescribed burning with total treated acres of 1,541.

Effects from harvest: Using monitoring data from past harvest units to determine soil disturbance from timber harvest in treatment areas (activity areas), approximately 7% of each unit is expected to have detrimental soil disturbance after application of post-logging design features (Emigration Timber Sale Monitoring 2007; Grays Range Timber Sale Monitoring 2007; Cheatbeck Basin Timber Sale Monitoring 2004).

All harvest units (activity areas) will meet the Regional Soil Quality guidelines for detrimental soil disturbance once design features are applied. Application of design features will reduced detrimental soil disturbance below the 15 percent allowable in each activity area. Design features are expected to improve soil conditions on 75% of the detrimentally disturbed areas in the harvest units caused by skid trails, landings and temporary roads (Cline et al. 1981; Seyedbagheri 1996: Monitoring 2004). Monitoring of detrimental soil disturbance will be done to determine when and how much amelioration will be applied to each harvest unit prior to sale closure to ensure soil quality standards are met. Landings, skid trails and roads will be ripped, disked, water barred, covered with slash and/or if needed, and seed will be applied if necessary to reduce detrimental soil disturbances to ensure site productivity. Table 4.5-1 shows the expected detrimental soil disturbance related to treatments that will occur in each unit. Also refer to Figure 2 in Appendix-A for a displays of the treatment units.

Effect from Roads: About 2.1 miles of existing system roads will be realigned and 5.1 miles of temporary road will be constructed. Additionally, 5.0 miles of open and closed roads would be reconstructed. All new construction that will become system roads is not considered in analyzing detrimentally disturbed soils however, there is a short term increase in erosion potential expected. Detrimental disturbance from temporary road construction/reconstruction would occur on an estimated 12 acres (5.1 miles). After applying mitigation measures, this will be reduced to 3.6 acres, or less than 3.0%. About 19 acres (7.8 miles) of existing roads will be obliterated and site productivity will be re-established in the long-term. In the short term, a slight increase in erosion would occur from shaping and ripping the road prisms. Within three years, these roads would return to near background levels as vegetation establishes and the area becomes armored (Cline et. al., 1981).

Effects from Prescribe Burning: Following harvest on 670 acres, a broadcast burn will be used to reduce fuels, prepare seedbed, and/or promote aspen regeneration. An additional 660 acres will be burned outside of harvest units. Prescribed burning has the potential to cause severely burned soil conditions and increase erosion potential. Forest monitoring indicates that when prescribed fire is applied in forested stands, less than 3 percent of the area is severely burned, potentially affecting 40 acres (Fox Flat Burn Monitoring 2005 and 2007; Emigration timber harvest burn monitoring 2007; Willow Creek Burn 2007; Swan Flat Burn Monitoring 2002). Additionally, amounts of large woody debris necessary for nutrient cycling could be consumed by fire. Approximately 10 to 20 tons of large woody debris is required to be left on-site after fire treatments for nutrient cycling (RFP III-7; Harvey et al. 1979; Harvey et al. 1987; Jurgensen et al 1990). Nutrient cycling is important to maintain soil productivity after harvesting occurs (Cromack, 1978). Using low to moderate broadcast burn prescriptions are expected to conserve necessary amounts of large woody debris on-site and should provide for limited areas of severely burned soils (DeBano 1998; Swan Flat Burn Monitoring 2002). Most of the burn areas occur on landtypes suited for prescribe fire. Prescribed burning treatments will occur on slopes mainly less than 40 percent which will also reduce erosion potential. Overlap of harvest and burn disturbance overestimates the amount of actual disturbance that will likely occur (see Table 4.5-1). Erosion from treatments is expected to stay below soil loss tolerance levels.

Table 4.5-1: Alternative 2–Estimated detrimental disturbance by unit from proposed treatment activities

Unit #	Total Unit Acres	Category	Temp Road Const. (acres)	Skid Trails (acres)	Landings (acres)	Prescribed Burning (acres)	Total Disturbance (acres)	Proposed % Disturb.
1	56	harvest	0	2.2	2.5	0	4.7	9%
2	24	harvest	0.6	1	1.1	0	2.7	11%
3	65	harvest	0.03	2.6	2.9	0	5.53	9%
4	36	harvest & burn	0.9	1.4	1.6	1.1	5	14%
5	44	harvest & burn	0.5	1.8	2	1.3	5.6	13%
6	68	harvest & burn	0.2	2.7	3.1	2	8	12%
7	49	harvest & burn	1.1	1.9	2.2	1.5	6.7	14%
8	9	harvest & burn	0.2	0.4	0	0.3	1.9	10%
9	48	harvest & burn	0.5	1.9	2.2	1.4	6	13%
10	34	harvest & burn	0.4	1.3	1	1	3.7	11%
11	52	harvest & burn	0	2.1	2.4	1.6	6.1	12%
12	195	harvest & burn	1	7.8	8.9	5.8	23.5	12%
13	87	harvest & burn	1	3.5	3.9	2.6	11	13%
14	15	harvest & burn	0	0.6	1	0.4	2.9	13%
15	25	harvest	0.3	1	1	0	2.5	10%
16	35	harvest & burn	0	1.4	1.6	1	4	11%
17	39	harvest	0	1.6	1.7	0	3.3	9%
A	54	burn	0.002	0	0	1.6	1.62	3%
B	326	burn	0.7	0	0	9.8	10.5	3%
C	31	burn	0.5	0	0	0.9	1.4	5%
D	114	burn	0	0	0	3.4	3.4	3%
E	101	burn	0.4	0	0	3	3.4	3%
F	34	burn	0	0	0	1	1	3%

Cumulative Effects

Total cumulative disturbance within activity areas (direct effects, future effects and existing condition) once all design features are applied is shown in Table 4.5-2. Design features are expected to improve detrimental disturbance by 75%. All values in treatment units remain within the allowable 15% disturbance requirement and meet RFP and Regional Handbook standards and guidelines. An increase in erosion would occur on disturbed areas where roads are constructed, realigned, reconstructed or obliterated for up to three years affecting approximately 38 acres. A decrease in site productivity is not expected to occur in the analysis area due to detrimental soil disturbance and would not cumulatively exceed the 15% guideline in harvest units after operations are completed (FHS 2509.18 supplement r4_2509.18-2001).

Additionally, in the long term, most detrimental disturbances within the activity areas would improve over time from natural processes such as wetting and drying, root action, freezing and thawing and the establishment of vegetation (Oztas et. 2003). Obliteration

of 7.8 miles of road will further reduce cumulative detrimental soil disturbance in the analysis area in the long term by restoring productivity on these acres.

Irretrievable commitments to the soil resource (areas taken out of production for system roads, facilities, etc) of 5 acres due to road relocation, have been identified for this alternative. Irretrievable commitment includes the lost productivity on detrimentally disturbed soils until rehabilitation or natural processes occur. No irreversible commitments were identified in this alternative.

Table 4.5-2: Cumulative Detrimental Soil Disturbance After Design Features are Applied.

Unit #	Acres/Unit	Acres Total Disturbance	% DSD	Unit#	Acres/Unit	Acres Total Disturbance	% DSD
1	56	1.2	2	12	195	6.3	3
2	24	1	4	13	87	2.8	3
3	65	1.4	2	14	15	0.8	5
4	36	1.3	4	15	25	0.6	2
5	44	1.4	3	16	35	1.3	4
6	68	2	3	17	39	0.8	2
7	49	2.2	5	A	54	1	2
8	9	0.5	6	B	326	2.7	1
9	48	1.5	3	C	31	0.4	1
10	34	1.5	4	D	114	1.9	2
11	52	2.4	5	E	101	1.1	1
				F	34	0.5	2

Alternative 3

Direct and Indirect Effects

Timber harvest is proposed on 288 acres. This alternative proposes to use dry-season, ground-based harvest methods with design features that would minimize soil disturbance within harvest units. All harvest units (activity areas) will meet the Regional Soil Quality guidelines for detrimental soil disturbance once design features are applied. This alternative includes 646 acres of prescribed burning with a total of 1,034 acres treated.

Effects from Harvesting: Effects from harvesting are similar to alternative 2 on those acres treated except fewer acres will be harvested in this alternative reducing overall effects on the soil. This alternative has the least effect on soils of all action alternatives. Table 4.5-3 shows the expected detrimental soil disturbance related to treatments that will occur in each unit. Also refer to Figure 3 in Appendix-A for a displays of the treatment units.

Effects from Roads: T here is 0.6 miles of temp road reconstruction to facilitate burning operations affecting 1.5 acres. This alternative would have the least impact on the soil resource due to limited road construction except for no action.

Effects from Prescribed Burning: Following harvest activity, a broadcast burn will be used to reduce fuels on 200 acres of harvested units, prepare seedbed, and/or promote aspen regeneration. An additional 646 acres will be burned outside of harvest units. Effects from burning will be similar to alternative 2 except 686 fewer acres will be treated than alternative 2 causing fewer impacts on the soil resource. Erosion rates will be similar to alternative 2 and are expected to be within soil loss tolerance levels.

Table 4.5-3: Alternative 3–Estimated detrimental disturbance by unit from proposed treatment activities

Unit #	Total Unit Acres	Category	Temp Road Const. (acres)	Skid Trails (acres)	Landings (acres)	Prescribed Burning (acres)	Total Disturbance (acres)	Proposed % Disturb.
1	55	harvest	0	2.2	2.2	0	4.4	8%
11	52	harvest & burn	0	2.1	2.4	1.6	6.1	12%
16	33	harvest & burn	0	1.3	1.5	1	3.8	12%
18	26	harvest	0	1	1	0	2	8%
19	7	harvest	0	0.3	0	0	0.3	4%
20	6	harvest & burn	0	0.2	0	0.2	0.4	7%
21	12	harvest & burn	0	0.5	0.5	0.4	1.4	12%
22	14	harvest & burn	0	0.5	0.5	0.4	1.4	10%
23	45	harvest & burn	0	1.8	1.8	1.4	4.9	11%
24	22	harvest & burn	0	0.9	0.9	0.7	2.5	11%
25	17	harvest & burn	0	0.7	0.7	0.5	1.9	11%
G	408	burn	0	0	0	12.2	12.2	3%
H	194	burn	0	0	0	5.8	5.8	3%
I	44	burn	0	0	0	1.3	1.3	3%

Cumulative Effects

Total cumulative disturbance within activity areas (direct effects, future effects and existing condition) once all design features are applied is shown in Table 4.5-4. Design features are expected to improve detrimental disturbance by 75%. All values in treatment units will remain within the allowable 15% disturbance requirement and meet RFP and Regional Handbook standards and guidelines. An increase in erosion would occur on disturbed areas where roads are constructed, realigned, reconstructed or obliterated for up to three years affecting approximately 7.8 acres. A decrease in site productivity is not expected to occur in the analysis area due to detrimental soil disturbance and would not cumulatively exceed the 15% guideline in harvest units after operations are completed (FHS 2509.18 supplement r4_2509.18-2001).

Additionally, in the long term, most detrimental disturbances within the activity areas would improve from natural processes such as wetting and drying, root action, freezing and thawing and the establishment of vegetation (Oztas et. 2003). Obliteration of 0.2 miles of road will further reduce cumulative detrimental soil disturbance in the analysis area in the long term.

Irretrievable commitments to the soil resource (areas permanently taken out of production for system roads, facilities, etc) of 1.5 acres due to temporary road construction, have been identified for this alternative. Irretrievable commitment includes the lost productivity on detrimentally disturbed soils until rehabilitation or natural processes occur. No irreversible commitments were identified in this alternative.

Table 4.5-4: Cumulative Detrimental Soil Disturbance After Design Features are Applied.

Unit #	Acres/Unit	Acres Total Disturbance	% DSD	Unit#	Acres/Unit	Acres Total Disturbance	% DSD
1	56	1.1	2	22	14	0.3	2.3
11	52	2.4	5	23	45	1	2.8
16	33	1.2	4	24	22	1	2.9
18	26	0.5	2	25	17	1	3.2
19	7	0.1	1	G	408	4	1
20	6	0.1	2	H	194	3	1.4
21	12	0.2	2	I	44	1	1.3

Alternative 4

Direct and Indirect Effects:

Timber harvest is proposed on 481 acres. This alternative proposes to use dry-season, ground-based harvest methods with design features that would minimize soil disturbance within harvest units. All harvest units (activity areas) will meet the Regional Soil Quality guidelines for detrimental soil disturbance once design features are applied. This alternative includes 1,185 acres of prescribed burning with a total of 1,381 acres treated.

Effects from Harvesting: Effects from harvesting are similar to alternative 2 on those acres treated except fewer acres will be harvested in this alternative reducing overall effects on the soil. This alternative has more effect on soils than alternative 3 but nearly half as much as alternative 2. Table 4.5-5 shows the expected detrimental soil disturbance related to treatments that will occur in each unit. Also refer to Figure 4 in Appendix-A for a displays of the treatment units.

Effect from Roads: This alternative proposes 2.0 miles of realignment of existing roads, 2.3 miles of new temporary roads, and 2.3 miles of reconstruction. This is less construction than the alternative 2 by 18 acres but more than alternative 3 by 20 acres. Detrimental disturbance from temporary road construction/reconstruction would occur on an estimated 20 acres.

Effects from Prescribed Burning: Following harvest, a broadcast burn will be used to reduce fuels on 385 acres, prepare seedbed, and/or promote aspen regeneration. An additional 798 acres will be burned outside of harvest units. Effects from burning will be similar to alternative 2 except 147 fewer acres will be treated than alternative 2 causing fewer impacts on the soil resource. Erosion rates are expected to be with soil loss tolerance levels.

Table 4.5-5: Alternative 4–Estimated detrimental disturbance by unit from proposed treatment activities

Unit #	Total Unit Acres	Category	Temp Road Const. (acres)	Skid Trails (acres)	Landings (acres)	Prescribed Burning (acres)	Total Disturbance (acres)	Proposed % Disturb.
1	56	harvest	0	2.2	2.5	0	4.5	8%
9	46	harvest & burn	0.5	1.8	2	1.4	5.7	12%
11	52	harvest & burn	0	2.1	2.4	1.6	6.1	12%
13	86	harvest & burn	0.6	3.4	3.9	2.6	9.9	12%
14	16	harvest & burn	0	0.6	0.7	0.5	1.8	11%
16	33	harvest & burn	0	1.3	1.5	1	3.8	12%
18	25	harvest	0	1	1.1	0	2.1	8%
19	7	harvest	0.1	0.3	0	0	0.4	6%
20	6	harvest & burn	0.2	0.2	0	0.2	0.6	10%
21	12	harvest & burn	0.1	0.5	0.5	0.4	1.5	13%
22	14	harvest & burn	0	0.6	0.6	0.4	1.6	11%
23	45	harvest & burn	0.4	1.8	2	1.3	5.5	12%
24	22	harvest & burn	0	0.9	1	0.7	2.6	12%
25	17	harvest & burn	0	0.7	0.8	0.5	2	12%
26	11	harvest & burn	0.01	0.4	0.5	0.3	1.21	11%
27	7	harvest & burn	0.03	0.3	0	0.2	0.53	8%
28	8	harvest	0	0.3	0	0	0.3	4%
29	14	harvest & burn	0	0.6	0.6	0.4	1.6	11%
30	4	harvest & burn	0.03	0.2	0	0.1	0.33	8%
J	30	burn	0.4	0	0	0.9	1.3	4%
K	365	burn	0.7	0	0	10.9	11.6	3%
L	179	burn	0.1	0	0	5.4	5.5	3%
M	186	burn	0.1	0	0	5.6	5.7	3%
N	40	burn	0	0	0	1.2	1.2	3%

Cumulative Effects

Total cumulative disturbance within activity areas (direct effects, future effects and existing condition) once all design features are applied is shown in Table 4.5-6. Design features are expected to improve detrimental disturbance by 75%. All values in treatment units will remain within the allowable 15% disturbance requirement and meet RFP and Regional Handbook standards and guidelines. An increase in erosion would occur on disturbed areas where roads are constructed, realigned, reconstructed or obliterated for up to three years affecting approximately 15 acres. A decrease in site productivity is not expected to occur in the analysis area due to detrimental soil disturbance and would not cumulatively exceed the 15% guideline in harvest units after operations are completed (FHS 2509.18 supplement r4_2509.18-2001).

Additionally, in the long term, most detrimental disturbances within activities areas would improve from natural processes such as wetting and drying, root action, freezing and thawing and the establishment of vegetation (Oztas et. al 2003). Obliteration of 4.3 miles of road will further reduce cumulative detrimental soil disturbance in the analysis area in the long term.

Irretrievable commitments to the soil resource of 5 acres due to road relocation have been identified for this alternative. Irretrievable commitments are the lost productivity on detrimentally disturbed soils until rehabilitation occurs. No irreversible commitment to the soil resource has been identified for this alternative.

Table 4.5-6: Cumulative Detrimental Soil Disturbance After Design Features are Applied.

Unit #	Acres/Unit	Acres Total Disturbance	% DSD	Unit#	Acres/Unit	Acres Total Disturbance	% DSD
1	56	1.1	2	24	22	0.7	3
9	46	1.4	3	25	17	0.6	9
11	52	2.4	5	26	11	0.3	3
13	86	2.5	4	27	7	0.1	1
14	16	0.5	3	28	8	0.1	1
16	33	1.2	4	29	14	0.4	3
18	25	0.5	2	30	4	0.1	0.2
19	7	0.1	1	J	30	0.4	1
20	6	0.2	3	K	365	3.3	1
21	12	0.4	3	L	179	2.7	2
22	14	0.5	4	M	186	1.6	1
23	45	1.4	3	N	40	0.6	2

Alternative 5

Direct and Indirect Effects

Timber harvest is proposed on 473 acres. The alternative proposes to use dry-season, ground-based harvest methods with design features that would minimize soil disturbance within harvest units. All harvest units (activity areas) will meet the Regional Soil Quality guidelines for detrimental soil disturbance once design features are applied. The alternative includes 1,199 acres of prescribed burning with a total of 1,387 acres treated.

Effects from Harvesting: Effects on the soil resource from timber harvesting are the same as alternative 4. About 8 less acres will be harvested and 14 additional acres will be burned in this alternative. Table 4.5-7 shows the expected detrimental soil disturbance related to treatments that will occur in each unit. Also refer to Figure 5 in Appendix-A for a displays of the treatment units.

Effect from Roads: The alternative proposes 4.5 miles of realignment of existing roads (new construction), 2.3 miles of new temporary roads, and 2.2 miles of reconstruction. Construction in this alternative will affect 18 acres less than alternative 2, and 20 acres more than alternative 3. Detrimental disturbance from temporary road construction/reconstruction would occur on an estimated 5.6 acres.

Effects from Prescribed Burning: Following harvest, a broadcast burn will be used to reduce fuels on 385 acres, prepare seedbed, and/or promote aspen regeneration. An additional 814 acres will be burned outside of harvest units. Effects from burning will be similar to alternative 2 except 133 fewer acres will be treated than alternative 2 causing fewer impacts on the soil resource. Erosion rates are expected to be with soil loss tolerance levels.

Table 4.5-7: Alt. 5–Estimated detrimental disturbance by unit from proposed treatment activities

Unit #	Total Unit Acres	Category	Temp Road Const. (acres)	Skid Trails (acres)	Landings (acres)	Prescribed Burning (acres)	Total Disturbance (acres)	Proposed % Disturb.
1	56	harvest	0	2.2	2.5	0	4.5	8%
9	46	harvest & burn	0.6	1.9	2.1	1.4	6	13%
11	52	harvest & burn	0	2.1	2.4	1.6	6.1	12%
13	86	harvest & burn	0.4	3.4	3.9	2.6	10.3	12%
14	16	harvest & burn	0	0.6	0.7	0.5	1.8	11%
16	33	harvest & burn	0	1.3	1.5	1	3.8	12%
18	25	harvest	0	1	1.1	0	2.1	8%
19	7	harvest	0.1	0.3	0	0	0.4	6%
20	6	harvest & burn	0.2	0.2	0	0.2	0.6	10%
21	12	harvest & burn	0.1	0.5	0.5	0.4	1.5	13%
22	14	harvest & burn	0	0.6	0.6	0.4	1.6	11%
23	45	harvest & burn	0.4	1.8	2	1.3	5.5	12%
24	22	harvest & burn	0	0.9	1	0.7	1.7	8%
25	17	harvest & burn	0	0.7	0.8	0.5	2	12%
26	11	harvest & burn	0.001	0.4	0.5	0.3	1.2	11%
27	7	harvest & burn	0.03	0.3	0	0.2	0.53	8%
30	4	harvest & burn	0.03	0.2	0	0.1	0.33	8%
31	14	harvest & burn	0	0.6	0.6	0.4	1.6	11%
J	30	burn	0.4	0	0	1	1.4	5%
K	365	burn	0.8	0	0	10.9	11.7	3%
L	193	burn	0.1	0	0	5.8	5.9	3%
M	186	burn	0.3	0	0	5.6	5.9	3%
N	40	burn	0	0	0	1.2	1.2	3%

Cumulative Effects

Cumulative effects in this alternative are the same as alternative 4. See Table 4.5-6. A decrease in site productivity is not expected to occur in the analysis area due to detrimental soil disturbance and would not cumulatively exceed the 15% guideline in harvest units after operations are completed (FHS 2509.18 supplement r4_2509.18-2001).

Additionally, in the long term, most detrimental disturbances within activities areas would improve from natural processes such as wetting and drying, root action, freezing and thawing and the establishment of vegetation (Oztas et. al 2003). Obliteration of 4.3 miles of road will further reduce cumulative detrimental soil disturbance in the analysis area in the long term.

Irretrievable commitments to the soil resource of 5 acres due to road relocation have been identified for this alternative. Irretrievable commitments are the lost productivity on detrimentally disturbed soils until rehabilitation occurs. No irreversible commitment to the soil resource has been identified for this alternative.

4.6 Wildlife

The Biological Assessment (BA) and Biological Evaluation (BE) for these species are located in the project file. The following Table 4.6-1 lists all species and habitats discussed, and summarizes any effects or impacts by alternative.

Table 4.6-1: T&E, Sensitive, & MIS Wildlife Species – Summary of Effects/Impacts

Wildlife Species or Habitat	H	S	Alt.	Alt.	Acres / Percent remaining or changes (-)				
T&E Listed Species (BA)			1	2-5	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Gray Wolf – XN	**Y**	**Y**	NLJ	NE	0	1,541	1,034	1,381	1,387
Canada Lynx – Threatened	**Y**	**Y**	NE	NE	0	1,541	1,034	1,381	1,387
Bald Eagle - Threatened/Sensitive	N	N	NE	NE	nc	nc	nc	nc	nc
Sensitive Species (BE)									
Spotted Bat	**Y**	**N**	NI	NI	nc	nc	nc	nc	nc
Townsend's Big-eared Bat	**Y**	**Y**	NI	MIIH	6,167	-1,138	-586	-777	-773
Pygmy rabbit	N	N	NI	NI	nc	nc	nc	nc	nc
North American Wolverine	**Y**	**Y**	NI	NI	0	1,541	1,034	1,381	1,387
Trumpeter Swan	N	N	NI	NI	nc	nc	nc	nc	nc
Harlequin Duck	N	N	NI	NI	nc	nc	nc	nc	nc
Peregrine falcon	N	N	NI	NI	nc	nc	nc	nc	nc
Northern Goshawk (MIS)	**Y**	**Y**	NI	MIIH	81%	69%	73%	71%	71%
C. Sharp-tailed Grouse (MIS)	**Y**	**Y**	NI	MIIH	100%	89%	93%	90%	90%
Greater sage-grouse (MIS)	**Y**	**Y**	NI	MIIH	100%	95%	95%	92%	92%
Great Gray Owl	**Y**	**Y**	NI	MIIH	81%	69%	74%	72%	72%
Flammulated Owl	**Y**	**Y**	NI	MIIH	81%	69%	74%	72%	72%
Boreal Owl	**Y**	**Y**	NI	MIIH	81%	69%	74%	72%	72%
Three-toed Woodpecker	**Y**	**Y**	NI	MIIH	6,167	5,029	5,581	5,390	5,394
Columbia spotted frog	**Y**	**N**	NI	NI	nc	nc	nc	nc	nc
Migratory Land Birds									
A – Riparian	**Y**	**Y**	NI	GM	nc	nc	+	++	+++
A – Wetland	Y	Y	NI	GM	nc	nc	nc	nc	nc
A – Sagebrush /Salt Desert Shrub	Y	Y	NI	GM	id	id	id	id	id
A – Aspen Woodland/Mule Deer	**Y**	**Y**	NI	GM	id	id	id	id	id
B – Low Elevation Mixed Conifer	**Y**	**Y**	NI	GM	id	id	id	id	id
B – High Elevation Mixed	**Y**	**Y**	NI	GM	id	id	id	id	id
B – Grassland	N	N	NI	NI	nc	nc	nc	nc	nc
B – Juniper/PinyonP/MMahogany	N	N	NI	NI	nc	nc	nc	nc	nc
B – Mountain Brush/Shrubland	**Y**	**Y**	NI	GM	id	id	id	id	id
B – Agricultural	N	N	NI	NI	nc	nc	nc	nc	nc
C – Cliffs/rock outcrops/talus	N	N	NI	NI	nc	nc	nc	nc	nc
C – Alpine	N	N	NI	NI	nc	nc	nc	nc	nc
C – Lodgepole Pine	**Y**	**Y**	NI	GM	id	id	id	id	id
Big Game									
Hiding Cover:Non-winter Forage	**Y**	**Y**	NI	BI	66:34	56:44	60:40	58:42	60:40
Mule Deer Initiative – Aspen	**Y**	**Y**	NI	BI	0	1,041	625	834	862
Winter Range, Forest Plan Areas	N	N	NI	NI	nc	nc	nc	nc	nc

H / S – Habitat and **Species** in or near project area. **NE** – No effect. **XN** – nonessential experimental population. **NLJ** – Not likely to Jeopardize the Continued Existence. **NI** – No impact to any populations, species, or habitat. **MIIH** – May impact individuals or habitat, but will not likely contribute to a trend towards Federal listings or loss of viability to the populations or species. **WIFV** – Will impact individuals or habitat, and may contribute to a trend towards Federal listings or loss of viability to the populations or species. **BI** – Beneficial impact to the species or habitat. **GM** – Goals met for bird habitats. **nc** – No change to species or habitat. + - Minor increase. **id** – Increase diversity of habitat successional stages.

***Cumulative Effects* Analysis Area** for changes to forested habitat is the 11,981 acre project area because species discussed are either seasonal residents of the localized area or traveling through. The size of the area is large enough to analyze effects. Areas that are adjacent to the forest must be considered to determine which wildlife species may occupy the area and be impacted. The adjacent areas are limited to the valley bottom or adjacent forest depending on the distance the species migrates. The historical conversion of valley bottom vegetation, outside the CEA, to agricultural/ranching and current or expected increase of housing development of private lands has and would continue to reduce winter and early spring habitat of wildlife that migrate to the project area (RFP and Wildlife Reports).

Cumulative effects in this discussion are foreseeable events. Natural disturbance that is a foreseeable, but not a controllable event is vegetation succession. Plant succession would continue as early seral or shade-intolerant species slowly decrease as dominant vegetation matures over time. Wildfires, insect, diseases, weather patterns, and impacts by wildlife are other natural events that are also not included.

The Caribou Travel Plan Revision will reduce vehicle impacts in the foreseeable future; by restricting wheeled motorized vehicles to designated routes. Impacts associated with user created trails should decline over time and increase re-vegetated areas with small increase acres of forest and non-forest vegetation.

Past vegetation changes from timber sales are incorporated into the existing conditions and displayed in Alternative 1. Firewood cutting along roads is the only foreseeable activities that would add a cumulative decrease of the snag or the down woody debris component of mature/old-forested stands. Continued livestock grazing (sheep), associated developments, camping, and off trail ATV use can impact brush, forbs, and grass vegetation, in localized areas, that are within the existing condition and will be a continuing foreseeable activity. Human disturbance from year round recreational uses, including hunting, and administrative activities can displace or harm wildlife directly as a past, current and future event. (Revised Forest Plan and Wildlife Reports).

4.6.1 Threatened and Endangered Species

Gray Wolf and Canada Lynx – It is possible that wolves or lynx could move through the project area. Due to their large territories and ability to move around any adverse disturbances, there are no project activities under any alternative that would impact wolves or lynx movement (see wolverine discussion). It was determined in the BA that this project would have no effects to T&E species. There would be no direct, indirect, or cumulative impacts to T&E species.

4.6.2 Sensitive Species

The proposed action may impact the following species. The unit of measure and action that may impact the species is in parentheses after the species name. Additional information about Sensitive Species is concluded in the Biological Evaluation.

Wolverine (Acres of Human Disturbance/Displacement)

Alternative 1

Direct and Indirect Effects

There would be no thinning, logging, or burning activities or associated human disturbance that would disrupt wolverines traveling through the 11,981 acre project area.

Cumulative Effects

Human disturbances would continue year around from recreational uses, permitted activities (livestock grazing, outfitter & guide, archery range use, and recreational events that use the warming hut), and administrative activities in the project area. There are no other foreseeable short-term future activities. Recreational uses may increase over time; the majority of human use in the area is during the hunting season. Most of the disturbances, specifically snowmobile travel, are limited to road corridors and non-forested basins. Disturbances to denning sites are expected to be non-existent to very low.

Alternatives 2, 3, 4, & 5

Direct and Indirect Effects

Denning habitat would not be impacted and there would be no disturbance to wintering wolverines. Human disturbance from activities on 1,541 acres in the summer and fall may disrupt wolverines traveling through the area. The disturbance project activities are localized to the project area and are usually for short durations. The remaining area would provide areas without major disturbances that the wolverine could move through. Because wolverines have large territories and project activities can be avoided, this project is not expected to impact wolverines. Short term disturbance would occur on 1,034 acres for alternative 3; 1,381 acres for alternative 4; and 1,387 acres for alternative 5.

Cumulative Effects

The same as Alternative 1.

Townsend's (Western) big-eared bat and Three-toed woodpecker

(Acres of Existing Snags Lost)

Alternative 1

Direct and Indirect Effects

There would be no impact to snags directly. Most of the available snags are aspen or recently dead conifer from bark beetle mortality. There are 6,167 cover type acres of mature and old forest to provide existing and future snags within the project area. Standards and guidelines would be met.

Cumulative Effects

Past harvest activities of the forested cover type focused on removing dominant trees and many of the older snags have fallen over. Firewood cutting has removed most of the dead trees along roads. Beetle mortality on large diameter Douglas-fir during the mid and late 1990's, increased snag numbers within the mature stands of the analysis area.

Dead and down trees near roads and campsites would continue to be lost to firewood gatherers; but this loss represents a low percentage. The remainder would be available for snag dependent wildlife. Thinning older harvest plantations is designed to allow the remaining trees to grow free of inter tree competition, thus providing larger diameter trees that could, have potential to provide a large snag in the long term (see vegetation section). Forested habitat would slowly return where user created motorized routes are closed.

Alternatives 2, 3, 4, & 5

Direct and Indirect Effects

Thinning, harvesting, and burning activities may impact existing snags that may provide foraging, nest cavities, or roosting habitat on 1,138 acres (leaving 5,029 acres of mature/old forest stands where there would be no potential impacts to snags for woodpeckers or bats to use) in Alternative 2; 586 acres, leaving 5,581 in Alternative 3; 777 acres, leaving 5,390 in Alternative 4; and 773 acres, leaving 5,394 acres in Alternative 5. Although these treatments could reduce total snag number available these alternatives would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species because 1) snag S&Gs would be implemented; 2) burning would consume existing snags but fire mortality of green trees would create a short-term increase in snag numbers; and 3) any reduction of tree density by thinning would allow the remaining trees to become larger in diameter and provide a larger snag in the long-term. See vegetation section for more information.

Cumulative Effects

The same as Alternative 1

<u>Northern Goshawk, Flammulated Owl, Boreal Owl, and Great Gray Owl</u>

(Mature/Old Forest Cover Types)

Alternative 1

Direct and Indirect

The project area provides 6,167 acres (81% of 7,660 forested acres) of mature and old forest stands that provide suitable nesting and foraging habitat. This is within the 40 percent for forest owls. There would be no 40-acre opening created. There would be no improvement of structural diversity at the landscape scale which is important for sustainability (Graham and others 1994). The existing stands in the nesting, post fledging and foraging area would not be impacted by vegetation management activities proposed in this project and should meet all RFP goshawk standards and guidelines as naturally occurring stands.

Cumulative Effects

Forested habitat would return where user created motorized routes have been closed. There are no other foreseeable future activities that would impact or reduce mature/old forest structure beyond the occasional dead tree cut as firewood along roads in the analysis area. This does not include vegetation succession described in the vegetation section that could have impacts on forest dependant wildlife.

Alternatives 2

Direct and Indirect Effects

Large raptor nests would be protected if located. Activities would reduce mature/old forest, leaving 69 percent respectively mature/old cover types; within the guidelines of 40 percent for forest owls. This alternative increase the early seral forested habitat slightly, contributing to a more even mix of cover types (age classes), and moves the landscape toward a sustainable mix of structure as recommended by the goshawk science committee (Reynolds & others 1992). The nesting and post fledging areas are described by the RFP as the two most critical use areas for the goshawk. Alternative 2 **would not** provide a mature/old forest stand structure for the 200 acre goshawk nesting area**,** and seven mechanically harvested regeneration units may create openings exceeding the 40 acre; not meeting several RFP standards and guidelines (S&Gs) for the goshawks. Refer to Figure 7 in Appendix A for a display of Alternative 2 and the Goshawk Territory.

Cumulative Effects

The same as Alternative 1.

Alternatives 3, 4, & 5

Direct and Indirect Effects

Large raptor nests would be protected if located. Activities would reduce mature/old forest, leaving 74, 72, & 72 percent respectively mature/old cover types; within the guidelines of 40 percent for forest owls. These alternatives increase the early seral forested habitat slightly, contributing to a more even mix of cover types (age classes), and moves the landscape toward a sustainable mix of structure as recommended by the goshawk science committee (Reynolds & others 1992). Table 4.6-2 below displays the percent in the remaining age classes. The nesting and post fledging areas are described by the RFP as the two most critical use areas for the goshawk. Alternatives 3, 4, & 5 meets S&Gs by providing a mature/old forest stand structure *exceeding* 200 acres and no cutting units would create opening exceeding the 40 acre maximum for mechanical harvest even age regeneration guideline. Vegetation management activities in Alternative 3, 4, & 5 are not proposed in and would have no impact to the existing structure of stands designated for the 206 acre nesting, 55 acre alternate nest, and 450 acre post fledging areas. Please refer to Appendix A for a display of Alternatives and the Goshawk Territory.

Table 4.6-2: Alternatives 3, 4, and 5 Age Class Percentages and Acres Distribution

	Goshawk Categories	Nonstocked / seedling		Sapling		Young/Pole		Mature/Old		Total
		ac.	%	ac.	%	ac.	%	ac.	%	
Alt 3	Nest Area	0	0%	0	0%	0	0%	206	100%	**206**
	Alternate Nest Area	0	0%	0	0%	0	0%	55	100%	**55**
	PFA	0	0%	37	8%	86	18%	327	70%	**450**
	Foraging Area	642	9%	195	3%	1,039	15%	5,073	73%	**6,949**
	Total	**642**	**8%**	**232**	**3%**	**1,125**	**15%**	**5,661**	**74%**	**7,660**
	Goshawk Categories	**Nonstocked / seedling**		**Sapling**		**Young/Pole**		**Mature/Old**		**Total**
		ac.	**%**	**ac.**	**%**	**ac.**	**%**	**ac.**	**%**	
Alt 4	Nest Area	0	0%	0	0%	0	0%	206	100%	206
	Alternate Nest Area	0	0%	0	0%	0	0%	55	100%	55
	PFA	0	0%	37	8%	86	18%	327	70%	450
	Foraging Area	865	12%	191	3%	1,003	14%	4,891	71%	6,949
	Total	**865**	**11%**	**228**	**3%**	**1,089**	**14%**	**5,479**	**72%**	**7,660**
	Goshawk Categories	**Nonstocked / seedling**		**Sapling**		**Young/Pole**		**Mature/Old**		**Total**
		ac.	**%**	**ac.**	**%**	**ac.**	**%**	**ac.**	**%**	
Alt 5	Nest Area	0	0%	0	0%	0	0%	206	100%	206
	Alternate Nest Area	0	0%	0	0%	0	0%	55	100%	55
	PFA	0	0%	37	8%	86	18%	327	70%	450
	Foraging Area	879	13%	191	3%	993	14%	4,886	70%	6,949
	Total	**879**	**11%**	**228**	**3%**	**1,079**	**14%**	**5,474**	**71%**	7,660

Cumulative Effects
The same as Alternative 1.

Cumulative Effects
The same as Alternative 1.

Summary: A forest wide survey (Trek 2005) conducted in 2004 met the Revised Forest Plan monitoring requirement (USDA 2003b 5-15). Approximately twelve active territories were found on the Caribou portion of the forest. Revised Forest Plan monitoring is continuing each year. The 40 percent mature stand structure for owls is exceeded in all alternatives. Goshawk surveys would be conducted yearly in the project area until the sale is sold. We conclude that owls/goshawk standards and guidelines for the nesting, post fledging and foraging areas described by the Caribou National Forest Revised Forest Plan for occupancy and production would be met under alternatives 1, 3, 4 and 5.

Columbian Sharp-Tailed Grouse
(Percent Change of Winter Forage)

Alternative 1
Direct and Indirect Effects
There would be no impacts to chokecherry, serviceberry, or aspen. There are 4,165 cover type acres (100%) of mountain brush/shrub, and young, middle age, mature, and old aspen in the project area available to provide winter forage meeting grouse guidelines. In the long term this alternative would have an impact as these types continue to age and lose their value.

Cumulative Effects
Natural succession would have the biggest impact to mature live aspen throughout the project area in the long-term. Aspen, chokecherry, and serviceberry are regenerating and reaching maturity within the current big game and livestock utilization levels. Closing motorized routes would increase shrub habitat in localized areas.

Alternatives 2, 3, 4, & 5
Direct and Indirect Effects
Project activities in Alternative 2 would reduce 460 aspen and mountain brush cover type acres leaving 89 percent as winter foraging habitat. Alternative 3 would reduce 308 cover type acres (leaving 93%), and Alternative 4 and 5 would reduce 413 cover type acres of aspen (leaving 90%). All alternative have a short term impact but the remaining winter habitat is within the 80 percent sharp-tailed grouse guideline to meets the needs of the grouse. Because winter forage would be available and disturbances would increase the age class diversity of this cover type, providing sustainability of these forage types in the long term, this project would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects
The same as Alternative 1.

Summary: RFP S&G for Columbian sharp-tailed grouse would be met under all alternatives and winter forage would be available to support viable populations. IDFG (2004b) completed the 2004 lek survey meeting the Revised Forest Plan monitoring requirement (USDA 2003b 5-15). Sharp-tails are currently hunted and the season and bag limit have not changed. Birds have been seen in new areas in southeast Idaho and proposed vegetation treatments would increase age class diversity. We conclude that sharp-tail occupancy and production within the Caribou National Forest would be met under all alternatives.

Greater Sage-Grouse (Percent of Mature Sagebrush)
Alternative 1

Direct and Indirect Effects
There would be no direct effect to sagebrush habitat. Leks are found on the valley bottoms, northeast of the project area. Sagebrush has a moderate canopy cover.

Cumulative Effects
Livestock grazing would continue implementing CNF RFP S&G. There would be a small increase in habitat from Travel Plan route closures. There are no proposals to decrease sagebrush canopy cover in the project area in the future.

Alternatives 2, 3, 4, & 5
Direct and Indirect Effects
There are no proposed treatments of sagebrush in alternatives 2, 3, 4, or 5. However, because burning aspen may ignite adjacent stands of sagebrush, the contingency plan for Alternative 2 includes 209 acres of sagebrush to reduce prescribed burn control issues, burning cost, and to provide for fire crew safety. This is five percent of 4,085 acre sagebrush within the project area. The contingency plan for Alternative 3 includes 210 acres (5%). The contingency plan for Alternative 4 and 5 includes 327 acres (8%) of mature sagebrush that may be burned. Any burning of sagebrush within the project area is within the 20 percent guideline and provides for age class diversity. Burning in May and June would be avoided in sagebrush types to prevent disturbance during the brood-rearing period. The project activities would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Cumulative Effects
The same as Alternative 1.

Summary: Nesting or winter range would not be impacted. The brood-rearing season would be avoided. Any loss of sagebrush would be within 20 percent early seral direction. IDFG (2004a) completed the 2004 lek survey meeting the Revised Forest Plan monitoring requirement (USDA 2003b 5-15). Sage-grouse are currently hunted but the season and bag limit have been reduced. Although Idaho's sage-grouse populations are below 1960s levels, they have been generally stable for the last decade (IDFG 2005). We conclude that sage-grouse occupancy and production within the Caribou National Forest would be met under all alternatives.

4.6.3 Management Indicator Species

MIS include northern goshawk, Columbian sharp-tailed grouse, and sage grouse. Effects for these species have been previously discussed in the sensitive species section. Revised Forest Plan Standards and Guidelines for goshawk, sharp-tailed grouse, and sage-grouse would be met under all alternatives, except the 40 acre guideline as described above. There are no foreseeable future activities where RFP S&Gs would not be met. Natural succession would have the greatest impact to MIS habitat but impacts are beyond the scope of this document.

4.6.4 Migratory Birds

Riparian (streambank vegetation growth)

Alternative 1

Direct and Indirect Effects

Willows are well established providing bird habitat along riparian corridors. However, there would be no direct effect to riparian habitat. Goals in the Plan for Bird Conservation in Idaho would be met.

Cumulative Effects

There would be a small increase in habitat from Travel Plan route closures. Livestock grazing would continue with lower utilization level from implementing RFP S&Gs. Willows are reaching maturity. Diversity of age structures is maintained for birds.

Alternative 2, 3, 4, and 5

Direct and Indirect Effects

There would be no loss of riparian habitat. Riparian buffers (if needed) would protect stream bank vegetation. Roads along riparian habitat would remain and continue to limit willow growth in Alternative 3. Willows providing bird habitat along riparian corridors would be able to move into the old road corridor where roads are moved. Alternative 2 would contribute the least followed by Alternative 4. Alternative 5 would contribute the most. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met.

Wetland (loss or change of wetlands)

Alternative 1

Direct and Indirect Effects

There would be no effect to wetland habitat. Seeps and springs are limited in the project area. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met.

Cumulative Effects

There would be a small increase in habitat from Travel Plan route closures. Riparian and upland vegetation would continue to be impacted by livestock grazing and recreational uses. Livestock grazing would be managed with Forest Plan S&Gs and recreation uses

are expected to increase slowly. Migratory bird goals of no loss of or changes to seeps, springs, lakes, and beaver ponds and the objective for available insects would be met.

Alternative 2, 3, 4, and 5
Direct and Indirect Effects
RFP S&G would protect wetlands and meet the goals in the Plan for Bird Conservation in Idaho would be met.

Cumulative Effects
The same as Alternative 1

Sagebrush (decrease of mature sagebrush)
Alternative 1
Direct and Indirect Effects
There would be no change to sagebrush Steppe habitats. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met.

Cumulative Effects
See the Sage grouse section above. There would be a small increase in habitat from Travel Plan route closures. No other treatments are proposed in the analysis area. Livestock grazing would be managed with Forest Plan S&Gs.

Alternative 2, 3, 4, and 5
Direct and Indirect Effects
Small areas containing sagebrush may be burned increasing age class diversity. Succession and regrowth of those types is expected following disturbances. The impacts to these habitats are analyzed in the sage grouse and sharp-tail grouse sections. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met.

Cumulative Effects
The same as Alternative 1

Aspen Woodland (aspen succession)
Alternative 1
Direct and Indirect Effects
There would be no direct effect to aspen woodland in the short term. There would be long term indirect effect because succession would continue. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met in the short term but not in the long term. This alternative would not contribute to attainment of the goals of the Letter of Agreement between the land management agencies of Eastern Idaho (April 2006). See Big Game Section.

Cumulative Effects
There would be a small increase in habitat from Travel Plan route closures. Livestock grazing would continue with lower utilization level from implementing RFP S&Gs. Aspen have resprouted successfully in recently disturbed sites with past livestock grazing. Aspen are reaching maturity with existing impacts (except in isolated areas). Natural succession would cause them to die under a mature forest canopy due to competition.

Alternative 2, 3, 4 and 5
Direct and Indirect Effects
Treatments to kill or remove encroaching conifer would allow aspen to resprout in the treatment units (see the vegetation section). Age class diversity would increase. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met both in the short and long term. These alternatives would contribute to attainment of the goals of the Letter of Agreement between the land management agencies of Eastern Idaho (April 2006).

Cumulative Effects
The same as Alternative 1

<u>Low & High Elevation Mixed Conifer and Lodgepole Pine</u>
(Maintain mature/old forests)

Alternative 1
Direct and Indirect Effects
There would be no direct effect to conifer habitat. There would be small indirect impacts with continued succession. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met.

Cumulative Effects
There would be a small increase in habitat from Travel Plan route closures. The acres of older forest habitat would increase as early seral forested stands mature over time.

Alternative 2, 3, 4 and 5
Direct and Indirect Effects
RFP S&G would maintain diverse forest habitat. Age class diversity would increase. Goals in the Plan for Bird Conservation in Idaho would be met. [See the analysis on boreal owls, great gray owls, flammulated owls, goshawk, three toed woodpecker above and the forest vegetation section for detailed information.]

Cumulative Effects
The same as Alternative 1

Mountain Brush / Shrubland (No net loss / increase both quality and quantity)

Alternative 1
Direct and Indirect Effects
There would be no direct effect to shrub habitat. There would be small indirect impacts with continued succession. Goals to protect, maintain, enhance and/or restore this habitat in the Plan for Bird Conservation in Idaho would be met.

Cumulative Effects
There would be a small increase in habitat from Travel Plan route closures.

Alternative 2, 3, 4 and 5
Direct and Indirect Effects
Some non-forested brush could be burned during forest treatments. Any loss is within RFP guidelines and disclosed in the analysis on sage grouse and sharp-tailed grouse. Age class diversity would increase. Goals in the Plan for Bird Conservation in Idaho would be met.

4.6.5 Big Game

Alternative 1
Direct and Indirect Effects
Hiding cover is provided on 7,850 acres (66%) and early seral vegetation provides summer/fall forage on 4,085 acres (34%) of the project; the ratio is 66:34. There are no forest plan guidelines for cover:forage ratios; however, 40:60 cover to forage ratio is considered optimum (Thomas 1979, 130). The forage ratio is low in the analysis area. There is no aspen restoration opportunity to assist IDFG in meeting their Mule Deer Initiative; a big game guideline (RFP 3-32).

Cumulative Effects
Natural succession, wildfire, and weather patterns are the only foreseeable events that would change the amount of forage and cover for big game. Livestock grazing would consume summer/fall forage within utilization levels. As young stands mature, forage opportunities decrease. Motorized route closures would increase forage and hiding cover over time.

Alternatives 2, 3, 4, & 5
Direct and Indirect Effects
Project activities would decrease cover:forage ratio to 56:44, 60:40, 58:42, 60:40; increasing forage opportunities by 10, 6, 8, 6 percent respectively for big game and increasing winter survival. Aspen restoration on 1,039,/ 625 / 832 / 860 acres respectively would assist IDFG in meeting their Mule Deer Initiative.

Cumulative Effects
The same as Alternative 1.

Irreversible and Irretrievable Resource Commitments

There would be no irreversible commitment of resources for wildlife. There would be an irretrievable loss of forage on relocated roads and mature forested habitat until rehabilitation occurs. Wildlife that use mature forests would be displaced to suitable habitat until the stands return to a mature forested habitat. Ground vegetation providing forage or cover would not be available until vegetation is allowed to be re-established over time on closed sections of roads. Wildlife displaced due to human disturbance would be an irretrievable loss until the human disturbance is over.

Endangered Species Act

The following threatened and endangered species are considered when evaluating projects on the Caribou National Forest: gray wolf (*Canis lupus irremotus)* and Canada lynx (*Lynx candensis);* the bald eagle (*Haliaeetus leucocephalus*) and yellow-billed cuckoo (*Coccyzus americanus*) were removed from list of species expected on the Caribou NF, provided the USFWS. Analysis, disclosure of effects and details of concurrence by US Fish and Wildlife Service is in Chapter IV.

4.7 Fisheries

***Cumulative Effects* Analysis Area:** The cumulative effects analysis area for the fisheries resource is the project area.

Alternative 1

Direct and Indirect Effects

This alternative would have no effect on fish habitat and fish other than a continuance of existing conditions and trends. Effects of ongoing activities such as grazing, recreation, fire suppression, and road use and maintenance would continue. Road-related sedimentation of Trail and Johnson creeks would not be reduced. No portion of road 20297 adjacent to Trail Creek and road 20126 adjacent to Johnson Creek would be relocated away from each stream. The percentage of substrate comprised of fine sediment in both streams would remain at 75-100%. Sediment would continue to limit trout populations by covering gravel substrate habitat needed for spawning and the macroinvertebrate food base. Conifer encroachment on aspen, and the risk of intense wildfires, would not be reduced and may result in negative impacts to riparian areas and fish populations.

Cumulative Effects

The cumulative effects of this alternative are the same as the effects described above. The alternative would add no incremental effects to past and present activities. No new activities are foreseen in the area.

Alternative 2

Direct and Indirect Effects

The alternative would have a long-term positive effect on fish habitat and fish, to a greater extent than Alternative 3 and a lesser extent than Alternatives 4 and 5. Alternative 2 is expected to yield slightly less benefit than alternative 4 due to the higher

level of temporary roads authorized in this alternative. It does not reduce AIZ road miles nearly as much as alternative 5, even though it reduces upland miles much more than alternative 5. Negative impacts, if any, are expected to be short-term and minor due to AIZ buffers. Road-related sedimentation of Trail and Johnson creeks would be reduced. A portion of road 20297 adjacent to Trail Creek and road 20126 adjacent to Johnson Creek would be relocated away from each stream. The percentage of substrate comprised of fine sediment in both streams would probably be reduced below its current level of 75-100%. In Johnson Creek, which is less dominated by beaver ponds that retain sediment, the sediment level is expected to approach 50%. The extent to which sediment limits trout populations, by covering gravel substrate habitat needed for spawning and the macroinvertebrate food base would be reduced. Conifer encroachment on aspen, and the risk of intense wildfires, would be reduced which may help maintain the quality of riparian areas and protect fish populations.

Cumulative Effects
This alternative is not expected to add any incremental negative effects on fish or their habitat to the effects of past, present, and reasonably foreseeable future actions. Sediment inputs to Trail and Johnson creeks from roads and their future use would be reduced. No new activities are foreseen in the area.

Alternative 3
Direct and Indirect Effects
This alternative would probably have a long-term positive effect on fish habitat and fish, but to a lesser extent than Alternatives 2, 4, and 5. Negative impacts, if any, would be short-term and minor due to AIZ buffers and the lack of road construction. Road-related sedimentation of Trail and Johnson creeks would not be reduced. No portion of road 20297 adjacent to Trail Creek and road 20126 adjacent to Johnson Creek would be relocated away from each stream. The percentage of substrate comprised of fine sediment in both streams would probably not be reduced below its current level of 75-100%. The extent to which sediment limits trout populations, by covering gravel substrate habitat needed for spawning and the macroinvertebrate food base would probably not be reduced. Conifer encroachment on aspen, and the risk of intense wildfires, would be reduced which may help maintain the quality of riparian areas and protect fish populations.

Cumulative Effects
This alternative is not expected to add any incremental negative effects on fish or their habitat to the effects of past, present, and reasonably foreseeable future actions. No new activities are foreseen in the area.

Alternative 4
Direct and Indirect Effects
The alternative would have a long-term positive effect on fish habitat and fish, and to a greater extent than Alternatives 2 and 3 and a lesser extent than Alternative 5. Alternative 4 would be about the same benefit as alternative 5 to all watersheds except Johnson Creek, where alternative 5 is more beneficial due to the much greater decrease in

miles of roads within the AIZ of Johnson Creek. Negative impacts, if any, are expected to be short-term and minor due to AIZ buffers. Road-related sedimentation of Trail and Johnson creeks would be reduced. A portion of Forest Road 20297 adjacent to Trail Creek and Forest Road 20126 adjacent to Johnson Creek would be relocated away from each stream. The lower section of road 20574 that is near an intermittent tributary to Johnson Creek would be relocated. The percentage of substrate comprised of fine sediment in both streams would probably be reduced below its current level of 75-100%. In Johnson Creek, which is less dominated by beaver ponds that retain sediment, attainment of a sediment level of 50% or less is expected. The extent to which sediment limits trout populations, by covering gravel substrate habitat needed for spawning and the macroinvertebrate food base would be reduced. Conifer encroachment on aspen, and the risk of intense wildfires, would be reduced which may help maintain the quality of riparian areas and protect fish populations.

Cumulative Effects
This alternative would not add any incremental negative effects on fish or their habitat to the effects of past, present, and reasonably foreseeable future actions. Sediment inputs to Trail and Johnson creeks from roads and their future use would be reduced to a greater extent than under alternatives 2 and 3. No new activities are foreseen in the area.

Alternative 5
Direct and Indirect Effects
The alternative would have a long-term positive effect on fish habitat and fish, and to a greater extent than Alternatives 2, 3 and 4. Alternative 5 would be about the same benefit as alternative 4 to all watersheds except Johnson Creek, where it is the most beneficial by moving the most miles out of the AIZ, and in particular to the AIZ of the lower perennial reach. Negative impacts, if any, are expected to be short-term and minor due to AIZ buffers. Road-related sedimentation of Trail and Johnson creeks would be reduced. Road 20297 adjacent to Trail Creek and portions of road 20126 adjacent to Johnson Creek would be relocated away from each stream. The percentage of substrate comprised of fine sediment in both streams would probably be reduced below its current level of 75-100%. In Johnson Creek, which is less dominated by beaver ponds that retain sediment, attainment of a sediment level of 50% or less is expected. The extent to which sediment limits trout populations, by covering gravel substrate habitat needed for spawning and the macroinvertebrate food base would be reduced. Conifer encroachment on aspen, and the risk of intense wildfires, would be reduced which may help maintain the quality of riparian areas and protect fish populations.

Cumulative Effects
This alternative would not add any incremental negative effects on fish or their habitat to the effects of past, present, and reasonably foreseeable future actions. Sediment inputs to Trail and Johnson creeks from roads and their future use would be reduced to a greater extent than any other alternative. No new activities are foreseen in the area.

4.8 Transportation and Access

***Cumulative Effects* Analysis Area**: The Cumulative effects analysis Area is the project area.

The table below summarizes the information displayed in Chapter III for the project area by Forest Plan Prescription Area. For the remainder of this section information will be displayed by the total for the project area. The information will be displayed this way to be consistent with the numbers and maps shown in Chapter II.

Table 4.8-1 Access/Road Status: Numbers below are for the 17.4 square mile project area only and are broken down by Forest Plan prescription block. The analysis does not include roads on private land.

Status	Miles				Miles/Sq Mile		
	R_x 5.2 (c,f)	R_x 2.7.1 (d)	Total Miles		R_x 5.2 (c,f)	R_x 2.7.1 (d)	Total
Square Miles	**13.6**	**3.8**	**17.4**	**R_x Allowable Miles/Sq Mile**	**none**	**1.5**	
Open	39.2	7.7	46.9		2.9	2.0	4.9
Closed	8.9	0.4	9.3		0.7	0.09	0.7
Total	**48.1**	**8.0**	**56.1**		**3.5**	**2.1**	**5.6**

Alternative 1

Direct and Indirect Effects

Under the No-action alternative, none of the proposed activities described in any of the action alternatives would occur. Current uses and activities would continue. Roads conditions would stay the same or worsen. Condition would depend on available maintenance funds, which are currently very limited. The best that can be expected is that they would stay the same, but more than likely without project generated funds the overall conditions will worsen.

Status	Miles	Miles/Sq Mile
Square Miles	**17.4**	
Open	46.9	4.9
Closed	9.3	0.7
Total	**56.1**	**5.6**

Cumulative Effects

None of the road improvements indicated in the proposed action would take place.

Alternative 2

Direct and Indirect Effects

The road activities described in chapter II for the proposed action would occur. The effect of reconstruction to transportation routes would be an improvement of access within the project area. Safety within the project area would also benefit over time with road widths and surfaces upgraded. However, safety concerns do exist when haul trucks mix with other forest road users

Status	Current		Post Alternative 2	
	Miles	Miles/Sq Mile	Miles	Miles/Sq Mile
Square Miles	**17.4**		17.4	
Open	46.9	4.9	46.8	2.7
Closed	9.3	0.7	8.7	0.5
Total	**56.1**	**5.6**	**55.5**	**3.2**

Cumulative Effects

The improvement of roads as a result of timber activities would provide more efficient and safer travel through the project area as well as reduce erosion. Realigning road 20574 will provide improved access and increased resource protection. Relocating road 20126 will improve drainage thereby increasing safety and resource protection. One section of road 20126 re-alignment will align the road such that the stream will stay in the channel and not down the road. Relocating road 20297 increases the distance between the stream and the road and will also provide improved recreation access. Deferred Maintenance cost will be reduced on the improved roads. Existing roads will be in better condition in the future and provide better access.

Alternative 3

Activities described in Chapter II for Alternative 3 would occur. The condition of open roads would not be improved. There would be no road reconstruction. Access in the project area would stay the same or worsen.

Status	Current		Post Alternative 3	
	Miles	Miles/Sq Mile	Miles	Miles/Sq Mile
Square Miles	**17.4**		**17.4**	
Open	**46.9**	**4.9**	47	2.7
Closed	9.3	0.7	9	0.5
Total	**56.1**	**5.6**	**56**	**3.2**

Cumulative Effects

Roads currently in poor locations would not be rerouted to reduce damage to resources and safety would not be improved.

Alternative 4

Direct and Indirect Effects

The road activities described in chapter II for alternative 4 would occur. The effect of reconstruction to transportation routes would be an improvement of access within the project area. Safety within the project area would also benefit over time with road widths and surfaces upgraded. However, safety concerns do exist when haul trucks mix with other forest road users

Status	Current		Post Alternative 4	
	Miles	Miles/Sq Mile	Miles	Miles/Sq Mile
Square Miles	**17.4**		**17.4**	
Open	**46.9**	**4.9**	47	2.7
Closed	9.3	0.7	9	0.5
Total	**56.1**	**5.6**	**56**	**3.2**

Cumulative Effects

The improvement of roads as a result of timber activities would provide more efficient and safer travel through the project area as well as reduce erosion. Realigning road 20574 will provide safer access by increasing site distance and vertical alignment of current intersection with 20126. Relocating road 20126 will improve drainage thereby increasing safety and resource protection. One section of road 20126 re-alignment will align the road such that the stream will stay in the channel and not down the road. Relocating road 20297 increases the distance between the stream and the road and will also provide improved recreation access. Deferred Maintenance cost will be reduced on the improved roads. Existing roads will be in better condition in the future and provide better access.

Alternative 5

Direct and Indirect Effects

The road activities described in chapter II for alternative 5 would occur. The difference between alternative 4 and alternative 5 is realigning road 20574 as primary access to Johnson Creek to save money, eliminate problematic road sections and provide safe access. Primary access to Johnson Creek across private land is estimated to cost $118,500 for road construction improvements as opposed to realignment construction of road 20574 cost of $80,000. Realignment of road 20574 would provide the opportunity to eliminate problem road sections and improve access to the Johnson Creek area. Safety within the project area would also benefit with road widths and surfaces upgraded. However, safety concerns do exist when haul trucks mix with other forest road users.

Status	Current		Post Alternative 5	
	Miles	Miles/Sq Mile	Miles	Miles/Sq Mile
Square Miles	**17.4**		**17.4**	
Open	**46.9**	**4.9**	47	2.7
Closed	9.3	0.7	8	0.5
Total	**56.1**	**5.6**	**55**	**3.2**

Cumulative Effects

The improvement of roads as a result of timber activities would provide more efficient and safer travel through the project area as well as reduce erosion. Relocating all of road 20574 will provide legal access to Johnson Creek, Dry Creek and Burchertt Canyon

without having to cross sections of private land that currently do not have access agreements. The new alignment would also provide safer access by increasing site distance and vertical alignment of the current intersection with 20126. Realigning sections of road 20126 will improve drainage such that the stream would stay in the channel and not run down the road. Obliterated sections of road 20126 and 20575 would move the road away from the riparian and decrease long term sediment delivery in Johnson Creek. Relocating road 20297 increases the distance between the stream and the road and will also provide improved recreation access. Deferred Maintenance cost will be reduced on the improved roads. Existing roads will be in better condition in the future and provide better access.

4.9 Timber Production

***Cumulative Effects* Analysis Area**: The Caribou National Forest.

Alternative 1

Direct and Indirect Effects

Under the No-action alternative, none of the proposed activities described in any of the action alternatives would occur. Of the Allowable Sale Quantity (ASQ) acres within the project all would remain available for commodity production for the next 10 to 15 years. Available/merchantable saw log on the Douglas-fir type would likely decrease as Douglas –fir beetle continues to kill the large diameter Douglas-fir in these stands.

Cumulative Effects

This alternative would not contribute to the Forests ability to provide goods and services within the productive capability of the lands in Forest Plan prescription 5.2.

Alternative 2

Direct and Indirect Effects

Activities described in Chapter II for the proposed action would occur. Approximately 744 ASQ acres would be treated. Forest products would be maximized on the ASQ acres treated. Approximately 650 acres that do not have merchantable products, subject to RFP harvest limitations or otherwise unfeasible for harvesting, would be included in the prescribed burn.

Cumulative Effects

This alternative would contribute to the Forests ability to provide goods and services within the productive capability of the lands in Forest Plan prescription 5.2.

Alternative 3

Activities described in Chapter II for the Alternative 3 would occur. Approximately 245 ASQ acres would be treated. Forest products would not be maximized on ASQ acres treated because of new road construction limitations within the alternative. Approximately 634 acres would be burned without capturing the economic value of accessible timber.

Cumulative Effects
This alternative would contribute to the Forest's ability to provide goods and services within the productive capability of the lands in Forest Plan prescription 5.2.

Alternative 4
Activities described in Chapter II for the proposed action would occur. Approximately 438 ASQ acres would be treated. Forest products would be maximized on the ASQ acres treated. Approximately 789 acres that do not have merchantable products, subject to RFP harvest limitations or otherwise unfeasible for harvesting, would be included in the prescribed burn.

Cumulative Effects
This alternative would not contribute to the Forest's ability to provide goods and services within the productive capability of the lands in Forest Plan prescription 5.2.

Alternative 5
Activities described in Chapter II for the proposed action would occur. Approximately 430 ASQ acres would be treated. Forest products would be maximized on the ASQ acres treated. Approximately 802 acres that do not have merchantable products, subject to RFP harvest limitations or otherwise unfeasible for harvesting, would be included in the prescribed burn.

Cumulative Effects
This alternative would not contribute to the Forest's ability to provide goods and services within the productive capability of the lands in Forest Plan prescription 5.2.

4.10 Air Quality

***Cumulative Effects* Analysis Area**: The cumulative effects area is Airshed 20.

Alternative 1 (No Action)
Direct and Indirect Effects
There would be no impact to air quality. Impacts from current dust, domestic wood smoke, burn permits, and vehicle emissions in the area would continue to occur. Wildfires would continue to be suppressed and mechanical treatment of fuels would not occur, thus promoting higher levels of available fuel for future fires. Emissions from potential wildfires would be greater than emissions from prescribed fires, primarily due to fuel moisture. Prescribed fires would not occur when fuels are very dry, so there would be less fuel consumed and less emissions produced. Wildfires would burn when fuels are very dry, and would tend to cover large areas. Significant amounts of particulates and gases would be released in a short amount of time, due to more intense burning. These impacts would occur in mid-late summer and early fall.

Cumulative Effects
There are no ongoing and reasonably foreseeable prescribed fire activities that would affect the air quality in and around the project area. Present air quality and visibility is

considered good in the area and should remain constant unless wildfire, prescribed fire, or agricultural burning takes place. Air quality may be adversely affected in the short-term in the event of wildfire, prescribed fire or agricultural burning.

Direct and indirect effects common to Alternatives 2, 3, and 4
Weather forecasts and fuel moisture conditions dictate the number of day's ignition would actually take place. Based on experience, an estimated five to ten days would occur each spring or fall (depending on alternative). Following ignition, residual smoke would be expected to occur for up to five days until weather conditions, usually in the form of intermittent rain showers, extinguish the burn. However, based on local experience, a one to two day degradation of air quality would be expected in local communities.

The Montana/Idaho Airshed Monitoring Unit is a regulatory group that coordinates smoke emissions by management ignited prescribed fire, discussed in Chapter 3, with the intent of limiting emissions to meet state and federal air quality regulations. All prescribed burning would need to be authorized prior to ignition.

Alternative 2 (Proposed Action)
Direct and Indirect Effects
The amount of PM_{10} and $PM_{2.5}$ emissions resulting from burning would be approximately 273 and 230 tons based on smoke emissions modeling using the First Order Fire Effects Model (FOFEM v. 4.0) and the Consume model (v.2.1). Most of the burning would occur in the fall; however some of the acreage may be burned in the spring. Burning is anticipated to occur approximately six years with an average annual PM_{10} and $PM_{2.5}$ emission of 46 to 38 tons. Since total emissions (PM_{10} or $PM_{2.5}$**)** will not exceed 100 tons per year, this alternative would meet NAAQS standards (Acheson et. al., 2000).

Table 4.10-1: Emissions for Alternative 2.

Activity Areas	Category	Acres	PM^{10} (Tons)	$PM^{2.5}$ (Tons)
All activity areas[1]	Hand & Landing Piles	Various	34	29
Harvest then Burn [2]	Aspen/Conifer	564	92	78
	Douglas-fir	109	36	30
Prescribed Burn [2]	Aspen/Conifer	456	88	74
	Mountain/Sage Brush	213	26	21
Total Emissions			**276**	**232**

[1] Consume model was used to estimate emissions from the hand and landing piles.
[2] FOFEM model was used to estimate emissions for the harvest and burn, and the prescribed burn areas.

Cumulative Effects
The emissions from the burning activities and when combined with the existing local emissions, the cumulative air quality concentrations would be well within NAAQS and State of Idaho air quality standards. However, these alternatives in combination with other future wildfires, prescribed fires, or agricultural burning could cumulatively affect air quality within the airshed to a point that burning restrictions are imposed.

Alternative 3

Direct and Indirect Effects

The effects would be similar as described for Alternative 2, except for fewer acres in the harvest and burn units, and the prescribed burn units. The amount of PM_{10} and $PM_{2.5}$ emissions resulting from burning would be approximately 156 and 132 tons. Most of the burning would occur in the fall; however some of the acreage may be burned in the spring. Burning is anticipated to occur over approximately four years with an average annual PM_{10} and $PM_{2.5}$ emission of 39 to 33 tons. Since total emissions (PM_{10} or $PM_{2.5}$) will not exceed 100 tons per year, this alternative would meet NAAQS standards (Acheson et. al., 2000).

Table 4.10-2: Emissions for Alternative 3.

Activity Areas	Category	Acres	PM^{10} (Tons)	$PM^{2.5}$ (Tons)
All activity areas[1]	Hand & Landing Piles	Various	11	10
Harvest then Burn [2]	Aspen/Conifer	183	30	25
	Douglas-fir	17	6	5
Prescribed Burn [2]	Aspen/Conifer	437	84	71
	Mountain/Sage Brush	209	25	21
Total Emissions			**156**	**132**

[1] Consume model was used to estimate emissions from the hand and landing piles.

[2] FOFEM model was used to estimate emissions for harvest and burn, and the prescribed burn areas.

Cumulative Effects

See Alternative 2

Alternative 4

Direct and Indirect Effects

The effects would be similar as described for Alternative 2, except for fewer acres in the harvest and burn units, and an increase in acres in the prescribed burn units. The amount of PM_{10} and $PM_{2.5}$ emissions resulting from burning would be approximately 217 and 184 tons. Most of the burning would occur in the fall; however some of the acreage may be burned in the spring. Burning is anticipated to occur over approximately six years with an average annual PM_{10} and $PM_{2.5}$ emission of 36 to 31 tons. Since total emissions (PM_{10} or $PM_{2.5}$) will not exceed 100 tons per year, this alternative would meet NAAQS standards (Acheson et. al., 2000).

Table 4.10-3: Emissions for Alternative 4

Activity Areas	Category	Acres	PM^{10} (Tons)	$PM^{2.5}$ (Tons)
All activity areas[1]	Hand & Landing Piles	Various	19	16
Harvest then Burn [2]	Aspen/Conifer	354	58	49
	Douglas-fir	31	10	9
Prescribed Burn [2]	Aspen/Conifer	476	91	77
	Mountain/Sage Brush	324	39	33
Total Emissions			**217**	**184**

[1] Consume model was used to estimate emissions from the hand piles.

[2] FOFEM model was used to estimate emissions for harvest and burn, and the prescribed burn areas.

Cumulative Effects

See Alternative 2.

Alternative 5

Direct and Indirect Effects

The effects would be similar as described for Alternative 2, except for fewer acres in the harvest and burn units, and an increase in acres in the prescribed burn units. The amount of PM_{10} and $PM_{2.5}$ emissions resulting from burning would be approximately 218 and 185 tons. Most of the burning would occur in the fall, however some of the acreage may be burned in the spring. Burning is anticipated to occur over approximately six years with an average annual PM_{10} and $PM_{2.5}$ emission of 36 to 31 tons. Since total emissions (PM_{10} or $PM_{2.5}$**)** will not exceed 100 tons per year, this alternative would meet NAAQS standards (Acheson et. al., 2000).

Table 4.10-4: Emissions for Alternative 5

Activity Areas	Category	Acres	PM^{10} (Tons)	$PM^{2.5}$ (Tons)
All activity areas[1]	Hand & Landing Piles	Various	19	16
Harvest then Burn [2]	Aspen/Conifer	368	60	51
	Douglas-fir	17	6	5
Prescribed Burn [2]	Aspen/Conifer	490	94	80
	Mountain/Sage Brush	324	39	33
Total Emissions			**218**	**185**

[1] Consume model was used to estimate emissions from the hand piles.

[2] FOFEM model was used to estimate emissions for harvest and burn, and the prescribed burn areas.

Cumulative Effects

See Alternative 2.

4.11 Visuals

***Cumulative Effects* Analysis Area**: The project area is the cumulative effects area.

Alternative 1 (No Action)

Direct, Indirect, and Cumulative Effects

No change to scenic integrity, so VQO's will continue to be met. Natural succession to conifer in the project area will result in less diversity in species composition which will result in less color, texture, and pattern. The most obvious effect to the forest visitor will be less and less fall colors. The opportunity to improve scenic integrity through the obliteration of unneeded roads would not be realized.

Alternative 2, 3, 4 and 5

Direct, Indirect, and Cumulative Effects

Action alternatives would have some effects to visual quality in the short term because of harvest and burning activities. Because all harvest units will be designed with irregular boundaries and islands of "leave" trees, VQO's will be met in both the partial retention and modification prescription areas of the project area. The same will be true for the prescribed burn areas because the mosaic nature of the burn will also result in irregular boundaries and islands of "leave" trees.

In addition, the treatment units in the Partial Retention area can not be seen from the US Hwy. 30 view corridor.

In the long term, scenic integrity will be enhanced by the increased diversity in color, texture, and pattern specifically due to increased aspen across the landscape.

In alternatives 2, 4 and 5. Obliteration, recontouring and seeding old roads should enhance scenic integrity in limited areas of the project area.

4.12 Tribal Treaty Rights

***Cumulative Effects* Analysis Area:** This is southern and central Idaho.

Effects Common to All Action Alternatives
All alternatives will maintain tribal treaty rights and the resources upon which those rights rely. Alternatives 2, 3, 4, and 5 would enhance those rights by improving the resources upon which they rely. Timber harvest and burning would increase the number of acres converted to early seral stage which are heavily relied upon by game species to sustain and expand current populations.

None of the alternatives would change access to federal lands on the Caribou-Targhee National Forest.
Cumulative Effects Common to All alternatives:
The cumulative effects analysis area for tribal treaty rights is southern and central Idaho. This area is chosen because it encompasses the majority of the area currently used by tribal members. In this area, the ability of Native Americans to practice their traditional culture has been reduced through loss of "unoccupied lands" and degradation of the resources over time. Dams along the Snake River affected salmon runs and limited the availability of salmon for consumption. Development of open space, access restrictions, and land disposals reduced unoccupied lands for practicing tribal treaty rights. Fire suppression, grazing, mining and timber harvest changed the vegetation and affected water quality. The Idaho National Engineering and Environmental Laboratory (INEEL) restricted access to vast acreages of federal lands.

In recent years, however, these trends are slowly being reversed and federal land managers have become more informed regarding treaty rights and trust responsibilities. Elk, moose and white-tailed deer numbers have increased. Federal and state agencies are enhancing native fish and wildlife habitat. In the shift towards ecosystem management federal land managers have reintroduced more natural processes such as fire across the landscape. These efforts to improve the condition of natural resources collectively serve to protect and begin restoration of tribal treaty rights.

The project area is a very small part of the cumulative effects area. Due to the altered nature of the area, it is unlikely that the project area is utilized much for exercise of treaty rights. The action alternatives, however, would enhance natural resources and thereby, treaty rights. Since the no action alternative maintains the status quo and the action

alternatives enhance tribal members' ability to practice treaty rights, this proposal would not add to negative cumulative impacts.

Alternative 1
Direct and Indirect Effects
In this alternative, tribal treaty rights to hunt, fish, and gather would remain as they currently exist.

No fish habitat exists within the project area; as such no changes can be expected by this alternative to fish habitats or tribal treat fishing rights.

Current trends in big game numbers would continue.

Gathering of native plants could still occur. The ability of Shoshone-Bannock tribal members to practice other traditions would not change

Alternative 2
Direct and Indirect Effects
This alternative proposes to treat approximately 1,541 acres by a combination of commercial harvest, precommercial thinning and prescribed burning. The proposed action would convert the greatest number of acres back to early successional stage. Alternative 2 would show the greatest net benefit to the habitat of big game within the project area.

No change can be expected by this alternative to fish habitats or tribal treaty fishing opportunities.

Gathering of native plants could still occur. The ability of Shoshone-Bannock tribal members to practice other traditions would not change. Tribal treaty rights to hunt, fish, and gather would remain as they currently exist.

Alternative 3
Direct and Indirect Effects
This alternative proposed to treat approximately 1,034 acres by a combination of commercial harvest, precommercial thinning and prescribed burning. The alternative would convert the least number of acres back to early successional stage. Alternative 3 would show the least net benefits to the habitat of big game within the project area.

Tribal treaty fishing opportunities would remain the same as under Alternative 2.

Gathering of native plants could still occur. The ability of Shoshone-Bannock tribal members to practice other traditions would not change. Tribal treaty rights to hunt, fish, and gather would remain as they currently exist.

Alternative 4
Direct and Indirect Effects
This alternative proposed to treat approximately 1,381 acres by a combination of commercial harvest, precommercial thinning and prescribed burning. The alternative would convert the third greatest number of acres back to early successional stage. Alternative 4 would show the third greatest net benefits, to the habitat of big game within the project area.

Tribal treat fishing opportunities would remain the same as under Alternative 2.

Gathering of native plants could still occur. The ability of Shoshone-Bannock tribal members to practice other traditions would not change. Tribal treaty rights to hunt, fish, and gather would remain as they currently exist.

Alternative 5
Direct and Indirect Effects
This alternative proposed to treat approximately 1,387 acres by a combination of commercial harvest, precommercial thinning and prescribed burning. The alternative would convert the second greatest number of acres back to early successional stage. Alternative 5 would show the second greatest net benefits, to the habitat of big game within the project area.

Tribal treat fishing opportunities would remain the same as under Alternative 2.

Gathering of native plants could still occur. The ability of Shoshone-Bannock tribal members to practice other traditions would not change. Tribal treaty rights to hunt, fish, and gather would remain as they currently exist.See direct and indirect effects for alternative 4

4.13 Irretrievable/Irreversible Effects

Vegetation - Timber volume production is irretrievably lost between the time a stand is harvested and full site-occupancy is achieved by the new stand of trees.

Soils - Refer to the Soils section in this chapter.

Hydrology - The main irretrievable effect to watershed resources for the action alternatives would be timber harvest and the conversion of land currently in vegetative production into new permanent road segments. There would be a net reduction in permanent road mileage under some alternatives. Possible other irretrievable effects to water quality and hydrologic integrity from alternatives 2, 3, 4 and 5 would include the potential for, increases in erosion from disturbed sites and sediment from road maintenance activities. Previous experience strongly indicates that the use of the appropriate watershed conservation practices will protect water quality and watershed health to the point that adverse effects from harvesting, transporting, planned new construction and route decommissioning activities will be minimized.

With the proper implementation of the appropriate BMPs, standards and guidelines and design features outlined earlier in this report, previous experience indicates that irreversible affects to water quality, hydrologic, riparian or watershed resources from any of the alternatives are unlikely.

4.14 Applicable Laws and Executive Orders

Several laws and executive orders require project-specific findings or other disclosures. These are included here and apply to all alternatives considered in detail in the DEIS.

National Forest Management Act

All project alternatives fully comply with the Revised Forest Plan. This project incorporates all applicable Forest Plan forest-wide standards and guidelines and management area prescriptions and complies with Forest Plan goals and objectives. This includes additional direction contained in all amendments. All required interagency reviews and coordination has been accomplished; new or revised measures resulting from these reviews have been incorporated.

Endangered Species Act

The following threatened and endangered species are considered when evaluating projects on the Caribou National Forest: gray wolf (*Canis lupus irremotus),* bald eagle (*Haliaeetus leucocephalus*), Canada lynx (*Lynx candensis),* and yellow-billed cuckoo (*Coccyzus americanus*). Analysis, disclosure of effects and details of concurrence by US Fish and Wildlife Service is in Chapter IV.

National Historic Preservation Act

Cultural resource surveys of varying intensities have been conducted, following inventory protocols approved by the State Historic Preservation Officer. Native American communities have been contacted and public comment encouraged. The consultation and concurrence process with the State Historic Preservation Officer has been concluded. No effects on known cultural resources are anticipated.

Clean Water Act

The design of project activities and roads is in accordance with Forest Plan standards and guidelines, the Regional Guide, Best Management Practices, and applicable Forest Service manual and handbook direction. Monitoring and evaluation of the implementation and effectiveness of Forest Plan standards and guidelines and Best Management Practices would occur. Project activities are expected to meet all applicable State of Idaho water quality standards. No permits under Section 404 of the Clean Water Act will be required. See analysis, Chapter IV.

Clean Air Act

Emissions anticipated from the implementation of any project alternative will be of a short duration and are not expected to exceed State of Idaho ambient air quality standards (18 AAC 50). See analysis, Chapter IV.

Executive Order on Floodplain and Wetlands(No. 11988 & No. 11990)
Implementation of any alternative will result in no net loss of wetlands.

Executive Order on Invasive Species (No. 13112, signed Feb. 3, 1999)
Implementation of any project alternative with design features is not anticipated to cause or promote the introduction or spread of invasive species. See management practices in Chapter II and analysis, Chapter IV.

Executive Order on Migratory Birds (NO. 13186, signed January 11,2001)
Management objectives from The Idaho Bird Conservation Plan (Version 1.0, January 2000, prepared by: Idaho Partners in Flight) would be met on all alternatives. This is the comprehensive planning effort that will be used in the interim until the Memorandum of Understanding with the US Fish and Wildlife Service is developed to promote the conservation of migratory bird population.

Roads Rule, Title 36, Code of Federal Regulations, Part 212.
These rules establish requirements for the administration of the forest development transportation system. A Roads Analysis has been completed for the portion of the project area affected by proposed road building, reconstruction, or obliteration.

4.15 Required Disclosures

4.15.1 Energy Requirements

Because the scope of the proposed action is limited both in terms of geographic area and extent of activities, the analysis disclosed in the FEIS shows that the Plan will have little or no effect on current local energy use and offers no opportunity for energy conservation.

4.15.2 Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Short-term uses are those uses that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource. Short-term use should not negatively affect long-term productivity. Based on chapter IV of this document, long-term productivity should be maintained or enhanced.

4.15.3 Possible Conflicts with Plans and Policies of Other Jurisdictions

No conflicts with other jurisdictions are anticipated as a result of this FEIS.

4.15.4 Environmentally Preferred Alternative

The Alternative 4 (preferred alternative) is the environmentally preferred alternative. Alternative 4 meets the purpose and need for saw log production, aspen restoration, stand

structure composition and improvements to the transportation system. The preferred alternative meets all standards and guidelines in the Revised Forest Plan.

4.15.5 Executive Order 12898 (Environmental Justice)

Federal actions to address Environmental Justice in Minority population and low-income populations, and Departmental Regulations 5600-2, direct Federal agencies to integrate environmental justice considerations into Federal programs and activities. Environmental justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment. Public involvement activities in Chapter 2 documents the efforts made to provide the opportunity to comment. Implementation of any project alternative is not anticipated to cause disproportionate adverse human health or environmental effects to minority or low-income populations.

V. LISTS – INCLUDING PREPARERS, SCOPING, AND BIBLIOGRAPHY

5.1 Interdisciplinary Team (IDT) and Consultants

The following individuals were primarily responsible for developing the analysis and the document.

Doug Heyrend	Team Leader / Recreation/ Forester
Dylan Johnson	Fuels Specialists / GIS Analysis
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Ann Keysor	Wildlife Biologist
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Craig Anderson	Forester
Maury Young	Visuals
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Dave Strahl	Engineer

5.2 Public Involvement

The following individuals, agencies, or groups responded to scoping.

Greater Yellowstone Coalition	Frank G. Beitia
Western Watersheds Project	Peter Riede
Idaho Conservation League	Jay Muir
United States Fish and Wildlife Service	Jack Sturm
Idaho Department of Parks and Recreation	Western Logging & Construction
Idaho Department of Environmental Quality	Harold Klein
Mark Steele	Louisiana Pacific Co.
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Bart Rhead	Ruth Shea & Rod Drewien

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APPENDIX A

Project *Maps*

Figure 1: 303 D Streams within the Project Area.

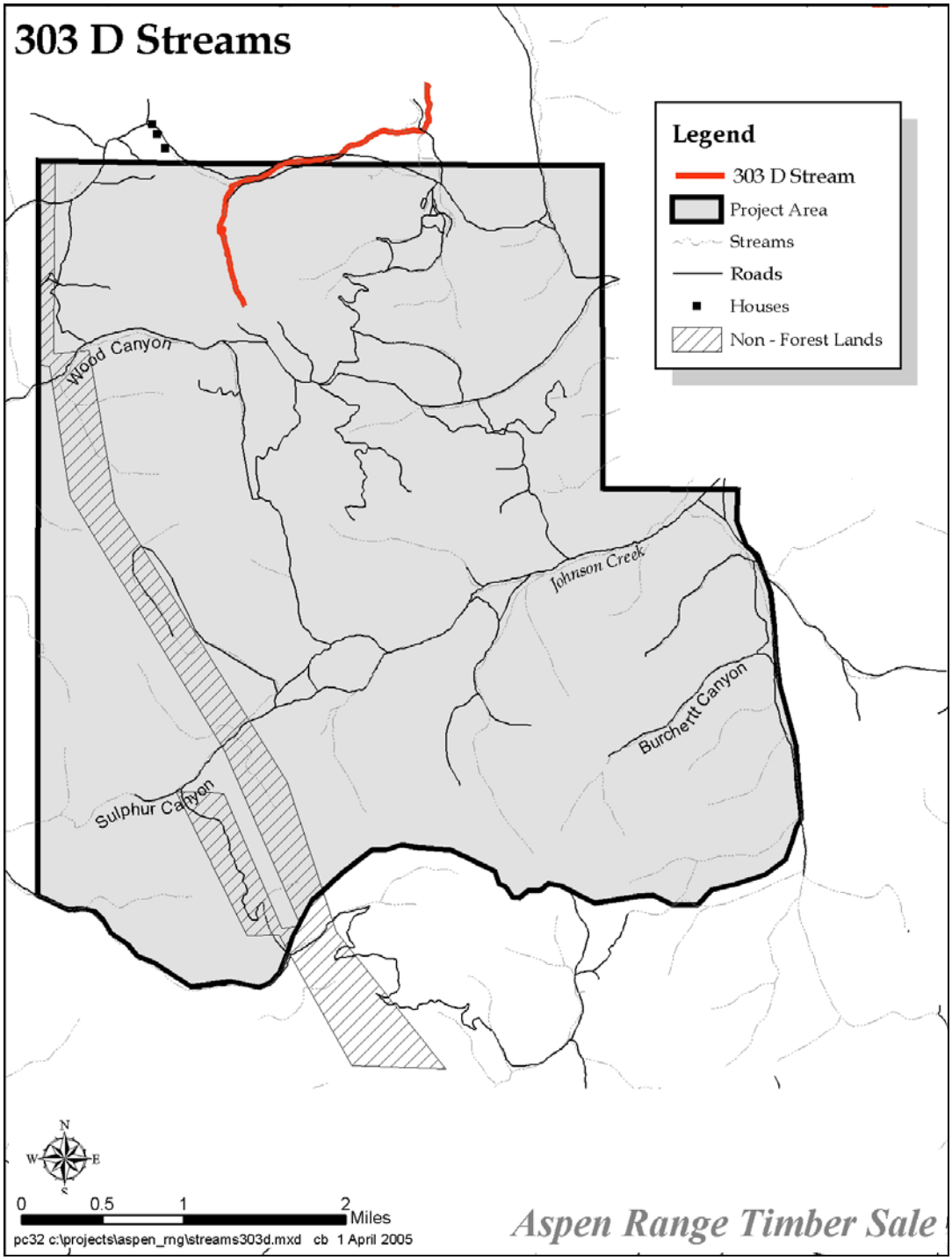


Figure 2: Alternative 2 Treatments

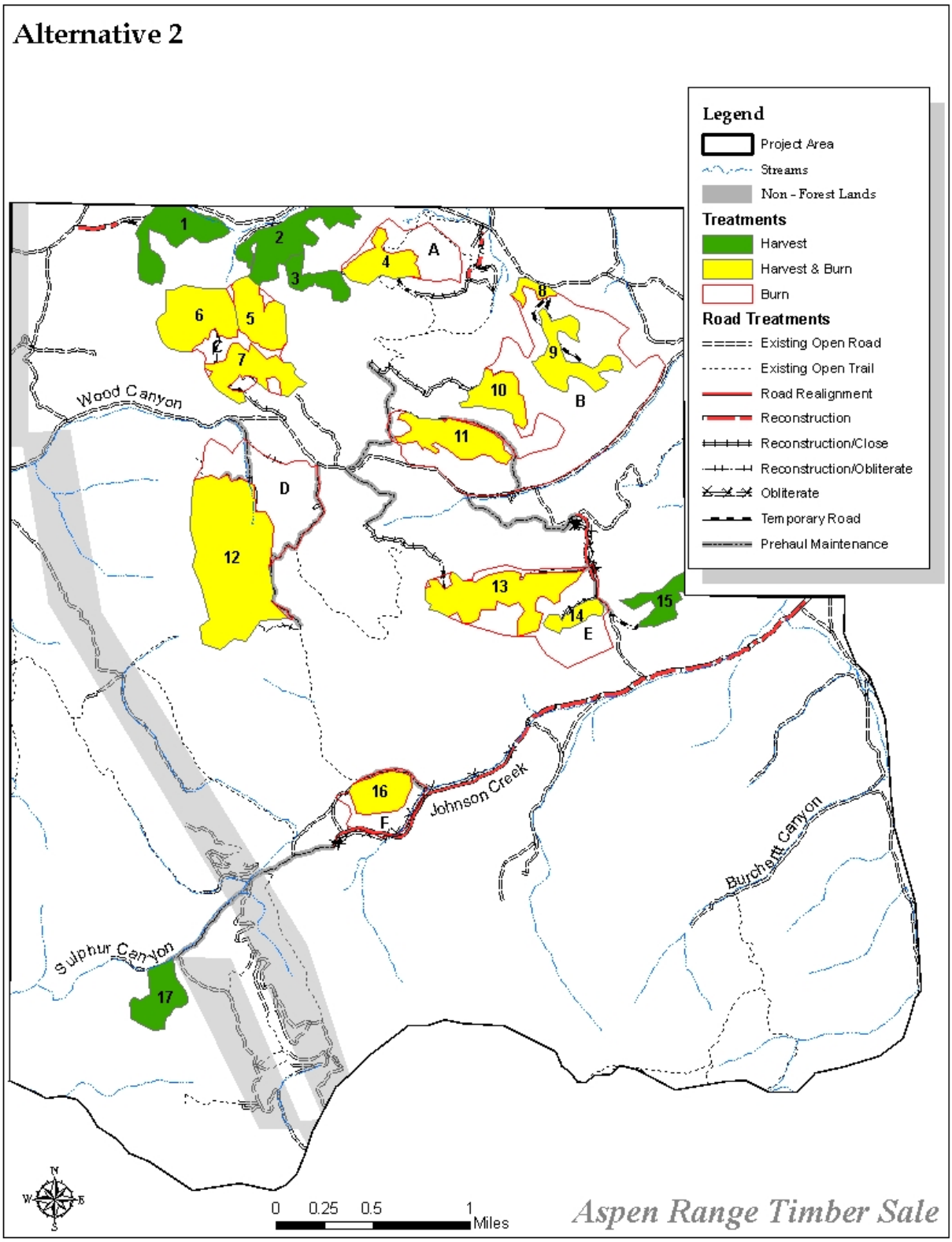


Figure 3: Alternative 3 Treatments

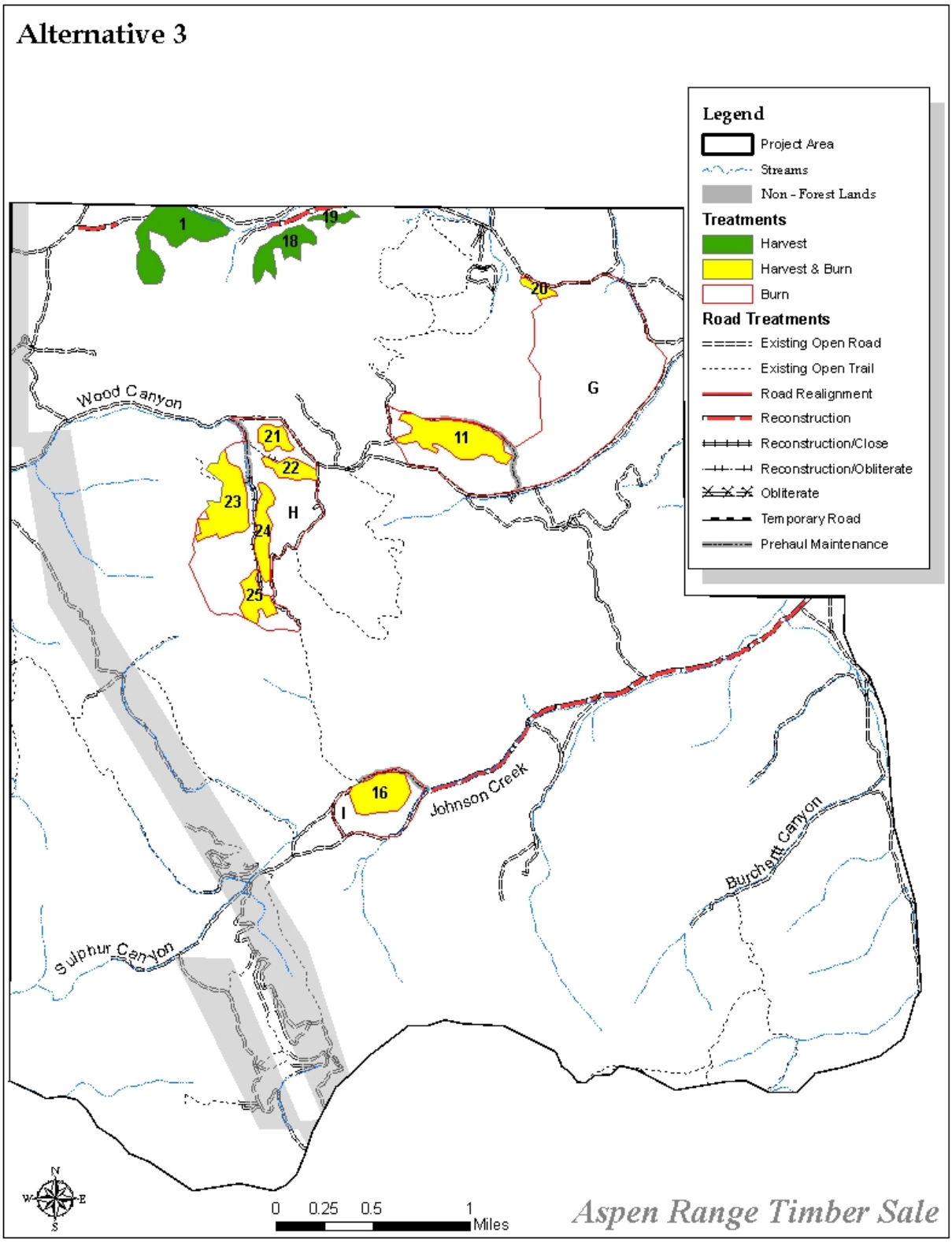


Figure 4: Alternative 4 Treatments

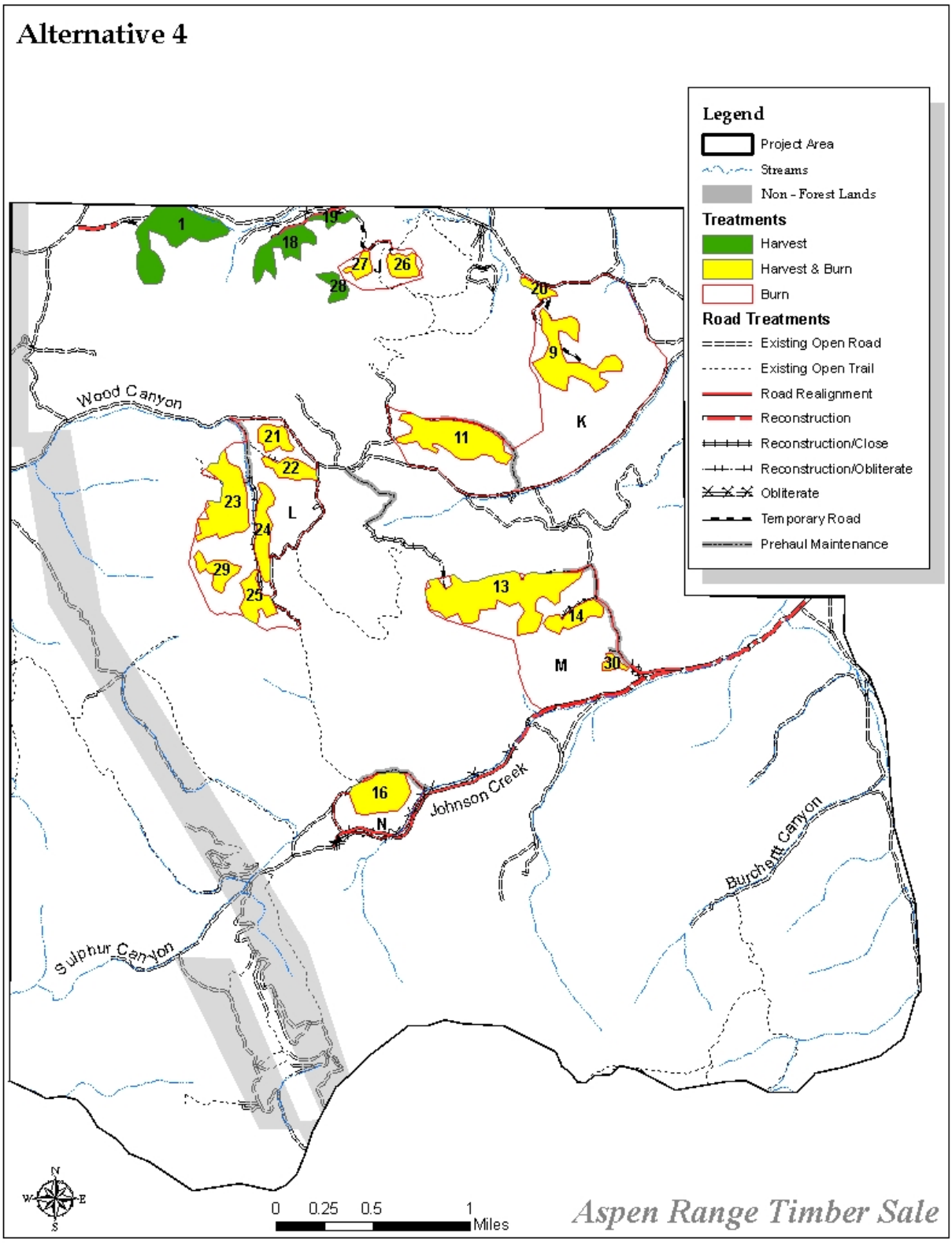


Figure 5: Alternative 5 Treatments

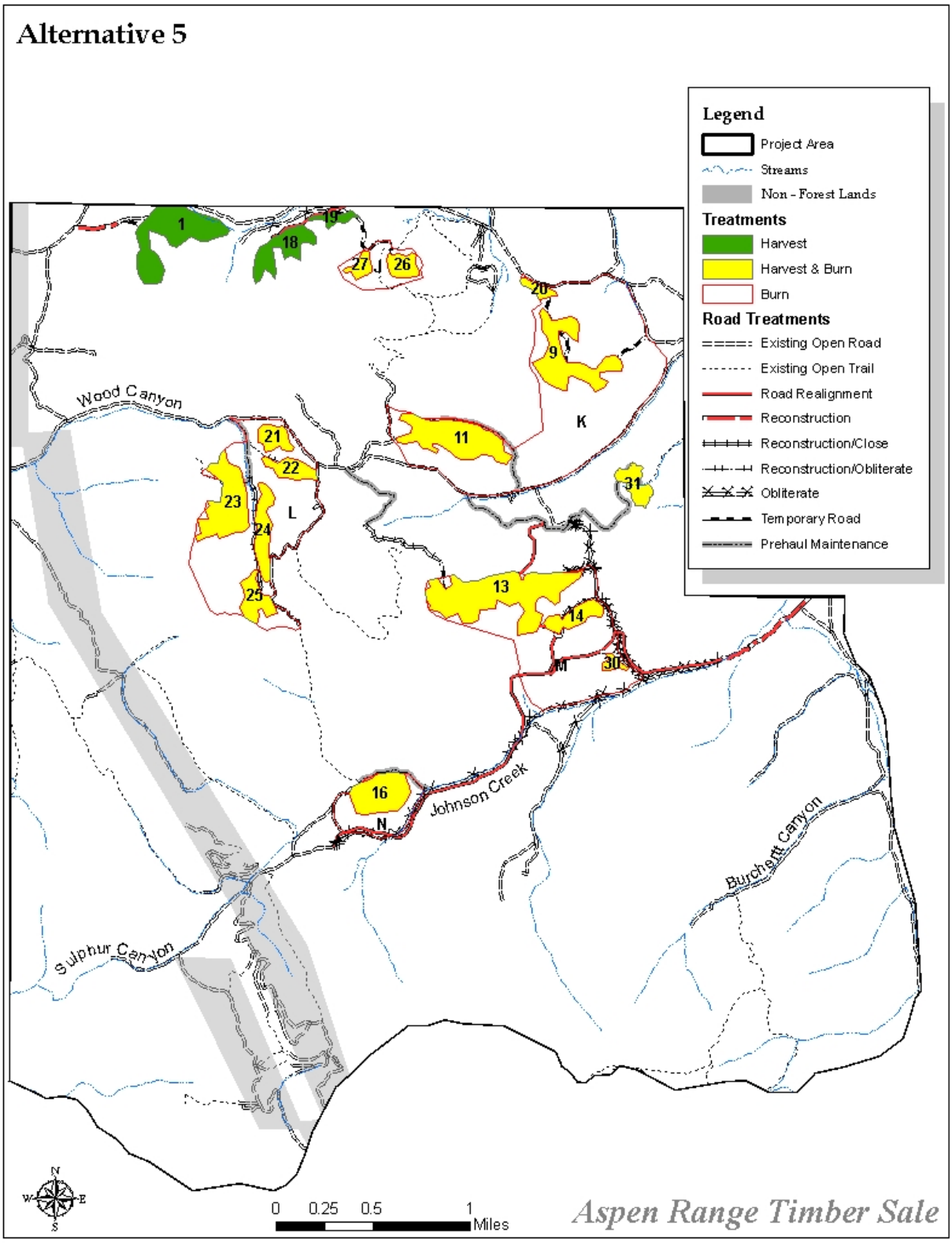


Figure 6: Goshawk Nesting Territory for the Aspen Range Project

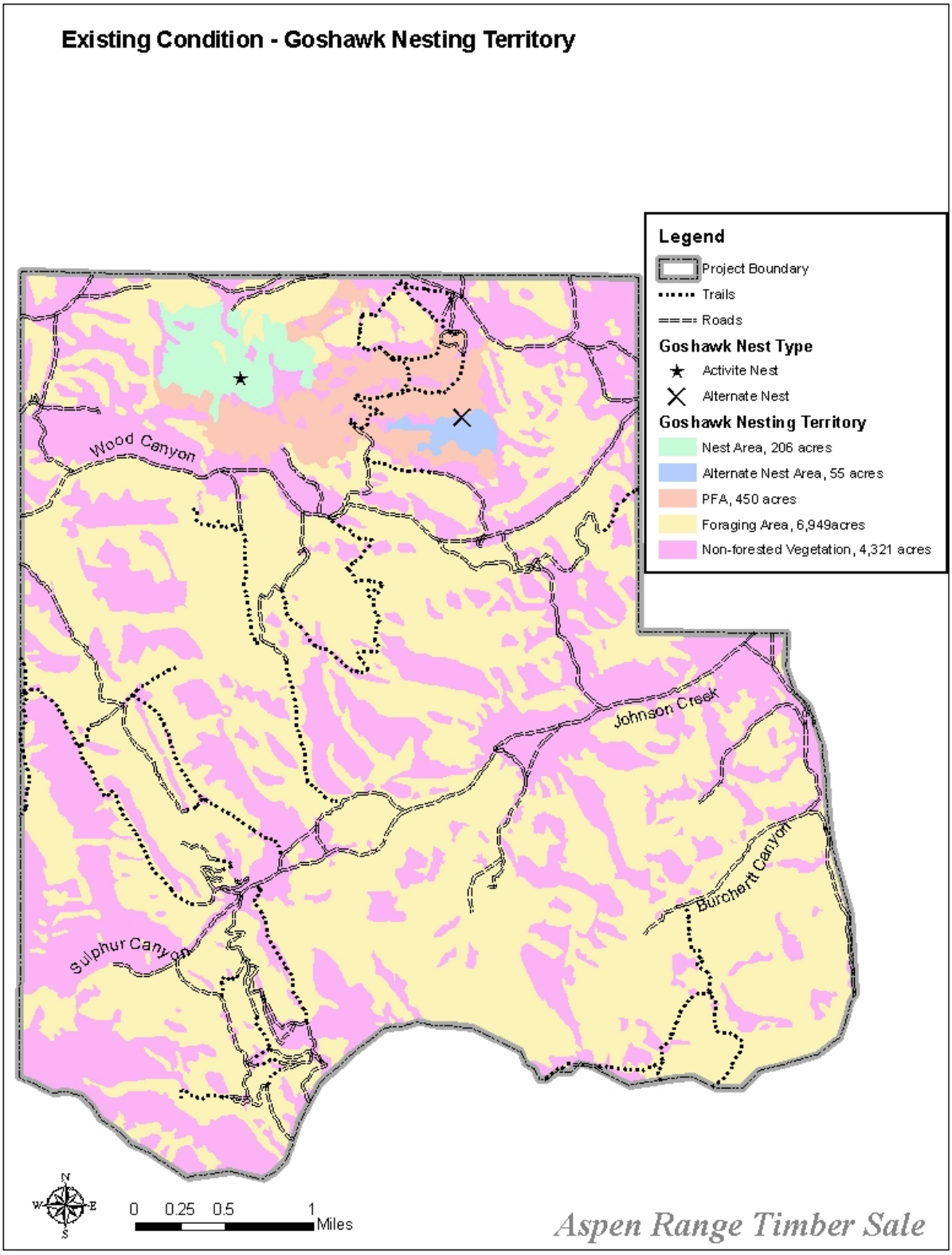


Figure 7: Goshawk Nesting Territory with Alternative 2 Treatments

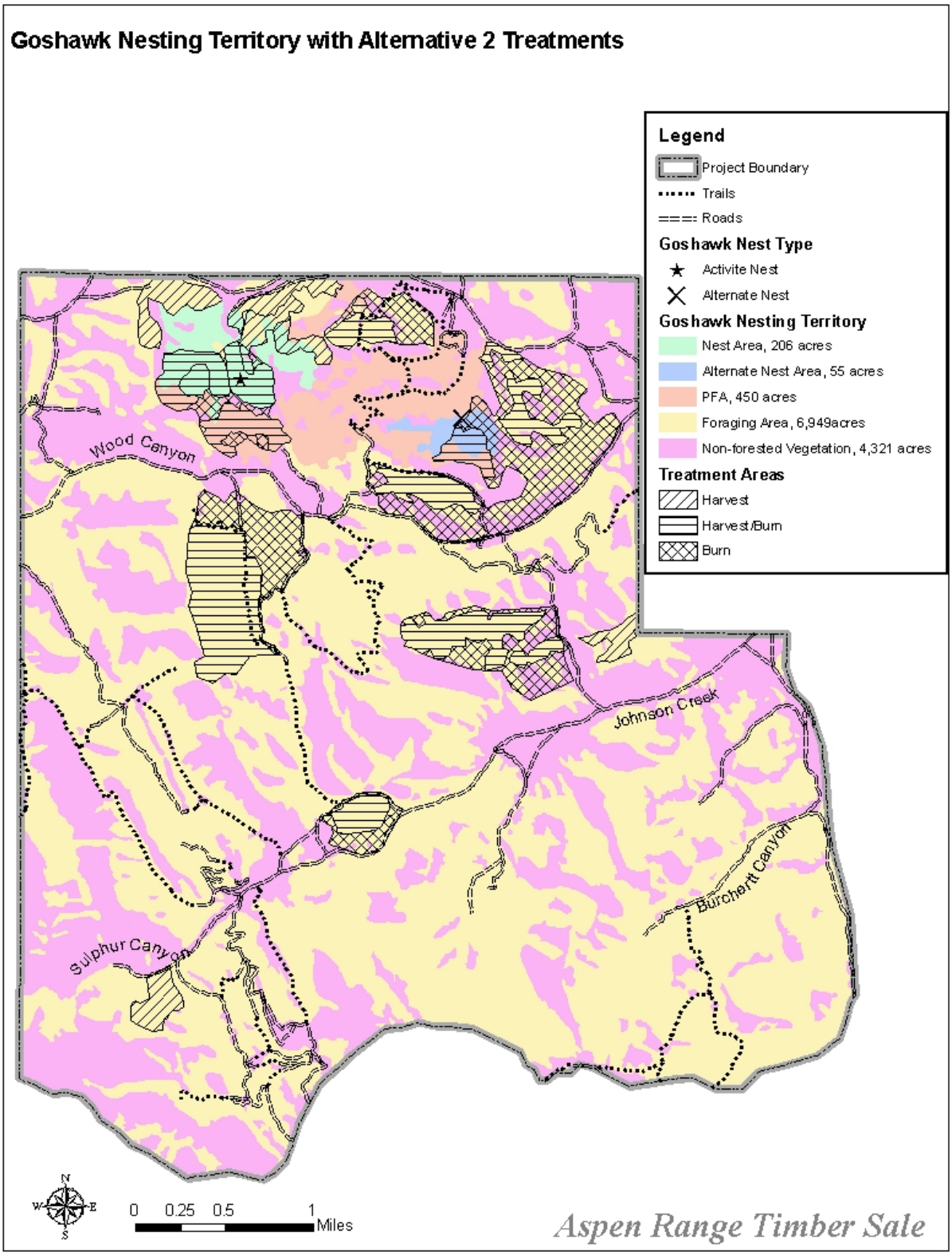


Figure 8: Goshawk Nesting Territory with Alternative 3 Treatments

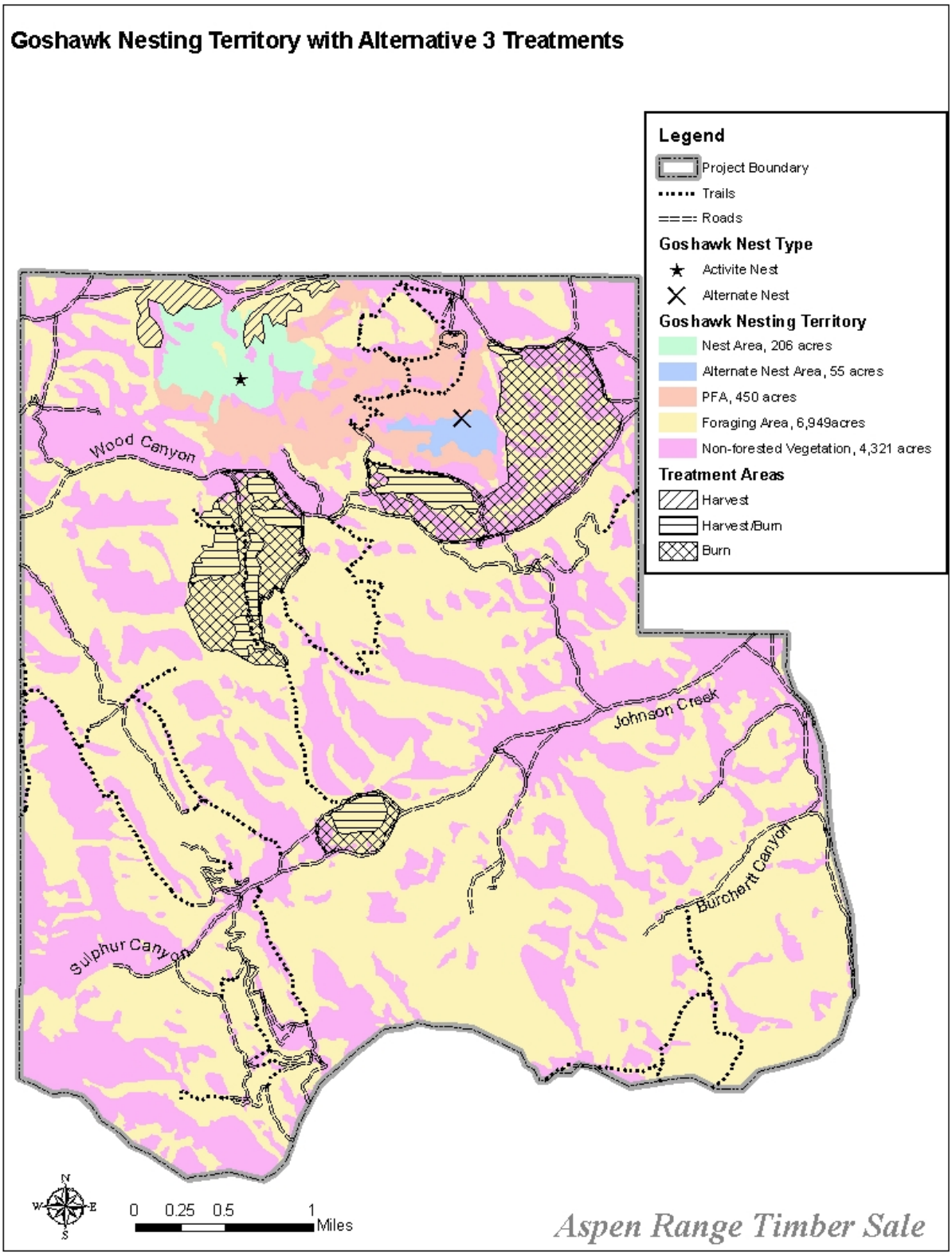


Figure 9: Goshawk Nesting Territory with Alternative 4 Treatments

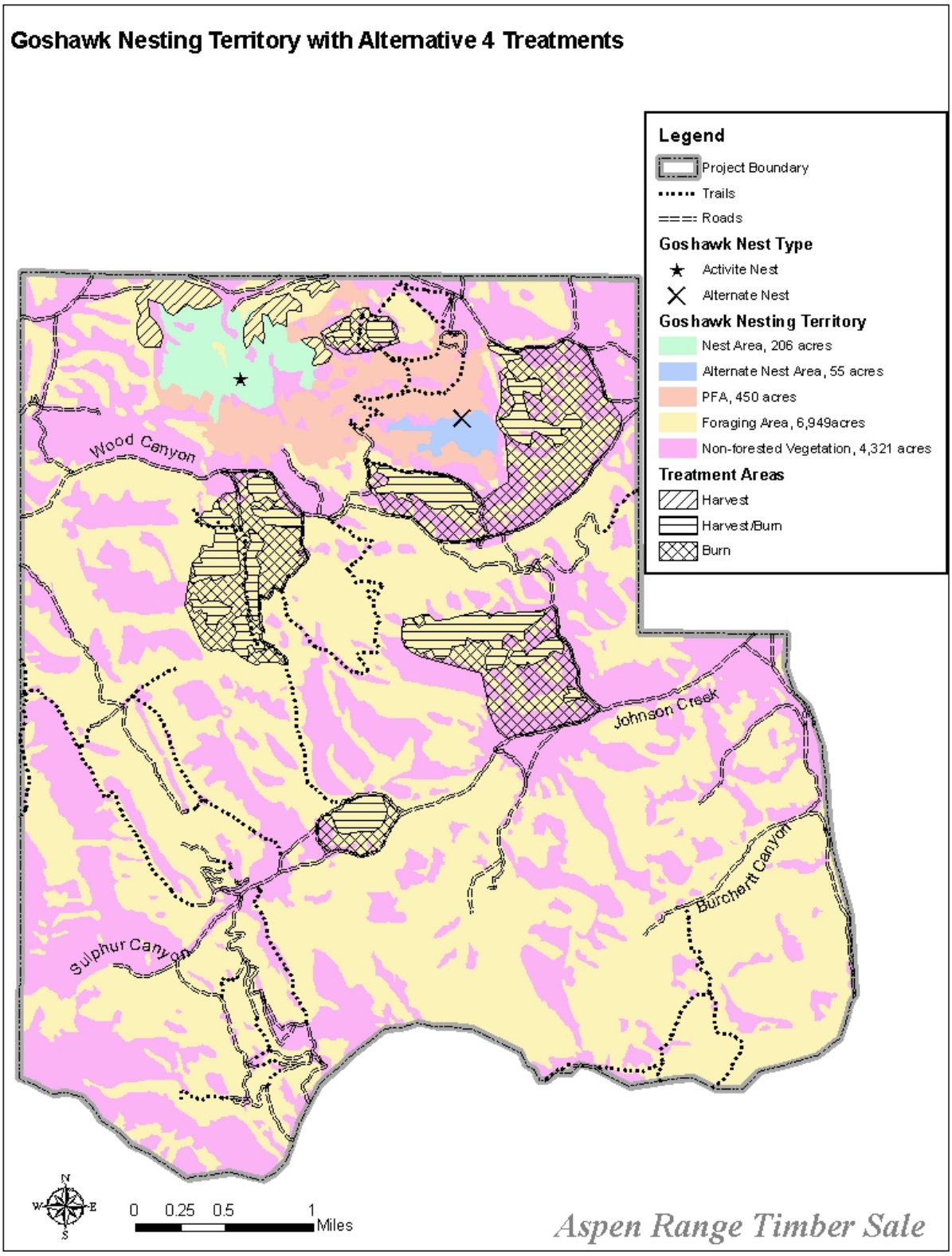
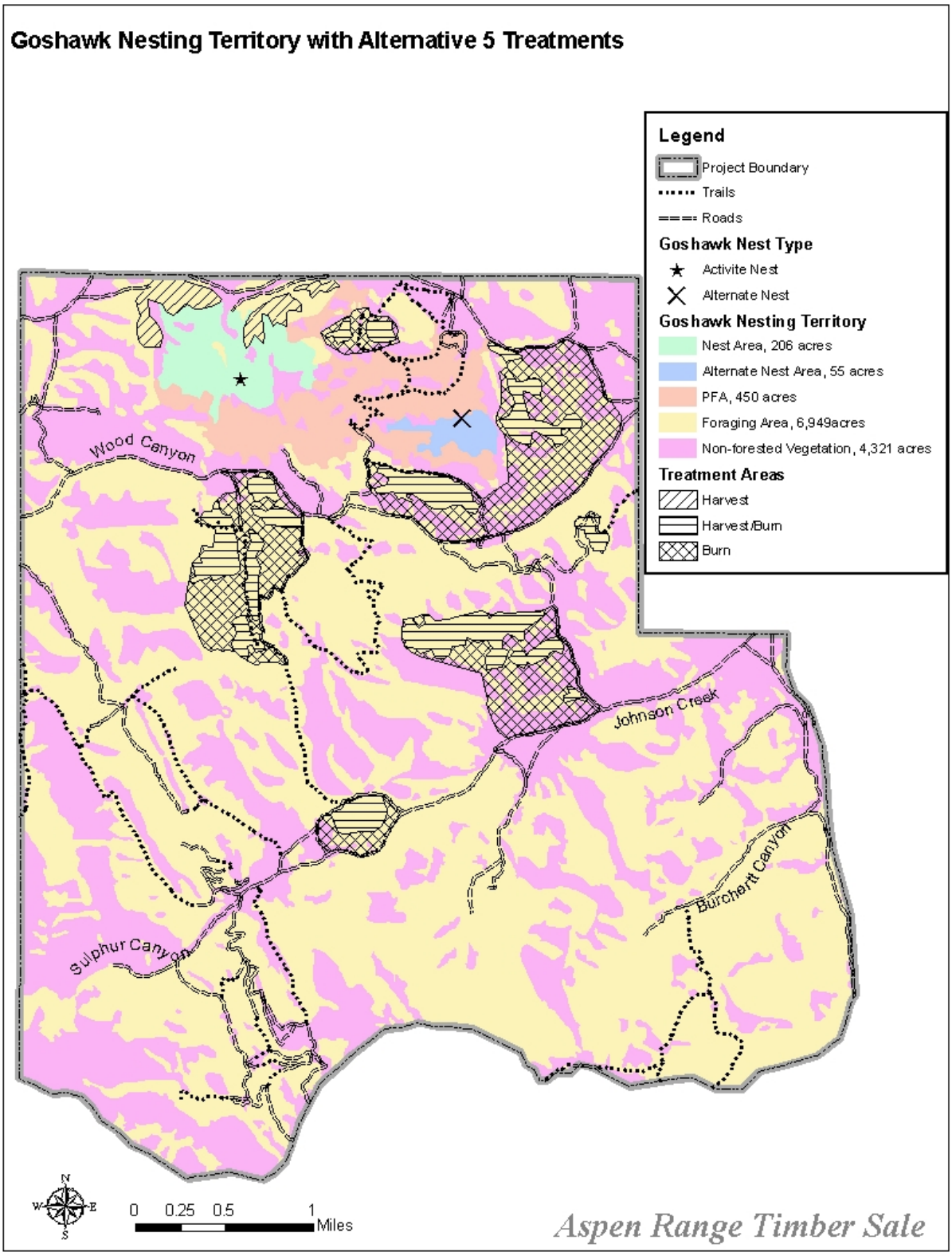


Figure 10: Goshawk Nesting Territory with Alternative 5 Treatments



Appendix B - Response to 45-Day Comments

The following comments were received during the comment period for this project. The Agency's response is provided in italics.

Comments letter #1 - The Ecology Center, Inc

"The action alternatives would reduce habitat MIS and TES species; unfortunately neither the Revised Forest Plan (RFP) nor DEIS provide any assurances that the project would be consistent with NFMA regulation requirements for population viability—minimum numbers of individuals and amounts of habitat well-distributed—have never been determined. The DEIS relies upon inadequate scientific analysis for wildlife species' habitat needs."

- *Population viability of MIS is determined at the Forest level based on monitoring documented by the Caribou-Targhee NF. Project level analysis determines if the activity is meeting Forest Plan Standards and Guidelines. The FEIS for the CNF RFP analyzed the impact of the Revised Forest Plan Standards and Guidelines. The Overall Viability Assessment (USDA 2003a Appendix D - 162) states: "Based on the risk assessments presented in this section, we have determined that Alternatives 3, 4 and 5 will maintain habitat able to support viable populations of existing native and desired non-native vertebrate species in the planning area. We have determined that the Plan is sufficient to provide well distributed habitat for reproductive individuals". Because alternatives 3, 4 and 5 are following CNF RFP S&Gs, the project would "maintain viable populations… well distributed across the forest" as required by 36 CFR 219.19.*

"Neither the RFP nor DEIS provide any assurances that soil and land productivity will be maintained with actions such as this. Not only will soil productivity be reduced, but increases in noxious weeds and subsequent herbicide treatments will reduce diversity."

- *The Revised Forest Plan provides Standards and Guidelines to provide long term soil productivity that are followed in all alternatives. Noxious weed treatment has been on going forest wide for some time and will continue in the future.*

"The discussions of modeling employed by the DEIS for various resource analyses do not include adequate disclosures of the precision of the models, the inventories upon which they're based, the estimates they produce, nor any discussions of verification of reliability."

- *Models are used in the fuels and prescribed fire portions of the Aspen Range FEIS to estimate fire behavior. The precision of any model is data dependent. The data used for the models was a Type 6 Stand Exam taken in the year 2002 and can be found in the project file.*

""Desired future conditions" is a so-called need, a set of RFP decisions, that have never been validated. Undisturbed, unmanaged habitats are what are in the shortest supply, more logging is not needed."

- *Desired Future Condition is programmatic direction within the Revised Caribou Forest Plan and is validated upon signing of the Forest Plan.*

"The need for the Caribou National Forest (CNF) to identify a management indicator species for aspen communities seems obvious, given the oft-repeated "need" to treat and restore aspen. Why does the CNF RFP not designate an indicator species for such habitats? What would ever "indicate" that such forestwide treatments have accomplished enough?"

- *Aspen is a keystone species. With the exception of riparian areas, aspen communities are considered the most biologically diverse ecosystems in the Intermountain West (Kay 1997). However as aspen dominated landscapes convert to other cover types, tremendous biodiversity is lost (Bartos and Amacher1998; Bartos and Campbell 1998 a,b). In other words, management indicator species such as the Goshawk utilize aspen cover types as primary or secondary habitat.*

- *Restoring the majority of aspen stands that have been encroached by conifer would indicate that aspen treatments have been accomplished.*

"The analysis did not adequately address the impacts of increased use of off-road motorized vehicles on soils, wildlife, and weed spread."

- *The impacts of off-road motorized trails were fully analyzed in chapter 4*

"The FS has not adequately monitored as the original Forest Plan and RFP specified, meaning that the action alternatives would be authorized with insufficient information to make an informed choice."

- *Forest Plan monitoring is outside the scope of this decision. Monitoring for this project complies with the Revised Forest Plan and can be found in Chapter 2 of the Aspen Range FEIS, Monitoring Activities.*

"The cumulative effects of livestock grazing were not adequately analyzed and disclosed."

- *Livestock use and management within the project area is not expected to change due to the proposed activities of the Aspen Range FEIS. The cumulative effects of sheep bedding grounds, salt grounds and water developments were adequately analyzed and disclosed.*

"The DEIS does not include a definition of old growth that makes sense from a biological diversity, or even stand diversity, standpoint."

- *The definition of old growth characteristics by forest type found in "Characteristics of Old Growth Forests in the Intermountain Region" (USDA Forest Service 1993) shall be used unless more current direction is developed. A summery of the definition can be found in the project file.*

"Also, before the Forest Service undertakes activities that affect roadless or wilderness characteristics, the roadless boundaries within this project area must be and the project's affects on roadless/wilderness characteristics fully disclosed. An important question that the DEIS ignores is, how many acres might be added to the IRA boundaries if a fair, genuine analysis of the issue were actually performed?"

- *Harvest activities in roadless areas have been dropped. Visuals for the Aspen Range FEIS are found in Chapter 3. An analysis of the IRA boundaries was conducted and disclosed during the development of the Revised Forest Plan.*

"The DEIS does not disclose the environmental impacts of past logging projects and other developments whose analysis areas encompass the areas to be logged under this proposal, nor does it disclose if the FS has performed all of the monitoring and mitigation required or recommended in those NEPA documents, and the results of the monitoring. Lacking such knowledge, justification for proceeding with this proposal is lacking."

- *Disclosure of past logging and other developments can be found in Chapters 3 and 4 as well as the Project record.*
- *The disclosure of individual resource analysis is summarized in numerous tables in Chapter 4. A combined resource summarization can be found in Chapter 2.*

- *Resource monitoring will continue as stated in the Revised Forest Plan and the Allotment Management Plan. Monitoring of past Timber Sales has been limited to regeneration surveys. All regeneration harvest areas meet NFMA requirements.*

Comments letter #2 – Environmental Protection Agency

"Chapter 1 of the EIS is entitled **Purpose of and Need for Action,** however, the purpose of the project is never stated. The EIS needs to include a clear and concise statement of the underlying. purpose for the proposed project, consistent with the implementing regulations for NEPA (see 40 CPR1502.3). In presenting the purpose for the project, the EIS should reflect not only the Forest Service's purpose, but also the broader public interest. Given the numerous objectives listed in the EIS, a concise purpose statement is critical to evaluating the alternatives."

- *The Purpose and Need is clearly stated and is not designed to be a single purpose statement. Please see Chapter 1, section 1.4 Need for Proposed Action.*

"The EIS includes Desired Future Condition (DFC) criteria as purpose and need indicators. Of the three DFC criteria only one of the criteria (seedling/sapling) is met by any of the alternatives (Alternative 2 and Alternative 4). In addition, the EIS states that all the action alternatives would continue to have surplus acres of mature/old structural stands and additional silvicultural restoration would be needed to provide new seedling/sapling structure. While the EIS does not provide a purpose statement, it is clear from the stated need and objectives that converting plant communities to early seral stages and moving structural stages closer to the DFC to improve long-term forest condition, are intended goals of this project. According to the analysis and discussion presented in the EIS, these goals will not be met by any of the alternatives presented in the EIS. It is recommended that the EIS either include an alternative that meets all the stated need and objectives of the project, or limit the project's need and objectives to reducing expected fire intensity, capturing the economic value of the timber and reducing sediment impacts from roads."

- *Desired future condition is generally not attainable within the scope of a single project due to Revised Forest Plan constraints on soil, water and wildlife. A maximum alternative "proposed Action" was provided but did not meet Standards and Guidelines of the Revised Forest Plan. Meeting DFC for stand structure will take multiple future projects on a smaller scale.*

"We support the use of undisturbed buffer strips on fish bearing and non-fish bearing streams, intermittent flowing streams and wetlands. In addition, we support the use of best management practices (BMPs) to control erosion from timber sale areas, skid trails and access roads. However, timber harvest will include heavy equipment and the skidding of merchantable logs resulting in impacts that will not return to background levels for six years after disturbance. In addition, the proposed harvest and prescribed burn activities will not meet Regional Soil Quality guidelines for detrimental soil disturbance prior to the application of BMPs. Therefore, we recommend that timber harvest be limited to winter months when snow pack would minimize harvest impacts and that BMPs be implemented as soon as an area is harvested and conditions are suitable for their success."

- *Best Management Practices are laws implemented by the State that take place during road construction and harvest operations to minimize impacts. Generally, Forest Plans and Federal Timber Contracts exceed BMPs in most cases. Rehabilitation of landings, skidtrails and temporary roads must be completed in a timely fashion following harvest or end of season activities. Harvest units can not be accepted and released from the performance bond without completed erosion control work.*

- *Short term effects are defined as six years or less after soil disturbing activity occurs. Erosion rates would be reduced substantially the first year after disturbance and completion of erosion control work. This is not to imply multiple years will pass before contractual erosion control would be performed.*

- *Detrimental soil disturbance has been accounted for in Chapter 4 Soils and is also discussed in Chapter 2, Management Practices. The cumulative effects analysis is within Revised Forest Plan Standards and Guidelines for alternative 3, 4 and 5. The fuels reduction unit would be required to be logged in the winter.*

"Table 3.6-1 describes the roads that currently exist within the project area and provides maintenance level ratings for these roads. However, the EIS does not describe the type of maintenance associated with each of these levels. The EIS needs to define these levels, discuss the impacts (e.g., sediment yields) associated with each of these maintenance levels, and how the proposed project may change these levels."

- *A definition of Forest Road Maintenance Level is provided in project file. Estimated sediment yields can be found in the project file. Maintenance levels will not change under any of the alternatives.*

"The EIS states that the archery range, located within the project area, has limited parking and a poorly constructed access road that doesn't properly drain leaving it with deep standing puddles for most of the summer. In addition, improvements in the archery range area are needed to meet Forest Standards and Guidelines. However, the EIS does not identify the impacts the archery range has on the project area, nor are the impacts from the archery range included in the cumulative impacts analyses. The EIS needs to discuss the impacts the archery range has on project area including sediment yields and water quality impacts. In addition, the EIS should discuss what measures this project includes to address these impacts."

- *The archery range is a short system of narrow foot trails between targets and posses little impact to the analysis area with the exception of the access road that close to Trail Creek and in poor condition. The Aspen Range FEIS identifies cumulative impacts of the archery range in Chapter 4; Existing Disturbances within Activity Areas and Cumulative Effects Area. All small disturbance areas are lumped in Type of Disturbance "WBSAH" in Table 4.5-1.*

- *Modeling for sediment yields on the archery range road do not convey the actual impact the road has on Trail Creek because of the permanent standing water in the road. The Aspen Range FEIS has addressed the archery range road in Alternative 2, Alternative 4 and 5. Each alternative is similar for relocating the road 300 feet away from Trail Creek and obliterate the old access. Alternative 3 is "No New Roads" therefore it was not entertained in the Alt 3.*

"Section 3.4.4 of the EIS states that the current big game forage:cover ratio in the project area is 35:65 (4,207 acres forage, 7,793 acres cover). Section 4.6.4 of the EIS states that the cover:forage ratio under Alternative 1 (No Action) is 65:35 and while there is no forest plan guidelines for cover:forage ratio, 40:60 is considered optimum for big game. Table S-4 lists the cover:forage ratio for Alternative 1 as 65:35 and reiterates that the optimum would be 40:60. It is not clear what the current big game cover:forage ratio is, whether it is close to the optimum ratio for big game, and what the ratio would be for each of the alternatives. The discrepancies in cover:forage ratios need to be corrected in the EIS. In addition, the EIS needs to clarify if the alternatives will result in significant changes in the cover:forage ratio, and discuss the impacts these changes would have on big game."

- *There is confusion but no discrepancies in the cover:forage ratios. The order of the forage and cover in the ratio including the respective numbers were reversed. <u>Cover:forage 65:35</u> is the same as <u>Forage:cover 35:65</u>. There is currently more cover (65%) than forage (34%). Any decrease of cover would increase forage and would move toward the optimum of 60 percent forage and 40 percent cover disclosed by Thomas (1979). The corresponding numbers are displayed on comparison of effects table including the unit of measure of 40:60 the optimum. Please see Chapter 2, Table 2.8-3.*

***Comments letter #3* – Idaho Conservation League**

"Although the Forest Service identified the negative effects of roads on water quality as a significant issue, it failed to develop a reasonable alternative reflecting this concern. The Forest Service arbitrarily separated the "no new roads" alternative from a similar strategy in which problematic roads are realigned. The Forest Service overlooked the fact that there is a significant difference between relocating or realigning an existing, problematic road and constructing an entirely new road. The "no new road" alternative should have included either realigning or closing the problematic road segments. By separating two favorable features that together address the same issue, the Forest Service is making each of these alternatives weaker and less attractive.
The "reduced road" alternative contains problematic temporary road construction and the favorable road realignment features that should have been part of the "no new road" alternative."

- *Alternative 3 "no new roads" was designed to analyze an alternative that does not include road construction of any kind. Realigned roads generally have new locations that require the construction of a new corridor and is analyzed the same as a new road. There is no difference in the hydrologic disturbance analysis between realigning an existing problematic road and constructing an entirely new road.*

- *Alternatives 4 and 5 were designed to address problematic roads and reduce construction miles of temporary roads while meeting the purpose and need of the project.*

"There is not an alternative in the DEIS to address **both** goshawk and watershed concerns."

- *Alternative 2 "the Proposed Action" exceeded Revised Forest plan guidelines for Goshawk habitat and hydrologic disturbance. Alternatives 3, 4 and 5 are in line with Revised Forest Plan guidelines for goshawks and watershed.*

"NFMA at §219.12(f)(1) states that "[a]lternatives shall be distributed between the minimum resource potential and the maximum resource potential to reflect to the extent practicable the full range of major commodity and environmental resource uses and values that could be produced from the forest." Providing the full spectrum of alternatives for the Aspen Range Timber Sale will require an alternative that addresses both these concerns.
A Seventh Circuit Court Decision also affirms the importance of providing a full spectrum of alternatives in an EIS:

> "No decision is more important than that delimiting what these 'reasonable alternatives' are ... One obvious way for an agency to slip past the structures of NEPA is to contrive a purpose so slender as to define competing "reasonable alternatives" out of consideration (and even out of existence) ... If the agency

constricts the definition of the project's purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role.""

- *A full spectrum of alternatives have been provided in the Aspen Range FEIS, beginning with alternative 1 "No Action". Maximum resource potential would be alternative 2 "Proposed Action". Minimum resource potential would be alternative 3 "No New Roads". Alternative 4 "Reduced Roads" and Alternative 5 "the Preferred Alternative" were created to best meet the intent of the purpose and need as well as issues generated during the scoping process. The deciding officer could select a combination of alternatives to be incorporated as part of the decision.*

"We still believe that the 25% hydrologic disturbance in Wood Canyon from all alternatives is too great and that this project, when combined with cumulative effects, will violate Forest Plan standards. The amount of disturbance in the Wood Canyon drainage needs to be reduced to address this concern."

- *The Revised Forest Plan allows for 30% cumulative effects within a hydrologic unit code 6 watershed. Table 2.8-3 in Chapter 2, provides combined cumulative effects from all known resource disturbance and is in compliance with the Revised Forest Plan. Please see Chapter 4 for individual resource analysis.*

"Lastly, decreasing the amount of road construction and tractor harvesting and increasing the amount of thinning and prescribed burning would still provide sawtimber, restore aspen, reduce conifer densities, reduce fuel loads, and do a better job of reducing the sediment."

- *During the scoping process the Idaho Conservation League commented that the project needed to reduce road construction, tractor harvesting and regeneration harvesting while increasing the amount of thinning and burning. Alternatives 3, 4 and 5 reduce the amount of temporary road construction, tractor harvesting and regeneration harvesting from the "Proposed Action" Alternative 2. Prescribed fire accounts for the greatest amount of hydrologic disturbance in all action alternatives. The amount of hydrologic disturbance could be significantly decreased if prescribed fire were to be excluded from the project. Increasing the amount of prescribed fire and decreasing mechanical harvest will not decrease disturbance values in the directed analysis process.*

"The Forest Service needs to analyze a restoration alternative with no road construction, smaller amounts of tractor harvesting, and larger amounts of prescribed burning."

- *Please refer to alternative 3 "No New Roads" in Chapter 2.*

"We believe that the purpose and need can best be accomplished by reducing the amount of tractor harvesting and increasing the amount of thinning and prescribed burning. Where logging is appropriate, we believe that silvicultural techniques should have the lightest ecological impact on the forest."

- *Part of the purpose and need is to provide commercial wood fiber. The area is Prescription 5.2 in the Revised Forest Plan and must be evaluated for commodity production incorporating the best silvicultural techniques available before the use natural or prescribed fire.*

"As much as possible, the largest, most fire-resistant trees should be left standing. We are concerned because Old/Mature trees constitute 80% in the project area. Since the Forest Service prefers Alternative 4, ten percent of Old/Mature trees will be cut. Any proposed action alternative must ensure no old growth trees are cut and that marking guidelines and diameter limits are effectively utilized. Additionally, on page 25 in the DEIS, Table 2.8-3 claims that Young/Mid sized trees should make up <22%. It is curious that each action alternative except No Action decreases this percentage from 16% to 13% or 14% when it should move towards the recommended <22%. To improve vigor, stands should be moved towards a more natural mosaic representative of seedling, sapling, pole, old, and patch dynamics."

- *As stated in Chapter 2, the largest most fire- resistant trees will be left standing. The majority of the large diameter trees are dead due to bark beetles attacks over the past few years. The general age of the harvest tree in the project area is 80-120 years old. The old/mature category does not equal old growth by definition "Characteristics of Old Growth Forests in the Intermountain Region" only that they are lumped in a group that is not seedling/sapling or young/mid.*
- *Harvest units within the project area do not meet the definition of Region 4 Characteristics of Old Growth. Stand exam data can be found in the project file.*
- *The Young/Mid category would move slightly lower in percentage away from DFC because it is difficult in planning create or retain small blocks of mid succession with the use of prescribed fire. Chances are the Young/Mid category would not be entirely consumed during the prescribed fire, but must be analyzed as such because of unpredictable situations that occur with the use of prescribed fire. Please see Chapter 3, Forest Structure at the Project Scale.*

"A sufficient number of snags need to be left standing in each treatment area for cavity nesters until snags can be replaced by natural recruitment. Standing trees need to be overstocked to ensure sufficient habitat until new trees mature. In addition, fallen snags that lean against other trees serve as important subnivean access points for mesocarnivores such as American Marten."

- *Standards and Guidelines for snag retention in the revised forest plan will be followed. In addition coarse woody debris guidelines will be followed. The American Martin is Not Known or expected to inhabit the project area.*

"Any potential commercial uses for small-diameter fuels should be explored. One possibility would be stacking non-commercial boles and branches at landings for use by commercial and private firewood cutters. By hauling logs to landings, you can reduce incursions by firewood cutters on undesignated roads."

- *The economics of small diameter products can not be predicted during the planning process but can be agreed upon within the scope of an awarded contract so long as it meets the intent of the NEPA document. "Incursions by firewood cutters on undesignated roads" has not been an issue on past sales.*

"We do recognize the ability to do some fuels reduction in the project area, and given the large-scale nature of the fuels load, we encourage the Forest Service to use prescribed burns as the primary fuels reduction treatment and to expand the use of prescribed burns beyond the isolated treatment areas described in this project. Using prescribed burns as the primary tool outside of the wildland/rural intermix will simulate natural processes, reduce the possibility of catastrophic fires, and recreate a more natural mosaic of varying age classes. We realize that in areas with high fuel loads, some thinning and removal of ladder fuels will be required before burning can be allowed. When removing ladder fuels, leave trees should represent a variety of age classes and species. The project also needs to detail in what places and under what situations wild fires will be allowed to burn. The final document must also detail the maintenance schedule for burns."

- *The project area is in close proximity to private land on three sides and also has a Forested Vegetation Management Prescription for wood fiber production prior to the use of natural or prescribed fire. A fire-use plan has been prepared that includes the project area. The area is not in a fire-use area because of the 5.2 management prescription and proximity to private lands.*

"To maintain suitable water quality standards for sensitive fish species, buffer zones around riparian areas should be maintained according to INFISH standards. Potential negative impacts to be considered include sedimentation, water temperature, fragmentation, loss of refugia, and competition with exotic species. Areas containing any populations of threatened, endangered, or sensitive fish species need to be mapped and monitored before, during, and after the proposed treatments.
We are especially concerned about Johnson Creek, Trail Creek, and the road to the Archery Range in and along the edge of riparian vegetation. Since the road is native surfaced and vehicles passing through push sediment down the slope from the road into the stream, road #20297 should be obliterated and closed to Off Highway Vehicles. We are concerned about sedimentation into streams from roads #20126 and #20574 and recommend they also be obliterated and closed."

- *All Standards and Guidelines in the Revised Forest Plan for riparian and fisheries have been followed. Aspects of each alternative have been included to address issues with existing roads. See Aspen Range FEIS Chapters 2 and 4.*

"Previous management activities have resulted in excessive road densities throughout our National Forests, including the Caribou-Targhee. This density compromises the project area's ability to support wildlife and fish by promoting further human disturbance, fragmenting habitat, accelerating sedimentation, and encouraging OHV use. Furthermore, there is a positive correlation between roads, even temporary ones, and human-caused wildfire ignitions."

- *The road density of the project area would remain the same if not slightly lower following completion. Open Road Management Density's are set in the Revised Forest Plan and the designation of open, closed and obliterated roads/trails have been analyzed in the Caribou Travel Plan Revision 11/2005.*

"We believe the Forest Service should base all harvests off preexisting roads, and are concerned that any temporary roads constructed to facilitate thinning will not be effectively closed or obliterated. Areas that cannot be logged without realigning or temporarily constructing roads should be treated through helicopter logging or prescribed burning."

- *Roads will be effectively obliterated by recountouring the slope, incorporating woody debris and available rock with an excavator. The District has effectively closed non-essential roads on other sales in the past.*

"The project should decommission and obliterate all high-risk and redundant roads as determined by a completed Roads Analysis. Three prime candidates are Forest Roads 20574, 20126, and 20297 which are contributing to erosion damage. Another alternative is realigning necessary roads to minimize watershed impacts. Where roads are removed, care must be taken to minimize sedimentation, remove noxious weeds, revegetate the area with native plants, and strictly enforce road closures. The obliterated road should be gated, signed, and patrolled to prevent incursions by OHVs.**"**

- *Roads 20574, 20126, and 20297 have been selected for segment realignment in Alternatives 2, 4 and 5. A steep section of road 20201 in the project area is part of Alternative 5R that was selected in the Caribou Travel Management Plan revision FEIS that closed the road to full size vehicles but retained as an ATV trail. Obliterated roads will be monitored for illegal activity as part of the Districts over-all law enforcement effort.*

"While road obliteration will improve water quality in the long term, it will inevitably entail soil disturbance and short-term increases in sedimentation rates. Additional mitigation measures, such as stream bank stabilization upstream and downstream of the site, are needed which guarantee no near-term net increases in soil disturbance or sedimentation in the watershed as a whole. All culverts should be removed from obliterated roads. Culverts that are not maintained may lead to blocked drainages and eventual blowouts. Proper road maintenance is critical for any remaining roads if sediment is to be controlled. The Forest Service should detail the maintenance plan for all roads in the project area."

- *Standards and Guidelines within the Revised Forest Plan concerning this subject will be followed. Road maintenance is discussed and prioritized annually by the District.*

"Road closure is a contentious issue but is simply the best way to restore watersheds suffering from legacy problems. Permanently closing all non-essential roads will save money, protect water quality, protect wildlife, and safeguard endangered species and their habitat."

- *The project area has a completed roads analysis and was further evaluated in the Caribou Travel Plan Revision 11/2005. The process of the Travel Plan recommended closing a steep portion of road 20201 to full size vehicles.*

"The DEIS should have included a map indicating soil stability and landslide potential. Potentially erosive treatments such as thinning, salvage logging, and road construction need to be placed outside identified unstable areas."

- *Soil stability has been evaluated in the Revised Forest Plan by prescription area. Soil stability in the Aspen Range Project was ground verified within vegetative treatment areas. Please see Chapter 3, and the Project File.*

"The fragmentation of the forest within the project area needs to be assessed. The effects of tractor harvesting on species dependent on contiguous forested habitat should be considered."

- *The effects of mechanical harvesting on species dependent on contiguous forested habitat have been analyzed. Please see Chapter 4, Wildlife section.*

"The devastating impacts of irresponsible OHV use on forest ecosystems are well established. Irresponsible OHV users degrade water quality, spread noxious weeds, fragment wildlife habitat, disturb wildlife and displace non-motorized recreationists. The Caribou-Targhee National Forest needs to monitor and control the use of OHVs on forest service roads and trails. The best way to control motorized use is simply to not build a road in the first place. The Forest Plan needs to restrict all OHV use to designated roads and roads should be considered closed unless marked open."

- *OHV use is outside the scope of the project. Please see the Caribou Travel Plan Revision FEIS 11/2005.*

"Tractor-jammer hauling systems contribute to the spread of noxious weeds. Where vehicle access is allowed, the tires and undercarriage must be hosed down with pressurized water to dislodge seeds in all alternatives. Funding needs to include monitoring surveys and treatment for noxious weeds before and after the project."

- *The washing of equipment is part of the sale contract. Funding weed treatments in KV has been ongoing for sometime. Please see Chapter 2, Management Practices section.*

"Expanded use of prescribed burns should be implemented instead of tractor harvests to stimulate aspen stands. The EIS should mention how saplings are going to be protected from grazing by livestock."

- *Increasing the amount of prescribed fire and decreasing mechanical harvest will not decrease disturbance values in the directed analysis process. The Aspen Range FEIS mentions how regeneration will be protected. Please see "Timber Harvest and Silvicultural Treatments" in Chapter 2 alternatives 2, 3, 4 and 5 as well as Chapter 2, Management Practices section.*

"The Forest Service needs to consider the cumulative impacts of grazing and associated management activities on forest fuels, water quality, soil conservation, and ecosystem integrity. The Forest Service needs to assess the impacts of any off-site compensation for grazing, such as moving livestock to other allotments.

- *Livestock use and management within the project area is not expected to change due to the proposed activities of the Aspen Range FEIS. The cumulative effects of sheep bedding grounds, salt grounds and water developments were adequately analyzed and disclosed. Please see chapter 4.*

***Comments letter #4* – Idaho Department of Parks and Recreation**

"The DEIS in Chapter 4, Page 40 identified a safety concern when haul trucks mix with other forest visitors. In order to mitigate this concern, the Soda Springs Ranger District should clearly post the haul route for logging traffic. If recreation use is heavy in the project area, the district should consider prohibiting logging on weekends and holidays."

- *Haul routes will be posted as directed in the Timber Sale Contract. Generally hauling is prohibited on the opening day of big game hunting seasons as well as holidays.*

***Comments letter #5* – Greater Yellowstone Coalition**

"The Forest Service's decisions on site-specific projects on the C-TNF are governed by the NFMA, which sets forth a statutory framework for the management of our national forests. NFMA first requires the Forest Service to develop a Land and Resource Management Plan for the entire forest. NFMA requires that the Forest Service "provide for diversity of plant and animal communities" in managing national forest The Forest Service is then required to ensure that the forest is managed in compliance with the Forest Plan. The Forest Service must analyze specific projects, such as the Three Basin Timber Sale, and the analysis must show that each project is consistent with the plan.

Section 219.19 of Volume 36 of the Code of Federal Regulations was promulgated to ensure such diversity, states that fish and wildlife habitat:

> "Shall be managed to maintain viable populations of existing native and desired non-native populations of vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one that has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area…
>
> (a) Each alternative shall establish objectives for the maintenance and improvement of habitat for management indicator species selected under paragraph (g)(1) of this section, to the degree consistent with overall multiple use objectives of the alternative. To meet this goal, management planning for the fish and wildlife resource shall meet the requirements set forth in paragraphs (a)(1) through (a)(7) of this section.
>
> (6) Population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with State fish and wildlife agencies, to the extent practicable."

The DEIS failed to adequately and completely disclose impacts to wildlife habitat by tiering the Aspen Range Timber Sale and Vegetation Treatment to the RFP's legally inadequate selection of management indicator species (MIS). The RFP's legally flawed circumvention of NFMA's requirement to select appropriate MIS is now playing out in yet another site-specific project – the Aspen Range Timber Sale and Vegetation Treatment – to the detriment of wildlife and their habitat in contravention of NFMA's mandate to "maintain viable populations of existing native and desired non-native populations of vertebrate species"

The deficiency in the Caribou's 2003 RFP in respect to MIS is that it only selected three avian species as the MIS to represent the C-TNF's estimated 334 species of terrestrial vertebrate species that inhabit the Caribou zone of the Forest. For its MIS standard, the RFP states:

> "In project analyses affecting the habitats listed below, assess impacts to habitat and populations for the following management indicator species:
>
> - Grassland and open canopy sagebrush habitats—Columbian Sharp-tailed Grouse
> - Sagebrush habitats—Sage Grouse
> - Mature and old forest habitats—Northern Goshawk

To further highlight the Forest's failure to select appropriate MIS in the RFP consider the fact that in comparison the revised Forest Plan for the Targhee zone of the C-TNF selected twenty-six MIS for terrestrial and aquatic habitats on the Forest, including eight

cavity nesters, elk habitat and vulnerability, red squirrel, and so on. Even the 1985 CNF LRMP, which the current RFP replaces, selected seven MIS, including:

- Bonneville Cutthroat Trout
- Bald Eagles (Snags, riparian rivers and lakes)
- Goshawk (Old growth, Douglas fir, mixed conifer and aspen)
- Hairy Woodpecker (Snags, old or decadent aspen)
- Red-naped Sapsucker (aspen and riparian)
- Sage grouse (sagebrush-grassland nesting and foraging)
- Mule deer and elk (early forest succession, aspen, Douglas fir, lodgepole, other conifer, mountain brush, sagebrush grassland)

The Forest's MIS selections left many habitat types un-represented by any MIS. As noted in the FEIS for the RFP, 550,000 acres of the Forest support forestland. However, the Forest identified only one MIS, the northern goshawk, for forested habitats. On the other hand the Forest selected two MIS, sage grouse and sharptail grouse, for non-forested half of the lands on the forest. While these two species should be accorded MIS status, only a portion of the non-forested lands on the forest provided habitat for sage grouse and sharptail grouse.

The types of non-forested vegetation types identified in the FEIS include sagebrush/mountain shrub, mountain mahogany, maple, juniper, rock, and water (including riparian areas, wetlands, and aquatic habitats). Clearly sage grouse and sharptail grouse can hardily be MIS for most of these non-forested habitat types. Given this fact, sage grouse and sharptail grouse are not appropriate MIS for a significant percentage of the non-forested habitat on the Caribou zone of the C-TNF. In addition, even where they occur, populations of these two species have been depressed for decades with only remnant, scattered populations of sage grouse and sharptail grouse occupying scattered areas within their historic range on the non-forested lands of the Caribou zone. This is not much different, nor is it any less difficult to monitor sparse, widely scattered groups of sharptail grouse or sage grouse which may only use the Forest for part of their habitat needs, than it would be for the Forest to select Williamson's sapsucker. In that case the Forest decided not to select and monitor Williamson's sapsucker because it is migratory, and is fairly shy and wary, making them harder to survey…or the red-naped sapsucker simply because it is too "widespread a species and changes in abundance would be very difficult to correlate in aspen habitats on the Forest?"

Furthermore, the C-TNF conceded that most of its "habitats at risk" do not have representative MIS. In addition, most other important habitats on the Forest are not represented by MIS. The C-TNF justified its MIS selections by stating that there was not enough of the habitat type, that all other potential MIS in the habitat were too difficult to monitor, and/or that habitat changes outside administrative control of the FS could cause population reductions. This seems to be a justification for more—not less—monitoring of their population levels. For those habitats with no representative MIS, the C-TNF replaced the use of MIS with "habitat monitoring. . . done in its place." For each habitat at risk with no MIS, the FEIS for the RFP gave a brief reason why no MIS were selected.

In general, national forests are expected to select different types of MIS to represent a variety of habitats on the forest. This mandate is based on the text of the National Forest

Management Act (NFMA) and its implementing regulations. NFMA provides that the forest planning regulations:

> shall include, but not be limited to – . . .
>
> (3) Specifying guidelines for land management plans developed to achieve the goals of the Program which – . . .
>
> (b) provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan.

The 1982 implementing regulations explain how to implement this diversity mandate by, in part, requiring the selection of MIS. Section 219.19, entitled "Fish and wildlife resource," provides that:

> Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. . . .
>
> (a) Each alternative shall establish objectives for the maintenance and improvement of habitat for management indicator species selected under paragraph (g) (1) of this section, to the degree consistent with overall multiple use objectives of the alternative. To meet this goal, management planning for the fish and wildlife resource shall meet the requirements set forth in paragraphs (a)(1) through (a)(7) of this section.
> (1) In order to estimate the effects of each alternative on fish and wildlife populations, certain vertebrate and/or invertebrate species present in the area shall be identified and selected as management indicator species and the reasons for their selection will be stated. These species shall be selected because their population changes are believed to indicate the effects of management activities. In the selection of management indicator species, the following categories shall be represented where appropriate:
>
> [1] Endangered and threatened plant and animal species identified on State and Federal lists for the planning area;
>
> [2] Species with special habitat needs that may be influenced significantly by planned management programs;
>
> [3] Species commonly hunted, fished, or trapped;
>
> [4] Non-game species of special interest; and
>
> [5] Additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality. On the basis of available scientific information, the interdisciplinary team shall estimate the effects of changes in vegetation type, timber age classes, community composition, rotation age, and yearlong suitability of habitat related to mobility

> of management indicator species. Where appropriate, measures to mitigate adverse effects shall be prescribed. . . .
>
> (6) Population trends of the management indicator species will be monitored and relationships to habitat changes determined. . . .

Nothing in the RFP record indicates that the Forest ever paused to consider threatened, endangered, or sensitive species as MIS for the planning area. The Forest was obligated by the NFMA to consider species with special habitat needs that may be influenced significantly by planned management programs. On the one hand the RFP FEIS claims that "there has been a significant decline in the amount of aspen-dominated communities…" "The steady loss of aspen to conifers has reduced aspen habitat and the species that depend on the patterns and structures found in functioning aspen woodland…Subsequently patterns of the type's occurrence and overall size and presence of wildlife corridors have been diminished.

According to the RFP FEIS the management of aspen communities as prescribed in the RFP (as Alternative 7R) will bring aspen stands closer to desired future conditions in the short- and long-term than any other alternative…" Given the claim that managing aspen communities according to the RFP will bring about short and long-term improvements in this habitat type, ostensibly to improve habitat for "species that depend on the patterns and structures found in functioning aspen woodlands…" as noted above, then the Forest was obligated to select at least one MIS that would serve as an indicator for this important habitat type. The RFP has failed to do so. This is directly tied to the Aspen Range Timber Sale and Vegetation Treatment since the purpose of the project is to enhance aspen on the landscape.

Even more troubling than the inadequate representation of the terrestrial MIS selected for the Caribou zone RFP is the fact that no MIS were selected for aquatic species, even though the Forest contains important aquatic habitats, many of which have been significantly impacted by past and current Forest approved activities such as logging, road building, phosphate mining, and domestic livestock grazing. This oversight is a serious defect in the Caribou zone RFP given that 70% of the streams on the Forest are non-functioning or functioning at risk and there are twenty-three streams on the state 303(d) list (more than 200 miles).

Again, the Targhee NF RFP selected five MIS for aquatic resources, including Yellowstone cutthroat trout. Given that there are two subspecies of cutthroat trout and two rare non-game fish species occupying the Caribou zone of the C-TNF, at a minimum the CNF RFP should have included several species as MIS for aquatic habitats in order to monitor the effects on this habitat type by site specific projects such as the Travel Plan.

In addition to failing to select MIS for aspen communities, aquatic habitats and most of the forested habitats on the forest, the Forest Service also failed to select MIS for tall forb communities; failed to select adequate MIS for most of the sagebrush-grassland communities on the Forest, and failed to select MIS for riparian areas and aquatic habitats, particularly willow-dominated communities. For example, abundant literature exists that highlights the requirements of native species of trout, i.e. Bonneville and Yellowstone cutthroat trout, for cold, clean water, yet the level of motorized travel the

Forest envisions permitting in Alternative Five of the DEIS will have an overall negative impact on these very parameters.

While the regulations specifically address fish populations and the Forest and the Idaho Department of Fish and Game have been collecting population data for years, the C-TNF arbitrarily and capriciously neglected considering native cutthroat trout populations as Management Indicator Species. In regards to MIS for riparian areas, the Forest noted:

> "The Draft Revised Plan identified beaver as the MIS for riparian habitats. However, after review it was decided that it would not be possible to determine population trends and be able to relate them to forest management. Amphibians were then considered as MIS, west-wide population declines have been attributed to many factors. Again, any changes in trends on the Forest, may not be tied directly to changes in forest management. Lastly, breeding bird complexes were considered as MIS. In general, breeding birds do not make good MIS because many of them are migratory, and they are exposed to many factors that can affect populations. We considered monitoring the number of species of breeding birds and relate to change in shrub riparian vegetation. However, this does not meet the intent of MIS and population trends of individual species could not be determined at this level. It was decided that riparian shrub vegetation would be monitored."

Nothing indicates the Forest ever considered fish for MIS despite the fact that populations of native cutthroat trout have been declining for decades due to land management practices endorsed by the agency. Furthermore, the regulations specify how management prescriptions should implement the diversity mandate, in the subsection entitled "Management requirements": The minimum specific management requirements to be met in accomplishing goals and objectives for the National Forest System are set forth in this section. . .

> (a) Resource protection. All management prescriptions shall -- . . .
> (5) Provide for and maintain diversity of plant and animal communities to meet overall multiple-use objectives, as provided in paragraph (g) of this section;
> (6) Provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species and provide that habitat for species chosen under § 219.19 is maintained and improved to the degree consistent with multiple-use objectives established in the plan;
> (g) Diversity. Management prescriptions, where appropriate and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest and the diversity of tree species similar to that existing in the planning area. Reductions in diversity of plant and animal communities and tree species from that which would be expected in a natural forest, or from that similar to the existing diversity in the planning area, may be prescribed only where needed to meet overall multiple-use objectives. . . .

The Forest Service Manual provides the following guidance on selection of MIS:

2621.1 - Selection of Management Indicators. Select management indicators for a forest plan or project that best represent the issues, concerns, and opportunities to support recovery of Federally-listed species, provide continued viability of sensitive species, and enhance management of wildlife and fish for commercial, recreational, scientific, subsistence, or aesthetic values or uses. Management indicators representing overall objectives for wildlife, fish, and plants may include species, groups of species with similar habitat relationships, or habitats that are of high concern. In selecting management indicators, meet the following requirements:

1. Involve State wildlife and fish agencies, other Federal agencies, and appropriate experts from universities and private organizations.

2. Select Federally-listed endangered or threatened species as management indicators if the forest or project plan potentially impacts those species, or if opportunities exist to enhance recovery efforts. Consider for selection all sensitive species in the plan or project area (FSM 2672). Also, consider for selection those species in demand for recreational, commercial, or subsistence use; and indicators representing special habitats, habitat components, or plant and animal communities.

3. Select ecological indicators (species or groups) only if scientific evidence exists confirming that measurable changes in these species or groups would indicate trends in the abundance of other species or conditions of biological communities they are selected to represent.

4. Document, in the permanent planning records for a forest plan or project-level plan, the rationale, assumptions, and procedures used in selecting management indicators.

5. Document, within the forest or project plan, how management indicators collectively address issues, concerns, and opportunities for meeting overall wildlife and fish, including endangered, threatened, and sensitive species goals for the plan or project area.

In addition, Forest Service Regions One and Four created an MIS protocol, which contains a very strict list of criteria for MIS. This document suggests the selection of indictors:

(1) Of environmental/ecological conditions including native ecological processes;
(2) affected by management activities on NFS lands; and that is
(3) A native or restricted range species;
(4) A keystone species or habitat specialist;
(5) Found on most or all of the administrative units in the planning area;
(6) A year-long resident of the planning units and vicinity;
(7) Relatively easy to monitor for population levels and habitats;
(8) Feasible to monitor populations and habitat conditions at similar scales; and for which
(9) Baseline data (population trends and/or habitat conditions) is already in place.

In summary, under NFMA, its regulations, and subsequent guidance, national forests must select MIS; write objectives to maintain and improve MIS habitat, which should in turn maintain viable, well-distributed populations of existing native vertebrates; and monitor population trends of the MIS to ensure that the assumptions were valid. The

selection of MIS is thus an integral part of maintaining viability, through the use of monitoring MIS populations.

The C-TNF's meager MIS selections:

1) Prevent the implementation of the viability mandate;
2) Contradict the guidance given by the regulations about MIS selection; and
3) Contradict several references to MIS being designed to indicate water quality and/or fish.

For the purpose of the MIS requirement—population viability—to work, common sense dictates that the MIS must (1) have representative habitat of all vertebrates, and (2) within those habitats, be representative vertebrates. Three avian species as MIS on a 1.1 million acre land mass that is home to 334 species of vertebrates are not representative in either fashion. Since the Forest failed to select adequate MIS, it cannot guarantee viable populations of wildlife will remain on the Forest, and in the case of the Three Basin Timber Sale, it cannot further maintain that this project will not affect species viability.

Furthermore, the Forest is not free to select another method of achieving viability to substitute for the MIS requirement, as the C-TNF has done. When explaining its rejection of all the possible MIS, the C-TNF candidly stated that it is using "habitat monitoring" in place of the MIS requirement. The choice of how to achieve viability was made by the Forest Service in 1982 when it promulgated the regulations, on the advice of a Committee of Scientists. The Forest is not at liberty to discard this methodology in favor of one they feel is better.

Additionally, while the RFP FEIS notes that "habitat monitoring" will be conducted for habitats for which the Forest failed to choose MIS—i.e. aspen, tall forbs, riparian, etc.—the RFP fails to contain any standards or guidelines, aside from snag levels, for ensuring that these habitats are maintained across the forest in a manner which protects species viability."

- *Effects, including cumulative effects, to MIS are discussed. The selection of MIS is a Forest Plan decision; as such it is beyond the scope of this project. Forest level based monitoring is documented by the Caribou-Targhee NF (2000, 2001, 2003c, 2006b). Project level analysis determines if the activity is meeting Forest Plan Standards and Guidelines. The FEIS for the CNF RFP analyzed the impact of the Revised Forest Plan Standards and Guidelines. The Overall Viability Assessment (USDA 2003a Appendix D - 162) states: "Based on the risk assessments presented in this section, we have determined that Alternative 7R will maintain habitat able to support viable populations of existing native and desired non-native vertebrate species in the planning area. We have determined that the Plan is sufficient to provide well distributed habitat for reproductive individuals."*

- *The Aspen Range FEIS analyzed five alternatives. Alternative Two (proposed action but not the preferred alternative) creates 7 openings larger then 40 acre. Though is does not meet one RFP Guideline for goshawk it does provide large openings. Graham and others (1999) suggest that openings between 10- 100 acres are needed in aspen and lodgepole types to maintain these types through time. Graham and others (1997) stated that a high interspersion of forest*

structure stages could lead to fragmentation of home ranges in forest types that evolved with a mixed severity fire regime. Exceeding the 40 acre guideline is not expected to have a significant impact on the goshawk because of the following factors.

- *Based on monitoring at the Forest level, relative abundance, distribution and trend documented in the Biological Evaluation (summarized in the Aspen Range FEIS Chapter 4) and providing habitat conditions outlined in the CNF RFP across the Caribou National Forest, the MIS appear to be secure and a viable population would be maintained across the Forest.*

- *Decision for Appeal (#03-13-00-0401) of Caribou National Forest Land and Resource Management Plan Revision found analysis in the FEIS and supporting documentation met the requirements of 36 CFR 219.19 [NFMA 1982] and FSM 2621 for selection and evaluation of management indicator species. This is beyond the scope of this decision.*

- *The Aspen Range Timber Sale and Vegetation Treatment FEIS contains analysis of effects to the habitat for a variety of wildlife species. These include threatened, endangered, and sensitive species, MIS, Migratory Birds, and Big Game. The fisheries analysis addresses effects to sensitive fish species, as well as fish habitat and aquatic resources. Therefore, in addition to the Forest MIS, the habitat conditions for a wide range of fish and wildlife species such as threatened, endangered, sensitive, Migratory Birds, and big game is addressed in the analysis for the Aspen Range project.*

"The Aspen Range Timber Sale and Vegetation Treatment affects a number of plant communities. On the other hand the discussion of MIS in the DEIS is limited to a few short paragraphs of text. And then it simply concludes that the proposed alternative fails to meets RFP standards and guidelines for goshawk — and there won't be any real affect on these species if the project is implemented as described in the action alternatives. It seems like this is the real reason the Forest short-circuited the MIS project at the RFP level in the first place.

Moreover, this seems to be at odds with reality. For example, the Forest admits in the FEIS for the RFP that it has failed to collect information on many of the habitat types that will be impacted by various projects and proposals, and the species that depend upon them. This and the fact that most of these habitats do not have representative MIS makes it impossible for the Forest to assert, with any verifiable data, that the viability of those resources will be maintained."

- *In the Forest Plan revision process vegetation analysis was completed. The RFP analysis process included analysis of a variety of cover type and size classes, this information was then used in modeling with 5 different size classes including Grass Forbs, Seedling/Sapling, Immature Tree, Mature Tree and Old Tree (RFP FEIS Appendix B-33-34). Vegetation analysis was also completed for stable and*

seral Aspen for the RFP. The RFP also established Aquatic Influence Zones as a prescription for guidance in riparian areas (RFP 4-45).

"NFMA requires that population trends of MIS be monitored and changes in the conditions of habitat be determined. In assessing impacts, the agency must gather quantitative baseline population data and monitor trends and distribution prior to and after implementing a site-specific project. Without this information, the Forest cannot ensure that implementation of any of the action alternatives for this proposal, or any other management action on the forest, will not threaten species viability. This is a violation of the NFMA."

- *Based on monitoring at the Forest level, relative abundance, distribution and trend documented in the Biological Evaluation (summarized in the Aspen Range FEIS Chapter 4) and providing habitat conditions outlined in the CNF RFP across the Caribou National Forest, the MIS appear to be secure and a viable population would be maintained across the Forest. Monitoring data includes data acquired before the RFP was signed. The Forest continues to build on this data and is fulfilling protocols in the RFP.*

"Recent case law has established that the Forest is required to analyze the effects of management activities on species viability at the site-specific level "compliance with NFMA's forest-wide species viability requirements is relevant to the lawfulness of any individual timber sale. To hold otherwise would permit the Forest Service to don blinders to the overall condition of a national forest each time it approved a sale, quite literally losing sight of the forest for the trees. This would contravene one of the fundamental purposes of Congress in enacting [NFMA]: that the National Forest System be managed with 'a systematic interdisciplinary approach,' by means of 'one integrated plan for each unit of the National Forest System.' "

NFMA requires that "wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native species in the planning area." In order to meet the requirement, habitat must be "well distributed" throughout the forest."

- *Forest level based monitoring is documented by the Caribou-Targhee NF (2006). Project level analysis determines if the activity is meeting Forest Plan Standards and Guidelines. The FEIS for the CNF RFP discloses the impact of the Revised Forest Plan Standards and Guidelines. The Overall Viability Assessment (USDA 2003a Appendix D - 162) states: "Based on the risk assessments presented in this section, we have determined that Alternative 7R will maintain habitat able to support viable populations of existing native and desired non-native vertebrate species in the planning area. We have determined that the Plan is sufficient to provide well distributed habitat for reproductive individuals."*

"The 2003 RFP for the Caribou zone of the C-TNF fails to delineate the minimum amounts and distribution of late seral/old growth habitat, riparian & aquatic habitats, aspen, tall forbs, and early seral forest structure that must be present across the Caribou zone of the C-TNF to ensure species viability as required by the NFMA."

- *The RFP analysis process included analysis of a variety of cover types (including Stable and Seral Aspen) and size classes, this information was then used in modeling with 5 different size classes including Grass Forbs, Seedling/Sapling, Immature Tree, Mature Tree and Old Tree (RFP FEIS Appendix B-33-34). The RFP also established Aquatic Influence Zones as a prescription for guidance in riparian areas (RFP 4-45).*

"Furthermore, no population data for MIS or sensitive species or monitoring information for all of the communities for which the Forest failed to designate MIS is disclosed in the DEIS for the Aspen Range Timber Sale and Vegetation Treatment. Because the RFP fails to comply with the NFMA as described above, the approval of the Aspen Range Timber Sale and Vegetation Treatment as now contemplated conflicts with the Forest Service's mandate to insure species viability in addition to the fact that the project violates Forest Plan guidelines for one of the three MIS selected by the Forest."

- *The Aspen Range FEIS does document known Goshawk information. Goshawk territories were discussed in the Aspen Range FEIS including discussion regarding the effects of all alternatives on Goshawks and if they are meeting RFP Standards and Guidelines. Alternative 2 would meet all but one RFP guidelines for goshawk. A forest wide survey conducted in 2004 (Trek 2005), 2005 (McDaniel 2006), and 2006 (document not currently available) met the RFP monitoring requirement (USDA 2003b 5-15) and planned surveys in the future would continue to meet these requirements.*
- *Regarding Columbian Sharp-tailed grouse the IDFG (2004b) completed the 2004 lek survey meeting the RFP monitoring requirement (USDA 2003b 5-15). The Aspen Range FEIS discloses that all RFP S&G's regarding sharp-tailed grouse would be met under all alternatives and winter forage would be available to support viable populations and occupancy and production, within the Caribou National Forest, would be met under all the alternatives (Aspen Range FIES Chapter 4).*
- *Regarding Sage-grouse, IDFG (2004a) completed the 2004 lek survey meeting RFP monitoring requirement (USDA 2003b 5-15). Idaho's sage-grouse populations are below 1960's levels, but they have been generally stable for the last decade (IDFG 2005). The Aspen Range FEIS discloses that all RFP S&G's would be met under all alternatives and spring burning in sagebrush would not be conducted to reduce any disturbance to brood rearing sage grouse that may use sagebrush in the project area (Aspen Range FIES Chapter 4).*

"The Forest has failed in the RFP to define what constitutes a viable population of all the MIS it did designate along with the failure to identify how much habitat and the distribution of such habitat that is needed to ensure population viability."

- *Decision for Appeal (#03-13-00-0401) of Caribou National Forest Land and Resource Management Plan Revision found analysis in the FEIS and supporting documentation met the requirements of 36 CFR 219.19 [NFMA 1982] and FSM 2621 for selection and evaluation of MIS, therefore this is beyond the scope of this decision.*

"This is particularly relevant with this proposal since one of the alternatives fails to comply with the RFP's standards for goshawk habitat. This is further exacerbated by the Forest's proposal in the Three Basin Timber Sale to exceed the 40 acre limit on clearcuts. Unless that is remedied before the FEIS for the Three Basin Timber Sale is released the Forest will be in violation of the NFMA."

- *The Aspen Range FEIS contains sufficient analysis of habitat and known nest sites to determine the potential impacts to goshawks, the only MIS with the greatest potential to be impacted by any of the alternatives. In developing the proposed action and alternatives the Agency sought to analyze and disclose the effects on all resources when one or more guidelines from the RFP were exceeded. The Aspen Range FEIS discloses to the public and deciding officer the potential consequences of choosing between differing levels of attainment of the purpose and need. The RFP specifically allows for exceeding the 40 acre limit for openings.*