



United States
Department of
Agriculture

Forest
Service

April 2005



Draft Environmental Impact Statement

Three Basins Timber Sale

Montpelier Ranger District, Caribou – Targhee National Forest
Bear Lake, Idaho



The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

THREE BASINS TIMBER SALE

Draft Environmental Impact Statement

April 2005

Location: Bear Lake and Caribou County, Idaho

Lead Agency: USDA Forest Service

Responsible Official:

Jerry B. Reese
Forest Supervisor
Caribou-Targhee National Forests
1405 Hollipark Drive
Idaho Falls, Idaho 83401
(208) 557-5760

For further information:

Ken Klingenberg, Project Team Leader
Caribou – Targhee National Forest
Montpelier Ranger District
322 North 4th Street
Montpelier, Idaho 83254
Ph: (208) 847-0375 FAX: (208) 847-3426

Abstract

This Draft Environmental Impact Statement (DEIS) documents the analysis of the proposed Three Basins Timber Sale. Three action alternatives were evaluated; all three included tractor-logging activities and prescribed fire. The alternatives all included road work to improve, repair and to make safe existing roads and obliterate/decommission of unneeded roads. They also all included new construction which would replace a road that is causing resource damage. The no action alternative was also analyzed.

The proposed project is located in: Township 10 South, Range 41 East, Sections 26, 35 and 36, and Township 11 South, Range 41 East, Sections 1, 2, 11, 12, and 13, and Township 11 South, Range 42 East, Sections 7 and 18 of the Boise Meridian.

The preferred alternative is Alternative 2 because it best meets: the purpose and need for achieving natural patch sizes and shapes, provides for improved structure and stand composition, aspen restoration, saw logs to the timber industry and it develops a transportation system that responds to the safety and economic needs with protection for other forest resources.

Comments on this Draft Environmental Statement must be post marked 45 days following the publication of the Notice of Availability (NOA) by the EPA in the Federal Register.

Reviewers Comments

The Forest Service believes, at this early stage it is important to give reviewers notice of several court rulings related to public participation in the environmental review process. First, reviewers of draft environmental impact statements must structure their participation in the environmental review of the proposal so that it is meaningful and alerts an agency to the reviewer's position and contentions. Vermont Yankee Nuclear Corp. vs NRDC, 435 U.S. 519, 553 (1978). Also, environmental objections that could be raised at the draft environmental impact statement stage but that are not raised until after completion of the final environmental impact statement may be waived or dismissed by the courts. City of Angoon v. Hodel, 803 F. 2d 10116, 1022 (9th Cir.1986) and Wisconsin Heritages, Inc. V. Harris, 490, Supp. 1334, 1338 (E.D. Wis. 1980). Because of these court rulings, it is very important that substantive comments and objections are made available to the Forest Service at the time when it can meaningfully consider them and respond to them in the final environmental impact statement.

To assist the Forest Service in identifying and considering issues and concerns on the proposed action comments on the environmental impact statement should be as specific as possible. It is also helpful if comments refer to specific pages or chapters on the draft statement. Comments may also address the adequacy of draft environmental impact statement or the merits of the alternatives formulated and discussed in the statement. Reviewers may wish to refer to the Council on Environmental Quality Regulations for implementing the procedural provisions of the National Environmental Policy Act a 40 CFR 1503.3 in addressing these points. Comments received in response to this solicitation, including names and addresses of those who comment, will be considered part of the public record on this proposed action and will be available for public inspection. Comments submitted anonymously will be accepted and considered; however, those who submit anonymous comments will not have standing to appeal the subsequent decision under 36 CFR 215 or 217. Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under FOIA, confidentiality may be granted in only limited circumstances, such as to protect trade secrets. The Forest Service will inform the requesters of the agency's decision regarding the request of confidentiality, and where the request is denied; the agency will return the submission and notify the requester that the comments may be resubmitted with or without name and address within 10 days.

Table of Contents

<i>Summary</i>	<i>S-1</i>
1 Purpose and Need for Action	1-1
1.1 Introduction	1-1
1.2 Proposed Action	1-2
1.3 Need for the Proposed Action	1-4
1.3.1 Forest Condition: Stand Structure, Species Composition and Fuels Need	1-4
1.3.2 Cost Effective Need.....	1-5
1.3.3 Long-term Transportation System Need.....	1-5
1.3.4 The purpose of this proposed action is to:	1-5
1.4 Objective of the Proposed Action	1-6
1.5 Management Direction Relative to the Analysis Area	1-7
1.6 Public Involvement	1-10
1.7 Identification of Issues	1-11
1.7.1 Issues that generate Alternatives to the Proposed Action	1-11
1.7.2 Issues that did not drive an Alternative, but are relevant to the proposal.	1-12
1.7.3 Issues beyond the Scope of this Proposal	1-12
1.7.4 Effects to be analyzed (other relevant resource concerns).....	1-14
1.8 Decision to be Made	1-14
2 Alternatives, Including the Proposed Action	2-1
2.1 History and Process Used to Formulate the Alternatives	2-1
2.2 Decision Criteria	2-1
2.3 Alternatives Considered but Eliminated from Detailed Study	2-2
2.3.1 No new roads.....	2-2
2.3.2 Selective Harvesting or limiting clearcut patch size to 4 acres or less.	2-3
2.3.3 Use Helicopter or Skyline logging systems instead of Tractor based logging.....	2-3
2.4 Alternatives Considered in Detail	2-4
2.4.1 Alternative 1 – No Action.....	2-4
2.4.2 Alternative 2 - The Proposed Action	2-4
2.4.3 Alternative 3 –Roadless Alternative	2-13
2.4.4 Alternative 4 - The Created Opening Alternative	2-18
2.5 Management Practices	2-24
2.5.1 Design Features Common to Alternatives 2, 3, and 4:	2-24
2.5.2 Monitoring Activities	2-31
2.6 Comparison of Effects and Outputs by Alternative	2-32

3	<i>Affected Environment</i>	3-1
3.1	Vegetation	3-1
3.1.1	Introduction	3-1
3.1.2	Forest Disturbance	3-5
3.1.3	Forest Age Structure	3-8
3.1.4	Species Composition (Seral Species)	3-11
3.1.5	Stand Size	3-17
3.1.6	Fire Regime and Condition Class	3-18
3.1.7	Summary of Vegetation Condition at the Landscape Scale	3-18
3.2	Hydrology	3-20
3.2.1	Existing Condition	3-20
3.2.2	Streams within the Analysis Area	3-22
3.2.3	Existing Impacts of Haul Routes to Streams	3-24
3.2.4	Karst and Surface Water – Subsurface Water Interactions	3-25
3.2.5	Water Quality Regulatory Framework, Practices and Beneficial Uses	3-25
3.2.6	Water Quality Limited Stream Segments 303(d).....	3-26
3.2.7	Existing Hydrologically Disturbed Areas	3-27
3.3	Soils	3-28
3.3.1	Detrimental Soil Disturbance	3-28
3.3.2	Existing Soil Disturbance	3-28
3.3.3	Soil Productivity and Monitoring	3-30
3.3.4	Revised Forest Plan (RFP) Soil Quality Standards and Guidelines.....	3-31
3.3.5	Desired Future Conditions	3-32
3.4	Wildlife	3-33
3.4.1	Threatened and Endangered Species	3-33
3.4.2	Sensitive Species	3-34
3.4.3	Management Indicator Species	3-37
3.4.4	Migratory Birds	3-37
3.4.5	Big Game	3-37
3.5	Rare Plants	3-38
3.6	Fisheries	3-39
3.7	Roads and Access	3-41
3.7.1	Roads	3-41
3.7.2	Access.....	3-44
3.8	Soda Point Inventoried Roadless Area -#04171	3-45
3.8.1	Past, Present, and Foreseeable Future Actions Affecting the Soda Point IRA	3-48
3.8.2	Wilderness Characteristics.....	3-53
3.8.3	Roadless Area Characteristics	3-55
3.9	Economics	3-61
3.10	Air Quality	3-63
3.11	Rangeland Management	3-64
3.12	Tribal Treaty Rights	3-65
3.13	Heritage Resources	3-66
3.14	Recreation	3-67
3.15	Visuals	3-70

4.0	<i>Environmental Consequences</i>	4-1
4.1	Cumulative Effects Activities	4-2
4.1.1	Past & Present Activities	4-2
4.1.2	Future Activities	4-4
4.2	Forested Vegetation	4-5
4.2.1	Alternative 1 (No Action)	4-7
4.2.2	Alternative 2 (Proposed Action).....	4-8
4.2.3	Alternative 3	4-11
4.2.4	Alternative 4	4-13
4.2.5	Noxious Weeds.....	4-15
4.3	Hydrology	4-16
4.4	Soils	4-20
4.5	Wildlife	4-33
4.2.6	Threatened and Endangered Species	4-34
4.2.7	Management Indicator Species	4-39
4.2.8	Migratory Birds	4-40
4.2.9	Big Game.....	4-41
4.6	Fisheries	4-43
4.7	Roads and Access	4-45
4.8	Soda Point Roadless Area	4-48
4.9	Economics	4-65
4.10	Air Quality	4-67
4.11	Heritage Resources	4-70
4.12	Tribal Treaty Rights	4-70
4.13	Visuals	4-73
4.14	Recreation	4-75
4.15	Irretrievable/Irreversible Effects	4-77
4.16	Required Disclosures and Potential Conflicts with Plans and Policies of other Jurisdictions	4-77
5.	<i>Lists – Including Prepares, Scoping, and Bibliography</i>	5-1
5.1	Interdisciplinary Team (IDT) and Consultants	5-1
5.2	Public Involvement	5-1
5.3	Bibliography	5-2

List of Tables & Figures

Tables

<i>Table S-1 Comparison of Alternative Activities</i>	S-5
<i>Table S-2 Project Purpose and Need Indicators, Summary Comparison of Alternatives</i>	S-6
<i>Table S-3 : Issue Indicators, Summary Comparison of Alternatives</i>	S-7
<i>Table S-5 Effects to be analyzed, Summary Comparison of Alternatives</i>	S-7
<i>Table S-6 Effects to analyzed, Wildlife Summary Comparison of Alternatives</i>	S-8
<i>Table 1.2-1 Proposed Action road activities</i>	1-3
<i>Table 2.4-1 Alternative 2 Forested Vegetation Proposal</i>	2-9
Table 2.4-2 Alternative 2 Soda Point Roadless Forested Vegetation Proposal	2-10
<i>Table 2.4-3 Road Activity Proposal Totals Alternative 2</i>	2-10
<i>Table 2.4-4 Alternative 2 Proposed Road Activities</i>	2-11
<i>Table 2.4-5 Road Activity Descriptions: The following narratives provide details for proposed road work</i> .2-12	
<i>Table 2.4-6 Alternative 3 Forested Vegetation Proposal</i>	2-14
<i>Table 2.4-7 Road Proposal Totals Alternative 3</i>	2-17
<i>Table 2.4-8 Alternative 3 Road Proposal</i>	2-17
<i>Table 2.4-9 Alternative 4 Forested Vegetation Proposal</i>	2-20
<i>Table 2.4-10 Road Proposal Totals Alternative 4</i>	2-23
<i>Table 2.4-11 Alternative 4 Road Proposal</i>	2-23
<i>Table 2.5-1 Large Down Woody Requirements</i>	2-25
<i>Table 2.6-1 Project Purpose and Need Indicators, Summary Comparison of Alternatives</i>	2-32
<i>Table 2.6-2 : Issue Indicators, Summary Comparison of Alternatives</i>	2-32
<i>Table 2.6-3 Effects to be analyzed, Summary Comparison of Alternatives</i>	2-33
<i>Table 2.6-4 Effects to analyzed, Wildlife Summary Comparison of Alternatives</i>	2-33
<i>Table 3.1-1. Break down of Project Area and Landscape vegetation, community and cover types</i>	3-3
<i>Table 3.1-2 Forest cover types</i>	3-4
<i>Table 3.1-3. Barrett did not use the exact same terminology as is used the Interagency Fire Regime Condition Class Guidebook (2004), but it is relatively easy to cross-walk between the documents</i>	3-6
<i>Table 3.1-4 Fire Regime Definitions. Hann (2004) and Interagency Fire Regime Condition Class Guidebook (2004)</i>	3-6
<i>Table 3.1-5 Age structure within the analysis area was assigned to each stand based on the definitions and terminology outline in the Montpelier R.D. structure white paper (2004), this table is a quick reference to the information in that paper</i>	3-8
<i>Table 3.1-6. Current landscape cover type age structures compared to the desired range</i>	3-9
<i>Table 3.1-7 PNVG Condition Class. Condition class definitions can be found in Figure 3.1-13</i>	3-18
<i>Table 3.2-1 Summary of Existing Conditions of Perennial Streams along Proposed Haul Routes</i>	3-24
<i>Table 3.2-2 Identified Beneficial Uses</i>	3-25
<i>Table 3.2-3 Water Quality Limited 303(d) Streams</i>	3-25
<i>Table 3.2-4 Existing Percent Hydrologic Disturbance</i>	3-26
<i>Table 3.3-1 Acres of detrimental soil disturbance by proposed harvest units, current condition</i>	3-28
<i>Table 3.7-1 Project Area Road Descriptions</i>	3-40
<i>Table 3.7-2 Access/Road Status. Numbers below are for the 4.03 square mile project area only and are broken down by Forest Plan Prescription areas</i>	3-43
<i>Table 3.8-1 RFP prescription acres within the Soda Point IRA</i>	3-46
<i>Table 3.14-1 Percentage of ROS within Project Area</i>	3-67
<i>Table 3.15-1 Visual Quality Objectives of the Analysis area</i>	3-69
<i>Table 4.2-1 Diversity Matrix: A comparison of the landscape scale structural diversity for all alternatives</i>	4-6
<i>Table 4.2-2 Alternative Comparison</i>	4-6
<i>Table 4.3-1 Percent Hydrologic Disturbance by Alternative</i>	4-19
<i>Table 4.3-2 Comparison of Alternatives for Hydrology</i>	4-20

<i>Table 4.4-1 Alternative 2 Percent of Detrimental Soil Disturbance Prior to Application and After Application of Design Features</i>	4-23
<i>Table 4.4-2 Alternative 3 Percent Detrimental Soil Disturbance Prior to and After Application of Design Features</i>	4-25
<i>Table 4.4-3 Alternative 4 Percent Detrimental Soil Disturbance Prior to and After Application of Design Features</i>	4-27
<i>Table 4.4-4 Cumulative Effects for Activity Areas</i>	4-31
<i>Table 4.4-5 Soil Detrimental Disturbance from Proposed Activities Prior to Application of Project Design Features (PDF)</i>	4-31
<i>Table 4.4-6 Soil Detrimental Disturbance from Proposed Activities after Application of Project Design Features (PDF)</i>	4-31
<i>Table 4.4-7 Cumulative Soil Detrimental Disturbance from Proposed Activities after Application of Project Design Features</i>	4-32
<i>Table 4.5-1: T&E, Sensitive, & MIS Wildlife Species – Summary of Effects/Impacts</i>	4-33
<i>Table 4.7-1 Current Road Densities of the Analysis Area</i>	4-45
<i>Table 4.8-1 Forest ASQ Volume Offered by Alternative:</i>	4-65
<i>Table 4.9-1: Emissions for Alternative 2.</i>	4-68
<i>Table 4.9-2: Emissions for Alternative 3.</i>	4-68
<i>Table 4.9-3: Emissions for Alternative 4.</i>	4-69

Figures

<i>Figure 1 Vicinity Map of Project Area</i>	1-1
<i>Figure 2.4-1 Alternative 2 Proposed Action Map</i>	2-7
<i>Figure 2.4-2 Alternative 3</i>	2-15
<i>Figure 2.4-3 Alternative 4</i>	2-21
<i>Figure 3.1-1. Project Area Vegetation Types</i>	3-2
<i>Figure 3.1-2 Project area cover types</i>	3-3
<i>Figure 3.1-3: This photo is a lodgepole pine stump that shows multiple fire scars, located in S. Cheatbeck. Field count dates this tree to approximately 1864 the first scar dates to about 1919 the next major scar dates to approximately 1947. These dates correspond to dates reported by Barrett (1994). The current stands in the project area can all be dated to about this same time period and some show the same evidence of more recent non-lethal to mixed severity fires. Older stumps found in the project area show similar scarring patterns as this tree, the last scar would date to about 1864 or the fire that scarred this tree. Most of the old scared stumps appear to have been cut in the late 1800's to early 1900's.</i>	3-5
<i>Figure 3.1-4 Forest age structure percentages for the project area and landscape.</i>	3-8
<i>Figure 3.1-5 Cover type Structure represented as a percent of the landscape. Every cover type is dominated by stands with a mature to old structure, younger stands are rare. It is clear that a balance of age classes does not exist in any cover type.</i>	3-9
<i>Figure 3.1-6 Canopy closure by structure class is useful in assessing risk (insect and disease as well as uncharacteristic fire). The canopy closure classes used are: 0 – 39% canopy cover of forested vegetation is open, 40 – 69% is moderately closed and 70 – 100% is closed canopy.</i>	3-10
<i>Figure 3.1-7 Succession This photo is a good illustration of succession, the aspen is pioneering out into the basin and the conifer (subalpine fir and Douglas-fir) are replacing the aspen further back in the stand. In the absence of disturbance the aspen can be lost from a stand invaded by conifer in a relatively short time.</i>	3-11
<i>Figure 3.1-8: This picture was taken in a past harvest unit (logged in 1971) near proposed unit #9, this portion of the stand regenerated with dense healthy aspen. This unit was not fenced and is in an active cattle allotment. The objective for this unit was conifer regeneration, but where aspen was present in the stand it has responded very well. To help provide a prospective of the density of the aspen saplings, it is estimate that the total sight distance in this photo is less than 40 feet.</i>	3-13
<i>Figure 3.1-9: This is a photograph of a 1980 harvest unit, in N. Cheatbeck Basin. Aspen and lodgepole regeneration were both very successful. This stand was thinned in 2003 to reduce inter tree competition and improve health and vigor. The photo was taken along an old logging road that now serves as a major</i>	

travel corridor for both livestock and big game, even with this amount of use by ungulates very little evidence was found of herbivory on the aspen. 3-13

Figure 3.1-10 Repeat Photographs (1953 & 2003). These photos were taken from North Cheatbeck Basin, looking toward Soda Peak (N 12 deg. W.). These photos provide one of best “loss of aspen from the landscape” visual displays available on the district, in fifty years there has been a dramatic reduction in aspen. There has been a striking loss of aspen on the peak in the aspen conifer types, but just as notable is the change in the lodgepole stands that now dominate the edge of the basin, where only small patches of aspen are now visible along the edge (highlighted with arrows), these areas had considerable amounts of aspen visible throughout fifty years ago (1953). 3-14

Figure 3.1-13 Fire Regime and Condition Class Definitions. These definitions are from Hann (2004), he interpreted them from Hardy et al. (2001) and Schmidt et al. (2002) for modeling landscape dynamics and departures from historical or natural range of variability at project and watershed scales...... 3-19

Figure 3.8-1 Roadless Routes and Harvests: This map shows past harvest and the routes that are within the within the IRA 3-51

Figure 4.2-1 Structural Diversity Graphs. These graphs represent a visual comparison of the landscape scale age structural diversity for all alternatives; the forested landscape as whole, the lodgepole pine and aspen/conifer cover types. Although the landscape structure does not make major movements towards DFC’s (shown as dashed lines) as a result of the developed alternatives the lodgepole pine and aspen/conifer cover types do. 4-5

Figure 4.2-2 Landscape Scale Structure with No-Action. Little changes in the structure of the landscape, however the species composition will continue to shift toward climax species and densities will continue to increase thus increasing the risk to uncharacteristic wildfire or insect event...... 4-7

Figure 4.2-3 Landscape age structure..... 4-8

Figure 4.2-4 Effect of the Proposed Action on Age Structure in the Lodgepole Pine Cover Type. Approximately 17% of the cover type within the landscape is moved from the mature/old structural group to the Seedling/Sapling group. This would move the structural age diversity of the cover type closer to desired future conditions. 4-9

Figure 4.2-5 Project area lodgepole pine stand size. This figure is a graphical representation of past and proposed activities in comparison to the natural/current stand distribution. A review of past aerial photos dating back to 1963 shows that past harvest activities tended to break-up stands, increasing the number of small stands. 4-9

Figure 4.2-6 Landscape age structure..... 4-11

Figure 4.2-7 Effect of the Alternative 3 on Age Structure in the Lodgepole Pine Cover Type. Approximately 14% of the cover type within the landscape is moved from the mature/old structural group to the Seedling/Sapling group. This would move the structural age diversity of the cover type closer to desired future conditions. 4-11

Figure 4.2-8 Project area lodgepole pine stand size. This figure is a graphical representation lodgepole pine stand size distribution within the project area for alternative 3 compare to the no action alternative. Unit 2 is split leaving the portion in the Soda Point Roadless. This decreased the number of stands in the 50 to 60 class and increases the 40 to 50 and the 3 to 10 classes. This does not have much affect on the stand average for the project area as whole but does decrease the lodgepole pine average by 1 acre. ... 4-12

Figure 4.2-9 Landscape age structure..... 4-13

Figure 4.2-10 Effect of the Alternative 4 on Age Structure in the Lodgepole Pine Cover Type. Approximately 12% of the cover type within the landscape is moved from the mature/old structural group to the Seedling/Sapling group. This would move the structural age diversity of the cover type closer to desired future conditions. 4-13

Figure 4.2-11 Project area lodgepole pine stand size. This figure is a graphical representation of project area lodgepole pine cover type size class distribution for alternative 4 compared to the no action alternative. This alternative splits 7 stands several into three pieces. This alternative creates 8 stands in the 30 to 40 size class and currently there are not any stands in that class. 4-14

Figure 4.3-1 Soil Pit in Unit 14: This is a site previously mapped as a soil hazard rating of hmm. Lott during field visit determined that the site was incorrectly mapped. 4-59

Summary

Proposed Action

The Montpelier Ranger District of the Caribou – Targhee National Forest proposes to treat 708 acres or 27% of a 2,581 acre project area encompassed within the internally drained basins of North, Middle, and South Cheatbeek Basins. Proposed activities may not occur on every acre within every treatment unit, but for analysis and reporting purposes, the entire unit acreage will be assumed treated.

This alternative proposes to treat, with a combination of timber harvest and prescribed burning, 521 acres of mature conifer and 69 acres of mature aspen/conifer (590 total). All stands proposed for harvest operation have aspen and lodgepole as a stand component. Additionally, 118 acres of mature aspen/conifer is proposed for prescribed fire only.

All treatments are designed to mimic a mixed severity fire, where most thin barked trees (aspen, subalpine fir and lodgepole pine) will be removed through logging or killed by the prescribed fire, patches of thin barked trees will be left as well as most large, thick barked Douglas-fir. This type of treatment will shift the competitive advantage to seral tree species aspen and lodgepole pine. It will also move the landscape age class structure toward DFC's, reduce the risk of Mountain .Pine Beetle and rejuvenate aspen.

This alternative proposes approximately 4.8 miles of road reconstruction, 0.9 miles of road construction and about 1.8 miles of temporary road construction. It also includes approximately 2.2 miles of existing road obliteration and conversion of 0.1 miles of road to trail.

This alternative proposes to exceed the maximum size limit for forested vegetation openings created in one commercial harvest operation by even-aged silvicultural systems and would be contingent upon approval from the Regional Forester. "Openings may exceed 40 acres in aspen and lodgepole pine type's contingent upon Regional Forester approval, or as a result of natural catastrophic conditions, such as fire, insect and disease, or windstorm."(RFP 3-45) The RFP states this is acceptable in aspen and lodgepole pine types contingent on Regional Forester approval. Commercial harvesting operations in eight units would create openings that exceed 40 acres. The proposed action would not meet the VQO guideline of retention in the short term. This alternative would also not meet the RFP guideline for maximum created openings in forested types within a historic goshawk nesting territory.

All mileages and acreages are approximate and have been determined with the use of Geographic Information System (GIS) technology. The Forest Service used the most current and complete data available. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information on GIS products used for this project contact the Montpelier Ranger District at (208) 847-0375.

Need

There is a need to manipulate stand structure, species composition and fuels to improve the overall condition class of the landscape. This need is due to the lack of disturbance in an ecosystem that was historically maintained by fire.

This project is being proposed because forested structure is outside the DFC. Currently, the mature/old class is over represented; the mid/young and seedling/sapling classes are under represented. The forested landscape as a whole is currently 92% mature/old. The lack of diversity in structure also means that climax species like subalpine fir are increasing, increasing inter tree competition and ladder fuels, all this creates a landscape that is susceptible to uncharacteristic wildfire, and insect events. It also creates a landscape that is less resilient to these types of events and creates a need to address age class structural diversity at the landscape scale.

The imbalance of landscape scale age structure in the lodgepole pine cover type puts this type at risk to Mountain Pine Beetle (MPB) attack. This coupled with the fact that the RFP set the goal to recruit and sustain seral species creates a need to emphasis management of the lodgepole pine type.

The aspen within the proposed project and landscape are declining in numbers and overall health, especially in conifer cover types where aspen is a minor component and aspen/conifer types where it is the dominate seral species. Regeneration of aspen is limited or absent and is not keeping pace with succession to conifers where conifer are present. This situation is a threat to the survival of some aspen clones within the project area and creates a need to emphasis management of aspen as a whole and aspen/conifer types.

There is a need to provide access for a variety of motorized uses including timber harvest to the project area and to other destinations accessed via the project area. The nature of these roads ranges from primitive two track roads to properly located, constructed and maintained roads. The lack of turnouts and gravel on some of these narrow, winding roads creates safety concerns and makes driving conditions hazardous when wet. There is a need to provide a safe road system that provides for users needs while reducing impacts on other forest resources.

There is a need to capture the value of the timber that is assigned the prescription of Forest Vegetation Management 5.2 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 of long-term forest resilience. 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.

Purpose

- To move age-class structural diversity on the landscape scale toward RFP desired future conditions (DFC).
- To recruit seral tree species (aspen and lodgepole pine) by mimicking a natural disturbance in scale, patch size and intensity while changing stand species composition and fuel loads
- To reduce the percentage of the landscape considered at high risk to Mountain Pine Beetle.
- To emphasize the cost effective production of timber within the land capability and capacity as outlined for lands within 5.2 Forest Vegetation Management Prescription.
- To develop and maintain the forest transportation system to the minimum level necessary to effectively manage natural resources, provide user access, protect capital investments, while providing for user safety and protecting the environment.

Objectives of the Proposed Action

The specific objectives of this proposed action are:

- Move the forested age class structure towards the desired future condition on a landscape scale by decreasing the percentage of mature/old and increasing the seedling/sapling stage.
- Increase seral species and reduce ladder fuels by mimicking a natural disturbance in scale, patch size and intensity.
- Decrease the percentage of the lodgepole cover type at risk to mountain pine beetle.
- Maintain and enhance aspen within the greater Cheatbeck Basin area. (RFP 3-17)
- Capture the economic value of the timber from acres assigned the prescription 5.2, Forest Vegetation Management, through timber harvest. Forested lands with this designation are to be managed to emphasize the cost-effective production of timber within the lands capability and capacity.
- Develop a transportation system in the project area that responds to resource, economic, and social needs and improves safety.

Identification of Issues

In determining the relevant issues relating to the proposed action and the range of alternatives, the Interdisciplinary Team (IDT) reviewed public and agency comments generated during the scoping process. Pertinent comments from these sources were used to develop the relevant issues to be studied in detail.

Comments identified during the scoping process were evaluated to determine whether an issue/concern would be studied in detail, or not. Evaluations were based upon several factors; is the issue/concern relevant to, and within the scope of the purpose and need, the decisions to be made, and does it pertain directly to the Proposed Action. Also, could the issue/concern be resolved through design and location or timing of activities in the Proposed Action or mitigated.

The IDT reviewed each comment/concern and categorized them into one of the following groups.

1. Issues that generate alternatives to the proposed action.
2. Issues which did not drive an alternative, but are relevant to the proposal.
3. Issues not relevant to or outside the scope of this proposal.

Group One Issues that generate alternatives:

No new roads.

- There were concerns that the road construction necessary for the purpose of accessing stands proposed for harvest has the potential to affect water quality, hydrologic function of the watershed, noxious weed invasion, wildlife habitat and security, soils, and travel management. The IDT generated an alternative to track this issue and carried it forward for some time unit it was determined that the new construction proposed was had a positive affect and the temporary roads could economically be replaced with skid trails. Therefore, the no action alternative would be used to track this issue. **Indicator:** Number of miles of temporary and new system road construction. **Indicator:** Miles of open roads at project completion.

No harvest or road construction within the Soda Point IRA.

- There are concerns that the project has the potential to affect the Soda Point Roadless area characteristics. **Indicator:** Changes in the Roadless Area and Wilderness Characteristics of Soda Point IRA.

Visuals

- Most of the project area lies within a full retention area, and within 5.2 prescriptions area, these two RFP prescriptions are in conflict. **Indicator:** Visual quality objectives (VQO's) met in the short term verses the long term.

Group Two Issues that did not drive an Alternative but are relevant to the proposed action. Comments put in this group can best be described as effects to be analyzed.

- These comments were combined into similar categories and will be discussed in detail within Chapters 3 and 4. The categories were: 1) Vegetation 2) Hydrology 3) Soils 4) Wildlife 5) Fisheries 6) Roads and Access 7) Economics 8) Air Quality 9) Visuals 10) Threatened, Endangered, and Sensitive Plants or Animals 11) Range Management 12) Recreation 13.) Tribal Treaty Rights and 13) Cultural Resources.

Group Three Issues are concerns outside the scope of the proposed action; already decided by law, regulation, Revised Forest Plan (RFP), or other higher level decisions; irrelevant to the decision to be made, or conjectural and not supported by scientific or factual evidence.

- These points of concern and the rational for being beyond the scope are discussed in length within Chapter 1.

Alternatives

The IDT developed and analyzed three action alternatives and analyzed the no action alternative for a total of four alternatives. The alternatives are summarized below. A more detailed description of the issues and the alternatives considered can be found in Chapter 2.

Table S-1 Comparison of Alternative Activities.

Activities	Alt.2			
	Alt. 1 No Action	Proposed Action	Alt. 3 Roadless	Alt. 4 Openings
Total Acres Treated	0	708	510	517
Harvest	Acres	Acres	Acres	Acres
Total	0	590	510	399
Commercial Harvest		580	500	389
Personal Use Harvest		10	10	10
Prescribed Fire	Acres	Acres	Acres	Acres
Total	0	708	510	517
Site Prep. & Natural Fuels Reduction		522	442	330
Disturbance, Site Prep & Fuels Redct.		69	69	69
Disturbance & Natural Fuels Reduction		118	0	118
Road Management Treatments	Miles	Miles	Miles	Miles
Road Construction	0	0.9	0.9	0.9
Temporary Road Construction	0	1.8	1.5	1.4
Reconstruction of Existing	0	4.8	4.6	4.2
Decommission/Obliteration of Existing	0	2.2	2.2	2.2
Convert Road to Trail	0	0.1	0.1	0.1

* Total acres treated includes: ?????

Alternative 1 – No Action

This alternative is used as the baseline against which the impacts of the various action alternatives can be measured.

Alternative 2 – Proposed Action

This alternative was developed to respond to the purpose and need, it could be considered the maximum restoration alternative. This is the alternative that was sent out during scoping.

Alternative 3 – Roadless

Alternative 3 was developed in respond to the concerns that the activities proposed in Alternative 2 would have an effect on Roadless Area and Wilderness Characteristics. It provides the baseline against which the other action alternatives can be compared against with respect to those characteristics. This alternative was constrained by the IRA boundary.

Alternative 4 – Openings

Alternative 4 was developed in respond to the concerns that the activities proposed in Alternative 2 would, exceed standards and guidelines established in the RFP. It provides a means to display the affects of exceeding 40 acres with created openings. This alternative was also designed to meet the purpose and need but was constrained by the standard and guidelines.

Environmental Consequences

This section summarizes the information from Chapter 3: Affected Environment and Chapter 4: Environmental Consequences. Below are several tables that are intended to provide a quick comparison of the differences in the affects of the Alternatives. The tables are organized to show how the alternatives address the purpose and need, the affects on the issue indicators and finally affects on the resources that were analyzed. A detailed discussion of consequences can found in Chapter 4.

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

Purpose and Need Indicators and Project Objectives			Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings
Forest Condition Indicators						
Percent in SS, YM, & MO.	SS ¹	DFC-10-40%	1%	5%	4%	4%
	YM ²	DFC-20-50%	7%	7%	7%	7%
	MO ³	DFC-20-50%	92%	88%	89%	89%
Acres with aspen as a stand component treated			0	708	510	516
% of MPB ⁴ susceptible acres, within Project Area, at high risk			47%	18%	23%	27%
Number of acres of fuels treated			0	708	510	516
# Miles of Forest System Road Improvements			0 Miles	5.7 Miles	5.5 Miles	5.1 Miles
MMBF (Million board feet) harvested			0 MMBF	4.2 MMBF	3.7 MMBF	2.8 MMBF

¹ SS – seedling/sapling. ² YM – young/mid. ³ MO – Mature/Old. ⁴ MPB – Mountain Pine Beetle.

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

Issues	Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings
Miles of construction				
Miles of temporary road construction	0 miles	1.8 miles	1.5 miles	1.4 miles
Miles of new system road construction	0 miles	0.9miles	0.9 miles	0.9 miles
Miles open roads at project completion.				
	14.71 miles	13.41 miles	13.41 miles	13.41 miles
Effects to Soda Point IRA				
New road construction	0 miles	0 miles	0 miles	0 miles
Temporary road construction	0 miles	0.3 miles	0 miles	0.3 miles
Changes to roadless area characteristics.	none	none	none	none
VQO's Short term				
	not met	not met	not met	not met
VQO's Long term				
	not met	met	met	not met
# of Stands Treated > 40 acres				
	0	7	6	0

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

Resource	Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings
Hydrology Indicator				
% Hydrological Disturbance	11%	12.8%	12.5%	12.8%
Hydrologic connectivity and sediment Water Quality	No benefit or affects	Beneficial to WQ, meets HDG	Beneficial to WQ, meets HDG	Beneficial to WQ, meets HDG
WQ = water quality HDG < 30% maximum hydrologic disturbance guideline				
Soils Indicators				
% Soil Detrimental Disturbance	1%	7%	7%	6%
Roads and Access				
Number of miles of road improvement	0 miles	5.7 miles	5.5 miles	5.1 miles
Recreation Opportunity Spectrum (ROS)				
RN Roaded Natural 64%	unaffected	unaffected	unaffected	unaffected
SPNM Semi-primitive non-motorized 25%	unaffected	unaffected	unaffected	unaffected
SPM Semi-primitive motorized 11%	unaffected	may draw attention/ most affected	may draw attention/ least affected	may draw attention/ moderately affected
Air Quality Indicator				
Smoke emissions	Within NAAQS	Within NAAQS	Within NAAQS	Within NAAQS
Potential Noxious Weed Increases/Acres Disturbed				
	Lowest potential/ 0 acres disturb	Highest potential/ 709 acres disturb	3rd highest potential/ 510 acres disturb	2nd highest potential/ 517 acres disturb

Three Basin Timber Sale
Draft Environmental Impact Statement

Table S-5 Effects to analyzed, Wildlife Summary Comparison of Alternatives

Resource		Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings
Wildlife Indicator & Unit of Measure					
Acres with human disturbance, wolverine		0 acres	709 acres	510 acres	517 acres
Goshawk	% Non Stocked / Seedling < 22%	0.0 %	4.4 %	3.2 %	3.2%
	% Saplings < 22%	0.6 %	0.6 %	0.6 %	0.6%
	% Pole < 22 %	7.2 %	7.2 %	7.2 %	7.2%
	% Old / Mature > 33% (Owls > 40%)	92.2 %	87.8 %	89.1 %	89.0%
	Openings > 40 acres	0	7	6	0
% Winter Forage, Sharp-tailed grouse > 80 %		100 %	95.4% +	98.3 % +	95.4%
% Sagebrush mature overstory, Sage grouse > 80%		100 %	100 %	100 %	100%
Big Game Cover : Forage ratio, 40 : 60		91 : 9	88 : 13	89 : 11	89 : 11
Aspen Restoration/IDF&G Mule Deer Initiative		0	187	69	187

Identification of the Preferred Alternative

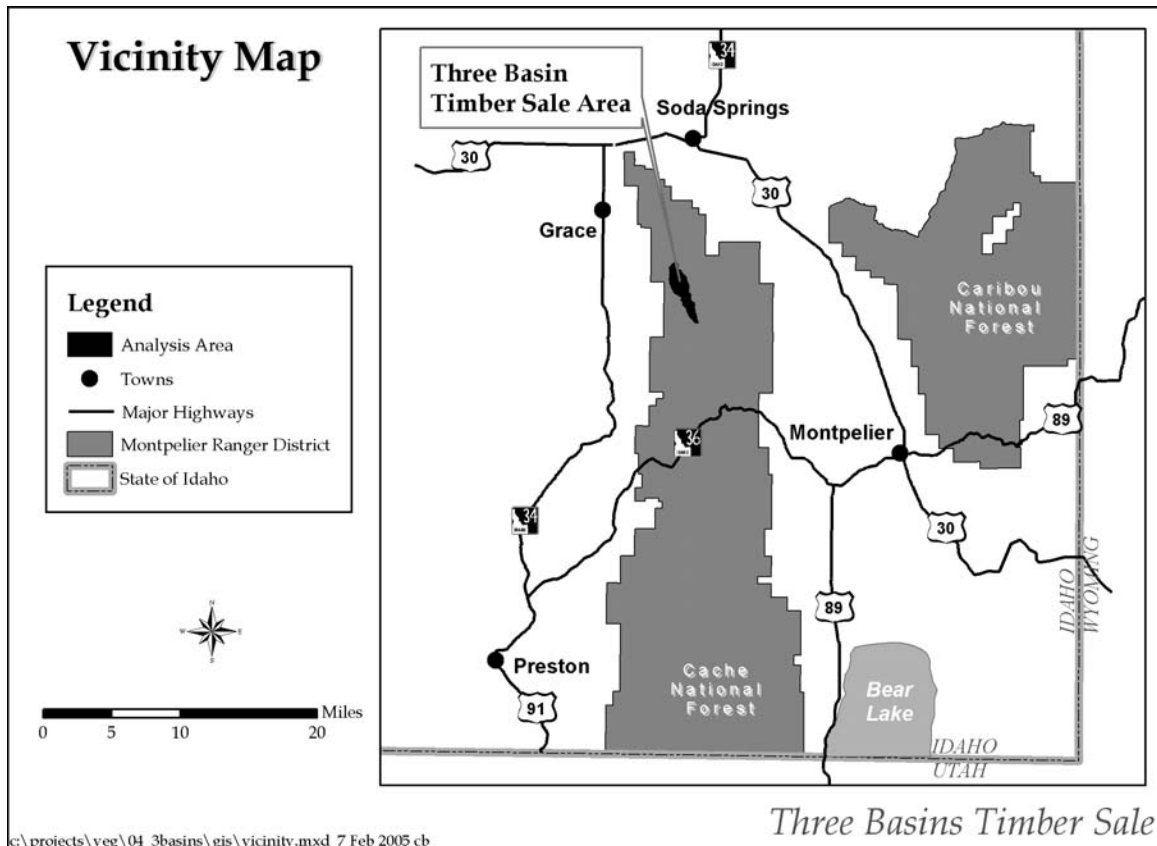
Alternative 2: The Proposed Action is the Agency preferred alternative.

1 Purpose and Need for Action

1.1 Introduction

The Montpelier Ranger District of the Caribou/Targhee National Forest proposes to treat approximately 760 acres of mature forest within the 2,582-acre project area with a combination of mechanical timber harvest and prescribed fire. The project area is located within North Cheatbeck Basin, Middle Cheatbeck Basin and South Cheatbeck Basin which are located approximately twelve (12) miles south of Soda Springs, Idaho. The legal land description for this proposal is: Township 10 South, Range 41 East, Sections 26, 35 and 36, Township 11 South, Range 41 East, Sections 1, 2, 11, 12, and 13, and Township 11 South, Range 42 East, Sections 7 and 18 of the Boise Meridian, Bear Lake and Caribou counties of Idaho. Project implementation could begin as early as the fall of 2005 and would take several years to fully implement.

Figure 1 Vicinity Map of Project Area



1.2 Proposed Action

This section provides a short summary of the activities proposed for the Three Basins Timber Sale. A more detailed description of the proposed action is presented in **Chapter 2: Alternatives**.

- A combination of vegetation management activities would occur on approximately 760 acres, all of which will occur in a Revised Forest Plan (RFP) 5.2 Forest Vegetation Management prescription area “The emphasis in this prescription area is on scheduled wood-fiber production, timber growth and yield while maintaining or restoring forested ecosystems processes and functions to more closely resemble historical ranges of variability with consideration for long-term forest resilience.” (RFP-4-71)
 - Approximately 590 acres of mature timber will be treated with a mechanical harvest of merchantable timber followed by prescribed fire. This includes approximately 10 acres set aside for personal-use, a “Mom and Pop” unit. The treatments will be designed to regenerate the stands.
 - Regeneration harvesting is where the current stand of trees is removed and a new stand is started. This would entail clearcutting the majority of the stand while leaving irregularly shaped islands, groups and fingers of reserve trees. These reserve trees would function as the seed source for natural regeneration. Harvest units would be designed to simulate historic patch sizes and shapes. This would include harvest units in excess of 40 acres in some cases, and would be contingent upon Regional Forester approval. All regeneration harvesting would be followed by a prescribed burning phase in order to prepare the ground for natural regeneration and to reduce fuel loading.
 - Approximately 118 acres of mature aspen/conifer will be treated with prescribed fire. The fire is designed to regenerate the stand and reduce fuels.
 - The fire would be designed to mimic a natural mixed severity fire, with patches, islands and fingers of the current stand remaining as relics.
 - Approximately 52 acres of mountain brush may be burned. It will be within the primary control lines, but no ignition will be done in this area, fire will be allowed to creep out into it, it is expected that very little of it will burn. This will be shown on the maps as primary contingency acreage.
- Several different types of road work are also proposed. The road work is proposed to meet transportation system needs for timber removal, resource needs and public safety. Approximate mileages and descriptions of the proposed activities are outlined below.

Table 1.2-1 Proposed Action road activities

New Construction	Reconstruction & Reconstruction w/closure	Temporary Road construct	Decommissioning of existing roads
0.9 miles	4.8 miles	1.8 miles	2.2 miles

- New construction would consist of building a new road to Forest Service specifications as a system road.
- Reconstruction would consist of one or more of the following: blading, culvert installation, ditching, road surface shaping for proper drainage, minor realignments and adding gravel in places where needed.
- Main haul route maintenance would be a contract requirement. This level of maintenance would include pulling ditches, blading and shaping the road surface, spot graveling, cleaning culverts and repairing drainage structures.
- Temporary roads would be constructed for implementation of the proposed project through the prescribed burning stage. Once all of the prescribed burning is completed these temporary roads would be decommissioned and closed to all motorized travel by a combination of: ripping, recontouring, placement of rocks, slashing, berming and seeding.
- Road decommissioning would include a combination of one or more of the following: ripping, recontouring, and placement of rocks, slashing, berming, and seeding. The intent is to close the road to motorized traffic and place the area back into production.

All acreages and road mileages are approximate and have been determined with the use of Geographic Information System (GIS) technology. Figures have been rounded and as such totals may not exactly match to the acre or tenth of a road mile. The Forest Service used the most current and complete data available. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information on GIS products used for this project contact the Montpelier Ranger District at (208) 847-0375.

1.3 Need for the Proposed Action

1.3.1 Forest Condition: Stand Structure, Species Composition and Fuels Need

There is a need to manipulate stand structure, species composition and fuels to improve the overall condition class of the landscape. This need is due to the lack of disturbance in an ecosystem that was historically maintained by fire.

A *fire regime condition class* (FRCC) assessment of the forested landscape indicated that the landscape qualifies as *condition class 2*, this means that: vegetation composition, structure and fuels have moderate departure from the natural regime and predispose the system to risk of loss of key ecosystem components.

This project is being proposed because forested structure is outside the Desired Future Condition (DFC) outlined in the Revised Forest Plan (RFP 3-17). Currently, the mature/old class is over represented; the mid/young and seedling/sapling classes are under represented. The forested landscape as a whole is currently 92% mature/old. The lack of diversity in structure also means that climax species like subalpine fir are increasing, increasing inter tree competition and ladder fuels, all this creates a landscape that is susceptible to uncharacteristic wildfire, and insect events. It also creates a landscape that is less resilient to these types of events and a need to address age class structural diversity at the landscape scale.

The RFP outlines the following guideline for **5.2 Prescription Areas**: *Practices to prevent or control natural disturbances, such as insects and disease losses and wildfire, are emphasized* (RFP 4-72). The imbalance of landscape scale age structure in the lodgepole pine cover type puts this type at risk to Mountain Pine Beetle (MPB) attack (BFO-TR-03-07). This coupled with the fact that the RFP set the goal to recruit and sustain seral species (RFP 3-18) creates a need to emphasis management of the lodgepole pine type.

The RFP outlines the following guideline for **5.2 Prescription Areas**: *Where aspen exists, it should be maintained or enhanced as a component through restoration treatments.* The aspen within the proposed project and landscape are declining in numbers and overall health, especially in conifer cover types where aspen is a minor component and aspen/conifer types where it is the dominate seral species. Regeneration of aspen is limited or absent and is not keeping pace with succession to conifers where conifer are present. This situation is a threat to the survival of some aspen clones within the project area and creates a need to emphasis management of aspen as a whole and aspen/conifer types.

1.3.2 Cost Effective Need

There is a need to capture the value of the timber that is assigned the prescription of **5.2 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 of long-term forest resilience. 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. (RFP 4-71)

1.3.3 Long-term Transportation System Need

There is a need to provide access for a variety of motorized uses including timber harvest to the project area and to other destinations accessed via the project area. The nature of these roads ranges from primitive two track roads to properly located, constructed and maintained roads. The majority of these roads have native surface material. The lack of turnouts and gravel on some of these narrow, winding roads creates safety concerns and makes driving conditions hazardous when wet. The hauling of logs across some of these roads could also create resource problems. There is a need to provide a safe road system that provides for users needs while reducing impacts on other forest resources. (RFP 3-36)

1.3.4 The purpose of this proposed action is to:

- To move age-class structural diversity on the landscape scale toward RFP desired future conditions (DFC). (RFP 3-18)
- To recruit seral tree species (aspen and lodgepole pine) by mimicking a natural disturbance in scale, patch size and intensity while changing stand species composition and fuel loads (RFP 3-18)
- To reduce the percentage of the landscape considered at high risk to Mountain Pine Beetle (RFP 4-72)
- To emphasize the cost effective production of timber within the land capability and capacity as outlined for lands within **5.2 Forest Vegetation Management Prescription**. (RFP 4-72)
- To develop and maintain the Forest transportation system to the minimum level necessary to effectively manage natural resources, provide user access, protect capital investments, while providing for user safety and protecting the environment. (RFP 3-36)

1.4 Objective of the Proposed Action

The specific objectives of this proposed action are:

- Move the forested age class structure towards the desired future condition on a landscape scale by decreasing the percentage of mature/old and increasing the seedling/sapling stage. (RFP 3-17) **Indicator:** Percentage of acres in seedling/sapling, young/mid, and mature/old stages relative to the DFCs.
- Increase seral species and reduce ladder fuels by mimicking a natural disturbance in scale, patch size and intensity. **Indicator(s):** Acres treated.
- Decrease the percentage of the lodgepole cover type at risk to mountain pine beetle. **Indicator:** Percent of lodgepole cover type at risk.
- Maintain and enhance aspen within the greater Cheatbeck Basin area. (RFP 3-17) **Indicator:** The number of acres with aspen as a stand component changed from mature/old to seedling/sapling structure class.
- Capture the economic value of the timber from acres assigned the prescription **5.2 Forest Vegetation Management**, through timber harvest. Forested lands with this designation are to be managed to emphasize the cost-effective production of timber within the lands capability and capacity. (RFP 4-72) **Indicator:** MMBF (Million board feet) harvested.
- Develop a transportation system in the project area that responds to resource, economic, and social needs and improves safety. (RFP 3-36) Improvements would be commensurate with the revenues generated by the sale of sawtimber from the project area. **Indicator:** Number of miles of road improvements.

1.5 Management Direction Relative to the Analysis Area

Revised Caribou Forest Plan Direction (RFP)

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 of consistently displayed 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.

The project area is located in Management Prescription **5.2 Forest Vegetation Management**. 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. (RFP 4-71)

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).

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.

Watershed and Riparian Resources (RFP 3-16)

- Not more than 30 percent of any of the principal watersheds and their sub-watersheds should be in a hydrologically disturbed condition at any one time.
- Proposed actions analyzed under NEPA should adhere to the State Source Water Assessment Plan to achieve consistency with the Safe Drinking Water Act, and amendments, to emphasis the protection of surface and ground water sources used for public drinking water.
- Projects in watersheds with 303(d) listed water bodies and/or delineated Source Water Protection Areas should be supported by scale and level of analysis sufficient to permit an understanding of the implications of the project within the larger watershed context.
- Proposed actions analyzed under NEPA should adhere to the State Non-Point Source Management Plan to best achieve consistency with both Sections 313 and 319 of the Federal Water Pollution Control Act.

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 sedimentation 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 VQO’s as displayed in the Forest VQO map.

Heritage Resources and Tribal Treaty Rights (RFP 3-41)

- Cultural resource inventories shall be conducted in consultation with the Idaho State Historical Preservation Office.
- The Shoshone-Bannock Tribes have ancestral Treaty Rights to uses of the Caribou-Targhee National Forest. The relationship of the United States government with American Indian tribes is based on legal agreements between sovereign nations. The Fort Bridger Treaty of July 3, 1868 granted hunting, fishing, and gathering rights to tribal members on “all unoccupied lands of the United States so long as game is present thereon.” This right applies to all public

domain lands reserved for National Forest purposes that are presently administered by the Caribou-Targhee National Forest. These rights are still in effect, and management actions recognize these rights. Consultation with the Shoshone-Bannock Tribal Business Council is required on land management activities and land allocations that could affect these rights.

- As part of government to government relations, the Shoshone-Bannock Tribes and Caribou-Targhee National Forest are developing a protocol which guides coordination, cooperation and consultation between the two entities. Tribal concerns with site specific projects revolve around impacts to their tribal treaty rights. According to the Fort Bridger Treaty and subsequent court cases clarifying these rights, the Shoshone Bannock Tribes have the right to hunt, fish, gather and practice traditional uses on all unoccupied lands in the United States. Forest Service managers have a responsibility to protect those resources essential for the Tribes to exercise their treaty rights. Concerns that the Shoshone-Bannock Tribes may have with this project will be discussed in the NEPA document.

Wildlife Resources (RFP 3-24)

- The Forest provides habitat that contributes to state wildlife management plans.
- Forest management contributes to the recovery of federally listed threatened, endangered, and proposed species and provides for conditions which help preclude sensitive species from being proposed for federal listing.

Ecological Subsection

The *Three Basins* proposed timber sale project is located within the Bear River Karst Highlands (M331Dd) ecological subsection (RFP 4-4). 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.

- Restoration and regeneration of the aspen ecosystem, focusing on areas succeeding to conifers.

1.6 Public Involvement

Caribou-Targhee National Forest, Quarterly Schedule of Proposed Actions

Public involvement in this project began in 2003 when the *Three Basins* proposed timber sale was published in the second & third quarter publications of the Caribou-Targhee National Forest NEPA Quarterly. This project has appeared in the NEPA quarterly schedule since this issue.

Public Scoping

A Notice of Intent (NOI) was published in the Federal Register, Vol. 69, No. 30, Friday, February 13th, 2004.

A scoping document describing the proposed action was sent to public groups and individuals on February 9th, 2004, soliciting comments for the proposed *Three Basins* timber sale.

A scoping document was also mailed directly to the Shoshone-Bannock Tribes, and directed to the Land Use Director, soliciting comments for the proposed *Three Basins* proposed timber sale project.

Public comments were also solicited through a legal notice published in the Idaho State Journal in Pocatello, Idaho on February 13th, 2004. The public and the Caribou-Targhee National Forest Interdisciplinary Team (IDT) identified concerns, issues, and analysis emphasis points during this scoping process.

1.7 Identification of Issues

Comment/concerns gathered from the public, internal scoping by an Interdisciplinary Team (IDT) and analysis of these comments by the IDT determined if any concerns were raised relevant to the decision to be made. The IDT reviewed each comment/concern and categorized them into one of the following groups.

1. Issues that generate alternatives to the proposed action.
2. Issues which did not drive an alternative, but are relevant to the proposal.
3. Issues not relevant to or outside the scope of this proposal.

1.7.1 Issues that generate Alternatives to the Proposed Action

Information gathered from public and internal scoping was analyzed to determine what concerns were raised relevant to the decision to be made. The IDT reviewed each comment/concern and categorized them into the following issues.

No new roads.

- There were concerns that the road construction and reconstruction necessary for the purpose of accessing timber stands proposed for harvest have the potential to affect water quality, hydrologic function of the watershed, noxious weed invasion, wildlife habitat and security, soils, and travel management. The IDT generated an alternative to track this issue and carried it forward for some time. A description of that alternative and the reason it was dropped is described in chapter 2, Alternatives Considered but Eliminated. The no action alternative will be used to track the effects of road activities. **Indicator:** Number of miles of temporary and new system road construction. **Indicator:** Miles of open roads at project completion.

No harvest or road construction within the Soda Point IRA.

- There are concerns that the project has the potential to affect the Soda Point Roadless area characteristics. **Indicator:** The potential changes in the Roadless Area and Wilderness characteristics of Soda Point IRA.

Visuals

- Most of the project area lies within a full retention area, and within a 5.2 prescription area, these two RFP prescriptions are in conflict. **Indicator:** Visual quality objectives (VQOs) met in the short term verses the long term.

Created Openings

- The proposed action exceeds FPR Standards and Guidelines related to “created openings.” The Goshawk Guideline is: the maximum created openings in forest types within historic goshawk nesting territories is 40 acres (RFP 3-30). The Timber Management Standard is: the maximum size of openings created by even-aged silvicultural system shall normally be 40 acres, in aspen and lodgepole types it may exceed with Regional Forester Approval (RFP 3-45) **Indicator:** Number of treatment units that exceed 40 acres and create an opening.

1.7.2 Issues that did not drive an Alternative, but are relevant to the proposal.

Some comments illustrated concerns about a variety of resources which require further analysis and disclosure within the environmental document. These comments were combined into similar categories and will be discussed in Chapters 3 and 4. The categories were: 1) Vegetation 2) Hydrology 3) Soils 4) Wildlife 5) Fisheries 6) Roads and Access 7) Economics 8) Air Quality 9) Visuals 10) Threatened, Endangered, and Sensitive Plants or Animals 11) Range Management 12) Recreation 13.) Tribal Treaty Rights and 13) Cultural Resources.

1.7.3 Issues beyond the Scope of this Proposal

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

Timber Harvest

Some people commented they did not want any timber harvest or that a 5.2 prescription (forest vegetation management) had been assigned to an inventoried roadless area. Both of these concerns are beyond this project level analysis and have been addressed by the Revised Forest Plan (RFP).

Develop a Wildland Fire Plan, instead of trying to mimic historic wildfires with prescribed burns or logging.

Wildland Fire Use Plans will be completed for those lands not assigned a 5.2 Forest Vegetation Management prescription according to RFP direction. All action alternatives for this proposal are on 5.2 lands.

Motorized Travel Densities

Road construction and reconstruction could have an effect of increased OHV use within the inventoried roadless area as well as the surrounding roaded areas. This project does not authorize any illegal activities nor does the Revised Forest Plan. The Forest Travel Plan Revision will address accepted motorized and non-motorized routes (Open Motorized Route Densities OMRD) within RFP standards. This proposal will not exceed the motorized travel densities for the prescription areas assigned by the RFP

Obliterate or otherwise close any and all high risk and user created roads and trails within the project area.

Some comments received from scoping wanted all high risk and user created roads and trails obliterated with this proposal. The Forest is currently undergoing a Travel Plan Revision which will address all roads and trails within the project area as well as all roads and trails outside the project area. This management strategy will address these concerns. This proposal will address only those roads which are directly influenced by this project.

Roads and trails within the project area not appearing on any Forest maps and if their numbers were used to calculate the accepted RFP standards for this area.

The current Travel Plan Revision will address specifically which roads and trails will be accepted routes recognized by the Revised Travel Plan. The Forest Service used the most current and complete data available. GIS data and product accuracy may vary. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. Additionally, Forest visitor maps are intended to provide visitors with basic information. They are not produced at a scale appropriate to show every road, trail, or other intensive information.

OHV use monitored and managed before, during and after project implementation.

This proposal will address motorized travel use on those roads specifically influenced by this project during the life of the project. Motorized travel use before and after project implementation will be addressed by the current Travel Plan Revision process.

Potential, increased illegal off-trail OHV damages and cumulative impacts of OHV use to the proposed treatment areas.

Some respondents felt that with the removal of vegetation, by either prescribed fire or logging, there would be an increase in the amount of illegal off-trail use by OHV's. This proposal will address the potential use on roads needed for project implementation, but this proposal does not authorize the illegal use of motorized vehicles. The Travel Plan Revision will address current and potential motorized vehicle uses and impacts.

Monitoring in general and monitoring specific to any past NEPA documents.

Concerns were raised about the proposed project effectiveness to reach stated objectives, and standard Forest Plan mandated monitoring will be insufficient to effectively meet the objectives of this proposal. Project design in the form of design features common to all action alternatives addresses the monitoring, and design features incorporated into each alternative. Monitoring is not an issue in itself but is a part of each action alternative.

Monitoring specific to any past NEPA decisions are included in the Caribou-Targhee National Forest Plan monitoring and evaluation reports and are not specific to this proposal. Past monitoring data is one source for the cumulative effects portion of this analysis.

The project should identify additional management indicator species.

The RFP has determined the number and species which will be the management indicator species (MIS) across the Forest and as such is outside the scope of this project.

Goshawks being forest and forest-edge predators, all openings should be 4 acres or less.

The alternative selected will address the RFP guideline as it pertains to goshawk habitat and size class distribution of forested acreages by percentage within an analysis area and RFP standard of 6,000 acres. The RFP guideline is “openings in post-fledging family areas and foraging areas should be 40 acres or smaller”.

No mining, hunting, or fishing allowed in the project area.

Currently there are no mining leases or proposals to mine, within the project area. Any proposed mining is outside the scope of this proposal. As well, all hunting and fishing opportunities are permitted through the State and are not within the scope of this proposal.

1.7.4 Effects to be analyzed (other relevant resource concerns)

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, which will be discussed in Chapter 3 of this document. The categories are

- 1.) Vegetation
- 2.) Hydrology
- 3.) Soils
- 4.) Wildlife
- 5.) Rare Plants
- 6.) Fisheries
- 7.) Roads and Access
- 8.) Inventoried Roadless
- 9.) Economics
- 10.) Air Quality
- 11.) Range Management
- 12.) Tribal Treaty Rights
- 13.) Heritage Resources
- 14.) Recreation
- 15.) Visuals

1.8 Decision to be Made

- Should resource management activities including: timber harvest, road construction and reconstruction, road closures and prescribed burning be implemented in the *Three Basins* proposed project area at this time?

If so:

- Where within the project area should these activities occur?
- What type and mix of timber harvests, prescribed burning, and road management should be used on this specific portion of Forest Service managed lands?
- What design features, mitigation measures, and monitoring should be applied to the project?

2 Alternatives, Including the Proposed Action

This chapter describes the No Action Alternative, the Proposed Action Alternative and two additional action alternatives that the Interdisciplinary Team (IDT) developed and analyzed in detail. It also briefly describes the other alternatives considered but eliminated from further analysis. Alternatives were designed in response to scoping issues described in Chapter 1.

In addition to describing the alternatives, this chapter presents a comparative summary of the alternatives based on the information and analysis in Chapter 3 Affected Environment and Chapter 4 Environmental Consequences.

2.1	History and Process Used to Formulate the Alternatives	2-1
2.2	Decision Criteria	2-1
2.3	Alternatives Considered but Eliminated from Detailed Study	2-2
2.4	Alternatives Considered in Detail	2-4
2.5	Management Practices	2-24
2.6	Comparison of Effects and Outputs by Alternative	2-32

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 Alternative 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. Two additional action alternatives were developed to address concerns identified through the scoping and IDT review process.

2.2 Decision Criteria

A goal of environmental analysis is to identify the current situation, the desired situation, also known as the desired future condition (DFC), and if there exists a void between these two, it should be recognized as an opportunity. This opportunity to shift towards a more desired condition and to what extent this opportunity is fulfilled are basic parameters for the decision maker. The overall goal is to optimize this shift to desired conditions with the identified project objectives while attempting to avoid 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 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 the aspen component of forested vegetation is maintained or enhanced. **Indicator:** The number of acres of mature aspen and mature aspen/conifer converted to aspen and aspen/conifer seedlings/saplings.
- The extent of economic value captured from acres assigned the prescription of 5.2 by timber harvest. **Indicator:** Millions of board feet (MMBF) harvested.

- The development of a safe transportation system within the project area which responds to resource and safety needs. **Indicator:** Number of miles of road improvements.

2.3 Alternatives Considered but Eliminated from Detailed Study

Public comments and the Interdisciplinary Team (IDT) proposed other approaches or alternatives to accomplish the project objectives. These alternatives were evaluated by the IDT, but eliminated from detailed study due to not fully meeting the project purpose and need, the Revised Forest Plan **Error! Bookmark not defined.** (RFP) direction, or other management constraints. A brief discussion of each alternative considered, and the reasons for elimination from detailed study are listed below.

2.3.1 No new roads.

The IDT considered an alternative in some detail that would construct “No New Roads”. This alternative was considered as a result of comments received during public scoping. Several of the publics that responded expressed concerns related to the effects of building new roads. Some of the concerns were: open road densities, wildlife, effectiveness of closures on temporary roads and road obliterations, etc. The team felt that an alternative that considered no new roads would be feasible and would address the purpose and need, so it was very carefully considered. It was analyzed and carried forward in the process for some time, until it was determined by the IDT and District Ranger that the affects would be so similar to the Proposed Action that it was not warranted to carry the alternative any further.

The IDT and the District Ranger determined that because the majority of the new construction was for resource benefit and was moving the road (# 479) so little that most of the potential effects raised by the public were not warranted under the circumstance. The IDT all felt that the construction of a new road that followed the old blazes along the west edge of North Cheatbeck Basin was the right thing to do for the resource. This would get the existing road out of the meadow and put it in a location where proper drainage could be provided. So, in both action alternatives this new construction (relocation) is still proposed.

The reason that the IDT still felt that the alternative should propose the construction was: the Montpelier Ranger District recently decided to do a similar thing in the Miles Canyon Environmental Analysis (EA). The Miles Canyon EA proposed to construct/relocate the # 940 road out of the bottom of the dry meadow to the side hill where drainage could be provided. The new road was constructed in 2000 and the old section was obliterated in 2001. To date the obliteration has been honored and the overall road density has remained the same. The district believes this was effective because access was still provided by the new location. Ripping of the old road prism, direct seeding to native species combined with seed from native plants along the old road has lead to very good plant establishment and growth. With proper decommissioning, there were no noticeable affects upon wildlife, hydrology, visuals, or soils.

Since the No New Roads alternative boiled down to a no new temporary road alternative, the question became; how far can we effectively skid on these areas and what is the difference in effects between temporary roads and skid trails from an effects stand point. Skid trails would have to be located in the same locations as proposed temporary roads and would have very similar disturbances, with ripping, brushing and seeding to close out as a design feature; the effects would be nearly the same. Therefore, the only real difference in the No New Roads alternative and the Proposed Action was a reduction in acres treated due to economical skidding distances. Preliminary analyses suggest that the reduction would have been less than 10% of the acres proposed for treatment in the Proposed Action. The affects of road construction will be assessed using the no action alternative.

2.3.2 Selective Harvesting or limiting clearcut patch size to 4 acres or less.

An alternative was proposed to limit harvesting to partial cutting or to limit all harvest created openings to no greater than 4 acres in size for all stands within the project area. This approach would not simulate the natural patch sizes or shapes of the predominating lodgepole pine stands within the project area. Using this patch size limit or partial cutting approach would require multiple logging entries across many years with multiple additional road construction and reconstruction needs which would potentially be required to remain open far longer than the proposed action. Small patch clearcut cutting is very inefficient for regeneration of even-aged lodgepole pine stands. In the past, many district timber sale units were 4 acres or less, and have shown this inefficiency of small acreage clearcutting. Partial cutting of lodgepole pine is not a desired silvicultural approach to regeneration of even-aged stands and tends to create residual stand damages unless sufficient trees are being removed to allow greater areas for logging equipment to operate. The type of harvest cutting where sufficient room for logging equipment occurs would not meet this alternative's objective. This alternative also does not address the high risk of infestation from mountain pine beetles and the risk of a potential outbreak within the project area.

2.3.3 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. The Montpelier District Ranger gave project specific direction in the project initiation letter to: "...analyze harvesting in stands that can be tractor logged only. Using helicopters to yard trees has not been an economical method of yarding sawtimber on the Caribou/Targhee National Forest." All stands considered for logging are located on terrain that can be tractor logged within the standards and guidelines of the RFP.

2.4 Alternatives Considered in Detail

This section describes the alternatives considered in detail. Detailed maps that display locations of activities by alternative can be found for each alternative later in this chapter.

2.4.1 Alternative 1 – No Action

Alternative 1

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. Management activities proposed by other environmental documents may still occur.

Under this alternative the present course of management would continue. There would be no active management to address the imbalance of structural stages present in the forest community. There also would be no active management to enhance or restore aspen, and conifer encroachment would continue. No roads would be improved beyond scheduled maintenance. There would be no benefit to the area economy resulting from the harvest of timber.

Resource management activities presently occurring within the project area are; cattle grazing, firewood gathering, post and pole cutting, fire suppression, road and trail maintenance, range improvement maintenance and allotment administration, upland bird and big game hunting, camping, dispersed recreational activities such as; motorized trail riding, snowmobiling, cross-country skiing, hiking, wildlife observation, and berry picking. These activities would continue to occur under this and all action alternatives.

The Revised Forest Plan (RFP) designated this area to motorized travel restriction status. The Caribou Travel Plan revision and analysis and the resulting decision will address open motorized route density (OMRDs).

2.4.2 Alternative 2 - The Proposed Action

Alternative 2

This is the proposed action; it would treat 708 acres or 27% of the project area (2,582 acres) in addition to the ongoing activities listed for Alternative 1. This alternative was designed to address the imbalance in forest structure classes, historic patch sizes and shapes, species composition and age class diversity on a landscape scale. It was also designed to maintain or enhance aspen clones within conifer and aspen/conifer stands in the project area. It emphasizes the cost effective production and removal of commercial timber within the lands capability and capacity.

All design features that have been listed in section **2.5.1 Design Features Common to Alternatives 2, 3, and 4** will be included in this alternative.

The emphasis is on shifting stand structure and species composition to an earlier seral stage, while providing wood to the commercial and local markets. This alternative would move forested stand composition and structure towards desired future conditions (DFC)

and would minimize potential insect outbreaks within the lodgepole pine timber type of the project area. Proposed activities may not occur on every acre within the harvest unit, but for analysis and reporting purposes, the entire harvest unit acreage will be assumed treated.

Because this alternative was designed to mimic a natural disturbance in scale it proposes to exceed the maximum size limit for forested vegetation openings created in one commercial harvest operation by even-aged silvicultural systems and would be contingent upon approval from the Regional Forester. "Openings may exceed 40 acres in aspen and lodgepole pine type's contingent upon Regional Forester approval, or as a result of natural catastrophic conditions, such as fire, insect and disease, or windstorm."(RFP 3-45) Commercial harvesting operations in seven units would create openings that exceed 40 acres.

This alternative would not meet two RFP guidelines; the VQO guideline of retention and the goshawk guideline related to created openings within goshawk nesting territories.

All treatments are designed to mimic a mixed severity fire, where most thin barked trees (aspen, subalpine fir and lodgepole pine) will be removed through logging or killed by the prescribed fire, patches of thin barked trees will be left as well as most large, thick barked Douglas-fir. This type of treatment will shift the competitive advantage to seral tree species aspen and lodgepole pine.

This alternative proposes to treat, with a combination of timber harvest and prescribed burning, 485 acres of mature lodgepole pine. Large blocks of mature sawtimber size trees, dominated by lodgepole pine overstories, would be treated by clearcutting the majority of the stand, islands and groups of reserve trees (up to 1 acre) would be left uncut to provide the seed and site protection necessary for natural regeneration. Harvesting large blocks while leaving islands uncut is designed to simulate the natural patch sizes, shapes and texture of lodgepole pine stands in the area that evolved with a mixed severity fire regime. All seven of the units that exceed 40 acres are in this type.

Approximately 69 acres of mature aspen/conifer (unit # 9) is also proposed to be treated, with a combination of timber harvest and prescribed burning for aspen restoration. It is expected that this unit will have a forested appearance after treatment due the number of Douglas-fir and the patches that will be left, it will not be considered a created opening.

Additionally, one 36 acre unit (unit # 12), classified as a mature Douglas-fir cover type is proposed for management using regeneration harvest followed with prescribed burning for site preparation for natural regeneration and fuels reduction. This stand currently has a mixed composition, lodgepole pine and subalpine fir are common, aspen is less common but can be found throughout. Lodgepole pine and aspen are expected to make up the majority of the regeneration with Douglas-fir coming later, under the established aspen.

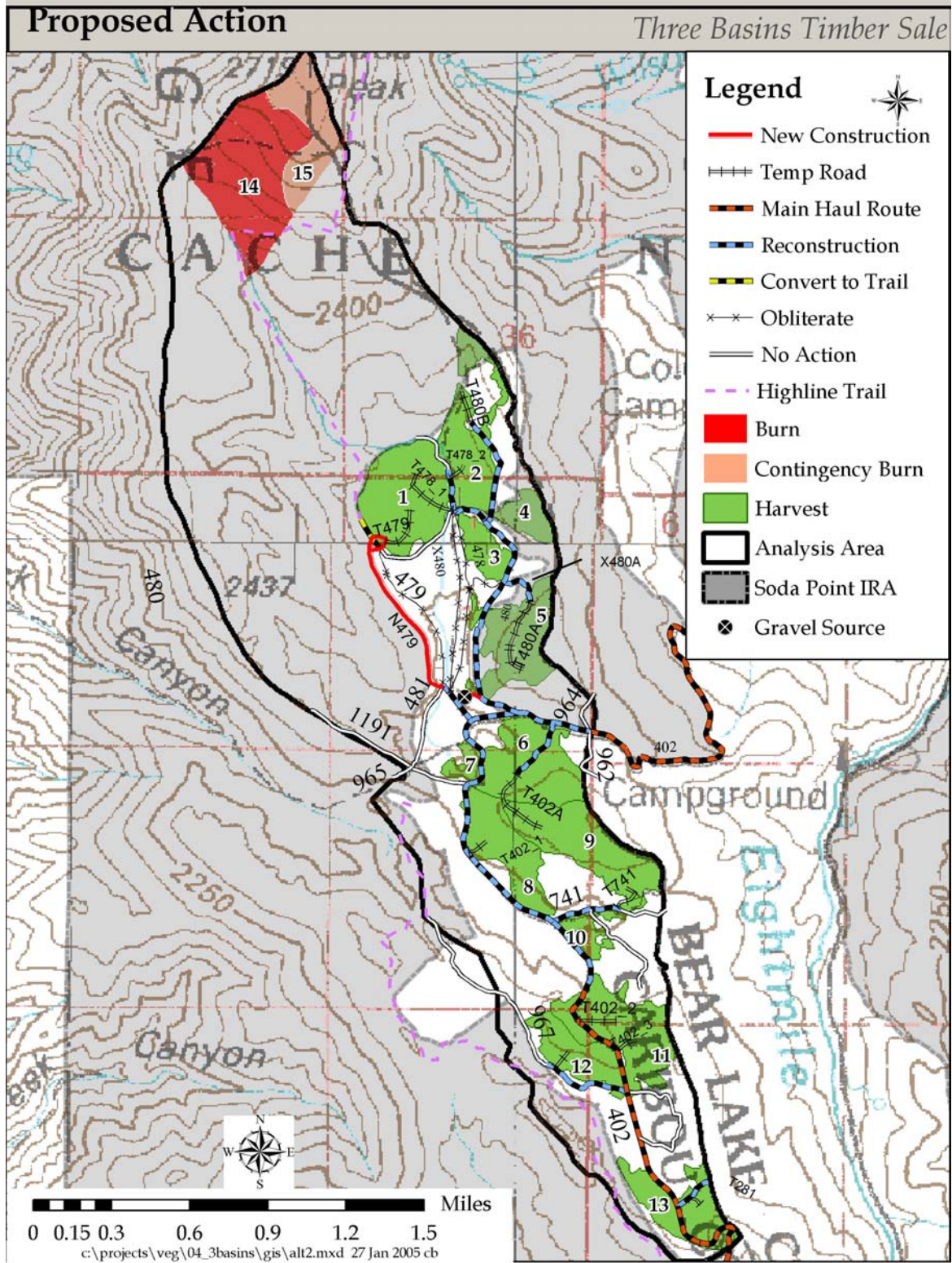
Approximately 118 acres of mature aspen/conifer (unit # 14) would be treated with prescribed fire for aspen restoration. Trails, natural or constructed fuel breaks, black lining, and weather forecasting would be utilized to minimize the risk of an escaped fire. Within the primary control lines there are approximately 52 acres of mountain brush (unit # 15), this will serve as a primary contingency area for the aspen restoration prescribed burn. Fire will not be ignited in this area but will also not be actively suppressed.

This proposed prescribed fire treatment is within the Soda Point Inventoried Roadless Area (IRA). All preparations for the prescribed burn would be accomplished with hand crews which would access the proposed prescribed burn unit within the roadless area by using the Highline Trail with ATVs/motorcycles and/or by hiking up the trail. Protection of the integrity of the Highline Trail would be a priority of the prescribed burn as well.

Along the southerly and easterly sides of unit # 14, the Highline Trail (# 316) will be used as a control line. Preparatory burning work along this trail would include scattering down fuels and removal of ladder fuels. Along the west and north sides of unit # 14, hand crews with chainsaws would be used to construct fuel breaks. These fuel breaks would be up to 10 feet wide, spanning from natural fuel break to natural fuel break, with all standing and down fuels being lopped and scattered along the length of the created break. Once fuel breaks are in place, the technique of black lining with hand ignition in combination with fire suppression resources would be used to secure the outer perimeter of the burn unit. Once secure, black lining would continue down the flanks in conjunction with a strip-head firing pattern to treat the middle of the burn unit. This strip head firing method will be done such to mimic a mixed severity fire, patches with light fuel or dominated by aspen will not be ignited, the fire will be allowed to back and creep into these patches.

Unit numbers and locations, as well as the proposed road activities are shown in Figure 2.4-1, Alternative 2 Proposed Action map.

Figure 2.4-1 Alternative 2 Proposed Action Map



This page intentionally left blank.

Table 2.4-1 Alternative 2 Forested Vegetation Proposal

Unit #	Acres	Cover Type	Harvest Method	Yarding Method	Regeneration Method	Slash Treatment
1	75*	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
2	57*	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
3	19	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
4	18	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
5	57*	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
6	67*	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
7	10	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Pile & Prescribed burn
8	49*	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
9	69	Mature Aspen/Conifer	Group Seed Tree	Ground Based r	Natural from Reserve Trees	Prescribed burn
10	19	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Pile & Prescribed burn
11	67*	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
12	36	Mature Douglas-fir	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
13	47*	Mature Lodgepole	Group Seed Tree	Ground Based	Natural from Reserve Trees	Prescribed burn
14	118	Mature Aspen/Conifer	Prescribed burn	None	Natural from existing clone	N/A
15	52**	Mountain Brush	Contingency burn area	None	None	N/A
Acres Treated	708					

* The maximum size limit for forested vegetation openings created in one harvest operation by the even-aged silvicultural system shall normally be 40 acres. Created openings may exceed 40 acres in aspen and lodgepole pine cover types contingent upon Regional Forester approval, or as a result of natural catastrophic conditions such as fire, insect and disease, or windstorm (RFP 3-45).

** This area is not planned for treatment but is within the primary control lines for unit 14 so is shown.

A portion of this proposal is within the Soda Point Inventoried Roadless Area # 04171. A table of the proposed treatments, unit numbers and acres, is listed within **Table 2.4-2**.

Table 2.4-2 Alternative 2 Soda Point Roadless Forested Vegetation Proposal

SODA POINT ROADLESS AREA PROPOSED TREATMENTS		
COVER TYPE	TREATMENT	ACRES/UNIT #s
Mature Aspen/conifer	Prescribed burning without harvest	118 acres Unit #14
Mountain brush	Contingency burning area without harvest	52 acres Unit #15
Mature Lodgepole pine	Logging & prescribed burning	80 acres Unit # 4,5 & part of 2
Total Acres		250

Roads:

The proposed road treatments are to improve and facilitate a safe, long-term transportation system that reduces impacts to the resource, while providing for long term resource management needs. See Figure 2.4-1, Proposed Action Map for locations of proposed road activities and Table 2.4-5 for a description of the activities. A detailed description of each road and the proposed activity can be found in Appendix C.

Table 2.4-3 Road Activity Proposal Totals Alternative 2

Proposed Road Activity	Total **
Road Construction	0.9*
Reconstruction	3.6*
Reconstruction then Closure***	1.2*
Decommissioning of Existing	2.2*
Temporary Road Construction	1.8*
Road Convert to Trail	0.1*

* Mileages are approximate.

** Approximately 0.3 miles of proposed new road activity is within the Soda Point Inventoried Roadless Area. See Chapter 4 for detailed information.

*** Reconstruction then closure is shown on the map as reconstruction.

Table 2.4-4 Alternative 2 Proposed Road Activities

Road #	Reconstruction and Reconstruction with Closure	Temporary Road	New Road Construction	Decommission	Convert to Trail
402	1.7				
281	0.2				
T281		0.1			
T402-A		0.3			
T402-1		0.1			
T402-2		0.1			
T402-3		0.1			
X402-A	0.3				
478	0.1				
478				0.7	
478	0.2				
T478-1		0.2			
T478-2		0.1			
X478-A				0.2	
479				0.6	
N479			0.8		0.1
T479		0.2			
480	1.0				
480-B	0.4				
N480-C			0.1		
T480-A		0.3			
T480-B		0.1			
X480				0.7	
X480-A	0.2				
741	0.3				
T741		0.1			
967	0.4				
T967		0.1			
*TOTAL	4.8 miles	1.8 miles	0.9 miles	2.2 miles	0.1 miles

Table 2.4-5 Road Activity Descriptions: The following narratives provide details for proposed road work.

Activities	Objective and Detailed Descriptions
New Road Construction	Construction of a road to Forest Service standards to be used for long term management of the resource. Road to be added to the Forest Service roads system. Locations and amounts shown are approximate for analysis purposes. Exact locations will be determined during project implementation.
Reconstruction	The objective of action is to provide a safe, operable road to haul logs from the project area, and/or to reduce resource impacts. Reconstruction involves one or more of the following: blading, culvert installation, shaping for proper drainage, placement of proper drainage structures, minor realignments, construction of pull outs and adding gravel in spots (spot graveling) where needed.
Reconstruction then Closure	The objective and activities are the same as above. Roads with this designation would be closed to motorized access after the project is completed. Shown as reconstruction on the map.
Obliteration/Decommission	The object of this treatment is to remove roads not needed for long term management from the system and return them to productivity. The intent is to eliminate motorized travel from these roads. This may include a combination of one or more of the following: ripping, recontouring, scattering of slash, placement of rocks, berming, and followed by seeding to native species.
Main Haul Route	The roads which comprise the main haul route would have maintenance performed as a requirement of the timber sale contract. This maintenance would include pulling ditches, blading and shaping the road surface, spot graveling, cleaning culverts and repairing drainage structures.
Temporary Road Construction	Roads that are needed for the harvest and burning stages of the project and are not needed for long term management or Forest access. Locations and amounts are approximate for analysis purposes. Exact locations will be determined during project implementation. Roads will be used for the project then decommissioned and returned to productivity by a combination of ripping, berming, recontouring, scattering of slash, rock placement, and seeding to native species.
Convert to Trail	Road section will be removed from road inventory and added to the trails inventory. A portion of the existing tread will be ripped, seeded and slashed to narrow the foot print to 50 inches or less. Barrier rocks will be placed at the beginning.
No Action	Roads within the project area that do not have any activities proposed.
Gravel Source	Top soil from site will be stockpiled, rock from site will be unearthed, pile then crushed. When stock piles sufficient to meet the needs of this project and other future projects in the area have been crushed, the pit area will be rehabilitated by contouring to a 3:1 and then placing stockpiled soil over site. The area will be seeded back with native species.

2.4.3 Alternative 3 –Roadless Alternative

Alternative 3:

This alternative proposes no new vegetation management activities within the Soda Point roadless area # 04171. It was designed to address the issues of logging, road building or burning within the Soda Point Roadless area. This alternative was also designed to meet the same forested vegetation objectives outlined in Alternative 2. (i.e. Forest age structure, seral species, aspen restoration, reducing MPB risk, providing available wood from management activities to commercial markets all while trying to mimic a mixed severity fire).

This alternative proposes to treat approximately 510 forested acres or 20% of the 2,582 acres within the project area in addition to the ongoing activities listed for Alternative 1 – No Action. Proposed activities may not occur on every acre within the stand, but for analysis and reporting purposes, the stand acreage will be assumed treated.

All design features that have been listed in section **2.5.1 Design Features Common to Alternatives 2, 3, and 4** will be included in this alternative.

Like Alternative 2 this alternative was designed to mimic a natural disturbance in scale, so it proposes to exceed the maximum size limit for forested vegetation openings created in one commercial harvest operation. It would be contingent upon approval from the Regional Forester. “Openings may exceed 40 acres in aspen and lodgepole pine type’s contingent upon Regional Forester approval, or as a result of natural catastrophic conditions, such as fire, insect and disease, or windstorm.”(RFP 3-45) Commercial harvesting operations in **six** units would create openings that exceed 40 acres.

This alternative would also not meet two RFP guidelines, the VQO guideline of retention and the goshawk guideline related to created openings within goshawk nesting territories.

This alternative proposes to treat, with a combination of timber harvest and prescribed burning, 406 acres of mature lodgepole pine. The design for these acres is basically the same as Alternative 2, with patches and islands left uncut, and entire stands will be treated except where split by the IRA boundary. All **six** of the units that exceed 40 acres are in this type.

Unit # 9 is the same 69 acres of mature aspen/conifer proposed for treatment in Alternative 2. The activities proposed in this alternative are also the same. It is expected that this unit will have a forested appearance after treatment due the number of Douglas-fir and the patches that will be left, it will not be considered a created opening.

Unit # 12 is also the same 36 acres of mature Douglas-fir cover type that is proposed for treatment in Alternative 2. The activities proposed in this alternative are also the same.

Unit numbers and locations are shown in Figure 2.4-2, Alternative 3 Map.

Table 2.4-6 Alternative 3 Forested Vegetation Proposal

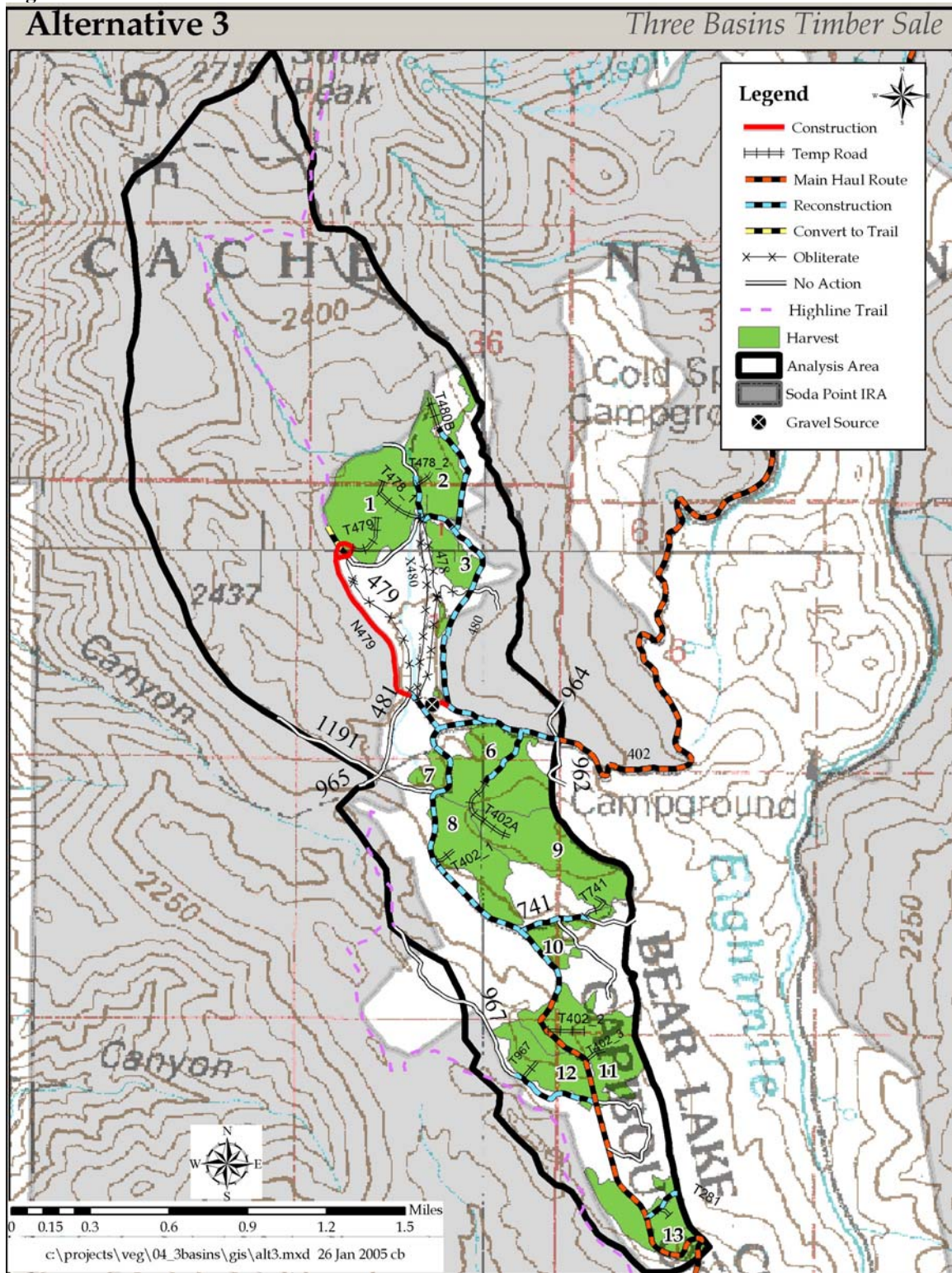
Unit #	Acres	Cover Type	Harvest Method	Yarding Method	Regeneration Method	Slash Treatment
1	75*	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
2	48*	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
3	19	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
5	4	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
6	67*	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
7	10	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Pile & Prescribed burn
8	49*	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
9	69	Mature Aspen/Conifer	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
10	19	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Pile & Prescribed burn
11	67*	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
12	36	Mature Douglas-fir	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
13	47*	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
Grand Total	510					

* The maximum size limit for forested vegetation openings created in one harvest operation by the even-aged silvicultural system shall normally be 40 acres. Created openings may exceed 40 acres in aspen and lodgepole pine cover types contingent upon Regional Forester approval, or as a result of natural catastrophic conditions such as fire, insect and disease, or windstorm (RFP 3-45).

Roads:

The proposed road treatments are to improve and facilitate a safe, long-term transportation system that reduces impacts to the resource, while providing for long term resource management needs. See Figure 2.4-2 Alternative 3 Map for locations of proposed road activities and Table 2.4-5 for a description of the activities.

Figure 2.4-2 Alternative 3



This page intentionally left blank.

Table 2.4-7 Road Proposal Totals Alternative 3

Proposed Road Activity	Total
New Road Construction	0.9 miles
Reconstruction	3.4 miles
Reconstruction then Closure	1.2 miles
Decommissioning of Existing	2.2 miles
Temporary Road Construction	1.5 miles
Road Convert to Trail	0.1 miles

Table 2.4-8 Alternative 3 Road Proposal

Road #	Reconstruction and Reconstruction with Closure	Temporary Road	New Road Construction	Decommission	Convert to Trail
402	1.7				
281	0.2				
T281		0.1			
T402-A		0.3			
T402-1		0.1			
T402-2		0.1			
T402-3		0.1			
X402-A	0.3				
478	0.1				
478				0.7	
478	0.2				
T478-1		0.2			
T478-2		0.1			
X478-A				0.2	
479				0.6	
N479			0.8		0.1
T479		0.2			
480	1.0				
480-B	0.4				
N480-C			0.1		
T480-B		0.1			
X480				0.7	
741	0.3				
T741		0.1			
967	0.4				
T967		0.1			
*TOTAL	4.6 miles	1.5 miles	0.9 miles	2.2 miles	0.1 miles

* All mileages are approximate.

2.4.4 Alternative 4 - The Created Opening Alternative

Alternative 4:

This alternative was generated to address the RFP Goshawk Guideline and Timber Management Standard related to created openings that exceeding 40 acres. The Goshawk Guideline is: the maximum created openings in forest types within historic goshawk nesting territories is 40 acres (RFP 3-30). The Timber Management Standard is: the maximum size of openings created by even-aged silvicultural system shall normally be 40 acres, in aspen and lodgepole types it may exceed with Regional Forester Approval (RFP 3-45).

This alternative proposes to treat approximately 516 forested acres or 20% of the 2,581 acres within the project area in addition to the ongoing activities listed for Alternative 1 – No Action. Proposed activities may not occur on every acre within the stand, but for analysis and reporting purposes, the stand acreage will be assumed treated

This alternative would provide wood to the commercial and local markets, address the imbalance in age-class structure across the landscape, by moving it toward DFC's and would rejuvenate aspen and reduce mountain pine beetle risk. However, because no commercial regeneration harvest units are proposed greater than 40 acres by this alternative it will not mimic natural patch size like the other alternatives which has some affect on how the units will be designed. Units in this alternative will have more forested edge (i.e. stands are fragmented/split) that will provide site protection and seed for regeneration, this reduces the need and feasibility of the larger reserve patches. Patches will tend to be smaller than the other alternatives to maintain the seral species competitive advantage (i.e. not provide so much shade that alpine fir will have the advantage). Most large thick barked Douglas-fir will still be left, the reserve patches of thin barked trees will tend to be of similar arrangement and size (slightly larger) to those in past sales in the area like the Cheatbeck Ridge Sale.

All design features that have been listed in section **2.5.1 Design Features Common to Alternatives 2, 3, and 4** will be included in this alternative.

This alternative proposes to treat, with a combination of timber harvest and prescribed burning, 330 acres of mature lodgepole pine. Up to 39 acre blocks of mature sawtimber size trees, would be treated by clearcutting the majority of the stand, small islands and groups of reserve trees (generally less than 1/4 acre) would be left uncut to provide the seed and site protection necessary for natural regeneration. As mentioned above arrangement and size of the reserve patches will be different than the other alternatives to account for the smaller opening size. The two main factors that necessitate this difference are burning feasibility and the silvicultural requirements of seral tree species.

Unit 9 is the same 69 acres of mature aspen/conifer proposed for treatment in alternative 2. The activities proposed in this alternative are also the same. It is expected that this unit will have a forested appearance after treatment due the number of Douglas-fir and the patches that will be left, it will not be considered a created opening.

The same 118 acres of mature aspen/conifer (unit 14) would be treated with prescribed fire for aspen restoration in this alternative as in alternative 2. Trails, natural or constructed fuel breaks, black lining, and weather forecasting would be utilized to minimize the risk of an escaped fire. Within the primary control lines there is approximately 52 acres of mountain brush (unit 15), this will serve as a primary contingency area for the aspen restoration prescribed burn. Fire will not be ignited in this area but will also not be actively suppressed.

The design and operations would be the same as described in Alternative 2.

Unit numbers and locations, as well as the proposed road activities are shown in Figure 2.4-3 Alternative 4.

Table 2.4-9 Alternative 4 Forested Vegetation Proposal

Unit #	Acres	Cover Type	Harvest Method	Yarding Method	Regeneration Method	Slash Treatment
1	39	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
2	39	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
3	19	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
4	18	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
5	39	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
6	36	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
7	10	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Pile & Prescribed burn
8	37	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
9	69	Mature Aspen/Conifer	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
10	19	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
11	39	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
13	34	Mature Lodgepole	Group Seed Tree	Tractor	Natural from Reserve Trees	Prescribed burn
14	118	Mature Aspen/Conifer	Prescribed burn	None	Natural from Existing clone	Not Applicable
15	52**	Mountain Brush	Contingency burn area	None	None	Not Applicable
Acres Treated	516					

** This area is not planned for treatment but is within the primary control lines for unit 14 so is shown

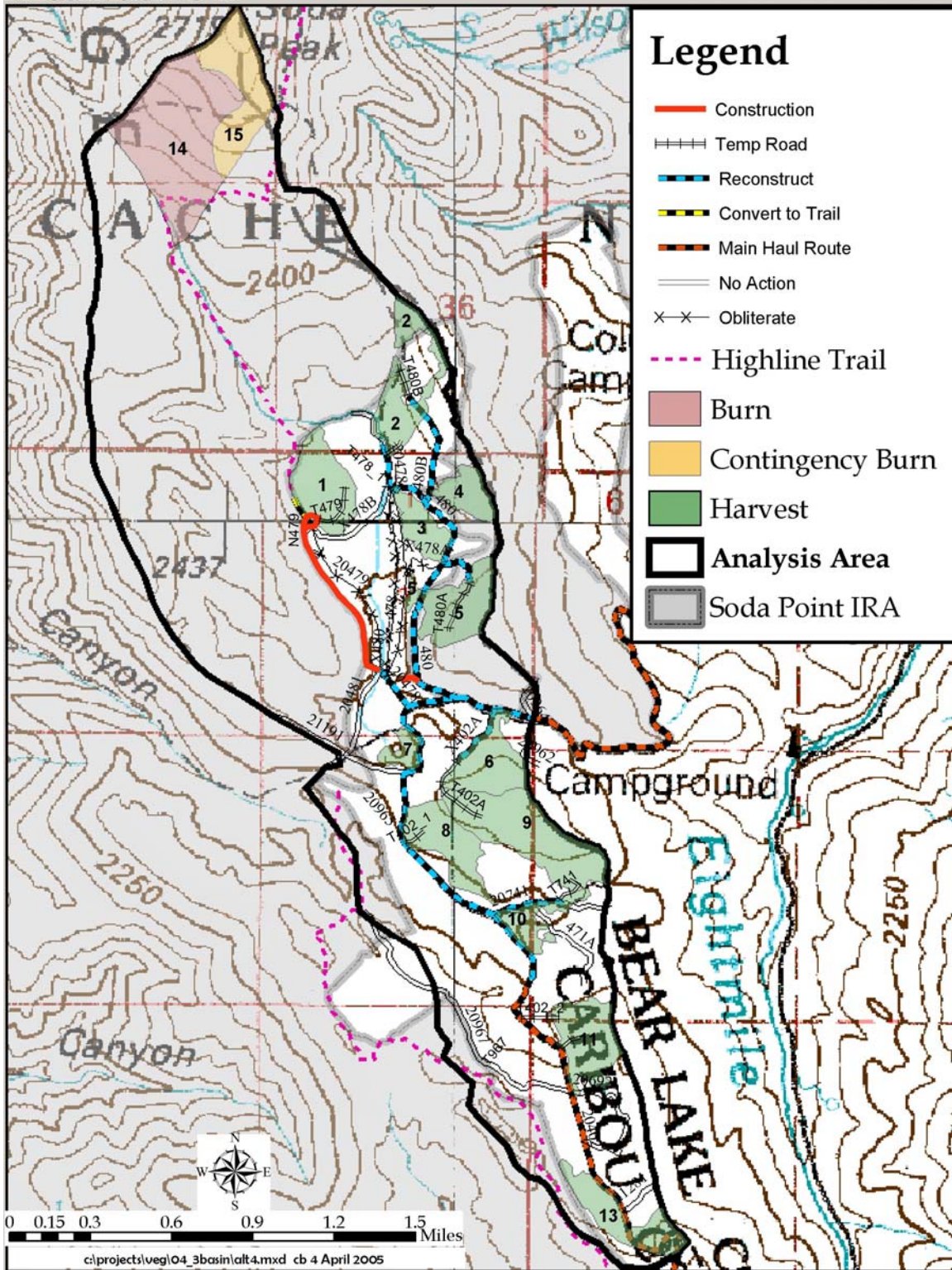
Roads:

The proposed road treatments are to improve and facilitate a safe, long-term transportation system that reduces impacts to the resource, while providing for long term resource management needs. See Figure 2.4-3, Alternative 4 Map for locations of proposed road activities and Table 2.4-5 for a description of the activities.

Figure 2.4-3 Alternative 4

Alternative 4

Three Basins Timber Sale



This page intentionally left blank.

Table 2.4-10 Road Proposal Totals Alternative 4

Proposed Road Activity	Total**
New Road Construction	0.9 miles*
Reconstruction	2.8 miles*
Reconstruction then Closure	1.4 miles*
Decommissioning of Existing	2.2 miles*
Temporary Road Construction	1.4 miles*
Road Convert to Trail	0.1 miles*

* Mileages are approximate

**Approximately 0.3 miles of proposed new road activity is within the IRA. See Chapter 4, for more detailed information on roads within the IRA.

Table 2.4-11 Alternative 4 Road Proposal

Road #	Reconstruction and Reconstruction with Closure	Temporary Road	New Road Construction	Decommission	Convert to Trail
402	1.7				
T402-A		0.3			
T402-1		0.1			
T402-2		0.1			
T402-3		0.1			
X402-A	0.3				
478	0.1				
478				0.7	
478	0.2				
T478-2		0.1			
X478-A				0.2	
479				0.6	
N479			0.8		0.1
T479		0.2			
480	1.0				
480-B	0.4				
N480-C			0.1		
T480-B		0.1			
X480				0.7	
741	0.3				
T741		0.1			
X480-A	0.2				
T480-A		0.3			
*TOTAL	4.2	1.4	0.9	2.2	0.1

2.5 Management Practices

2.5.1 Design Features Common to Alternatives 2, 3, and 4:

Forested Vegetation

- Trees, to be left uncut, would be selected and marked prior to logging. These “reserve trees” would be individuals and/or groups of varying sizes and shapes irregularly arranged across the harvest units to provide seed for natural regeneration. These reserve trees would also function as green tree replacement snags, a reservoir for future large down woody material, vertical and visual diversity while mimicking the patch sizes and shapes that would be left unburned after a natural fire.
- Northern Pocket Gopher control to insure meeting minimum Forest Plan stocking rates in conifer regeneration units.
- Other silvicultural activities that may occur as needed could include: insect controls such as Carbaryl spraying to protect trees from bark beetle attack, disease control of mistletoe by felling and/or pruning, thinning of plantations, and control of undesirable tree species.
- One proposed harvest unit, # 7, 10 acres, would be withheld from the commercial timber sale harvest units and be made available for small “Mom & Pop” personal-uses. This unit would be harvested and then naturally regenerated after the slash has been piled and burned. This unit could be logged over a period of a few years as demand dictates.
- All commercial logging units would be yarded with ground based equipment such as tractors or rubber tired skidders. The “Mom and Pop” harvest unit would use ground based equipment such as tractors to skid trees and provide the necessary site preparation for natural regeneration of conifers.
- All regeneration is to be by natural means, no planting is planned. Burning would provide the necessary site preparation while the reserve trees and the harvest unit edges would provide the seed sources for natural regeneration of conifers. Aspen regeneration would be from the existing root systems.
- Whole tree skidding is specified.
- Firewood will be made available from the residue created by the harvesting where practical.
- Monitoring for tree seedling survival, species composition, and population numbers will be conducted with Type II exams at a minimum of the first, third and fifth years following harvest. Conifer regeneration will be considered successful if there are a minimum of 175 conifer trees per acre. Site specific silvicultural prescriptions for aspen could prescribe differing numbers of aspen per acre than the RFP 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.
- Harvest units and the prescribed burn unit (unit # 14) will be monitored for five years following implementation. This monitoring will include but is not limited to: tree regeneration surveys, tree condition survival and mortality, herbivory by ungulates, firewood/post/pole gathering (as it pertains to snags), motorized violations on closed

roads within the project area, noxious weeds, livestock movements and utilization and any natural events such as insect outbreaks.

Noxious Weeds

- To minimize the spread of noxious weeds, the purchaser would be required under standard contract provision, BT 6.35 Equipment Cleaning, to clean all logging and construction equipment that operates off-road prior to entry on the sale area.
- Monitor noxious weed populations as part of overall monitoring cited above in Forested Vegetation section. If noxious weeds were discovered, they would be treated as funds were available. Newly established populations of noxious weeds would be reported to the district noxious weed manager.

Hydrology/Soils

- 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.
- Soil and Water Conservation Practices (Region 1/Region 4 Forest Service Handbook 2509.22, 5/88) would be followed for this project.
- To ensure long-term soil productivity, provide for a minimum of 10 to 15 tons per acre of large woody debris (≥ 3 inches in diameter), distributed over the harvest units, to remain on all activity areas that have sub alpine fir habitat types after the sale is closed (RFP 3-7).

Table 2.5-1 Large Down Woody Requirements

Woody Residue	Forest Habitat Types	
5-10 tons per acre	Douglas-fir/mountain maple	Douglas-fir/Oregon grape
	Douglas-fir/pine grass	Subalpine fir/pine grass
10-15 tons per acre	Douglas-fir/mountain sweetroot	Subalpine fir/Oregon grape
	Subalpine fir/mountain maple	Subalpine fir/mountain arnica
15-20 tons per acre	Subalpine fir/mountain sweetroot	

- To ensure long-term soil productivity, all skid trails and landings that have adverse soil compaction will be ripped, seeded and/or covered with slash once harvest operations are completed.
- In order to restore site productivity and to reduce detrimental soil conditions caused from: roads, decommissioned or relocated roads and trails, primary skid trails and landings, apply appropriate measures such as ripping, disking, appropriate water erosion control structures, covering with slash, seeding, replacing soils from berms, and effective closures. CT 6.6# – Erosion Prevention and Control and CT 6.601# Erosion Control Seeding provisions will be used to protect any aquatic influence zones (AIZ) if encountered, and to control erosion potential on all skid trails and temporary roads. The Forest Contracting Officer and Timber Sale Administrator will be responsible for the inclusion and use within the timber sale contract. 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.

- Monitor detrimental soil disturbance in harvest units during harvest operations to determine when and how much mitigation must be applied to meet soil quality standards. (Sale Administrator/Soil Scientist)
- Logging operations will occur only when the soils are frozen or there is sufficient snow cover, or during the dry season when the soils are not saturated to avoid adverse soil compaction. (RO-CT 6.312# Sale Operation Restrictions - Sale Administrator/Soil Scientist)
- Road, skid trail, and landing locations would avoid slopes with a moderate to high risk of mass wasting.
- No bogs, springs, seeps, seasonally flowing or intermittent streams are known to exist within the project area. If any of these features are encountered during sale preparations or sale administration, they would be protected from damage by leaving an undisturbed strip at least 50 feet in width adjacent to the water source.
- Areas compacted by this project would be rehabilitated, as needed, to re-establish infiltration and natural drainage by preventing water from becoming channelized and causing erosion.
- Existing skid trails and landings would be re-used, where possible, to minimize new ground disturbance. These features would be ripped, covered with scattered slash and seeded no native species following operations to restore infiltration capacity and restore the land to production.

Tribal Issues and Concerns

The following list includes the concerns of the Shoshone-Bannock Tribes have with general forest management. The NEPA document will disclose impacts to only those tribal concerns relevant to this proposed action.

- Tribal historical/archeological sites. During “on the ground” surveys of this area no significant cultural or historical sites were noted.
- Sacred sites, pictographs, etc. No sacred sites or pictographs are known to exist in the project area.
- Traditional Cultural Properties. No traditional cultural properties were identified within this project area.
- Treaty Rights defined in the Fort Bridger Treaty of 1868. These 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, in the Shoshone language, the same verb is used for hunt, fish and gather so it is assumed that the Tribes expected to retain rights for all of those practices (Smoak 2004, From a presentation at the Shoshone-Bannock Tribes, 1868 Fort Bridger Treaty Rights Seminar: April 12-13, 2004).
- Water quality. Refer to Chapter 3 and 4 for effects of the proposed project upon water quality as well as the hydrologist’s specialist report in the project record.
- Fisheries, particularly native fish. Bonneville cutthroat trout do not occur in the project area because is within internally drained basins and contains no perennial streams. No suitable habitat for Bonneville cutthroat trout exists within the project area. For further analysis about native fish refer to Chapters 3 and 4.

- Fishing areas – habitat and access. No traditional fishing areas are known to exist within the project area.
- Collection of plants (medicinal, edible, other uses) and materials such as rocks, paints, clays. This project would not affect the tribes ability to collect plants and other materials.
- Wildlife issues – Big and small game, habitat and migration in general and how it impacts their hunting rights. Refer to Chapters 3 and 4 for effects to wildlife.
- Noxious weeds and invasive species and how they impact hunting and gathering rights. Refer to Chapters 3 and 4 for analysis of invasive plants and their effects.
- Access issues. Refer to Chapters 3 and 4 for access analysis effects.
- Camping areas for the Tribe. The project will not affect any known tribal camping areas.
- Burial issues. There is no indication of burials in the project area. If unanticipated human burials are located during the implementation of this project all work around the discovery will immediately cease and consultation with the Shoshone-Bannock Tribes will begin as prescribed in the Native American Graves Protection and Repatriation Act (NAGPRA).
- Tipi poles. Consultation has shown that dry or dead poles of lodgepole pine are the only type desired. There are no known stands of lodgepole pine with a quantity of dead pole size trees in the project area that could be set aside for the Tribes. Almost all available dead pole sized trees are annually removed by the general public as firewood or poles. Mature lodgepole pine stands to be harvested do not have many trees of this preferred size. No remote stands of preferred trees will have new access by this project.
- Land exchanges, easements, energy sources or anything that would reduce the “unoccupied lands of the United States. No aspect of this project will result in a reduction of “unoccupied lands”.
- Employment and socioeconomic issues. Timber harvest and road improvements would provide employment for individuals employed by the companies awarded the contracts.
- Air quality. Refer to Chapters 3 and 4 for analysis on air quality effects for this project.
- Fire plans. No fire use plans are as yet completed for the Cache portion of the district which includes the project area.
- Transportation systems. Refer to Chapters 3 and 4 for analysis of the transportation systems and proposed improvements by each alternative.

Heritage Resources

- If additional sites are discovered during on the ground layout and design of any action alternatives or other on-going survey activities, the Forest Archaeologist will consult with the State Historic Preservation Officer, as required by law to document and determine the significance of the discovery and the effects of the project on it. The Shoshone-Bannock Tribes and Northwest Band of Shoshone will be consulted regarding Native American sites.
- Mitigation of effects to other identified cultural resource sites could be accomplished through complete avoidance or scientific removal of the resource. If cultural

resources are discovered during future ground disturbing activities, such activities will be stopped until the cultural materials are properly documented and evaluated by the Forest Archaeologist in compliance with 36 CFR 800.11.

Operating Season

- In order to provide for the groomed snowmobile route no snow plowing would be permitted during the logging phase.
- Logging operations will occur only when the soils are frozen or there is sufficient snow cover, or during the dry season when soils are not saturated to avoid adverse soil compaction (RFP 3-45).
- Hauling on weekends should be avoided if possible to reduce conflicts with other Forest users.

Visual Quality Objectives

- Harvest units will be designed with islands, groups and blocks of reserve trees of differing sizes, shapes, and spatial arrangement across the landscape. Harvest unit boundaries will have irregular edges.
- To mitigate the VQO of Retention, burning activities should avoid straight control lines that will line up with viewing corridors.

Wildlife

- Goshawk surveys would be conducted during the nesting season through the logging phase of the project. This can be accomplished with a formal or informal goshawk survey or detection during regular field reconnaissance by Forest Service employees, contractors or volunteers.
- An owl survey was conducted during the winter of 2004.
- Flammulated owl nests would be protected if found (RFP S&G).
- Large cavity snags and raptor nests would be protected, if possible.
- Follow the snag guidelines in the RFP.
- Follow big game guidelines in the RFP when leaving vegetation buffers around elk wallows (RFP 3-31).
- Biological Assessments would be prepared 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.

Fuels/Prescribed Fire (Prescribed Burning)

- 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 requirements, fire behavior predictions, a smoke prediction model, wild land fuel loads and models, 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.

- Harvest units that are designated with a broadcast burn prescription will have a dozer line constructed around the outer edge of each unit and around all large reserve tree islands. These dozer lines would be used as a control line and the same ignition method and patterns would be used as described above.
- 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 affects.
- Existing roads and trails, natural fuel breaks, and constructed fire lines would be used as control lines. Harvest units that are designated with a broadcast burn prescription will have a control line constructed by a dozer around the perimeter of each unit. Constructed firelines would have erosion control structures (waterbars), constructed at locations that could potentially cause erosion. Firelines that could create motorized access would either be obliterated or made impassable after burning is completed.
- To limit impacts from the burn, the duff layer should have moisture content greater than 30%.
- Fireline construction, in the commercial harvest units, would be accomplished with equipment such as tractors, around unit boundaries and larger islands and groups of reserve/seed trees. The smallest groups or individual trees would be firelined by hand crews, after the purchaser had completed “pull-back” of activity generated slash
- Design prescribed fires 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).

Aspen Restoration

- Approximately 118 acres (20%) of mature aspen/conifer (unit # 14) within the Soda Point IRA would be treated by prescribed fire without pretreatment from timber harvest, for aspen restoration. Unit # 15, approximately 52 acres (21%) of the mountain brush within the project area, and adjacent to unit # 14, would serve as a contingency area for the prescribed broadcast burn. All preparations for this prescribed burn would be accomplished with hand crews.
- Protection of the integrity of the Highline Trail is an integral part of the aspen restoration proposal. Crews could be transported via ATVs, motorcycles or on foot to the project area. Burning would most likely be accomplished with hand ignition. No pretreatment by logging is planned for this aspen restoration/prescribed burn.
- The aspen/conifer unit, within Middle Cheatbeck Basin, planned for aspen restoration, would be logged for its merchantable conifer sawlogs, leaving a conifer presence on the site, and then broadcast burned. Aspen regeneration is the goal and Type II exams would be implemented as a monitoring method.

Roads

- The proposed road activities are to facilitate and improve a safe, long-term transportation system that reduces impacts to the resource, while providing for long-term resource management needs. The project area is a portion of a larger management prescription area which has an assigned motorized travel density from the RFP. The motorized travel density assigned to this area is not a part of this decision.
- Road activity proposals common to Alternatives 2, 3 and 4 are listed below. Two haul routes from the project area will be analyzed as well. One route would use road # 402 to the north, down Cow Fork and out the Eightmile road # 425 to Highway 30. The other haul route will use road # 402 to the south to road # 439, then to road # 425, down to road # 401 and to Highway 36.
- All other roads and trails within the Three Basins project area are being addressed within the CNF Travel Plan Revision process which is currently in the draft stage. The road proposals in this proposal reflect The Roads Analysis for the Three Basins Timber Sale and coordination with the CNF Travel Plan Revision process.
- The road numbers used in this document are for identification purposes. The final road numbering is an administrative decision and will be made at a later date.
- Designated haul routes will be signed for heavy truck traffic at points deemed necessary by the road engineer, each season during hauling.
- A State of Idaho, Mining Development and Reclamation Plan permit will be obtained prior to any ground work beginning on the gravel source site.

Livestock Grazing

- Livestock grazing shall be restricted following the prescribed burning phase of the project until silvicultural objectives have been met. This shall be accomplished by a combination of rest/rotation and AOI (annual operating instruction) modifications. Site specific monitoring shall be conducted to assure objectives are met and to document any need for adaptive management strategies in order to attain the prescribed objectives (RFP 3-42).

2.5.2 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 5 years.
- Sales that would be generated by this EIS would be included in the Forest BMP monitoring program to evaluate BMP implementation and effectiveness and AIZ adequacy.
- The Forest Hydrologist will conduct a BMP and Implementation Review at least once during the life of the project.
- District personnel will monitor for and treat noxious weeds.
- Goshawk surveys would be conducted during the logging phase of the project, during the nesting season. This can be accomplished with formal or informal goshawk survey or detection during regular field reconnaissance by Forest Service employees, contractors or volunteers.
- 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 disturbances in activity areas (Prescription Areas 1-5).

District personnel will monitor plantations for seedling establishment and growth to determine the return of livestock to this portion of the allotment.

2.6 Comparison of Effects and Outputs by Alternative

This section summarizes the information from **Chapter 3: Affected Environment** and **Chapter 4: 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 2.6-1 Project Purpose and Need Indicators, Summary Comparison of Alternatives

Purpose and Need Indicators and Project Objectives			Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings
Forest Condition Indicators						
Percent in SS, YM, & MO.	SS ¹	DFC-10-40%	1%	5%	4%	4%
	YM ²	DFC-20-50%	7%	7%	7%	7%
	MO ³	DFC-20-50%	92%	88%	89%	89%
Acres with aspen as a stand component treated			0	708	510	516
% of MPB ⁴ susceptible acres, within Project Area, at high risk			47%	18%	23%	27%
Number of acres of fuels treated			0	708	510	516
# Miles of Forest System Road Improvements			0 Miles	5.7 Miles	5.5 Miles	5.1 Miles
MMBF (Million board feet) harvested			0 MMBF	4.2 MMBF	3.7 MMBF	2.8 MMBF

¹ SS – seedling/sapling. ² YM – young/mid. ³ MO – Mature/Old. ⁴ MPB – Mountain Pine Beetle.

Table 2.6-2 : Issue Indicators, Summary Comparison of Alternatives

Issues	Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings
Miles of construction				
Miles of temporary road construction	0 miles	1.8 miles	1.5 miles	1.4 miles
Miles of new system road construction	0 miles	0.9miles	0.9 miles	0.9 miles
Miles open roads at project completion.				
	14.71 miles	13.41 miles	13.41 miles	13.41 miles
Effects to Soda Point IRA				
New road construction	0 miles	0 miles	0 miles	0 miles
Temporary road construction	0 miles	0.3 miles	0 miles	0.3 miles
Changes to roadless area characteristics.	none	none	none	none
VQO's Short term				
	not met	not met	not met	not met
VQO's Long term				
	not met	met	met	not met
# of Stands Treated > 40 acres				
	0	7	6	0

Table 2.6-3 Effects to be analyzed, Summary Comparison of Alternatives

Resource	Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings
Hydrology Indicator				
% Hydrological Disturbance	11%	12.8%	12.5%	12.8%
Hydrologic connectivity and sediment Water Quality	No benefit or affects	Beneficial to WQ, meets HDG	Beneficial to WQ, meets HDG	Beneficial to WQ, meets HDG
WQ = water quality HDG < 30% maximum hydrologic disturbance guideline				
Soils Indicators				
% Soil Detrimental Disturbance	1%	7%	7%	6%
Roads and Access				
Number of miles of road improvement	0 miles	5.7 miles	5.5 miles	5.1 miles
Recreation Opportunity Spectrum (ROS)				
RN Roaded Natural 64%	unaffected	unaffected	unaffected	unaffected
SPNM Semi-primitive non-motorized 25%	unaffected	unaffected	unaffected	unaffected
SPM Semi-primitive motorized 11%	unaffected	may draw attention/ most affected	may draw attention/ least affected	may draw attention/ moderately affected
Air Quality Indicator				
Smoke emissions	Within NAAQS	Within NAAQS	Within NAAQS	Within NAAQS
Potential Noxious Weed Increases /Acres Disturbed	Lowest potential/0 acres disturb	Highest potential/709 acres disturb	3 rd highest potential/510 acres disturb	2 nd highest potential/517 acres disturb

Table 2.6-4 Effects to analyzed, Wildlife Summary Comparison of Alternatives

Resource	Alternative 1 No Action	Alternative 2 Proposed	Alternative 3 Roadless	Alternative 4 Openings	
Wildlife Indicator & Unit of Measure					
Acres with human disturbance, wolverine	0 acres	709 acres	510 acres	517 acres	
Goshawk	% Non Stocked / Seedling < 22%	0.0 %	4.4 %	3.2 %	3.2%
	% Saplings < 22%	0.6 %	0.6 %	0.6 %	0.6%
	% Pole < 22 %	7.2 %	7.2 %	7.2 %	7.2%
	% Old / Mature > 33% (Owls > 40%)	92.2 %	87.8 %	89.1 %	89.0%
	Openings > 40 acres	0	7	6	0
% Winter Forage, Sharp-tailed grouse > 80 %	100 %	95.4% +	98.3 % +	95.4%	
% Sagebrush mature overstory, Sage grouse > 80%	100 %	100 %	100 %	100%	
Big Game Cover : Forage ratio, 40 : 60	91 : 9	88 : 13	89 : 11	89 : 11	
Aspen Restoration/IDF&G Mule Deer Initiative	0	187	69	187	

3 Affected Environment

This section summarizes the current conditions of the physical, social and economic environment in and adjacent to the Project Area that are likely to be affected by the alternatives that are described in this document. For most sections there is additional information contained within the project record.

3.1	Vegetation	3-1
3.2	Hydrology	3-20
3.3	Soils	3-28
3.4	Wildlife	3-33
3.5	Rare Plants	3-38
3.6	Fisheries	3-39
3.7	Roads and Access	3-41
3.8	Soda Point IRA -#04171	3-45
3.9	Economics	3-61
3.10	Air Quality	3-63
3.11	Rangeland Management	3-64
3.12	Tribal Treaty Rights	3-65
3.13	Heritage Resources	3-66
3.14	Recreation	3-67
3.15	Visuals	3-70

3.1 Vegetation

Analysis Area: The proposed 3 Basin project area is relatively small but falls within portions of several HUC's (hydrologic unit codes), therefore, vegetation will be described at two different scales in this section, the project area and the landscape. The landscape for this analysis is defined as, all of the Eight Mile/Cow Fork drainage plus the remainder of the project area that falls in the other HUCs (see Figure 3.1-2). The landscape will be the primary analysis unit for affects.

Analysis Method: 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.

The Revised Forest Plan (RFP) sets the following goal: *“Forested ecosystems are moving towards a balance of age and size classes in each forested vegetation type on a watershed or landscape. Early seral species are recruited and sustained while still providing a diversity of successional stages.”*

3.1.1 Introduction

Forested ecosystems in the Rocky Mountains are highly diverse, complex and dynamic (Long, 2003). Long goes on to state that topography in watersheds in the Rockies strongly influences temperatures and water availability which affects species distribution within forested ecosystems. Elevation and climatic gradients coupled with disturbance regimes often affect a species successional status within its distribution even at the watershed scale. The most common and well documented disturbance process is fire. Because fire is the most common and well documented disturbance and because of its affects on species composition and structure, fire regime is increasingly used to describe and define landscape and community ecology.

This idea was incorporated while defining the landscape used in this analysis. The watersheds that drain to the west of the project area have drastically different moisture regimes than the project area, but a large portion of the Eight Mile/Cow Fork drainage has a very similar regime. These differences in available moisture have driven different vegetation and fire regimes to develop on either side of the Bear River Range.

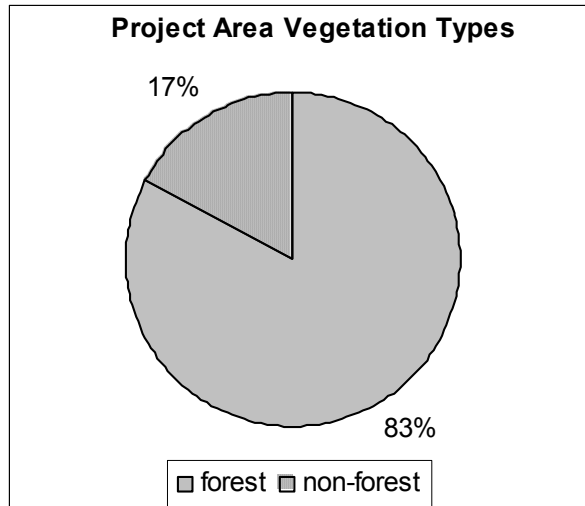


Figure 3.1-1. Project Area Vegetation Types.

In an attempt to describe this dynamic landscape and the ecology and natural processes that affect it; forest age structure, species composition and fire regime have been assessed and are displayed in this section. The *Interagency Fire Regime Condition Class Guidebook (2004)* describes a method for assessing landscapes that uses these same ecological components. Each component was assessed and is described below, then using the method outlined in the *guidebook* a fire regime condition class assessment was completed and the results area displayed.

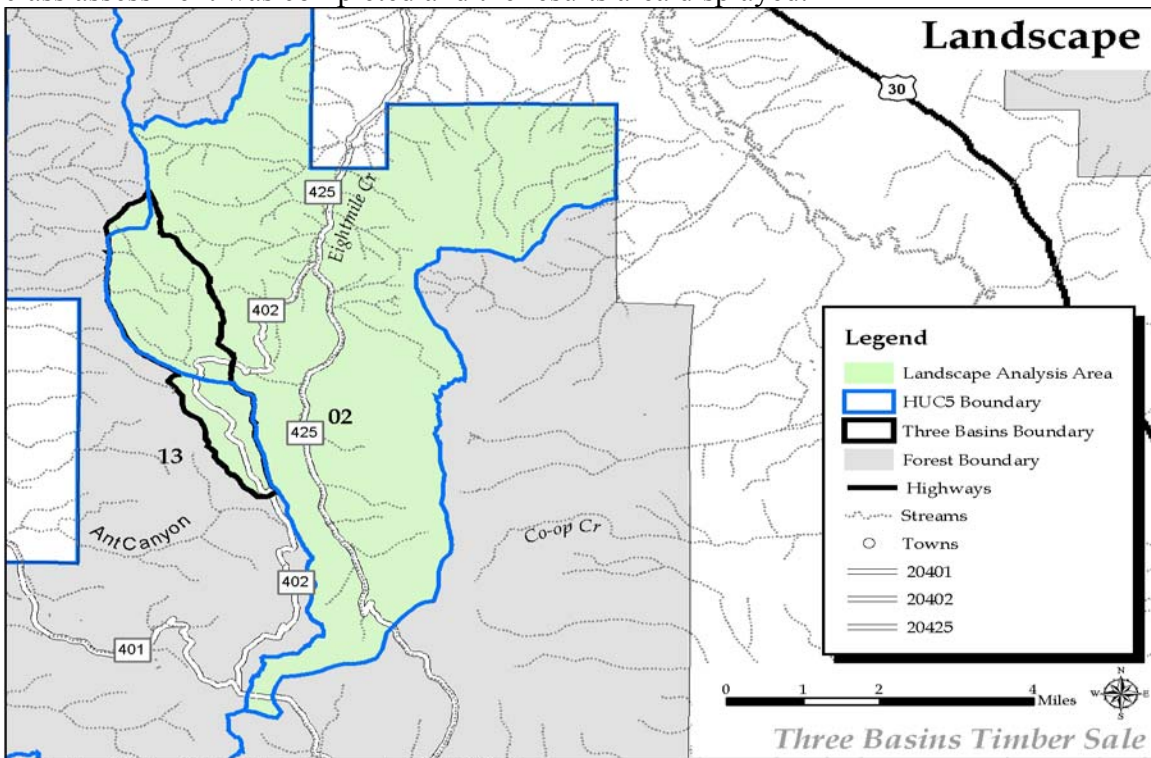


Figure 3.1-2 Landscape Analysis Area.

Forested

Approximately **2,138** acres or 83% of the project area is forested vegetation and the forested vegetation is best characterized as mature conifer.

For the purpose of analysis forested vegetation has been broken into seven cover types: alpine fir, aspen, aspen/conifer, Douglas-fir, limber pine, lodgepole and spruce/fir. Only three of which are represented on the project area, almost half of the project area was classified as lodgepole pine (see **Figure 3.1-3** and **Table 3-1**).

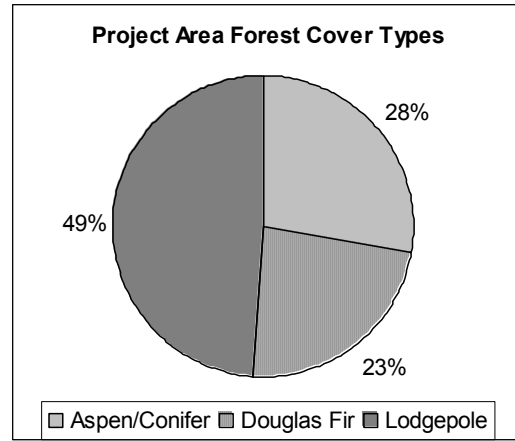


Figure 3.1-3 Project area cover types.

Table 3-1. Break down of Project Area and Landscape vegetation, community and cover types.

Vegetation Type	Community Type	Cover Type	Project Area		Landscape	
			Acres	%	Acres	%
Forest	Forest	Alpine Fir		0%	352	2%
		Aspen		0%	1162	6%
		Aspen/Conifer	601	23%	1477	8%
		Douglas Fir	499	19%	8823	45%
		Limber Pine		0%	46	0%
		Lodgepole	1038	40%	2856	15%
		Spruce/Fir		0%	1349	7%
Forest Vegetation Type Total			2138	83%	16065	82%
Non-Forest	Shrub	Juniper		0%	40	0%
		Maple		0%	18	0%
		Mtn Mahogany		0%	326	2%
		Mtn Shrub		0%	24	0%
	Brush	Mtn Brush	243	9%	1469	7%
		Sagebrush		0%	1230	6%
	Riparian	Riparian		0%	131	1%
	Grass/Forb	Grass/Forb	201	8%	381	2%
	Non-Forest Vegetation Type Total			444	17%	3617
Grand Total			2582*		19683*	

* All numbers in this table are represented as whole numbers, therefore they have been rounded, direct addition or subtraction many not produce the exact same answer as shown. Depending on how it is done acreages may vary as much as 4 acres.

Table 3-2 Forest cover types.

Cover Type	Description
Alpine Fir	Subalpine fir is the dominant climax tree species in this type with occasional Engelmann spruce. Aspen, limber pine, lodgepole pine and Douglas-fir may occur in various ratios in the seral to late seral stages. Much of this type is high elevation and has a very patchy nature, with natural disturbances and succession working on the patch scale rather than the stand scale.
Aspen	Quaking aspen is the dominant tree in this type. Aspen can vary from an early seral to persistent seral species. It can also occur as a climax species, occupying sites below the ecological limit of conifers. Subalpine fir or Douglas-fir are the typical conifer climax species associated with this type, which is climax depends on the site conditions. All tree species, woodland/shrub and brush species can be found in association with this type
Aspen/Conifer	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. Aspen dominated some stands in this type under a natural disturbance regime and some were always mixed.
Douglas-fir	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 sub alpine fir are often associated with this type. On the very driest sites curlleaf mountain mahogany and limber pine are often associated with this type.
Limber Pine	Where limber pine dominates the overstory is a very minor type within the landscape. These sites tend to be wind swept ridge tops. Curlleaf mountain mahogany or Douglas Fir is usually associated with this type.
Lodgepole	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, under most circumstances. Because lodgepole is shade intolerant it serves as the seral species with subalpine fir being the climax species on these sites. Aspen may co-dominate during the early development stands of this type (seedling to young structure) and Douglas-fir may be found as a minor components or co-dominate the type. As this type moves toward climax conditions, it changes type to a spruce/fir type.
Spruce/Fir	Stands that currently have a mix of conifer species, or are currently dominated by subalpine fir or Engelmann spruce, have been included in this type. In this type subalpine fir and/or Engelmann spruce are the dominant climax species. Aspen, lodgepole pine and Douglas-fir often occur in various ratios in the seral to late seral stages. Stands that fall in this type have very large ecological amplitude because without disturbance most stands will eventually end up in this type, however some have been in this cover type for a very long time (i.e. large scale nature disturbance was rare).

Non-Forested

Approximately 444 acres or 17% of the project area can be characterized as non-forested vegetation. Non-forested vegetation was classified into four general community types and further classified into cover types. The landscape percentage of non-forest types is basically the same as the project area but the community and cover types percentages differ. These differences are a result of the broader elevation, precipitation and aspect ranges of the landscape as compared to the project area, **Table 3-1** displays these differences.

3.1.2 Forest Disturbance

Fire as a Disturbance Agent

Historically, fire was an integral and significant disturbance factor within the project area and landscape. 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 analysis and landscape areas, multiple fire scars on some remnant trees supports 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 Marco-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 Bear River Range for his report on "Fire Regimes on the Caribou National Forest." Barrett's transect for the Bear River Range incorporated much of the landscape described in this assessment. Therefore, Barrett's report provides a good estimate of both fire regimes and frequencies for this project area and landscape. In his report, he also stated that the Bear River Range had historically experienced more frequent fires than many of the surrounding mountain ranges. These more frequent fires lead to a less severe fire regime for much of the area. The results of the study are outlined in **Table 3-3.**

Fire frequency within the landscape 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



Figure 3.1-4: This photo is a lodgepole pine stump that shows multiple fire scars, located in S. Cheatbeck. Field count dates this tree to approximately 1864 the first scar dates to about 1919 the next major scar dates to approximately 1947. These dates correspond to dates reported by Barrett (1994). The current stands in the project area can all be dated to about this same time period and some show the same evidence of more recent non-lethal to mixed severity fires. Older stumps found in the project area show similar scarring patterns as this tree, the last scar would date to about 1864 or the fire that scarred this tree. Most of the old scarred stumps appear to have been cut in the late 1800's to early 1900's.

conditions began to improve. Fire suppression techniques also improved. The Forest Service became highly effective at suppressing fire post World War II. So, fires that had been controlled indirectly by the lack of fine fuel could be controlled by the direct will of man. Available records from 1973 to present indicate that 16 fires have been suppressed within the landscape totaling approximately 68 acres. Of these fires six were human caused for 66 acres, and ten fires were lightning caused for 2 acres. Suppression has affected fire frequency at the landscape scale; 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 very near lethal (i.e. mortality approaching 90% versus 60-70%). If a large fire were to occur within the landscape it would be more severe than in pre-settlement times.

Table 3-3. Barrett did not use the exact same terminology as is used the *Interagency Fire Regime Condition Class Guidebook (2004)*, but it is relatively easy to cross-walk between the documents.

Vegetation Type	Frequency	Reference Condition	Current Condition	Comments
	Regime			
Aspen (G4)*	Frequency	16–97 Ave 45 yrs	~120 Years	More than twice the average, out side range
	Regime	Mixed to Lethal	Mixed to Lethal	Average patch size has likely increased
Douglas-fir (G3/4)	Frequency	16 –66 Ave 41 yrs	~120 Years	More than twice the average, out side range
	Regime	Non-lethal to Mixed	Mixed to Lethal	Average patch size has likely increased
Lodgepole & Mixed Conifer (G6/4)	Frequency	29 –97 Ave 54 yrs	~120 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.

Table 3-4 Fire Regime Definitions. Hann (2004) and *Interagency Fire Regime Condition Class Guidebook (2004)*

Fire Regime Class	Frequency (Mean Fire Return Interval)	Severity	Modeling Assumptions
I	0 – 35+ Years, Frequent	Surface and Mixed	Open forest, woodland, shrub and savannah structures maintained by frequent fire; also includes frequent mixed severity fires that create a mosaic of different age post-fire open forest, woodlands, shrub or herb patches that make a mosaic of structural stages, with patches generally < 40 hectares. Mean fire interval can be greater than 35 in systems with high temporal variation.
II	0 – 35+ Years, Frequent	Replacement	Shrub or grasslands maintained or cycled by frequent fire; fires kill non-sprouting shrubs which typically regenerate and become dominant within 10 – 15 years; fires remove tops of sprouting shrubs which typically re-sprout and dominate within 5 years; fires typically remove most tree regeneration.
III	35 – 100+ years, Less Infrequent	Mixed and Surface	Mosaic of different age post-fire open forest, early to mid-seral forest structural stages, and shrub or herb dominated patches generally < 40 hectares; maintained or cycled by infrequent fire. Interval can range up to 200 years.
IV	35 – 100+ years, Less Infrequent	Replacement	Large patches generally > 40 hectares, of similar age post-fire shrub or herb dominated structures, or early to mid-seral forest cycled by infrequent fire. Interval can range up to 200 years.
V	200+ years	Replacement Mixed, and Surface	Variable size patches of shrub or herb dominated structures, or early to mid to late seral forest depending on the type of biophysical environment. Cycled by rare fire or other disturbance events. Often have complex structures influenced by small gap disturbances and understory regeneration.

Insects as a Disturbance Agent

Insects and diseases that cause tree mortality are agents of disturbance. Native insects and disease are part of the forested ecosystem; they naturally cycle from endemic or low levels to epidemic or extremely high levels. At endemic levels insects and disease 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 Mountain Pine and Douglas-fir Bark Beetle. Other insects such as spruce bark beetle, spruce budworm, and tussock moth could create small-scale disturbance or can be contributing factors to larger disturbances. A suite of rots that affect aspen are the most common diseases, these diseases also do not create large scale disturbances but could be contributing factors to a larger disturbance.

As trees reach maturity growth rates decrease and vigor is reduced, which puts them at greater risk to insects that cause mortality. The current percentage of forest in the mature structural class puts the landscape and the project area at risk to a wide scale insect epidemic. Due to the high percentage of the lodgepole pine cover type in the project area and landscape that is mature, the district believed that mountain pine beetle (MPB) represented the greatest threat to the desired future conditions of this landscape. MPB has the potential to kill nearly every host tree when at epidemic levels, which would cause a major shift in the species composition of the landscape. MPB outbreaks in lodgepole pine are often stand-replacing events, as fire usually follows the outbreak within 15 years. If fire does not occur or is not allowed following an outbreak, the reductions in stand density will release the understory trees, usually shade tolerant species (RMRS-GTR-62, 2000). Douglas-fir bark beetle (DBB) also has the potential to build and cause significant mortality from an economic stand point but does not pose the same ecological threat. DBB typically kills 40-60% of the stand and does not have the clear association with fire, therefore it is not typically viewed as stand replacing event and would not have as great of an affect on species composition or structure.

During the summer of 2003 the district requested Forest Health Protection (FHP) specialists visit the project area, Dale Bennett and James Hoffman visited and provide an assessment of the project area. The following is an excerpt from their report:

Based on our observations, stand conditions throughout most of the Three Basins Vegetation Management Area are highly conducive to a mountain pine beetle (MPB) outbreak that would result in substantial mortality of lodgepole pines over five inches in diameter. The stands within this area consist primarily of large diameter (over 10 inches at breast height) lodgepole pine that average 130 years of age. Stand basal areas average 160 to 180 square feet per acre and the elevations range from 7400 to 7600 feet. These stand conditions equal a high hazard to mountain pine beetle (Steele. et. al., 1996) and, while no beetle activity is currently occurring in the area, MPB populations are at outbreak levels elsewhere in Idaho and it is only a matter of time before a similar outbreak occurs within the Three Basins area.

They go on to say that if substantial mortality is unacceptable, silvicultural methods can be used to reduce susceptibility (Bennett & Hoffman, 2003).

3.1.3 Forest Age Structure

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 Revised Caribou N.F. Forest Plan (RFP) incorporated this idea and adopted desired future conditions (DFC) for mature/old structure/age classes; it set the range for conifer at 30 to 40% and 20 to 30% for aspen. The overall age structure of the landscape compared to “natural conditions” is also a major component of the Fire Regime Condition Class (FRCC) assessment outlined in the *Interagency Fire Regime Condition Class Guidebook (2004)*.

Forest age structure in the project area and on the landscape is out of balance, 88% and 92% respectively of the forest vegetation has mature/old structure characteristics. Across all cover types at both analysis scales the mature/old class is over represented. The young/mid class is under represented in all but the aspen cover type and the seedling/sapling class is under represented except in the lodgepole cover type. The exception in the lodgepole type is a result of past harvest activities that have occurred across the project area and landscape. The exception in the aspen type is likely a result of poor sites that are incapable of producing trees large enough to meet the mature classification and inadequate information to classify them as uneven aged aspen climax stands. Cover type specific information for the landscape can be found in Table 3-6 and Figure 3.1-6

Table 3-5 Age structure within the analysis area was assigned to each stand based on the definitions and terminology outline in the Montpelier R.D. structure white paper (2004), this table is a quick reference to the information in that paper.

Stand Age/Structure Classes			
Mature/Old	Age	TPA	DBH
Lodgepole	100+	40+	9+
Mixed Conifer	100+	40+	12+
Spruce/fir	110+	20+	12+
Douglas-fir	140+	25+	14+
Aspen	60+	20+	10+
Aspen/Conifer	60+	20+	10+
Young/Mid	Transition between		
Seedling/Sapling			
All Conifer	~<33		<4.9
Aspen	~<20		<4.9

TPA = Trees per acre
DBH = Diameter at breast height (4.5 feet)

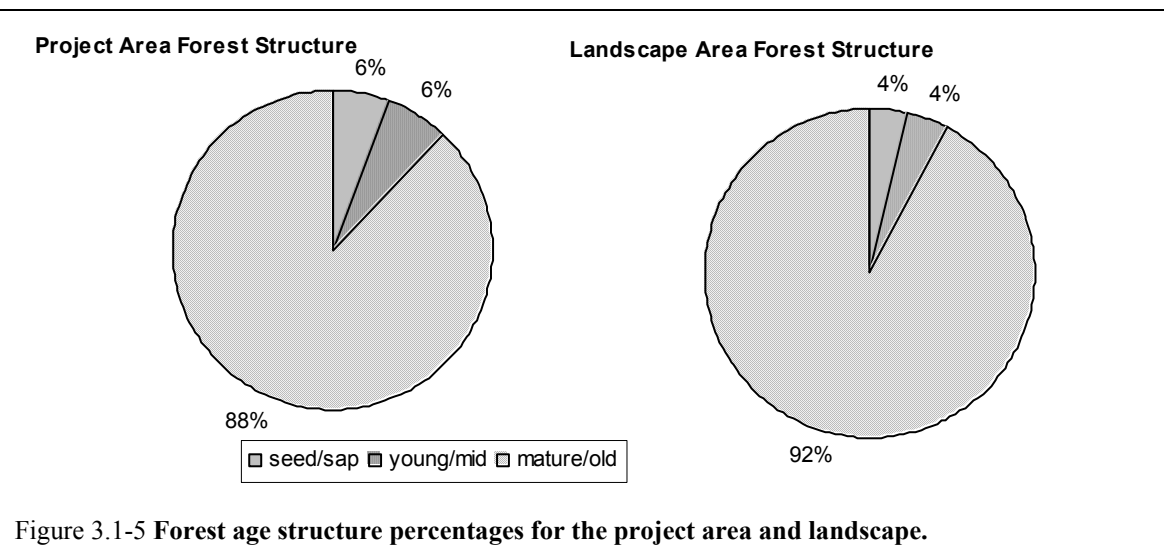


Figure 3.1-5 Forest age structure percentages for the project area and landscape.

Table 3-6. Current landscape cover type age structures compared to the desired range.

Structure	Condition	Seedling/Sapling	Young/Mid	Mature/Old
Alpine Fir	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	0%	7%	93%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Aspen	Desired	20 - 40%	20 - 40%	20 - 40%
	Current	8%	26%	66%
	Assessment	Less than DFC*	Within DFC*	Above DFC*
Aspen/Conifer	Desired	20 - 40%	20 - 40%	20 - 40%
	Current	2%	1%	97%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Douglas-fir	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	<1%	<1%	99%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Lodgepole	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	12%	10%	78%
	Assessment	Within DFC*	Less than DFC*	Above DFC*
Spruce/Fir	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	7%	0%	93%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*
Limber Pine	Desired	10 - 30%	30 - 50%	30 - 50%
	Current	0%	0%	100%
	Assessment	Less than DFC*	Less than DFC*	Above DFC*

- * DFC = Desired Future Condition (defined by RFP for mature/old).
- * Assessment is made for the landscape area as a whole.

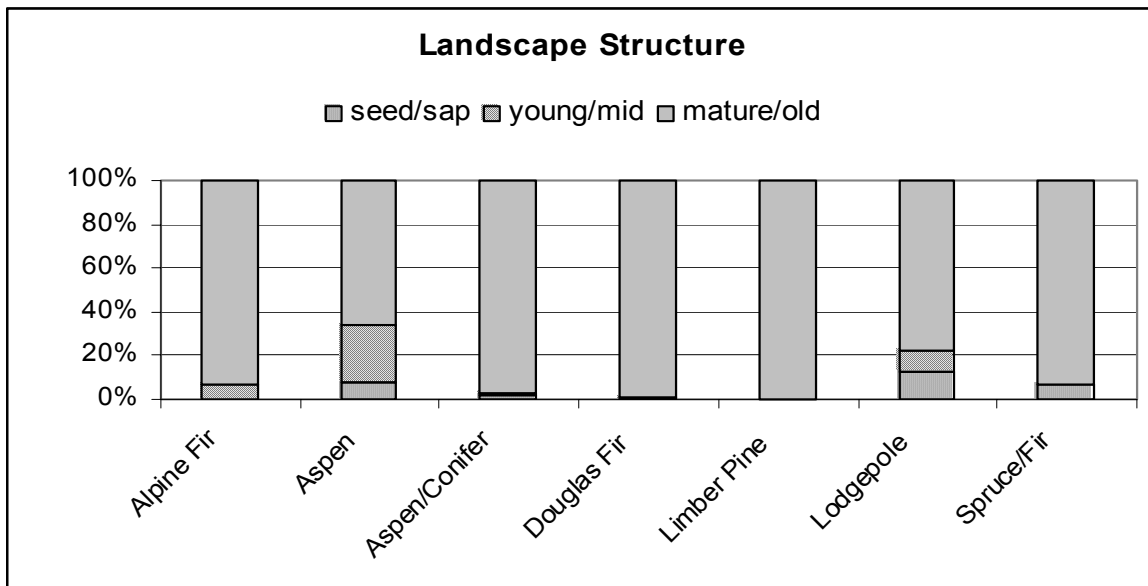


Figure 3.1-6 Cover type Structure represented as a percent of the landscape. Every cover type is dominated by stands with a mature to old structure, younger stands are rare. It is clear that a balance of age classes does not exist in any cover type.

Viewing cover type structure in combination with canopy cover can be a useful tool in assessing forest condition and risk across the landscape. Figure 3.1-7 shows that not only is the landscape dominated by mature forest but that the majority has closed to moderately closed canopy. Canopy cover is useful because it can be used as a surrogate for density and gives a good idea which species have the competitive advantage. Regeneration of seral species such as aspen and lodgepole is rare with closed canopy conditions (i.e. canopy cover greater than 70%) and can be considered uncommon under a moderately closed canopy.

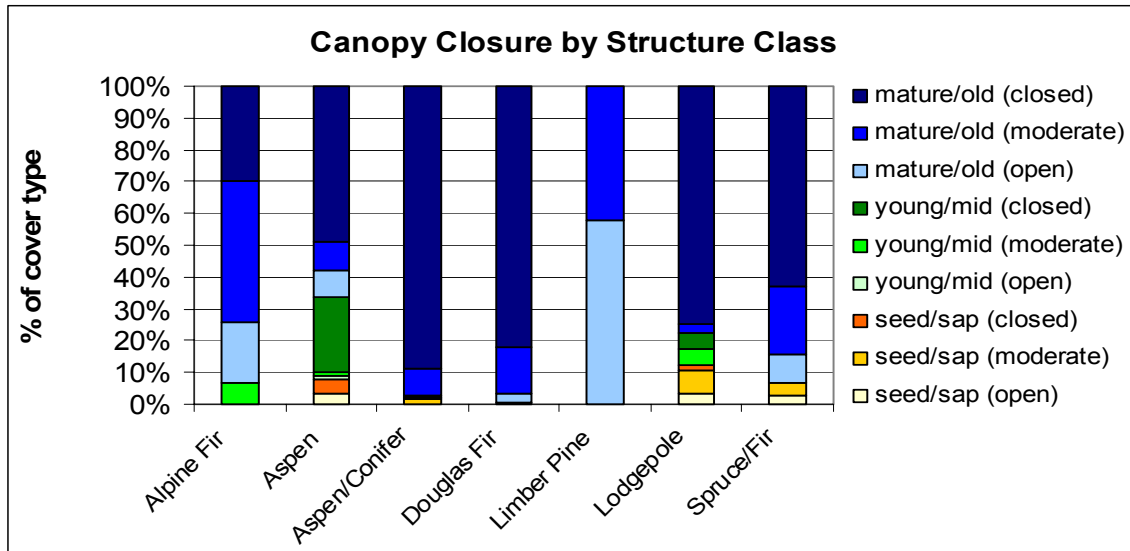


Figure 3.1-7 Canopy closure by structure class is useful in assessing risk (insect and disease as well as uncharacteristic fire). The canopy closure classes used are: 0 – 39% canopy cover of forested vegetation is open, 40 – 69% is moderately closed and 70 – 100% is closed canopy.

Although, the landscape is dominated by the mature/old structure class, no stands that have been visited meet all the criteria for the old forest structure class. No stands that are proposed for treatment with this project meet the criteria, they are all mature. Natural processes and succession do not allow aspen/conifer and lodgepole cover types to maintain the conditions specified for long periods (i.e. the old structure class is not sustainable; the seral trees succumb to subalpine fir and the stand drops to a younger class).

All this information paints a picture of a landscape that has not experienced large-scale stand-initiating events during the last 100 to 120+ years. Evidence also exists that turn of the century logging may have removed many of the remnant trees that survived the event(s) that initiated the current stands, further reducing structural diversity. The high percentage of the landscape with dense and moderately dense canopy is a result of very little moderate to light disturbance in recent years. The landscape has not experienced a natural disturbance regime for over 120 years (since pre-settlement) and the result is a landscape that is out of balance with respect to age structure.

3.1.4 Species Composition (Seral Species)

The RFP sets a goal to recruit “early seral species,” this goal was set largely because of the lack of disturbance that many of the forested landscapes around the Forest have experienced in the last century, as evident in this landscape. The RFP also emphasizes aspen maintenance and restoration, due to the lack of disturbance that the forest has seen and because the decline of aspen has been documented around the region (Bartos 2001).

Two early seral tree species are of practical importance in this landscape and project area, lodgepole pine and aspen. As seral species, both are capable of quickly occupying sites that have experienced stand replacing disturbances (e.g. lethal fire, mixed severity fire, etc) and both are shade intolerant so they do not persist on the site in the absence of disturbance (they don’t regenerate under a canopy). In the absence of disturbance both succumb to succession and are replaced by more shade tolerant tree species (sub-alpine fir).

Aspen: Aspen has a downward trend (i.e. numbers are decreasing) in all cover types within the project area and most within the landscape. Aspen historically has been a seral component in most stands in the project area and the landscape. Aspen numbers and vigor are decreasing due to succession and the lack of disturbance.



Figure 3.1-8 Succession This photo is a good illustration of succession, the aspen is pioneering out into the basin and the conifer (subalpine fir and Douglas-fir) are replacing the aspen further back in the stand. In the absence of disturbance the aspen can be lost from a stand invaded by conifer in a relatively short time.

Aspen has been documented by many as an important species for such values as: habitat for wildlife, livestock forage, water for down stream users, esthetics, recreation, wood fiber and the diversity it contributes to intermountain landscapes (Bartos 2001). Bartos (2001) also references many others when stating that sexual reproduction of aspen is extremely rare. However, once established aspen is usually very successful at vegetative reproduction (suckering), but this requires disturbance or die back of the original tree/stand. Aspen as a tree is relatively short lived (usually < 150 years) but the clones are extremely long lived, most likely dating back to the last ice age 10,000 or more years ago (last time environmental conditions were suited for large scale aspen sexual reproduction)(Kay 1997). For thousands of years aspen clones across the intermountain West and this landscape have persisted, through a cycle of disturbance and vegetative

reproduction (suckering). Fire has likely been the main disturbance that has sustained the aspen clone although large scale wind events have also played a role. Disturbance return intervals of 20 to 130 years are necessary to maintain aspen, especially in aspen conifer types, and as fire/disturbance cycles lengthen, aspen is eliminated (Kay 1997).

Campbell and Bartos (2001) state that aspen is a keystone species and thus as aspen dominated landscapes convert to other types tremendous biodiversity is lost. They go on to outline risk factors and a key to prioritize restoration and conservation activities. The points from their list as related to this landscape are aspen/conifer types (particularly where subalpine dominates) and stands that are dominated by trees greater than 100 years old are at risk and should have high priority, for restoration efforts.

An analysis of the GIS cover created for this assessment indicates that aspen is present on 38% of all forested acres in the landscape and 88% of all forested acres in the project area, at both scales, the vast majority of acres with aspen present, are at risk 81 and 98% (aspen makes up less than 50% of the canopy cover, alpine fir present and the stands have a mature/old structure). The higher numbers for the project area as compared to the landscape are likely a result of better information, approximately 46% of the aspen acres in the project area have 10% or less canopy cover, for the landscape stands aerial photo interpretation was used and only species that appeared to compose at least 10% canopy cover were recorded.

The lack of disturbance in the project area and landscape has put many aspen clones and the many values they provide at risk. While the risk of losing aspen from the landscape is low, the risk of losing it from some stands or portion of stands is high. This is due to the short life expectancy of aspen, if the clone can not send up new suckers every 20 to 130 years, then it can not sustain itself. Aspen roots **do not** stay viable under ground for years. If there are no above ground aspen stems for a year or two (no photosynthesis), the roots will have used up all of their reserves and they will not be able to sprout (Jenkins - Bartos, field trip notes 2004).

Across the West herbivory/browsing is a major concern when regenerating aspen, but on the majority of this landscape and most of the Montpelier Ranger District this has not been a major issue. On a field trip the summer of 2004 Dale Bartos stated that "I have not seen a problem with browsing by domestic or wild ungulates" while on the Montpelier District. Only some very minor amounts of browsing were seen in small isolated areas. Dale felt that the reason the district had not experienced the browsing problems that other places have was due the amount of aspen on the district, he felt it was dispersing the use. Bartos went on to say: "Overall the aspen that we have looked at on the District seems healthy with little disease or animal pressure. Succession is the big problem around here." (Jenkins - Bartos, field trip notes 2004)

Recent disturbances in the project area (timber harvest) have proven very successful at restoring/rejuvenating aspen clones that exist in conifer stands. Past experience has shown that aspen regeneration within the project area can be successful with-out going to heroic effort (fencing, etc) to protect the regenerating sprout/suckers.



Figure 3.1-9: This picture was taken in a past harvest unit (logged in 1971) near proposed unit #9, this portion of the stand regenerated with dense healthy aspen. This unit was not fenced and is in an active cattle allotment. The objective for this unit was conifer regeneration, but where aspen was present in the stand it has responded very well. To help provide a prospective of the density of the aspen saplings, it is estimated that the total sight distance in this photo is less than 40 feet.



Figure 3.1-10: This is a photograph of a 1980 harvest unit, in N. Cheatbeck Basin. Aspen and lodgepole regeneration were both very successful. This stand was thinned in 2003 to reduce inter tree competition and improve health and vigor. The photo was taken along an old logging road that now serves as a major travel corridor for both livestock and big game, even with this amount of use by ungulates very little evidence was found of herbivory on the aspen.



Figure 3.1-11 Repeat Photographs (1953 & 2003). These photos were taken from North Cheatbeck Basin, looking toward Soda Peak (N 12 deg. W.). These photos provide one of the best “loss of aspen from the landscape” visual displays available on the district, in fifty years there has been a dramatic reduction in aspen. There has been a striking loss of aspen on the peak in the aspen conifer types, but just as notable is the change in the lodgepole stands that now dominate the edge of the basin, where only small patches of aspen are now visible along the edge (highlighted with arrows), these areas had considerable amounts of aspen visible throughout fifty years ago (1953).

Past harvest units along the east side of the basin now show the same type of diversity with aspen and lodgepole saplings occupying the site, the aspen responded favorably to the disturbance (logging).

Lodgepole Pine:

Lodgepole pine is the other seral tree species that plays an important role in the landscape and project area, like aspen it is an aggressive pioneer species, and its presence on the landscape supports the characterization that the landscape experienced relatively frequent disturbances. Lodgepole is a relatively short lived species that is very shade intolerant, so it is easily replaced through succession by more shade tolerant species like subalpine fir.

Throughout the project area and across a band along the upper portion of the landscape lodgepole pine is the dominate tree species, in fact the lodgepole pine cover type makes up approximately 49% of the project area. Like all the other cover types, lodgepole in the project and landscape area can be characterized as having a mature structure. The dominate trees are relatively large, some down wooding debris exists (generally patchy) and the under story is dominated by shade tolerant subalpine fir.

Much evidence exists in this project area that supports the characterization that these lodgepole pine stands experienced frequent disturbance, which maintained the competitive advantage lodgepole had over the always persistent successor alpine fir. During field visits numerous fire scared stumps on very old logging stumps were found. Also, it was noted that a very low percentage of the cones were serotinous. Serotinous cones are typically found on sites that experienced a lethal fire regime; the trees invest in seed storage because most trees are killed in that type regime. Additionally, the old harvest stumps that were found tended to be clumpy, which leads to the conclusion that the trees harvested at the turn of the century had survived the fire that initiated the current stands.

Lodgepole has been very successful on this project area for many years as a result of its adaptations to disturbance. Now, lodgepole pine is at risk in this project area due to the lack of disturbance in the last 75 to 100 years. Some harvest has occurred but not enough to provide for a balance of structural stages, as a result approximately 75% of the lodgepole pine cover type in the project area and 78% in the landscape could convert to a subalpine cover type in the future. This conversion could be slow through continued low level, age related mortality of the lodgepole or it could happen very rapidly if a Mountain Pine Beetle outbreak occurs.

The RFP outlines the following guideline for 5.2 Prescription Areas: *Practices to prevent or control natural disturbances, such as insects and disease losses and wildfire, are emphasized.*

Serotinous Cones

The Dictionary of Forestry produced by the Society of American Foresters, defines serotinous as: *pertaining to fruit or cones that remain on a tree without opening for one or more years.*

Lodgepole pine can have serotinous cones. Serotinous lodgepole pine cones do not open at maturity due to resinous bonds between scales. This allows viable seed to be stored for decades. The resin scale bonds break when cone temperatures reach between 113 and 140 degrees Fahrenheit. The serotinous cone habit within lodgepole varies over geographic areas and locally. (Silvics of North America)

Lodgepole Pine stands in the Project Area.



Figure 3.1-12: **Both of these photos represent current conditions found in the project area lodgepole pine stands. The stands are succumbing to succession, for each lodgepole that dies there are numerous subalpine to replace them. The lower picture has few seedling and sapling sized alpine fir, but pole size trees are relatively frequent, while the upper picture has a dense seedling/sapling layer. Much of this variation is attributable to variations in past disturbance levels.**

3.1.5 Stand Size

An assessment of forested stand size for the landscape revealed that the average stand size is 27 acres, the maximum size 197 acres and minimum size is 3 acres. The average forested stand size for the project area is 32 acres the maximum is 118 and the minimum is 4 acres. The standard deviation at both scales is 27. **Figure 3.1-13** shows the number of stands in 12 different acreage classes, the classes are 10 acre groups up to 100 acres then 50 acre groups up to 200-acres, and it also shows the total acreage in each group.

Past harvest units average 16 acres and account for 63% of the stands less than 10 acres in the project area. Past harvest activities have not mimicked natural disturbance size and have lead to a decrease in the natural patch/stand size.

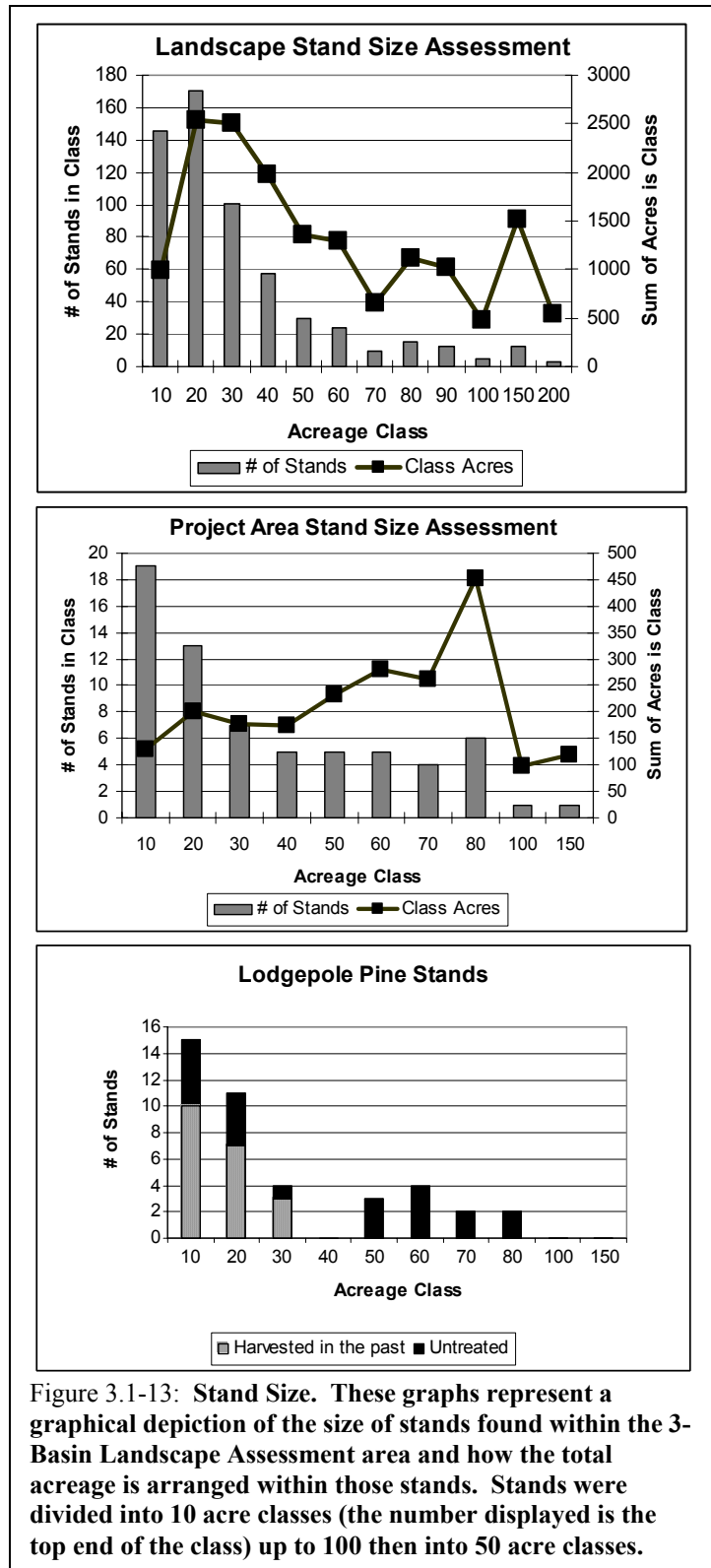


Figure 3.1-13: Stand Size. These graphs represent a graphical depiction of the size of stands found within the 3-Basin Landscape Assessment area and how the total acreage is arranged within those stands. Stands were divided into 10 acre classes (the number displayed is the top end of the class) up to 100 then into 50 acre classes.

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 3-Basin landscape 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 in the landscape. The PNVG’s used were *Interior West Lower Subalpine forest #1 (SPFI1)* and #2 (*SPFI2*) described in the FRCC guidebook and the FRCC website, SPFI1 was modified slightly to reflect the information in Barrett’s 1994 Fire regime report on the Caribou National Forest.

Table 3-7 PNVG Condition Class. **Condition class definitions can be found in Figure 3.1-14**

PNVG (% of project area)	Veg-Fuel Condition Class	Frequency-Severity Condition Class	PNVG Condition Class
SPFI1 (87%)	2	2	2
SPFI2 (13%)	2	1	2
Project Area	2	2	2

The landscape overall FRCC departure score was 62, which is on the high end 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 the departure in the vegetation/fuels composition and structure much more than the frequency/severity departure, which scored only 32. According to the nomogram at the end of the FRCC report, restoration efforts for landscapes in this condition should focus on restoration of the vegetation composition, structure, and fuels.

3.1.7 Summary of Vegetation Condition at the Landscape Scale

The affects of fire exclusion in forests with fire regimes III and IV are more apparent at the landscape scale than the stand level (Long, 2003). This means that viewing a single stand or a small group of stands does not tell the whole picture, (e.g. a mature/old stand or a group of stand is not out of the ordinary, but landscapes dominated by any single stand age structure class are).

It is apparent that forested vegetation in this landscape lacks age class structural diversity when viewed at the landscape scale. This landscape is mature, dense and species composition is trending towards climax. A landscape in this condition can be considered at moderate risk to loss of key ecosystem components (condition class 2). The lack of diversity in age structure and the high percentage of stands that have a dense understory of subalpine fir (ladder fuels) created by the lack of past disturbance creates a landscape

that is susceptible to catastrophic fire, insects, and wind events that are outside the natural range. It also creates a landscape that is less resilient to these type events.

Natural (historical) fire regime classes.			
Fire Regime Class	Frequency (Mean Fire Return Interval)	Severity	Modeling Assumptions
I	0 – 35+ Years, Frequent	Surface and Mixed	Open forest, woodland, shrub and savannah structures maintained by frequent fire; also includes frequent mixed severity fires that create a mosaic of different age post-fire open forest, woodlands, shrub or herb patches that make a mosaic of structural stages, with patches generally < 40 hectares. Mean fire interval can be greater than 35 in systems with high temporal variation.
II	0 – 35+ Years, Frequent	Replacement	Shrub or grasslands maintained or cycled by frequent fire; fires kill non-sprouting shrubs which typically regenerate and become dominant within 10 – 15 years; fires remove tops of sprouting shrubs which typically re-sprout and dominate within 5 years; fires typically remove most tree regeneration.
III	35 – 100+ years, Less Infrequent	Mixed and Surface	Mosaic of different age post-fire open forest, early to mid-seral forest structural stages, and shrub or herb dominated patches generally < 40 hectares; maintained or cycled by infrequent fire. Interval can range up to 200 years.
IV	35 – 100+ years, Less Infrequent	Replacement	Large patches generally > 40 hectares, of similar age post-fire shrub or herb dominated structures, or early to mid-seral forest cycled by infrequent fire. Interval can range up to 200 years.
V	200+ years	Replacement Mixed, and Surface	Variable size patches of shrub or herb dominated structures, or early to mid to late seral forest depending on the type of biophysical environment. Cycled by rare fire or other disturbance events. Often have complex structures influenced by small gap disturbances and understory regeneration.

Fire Regime Condition Classes		
Class	Departure	Description
Condition Class 1	Low	Vegetation composition, structure, and fuels are similar to those of the natural regime and do not predispose the system to risk of loss of key ecosystem components. Wildland fires are characteristic of the natural fire regime behavior, severity, and patterns. Disturbance agents, native species habitats, and hydrologic functions are within the natural range of variability.
Condition Class 2	Moderate	Vegetation composition, structure, and fuels have moderate departure from the natural regime and predispose the system to risk of loss of key ecosystem components. Wildland fires are moderately uncharacteristic compared to the natural fire regime behaviors, severity, and patterns. Disturbance agents, native species habitats, and hydrologic functions are substantially outside the natural range of variability.
Condition Class 3	High	Vegetation composition, structure and fuels have high departure from the natural regime and predispose the system to high risk of loss of key ecosystem components. Wildland fires are highly uncharacteristic compared to the natural fire regime behaviors, severity, and patterns. Disturbance agents, native species habitats, and hydrologic function are substantially outside the natural range of variability.

Figure 3.1-14 Fire Regime and Condition Class Definitions. **These definitions are from Hann (2004), he interpreted them from Hardy et al. (2001) and Schmidt et al. (2002) for modeling landscape dynamics and departures from historical or natural range of variability at project and watershed scales.**

3.2 Hydrology

Analysis Methods: Field visits were conducted by the project hydrologist during 2003 and 2004 by walking all of the areas mapped as wetlands, drainages mapped by USGS as perennial and intermittent streams in the project area, most other mapped ephemeral draws within the project area, and all perennial streams within 300 feet of both proposed haul routes. The stream analysis is based upon the Rosgen stream classification system (Rosgen, 1994), Pfankuch stream surveys (Pfankuch, 1978), Proper Functioning Condition Assessment (BLM, 1997 and 1998) and direct observation of geology, geomorphology and erosion/deposition conditions as they relate to hydrologic conditions and management effects.

To insure compliance with the Forest Plan guideline of a maximum 30 percent hydrologic disturbance, the entire HUC-5s where the disturbance takes place were used.

The Forest's GIS system was used to calculate percent hydrologic disturbed area to assure compliance with the RFP guidelines. The output was then interpreted along with in-stream data to evaluate stream, wetland and watershed function. No one indicator was used as an absolute measure of project effects.

This analysis included additional data from the following sources:

- personal interviews with local residents and Forest Service personnel familiar with the project area, Forest Service data, reports, and studies
- Idaho Department of Environmental Quality's "Beneficial Use Reconnaissance Project (BURP) Program activities and reports.
- Forest Service Properly Functioning Condition (PFC) assessments (USDI, 1993)
- Forest Service evaluations of channel stability using Pfankuch methodology (USFS 1975) from 2001 – 2004.
- The Inland West Water Initiative (IWWI) at the 5th level Hydrological Unit Code (HUC).
- National Wetlands Inventory (NWI) GIS data from the U.S. Fish and Wildlife Service. (<http://wetlandsfws.er.usgs.gov>)

Analysis Area: The analysis area consists of the three internally draining Cheatbeck Basins, consisting of the portions of the three HUC-5 s within the Forest that cover the project area. It also includes roads along the two potential haul routes outside the project boundary.

3.2.1 Existing Condition

The project area is in an enclosed basin and there are at least six depressions that appear to be sinkholes within the basin. Most of these sinkholes are on the western side of the basin and have a steeper vertical face of carbonate rock on the western side, which is the "down-dip" side, suggesting that they are related to the bedding planes in the carbonate bedrock. There are no known connections between the sinkholes or dolines in the basin and springs or any re-appearing stream flows outside the basin.

There are many drainage bottoms present in the project area that carry ephemeral flow from snowmelt and rainstorm events. There are also five wet lentic areas of about equal size totaling about 1.5 acres that are mapped as wetlands within the project area, one of which is perennial. Three of the mapped wetland areas are associated with sinkholes, none of which had riparian plants present, save one with a sedge plant about 3” across on the edge of the associated sinkhole. The other two, most northern mapped wetland areas, appear to hold water much of the year. One of those had substantial wetland rushes present. In accordance with the Forest Plan, no harvest activities are proposed within 100 feet of the wetland areas or within 50 feet of the ephemeral draws.

There are no perennial or well-defined intermittent streams within any of the three internally drained Cheatbeck Basins. The provisional USGS Soda Peak topographic map quadrangle erroneously shows a perennial stream channel flowing southward through the northernmost internal basin where only an ephemeral draw is actually present. The stream designation on the map changes to intermittent where the stream is marked on the North Canyon topographic quadrangle to the south. A few small pockets of reworked gravels are present in the draw on this quad, but one small willow was the only riparian plant present.

Climate

The nearest weather station is at the Soda Springs, Idaho Airport, about ten miles north of the project area. There is a SnoTel weather gage near Emigrant Summit, about eight miles south of Cheatbeck Basins and immediately south of Hwy 36. Data from these stations is presented in the table below.

	Soda Springs Airport NWS Data			SnowTel Data
Month	Mean min Temp (F)	Mean max temp (F)	Mean Soda precip (in)	Mean Emigrant Basin precip (in)
January	10.4	30.3	1.2	3.9
February	13.4	34.8	1.08	4.7
March	20.5	42.7	1.19	4.7
April	28.9	55.2	1.37	3.8
May	36.4	65.6	1.8	3.8
June	42.4	74.8	1.46	1.9
July	48.5	84.4	0.94	1.2
August	46.9	83	1.03	1.6
September	38.8	73.4	1.14	2.2
October	30.5	60.6	1.21	2.7
November	21.2	43.3	1.14	4.5
December	13.1	32.5	1.13	4.8
Annual	29.2	56.7	14.7	39.8

Since roads are the primary source of this area’s sediment, they received a detailed analysis. Table 3-8 Summary of Existing Conditions of Perennial Streams along Proposed Haul Routes summarizes key variables used to evaluate whether roads have influenced sediment delivery processes. These values do not by themselves or cumulatively infer that actual in-stream sediment levels are altered. This is because even

if a process is altered, it may not result in a change in sediment levels. The assessment is only intended to evaluate potential alterations in sediment producing processes (related to the disturbances in sensitive areas indicator).

3.2.2 Streams within the Analysis Area

Eightmile Creek and Cow Fork of Eightmile Creek

Eightmile Creek is a moderately stable stream with an average condition rating of fair and a Properly Functioning Condition (PFC) rating of functioning at risk. Primary disturbances include livestock grazing, roads, and ATV use, developed and some remaining dispersed recreation sites. Placement of barrier rock to protect riparian areas in both the mainstem of Eightmile and Cow Fork in 2003 has contributed to a trend of improving conditions as riparian vegetation recovers.

Continuous flow in the main fork begins at a spring in the Eightmile Creek Campground about 5 miles above where the haul route leaves the mainstem. From this campground to the bridge, the creek is a stable stream in excellent condition. Its riparian area is in very good condition and is restricting cattle access to the creek. Between the bridge and the culvert, past logging and grazing have resulted in isolated channel impacts including limited braiding. While conditions remain good between the culvert and the Cold Springs Campground, dispersed recreation plays a larger role as localized bank erosion becomes more pronounced. The overall conditions of this upper section are good and trends are static. A second unnamed spring in this area has a stockwater water use. The main fork of Eightmile Creek above the Cold Spring Campground is above the proposed haul route.

Eightmile Creek, below the Cold Springs Campground, conditions had been degraded by dispersed recreation but are now improving due to the effective placement of barrier rock in 2003 to close off dispersed campsites. Livestock grazing is still causing some erosion as bank vegetation is altered allowing cattle to concentrate and easily reach the stream, as opposed to fighting the thick willows and marshy ground associated with the nearby wetlands. These disturbed banks still are subject to the potential for erosion during high flows which can produce large sediment inputs. Before the placement of barrier rock, this was the largest sediment source in the entire watershed. The previous impacts from dispersed camping, as well as local grazing, have changed the stream type of the lowest federally managed reach from cobble to gravel. This entire area has a moderate to very high bank erosion potential, a good recovery potential, and a very high vegetation controlling influence (Rosgen, 1996).

At the upper county road crossing (below the forest boundary), flows are substantially reduced. The 1994 BURP survey found base flows at 2.3 cfs on the Forest and only .1 cfs at the county road. This lower area is heavily impacted by grazing and has low bank stability and high levels of fines.

The **Cow Fork of Eightmile Creek**, from the upper crossing of the northernmost perennial fork to the confluence with the main fork, parallels the northern proposed haul route, and is closest to the road just below the upper crossing. Perennial flow in this

tributary of Cow Fork begins at a spring a few hundred feet above the upper road crossing. Conditions have been degraded by substantial sediment delivery from the road and a user-created “mud bog” road that forks off the main road above the campground, paralleling and crossing the creek. Placement of barrier rock at this location has not been fully effective due to the close proximity of the barrier rock to the channel along the road and the poorly designed creek crossing.

Meadow Creek is a small stream that is perennial along about 3/4 of its length and lies along the proposed southern haul route. It has abundant fine sediment and has widened in some sections in this reach, but overall this reach is in fair to good condition, with abundant sedges along the banks throughout nearly all of the reach. A section about 200 feet long in the upper reach is very straight, likely because it was displaced by the road, but this has not caused any visible degradation of the channel due to the abundance of sedges that grow along the channel.

The lower reach in the forested canyon and is a steep stream greatly degraded by the road that closely parallels it. This is evidenced by several deltas into the channel consisting of road base/gravel material where there is concentrated flow from the road into the channel.

There is a section of up to ½ mile where the road filled the original channel, displacing the channel to the side where it is more a jumble of rocks with little riparian vegetation than a functioning step-pool stream as it is much of the rest of the lower reach. However the predominance of cobble to boulder size rock in the channel and banks along the lower reach is preventing any downcutting from occurring in that section or anywhere else in the lower reach. An additional mile of the lower reach of the creek has at least been partly constricted by the construction of the road. Recreation is also a major land use in this area, though the canyon along this reach is generally too narrow for dispersed camping. This stream is intermittent for about the lower mile above its confluence with North Creek.

North Canyon Creek is a moderately stable B4 stream in fair-poor condition, though the reach in poor condition is above the proposed haul route. Its overall PFC rating is functioning at risk. The main concern is very high sediment levels in all reaches. The majority of this sediment appears to be coming from lower bank erosion (along the entire channel), upper bank erosion (above the Highline trail crossing, which is above the haul route), and riparian disturbances. These disturbances include sheep grazing, dispersed camping, ATV use, and the main valley bottom road. The trend is currently declining.

While North Canyon Creek is very sensitive to livestock grazing, it also has an excellent recovery potential and a moderate vegetation controlling influence (Rosgen, 1994 This drainage has two springs with existing stockwater water uses/rights (Humberg and an unnamed spring).

3.2.3 Existing Impacts of Haul Routes to Streams

The majority of sediment currently delivered to streams along the haul routes areas is the result of erosion of road surfaces and adjacent ditches. Existing sediment impacts to perennial water are greater along the northern (Eightmile) haul route than from the southern (Meadow/North Canyon) haul route. This is because the dominant rock type in Meadow Creek and lower North Creek are massive to very coarsely bedded limestones and cherts with much higher resistance to erosion (hence the rocky, steep-sided canyon of Meadow Creek) which tend to produce relatively low quantities of fine sediment. Hence, soils are thin or absent along most of the lower canyon slopes and bottom. By contrast, the sideslopes have a much thicker soil cover in most of Cow Fork of Eightmile and are derived of much more erodible siltstones and mudstones, providing much more source material that can be eroded and delivered to streams.

Substantial quantities of sediment are being delivered to Cow Fork of Eightmile from road #402, which appears to be far greater than what is being delivered to Meadow Creek from road #425 and to North Creek from road #401. Conversely, the road along Meadow Creek is constructed of much more durable road base material. Though the road along Meadow Creek is delivering sediment to the channel, it is nearly all road base material which is eroding from the road surface due to a lack of proper outsloping. This is causing water to accumulate on the road and run down the tire ruts in the road.

Summary of Existing Stream Conditions

Table 3.2.1 is a summary of the existing stream conditions and ratings for each stream along the two proposed haul routes.

Table 3-8 Summary of Existing Conditions of Perennial Streams along Proposed Haul Routes

Stream	Reach	Current Condition Assessment				General Channel Type Rating
		Stream type	Channel Condition	Current Condition Rating	Trend	
Eightmile	8mile CG-Bridge	B3/4	Excellent	Stable	Static	Stable
Eightmile	Bridge-Culvert	C3	Good	Stable	Static	Stable
Eightmile	Culvert-Cold Springs	B3	Good	Stable	Static	Stable
Eightmile	Cold Springs-1.3 mi	C3	Fair	Sensitive	Down	Sensitive
Eightmile	1.3 miles-Prop.Line	C4	Fair	Sensitive	Down	Sensitive
North Cyn	Above Highline Trail*	B5	Poor	Unstable	Down	Sensitive
North Cyn	Highline-Mill Hollow	B4	Fair	Sensitive	Down	Sensitive
North Cyn	Mill Hollow-Culvert	B4	Fair	Sensitive	Down	Sensitive
Meadow	Upper (above timber)	E4/E5		Sensitive	Static	Sensitive
Meadow	Lower	B3/B4		Sensitive	Static	Sensitive

* This reach of North Canyon Creek is above the proposed haul route.

3.2.4 Karst and Surface Water – Subsurface Water Interactions

Carbonate sedimentary rocks, mostly limestones, dolomites and calcareous mudstones are very common components of bedrock of the Bear River Range. Geologic stresses in the area over time, especially the uplift of these rocks to form the Bear River Range has resulted in the formation of numerous joints, fractures and faults in the bedrock of the project area. Subsequent deep percolation of precipitation, enriched by acidic dissolved carbon dioxide from the soil zone has over time enlarged these fractures. These are some of the major elements in the formation of the system of solution openings and depressions in the carbonate rocks of the area commonly known as Karst geology. This geology is common in the project area, and believed to be a determining factor behind the formation of these enclosed basins as such.

3.2.5 Water Quality Regulatory Framework, Practices and Beneficial Uses

A matrix of beneficial uses that have been identified by the Idaho Department of Environmental Quality (IDEQ) in the project area and selected streams downstream of the project area are given in Table 3-9 Identified Beneficial Uses. The data presented

comes from the latest Integrated 305(b) Report (IDEQ, 2003), and from Appendix F forms completed after Beneficial Use Reconnaissance Project (BURP) surveys. All streams are covered by the Idaho anti-degradation water quality policy (IDAPA 58.01.02.051). The objective of this policy is to ensure that existing water uses and the level of water quality necessary to protect these uses is maintained and protected (IDAPA 58.01.02.051.01).

Table 3-9 Identified Beneficial Uses

Stream: Reach	CWB	SS	PCR	SCR	DWS	AWS	IWS	WH	AE
Eightmile Creek	E	E		E		DE	D	D	D
Meadow Creek	E			E		DE	D	D	D
North Creek	E		E	E		DE	D	D	D

Key: E = Existing Use; D = Designated Use; DE = Designated and Existing Use.
 CB = 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

3.2.6 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 3-10 Water Quality Limited 303(d) Streams lists the water quality limited stream segments along the proposed haul routes.

There are no 303(d) streams within the project area.

No public water supplies have been designated within the project area or from streams within 300 feet of the haul routes.

In addition to impacts from roads to North Canyon, Meadow and Eightmile Creeks on the Forest, major impairments to water quality or dewatering for human uses are occurring below the Forest Boundary.

Three streams along the proposed haul route areas are on the draft 303(d) list for 2002 and are listed in Table 3-10 Water Quality Limited 303(d) Streams (IDEQ, 1998, 2002).

Table 3-10 Water Quality Limited 303(d) Streams

Stream – Reach	Miles perennial on Forest	1998 list?	Failing use(s)	Cause
Eightmile Cr	7.5	No	CB, SS	U
Meadow Cr	3.1	Yes	CB	M, S
North Cr	8.1	Yes	SS	U

KEY: CB = Cold Water Biota; SS = Salmonid Spawning M = Metals; S = Sediment; U = Unknown or as yet undetermined.

3.2.7 Existing Hydrologically Disturbed Areas

Hydrologically Disturbed Condition: Harvest and post harvest site preparation disturb the upper layers of soil, which alters the hydrologic properties of the soil. The Forest guideline is a maximum of 30% hydrologic disturbance of principal watersheds or their sub-watersheds should be disturbed at any one time. The disturbance for the proposed project is within the three internally draining Cheatbeck basins, which total about 6,200 acres. The ephemeral drainages of the basins drain into small perennial ponds and depressions mapped as wetlands and several other sinkholes within the basin.

The basins of the project area are split between portions of two HUC-5 watershed units within the Bear Lake and Middle Bear River HUC-4 subbasins. The northern two-thirds of the project is in the same HUC-5 as Eightmile Creek, which drains to the east, and the southern third of the project area is in the same HUC-5 as Trout Creek and Ant Canyon to the west.

Percent hydrologic disturbance was calculated in GIS using a 15-foot buffer for roads, 3-foot buffer for trails, two meter (about six feet) buffer for fences, and a one acre buffer for water improvements constructed for livestock and wildlife. Previous harvest units dating back to 1970 were included. Post and pole harvest units were assumed to have a 50% disturbance rate of the total 6 acres used, and firewood cutting was assumed to total 3 acres. The North Canyon HUC-5, which contains the southern haul route, is not included in this analysis because no ground disturbing activities are proposed in that HUC-5. As shown in table 3-4, the two HUC-5 units and internally draining Cheatbeck basins at present currently have no more than 11 percent area classified as hydrologically disturbed. The current conditions are well within the forest guideline that states “Not more than 30 percent of any of the principal watersheds and their sub-watersheds should be in a hydrologically disturbed condition at any one time.”

Previous harvest units dating back to the 1970s were included. Post and pole harvest units were assumed to have a 50% disturbance rate of the total 6 acres used, and firewood cutting was assumed to total 3 acres. The North Canyon HUC-5, which contains the southern haul route, is not included in this analysis because no ground disturbing activities are proposed in that HUC-5. As shown in **Table 3-11 Existing Percent Hydrologic Disturbance**, the two HUC-5 units and internally draining Cheatbeck basins at present currently have no more than 11 percent area classified as hydrologically disturbed. The current conditions are well within the Forest guideline that states “Not more than 30 percent of any of the principal watersheds and their sub-watersheds should be in a hydrologically disturbed condition at any one time.”

Table 3-11 Existing Percent Hydrologic Disturbance

Area	Total Disturbed	Total Acres	Percent
1601020213 Trout Cr	2123 acres	19298 acres	11.0 %
1601020102 Eightmile Cr	2044 acres	18794 acres	10.9 %

3.3 Soils

Analysis Methods: The effects of management activities on soil productivity are measured by the amount of detrimental soil disturbance remaining in the harvest units (activity areas) after the project is completed and project design features are applied, as outlined in Chapter 2 and the R-4 Soil Management Handbook (FSH 2509.18 supplement r4_2509.18-2002-1). Skid trails, landings and temporary roads within harvest units were calculated as detrimental soil disturbance. On-site field visits along with soil characteristics and interpretations from the Soil Survey of the Caribou National Forest (USDA-FS, 1990) were used to determine how soils within the project area could be affected by the proposed action and alternatives to the proposed action. The Water Erosion Prediction Project (WEPP) model was used to estimate erosion rates under natural conditions and after harvest activities are completed for each alternative. Specified transportation facilities such as designated open roads are excluded from the detrimental soil disturbance assessments. Soils were examined in each proposed harvest unit to document existing erosion potential, existing detrimental soil disturbance and productivity characteristics. (Field notes 2003 and 2004).

Analysis Area: The analysis areas for determining the effects of the proposed action and alternatives to the proposed action on soil productivity are the proposed harvest units (activity areas) as defined in FSH 2509.18, R4-2002-1.

3.3.1 Detrimental Soil Disturbance

Detrimental soil disturbance is defined in the RFP (RFP G-40) and is a measure of soil displacement, soil compaction/puddling and severe burning. Detrimental soil disturbance is calculated for activity areas, in this case timber harvest units, system roads are not included in this measurement (FSH 2509.18 supplement r4_2509.18-2002-1). The Region 4 soil quality standards and guidelines provides direction stating that detrimentally disturbed soils should not be present on more than 15% of the activity area after project related activities have been completed.

3.3.2 Existing Soil Disturbance

Soils within the proposed project were evaluated during the summer of 2003 and 2004 to determine soil conditions and quality, and their capability to sustain timber harvest activities. Existing disturbances observed in the proposed harvest units related to firewood, post/pole collections, grazing, off-road vehicle use, and recreation use were documented by field observations. Approximately 10 acres of detrimental soil disturbance were identified in the proposed harvest units collectively. Soil quality standards apply to detrimental soil disturbances inside activity areas, in this case proposed harvest units (FSH 2509.18 r-4 supplement 2509.18_2002).

Table 3-12 Acres of detrimental soil disturbance by proposed harvest units, current condition

Proposed Treatment Unit #	Proposed Treatment Unit Acres(*)	Approximate Detrimental Soil Disturbance (acres*)
1	77	1.0 dispersed recreation
2	57	0.5 old pioneered trail
3	19	0
4	18	0
5	56	0
6	67	0.25 recreation trails
7	10	0
8	54	1.0 firewood/recreation
9	64	3.5 timber harvest
10	19	0.25 firewood gathering
11	67	1.0 firewood gathering
12	36	0.25 firewood gathering
13	47	1.25 firewood gathering
14	118	1.0 livestock trailing
15	52	0
Total Acres	761	~10.0

* Acreages are approximate.

A timber harvest unit from the Cheatbeck #2 Timber Sale was monitored in 2004 to determine the amount of detrimental soil disturbance remaining on the activity area. The old cutting units in this sale were harvested in the early 1970's and then thinned in 1987. Bulk density measurements were taken on a line-intercept transect to determine compaction of the surface soils. The results showed that about 7 percent of the harvest unit had detrimental soil compaction remaining generally located in old skid trails and landings, although trees were growing in the old road prisms (Lott 2004).

However, for cumulative effects analysis, estimated acres that have been disturbed by all activities including management activities within the proposed project area are approximately 261 acres, or about 10 percent of the project area, as shown below. These disturbances may or may not have soil conditions that meet the definition of detrimental disturbance. Cumulative effects of detrimental soil disturbance will be assessed in each harvest unit in Chapter 4. System roads and other designed facilities such as designated camp grounds are excluded from these calculations.

<u>Activity</u>	<u>Disturbance</u>
Past Timber harvest-----	~ 249 acres
Wildfire disturbances -----	1 acre
Prescribed fire disturbances -----	0 acres
Recreation from OHV use -----	~ 5.0 acres
Livestock trailing/Range improvements -----	~ 1.0 acres
Recreation from dispersed camping -----	~ 2.0 acres
Firewood Gathering-----	~ 3.0 acres
Total -----	~ 261 acres

3.3.3 Soil Productivity and Monitoring

The geology of the watershed is primarily sedimentary rocks of the Garden City Limestone, Swan Peak Quartzite, Nounan Limestone, and St. Charles Limestone. These geologic formations consist of siliceous limestone, quartzite, dolomite, and chert (Mitchell et al. 1979). They form loamy, clayey, and sandy soils high in base saturation with relatively high inherent fertility (CNF Lab data 1992).

No unstable, marginally unstable, or landslide prone areas were identified or have been mapped during field investigations in the analysis area (Caribou Soil Survey 1990). Landforms in the analysis area are considered stable. Soils in the project area have been determined to be suitable and capable of sustaining impacts from timber harvest activities.

Woody residue and fine organic matter transects were taken in proposed harvest units to determine RFP requirements will be met. The data shows abundant woody residue and fine organic matter exists on all proposed harvest units (Field Data 2003) although not spread evenly. Current existing down woody debris in proposed harvest units ranges from 5.0 tons per acre within 300 feet of roads to 18.7 tons per acre further inside proposed harvest units (Field Data 2003 and 2004). The RFP requires that 10 to 15 tons per acre woody residue remain after activities are complete. Ground cover and fine organic matter is 85 to 100 percent on all proposed units (USDA FS 1997).

The proposed Three Basins Timber Sale analysis area has productive soils that are mapped in seven different land types (see land type/soils map from Caribou Soil Survey, 1990 in project file). Aspen/conifer areas are found on all aspects of high mountain side slopes, and basins are dominated by wet and dry meadow vegetation and are usually wet in the spring. Elevations in the Cheatbeck Basin watershed range from 7,340 feet in Middle Cheatbeck Basin to 8,800 feet at the top of Soda Peak. Annual precipitation ranges from 30 to 40 inches and mean annual air temperature is 29 to 35 degrees F.

Productivity can be reduced when soils are detrimentally disturbed by compaction, displacement or puddling causing excessive erosion, and when soils are severely burned (FSH 2509.18 supplement r4_2509.18-2002-1). Soil productivity and quality are considered sustainable if detrimental soil disturbance threshold values do not exceed

more than 15 percent of the harvest units. Timber harvest activities such as skidding logs, slash piling/burning and construction of landings and temporary roads have the potential to reduce soil productivity by creating soil compaction, soil displacement, soil puddling, and expose the mineral soil surface to erosive forces within the harvest units (Meeuwig, 1975; Stone, 1977; Greacen et al., 1980).

On many locations within the proposed project area, site productivity is directly influenced by soil characteristics such as soil depth, infiltration/permeability, soil texture and rock fragment content among other factors (USDA Forest Service 1995). Soils are most productive where they are deep and have an adequate supply of moisture during the growing season. In the proposed project area, these soil conditions are representative of most aspen/conifer and mountain basin areas.

Soil temperature and moisture data have been collected near the analysis area. The data indicates that the soils are moist through most of the growing season and have cold temperatures. Twenty years of erosion monitoring in Nelson Canyon, just north of the analysis area, indicates that background soil loss is less than 0.18 tons per acre per year. Soils in the project area have soil loss tolerance ratings between 1 and 4 tons per acre per year. Soil erosion rates must be less than soil loss tolerance to maintain soil productivity.

Site-specific soils analysis documented few variations that were inconsistent with the original landtype mapping (USDA FS 1990). Soils in the proposed burn units 14 and 15 are on soils mapped as having high erosion potential. However, site-specific analysis indicates soils in these units have low to moderate erosion hazard because slopes are less than 40% and are considered an inclusion in the map unit (Site Visit July 2004). All other soils were found to be consistent and conform to the range of characteristics found in the Soil Resource Inventory (USDA FS 1990).

3.3.4 Revised Forest Plan (RFP) Soil Quality Standards and Guidelines

Regional soil quality standards and guidelines must be followed for Region 4 as found in Forest Service Handbook 2509.18, supplement r4_2509.18-2002-1. The standard is “Soil resource management must be consistent with the Forest Service goal of maintaining or improving long-term soil productivity (NFMA) and soil hydrologic function.” The guideline is “No more than 15 percent of an activity area should have detrimentally disturbed soil after completion of all management activities.” An activity area is defined as “An area impacted by a land management activity, excluding specified transportation facilities, dedicated trails, and mining excavation and dumps.”

The RFP has four standards and five guidelines that must be followed to maintain soil productivity.

Standards All ecosystems

- Landtypes identified as being unstable or marginally unstable in the Caribou National Forest Soil Resource Inventory shall be ground verified prior to soil

disturbing activities to determine the capability of the land to sustain resource development activities including road construction.

- Suitability for resource management activities shall be disclosed in the site-specific analysis.
- For ground-disturbing activities where detrimental soil disturbances (defined in FSH 2509.18 supplement r4_2509.18-2002-1) occur on areas of 10 acres or greater, plan and implement rehabilitation to meet desired future conditions.
- On landtypes where landslides or landslide prone areas have been identified, a site-specific analysis shall be conducted to ensure project implementation is compatible with desired future conditions.

Guidelines All ecosystems

- Resource development 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 for 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.

Guidelines Forested ecosystems

- 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 minimum amounts of woody residue >3 inches in diameter dispersed on the site.

3.3.5 Desired Future Conditions

Soils have adequate protective cover, adequate levels of soil organic matter (litter), and coarse woody materials for long-term nutrient cycling. Ensure long-term soil productivity by providing a minimum of 10 to 15 tons per acre of large woody debris distributed across all activity areas. Physical, chemical and biological processes in most soils function to sustain the site.

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 (RFP), Migratory Land Birds as required by Executive Order, 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.

Analysis Methods: Survey data, known locations (MRD 2004, 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 contents of Chapter 3 and 4 are a summary of the *draft* Biological Assessment (BA) for Threatened or Endangered species, Biological Evaluation (BE) for sensitive species, Montpelier Ranger District (MRD 2005) Wildlife White Papers, and specialist's reports. Final copies will be part of the Project Record.

Analysis Area: The 19,683 acre analysis area used for the vegetation section is used to display acres of suitable habitat available for wildlife because the goshawk requires an analysis of a 6,000 acre territory. Potential species occurrence was based on habitat within the project area and suitable habitat down to the Bear River on the east, north and west to account for seasonal migration into the project area. Neighboring suitable habitat is used to determine potential occupancy of forest carnivores that migrating long distances.

Forest Plan Direction: The RFP standards and guidelines for wildlife is found in RFP 3-24 – 33 (USDA 2003b). The analysis of impacts on wildlife is found in CNF RFP FEIS 4-195 – 241 and Appendix D-1 – 178 (USDA 2003a).

3.4.1 Threatened and Endangered Species

The following Threatened and Endangered Species are considered for the Montpelier Ranger District, Caribou-Targhee National Forest USFWS (2005). This project was discussed and preliminary determinations made at the Section 7 streamlining meeting with the USFWS on March 12, 2004.

Gray Wolf – The project area is within the Yellowstone experimental/non-essential (XN) population area. Because all conditions required in the final rules (USFWS 1994a and 1994b) for the XN population of gray wolves are being met, the gray wolf was given a “*no affect.*” The USFWS agreed with the *no affect* determination in the streamlining meeting.

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 affect*” was given.

Bald Eagle – The project area does not provide nesting or winter habitat. A determination of “*no affect*” 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 will not be analyzed further.

Yellow-billed cuckoo – The project area does not contain 50 acres of large cottonwood stands with a willow understory. A determination of “*no affect*” was given because this cuckoo is not expected to occur in or near the project area (Trec, Inc 2004); it 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. These 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 has been one vocal sighting of this bat in Southeast Idaho (Gillies 2004 *draft*). 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. (Pierson, E.D. et al. 1999). 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 (Roberts 2003). 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 (*Gulo 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 may be possible, but large rock outcroppings 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. Carrion would continue to be available. Human disturbance from activities may disrupt 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 (USDA 2004c), 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 (Atkinson and Atkinson 1990); and the project area is south of the southern edge of their range. Harlequin ducks will not be analyzed further.

Peregrine falcon – An active eyrie is located ten miles from northern end 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 (USFWS 1999c), this species will not be analyzed further.

Northern goshawk (*Accipiter gentilis*) – Suitable nesting and prey (birds and small mammals) habitat occurs in mature dense forest stands (Reynolds 1992) in the project area. Approximately 14,817 acres or 92 percent of the forested stands in the analysis area are mature and old and may provide nest habitat. The analysis area provides suitable habitat for 2.7, 6,000 acre goshawk territories (RFP S&Gs). There is one known goshawk territory east of the project area. A goshawk was sighted again in 2004 near an older 70 acre opening along the road between North and Middle Cheatbeck Basins. Goshawks were found in Cheatbeck Basin in 1994. No nest sites have been located in the treatment units during field surveys; these surveys would continue during the life of the logging phase.

Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) – Nesting habitat is located west and northwest of the Bear River Range in the valley bottoms, 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. There have been no recent (within 7 years) disturbances creating early seral forage reducing available winter forage (Ulliman et al. 1998). Therefore, 100 percent of approximately 4,101 acres of mountain brush along with young, middle age, mature, and old aspen in the analysis area is mature and capable of providing winter foraging habitat.

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 closed proximity (Connelly et al. 2000). Known leks are three to four miles east of the project area (IDFG 2004a). Birds can migrate two to 11 miles from leks. Surveys have found sage-grouse leks northeast, northwest and southeast of the project area in sagebrush habitat located in the valley bottoms or foothills. The project area may be within the 11 mile nesting and foraging area of unknown leks. Big sagebrush is found between the forest edge and grass/forb meadows and on drier non-forested slopes in the project area. Because leks are not known close by at lower elevations, the high elevation (>7,400'), and the small patches of sagebrush surrounded by trees in the project area does not provide suitable brood rearing habitat. Impacts are not expected to sage-grouse. There is 1,230 acres of sagebrush within the analysis area. Small pockets and individual sagebrush plants within mountain brush habitats are found in treatment units.

Great gray owl (*Strix nebulosa*) – Suitable nesting habitat (abandoned raptor nests or the top of a broken tree) occurs in conifer and aspen forest types on 14,817 acres (92%) in the analysis area, along with small mammals used as prey (Hayward 1994). Winter owl surveys did not locate great gray owls and occupancy is unknown.

Flammulated owl (*Otus flammeolus*) – Suitable nesting (tree cavities) and foraging habitat (insects in an open stand of trees) occurs in mature and old forest habitat (Hayward 1994) on 14,817 acres (92%) in the analysis area. Occupancy is unknown in the project area. 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 analysis area provides 14,817 acres (92%) of mature and old aspen and conifer forest stands that is suitable nesting and foraging habitat. Winter owl surveys located three boreal owls northeast of the project area but occupancy is unknown.

Three-toed woodpecker (*Picoides tridactylus*) – The project area contains suitable nesting (12" snag) and foraging habitat (bark beetle larvae in recently killed trees). There is potential for suitable foraging habitat within 14,817 acres (92%) of mature and old forested stands. 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 not 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 2003a 3-223). Suitable habitat is found in the analysis area but perennial water is not found in the project area and Cheatbeck Basin 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). Viable populations are monitored and determined at the Forest Plan Level. Monitoring data for these species is found in the Wildlife Reports. Meeting Revised Forest Plan (2003) Standards and Guidelines is the unit of measure for MIS.

3.4.4 Migratory Birds

Migratory Birds – Riparian, non-riverine wetland, sagebrush, are three of the four highest priority habitats identified in the Idaho Bird Conservation Plan (Ritter 2000) that are found in the project area. Ponderosa pine is the fourth high priority habitat but it is not found in southeast Idaho. Aspen and conifer are in the “other habitats” important for migratory birds. Objectives have not been developed for these birds. 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: Stream bank vegetation is found along perennial streams in the analysis area but outside the project area. Willows, cottonwood, and aspen are sustaining growth and reaching maturity. Tall willows are found in the analysis area. However, there are no acres classified as riparian/water in the project area.

Non-Riverine Wetland: Seeps, springs, and small beaver ponds provide habitat. Beaver ponds are found along perennial streams in the analysis area. Springs, seeps, and livestock water troughs and catchment ponds are available for bird use within the analysis area but only livestock water developments are found in or near the treatment units.

Sagebrush: Sagebrush succession is continuing on 1,230 acres within the project area. Sage-grouse leks are found in sagebrush habitat northeast of the project area. See sage-grouse section above.

3.4.5 Big Game

MULE DEER AND ELK – The project area contains summer and fall foraging habitat, but no winter range (Revised Forest Plan 2003). The analysis area contains 1,081 acres of winter range at lower elevations. There would be no change to winter range habitat. The forage to cover ratio in the analysis area is 9:91. There are 1,808 acres (9%) 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 provide hiding cover on 17,876 acres (91%). Aspen restoration on public lands is one component of the 2004 IDFG Mule Deer Initiative (IDFG 2005a) to reduce the long-term decline in mule deer numbers. Reducing conifer in aspen stands would help meet this IDFG Initiative.

3.5 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.

Forest Plan Direction: The RFP standards and guidelines for rare plants are found in CNF RFP 3-21 – 23 (USDA 2003b). The analysis of impacts on rare plants is found in CNF RFP FEIS 4-195 – 241 and Appendix D-179 – 191 (USDA 2003a).

There are no T & E (threatened and endangered) plants identified on the Montpelier RD. There are three Sensitive Plant Species identified by the Regional Forester that may be of concern on the Caribou National Forest location of known populations, habitat requirements, and field observations in the project area.

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 between 9,200 and 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*) – This occurs along high elevation ridgecrests and associated summit or upper slopes areas between about 8,600 to 9,400 feet elevation on the southern end of the Bear River Range in Idaho. The dry, open sites tend to be dominated by low herb and/or lowshrub subalpine plant communities near the fringe of, or fingering into Douglas-fir/limber pine woodlands. The elevation of the treatment units is 7,400 to 7,800 feet and the proposed project would not impact this type of habitat. Plants are not expected to occur in the project area and they will not be analyzed further.

3.6 Fisheries

Analysis Methods:

Maps of the project area and alternative haul routes were reviewed to determine potentially affected perennial streams. Where such streams were identified, Forest Service files were searched for fish survey and habitat quality information. If presence or absence of fish was unknown, the potential of a stream to harbor fish was determined by observation. These investigations occurred during the period July 16-October 12, 2004 and are reported in Berg (2004).

Analysis Area:

The analysis area for fisheries includes the project area as well as the portion of perennial streams and riparian areas paralleling timber haul routes outside the project area. A review of maps indicated that the project area is within an internally drained basin containing no perennial streams. Therefore, the project area does not represent current or historical fish habitat. The northern haul route runs alongside a portion of Eightmile Creek. The southern haul route runs beside all of Meadow Creek and part of North Creek.

A fisheries survey was performed at Eightmile Creek in 2001. At that time, trout and sculpin were abundant. The density of trout was estimated conservatively at 351 fish per fish-bearing mile. Despite the abundance of trout, only 5% of the trout population was comprised of Bonneville cutthroat trout (BCT). Brook trout (86%) and rainbow trout (9%) were the most common trout species. The density of BCT was 17 fish per mile. This density is considered insufficient to sustain the BCT population for more than a few years. Brook trout are considered to be a serious threat to persistence of BCT in the stream, through competitive exclusion. The genetic status of BCT in the stream is unknown but little if any ongoing hybridization of or with rainbow trout is expected because rainbow trout being stocked by the Idaho Department of Fish and Game are produced from eggs treated to induce triploidy and are at least 95% sterile (Dick Scully 2003, personal communication).

Some habitat problems were noted during the 2001 survey in the portion of Eightmile Creek paralleling the northern timber haul route. In this reach, stream channel stability was rated as fair using the Pfankuch method. Stream substrate in all portions of the reach was covered with fine sediment. Stream sedimentation reduces the food supply and reproductive success of trout, and is generally thought to be handled better by brook trout than by native cutthroat trout. Bank cutting was a major contributor to sedimentation. Although probably related to beaver dams, bank cutting and sedimentation appeared to be aggravated by livestock, high recreation use of streamside dispersed campsites, and non-armored vehicle stream crossings. Sedimentation in the reach was addressed in 2003 by installing a livestock enclosure fence along 0.25 mile of stream and by placing rock barriers at dispersed campsites to keep vehicles away from the stream.

A fisheries survey was conducted at North Creek in 2001. At that time, trout and sculpin were abundant in the stream. The density of trout was estimated conservatively at 409 fish per mile. Only 20% of the trout population was comprised of Bonneville cutthroat trout (BCT), a density of 82 BCT per mile. Brook trout (80% of the trout population) was the other species present. This species is considered to be a serious threat to persistence of BCT in the stream, through competitive exclusion.

Channel stability of North Creek during the 2001 survey was rated as Good using the Pfankuch method. However, sedimentation problems were noted in all units surveyed. Sedimentation was linked to a trail crossing of the stream and to proximity of the road to the stream. Input of sediment to North Creek is thought to also result from road proximity to its tributary Meadow Creek. Approximately 0.75 mile of the southern timber haul route is within about 10 feet of Meadow Creek. Although this road has a gravel surface, the slope above it is steeper than 1:1. Ruts develop in the road when it is wet and material enters the stream via gullies in the road surface. Stream sedimentation reduces the food supply and reproductive success of trout, and is generally thought to be handled better by brook trout than by native cutthroat trout. An additional road impact to North Creek is a double-culvert that appears to be a partial barrier to fish migration. This structure is located about 2 miles above the Forest boundary.

No fisheries survey has been performed at Meadow Creek. However, low/absent water flows observed in summer 2003 (about 2 miles of the stream were dry) and fall 2004 (about 1 mile dry and where flowing estimated to be 0.1-0.3 cfs) suggest that this stream does not support fish. Some road impacts to Meadow Creek are described above in the discussion on North Creek. An additional road impact is channelization of about 0.3 mile of the stream.

3.7 Roads and Access

Analysis Method: The Road Analysis for the Caribou National Forest, Roads Analysis for the Three Basins 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.

3.7.1 Roads

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.

The transportation system required for this timber sale 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 2. The system roads in this area receive moderate recreation use with some noted below receiving additional pressures.

Most of the roads in this project area are of native materials and when traveled in wet conditions lead to accelerated road deterioration. This illustrates a need for gravel on the road surfaces within the project area.

Table 3-13 Project Area Road Descriptions.

Road	Description
20401 The North Canyon Road (401)	This road is maintained by the forest service at a level 3 on the section potentially affected by the sale, and level 2 to the west. It is maintained by Bear Lake County from Emigration Canyon, state highway 36, to the intersection of Forest Road #21000, access to the Boy Scout camp at Bartlett Lake. During the summer months, this road receives considerable recreation use up to the intersection with #21000, and functions as a through road across the forest east and west.
20402 The Cheatbeck Road (402)	This road is the main haul route from north to south through the project area. It begins approximately 1.5 miles from the Forest boundary from road # 425 “Eightmile Road,” at the Cold Springs campground. It then climbs up the Cow Fork drainage of Eightmile and passes through the project area, the three basins of Cheatbeck. It then goes south and forms a junction with road # 439 “The Cutoff Road”. This roads peak use is during the hunting season. It is in relatively good shape, but portions through the project area need reconstruction. A portion within the project area, approximately 1.8 miles in length is in need of some reconstruction which could include blading, reshaping, culvert installation, proper drainage structures, ditches, and/or spot graveling where needed.
402A User Created	This road originates from road # 402 and serves as a woodcutting and ATV road and is in need of reconstruction. Approximately 0.3 miles will need reconstruction to provide clearance, drainage and minor realignment. After the logging and burning phase of the project is completed this road will be closed to motorized travel. The primary purpose of this road is short term resource management.
20425 The Eightmile Road (425)	This road provides access to the sale area and two campgrounds from the north. The north section is also the main access point for the city of Soda Springs to access the national forest. The southern portion travels adjacent to Meadow Creek to access the North Canyon Road. Previous timber sales have used this road as a haul route. No improvements are suggested for the segments proposed in this sale, because they are already to standard.
20439 Cutoff Road (439)	This road is about 1.7 miles long and provides access to the southern portion of the Eight Mile Road from the Cheatbeck Road.
21191 Cheatbeck Road (191)	This road is a closed system road within the project area; however it is not anticipated to be used for this sale.

Road	Description
21281 Cheatbeck Ridge Road (281)	This is an existing system road constructed for the Cheatbeck Ridge timber sale during the mid 1990s. It is a dead end road approximately 0.2 miles in length and is used for dispersed recreation. It will be reconstructed to facilitate resource management and to allow for continued dispersed recreation use.
20741 Middle Cheatbeck Road (741)	This is an existing system road which branches from road # 402 in Middle Cheatbeck Basin. It was constructed for past timber harvest in the very early 1970s and used for subsequent timber sales since. It is a dead end road with native surface in poor condition that will be reconstructed for approximately 0.3 miles to facilitate timber harvest and burning of unit # 9. After the burning phase is completed it will be closed off at approximately 0.2 miles in length for dispersed recreation use and for access to the “Mom and Pop”, harvest unit # 10, small, personal use timber sales.
20478 (478)	This road is a system road that traveled through the center of the meadow. Due to poor drainage, the road has deteriorated severely. A new path was pioneered along the east side of the meadow to replace this worn travel way and tied back into the northern portion. This pioneered road also lacks sufficient drainage opportunity and has similar erosion. Neither road offers adequate access to the northern basin. Both sections of road are to be obliterated within the meadow, and replaced with reconstruction of road #480 on the hill side. It will have the northern portion reconstructed to facilitate this sale.
X478-A User Created	This road was constructed for past timber harvest and is approximately 0.2 miles in length. It is proposed to be decommissioned and returned to production by ripping, slashing and seeding.
20479 (479)	This road currently travels along the west side of an open meadow and is part of the Highline trail. It will have approximately 0.8 miles of road relocated out of the meadow and will have a trail head constructed at its terminus for trail access when the sale concludes. Current location will be obliterated for the more favorable location.
20480 (480)	This road is a closed system road that was used to access previous timber sale units. It has not been traveled for many years and will require reconstruction. The inventory map dated 1985, shows it tying into the northern section of road #20478. This connection is not apparent on the ground. After the sale, this road will remain on the system as the official access route to the northern basin. It is located on a hill slope and will provide adequate drainage.
X480 User Created	This road originates from road # 478 at the southern end of North Cheatbeck Basin, and parallels road # 478 through the length of the basin. This segment of road # 480 lacks drainage, is rutted, and is used heavily during the hunting season. The proposal is to place back into production this section, approximately 0.7 miles in length, decommissioning by ripping, slashing and seeding to native vegetation.

Road	Description
20962 (962)	This road is a low maintenance, gated and closed, system road that is on the eastern boundary of the sale area. It accesses an old timber sale area from the early 1980's and serves no purpose to this sale. There is no action recommended for this road.
20964 (964)	This road is a low maintenance system road that is on the eastern boundary of the sale area. It accesses an old timber sale area and serves no purpose to this sale. There is no action recommended for this road.
20965 (965)	This road is a low maintenance system road that is on the western boundary of the sale area and is not located near any proposed stands. Currently 0.23 miles of this road acts as the Highline trail. There is no action planned for this road.
20967 (967)	This is an existing system road originating from road # 402 in South Cheatbeck Basin, originally constructed for timber harvest, and was reconstructed for the Cheatbeck Ridge timber sale during the mid 1990s. Approximately 0.4 miles need reconstruction to access harvest unit # 12. It will be reconstructed to facilitate resource management and for continued Forest access.

3.7.2 Access

This project area has a high density of roads due to past management activities, intersecting routes and previously, unregulated cross country travel. It currently exceeds the Revised Caribou National Forest Management Plan (RFP) for open motorized route densities (OMRD). It must be noted that this analysis area is only a portion of a much larger management prescription for OMRD.

The RFP closed the majority of the Forest and all of this project area to cross-country motorized travel, excluding snowmobiles during the snow season. It also set allowable OMRDs by management prescription area. The project is within prescription areas 3.2.b and 5.2.b. The RFP identifies both prescription areas as exceeding motorized densities. Although the scope of this project is not to treat the prescription area's motorized density, it will result in a net reduction. The current status of the roads in the project area is summarized in **Table 3.7-1**. A summary of miles and motorized densities is portrayed in **Table 3.7-2** below. A full analysis of the current status can be found in the Three Basins Timber Sale Roads Analysis in the project record.

Table 3-14 Access/Road Status. Numbers below are for the 4.03 square mile project area only and are broken down by Forest Plan Prescription areas.

Status	Miles			R _x Allowable Miles/Sq Mile	Miles/Sq Mile		
	R _x 3.2.b	R _x 5.2.b	Total Miles		R _x 3.2.b	R _x 5.2.b	Total
Square Miles	0.61	3.42	4.03				
Open	1.33	13.38	14.71		2.18	3.91	3.65
Closed	2.10	1.14	3.24		3.44	0.33	0.80
Total	3.43	14.52	17.95				4.45

3.8 Soda Point Inventoried Roadless Area -#04171

(~23,130 acres)

The Soda Point Roadless Area contains 23,127 acres and is located in Caribou and Bear Lake counties Idaho, on the Cache National Forest, administered by the Montpelier District, Caribou-Targhee National Forest. It lies seven miles southwest of Soda Springs, Idaho. The Nelson Canyon Road provides access from the north, and the Eightmile Road provides access from the east. The Cheatbeck Road provides access to the area from the northwest. The North Ant Canyon Road is on the southern boundary.

The area forms the northern tip of the Wasatch Range. The elevation varies from 8,921 feet at Soda Peak to 6,600 feet near the Bear River. Southwest slopes are steep and rocky with juniper, sagebrush, and mountain mahogany. North and east slopes are gentle with lodgepole pine, Douglas-fir, aspen and mountain brush.

The shape of this IRA is fairly linear north to south, with irregular edges. Two small, odd-shaped, protrusions exist along the east side of the IRA, one of which is affected by the proposed action. This IRA is separated from the adjoining Sherman Peak IRA by the Eightmile Road, past harvest activities and the concentration of developed and dispersed camping.

Analysis Methods: Data from the Caribou National Forest Revised Forest Plan (RFP), the Roadless Area Re-Inventory Land & Resource Management Plan, Caribou National Forest and Curlew National Grassland, completed June, 1996 and field observations are used in this analysis. Information provided in these documents was verified site specifically with the use of GIS analysis. Three major GIS coverage's have been updated and improved since the above listed documents were prepared, they are: Montpelier stands, Montpelier past harvest and the Caribou travel routes coverage's.

The Soda Point Roadless Area will be described and evaluated by:

- Wilderness Characteristics as described in the RFP, Volume IV, Appendix C
- Roadless Area Re-Evaluation as described in the RFP, Volume IV, Appendix R

Analysis Area: The entire 23,127 acres within the boundary of the Soda Point IRA is used as the analysis area.

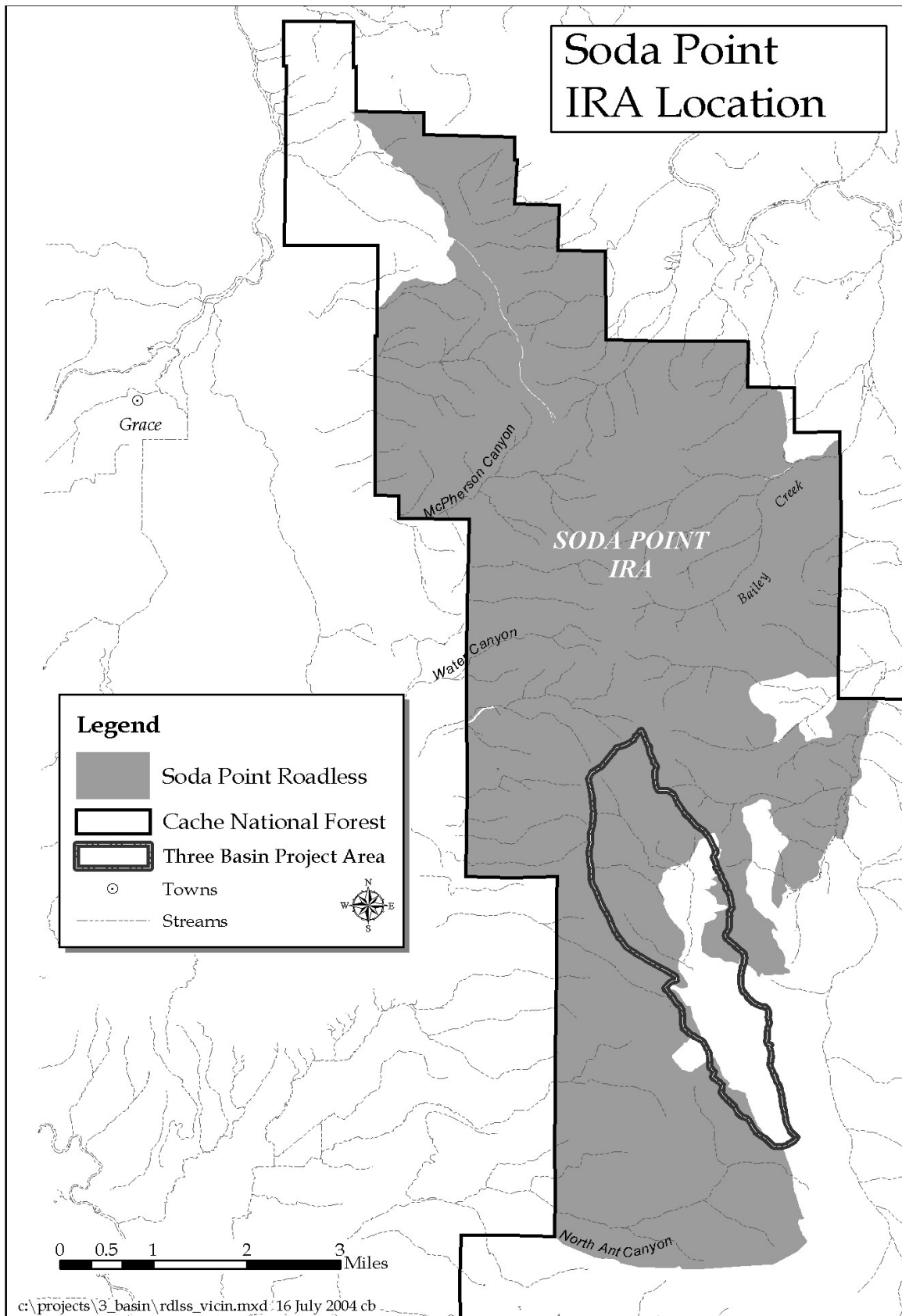


Figure 3.8-1 Soda Point IRA in relation to the Project Area.

National Policy Direction

On July 12, 2004, Secretary of Agriculture, Ann Veneman, announced the reinstatement of an interim directive to conserve roadless areas and proposed a new rule that continues the cooperative conservation of roadless areas in national forests and grasslands. The interim directive would protect roadless areas that were afforded protection by the 2001 rule. These roadless areas have not been under protection since the District Court for the District of Wyoming permanently enjoined implementation of the 2001 rule last July. The interim directive will remain in effect for a period of 18 months after the finalization of a new roadless rule being proposed on July 12, 2004.

RFP Direction

The interim directive does not apply to forests that have revised forest plans.

The Caribou National Forest's Plan Record of Decision was signed on Feb. 19, 2003. The RFP decision was appealed. The Forest Service was upheld on the decision on June 4, 2004.

The RFP Record of Decision (ROD) states "Since the direction is subject to change, the Caribou NF will follow the most current direction for management of IRAs. If the RACR (Roadless Area Conservation Rule) does become effective it will supercede this Revised Plan, but only in those areas included in the RACR inventory used in the 2000 RACR FEIS. Those areas in Alternative 7R that are identified as available for treatment could not be treated unless they meet the exceptions in the RACR." ROD-20

The RFP considered the roadless question and provides the following management direction.

The Revised Forest Plan recommends two areas for Wilderness designation—Caribou City and Mount Naomi. The Caribou City recommendation was not included in the previous Forest Plan recommendation. Using the Interim Directives and process outlined in the Advance Notice of Proposed Rulemaking, the Forest reviewed environmental and social characteristics of each Inventoried Roadless Area (IRA) in 2002. This information was used to determine how each IRA should be managed. Mixes of prescriptions are allowed in the inventoried Roadless areas on the Caribou. See Appendix R: Roadless Area Re-evaluation and the map, "Inventoried Roadless Areas on the Caribou NF". RFP 2-13

The proposed harvest units within the Soda Point IRA are within the portion designated as 5.2 (b) Forested Vegetation Management Prescription. Timber lands located within this prescription are described by the RFP as suitable and contribute to the annual Allowable Sale Quantity (ASQ) for the Caribou National Forest.

Table 3-15 RFP prescription acres within the Soda Point IRA.

Soda Point IRA	Acres	% of IRA
2.2 Research Natural Area	1023	4%
2.7.1 Deer & Elk Winter Range Critical	4013	17%
2.7.2 Deer & Elk Winter Range	1187	5%
3.2 Semi-Primitive Recreation	7868	34%
3.3 Semi-Primitive Restoration	1262	5%
5.2 Forest Vegetation Management	7773	34%

Mapping Methods

The Forest Service used the IRA boundary used for the Revised Forest Plan; using GIS the Soda Point IRA was selected out and made into a stand alone coverage. All analysis and maps are based on the Soda Point IRA cover; no other modifications were made to that coverage.

However, for site specific analysis of this project the latest past harvest coverage (updated in 2002) and travel routes coverage (update 2004) were used. Both of these covers were updated using DOQs (digital ortho-quads) which were not available during 1996, when the last roadless area inventory was completed.

The use of the more recent and improved coverage's revealed that several roads and past harvest units are within the IRA boundary (see past, present and foreseeable actions below and attached maps). When comparing the covers it is obvious that most of the past harvest units and roads that fall within the IRA were intended to be excluded. It is not the intent of this project to relocate or redraw the IRA boundaries to exclude the cutting units or constructed roads.

However, this analysis discloses that using the improved GIS coverage's and the same ¼ mile criteria used in 1996 would have resulted in 420 acres being dropped from the IRA. The portion that would have dropped is the protrusion affected by this proposed project. Other mapping corrections around the perimeter of the IRA related to this improved information would result in both additions and subtractions. Again, there has been no attempt to relocate or redraw the IRA boundaries, the information is proved for context only.

3.8.1 Past, Present, and Foreseeable Future Actions Affecting the Soda Point IRA

Timber Harvest

Table 3-16 below displays past harvest information found in the districts past harvest GIS coverage. That coverage is considered comprehensive for harvest activities that have occurred since 1970, information prior to that tapers off quickly. Evidence does exist of older past harvest within the IRA. Stumps that have the appearance of axe and cross cutting falling are relatively frequent throughout the IRA, extensive harvest likely occurred prior to the creation of the Forest Service. There are no other foreseeable future timber sales planned within the IRA boundary.

Scattered, light, personal use post/pole and firewood gathering has occurred within the IRA boundary in the past and is continuing at the present time. In the foreseeable future there would continue to be limited personal use firewood and dead post/pole gathering. There is no foreseeable future road construction planned for personal use firewood and dead post/pole gathering.

Table 3-16 Recent past harvest within Soda Point IRA.

Sale Name	Acres in Roadless	Year	Yarding Method	Roads	Harvest Method
Wilson Boundary	43	1983	Tractor	No roads constructed in IRA	Improvement (Partial Cut)
McPherson Salvage	928	1994	Helicopter	No roads constructed in IRA	Salvage (Partial Cut)
Eightmile	12	1980	Tractor	N. Cow Creek Road 402B, 0.9 miles	Clear Cut and Partial Cut
Cow Fork #2	17	1970	Tractor	Cheatbeck Road #964	Clear Cut
Cheatbeck #2	11	1970	Tractor	Cheatbeck Road #480 and #X480A	Clear Cut

Recreation

All terrain vehicle traffic (ATV) has greatly increased in recent years. ATV riders have pioneered many new trails in the IRA.

The RFP closed the entire Cache portion of the Forest to cross country motorized travel and set motorized route densities for each management prescription areas. Past travel management has restricted motorized travel from King Canyon to Nelson Canyon to designated routes. Presently the Caribou National Forest is in the process of revising a travel plan which will decide the type and location of use within the IRA.

Snow machine use is heavy during the winter and early spring months.

Minerals

There are no known mineral activities in the past. The area has no current oil or gas leases. There are no foreseeable future mineral activities.

Livestock Grazing

One allotment and portions of six other allotments are located within the IRA. Livestock grazing is authorized on most of the IRA. Recorded livestock grazing goes back in most cases to the 1920's. Many of the allotments had common use for many years. Since records were kept most of the allotments have had a reduction in the number of animals and the length of season.

Past range improvements include fences, spring development with watering trough, and ponds. There are approximately 6.5 miles of fence, nine livestock watering ponds, and five watering troughs within the IRA boundary.

Table 3-17 Grazing allotments within the Soda Point IRA.

Name	Kind	Number of head	Season	Comments
Soda Point	Cattle	79 cow/calf	5/8-7/1	Vacant
Soda Peak	Sheep	1,080 ewe/lamb	6/26-9/15	Vacant
Bailey Creek	Cattle	175 cow/calf	6/11-8/25	
Water Canyon	Cattle	79 Cow/calf	6/11-8/25	
Eightmile	Cattle	158 cow/calf	6/26-9/10	
North Canyon	Sheep	1,150 ewe/lamb	6/16-9/30	
Lago	Cattle	402 cow/calf	6/11-8/25	

Prescribed Fire

Past treatments of sage and mountain brush include prescribed burns in McPherson and King Canyon (mid 1980s). Each treatment was less than 100 acres. No prescribed fires are planned in the foreseeable future.

Wildfire

Historical wildfire records from 1973 through 2004 documents that there have been 20 wildfires in the Soda Point IRA. Seventeen fires burning over 16 acres were caused by lightning and three human caused fires burned 0.5 acres. In the past all wildfires have been actively suppressed. Future management of wildfires is to take immediate suppression action until a wild land fire use plan is implemented. The Forest Service is planning to write a wild land fire use plan for the entire portion of the Cache National Forest located in Idaho in three years. The RFP excluded prescription area 5.2 from Wildland fire use; the Southern portion of the IRA will continue to see fire suppression of all fires.

Other Treatments

About 100 acres of sage brush was sprayed northeast of Soda Peak (mid 1980s). Treatment of noxious weeds in the IRA has occurred for years. This policy would continue. There are no foreseeable spraying projects for sage brush.

Water - The area supports one municipal water use for the town of Grace located in Hawkins Hollow and McPherson Canyon. Several domestic culinary/irrigation collection systems and transmission pipelines originates within the roadless area. These are located in Burton Canyon, Egbert Canyon, Water Canyon, and Polethief Canyon. No other special use permits for water development are pending.

Land Uses - The area has one special use authorization for a communication site. No other special use permits for land uses are pending.

Following are the current number of each special use permits and uses within Soda Point IRA.

- 1 – Electronic equipment
- 1 – Irrigation water ditch
- 1 - Culinary water collection system and transmission line, Village of Grace, ID
- 5 – Spring head box and water transmission line for livestock and domestic culinary use

Roads and Trails – For this discussion about roads within the boundary of the Soda Point IRA, the definition of a road is: “If the road is maintained (by blading), constructed, or improved for vehicular traffic, it is considered a road.” (RFP FEIS 3-196) The Soda Peak IRA contains three constructed roads that that were not accounted for or were not accounted for properly during the 1996 re-inventory, all three date to 1980 or before. Below you will find a description of these roads; these three roads were of interest due to their proximity to the project area:

Road # 402B, North Cow Creek, was constructed to remove saw timber during the Eight Mile Timber Sale. It weaves in and out of the present roadless area boundary. There is **0.9 miles** of this road within the Soda Point IRA. This road was gated as part of the sale. Since the closure of this sale it has been closed to truck/sedan traffic. The corrected location of this road is one of the factors that would lead to the IRA protrusion affected by this project to be dropped if the IRA boundary was re-mapped

Road # 964, Cheatbeck Road, was constructed to harvest saw timber from the Cow Fork #2 Timber Sale, this road was accounted for during the original inventory (i.e. cherry stemmed) but there is **0.1 mile** of this road in the Soda Point IRA. Presently it is drivable with high clearance vehicles.

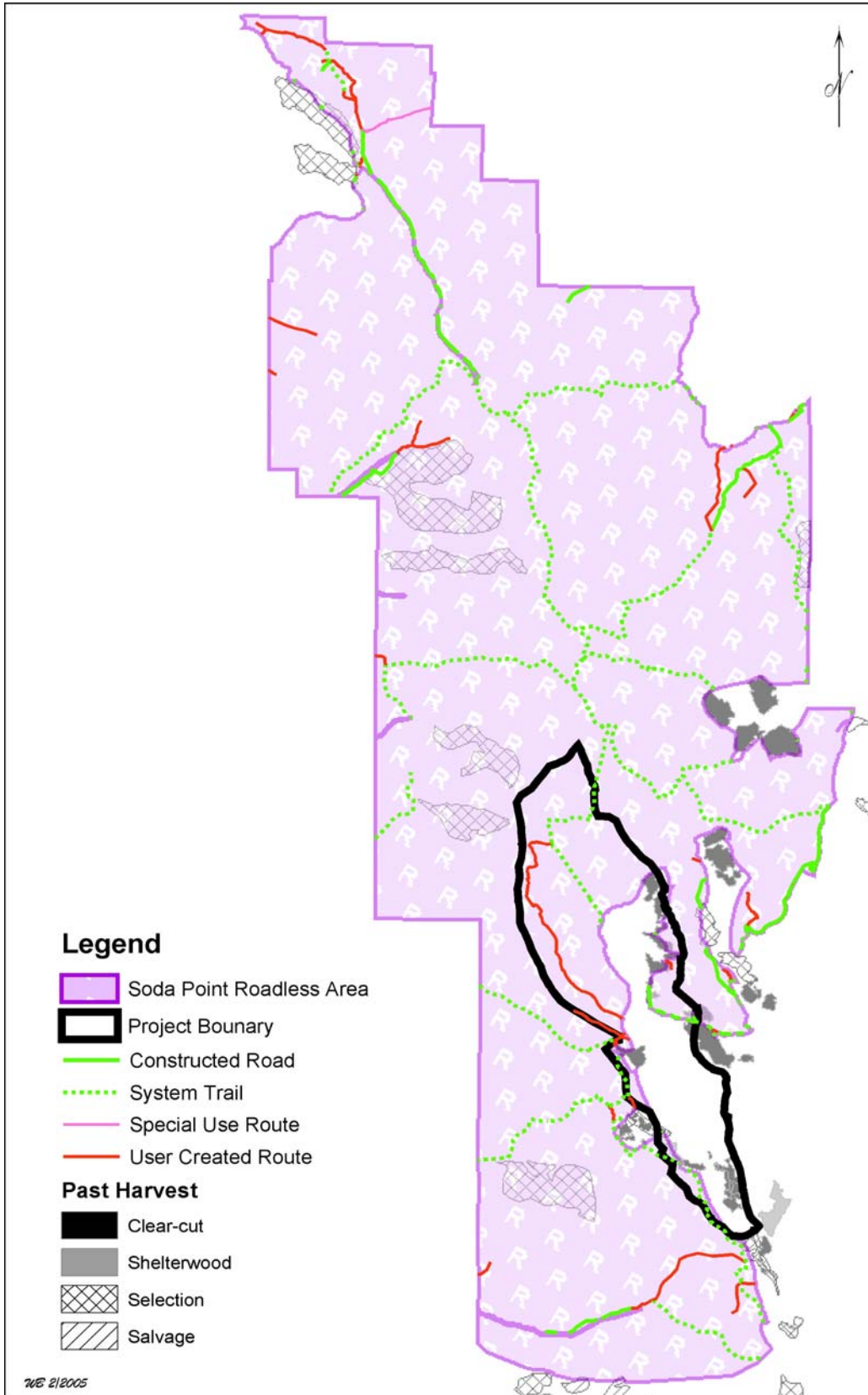
Road # 480, Cheatbeck was constructed to harvest saw timber from the Cheatbeck #2 Timber Sale around 1970. The GIS intersection indicates that approximately **0.3 miles** across 3 different sections is within the IRA. Most of this road is physically closed to truck/sedan traffic; a portion is accessible via an old firewood cutting road. This project proposes to reconstruct the 480 road and make it the primary access to the east side of north Cheatbeck Basin and to close the parallel routes in the basin.

In addition to the three roads listed above, intersecting the new road inventory with the roadless cover revealed that, **3.5 miles** of road along the perimeter is now within the IRA boundary (including Cold Springs Campground) and **3.7 miles** is outside of the area originally “cherry stemmed.”

No other road construction is planned in the IRA in the foreseeable future.

There are forty-one miles of motorized system trail. There are some unimproved non system roads within the boundary. The Highline Trail (a National Recreation Trail) traverses the entire length of the roadless area. The north end of this trail can be accessed by vehicle over 40 inches in width. There is no known foreseeable future trail construction or reconstruction. The revised travel plan could impact the trail system when implemented.

Figure 3.8-2 Roadless Routes and Harvests: This map shows past harvest and the routes that are within the IRA



3.8.2 Wilderness Characteristics

The six wilderness characteristics for the Soda Point IRA are described below; the rating from the RFP (Appendix C) is shown in **bold** text. Site specific observation and new information related to the characteristics is shown in *italics*.

- **Natural Integrity** is the extent to which long-term ecological processes are intact and operating. Impacts to natural integrity are measured by the presence and magnitude of human induced change to an area. The RFP rated natural integrity for the Soda Point IRA as **moderate** because of the following man caused activities: livestock grazing, water developments, recreation activities, and timber harvest. RFP IV, Appendix C-29. *The Fire Regime Condition Class Rating for the IRA is: “2 Moderate Departure from natural conditions.” (See Vegetation sections for definition).*
- **Apparent Naturalness** deals with how natural the environment looks to most people using the area. It is a measure of the importance of human impacts to the area to visitors. If the landscape has been modified by human activity but the evidence is not obvious to the casual observer, or it is disappearing due to natural processes, then the area may have a natural appearance. The RFP rated apparent naturalness of the Soda Point IRA as **moderate**, it has been impacted by unimproved roads and other man caused activities. RFP IV, Appendix C-29. *No new information is available to change this rating, new data shows some additional impact around the edges of the IRA but these would not change the rating.*
- **Remoteness** is a measure of distance from the sights and sounds of civilization. It tries to indicate whether the visitor will experience a setting that is removed from civilization. The RFP rated remoteness in the Soda Point IRA as **moderate** because of its moderate size. RFP IV, Appendix C-29. *This rating seems appropriate, highways (30 & 34) and towns (Soda Springs & Grace) can be seen from many locations within the IRA.*
- **Solitude** is often described as opportunities to experience, or the isolation from the sights, sounds, and presence of others, and from the developments and evidence of man. Solitude is measured by looking at the size of the area, the presence of screening, distance from impacts to the rest of the area, and degree of permanent intrusions. The RFP rated solitude in Soda Point IRA as **moderate** because of its natural screening. RFP IV, Appendix C-29. *The presence of the Highline trail (316) through the center of the IRA also contributes to a rating of moderate.*
- **Opportunity for Primitive Recreation** is a measure of the experience available to be isolated from the evidence of man, to feel a part of nature, to have a vastness of scale, and a high degree of challenge and risk while using outdoor skills. Examples of primitive recreation activities are horseback riding, hiking, tent camping, fishing, hunting, cross country skiing, and snow shoeing. The RFP rated the opportunities for primitive recreation as **low** due to the lack of screening. RFP IV, Appendix C-29. *The presence of the Highline trail and it’s juxtaposition in the IRA contribute to this rating.*

- **Special ecological, geological, or cultural features** is a feature that recognizes that wilderness may contain other values of ecological, geologic, scenic or historical or cultural significance. Unique fish and wildlife species, unique plants or plant communities, potential or existing research natural areas, outstanding landscape features, and significant cultural resource sites should all be considered as types of values that might exist. The RFP identified the **Burton Canyon Research Natural Area** located within the boundaries of this IRA, as the only notable special feature. RFP IV, Appendix C-29. *The geological and ecological features of the IRA can be considered very similar to those found throughout the Bear River Range.*
- **Manageability** is a measure of the ability to manage an area to meet the size criteria (5,000+ acres), the resulting configuration of the potential wilderness, and the interaction of the other elements above. The RFP identified the manageability of the Soda Point IRA as **poor** along inventoried boundaries. It noted however that, a core area could be achieved if boundaries were placed on natural features. RFP IV, Appendix C-29. *The two protrusions or peninsulas along the east side of the IRA contribute to this poor rating. As noted above if the re-inventory was done using the most current information the southern protrusion would not meet the 1/4 mile criteria used in 1996.*

3.8.3 Roadless Area Characteristics

This section displays site specific roadless characteristic information from the RFP (Appendix R) as it relates to the Soda Point Roadless Area. In RFP Appendix R roadless characteristics were analyzed using criteria originally identified in the 1999 Roadless Area Conservation FEIS and additional criteria tailored to evaluate the roadless areas on the Caribou National Forest. These criteria are shown below as they appear in the RFP, additional information resulting from this analysis has been added in *italics*.

Cultural Resources: Identified as those resources either directly or indirectly related to the material life ways of a cultural group(s) (36 CFR 296.3). Cultural resources may refer to sites, areas, buildings, structures, districts, and objects, which possess scientific, historic, and/or social values.

Traditional Cultural Properties: Generally defined as properties eligible for inclusion in the National Register of Historic Places because of their association with cultural practices or the beliefs of a living community that are:(a.) rooted in that community's history; and/or (b.) important in maintaining the continuing cultural identity of the community.

Sacred Sites: Any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe (or an Indian individual determined to be an appropriate, authoritative representative of an Indian religion) as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe, or the authoritative representative, has informed the agency of the existence of such a site. RFP IV, APPENDIX R-4

The potential rating for cultural resources is **low**. There are no known existing traditional cultural properties, or scared sites. There are no Class I or II sites. *Work in conjunction with Three Basin Sale would have no effect. The State Historic Preservation Officer agrees with this finding.*

Soil Resources

According to the RFP about 28 percent of the IRA land types have an erosion hazard and 0% is considered unstable. In the RFP, land types 400 and 401 are identified as "hbm," this means that two of the three soil families in the land type have a high erosion hazard and one a moderate. (RFP IV, Appendix R-6)

GIS analysis showed that a portion of the prescribed aspen burn is located within an area identified as an erosion hazard area. However, a site specific soil analysis of the area was conducted 21 July 2004; it revealed that the area was not an erosion hazard. The soil best fits Map Unit 080 which has low to moderate erosion hazard. (Lott, 2004)

There is no land types with an "hbm" rating in the portion of the IRA proposed for timber harvest. Monitoring data has shown that erosion rates are within soil loss tolerance and site productivity is being maintained. For a more detailed location of these land types see Erosion Hazard Map located in appendix D.

Air Quality

Generally, conditions of excellent air quality exists on National Forest System lands administered by the Forest Service. (FEIS, Caribou National Forest Revised Forest Plan 3-244). The elevation of the majority of the Soda Point IRA is high enough to avoid the impacts of valley inversions. Soda Springs and Grace Idaho are sensitive air quality receptors and are within the twenty-mile sensitive receptor radius. The IRA is not within 200 kilometers of a Class I area. (RFP IV, APPENDIX R-98) *No more or different information was found.*

Municipal Watersheds, Sources of Public Drinking Water, Watershed Condition, and Water Quality

There are no congressionally designated municipal watersheds in the Soda Point IRA. However, Soda Point IRA supports the Grace Watershed which supplies culinary water for the City of Grace, Idaho. *These sources are located in Hawkins Hollow and McPherson Canyon. Several domestic culinary/irrigation collection systems and transmission pipelines originate within the IRA. These are located in Burton Canyon, Egbert Canyon, Water Canyon, and Polethief Canyon. There are no municipal watersheds or domestic culinary/irrigation systems in any of the drainages in the portion of the IRA proposed for timber harvest.*

*The following perennial streams **originate** in the Soda Point IRA:*

- *Bailey Creek*
- *North Wilson Creek*
- *South Wilson Creek*
- *Largilliere Creek*
- *Winchell Creek*
- *McPherson Spring*
- *Water Canyon Spring*
- *Trail Spring*
- *Egbert Spring*
- *Burton Spring*
- *Unnamed Springs (3)*

The main stem of Eightmile Creek does not originate in the Soda Point IRA. The lower reach of Eightmile Creek weaves along the boundary of the IRA in several places adjacent to the Eightmile Road. Eightmile Creek has been identified by IDEQ in the State of Idaho's draft 2002 integrated 303(d)/305(b) report as water quality limited as it does not fully support the cold water biota and salmonid spawning. However the pollutants have not been identified. Eightmile Creek is the only water body identified by the State of Idaho, within the Soda Point IRA, as not fully supporting beneficial uses.

The Soda Point IRA watershed condition was rated using the Inland West Water Initiative (IWWI). This rating is a combination of Watershed Vulnerability, Geomorphic Integrity and Water Quality. Relative to watershed rating, ninety seven percent of the IRA is rated "yellow." The area identified as "yellow" is in moderate condition current or potential for watershed disturbance. Table R.25 rates the water resource as moderate

overall condition for the Soda Point IRA. The RFP gives no prescription recommendation for the Soda Point IRA. (RFP IV, Appendix R-100)

The three percent of the IRA designated as “red” is located the sixth code Hydrologic Unit Code # 160102021201. *A “red” rating is identified as having poor condition watershed condition. It is based on the high potential for erosion potential rather than an actual disturbance.* RFP IV, Appendix R-1

Ecosystem Disturbance

An ecosystem disturbance is a human-caused or natural disturbance in a self-maintained system of living and non-living interacting parts that are organized into biophysical and human dimension components.

To assess potential for ecosystem disturbance, three ecosystem management issue indicators from the CNF Plan revision were analyzed: aspen decline, insect hazard and wildfire hazard. RFP IV, Appendix R-10, 11. *In addition to the three from the RFP, a Fire Regime Condition Class rating was completed for the IRA.*

Aspen Decline Rating:

A decline rating of “high,” “moderate” or “low” was assigned to each IRA based on the aspen decline potential. Due to a generally acknowledged decline of aspen on the Forest, all of the Aspen and Aspen/Conifer vegetation cover type not affected by disturbance were assumed to be mature and assigned a “high” decline rating. An aspen decline rating of **high** is designated for the Soda Point IRA. *GIS analysis of the stands cover shows that 92% of the IRA’s aspen and aspen/conifer stands are in the mature/old age-structure class. Approximately 2/3’s of the total aspen is in the aspen/conifer type were conifer is quickly replacing the aspen in the absence of disturbance. This information supports the RFP rating of high.*

Insect Hazard:

A hazard rating of “high,” “moderate” and “low” was assigned to each IRA based on the conifer vegetation’s potential for attack by bark beetles. The RFP insect rating for the Soda Point IRA is **low** due to Douglas-fir found in Bailey Creek. The Douglas-fir in Bailey Creek is younger than the Douglas-fir found on the west facing slopes of the IRA. The abundance of aspen in the Douglas-fir in Bailey Creek makes it less susceptible to insect attack than the fir on the west facing slopes. The majority of the Douglas-fir stands on the west facing aspects suffered epidemic beetle attacks ten to fifteen years ago. *The RFP did not assess Mountain Pine Beetle (MPB) Risk in this IRA due to the low percentage lodgepole pine and limber pine represents (MPB host species). However, an assessment of the IRA indicates that 95% of the Lodgepole type and 63% of the acres with host trees is considered high risk.*

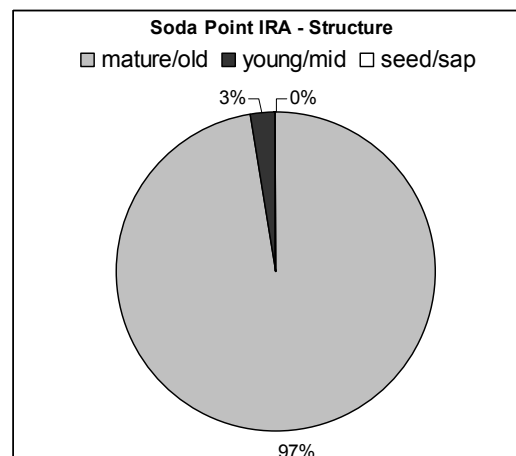
Fire Hazard:

The Forest Inventory for the Caribou National Forest, conducted in 1992, portrays approximately 70-80 percent of the coniferous forest stands and 40 percent of the aspen stands as mature and old. “Mature” refers to ages and sizes of dominant trees that are at least at culmination of average annual increment of tree stand volume growth. “Old” refers to dominant tree ages and sizes significantly beyond those of mature trees. Barrett’s “Fire Regimes on the Caribou National Forest” (1994) discusses how the “long term fuel buildup in these stands will continue to promote a shift toward stand replacement fire regimes” and as “having missed three or four fire “thinning” treatments.” This phenomenon is also described in the Upper Columbia River Basin DEIS (1997).

A hazard rating of “high,” “moderate” or “low” was assigned to each IRA based on the forested vegetation’s potential for stand-replacing wildfire. About 85 percent of the IRA’s were assigned a moderate to high fire hazard rating mainly concentrated on the eastside of the Forest. The Soda Point IRA has a fire hazard rating of **high** due to the long term fuel buildup.

Fire Regime Condition Class

The vegetation within the IRA is very similar to the landscape described in the vegetation section of this document. The IRA is 66% forested and 34% non-forested. The forested landscape is dominated by the mature/old age-structure class, and is relatively dense due to the lack of disturbance. This factors lead to a FRCC rating of 2. Which 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. Wildland fires are moderately uncharacteristic compared to the natural fire regime behaviors, severity, and patterns. Disturbance agents, native species habitats, and hydrologic functions are substantially outside the natural range of variability” Hann (2004).



Invasive Plant Species

Invasive species occupy 27.6 percent of the area. Species include leafy spurge (2 acres), Dyers woad (6,348 acres), Musk thistle (4 acres), and Whitetop (22 acres). RFP IV, Appendix R-98

Threatened, Endangered, Proposed, Candidate and Sensitive Animal Species Habitat

A known occurrence for the boreal owl has been recorded in the IRA.

This area rated **moderate** for lynx linkage habitat based on: 1) the amount of forested cover (31 percent); 2) low security (15 percent); and 3) the presence of a north-south

ridge that may function as a travel corridor. Because of the low amount of security (15 percent), this area ranks **low** for wolverine and wolves. RFP IV, Appendix R 98-100

Biological Conservation Assessment (Wildlife Biological Strongholds)

This IRA has conifer cover over 31 percent of the area, ranking it **moderate** for forest-associated species. About 8 percent of the area is in grass/shrub cover, but these areas are over ten miles from the nearest known sage grouse leks and are not considered potential sage grouse habitat. RFP IV, Appendix R 98-100

Parts of this roadless area lie in Noss' Bear River Range site. The Bear River Range site was placed in Quadrant 2. Quadrant 2 sites are highly irreplaceable but have low vulnerability. It has an irreplaceability score of 57. It ranks **moderate** for this criteria. Based on the amount of vegetation at high departure from PFC (34 percent), this area ranks as **moderate** potential. RFP IV, R 98-100

Fisheries Biological Strongholds

Fisheries biological strongholds are interpreted, on the Caribou National Forest, to be areas dominated by the Yellowstone and Bonneville cutthroat trout, the native trout species. The Forest defines cutthroat trout stronghold streams as those streams with greater than 50 percent of the salmonid community consisting of native cutthroat trout. Eightmile Creek and Bailey Creek are the only two fish bearing streams in the Soda Point IRA. Neither of these streams are cutthroat trout strongholds. Both creeks are dominated by non-native brook trout, although some Bonneville cutthroat trout remain.

Rare Plants, Rare Plant Communities and Plant Communities

No rare plants, rare plant communities, or plant community reference areas have been documented in this IRA. RFP IV, Appendix R-98

Reference Landscapes

Reference landscapes are larger areas that act as “baselines” for monitoring management activities, or to leave undisturbed areas for future research. The RFP identified three assessment rating criteria for reference landscapes. RFP IV, Appendix R-18

- **Acreage** – Soda Point is the fourth largest IRA on the Montpelier Ranger District at 23,127 acres.
- **Opportunity to study large-ranging animals** – The IRA is rated **moderate** for lynx linkage habitat and **low** for wolverine and wolves. RFP IV, Appendix R-98
- **Opportunity for large-scale vegetation restoration projects** – Aspen decline is rated **high**. Management Prescription 5.2, Forest Vegetation Management Guideline states that aspen should be maintained or enhanced as a component through restoration treatments. RFP IV, Appendix R-100

An assessment rating of **moderate to high** was derived from the criteria mentioned above to indicate the potential value of a particular area as a reference landscape. The RFP identifies Burton Canyon RNA, the Grace municipal watershed and large scale

aspen restoration areas are unique reference values in the Soda Point IRA. RFP IV, Appendix R-100

Site specific analysis indicates that the area that contains Management Prescription 2.7.1(d) Elk and Deer Winter Range – Critical. (RFP/FEIS, List of Maps #8) This area is located on the west aspect of the IRA. This winter range is heavily infested with dyers woad. Another serious threat to the winter range is from infestations of leafy spurge from adjacent private lands.

Semi-Primitive Recreation Summer, and Semi-Primitive Winter

The area is managed in the summer for semi-primitive non-motorized recreation experience on 3,486 acres, and for semi-primitive motorized experience on 11,184 acres. The remaining 8,457 acres are managed for Roded Natural. In the winter 3,486 acres are managed for semi-primitive non-motorized recreation. The remaining 19,635 acres are managed for semi-primitive motorized experiences. RFP IV, Appendix R-98

Landscape Character and Scenic Integrity

The Landscape Character of the Soda Point IRA includes:

- Mountains located at all elevations with slopes ranging from ten to sixty percent. These landscapes include ridge and mountain slopes that are formed from sedimentary parent materials.
- Broad valleys at high elevations include bottoms and plateaus on the top of mountain crest formed in sedimentary materials.
- Lower elevation foothills including rolling hills, fans and mountain foothills formed from sedimentary parent materials.

Vegetation is intermixed with natural openings. North facing slopes have stands of Douglas-fir and aspen. Southern aspects include sagebrush, mountain brush and mountain mahogany. As stands of maple and aspen change colors during the fall months, they offer an array of attractive fall colors of reds, oranges and yellows. Vegetation in this IRA is similar of vegetation found the remainder of the Bear River Range and is not considered unique.

The west facing aspect of the IRA from Nelson Canyon south to Cheatbeck Canyon is an important big game wintering range.

The existing landscape character has been influenced by both direct and indirect human activities, but appears natural to the majority of viewers. Natural elements such as native trees, shrubs grasses, forbs, and rock outcropping dominate the views. While there is evidence of human influence from historic use, recreational uses, and other management activities, these deviations would appear to be part of the landscape for the majority of viewers.

The majority of the IRA is viewed from middleground distance (1/2 to 4 miles) from State Highway 34 and US Highway 30. From these viewing points high scenic integrity is maintained. This refers to landscapes where the valued landscape “appears” intact.

Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident. Even when viewed from foreground (0 – ½ mile) as in the Cheatbeck Basin area this high scenic integrity is maintained. While deviations are apparent in the landscape adjacent to the IRA, human activities within the IRA boundary are not evident due to the nature of impacts and the vegetative screening of these activities.

Oil/Gas and Phosphate Leases, Locatable Minerals and Minerals Materials

The IRA lies within the overthrust belt. Although the potential for oil and gas reserves is high in the area, there are no existing leases. No known potential exists for phosphate ore, and no active mining or exploration for locatable minerals is occurring. RFP IV, Appendix R-99

Special Uses Permits, Utility Corridors and Other Features

The RFP identified that there were electronic sites in the IRA.

- *A complete list of special used permitted activities that would affect IRA characterizes is show in this section under past present and foreseeable actions. Additionally at one time there was a permit for a hunting outfitter and guide (it would not have had an affect).*

3.9 Economics

Analysis Method:

Review of the Final Environmental Impact Statement (FEIS) for the Caribou National Forest (CNF), Chapter 3; Wood Products, and Appendix B, specific to Timber.

Analysis Area: The analysis scale is the Caribou National Forest Zone of Influence that includes a nine county area in southeast Idaho and Wyoming. The nine counties that are included in the analysis area represent the region of economic and social relationship and interaction with the CNF and its management policies. A small portion of the Forest lies in Rich and Box Elder counties in Utah, but due to the limited area and lack of population surrounding the area, these counties have not been included in this analysis. The analysis of the effected environment is a summary and update of several social and economic documents. Refer to the planning record for the complete documents.

The majority of the analysis area, including all proposed harvest units, is within RFP prescription area 5.2 Forest Vegetation Management. Only a small portion of the project area is within the 3.2 prescription area, however no proposed harvest units are located within this prescription area.

Caribou RFP emphasis in a 5.2 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. 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. (RFP 3-35) One of the goals assigned is lands are managed to emphasize the cost-effective production of timber within its land capability and capacity. (RFP 4.72)

During the summers of 2002 and 2003 field visits were conducted by the district timber staff to determine if the proposed harvest units were economically feasible to harvest. Logging technologies commonly used in the local area, current and proposed road activities and distances, topography, skidding distances, available landings and the amount of merchantable volume per acre were used to determine the economic feasibility of logging most stands within the project area.

All proposed harvest units, were determined to be economically feasible to log. Unit # 14 was not considered feasible and is not expected to be in the future. The stands location, the scattered and random nature of the wood in it and the species composition (mostly alpine fir (low value species)) equate poor access and low volume and value per acre. Low volume and value per acre combine with poor access equates to not feasible.

The objective of this prescription area, is to offer an Allowable Sale Quantity (ASQ) of 5,200 hundreds of cubic feet (CCF) or the approximate equivalent of 2.7 million board feet (MMBF) of sawlogs and other commercial products per year. (RFP 4-72)

A review of timber sales offered by the Montpelier Ranger District over the previous five years illustrates all sales sold, produce timber sale receipts in excess of those funds required for all essential reforestation in addition to those costs required to be returned to the Treasury. Most Sale Area Improvement (KV) projects specific to each timber sale area have been fully funded and accomplished as a result of the total timber sale value. Forest salvage sale funds and Forest road surface replacement funds have also shown the appropriate gains per unit of measure sold as a result of past timber sales.

PILT is a Federal revenue-sharing program designed to compensate local governments for the presence of tax-exempt Federal lands within their jurisdiction. The formula used to calculate these payments takes into account such factors as other forms of revenue sharing, acreage, and population. These payments are made directly to counties and may be used for any purpose. PILT payments can be and recently have been limited by Congress through the appropriation process. Congress has not appropriated sufficient funds to fully pay counties since 1994.

All counties within the Caribou National Forest analysis area have selected stable payments under the Secure Payments legislation also known as the 25% Fund.

For further detailed discussion and analysis of the RFP economic determinations for 5.2 Forest Vegetation Management prescription lands, please reference Chapter 3, and Appendix B of the Caribou National Forest FEIS.

3.10 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 (20).

The Federal Clean Air Act, revised in 1991, is a legal mandate designed to protect human health, visibility, and welfare from air pollution. The act defines National Ambient Air Quality Standards (NAAQS) as levels of pollutants above which detrimental effects on human health and welfare could occur. An area found to be in violation of NAAQS is called a “non-attainment area.” Pollution sources in these areas are subject to tighter restrictions.

The Clean Air Act also contains a provision called the Prevention of Significant Deterioration (PSD). This provision was designed to prevent areas from being polluted up to the maximum point established by the NAAQS. Three air quality classes (I, II, and III) were established. Class I Airsheds are subject to the tightest restrictions. The Class II air quality designation allows moderate increases in new air pollution.

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. Members submit a list of planned burns to the Monitoring Unit in Missoula, Montana. For each planned burn, information is provided describing the type of burn to be conducted, the number of acres, as well as the location and elevation at each site. Prescribed burns are reported by Airshed, which are geographical areas with similar topography and weather patterns. Weather balloons may be launched and tracked to identify specific atmospheric conditions to aid in decision-making. The Missoula Monitoring Unit issues daily decisions, which can restrict burning when atmospheric conditions are not conducive to good smoke dispersion. Restrictions may be directed by airshed, elevation or by special impact zones around populated areas (<http://www.smokemu.org>).

The project area is within Montana/Idaho airshed number 20. The nearest non-attainment area is Pocatello, Idaho for PM₁₀ (90 miles to the northwest). The project area and the entire Caribou National Forest is a class II airshed (for PSD purpose). The proposed project is approximately 100 miles southwest of Grand Teton National Park and 90 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 receptors near the proposed project area are the City of Soda Springs, Grace, Bailey Creek 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/>).

3.11 Rangeland Management

Analysis Method:

- The Eightmile C&H and Soda Peak S&G range analysis write-ups.
- North Bear River Range AMP Revisions EA/DNFONSI 2002
- Bear River Range Field Notes July 2001 p.2-4

Analysis Area:

The Eightmile Cattle Allotment and the Soda Peak Sheep Allotment are the analysis area because the project area is within these allotments. Only these allotments could be impacted by the proposed action

The majority of the project area is on the Eightmile Allotment. The allotment consists of 5,853 acres. This allotment is managed under an adaptive management strategy. Cattle start in the lower elevation pastures until proper use is met then moved into upper pastures. Time allowed in the unit is based on livestock distribution and utilization of key areas. Permittee's compliance with the forage utilization has been successful (current season range inspection notes and end-of-season inspection – 2004). There is one permittee who is permitted to graze 158 cow/calf pairs on the Eightmile allotment for a season of 6/26 to 9/10.

A small portion of the project area is within the Soda Peak Sheep Allotment (6,030 acres). It is authorized at 1,080 sheep for a season of use of 6/26 to 9/20. At this time, there is no Term Grazing Permit holder.

The RFP 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).* Livestock grazing in the project area was authorized within the North Bear River Range AMP Revisions (2002). The analysis dealt with issues/concern applicable to livestock use within the project area. Livestock use and management will not be discussed in this document. Impacts from livestock on other resources in the project area are documented. Livestock use/management is outside the purpose and need and the decision to be made. More information on livestock management and rangeland trends is located in the project file. Range management will not be analyzed further

3.12 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 did, however, retain 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, in the Shoshone language, the same verbs is used for hunt, fish and gather so it is assumed that the Indians expected to retain rights for all of those 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 “sheep eaters” 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. Geysers, 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

3.13 Heritage Resources

Analysis Method:

Survey methods included pedestrian transects and visual assessments of the project area of potential effects (APE). The percentage of assessment area to be surveyed was dependent upon identified site location probability and actual areas affected by the proposed action. Coverage of such previously un-surveyed areas was performed in compliance with the National Historic Preservation Act Section 106 Process.

Analysis Area: The analysis area is the project area.

One hundred percent of high cultural site probability areas were inventoried. Cultural resources property significance, i.e., National Register of Historic Places eligibility, was determined by Forest Service Cultural Resources Specialist in consultation with the State Historic Preservation Officer (SHPO). Because no significant cultural resource properties fall within the area of potential effects or impact area, mitigation measures will not be recommended in order to achieve a “no adverse effect” determination. All inventory reports were submitted to the SHPO in completion of the National Historic Preservation Act (NHPA), Section 106 process.

Nothing beyond project design features will be recommended in order to achieve a “no adverse effect” determination. No significant cultural resource properties fall within the area of potential effects. As such, no further analysis of heritage resources is necessary.

3.14 Recreation

Analysis Method:

Data and direction taken from The Caribou Revised Forest Plan, (RFP), “Landscape Aesthetics, A Handbook for Scenery Management (AH- 701) National Visitor Use Monitoring studies “Off- Highway Vehicle Use on National Forests: Volume and Characteristics of Visitors” Special Report to the National OHV Implementation Team, 5 August 2004 (NVUM), GIS files used to calculate data and personal observations.

Analysis Area:

The project area and the dispersed access areas along the proposed haul routes within the Caribou-Targhee National Forest administered lands will be included for the purpose of this analysis.

Current Road and Trail Systems:

The system roads in this area receive moderate recreation use with some noted below receiving additional pressures.

The North Canyon Road #20401, during the summer months receives considerable recreation use up to the intersection with #21000, access road for the Camp Bartlett Boy Scout Camp, and functions as a through road across the Forest.

The Eight Mile Road #20425 provides access to the sale area and two campgrounds from the north. The north section is also the main access point for the city of Soda Springs to access the Forest. The southern portion travels adjacent to Meadow Creek to access the North Canyon Road. Previous timber sales have used this road as a haul route.

The current roads within the project area, for the most part, have no road base and are poorly drained. Large puddles of mud and ruts form after any type of precipitation event. Motorists have driven around these areas causing many user-defined roads. If any form of road base could be added the durability would improve and seasons of use could be extended to provide the recreational traveler with a more stable road prism for a longer period of time. Recreational motorists should have little or no objection to eliminating duplicate roads as long as the access road provided is improved. Care should be taken in the construction/reconstruction of these access roads as to their quality and durability so that they won't encourage the creation of additional user-defined roads.

Travel standards for the prescription area allow for motorized travel on designated roads and trails during the snow free season and open to cross country motorized travel during the snow season.

The Highline Trail, a National Recreation Trail, is located in and adjacent to the proposed treatment area. This trail is open to motorized use.

The Caribou-Targhee National Forest has the highest amount of Off Highway Vehicle (OHV) use in the entire Intermountain Region (NVUM). The Caribou-Targhee Travel Plan allowed for cross-country motorized travel in the project area prior to and separate

from this proposed action. The RFP now restricts motorized travel to designated roads and trails. This explains the user-created trails in the area. Not all of these trails are legal motorized trails. The Revised Travel Plan will address those roads and trails not covered with this analysis.

Recreation Opportunity Spectrum (ROS):

The Forest Service uses a system called Recreation Opportunity Spectrum (ROS) as a planning tool to categorize areas based on activity type, levels of management, the amount of development, and differences in natural settings, into one of seven classes. The analyses area falls into three summertime ROS categories.

All of the haul routes fall into “Roaded Natural” by definition.

Roaded Natural (RN) is an area that is a predominately natural-appearing environment with moderate evidence of human activity. An equal probability of experiencing isolation from or affiliation with other user groups exists. There are opportunities for a high degree of interaction with the natural environment, but opportunities for challenge and risk are minimal. Resource modification and utilization are evident, but harmonize with the natural environment. From sensitive travel routes and use areas, these alterations should remain visually subordinate. There is much evidence of roads or motorized trails.

Semi-Primitive Non-Motorized (SPNM) is defined as an area of natural or natural-appearing environment. Interaction between users is low, but there is often evidence of other users. There is a high, but not extremely high, probability of experiencing isolation from the sights and sound of humans. There is an opportunity for independence, closeness to nature, tranquility, and self-reliance. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted.

Semi-Primitive Motorized (SPM) is defined as an area of predominately natural or natural appearing environment. There is moderate isolation from sights and sounds of humans. There is a moderate degree of challenge and risk. Modifications do not draw attention of visitors. Roads and trails are obvious. Motorized use is permitted. (RFP - Glossary)

Table 3-18 Percentage of ROS within Project Area

Roaded Natural (RN)	64%
Semi-Primitive Non-Motorized (SPNM)	25%
Semi-Primitive Motorized (SPM)	11%

Recreation Types:

Developed Recreation: This is the type of recreation that occurs where modifications (improvements) enhance recreation opportunities and accommodate intensive recreation activities in a defined area.

Dispersed Recreation. This is the type of recreation use that requires few, if any, improvements and may occur over a wide area. This type of recreation involves activities related to roads and trails. The activities do not necessarily take place on or adjacent to a road or trail, only in conjunction with it. Activities tend to be day-use oriented and include hunting, fishing, berry picking, off-road vehicle use, hiking, horseback riding, picnicking, camping, viewing scenery, snowmobiling, and many others. (RFP- Glossary)

Along the proposed haul routes and at the intersection of Cheatbeck Road #402 and the Eight Mile Road #425 is Cold Springs Campground. This is the only developed recreation site within the analysis area. Two developed sites are accessed through the analysis transportation system roads. Eightmile Campground is north of the junction of Eightmile and Cowfork. Camp Bartlett is an organizational camp operating on Special Use permit that is accessed from the North Canyon road #401

Dispersed campsites are found scattered throughout the analyses area but seem to be concentrated along the Eightmile road to the Cowfork intersection and along the North Canyon road.

The area is popular for firewood gathering, berry picking, hunting, ATV's and winter recreation in the form of snowmobiling. Activities tend to be day use oriented.

Specific Human Use Trends:Social Environment and Economics

The population in southeast Idaho is growing more rapidly than in the nation as a whole. Bannock, Bonneville, and Cache Counties are the most urban counties; Oneida and Franklin Counties are the most rural.

Shifts in populations to the West are increasing demands on the Forest for a broader mix of uses. The Forest is becoming more important to people for its recreational opportunities, scenery, aesthetics, wildlife habitat, etc.

Recreation Opportunities

Demand will continue to grow for a wider variety of recreation experiences, both developed and dispersed.

Winter sports activities will continue to grow.

3.15 Visuals

Analysis Method:

Data and direction taken from The Caribou Revised Forest Plan, (RFP), “Landscape Aesthetics, A Handbook for Scenery Management (AH- 701) National Visitor Use Monitoring studies “Off- Highway Vehicle Use on National Forests: Volume and Characteristics of Visitors” Special Report to the National OHV Implementation Team, 5 August 2004 (NVUM), GIS files used to calculate data and personal observations.

Analysis Area:

The analysis area is the area used for the visual quality objectives analysis.

Visual Quality Objective (VQO) Classifications for the Analysis Area:

Retention: A visual quality objective; management activities that are not visually evident; activities repeat form, line, color, and texture characteristics found in the landscape.

Partial Retention: A visual quality objective which, in general, means human activities may be evident, but must remain subordinate to the characteristic landscape.

Modification: A visual quality objective; management activities may visually dominate the original characteristic landscape, but they must borrow from naturally established form, line, color or texture so that the activity blends with the surrounding area.

VQO’s despite efforts to standardize, remain subjective to interpretation.

VQO Breakdown for Analysis Area:

Table 3-19 Visual Quality Objectives of the Analysis area

Visual Quality Classification	Percent of Project Area	Acres w/in Project Area
Retention	87	2248
Partial Retention	8	198
Modification	5	132

There is evidence of former timber harvests in the Retention area causing this area not to meet the visual quality objective of Retention at the present time.

Over 99% of the proposed treatments are in Retention, less than 1% are in Partial Retention, and 0% Modification.

4.0 Environmental Consequences

Environmental effects that would occur relative to the implementation of any alternative presented in Chapter 2 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, and/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.

4.1	Cumulative Effects Activities	4-2
4.2	Forested Vegetation	4-5
4.3	Hydrology	4-16
4.4	Soils	4-20
4.5	Wildlife	4-33
4.6	Fisheries	4-43
4.7	Roads and Access	4-45
4.8	Soda Point Roadless Area	4-48
4.9	Economics	4-65
4.10	Air Quality	4-67
4.11	Heritage Resources	4-70
4.12	Tribal Treaty Rights	4-70
4.13	Visuals	4-73
4.14	Recreation	4-75
4.15	Irretrievable/Irreversible Effects	4-77
4.16	Required Disclosures and Potential Conflicts with Plans and Policies of other Jurisdictions	4-77

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 Three Basins environmental consequences analysis.

4.1.1 Past & Present Activities

Mining

- There have not been any known mining activities within the project area.

Range Management/Improvements

- Grazing of the Soda Peak S&G as well as the Eightmile C&H allotment has occurred in the past. The Soda Peak S&G allotment has been vacant for the last several years.
- There have been no significant effects from grazing upon reforestation in the past.
- Continued grazing of the Eightmile C&H allotment.
- Soda Peak S&G allotment currently has no term grazing permit holder.
- Adaptive management is the current management strategy for these allotments.
- 3 livestock ponds, 1 interior allotment fence.

Recreation

- Day use is the main form of recreation within the project area.
- Big game and upland bird hunting are popular during the fall months. Hunting seasons begin in late August with the archery seasons and carries through the fall into December.
- There are a few traditional dispersed camping sites within the project area and used in the fall during hunting season.
- The project area is a traditional huckleberry picking area.
- Snowmobiling, cross-country skiing, hiking and motorized trail riding are the main forms of dispersed recreational use.

Noxious Weeds

- Weeds have been treated within the analysis area as funding permitted.
- The analysis area is currently ranked as a low priority for noxious weed control.

Private Inholding/Lands

- There is no private land within the project area for Three Basins.

Roads

- Roads within the project area receive use mainly during the snow-free season. Roads # 425, # 402, # 439, # 401, the proposed haul routes, are groomed snowmobiling routes and are used during the snow season.

Wildfire Suppression

- Wildfire suppression has been an ongoing activity. From 1942 to present, there have been a total of 3 known lightning fires burning a total of 1 acre within the project area. Wildfires are still actively suppressed within the project area.

Thinning

- Precommercial thinning by hand crews using chainsaws has occurred on 211 acres, from 1991 through 2003. These plantations are a result of 6 past timber sales which occurred from the early 1960s through 1986.

Timber Sales, Firewood Gathering, Post and Pole Harvesting

- Three small clear cuts totaling approximately 3 acres were harvested approximately 1970 in North Cheatbeck Basin.
- The Cheatbeck #2 timber sale occurred 1970 – 1972, harvesting approximately 95 acres by clearcutting.
- The Cow Fork #2 timber sale occurred 1970 – 1972; the portion of this sale within the project area totals 13 acres of clearcutting.
- The Eightmile timber sale occurred 1979 – 1986, harvesting approximately 102 acres by clearcutting within the project area.
- The Cheatbeck Ridge timber sale harvest approximately 9 acres by clearcutting from 1995 – 1997 within the project area.
- There are six clearcuts totaling approximately 27 acres that were harvested between 1970 and 1955 within South Cheatbeck Basin.
- Very selective, scattered individual tree harvest with horses during the snow season. This light harvest was prior to district records being kept (pre 1950s).
- There is also evidence of extensive logging dating prior to the creation of the Forest Service.
- Firewood gathering has occurred from settlement times until the present and has predominately occurred within 100 feet of open road corridors.
- Post and pole harvesting for personal use has occurred within the same open road corridors as for firewood gathering.

Travel Plan

- The Caribou National Forest is currently preparing the environmental documentation of the Caribou Revised Travel Plan.

4.1.2 Future Activities

Mining

- There are no known future mining proposals within the project area.

Noxious Weeds

- If the need to treat weeds arises and funding is available, weeds will be treated as funding permits.

Rangeland Management/Improvements

- Building 3 new stock ponds
- Cattle grazing of the Eightmile allotment
- Range improvement maintenance
- Allotment administration using an adaptive management strategy

Recreation

- All recreational activities listed in the past and present section will continue into the foreseeable future.

Thinning

- Eight plantations, totaling 65 acres are planned to be precommercial thinned by hand crews using chainsaws. The timing of thinning is budget dependent, but it is estimated to occur within the next three years.

Timber Sales, Firewood Gathering, Post and Pole Harvesting

- No timber sales outside of this proposal are planned for the foreseeable future within this project area.
- Firewood gathering and dead post/pole harvesting for personal use will continue, although availability is decreasing.

Travel Planning

- The Caribou Travel Plan Revision is forecast to be completed in the later part of 2005.

Wildfire Suppression

- Wildfires will continue to be suppressed within the project area.

There are no other known foreseeable actions in the Three Basins Project Area.

4.2 Forested Vegetation

The disruption of the natural disturbance regime and succession are the two factors that have had the most effect on the condition of forest vegetation within the project area and landscape. The effects of succession and the lack of a natural disturbance cycle have been building across the landscape since the settlement of the surrounding areas (late 1800's). The ecology of this landscape evolved with a relatively frequent fire regime (16-97 years) (Barrett 1994), or an intermediate fire free regime. Natural fires were dominated by mixed severity fires in the low to mid elevation forest types and were mixed to lethal and less frequent in the higher types. Aspen and lodgepole pine depend on disturbance (usually fire) to sustain them in the landscape; fires set back succession and created openings with favorable conditions for them to successfully regenerate.

The implications of fire exclusion for forests with intermediate fire-free interval regimes are more apparent at the landscape scale than the stand level (Long, 2003). When current age-class structure is viewed for this landscape it is apparent that the lack of fire and succession has caused a dramatic shift in the age-class structure within the landscape. The RFP set age-class structural desired future conditions (DFC), therefore age-class structure at the landscape scale is the primary indicator used in this section. However, species composition, scale, and patch/stand size are also important considerations when restoring age-class structural on a landscape (Long, 2003, Hann, 2004 and Barrett 1994).

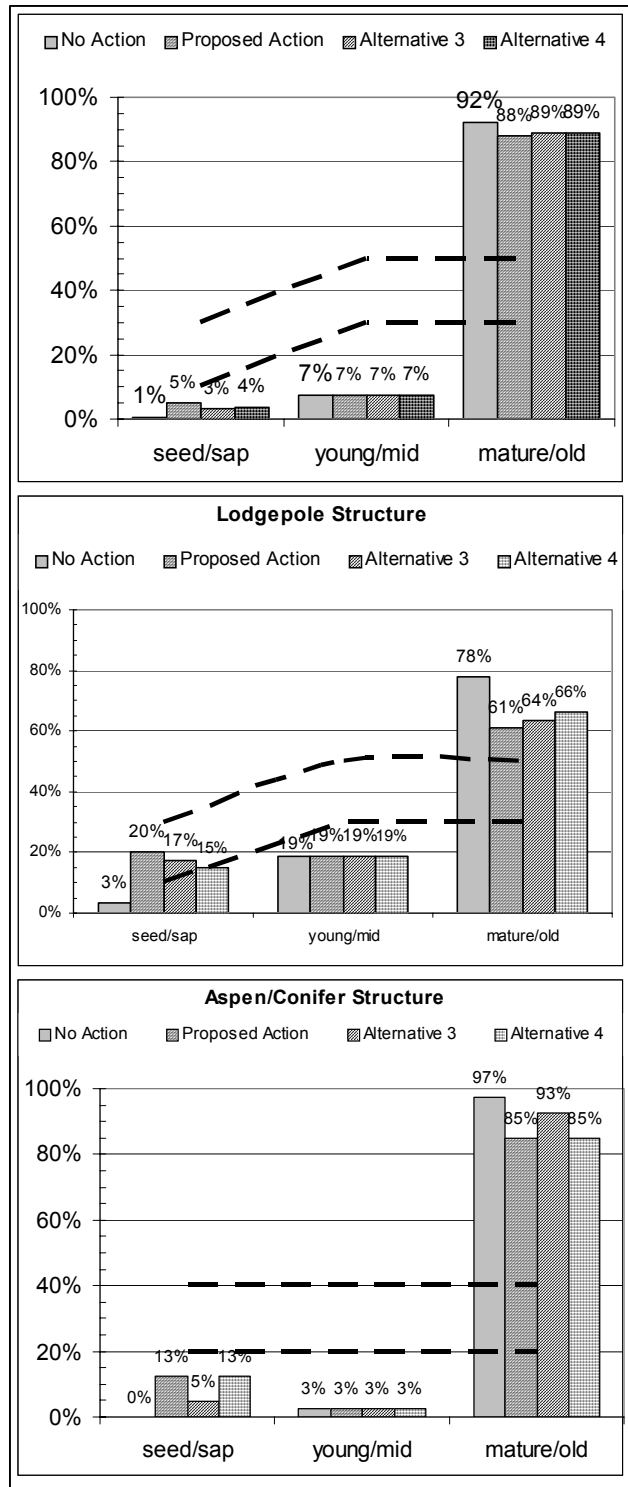


Figure 4.2-1 Structural Diversity Graphs. These graphs represent a visual comparison of the landscape scale age structural diversity for all alternatives; the forested landscape as whole, the lodgepole pine and aspen/conifer cover types. Although the landscape structure does not make major movements towards DFC's (shown as dashed lines) as a result of the developed alternatives the lodgepole pine and aspen/conifer cover types do.

Table 4.2-1 Diversity Matrix: A comparison of the landscape scale structural diversity for all alternatives.

		Predictions 10 years after project implementation				
Age-class Structure	DCF Range	Condition	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Seedling/Sapling	10 - 40%	4%	1%	5%	4%	4%
Young/Mid	20 - 50%	4%	7%	7%	7%	7%
Mature/Old	20 - 50%	92%	92%	88%	89%	89%

The age-class structure diversity matrix shown in (Table 4.2-1) displays the structural stages within the analysis landscape for each alternative, approximately 10 years after decision (based on a simple GIS model, and local knowledge). Successional pathways decisions were made and assigned to each stand based on the activities that are described in chapter two for each alternative the results were summarized for display of effects. The values displayed in the matrix account for proposed harvest and "post harvest" activities such as; prescribed fire, reforestation, pre-commercial thinning, and other timber stand improvement activities and natural succession. Refer to *Appendix A* for maps displaying projected structural stages for the area 10 years after decision for all Alternatives.

None of the alternatives bring the landscape within DFC conditions for any of the structural groups; however, all action alternatives decrease the percentage of the landscape in the mature/old structural group, thus increasing landscape diversity. This project was primary designed to address the successional threats to the cover types most affected by the lack of disturbance, the lodgepole pine and aspen/conifer cover types. A look at those cover types provides a more useful comparison of alternatives (see Figure 4.2-1). Because very little can be done to increase the young/mid group the important thing is the effect on the seed/sap and mature/old groups. All of the action alternatives do a good job at moving the lodgepole pine cover type towards DFC's and Alternatives 2 and 4 do are better than 3 for the aspen/conifer type. The aspen/conifer type is limited within the project area so with the design constraints there was not a viable alternative that could bring the type any closer to DFC's than 2 and 4.

The project was designed to recruit seral tree species while providing for a balance of age structural classes. With emphasis on mimicking a natural disturbance in scale, patch size, intensity and reducing the overall percent of the landscape at risk to Mountain Pine Beetle. A comparison of the alternative with respect to these items is shown below in Table 4.2-2.

Table 4.2-2 Alterative Comparison.

	Acres Recruited to Seral *	% High Risk MPB*	Avg. Stand Size	Size Ratio*	
Alt 1	0	52%	32 (66)		* Recruited Seral = Acres treated that will provide seral species the competitive advantage.
Alt 2	708	40%	32 (66)	(51/32) 1.6	* % high risk to MPB =% of stands with "pine" at high risk to Mountain Pine Beetle
Alt 3	510	42%	32 (67)	(43/32) 1.3	* Avg. Stand Size = The average size of the stands in the project area at the end of the project. (=# of stands)
Alt 4	517	44%	29 (74)	(40/32) 1.3	* Ratio = Average acreage of treatment stands over average stand acreage within the project area.

Alternative 2 treats the most acres, does the most to reduce mountain pine beetle (MPB) risk and maintains the current average stand size. Alternative 3 treats the least acres, but treats more lodgepole acres than 4 thus reducing MPB risk more than 4, but it does the least for aspen restoration. Alternative 4 treats the least acres at risk to MPB and it creates eight new stands which reduces the project area average by 3 acres. All the alternatives have an average treatment size greater than the current project area average this is driven by past management, most of the past harvest operation in the project area have been less than 20 acres which had a two fold affect they have created new stands and left small pieces of untreated both of which has led to a lower than natural stand/patch size in the project area. All the action alternatives were designed to treat as large of block as was possible in an attempt to not further fragment the area. Alternative 1 (no action) keeps aspen and lodgepole pine at risk and continues the imbalance of age structure on the landscape. The risk of MPB will continue to increase until an epidemic occurs, aspen will continue to be replaced by alpine fir and other more shade tolerant species, lose of aspen is an irretrievable affect, once driven from a stand by succession it will not return.

4.2.1 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.

Stand conditions within the assessment area would continue to move toward a dense, multistory stand structure with subalpine fir increasing and seral species decreasing. The current imbalance in landscape scale structural age diversity would continue, as the majority of the stands within the analysis area continue to move through the mature stage with a few stands beginning to approach the old structure stage. Almost all of the existing plantations would grow and age enough to move into the young/mid stage (many of the existing plantations are a result of the Eight Mile Timber Sale that operated from 1979-1983), nearly eliminating the seedling/sapling age class from the landscape.

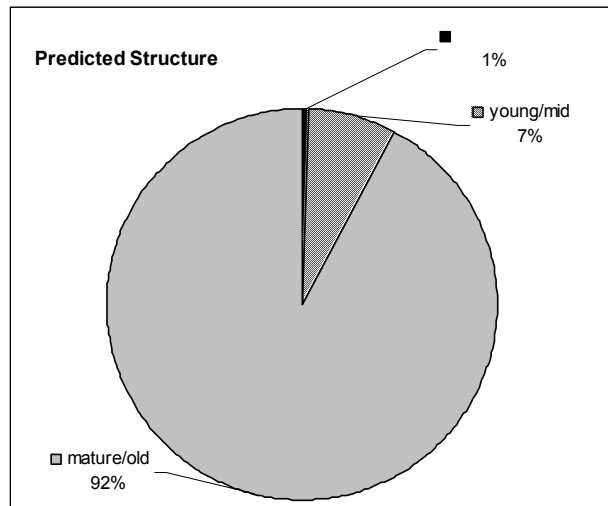


Figure 4.2-2 Landscape Scale Structure with No-Action. Little changes in the structure of the landscape, however the species composition will continue to shift toward climax species and densities will continue to increase thus increasing the risk to uncharacteristic wildfire or insect event.

Alpine fir would continue to add to the density of stands, as density increases, risk of uncharacteristic insect and wild fire events would also increase. Although this is a natural progression for stands in this landscape it is uncharacteristic due to the high percent of stands in this condition (i.e. lack of age diversity at the landscape scale).

Aspen would continue to decline as conditions for regeneration (open canopy) would be rare. Regeneration will likely not keep pace with mortality; alpine fir will continue to replace aspen across the landscape.

In the absence of a Mountain Pine Beetle (MPB) epidemic lodgepole pine cover types across the landscape would continue to be dominated by mature lodgepole for the next 10 to 20 years, but they will continue to lose ground to alpine fir. If a MPB epidemic does occur, a large percentage of the lodgepole pine cover type would shift to an alpine fir type. In either case the increase in alpine fir will continue to alter the fire regime moving it from mixed to lethal. Given the low occurrence of serotinous cones in the project area and the landscape, a shift to a lethal regime could case future problems with regeneration of lodgepole pine. Approximately **47%** of the project area would be at **high risk** ten years after the decision.

	High	Mod	Low
Landscape	52%	23%	25%
Project Area	47%	22%	31%

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

This project area would not add to the age structure diversity of Bear River Range which is also out of balance. Succession will continue.

Firewood availability to the public within the project area and the landscape would increase as mortality increases on both aspen and lodgepole pine.

4.2.2 Alternative 2 (Proposed Action)

Direct and Indirect Effects

Under the proposed action alternative, all of the activities described for the alternative in chapter two (proposed actions and design features) would occur in addition to current uses, activities and processes.

At the landscape scale age structural diversity and species composition diversity would be increased. The current imbalance in structural diversity would shift toward desired future conditions (DFC) outlined in the RFP. Treated stands would experience a

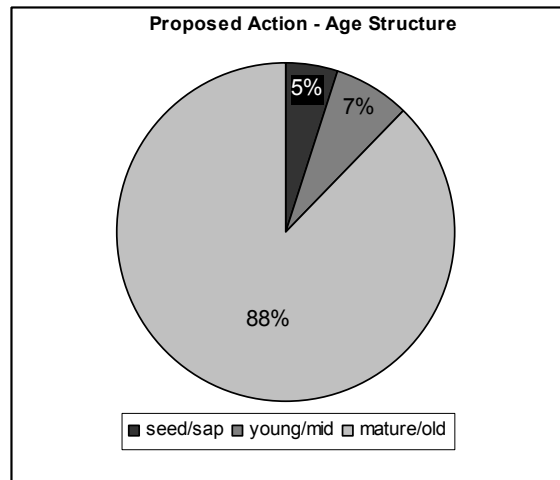
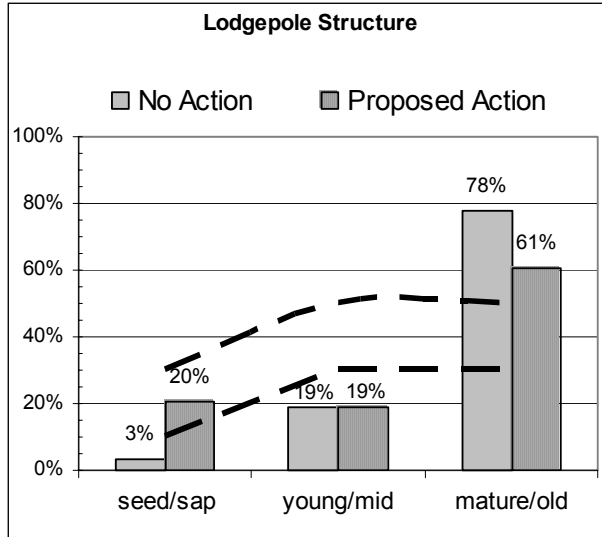


Figure 4.2-3 Landscape age structure. Alternative 2.

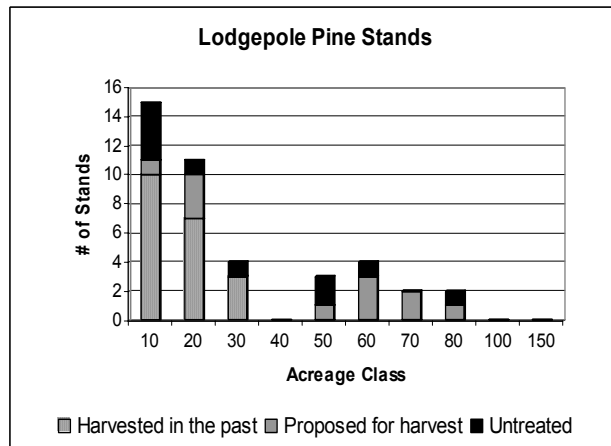
flush of new growth by seral species; such as aspen and lodgepole pine. Based on past experience there is a relatively high probability that these stands would be fully stocked in five years and be sapling size within fifteen years (i.e. there is a low probability of failure). Succession will continue in the untreated mature stands with a few stands beginning to approach the old structure stage. Most of the existing plantations (seed/sapling stage) would grow enough to move into the young/mid stage. The combination of natural succession and management activities would create a landscape that is more structurally diverse and closer to desired future condition, although it would still be a long way from the DFC. The aspen/conifer and lodgepole pine cover types would experience much greater shifts putting them much closer to DCF than the landscape as a whole, see Figure 4.2-1 and Figure 4.2-4.



Structure in the Lodgepole Pine Cover Type.

Approximately 17% of the cover type within the landscape is moved from the mature/old structural group to the Seedling/Sapling group. This would move the structural age diversity of the cover type closer to desired future conditions.

This alternative would shift the competitive advantage to seral tree species (aspen and lodgepole pine) on **708** acres, 33% of forested acres (27% of the project area). Overall at the project scale seral species would increase and climax species would decrease.



Remnant aspen was found in every stand proposed for treatment so aspen would be rejuvenated on **708** stand acres. Aspen will quickly respond to the proposed disturbance (harvest and burn) where it exists in the stands which will insure clone survival within the treated stands for approximately another 130 years (Kay 1997). The monitoring of the aspen outlined in the design features will help insure that herbivory does not cause a regeneration problem.

This figure is a graphical representation of past and proposed activities in comparison to the natural/current stand distribution. A review of past aerial photos dating back to 1963 shows that past harvest activities tended to break-up stands, increasing the number of small stands.

This alternative would shift **486** acres of the lodgepole cover type in the project area from the mature/old age class to seed/sapling class. It will bring the lodgepole pine cover type seedling/sapling class into DFC at the landscape scale, see Figure 4.2-3. Additionally, it will treat unit 12 (36 acres) which was classified as a Douglas-fir cover type. This stand is currently a reasonably even mix of Douglas-fir and lodgepole, lodgepole will make up the majority of the regeneration. Bringing the total acres where lodgepole is regenerated to **522**. The proposed treatments would reduce the percentage of project area at high risk to **MPB** down to **18%**.

	High	Mod	Low
Landscape	40%	22%	38%
Project Area	18%	19%	63%

This alternative would maintain the current average stand size within the project area, **32** acres (i.e. no stands would be split). The average treatment stand size would be 51 acres which is greater than the project average. This is driven by two factors, the majority of the small stands have been treated in the past (which has created a lower than natural average stand size) and the largest stand (118 acres) is being proposed for burning. When looking at only harvest treatments the average drops to 45 acres. This alternative proposes to treat **8 stands that are greater than 40 acres, 7 of which will require Regional Forester approval (RFP 3-45)**. These stands are being proposed to the Regional Forester on the basis of mimicking natural disturbance in scale and patch size; all seven requiring approval are in the lodgepole type.

Cumulative Effects

The project area would add to the age structure diversity of the Bear River Range, which is also out of balance.

Firewood availability to the public within the project area would decrease.

This action could create a future need for management actions.

- As the trees in the proposed stands moved through the Seedling/Sapling structural group, they may need to be thinned (at approximately 20 years old) in order to maintain their health and vigor (most past harvest units within the project area have had extensive regeneration and have required thinning).

4.2.3 Alternative 3

Direct and Indirect Effects

Under this action alternative, all of the activities described for Alternative 3 in chapter two (including design features) would occur in addition to current uses, activities and processes.

At the landscape scale age structural diversity and species composition diversity would be increased. The current imbalance in structural diversity would shift toward desired future conditions (DFC) outlined in the RFP. Treated stands would experience a flush of new growth by seral species; such as aspen and lodgepole pine. Based on past experience there is a relatively high probability that these stands would be fully stocked in five years and be sapling size within fifteen years (i.e. there is a low probability of failure). Succession will continue in the untreated mature stands with a few stands beginning to approach the old structure stage. Most of the existing plantations (seed/sapling stage) would grow enough to move into the young/mid stage. The combination of natural succession and management activities would create a landscape that is more structurally diverse and closer to desired future condition, although it would still be a long way from the DFC. The aspen/conifer and lodgepole pine cover types would

experience much greater shifts putting them much closer to DCF than the landscape as a whole, see Figure 4.2-1 and Figure 4.2-7.

This alternative would shift the competitive advantage to seral tree species (aspen and lodgepole pine) on **510** acres, 24% of forested acres (20% of the project area). Overall at the

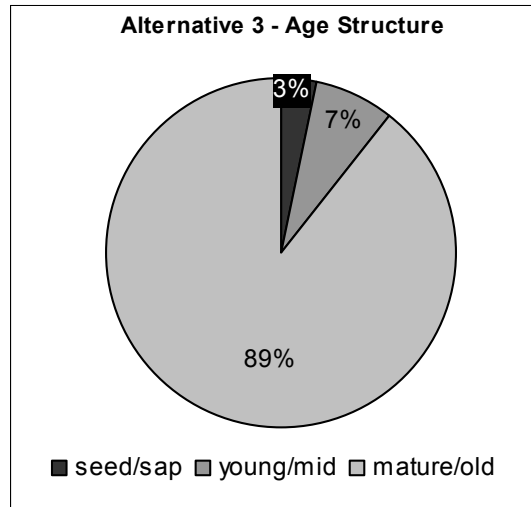
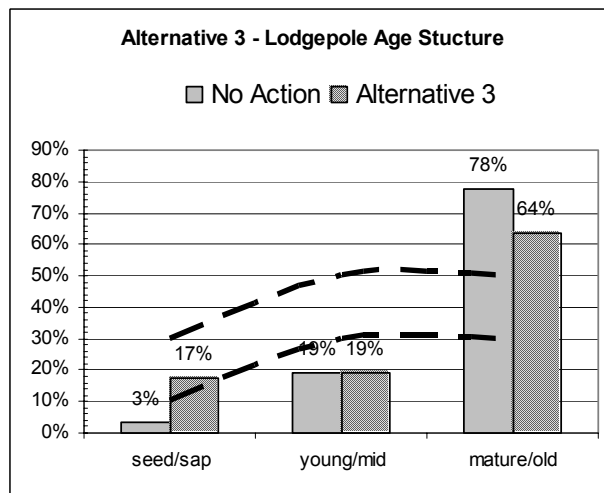


Figure 4.2-6 Landscape age structure. Alternative 3.



Structure in the Lodgepole Pine Cover Type.

Approximately 14% of the cover type within the landscape is moved from the mature/old structural group to the Seedling/Sapling group. This would move the structural age diversity of the cover type closer to desired future conditions.

project scale seral species would increase and climax species would decrease.

Remnant aspen was found in every stand proposed for treatment so aspen would be rejuvenated on **510** stand acres. Aspen will quickly respond to the proposed disturbance (harvest and burn) where it exists in the stands which will insure clone survival within the treated stands for approximately another 130 years (Kay 1997). The monitoring of the aspen outlined in the design features will help insure that herbivory does not cause a regeneration problem.

This alternative would shift **406** acres of the lodgepole cover type in the project area from the mature/old age class to seed/sapling class. It will bring the lodgepole pine cover type seedling/sapling class into DFC at the landscape scale, see Figure 4.2-7. Additionally, it will treat unit 12 (36 acres) which was classified as a Douglas-fir cover type. This stand is currently a reasonably even mix of Douglas-fir and lodgepole, lodgepole will make up the majority of the regeneration. Bringing the total acres where lodgepole is regenerated to **442** acres. The proposed treatments would reduce the percentage of the project area at high risk to **MPB** to **23%**.

MPB Risk	High	Mod	Low
Landscape	42%	22%	36%
Project Area	23%	19%	58%

This alternative would maintain the current average stand size within the project area, 32 acres, however several stands are split in the alternative, but the average stays the same (i.e. still rounds to 32). The average treatment stand size would be **43 acres** which is greater than the project average. This is driven by the same two factors as the proposed action. This alternative proposes to treat **7 stands that are greater than 40 acres, 6 of which will require Regional Forester approval (RFP 3-45)**. These stands are being proposed to the Regional Forester on the basis of mimicking natural disturbance in scale and patch size; all six are in the lodgepole type.

Cumulative Effects

The project area would add to the age structure diversity of the Bear River Range, which is also out of balance.

Firewood availability to the public within the project area would decrease.

This action could also create a future thinning need, as described for Alternative 2.

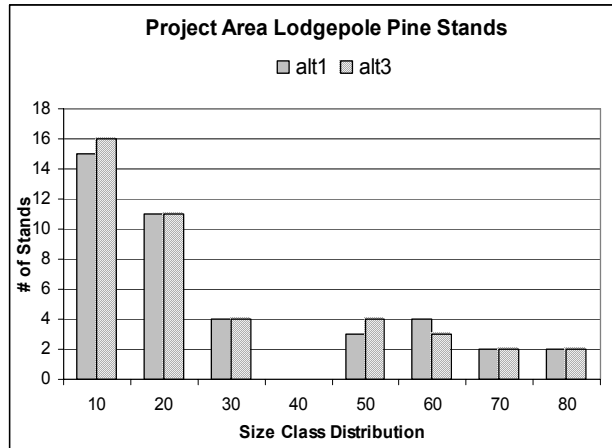


Figure 4.2-8 Project area lodgepole pine stand size. This figure is a graphical representation lodgepole pine stand size distribution within the project area for alternative 3 compare to the no action alternative. Unit 2 is split leaving the portion in the Soda Point Roadless. This decreased the number of stands in the 50 to 60 class and increases the 40 to 50 and the 3 to 10 classes. This does not have much affect on the stand average for the project area as whole but does decrease the lodgepole pine average by 1 acre.

4.2.4 Alternative 4

Direct and Indirect Effects

Under this action alternative, all of the activities described for Alternative 4 in chapter two (including design features) would occur in addition to current uses, activities and processes.

At the landscape scale age structural diversity and species composition diversity would be increased. The current imbalance in structural diversity would shift toward desired future conditions (DFC) outlined in the RFP. Treated stands would experience a flush of new growth by seral species; such as aspen and lodgepole pine. Based on past experience there is a relatively high probability that these stands would be fully stocked in five years and be sapling size within fifteen years (i.e. there is a low probability of failure). Succession will continue in the untreated mature stands with a few stands beginning to approach the old structure stage. Most of the existing plantations (seed/sapling stage) would grow enough to move into the young/mid stage. The combination of natural succession and management activities would create a landscape that is more structurally diverse and closer to desired future condition, although it would still be a long way from the DFC. The aspen/conifer and lodgepole pine cover types would experience much greater shifts putting them much closer to DCF than the landscape as a whole, see Figure 4.2-1 and Figure 4.2-7.

This alternative would shift the competitive advantage to seral tree species (aspen and lodgepole pine) on **516** acres, 24% of forested acres or 20% of the project area as a whole. Overall at the project scale seral species would increase and climax species would decrease.

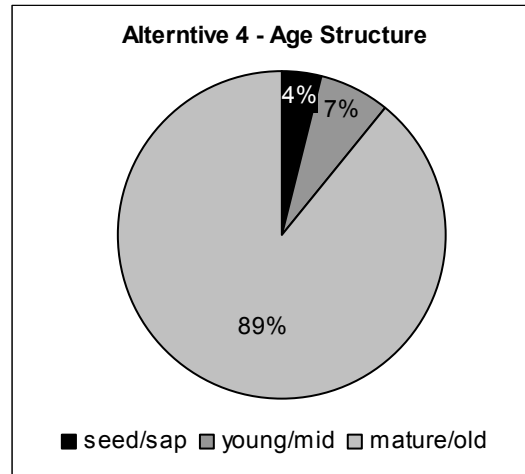


Figure 4.2-9 Landscape age structure. Alternative 4.

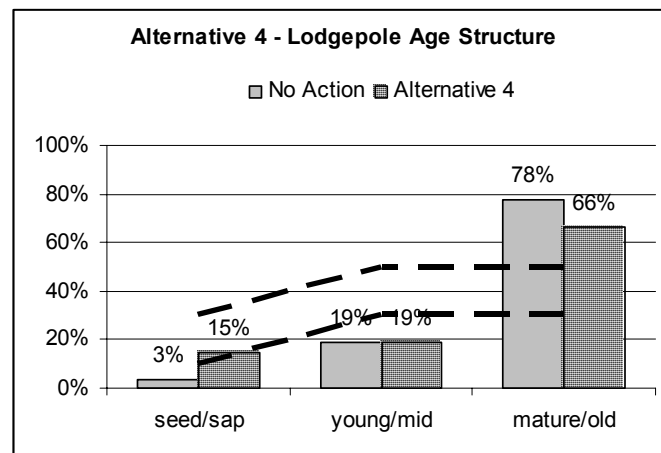


Figure 4.2-10 Effect of the Alternative 4 on Age Structure in the Lodgepole Pine Cover Type.

Approximately 12% of the cover type within the landscape is moved from the mature/old structural group to the Seedling/Sapling group. This would move the structural age diversity of the cover type closer to desired future conditions.

Remnant aspen was found in every stand proposed for treatment so aspen would be rejuvenated on **516** stand acres. Aspen will quickly respond to the proposed disturbance (harvest and burn) where it exists in the stands which will insure clone survival within the treated stands for approximately another 130 years (Kay 1997). The monitoring of the aspen outlined in the design features will help insure that herbivory does not cause a regeneration problem.

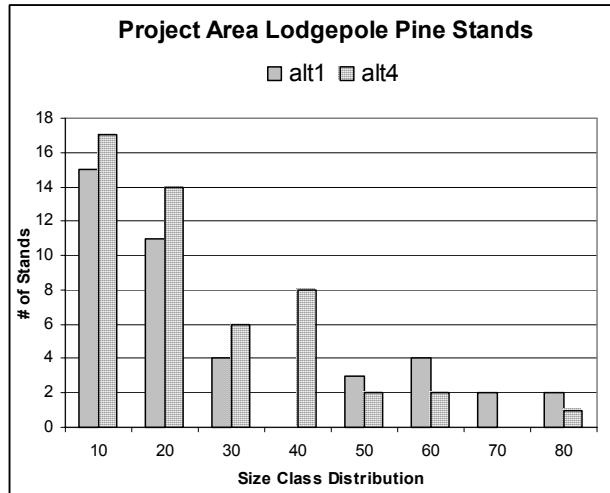


Figure 4.2-11 Project area lodgepole pine stand size. This figure is a graphical representation of project area lodgepole pine cover type size class distribution for alternative 4 compared to the no action alternative. This alternative splits 7 stands several into three pieces. This alternative creates 8 stands in the 30 to 40 size class and currently there are not any stands in that class.

This alternative would shift **330** acres of the lodgepole cover type in the project area from the mature/old age class to seed/sapling class. It will bring the lodgepole pine cover type seedling/sapling class into DFC at the landscape scale, see Figure 4.2-7. The proposed treatments would reduce the percentage of the project area at high risk to **MPB** to **27%**.

MPB Risk	High	Mod	Low
Landscape	44%	23%	33%
Project Area	27%	22%	51%

This alternative would not maintain the current average stand size within the project area; seven stands are split in this alternative, the average stand size within the project area drops from 32 to 29. The average treatment stand size would be **40 acres** which is greater than the project average. This is driven by the same two factors as the proposed action. This alternative proposes to treat **1 stands that is greater than 40 acres** with a combination of harvest and prescribe fire. The harvest portion of the treatment will not create an opening greater than 40 acres, Regional Forester approval is only required when regeneration harvest exceeds 40 acres. Prescribed fire operations that exceed 40 acres do not require RF approval.

Cumulative Effects

The project area would add to the age structure diversity of the Bear River Range, which is also out of balance.

Due to the 40 acre created opening constraint (goshawk guideline and created opening standard) the average stand size will decrease adding to the impacts of past harvest operations. In the future (80+ years) it will be difficult to provide large blocks of mature lodgepole pine which could affect as an example goshawk nesting habitat.

Firewood availability to the public within the project area would decrease.

This action could also create a future thinning need, as described for alternative 2.

4.2.5 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 disturbance activities would not occur under Alternative 1, decreasing opportunity for new noxious weed establishment. Potential introduction of noxious weeds into a new location always exists by the many vectors for seed dispersal.

Alternatives 2, 3 and 4

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 past 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.

Alternatives 2, 3, and 4

Cumulative Effects

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

Past and present soil and vegetative disturbances within the project area have contributed to the establishment and expansion of existing noxious weeds. Livestock grazing and recreational activities would continue in the project area. Direct and indirect effects for all action alternatives are described above. There are no foreseeable actions that would increase noxious weed populations in the project area beyond those listed above.

4.3 Hydrology

Cumulative Effects Analysis Area for Hydrological Disturbance: The lower extent of cumulative analysis areas for water quality are defined by our ability to detect project effects on water quality, beneficial uses or stream function at some point below the project. These effects are described from where they originate and are then qualitatively routed to the point where they are no longer detectable. The absence of defined channels in the project area, which is entirely composed of enclosed basins, prevents hydrologic effects occurring in the project area from being detectable in any water bodies outside the project area. Therefore cumulative effects areas outside the project area for water quality and stream function are defined to measure the effects of the use and potential improvements of the haul routes.

Cumulative Effects Analysis Areas for Water Quality:

The northern haul route: This comprises Cow Fork, Eightmile Creek from the headwaters of Cow Fork down to Eightmile Creek, and continues down Eightmile Creek below Cow Fork to the Bear River.

The southern haul route: This area begins at the headwaters of Meadow Creek, continues down North Canyon Creek and ends where North Canyon Creek joins with Ovid Creek.

Hydrology Issue #1: Watershed disturbances, such as timber harvest, site preparation, prescribed burning and road construction can change the volume and timing of a basin's runoff pattern.

Indicator: Percent Hydrologic disturbance.

Rationale for Indicator: A threshold of change in water yield has been documented in relatively small watersheds when approximately 30% (or more) of the basin has been altered. A Forest Plan guideline addresses this concern stating "Not more than 30 percent of any of the principal watersheds and their sub-watersheds should be in a hydrologically disturbed condition at any one time" (USDA 2003, pg III-16).

Red Flag: Exceedance of 30% disturbance of the affected HUC-5 watersheds.

Hydrology Issue #2: Increased traffic on haul roads with poor drainage design within AIZs of streams could result in increased sediment to streams.

Indicator: Hydrologic connectivity of roads to streams and associated potential for sediment delivery. Hydrologic connection and sediment is measured by adequacy of road drainage design and sediment production from road surface and ditches.

Rationale for Indicator: The two potential haul routes closely parallel Eightmile, Meadow and North Canyon Creeks, all 303d, outside the project area. Sediment is an identified or suspected pollutant. Hydrologic connectivity of roads is the collection and delivery of road drainage to streams. Reducing road drainage spacing and increasing the

effective buffer width by placing drainage exits where roads are farthest from streams effectively increases stream buffers. Graveling roads and armoring eroding ditches near streams decreases sediment production.

Red Flag: Measurable increase in overall sediment delivery along the haul route.

Alternative 1

Direct and Indirect Effects

Under implementation of Alternative 1, road improvements targeted to reduce sediment delivery to streams along one or the other of the proposed haul routes would not be undertaken. Current levels and trends of water quality impairment due to sediment from roads would continue in Eightmile, Meadow, and North Canyon Creeks. Beneficial uses would continue to be impaired by roads to the same degree or with the same trend as in the past. The current hydrologic disturbance is 11 percent, well below the 30 percent limit of the Forest Plan Guideline and would continue to be met in the Eightmile and Trout Creek HUC-5s with all disturbances coming from past activities. The amount of disturbance from previous activities would decrease as these impacted areas recover.

Cumulative Effects

A review of future actions indicates that there is no other foreseeable project within the cumulative effects areas that would add or increase the sum of existing condition and project effects. Ongoing road maintenance and use by Forest users are the main cumulative factors relative to roads.

Alternative 2

Direct and Indirect Effects

Under Alternative 2, hydrologic disturbance per HUC-5 would increase no more than 1.9% to a maximum of 12.8%. Though it would disturb the most ground, the total would still be less than one half the hydrologic disturbance limit of the Forest Plan guideline. This alternative would reconstruct 4.8 miles of road within the project area, which would have minor, short-term, localized negative effects to watershed health, but would be beneficial to watershed health in the medium to long term due to the movement of the road segments to less sensitive and more stable areas and alignments. This alternative would authorize 1.8 miles of temporary roads, which would produce only short to medium term negative effects to watershed health. The slight additional disturbance, increase in temporary roads and road reconstruction over the no action alternative would not produce any measurable difference in effects to water quality, quantity, timing or riparian function at the watershed scale over Alternative 1 to the project area.

Alternative 3

Direct and Indirect Effects

Under Alternative 3, hydrologic disturbance per HUC-5 would increase no more than 1.5% to a maximum of 12.5% or less, which would still be less than one half the hydrologic disturbance limit of the Forest Plan guideline. This alternative would reconstruct 4.6 miles of road within the project area, which would have minor, short-term, localized negative effects to watershed health, but would be beneficial to watershed health in the medium to long term due to the movement of the road segments to less

sensitive and more stable areas and alignments. This alternative would authorize 1.6 miles of temporary roads, which would produce only short to medium term negative effects to watershed health. The slight additional disturbance, increase in temporary roads and road reconstruction over the no action alternative would not produce any measurable difference in effects to water quality, quantity, timing or riparian function at the watershed scale over Alternative 1 to the project area.

Alternative 4

Direct and Indirect Effects

Under Alternative 4, hydrologic disturbance per HUC-5 would increase no more than 2% to a maximum of 12.8%. This total would still be less than one half the hydrologic disturbance limit of the Forest Plan guideline. This alternative would reconstruct 4.2 miles of road within the project area, which would have minor, short-term localized negative effects to watershed health, but would be beneficial to watershed health in the medium to long term due to the movement of the road segments to less sensitive and more stable areas and alignments. This alternative would authorize 1.4 miles of temporary roads, which would produce only short to medium term negative effects to watershed health. The slight additional disturbance, increase in temporary roads and road reconstruction over the no action alternative would not produce any measurable difference in effects to water quality, quantity, timing or riparian function at the watershed scale over Alternative 1 to the project area.

Cumulative Effects Common to Alternatives 2, 3, and 4

Roads

Permanent road construction can have negative effects on watershed health. Roads by design are smoother and less permeable than the lands from which they are constructed. Because of their lower permeability, they yield more drainage water and because of their smoother character, they help deliver it faster and more efficiently closer to the watershed outlet. Hydrologic connectivity of roads is the delivery of road drainage to streams (USDFS, 1999 pgs 59-63). Road drainage can carry sediment, which can negatively affect streams. Both closer proximity of road drainage exits (such as cross-drains) to streams and increased distances between the drainage exits can increase sediment delivery, by providing more water, and hence more energy to carry sediment from the road to the stream. The main thrust of the drainage improvements is to better diffuse road runoff onto the buffer between the creek and the road, which will reduce as much as possible, channelized flow of road drainage across the buffer. Channelized flow is the most frequent cause of failure of stream buffers according to Belt (1992).

Graveling of native surfaced roads can reduce sediment production. 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. Temporary road construction has the same effects as permanent construction, but the effects are reversed when roads are properly obliterated. Road relocation is generally undertaken to move roads to areas where these effects are reduced, or to areas that are more resilient or resistant to the negative effects from these changes. While there will be short-term, less than 2 years, impacts associated with the construction of these features and minor sediment from

increased road use, the improvements will reduce of sediment delivery to the streams along the haul route in the medium to long term ,greater than 5 years.

The northern haul route:

Potential effects from use of this haul route for the project would not be measurable above background levels once Eightmile Creek discharges into the Bear River.

The southern haul route:

Potential effects from use of this haul route for the project would not be measurable above background levels once North Canyon Creek joins with Ovid Creek.

Hydrologic Disturbance for the Project Area

The entire project area is contained in the three internally draining Cheatbeck basins: North, Middle, and South, none of which has perennial or intermittent streams. Because the basins are internally drained, local increases in water yield that may result have no surface connection to streams outside the basins. There is also no surface connection between the basins.

The greatest increase for any alternative would be 2% to a maximum of 13%, which is less than half the guideline maximum. Most of the previous harvested areas, which make up nearly all the current disturbance, are in the sapling to post stage, which signifies these areas have recovered nearly to the point where they are no longer considered hydrologically disturbed. Most of these old harvest areas were considered as hydrologically disturbed to ensure the most conservative “worst case” conditions were used for this analysis. Due to the nearly recovered stages of the previous harvested areas, the percent of hydrologic disturbance will greatly decrease below the already acceptable level in the medium term, 2 to 5 years.

Past activities are accounted for in the existing conditions. A review of future actions indicates there are no other foreseeable projects within the cumulative effects areas that would add to the sum of existing conditions and project effects. Ongoing road maintenance and use by Forest users are the main cumulative factors relative to roads.

Summary of Cumulative Effects for all Alternatives

Table 4.3-1 displays hydrologic disturbance of direct project effects, combined project, past, present and reasonably foreseeable hydrologic disturbances by HUC-5.

Table 4.3-1 Percent Hydrologic Disturbance by Alternative

HUC-5 # & major stream	Total acres	Alt 1	Alt 2		Alt 3		Alt 4	
		Cuml	Direct	Cuml	Direct	Cuml	Direct	Cuml
1601020213 Trout Cr	19298	11.0%	1.8%	12.8%	1.5%	12.5%	0.8%	11.8%
1601020102 Eightmile Cr	18794	10.9%	1.9%	12.8%	1.2%	12.1%	1.9%	12.8%

Cuml = cumulative.

Table 4.3-2 compares effects of all alternatives. As stated above, the improvements in road drainage and surfacing associated with all action alternatives would greatly reduce sediment delivery to the streams in the medium to long term.

Table 4.3-2 Comparison of Alternatives for Hydrology

Resource	Alt 1	Alt 2	Alt 3	Alt 4
Hydrology & Riparian	No benefit or affects.	Most benefit, only slightly greater than 3 & 4.	Second most benefit, very slightly less than 2.	Third most benefit, very slightly less than 3.

Floodplains and Wetlands (E.O 11988 & 11990)

There would be no negative effect under any alternative on wetlands as defined by Executive Order 11990 or to floodplains as defined in EO 11988.

Irreversible and Irretrievable Resource Commitments:

With the proper implementation of the appropriate BMPs, standards and guidelines and design features, previous experience indicates that irreversible and irretrievable resource commitments to water quality, hydrologic, riparian or watershed resources from any of the alternatives are unlikely.

4.4 Soils

Management activities such as timber harvest, road construction and maintenance, and burning have the potential to affect soil properties that may reduce long-term soil productivity and increase the potential for erosion in the project area. The effects of management activities on soil productivity are measured by the amount of detrimental soil disturbance remaining in each harvest unit (activity area) after the project is completed and project design features are applied, as outlined in the Chapter 2 and R-4 Soil Management Handbook (FSH 2509.18 supplement r4_2509.18-2002-1). Detrimental soil disturbance is defined in the RFP (RFP G-40) and is a measure of soil displacement, soil compaction/puddling and severe burning. Cumulative effects analysis addresses detrimental disturbance from all activities such as grazing, recreation, timber harvest including temporary road construction, skid trails and landings within the proposed activity areas.

Short term effects are defined as being six years 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 and landings described in **2.5.1 Design Features Common to Alternatives 2, 3 and 4**. 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 Issue 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.

Analysis Area: The analysis areas for determining the effects of the proposed action and alternatives on soil productivity are the proposed harvest units (activity areas) as defined in FSH 2509.18_r_4-2002-1.

Cumulative Effects Analysis Area:

The scale of the analysis for soils cumulative effects is also the activity areas within Sulfur Canyon and Burton Watersheds 02/13. Cumulative effects on the soil resource apply to the specific area that is affected by management actions called activity areas (FSH 2509.18 page 5 of 18). Direction states that “Existing, predicted, and cumulative levels of soil disturbance are used together to determine that guidelines are being met. Guidelines are assessed by Activity Area, which is specifically described for each management activity.”

Alternative 1 Detrimental Soil Disturbance

Direct and Indirect Effects:

Timber harvest 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, post/pole collection, livestock grazing and recreation use. These disturbances may or may not have soil conditions that meet the definition of detrimental disturbance. See, Table 3.3-1 Acres of detrimental soil disturbance by proposed harvest units, Chapter 3 for current disturbances.

Cumulative Effects:

No cumulative effects on the soil resource would occur with this alternative because no added actions will occur in the activity areas from this proposal. 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; Willatt et al., 1983).

Existing disturbances are currently estimated to be about 261 acres within the cumulative effects analysis area as shown in Chapter 3 under **3.3.1 Existing Soil Disturbance** and occur mostly outside proposed harvest units, although a few pioneered OHV trails and firewood gathering trails are found in some of the activity areas. Disturbances from dispersed camping, livestock grazing and timber harvest are not expected to increase substantially under this alternative however, an increase in pioneered trails by OHV's could occur. Three stock water ponds are planned to be installed in the project area in the foreseeable future which will create an additional 1 to 3 acres of soil disturbance. Two of these ponds are within activity areas and the other is in Middle Cheatbeck near road #741. No activity area in this alternative will exceed the Regional soil quality guideline of 15 percent detrimental soil disturbance and long term soil productivity will be sustained.

Wildfires will continue to be suppressed, however, any escaped wildfires are likely to create disturbance where soils are severely burned.

Irretrievable and Irreversible Commitments Specific to Alternative 1:

No irreversible commitments to the soil resource have been identified for this alternative. In the short term, irretrievable commitments are a slight loss in site productivity on 10 acres as a result of trail pioneering, dispersed camping, firewood and post/pole collecting. In the long term, no additional acres are expected to lose site productivity due to compaction 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 in this alternative in the foreseeable future.

Alternative 2 Detrimental Soil Disturbance

Direct and Indirect Effects

Prescribed burning on 170 acres (52 acres of which are burning contingent acres) could cause some areas to have severely burned soil conditions and increase erosion potential. Studies and monitoring have shown that when prescribed fire is applied in forest stands, less than 10 percent of the area is severely burned potentially affecting 17 acres (Tepler Transects 2004, Meeuwig et al. 1975, personal communication S.Hurt 2002). Additionally, amounts of large woody debris necessary for nutrient cycling could be consumed by fire. Approximately 10 to 15 tons of large woody debris are 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 intensity 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). Burning on 62 acres of landtype 400 in this alternative may increase erosion potential. Erosion hazard is moderate to high on landtype 400; however, field visits and site analysis show these soils are capable for prescribed burning on slopes less than 40 percent (Field Notes 2004). Prescribed burning treatments for these units will occur on slopes mainly less than 40 percent.

This alternative also proposes to harvest timber on 590 acres within the project area. Harvest activity will occur on landtype 001, landtype 155, landtype 400, landtype 550, landtype 800, and landtype 801. This alternative proposes to use dry-season, ground-based harvest methods with design features that would minimize soil disturbance within harvest units.

Effect from Roads: This alternative has the most road construction of the action alternatives. Total road construction/reconstruction is 6.0 miles affecting approximately 10.9 acres. Detrimental disturbance from temporary road construction/reconstruction would occur on 1.8 miles affecting 3.3 acres within activity areas. About 2.2 miles of existing roads will be decommissioned and will improve site productivity on about 4 acres in the short and long-term.

Summary of Alternative 2:

Using the process papers for determining soil disturbance from timber harvest in activity areas (Lott 2004 and Beck 2004), the following table shows the percent detrimental soil disturbance calculated for each harvest unit caused by skid trails, landings, temporary road construction, and prescribed burning prior to application of design features for Alternative 2.

Table 4.4-1 Alternative 2 Percent of Detrimental Soil Disturbance Prior to Application and After Application of Design Features

Unit #	Acres in Unit	Burned acres	Skid trails acres	Landings acres	Temp Rds acres	% Activity Area Left Disturbed	
1	75	0	3.0	3.4	0.55	9.3	2.3*
2	57	0	2.3	2.5	0.55	9.4	2.3*
3	19	0	0.7	1.0	0	8.9	2.2*
4	18	0	0.7	1.0	0	9.4	2.4*
5	57	0	2.3	2.6	0.55	9.6	2.4*
6	67	0	2.7	3.0	0.18	8.8	2.2*
7	10	0	0.4	0.5	0	9.0	2.2*
8	49	0	2.0	2.2	0.36	9.3	2.3*
9	69	0	2.8	3.1	0.36	9.1	2.3*
10	19	0.7	0.7	1.0	0	12.6	5.9*
11	67	0	2.7	3.0	0.36	9.0	2.3*
12	36	0	1.4	1.6	0.18	8.8	2.2*
13	47	0	1.9	2.0	0.18	8.7	2.2*
14	118	11.8	0	0	0	10.0	10.0*
15	52	5.2	0	0	0	10.0	10.0*
Total	760	17.7	23.6	26.9	3.3	9.3	2.3*

*Percent of activity area left in detrimental disturbance after design features are applied.

All harvest units (activity areas) meet the Regional Soil Quality guidelines for detrimental soil disturbance prior to the application of design features. Once design features are applied detrimental soil disturbance will be reduced even further 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 to ensure soil quality standards are met. Temporary roads will be obliterated and returned to production. In the short term, approximately 71.5 acres of land in all harvest units combined would be detrimentally disturbed from harvest activities before design features are applied. Landings, skid trails and roads will be ripped, disked, water barred, covered with slash and/or if needed, seed will be applied to reduce detrimental soil disturbances to ensure site productivity.

An average of 9.3 percent of the area in harvest units would be detrimentally disturbed before design features are implemented. Once design features are applied, the area left in a detrimentally disturbed condition from harvest, roads and burning is expected to be

reduced to less than 31.1 acres or an average of 2.3% of activity areas. Monitoring information also verifies these estimates (see Monitoring Soil Productivity in Chapter 3).

Road decommissioning of an additional 2.2 miles would improve soil productivity on approximately 4.0 acres within the analysis area. 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 (Cline et. al., 1981).

Cumulative Effects:

Total cumulative disturbance within activity areas, when combined with all past, present and foreseeable actions, would increase in the activity areas slightly but still remain within the allowable 15% disturbance requirement. An increase in erosion would occur on an additional 10.9 acres for up to three years due to road construction/reconstruction. A decrease in site productivity is not expected to occur in the analysis area because detrimental soil disturbance would not exceed the 15 percent guideline in harvest units after operations are completed (FSH 2509.18 supplement r4_2509.18-2002-1). New stock ponds are planned to be installed that will increase disturbance in each of units 9 and 10 to 14.6% and 14.2% respectively prior to application of project design features. However, project design features will reduce impacts to 14.1 percent. Another stock pond affecting about 1 acre is planned within the project area (South Cheatbeck meadow) but is outside the harvest units. Total disturbance from these ponds is three acres.

In the short term, this alternative would result in a total net increase of 31.1 acres of detrimental disturbance in the analysis area to the already existing 261 acres. In the long term, detrimental disturbance on the 31.1 acres 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 2.2 miles of road will further reduce cumulative detrimental soil disturbance in the analysis area by 4 acres. No activity area in this alternative would cumulatively exceed 15% detrimental soil disturbance.

Irreversible and Irrecoverable Resource Commitments:

Irreversible commitments (area permanently taken out of production for system roads, facilities, etc.) of 1.5 acres (0.9 miles of system roads) to the soil resource have been identified for this alternative. An additional 3 acres will be used as a gravel pit. Irrecoverable commitments are detrimental disturbance on 3.3 acres of temporary road construction/reconstruction in addition to 5 acres of existing non-system trails that occur outside the activity areas. These acres in roads would have an irretrievable loss of site production until rehabilitation occurs.

Alternative 3; Detrimental Soil Disturbance

Direct and Indirect Effects:

This alternative also proposes to harvest timber on 510 acres within the project area. Timber harvest activities will occur on landtype 001; landtype 155; landtype 400; landtype 550; landtype 800; and on landtype 801. This alternative proposes to use dry-season, ground-based harvest methods with design features that would minimize soil disturbance within harvest units.

Effect from Roads: This alternative has the least road construction of the two action alternatives. Total road construction/reconstruction is 5.5 miles affecting approximately 10.0 acres. Detrimental disturbance from temporary road construction/reconstruction would occur on 1.5 miles affecting 2.7 acres within activity areas. About 2.2 miles of existing roads will be decommissioned and will improve site productivity on about 4 acres in the short and long-term.

Summary of Alternative 3:

Using the process papers for determining soil disturbance from timber harvest in activity areas (Lott 2004 and Beck 2004), the following table shows the percent detrimental soil disturbance calculated for each harvest unit caused by skid trails, landings, temporary road construction, and prescribed burning prior to application of design features for Alternative 3.

Table 4.4-2 Alternative 3 Percent Detrimental Soil Disturbance Prior to and After Application of Design Features

Unit #	Acres in Unit	Burned acres	Skid trails acres	Landings acres	Temp Rds acres	% Activity Area Left Disturbed	
1	75	0	3.0	3.4	0.55	9.3	2.3*
2	48	0	1.9	2.3	0.55	9.9	2.5*
3	19	0	0.7	1.0	0	8.9	2.2*
5	4	0	0.2	0.2	0	10.0	2.5*
6	67	0	2.7	3.0	0.18	8.8	2.2*
7	10	0	0.4	0.5	0	9.0	2.2*
8	49	0	2.0	2.2	0.36	9.3	2.3*
9	69	0	2.8	3.1	0.36	9.1	2.3*
10	19	0.7	0.7	1.0	0	12.6	5.9*
11	67	0	2.7	3.1	0.36	9.2	2.3*
12	36	0	1.4	1.7	0.18	9.1	2.3*
13	47	0	1.9	2.2	0.18	9.1	2.3*
Total	510	0.7	20.4	23.7	2.72	9.3	2.3*

*Percent of activity area left in detrimental disturbance after design features are applied.

All harvest units (activity areas) meet the Regional Soil Quality guidelines for detrimental soil disturbance prior to the application of design features. Once design features are applied detrimental soil disturbance will be reduced even further 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 to ensure soil quality standards are met. Temporary roads will be obliterated and returned to production. In the short term, approximately 47.5 acres of land in all harvest units combined would be detrimentally disturbed from harvest activities before design features are applied. Landings, skid trails and roads will be ripped, disked, water barred, covered with slash and/or if needed, seed will be applied to reduce detrimental soil disturbances to ensure site productivity.

An average of 9.2 percent of the area in harvest units would be detrimentally disturbed before design features are implemented. Once design features are applied, the area left in a detrimentally disturbed condition from harvest, roads and burning is expected to be less than 12.4 acres or an average of 2.4% of activity areas. Monitoring information also verifies these estimates (see Monitoring Soil Productivity in Chapter 3).

Road decommissioning of an additional 2.2 miles would improve soil productivity on approximately 4.0 acres within the analysis area. 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 (Cline et. al., 1981).

Cumulative Effects:

Total cumulative disturbance within activity areas, when combined with all past, present and foreseeable future actions, would increase in the activity areas slightly but still remain with the allowable 15% disturbance requirement. An increase in erosion would occur on an additional 10.0 acres for up to three years due to road construction/reconstruction. A decrease in site productivity is not expected to occur in the analysis area because detrimental soil disturbance would not exceed the 15 percent guideline in harvest units after operations are completed (FSH 2509.18 supplement r4_2509.18-2002-1). New stock ponds are planned to be installed that will increase disturbance in each of units 9 and 10 to 14.6% and 19.2% respectively. However project design features will reduce impacts to 14.1 percent. Another stock pond affecting about 1 acre is planned within the project area (South Cheatbeck meadow) but is outside the harvest units. Total disturbance from these ponds is three acres.

In the short term, this alternative would result in a total net increase of 12.4 acres of detrimental disturbance in the analysis area to the already existing 261 acres. In the long term, detrimental disturbance on the 12.4 acres would improve from natural processes such as wetting and drying, root action, freezing and thawing and the establishment of vegetation (Oztas et. al 2003). Decommissioning of 2.2 miles of road will further reduce cumulative detrimental soil disturbance in the analysis area by 4 acres. No activity area in this alternative would cumulatively exceed 15% detrimental soil disturbance.

Irreversible and Irrecoverable Resource Commitments:

Irreversible commitments (area permanently taken out of production for system roads, facilities, etc.) of 1.5 acres (0.9 miles of system roads) to the soil resource have been identified for this alternative. An additional 3 acres will be used as a gravel pit.

Irretrievable commitments are detrimental disturbance on 2.7 acres of temporary road construction/reconstruction in addition to 5 acres of existing non-system trails that occur outside activity areas. These acres in roads would have an irretrievable loss of site production until rehabilitation occurs.

Alternative 4 Detrimental Soil Disturbance

Direct and Indirect Effects

The effects on the soil resource from prescribe burning on 170 acres in this alternative would be the same as Alternative 2. This alternative proposes to harvest timber on 399 acres within the project area. This alternative uses dry-season, ground-based harvest methods with design features that would minimize soil disturbance within harvest units.

Effect from Roads: This alternative has the least road construction of the three action alternatives. Total road construction/reconstruction is 5.1 miles affecting approximately 9.3 acres. Detrimental disturbance from temporary road construction/reconstruction would occur on 1.4 miles affecting 2.5 acres within activity areas. About 2.2 miles of existing roads will be decommissioned and will improve site productivity on about 4 acres in the short- and long-term.

Summary of Alternative 4:

Using the process papers for determining soil disturbance from timber harvest in activity areas (Lott 2004 and Beck 2004), the following table shows the percent detrimental soil disturbance calculated for each harvest unit caused by skid trails, landings, temporary road construction, and prescribed burning prior to application of design features for Alternative 4.

Table 4.4-3 Alternative 4 Percent Detrimental Soil Disturbance Prior to and After Application of Design Features

Unit #	Acres in Unit	Severely Burned acres	Skid Trails acres	Landings acres	Temp Roads acres	% Activity Area Left Disturbed	
1	39	0	1.6	1.8	0.36	9.6	2.4*
2	39	0	1.6	1.8	0.18	9.2	2.3*
3	19	0	0.8	0.9	0	8.9	2.2*
4	18	0	0.7	0.8	0	8.3	2.1*
5	39	0	1.6	1.8	0.36	9.6	2.4*
6	36	0	1.4	1.6	0.24	9.0	2.2*
7	10	0	0.4	0.5	0	9.0	2.2*
8	37	0	1.5	1.7	0.18	9.1	2.3*
9	69	0	2.8	3.1	0.3	9.0	2.3*
10	19	0.7	0.7	1.0	0	12.6	7.5*
11	39	0	1.6	1.8	0.36 in/.52 out	10.9	2.7*
13	34	0	1.4	1.5	0	8.5	2.1*
14	118	11.8	0	0	0	10.0	10.0
15	52	5.2	0	0	0	10.0	10.0
Totals	569	17.7	16.1	18.2	2.5	9.5	3.8

All harvest units (activity areas) meet the Regional Soil Quality guidelines for detrimental soil disturbance prior to the application of design features. Once design

features are applied detrimental soil disturbance will be reduced even further 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 to ensure soil quality standards are met. Temporary roads will be decommissioned and returned to production. In the short term, approximately 54.6 acres of land in all harvest units combined would be detrimentally disturbed from harvest activities before design features are applied. Landings, skid trails and roads will be ripped, disked, water barred, covered with slash and/or if needed, seed will be applied to reduce detrimental soil disturbances to ensure site productivity.

An average of 9.5 percent of the area in harvest units would be detrimentally disturbed before design features are implemented. Once design features are applied, the area left in a detrimentally disturbed condition from harvest, roads and burning is expected to be reduced to less than 32.9 acres or an average of 3.8% of activity areas. Monitoring information also verifies these estimates (see Monitoring Soil Productivity in Chapter 3).

Road decommissioning of an additional 2.2 miles would improve soil productivity on approximately 4.0 acres within the analysis area. 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 (Cline et. al., 1981).

Cumulative Effects: Total cumulative disturbance within activity areas when combined with all past, present and foreseeable future action would increase in the activity areas slightly but still remain within the allowable 15% disturbance requirement. An increase in erosion would occur on an additional 9.3 acres for up to three years due to road construction/reconstruction. A decrease in site productivity is not expected to occur in the analysis area because detrimental soil disturbance would not exceed the 15 percent guideline in harvest units after operations are completed (FSH 2509.18 supplement r4_2509.18-2002-1). New stock ponds are planned to be installed that will increase disturbance in each of units 9 and 10 to 10.4% and 19.2% respectively prior to application of project design features. However project design features will reduce impacts to 14.1 percent. Another stock pond affecting about 1 acre is planned within the project area (South Cheatbeck meadow) but is outside the harvest units. Total disturbance from these ponds is three acres.

In the short term, this alternative would result in a total net increase of 32.9 acres of detrimental disturbance in the analysis area to the already existing 261 acres. In the long term, detrimental disturbance on the 32.9 acres 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 2.2 miles of road will further reduce cumulative detrimental soil disturbance in the analysis area by 4 acres. No activity area in this alternative would cumulatively exceed 15% detrimental soil disturbance.

Irreversible and Irretrievable Resource Commitments: Irreversible commitments (area permanently taken out of production for system roads, facilities, etc.) of 1.5 acres (0.9 miles of system roads) to the soil resource have been identified for this alternative. An additional 3 acres will be used as a gravel pit. Irretrievable commitments are detrimental disturbance on 2.5 acres of temporary road construction/reconstruction in addition to 5 acres of existing non-system trails that occur outside activity areas. These acres in roads would have an irretrievable loss of site production until rehabilitation occurs.

Effects Common to All Action Alternatives: Detrimental Soil Disturbance

Direct and Indirect Effects

In the short term, potential erosion would increase on newly constructed roads, skid trails and landings. Erosion created by road construction or reconstruction is greatest during the first year of disturbance (Cline et al. 1981). From a 30-year storm event, the WEPP model (www.fsweb.moscow.rmrs.fs.fed.us/fswepp/) estimates a substantial increase in erosion on all areas of road construction/reconstruction. Much of the erosion from roads can be controlled by proper road design, construction precautions, and maintenance (Meeuwig et al., 1975; Burroughs et al., 1989; Megahan, 1977; Packer et al., 1977). Applying project design features reduces the potential for erosion and maintains soils on-site to ensure long-term productivity (IDFA 1992; Seyedbagheri 1996; Grier et al. 1989).

Soil loss tolerance for the soils in the project area ranges from 1 to 4 tons per acre per year (USDA FS, 1997). It is required by the RFP (2003) to reduce erosion to soil loss tolerance within one growing season after disturbance (RFP 3-7).

Erosion in activity areas is predicted to be less than soil loss tolerance for these soils when design features are applied. Soil productivity is not expected to be adversely affected from erosion by any of the action alternatives. Erosion rates would be reduced substantially the first year after disturbance occurs once erosion control design features are applied to the skid trails, landings and temporary roads described in Chapter 2. Within 4 to 6 years after disturbance, armoring and vegetative growth should reduce erosion rates to near background levels (Cline et al., 1981).

All activity areas with detrimental soil disturbance would be treated after completion of harvest operations following design features outlined in **2.5.1 Design Features Common to Alternatives 2, 3 and 4** of the DEIS. Slash piles will be burned within the landing areas to minimize detrimental soil disturbance from severe burning.

Studies show that soil surface disturbance from logging operations are greatest when ground-based harvest systems are used particularly in clear-cut areas (Dyrness, 1972; Froehlich, 1978). However, much less disturbance occurs when harvest operation are less intensive as with a selection cutting method. These alternatives propose to use dry-season, ground-based timber harvest methods that would minimize soil surface disturbance within harvest units. Reports indicate that the area disturbed by these harvest methods ranges from 8 to 15 percent (Stone, 1977).

Once design features are applied to improve detrimental disturbances and the rehabilitation of temporary roads is completed, the area left in detrimental disturbance would be much less than the Regional 15% guideline. Specific analysis for reduction in soil disturbance after design features are applied is shown for each alternative.

Decommissioning of 2.2 miles of existing roads would also benefit soil conditions. Method of closure would primarily be ripping and placing debris on the road surface. Earthen berms would be placed near intersections with open roads where needed. These areas would no longer be considered detrimentally disturbed after this treatment and would be return to the productive land base.

An additional 0.9 miles of new system road construction or approximately 1.6 acres will be permanently taken out of production. No other total commitment of the soil resource would occur under any action alternative. All harvest activity areas meet FSH (Forest Service Handbook) direction for detrimental soil disturbance.

All action alternatives are required to meet the requirements for woody residue and above ground organic matter as outlined in 3-6 and 3-7 of the RFP. Monitoring will be accomplished to ensure compliance.

All Action Alternatives- Detrimental Soil Disturbance

Cumulative Effects

All alternatives would meet Regional soil quality standards to maintain soil productivity and would follow standards and guidelines applicable to soils in the Revised Forest Plan prior to and after project design features are applied.

Leaving down woody residue and above ground organic matter on site after harvest activities occur (See Project Design Features in Chapter 2) would provide for long term nutrient recycling on all harvest units. Down wood is a necessary component of maintaining site productivity. No long-term cumulative effects were identified for the soil resource.

Table 4.4-4 Cumulative Effects for Activity Areas

Unit #	Acres in Unit			Cumulative Detrimental Soil Disturbance (Acres)			Percent of Activity Area in Detrimental Disturbance		
	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4	Alt 2	Alt 3	Alt 4
1	75	75	39	2.8	2.8	2.0	3.6	3.6	5.1
2	57	48	39	1.8	1.8	1.4	3.1	3.1	3.6
3	19	19	19	0.4	0.4	0.4	2.1	2.1	2.1
4	18	0	18	0.4	0	0.4	2.2	0	2.2
5	57	4	39	1.3	0.1	1.0	2.3	3.3	2.4
6	67	67	36	1.7	1.7	1.0	2.5	2.5	2.8
7	10	10	10	0.2	0.2	0.2	2.0	2.0	2.0
8	49	49	37	2.3	2.3	1.8	4.2	4.2	4.9
9	69	69	69	5.0	5.0	5.0	7.8	7.8	7.8
10	19	19	19	2.3	2.3	2.3	12.1	12.1	12.1
11	67	67	39	2.5	2.5	2.1	3.7	3.7	5.4
12	36	36	0	1.0	1.0	0	2.8	2.8	0
13	47	47	34	2.2	2.2	2.0	4.7	4.7	5.9
14	118	0	118	12.8	0	12.8	10.8	0	10.8
15	52	0	52	5.2	0	5.2	10.0	0	10.0
Totals	760	510	569	41.9	22.3	37.4	5.5 Ave.	4.4 Ave.	6.6 Ave.

Table 4.4-5 Soil Detrimental Disturbance from Proposed Activities Prior to Application of Project Design Features (PDF)

Alternative	Ac. Disturbed By Temp Road Re/Construction	Acres Disturbed By Fire	Total Acres Disturbed In Harvest Units	Average Percent Acres Disturbed In Harvest Units
1	0	0	0	0%
2	3.3	17	53.9	9.3%
3	2.7	0	47.1	9.2%
4	2.5	17	36.9	9.5%

Table 4.4-6 Soil Detrimental Disturbance from Proposed Activities after Application of Project Design Features (PDF)

Alternative	Acres left Disturbed In Harvest Units	Percent Acres Disturbed In Harvest Units	Acres Disturbed In Analysis Area After PDF	Percent Disturbed In Analysis Area After PDF
1	0	0 %	0	0%
2	17.7	2.3 %	36.2	1.4%
3	11.8	2.3 %	27.6	1.1%
4	19.3	3.4%	34.9	1.3%

Table 4.4-7 Cumulative Soil Detrimental Disturbance from Proposed Activities after Application of Project Design Features

Alternative	Acres Disturbed In Analysis Area After PDF	Percent Disturbed In Analysis Area After PDF
1	261	10.1%
2	299	11.6%
3	279	10.8%
4	294	11.4%

All Action Alternatives- Cumulative Effects; Detrimental Disturbance

All alternatives would meet Regional soil quality standards to maintain soil productivity and would follow standards and guidelines applicable to soils in the Revised Forest Plan prior to and after project design features are applied.

Leaving down woody residue and above ground organic matter on site after harvest activities occur (See Design Features in Chapter 2; 2.5.1 Design Features Common to Alternatives 2, 3 and 4) would provide for long term nutrient recycling on all harvest units. Down wood is a necessary component of maintaining site productivity. No long-term cumulative effects were identified for the soil resource.

4.5 Wildlife

Information for Chapter 4 is from *draft* copies of the Biological Assessments (BA), Biological Evaluation (BE), Wildlife White Papers, and Wildlife Specialists Reports. The *final* versions of for these species will be completed for the FEIS. Table 4.5-1 lists all Threatened, Endangered, Sensitive, Management Indicator Species, Migratory Birds and Big Game discussed in Chapter 3, denotes if potential habitat or the species is known to exists in or near the project area, lists those species that are analyzed in Chapter 4, and summarizes effects or impacts by alternative.

Table 4.5-1: T&E, Sensitive, & MIS Wildlife Species – Summary of Effects/Impacts

Wildlife Species or Habitat	Potential Habitat in / near	Species exists in or near area	Analyze effects in Chapter 4	Alt. 1	Alt. 2, 3 & 4
T&E Listed Species					
Gray Wolf – Threatened	Yes	Possible	Yes	NE	NE
Canada Lynx – Threatened	Yes	Possible	Yes	NE	NE
Bald Eagle – Threatened	No	No	No	NE	NE
Yellow-billed cuckoo – Proposed	No	No	No	NE	NE
Sensitive Species					
	Potential	In or Near	Chapter 4	Alt. 1	Alt. 2-4
Spotted Bat	Yes	No	No	NI	NI
Townsend's (Western) Big-eared Bat	Yes	Yes	Yes	NI	MIIH
Pygmy rabbit	No	No	No	NI	NI
Wolverine	Yes	Yes	Yes	NI	MIIH
Trumpeter Swan	No	No	No	NI	NI
Harlequin Duck	No	No	No	NI	NI
Peregrine falcon	No	No	No	NI	NI
Northern Goshawk	Yes	Yes	Yes	NI	MIIH
Columbian Sharp-tailed Grouse	Yes	Yes	Yes	NI	MIIH
Greater sage-grouse	Yes	No	Yes	NI	NI
Great Gray Owl	Yes	Yes	Yes	NI	MIIH
Flammulated Owl	Yes	Yes	Yes	NI	MIIH
Boreal Owl	Yes	Yes	Yes	NI	MIIH
Three-toed Woodpecker	Yes	Yes	Yes	NI	MIIH
Columbia spotted frog	Yes	No	No	NI	NI
Management Indicator Species					
	Potential	In or Near	Chapter 4	Alt. 1	Alt. 2-4
Northern Goshawk	Yes	Yes	Yes	NI	MH
Columbian sharp-tail grouse	Yes	Yes	Yes	NI	MH
Sage-grouse	Yes	Yes	Yes	NI	MH
Migratory Land Birds					
	Potential	In or Near	Chapter 4	Alt. 1	Alt. 2-4
Riparian	Yes	Yes	Yes	NI	MIIH
Non-Riverine Wetland	Yes	Yes	Yes	NI	MIIH
Sagebrush (Sage-grouse)	Yes	Yes	Yes	NI	MIIH
Big Game					
	Potential	In or Near	Chapter 4	Alt. 1	Alt. 2-4
Hiding Cover / Non-winter Forage	Yes	Yes	Yes	NI	BI
Winter Range, Forest Plan Mgt Area	No	No	No	NI	NI
<p>NE – No effect to T&E species. 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 MH maintain habitat able to support viable populations. XN – nonessential experimental population.</p>					

Cumulative Impacts Area (CEA) for changes to forested habitat is the 19,684 acre analysis area. Areas that are adjacent to the forest must be considered to determine which wildlife species may occupy the area and be impacted. These areas are limited to the valley bottom or adjacent forest depending on the distance the species migrates.

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 seral or shade-intolerant species slowly decrease as dominant vegetation matures slowly over time. Natural events that are not included because they are expected but not foreseeable are wildfires, insect, diseases, and weather patterns. Impacts by wildlife are also included in this category. Past forest vegetation changes are from timber sales. These changes are incorporated into the existing conditions and displayed in Alternative 1. Firewood cutting along roads are the only foreseeable activities that would add a cumulative decrease of the snag or the down woody debris component of mature/old-forested stands. Implementing the North Bear River Range AMP revision of the allotment within in the project area is within the existing condition and a continuing foreseeable activity. Camping, off-trail ATV can impact brush, forbs, and grass vegetation, usually in localized areas, are within the existing condition and a continuing foreseeable activity. The proposed Travel Plan would reduce vehicle impacts in the foreseeable future. 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. The historical conversion of valley bottom vegetation 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).

4.2.6 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. There would be no direct, indirect, or cumulative impacts to T&E species.

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.

Wolverine (Acres of Human Disturbance/Displacement)

Alternative 1

Direct and Indirect Effects

There would be no logging or burning activities or associated human disturbance that would disrupt wolverines traveling through the 19,683 acre project area.

Cumulative Effects

Human disturbances would continue year round from recreational uses, permitted activities (livestock grazing and outfitter & guide), and administrative activities in the

project area. One foreseeable short-term future activity is thinning 65 acres of the remaining harvest units. 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.

Alternative 2

Direct and Indirect Effects

Human disturbance from activities on 709 acres in the summer and fall may disrupt wolverines traveling through the area, but is unlikely to contribute to a trend towards Federal listing or cause a loss of viability to the population or species. Denning habitat would not be impacted and there would be no disturbance to wintering wolverine. The disturbance project activities are localized to the project area and usually short duration. The remaining area would provide areas without major disturbances that the wolverine can move through. Logging and associated activities may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species because all but one of the S&Gs would be met and birds have and are continuing to use this area.

Cumulative Effects

The same as Alternative 1.

Alternative 3

Direct and Indirect Effects

Impacts would be the same as Alternative 2 except disturbance would occur on 511 acres.

Cumulative Effects

The same as Alternative 1.

Alternative 4

Direct and Indirect Effects

Impacts would be the same as Alternative 2 except disturbance would occur on 517 acres.

Cumulative Effects

The same as Alternative 1

Northern goshawk, Flammulated owl, Boreal owl, and Great Gray Owl (Mature/Old Forest cover types)

Alternative 1

Direct and Indirect

The analysis area provides 14,819 cover type acres (92% of 16,064 forested acres) of mature and old aspen and conifer forest stands that provide suitable nesting and foraging habitat in the analysis area. The remaining 8 percent of the forest cover types are non-stocked / seedlings (0.0%), saplings (0.6%), pole, and young (7.2%) aspen and conifer stands. There would be no 40-acre opening created.

Cumulative Effects

There are no other foreseeable future activities that would impact or reduce mature/old forest cover types beyond the occasional dead tree cut as firewood along the road. This does not include vegetation succession described in the vegetation section that could have impacts on forest dependent wildlife.

Alternative 2

Direct and Indirect Effects

Large raptor nests would be protected if possible. Activities would reduce mature/old forest on 709 acres leaving 88 percent mature/old cover types. This is within CNF RFP S&Gs (USDA 2003b) of 33 percent for goshawk and 40 percent for forest owls. The remaining 12 percent in early seral cover types in the analysis area is also within Forest Plan Guidelines. Because this alternative increased the most early-seral forested habitat it contributes more to an even mix of cover types (age classes). However, this alternative creates seven openings that exceed the 40 acre Forest Plan Guideline for goshawk. This is not expected to have a significant impact on the goshawk because several large pockets (up to one acre) of leave trees are designed into the unit to breakup the vastness of the large opening providing hiding cover throughout the openings. The distance from mature forested edge to mature forested edge would be probably less than Alternative 4 with the 40 acre size limit. The extent of the large openings matches the natural historic stand patterns (see vegetation section). The created openings would be comparable to natural openings of non-forested habitat of North (134 acres), Middle (47 acres) and South (20 acres) Cheatbeek Basins; and similar to a 70 acre logging created opening in a known goshawk territory. All of the other standards and guidelines are being met. Logging and associated activities may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species because all but one of the S&Gs would be met and birds have and are continuing to use this area.

Cumulative Effects

The same as Alternative 1

Alternative 3

Direct and Indirect Effects

Impacts would be the same as Alternative 2 except 511 cover type acres would be converted to early seral, leaving 89 percent of old/mature-forested habitat and increasing non-stocked/seedling to 3.2 percent. Six cutting units would exceed the 40 acre guideline.

Cumulative Effects

The same as Alternative 1.

Alternative 4

Direct and Indirect Effects

Impacts would be the same as Alternative 2 except 517 cover type acres would be converted to early seral, leaving 89 percent of old/mature-forested habitat and increasing non-stocked/seedling to 3.2 percent. However, no cutting units would exceed the 40 acre guideline; all of the S&Gs would be met. The cutting units would not contain the large pockets of “leave trees” within the center of the opening to provide hiding cover. The distance from mature forested edge to mature forested edge would be longer than in Alternatives 2 and 3.

Cumulative Effects

The same as Alternative 1.

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

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 14,819 cover type acres of mature and old forest to provide existing and future snags.

Cumulative Effects

Recent logging of 8 percent of the forested cover type removed larger trees and many of the older snags have fallen over. Firewood cutting has removed most of the dead trees along roads. Snag numbers may increase as trees become older and are killed by insect and disease (see vegetation section). 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 plantations is designed to allow the remaining trees to grow larger in diameter that could in turn have potential to provide a large snag in the long term.

Alternative 2

Direct and Indirect Effects

Harvesting and burning activities may impact existing snags that could provide roosting habitat on 709 acres, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species because snag S&Gs would be implemented. In addition, burning would consume existing snags but fire mortality of green trees would create a short-term increase in snag numbers.

Cumulative Effects

The same as Alternative 1

Alternative 3

Direct and Indirect Effects

Impacts would be the same as Alternative 2, but harvesting and burning activities may impact existing snags that could provide roosting habitat on 511 acres.

Cumulative Effects

The same as Alternative 1

Alternative 4

Direct and Indirect Effects

Impacts would be the same as Alternative 2, but harvesting and burning activities may impact existing snags that could provide roosting habitat on 517 acres.

Cumulative Effects

The same as Alternative 1

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 4,108 cover type acres (100%) of mountain brush and young, middle age, mature, and old aspen in the analysis area is available to provide winter forage.

Cumulative Effects

Natural succession would have the biggest impact to mature live aspen throughout the analysis area in the long-term. Aspen, chokecherry, and serviceberry are regenerating and reaching maturity within the current big game and livestock utilization levels.

Alternative 2

Direct and Indirect Effects

Project activities would reduce 187 acres of cover type acres of aspen leaving 95 percent as winter foraging habitat; this is above the 80 percent sharp-tailed grouse guidelines. Because 80 percent winter forage would be available, 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

Alternative 3

Direct and Indirect Effects

Impacts would be the same as Alternative 2 except activities would reduce 64 cover type acres of aspen leaving 98 percent as winter foraging habitat.

Cumulative Effects

The same as Alternative 1

Alternative 4

Direct and Indirect Effects

Impacts would be the same as Alternative 2 except activities would reduce 187 cover type acres of aspen leaving 95 percent as winter foraging habitat.

Cumulative Effects

The same as Alternative 1

Sage-grouse (Percent Sagebrush Canopy Cover of Nesting and Brood-rearing Habitat.)

The sagebrush does not provide suitable sage-grouse nesting or brood-rearing habitat. The sagebrush in the project area is 1) not near known leks at lower elevations, 2) at a high elevation, 3) in forested openings, 4) small patch size, or 5) scattered individuals in mountain brush habitat. Any loss of sagebrush, under any alternative, would not impact sage-grouse.

4.2.7 Management Indicator Species

Revised Forest Plan Standards and Guidelines for goshawk, sharp-tailed grouse, and sage-grouse would be met under all alternatives. 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.

Northern goshawk

Alternatives 2 and 3 meet all but one Goshawk S&G and Alternative 4 meets all S&Gs to support viable populations. 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 NF. Surveys would be conducted yearly until tree removal activities are completed. Seven units exceeding the 40 acres guideline under Alternative 2 and six units in Alternative 3 are designed to treat the forested stands in a size reminiscent of the historical disturbance. See discussion above on description of openings. Goshawk productivity is expected in the future by meeting S&Gs in Alternative 4, and all but one in Alternative 2 and 3. Because the proposed change in forested stands would provide future goshawk habitat in the long term, and the existing goshawk nest has been productive with existing size of natural openings, including a 70 acre timber sale opening described above, we conclude that goshawk occupancy and production within the Caribou National Forest would be met under all alternatives.

Columbian sharp-tailed grouse

RFP S&G 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 project area would continue with the all alternatives.

Sage-grouse

RFP S&Gs would be met under all alternatives. Because sage-grouse are not expected to occupy sagebrush habitat in the project area impacts to sage-grouse were not analyzed. 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 2005b). We conclude that sage-grouse occupancy and production within the project area would continue with all alternatives.

4.2.8 Migratory Birds

Riparian (Aspen and Willow Growth)

Alternative 1

Direct and Indirect Effects

There would be no direct effect to riparian habitat. There would be small indirect impacts by maintaining no disturbances.

Cumulative Effects

Livestock grazing would continue with lower utilization level from implementing RFP S&Gs. Aspen and willows have resprouted in 8 percent of recently disturbed sites. Beaver and other wildlife foraging have caused resprouting. Aspen and willows, both early seral species, are reaching maturity with existing impacts (except in isolated areas). Natural succession will cause them to die under a mature forest canopy due to competition. This alternative would meet the intent of the Idaho Bird Plan objectives.

Alternative 2

Direct and Indirect Effects

Riparian buffers (if needed) would protect stream bank vegetation and meet the intent of the Idaho Bird Plan objectives. Aspen and willow outside riparian habitats would resprout on 709 acres of early seral habitat.

Cumulative Effects

The same as Alternative 1

Alternative 3

Direct and Indirect Effects

Impacts are the same as Alternative 2 except aspen and willow outside riparian habitats would resprout on 511 acres.

Cumulative Effects

The same as Alternative 1

Alternative 4

Direct and Indirect Effects

Impacts are the same as Alternative 2 except aspen and willow outside riparian habitats would resprout on 517 acres.

Cumulative Effects

The same as Alternative 1

Non-Riverine 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.

Cumulative Effects

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. Livestock water developments have increased the number of watering sites in the project area. There would be an increase of three livestock ponds. Migratory bird objectives 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 and 4

Direct and Indirect Effects

RFP S&G would protect wetlands and meet the Idaho Bird Plan objectives.

Cumulative Effects

The same as Alternative 1

Sagebrush (decrease of mature sagebrush)

There would be no change to sagebrush under any alternative.

4.2.9 Big Game

MULE DEER AND ELK (Forage:cover ratio)

Alternative 1

Direct and Indirect Effects

Hiding cover is provided on 17,940 acres (91%) and early seral vegetation provides summer/fall forage on 1,743 acres (9%) of the analysis area; the ratio is 91:09. There are no forest plan guidelines for cover:forage ratios however, 40:60 is considered optimum (Thomas 1979, 130). 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. Thinning young stands would not change cover/forage ratios.

Alternative 2

Direct and Indirect Effects

Project activities would decrease cover:forage ratio to 88:12; increasing forage. Aspen restoration on 187 acres would assist IDFG in meeting their Mule Deer Initiative.

Cumulative Effects

The same as Alternative 1

Alternative 3

Direct and Indirect Effects

Timber harvest would decrease cover to 89:11. Aspen restoration on 69 acres would assist IDFG in meeting their Mule Deer Initiative.

Cumulative Effects

The same as Alternative 1

Alternative 4

Direct and Indirect Effects

Timber harvest would decrease cover to 89:11. Aspen restoration on 187 acres would assist IDFG in meeting their Mule Deer Initiative.

Cumulative Effects

The same as Alternative 1

Irreversible and Irretrievable Resource Commitments:

Irreversible commitments of resources refer to non-renewable resources, such as heritage resources, or those factors that are renewable only over long periods, such as soil productivity. Irretrievable commitment applies to losses of production, harvested or use of renewable natural resources.

There would be no irreversible commitment of resources for wildlife. There would be an irretrievable loss of forage on roads and gravel pit areas, and mature forested habitat until rehabilitation occurs.

4.6 Fisheries

Cumulative Effects Analysis Area: Is the project area and those streams located along the two haul routes.

Alternative 1

Direct and Indirect Effects

This alternative would have no effect on fish habitat and fish other than a continuance of existing conditions. Stream sedimentation from roads along fish-bearing streams would continue to occur as a result of close proximity of roads to streams, steep slopes, road damage from non-logging vehicles, and poor drainage. No road improvements would be made in problem areas. Trout abundance would probably remain high because brook trout have demonstrated good reproduction in these conditions and because of rainbow trout stocking. Bonneville cutthroat trout populations would probably continue to decline until the species is extirpated from the analysis area.

Cumulative Effects

The cumulative effects of this alternative include the effects described above as well as impacts to fish habitat and/or fish from other sources like culverts, livestock, trail crossings, dispersed recreation, and competitive fish species. The alternative would add no incremental effects to past and present activities. No new activities are foreseen in the area.

Alternatives 2

Direct and Indirect Effects

This alternative is expected to have no measurable effect on fish habitat and fish. Existing conditions would continue as under Alternative 1. Hauling of timber on roads next to streams would not increase stream sedimentation because hauling would only occur when roads are dry and because some road improvements (spot graveling and drainage improvements) would be made in problem areas. The road improvements would not be sufficient to improve the overall quality of fish habitat. As under Alternative 1, trout abundance would remain high because brook trout have demonstrated good reproduction in existing conditions and because of rainbow trout stocking. Bonneville cutthroat trout populations would probably continue to decline until the species is extirpated from the analysis area.

Cumulative Effects

The cumulative effects of this alternative include the effects described above as well as impacts to fish habitat and/or from other sources like culverts, livestock, trail crossings, dispersed recreation, and competitive fish species. The alternative would add no incremental effects to past and present activities. No new activities are foreseen in the area.

Alternative 3

Direct and Indirect Effects

This alternative is expected to have no measurable effect on fish habitat and fish. Existing conditions would continue as under Alternatives 1 and 2. Hauling of timber on roads next to streams would not increase stream sedimentation because hauling would only occur when roads are dry and because some road improvements (spot graveling and drainage improvements) would be made in problem areas. The road improvements would not be sufficient to improve the overall quality of fish habitat. As under Alternatives 1 and 2, trout abundance would remain high because brook trout have demonstrated good reproduction in existing conditions and because of rainbow trout stocking. Bonneville cutthroat trout populations would probably continue to decline until the species is extirpated from the analysis area.

Cumulative Effects

The cumulative effects of this alternative include the effects described above as well as impacts to fish habitat and/or from other sources like culverts, livestock, trail crossings, dispersed recreation, and competitive fish species. The alternative would add no incremental effects to past and present activities. No new activities are foreseen in the area.

Alternative 4

Direct and Indirect Effects

This alternative is expected to have no measurable effect on fish habitat and fish. Existing conditions would continue as under Alternatives 1 and 2. Hauling of timber on roads next to streams would not increase stream sedimentation because hauling would only occur when roads are dry and because some road improvements (spot graveling and drainage improvements) would be made in problem areas. The road improvements would not be sufficient to improve the overall quality of fish habitat. As under Alternatives 1, 2, and 3, trout abundance would remain high because brook trout have demonstrated good reproduction in existing conditions and because of rainbow trout stocking. Bonneville cutthroat trout populations would probably continue to decline until the species is extirpated from the analysis area.

Cumulative Effects

The cumulative effects of this alternative include the effects described above as well as impacts to fish habitat and/or from other sources like culverts, livestock, trail crossings, dispersed recreation, and competitive fish species. The alternative would add no incremental effects to past and present activities. No new activities are foreseen in the area.

4.7 Roads and Access

Cumulative Effects Analysis Area: The analysis area for transportation and access is all roads that provide access to and from the project area or are accessed by them.

Temporary road building and upgrading roadbeds will be held to a minimum. Road densities will be reduced to act in accordance with road density standards designated in the RFP for each management prescription area. Once the burning phase of the project has been completed all temporary roads will be closed to motorized travel and decommissioned. These road closures would be made effective by a combination of one or more of the following: piling logs, stumps, debris (slashing) across the entire road grade and physically decommissioning the passageway by ripping and berming. These disturbed sites would then be seeded to native species to assist in the control erosion and noxious weed invasion.

Roads and Access Issue Indicators: The indicator is the total number of miles of road improvements by each alternative which includes the number of miles of road construction and reconstruction, but does not include the number of miles of temporary roads. Temporary roads by their definition are intended for short term resource management. They will be decommissioned and returned to production after the burning phase of the proposal is completed.

The table below summarizes the information displayed in Chapter 3 for the project area as a whole rather than 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 2.

Table 4.7-1 Current Road Densities of the Analysis Area

Status	Miles				Miles/Sq Mile		
	R _x 3.2.b	R _x 5.2.b	Total Miles		R _x 3.2.b	R _x 5.2.b	Total
Square Miles	0.61	3.42	4.03	R_x Allowable Miles/Sq Mile	1.50	2.00	
Open	1.33	13.38	14.71		2.18	3.91	3.65
Closed	2.10	1.14	3.24		3.44	0.33	0.80
Total	3.43	14.52	17.95				4.45

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 upon available maintenance

Status	Miles	Miles/Sq Mile
Square Miles	4.03	
Open	14.71	3.65
Closed	3.24	0.80
Total	17.95	4.45

funds, which are currently very limited. The costs associated with purchasing and hauling of gravel from a source other than from the Forest is cost prohibitive. 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.

Indicator: number of miles of road improvements. Total road improvements of construction and reconstruction for Alternatives 1 are 0 miles, with no road obliteration.

Cumulative Effects: Open roads within the project would continue to contribute to the density for both Forest Plan Prescription areas.

Alternative 2

Direct and Indirect Effects:
The road activities described in **Chapter 2** for the proposed action would occur. The effect of reconstruction to transportation routes would be an improvement of access within the project

Status	Current		Post Alternative 2	
	Miles	Miles/Sq Mile	Miles	Miles/Sq Mile
Square Miles	4.03		4.03	
Open	14.71	3.65	13.41	3.33
Closed	3.24	0.80	4.84	1.20
Total	17.95	4.45	18.25	4.53

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. Approximately 1.0 miles of road reconstruction (road # 480) is on a road that is maintained as closed currently and will be maintained as open after the project is completed. New road construction would disturb not more than three acres. Decommissioning existing roads would reclaim approximately six acres. All temp roads would be reclaimed and have no net effect upon open road densities.

There is an economic need to identify and develop a gravel source near or within the project area to facilitate the road proposal improvements of reconstruction and spot graveling.

Indicator: number of miles of road improvements: Total road improvements (approximate mileages) of construction and reconstruction for Alternatives 2 are 5.7 miles, 1.8 miles temporary road construction, with a total of 2.2 miles of road obliteration, and 0.1 miles of road converted to trail.

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. Obliterating Roads 478, X480 and obliteration with relocation of 479 will reduce erosion considerably. Deferred Maintenance cost will be reduced on the improved roads. Existing roads will be in better condition in the future and provide better access with less miles of open road.

Alternative 3

The effects of Alternative 3 would be the same as Alternative 2 with the following exceptions that exclude road activities in the Soda Point IRA.

Direct and Indirect

Effects: There would be 0.2 miles less road reconstructions and 0.3 miles less temporary road construction then under the proposed action. Approximately 1.0 miles

Status	Current		Post Alternative 3	
	Miles	Miles/Sq Mile	Miles	Miles/Sq Mile
Square Miles	4.03		4.03	
Open	14.71	3.65	13.41	3.33
Closed	3.24	0.80	4.84	1.20
Total	17.95	4.45	18.25	4.53

of road reconstruction (road # 480) is on a road that is maintained as closed currently and will be maintained as open after the project is completed.

There is an economic need to identify and develop a gravel source near or within the project area to facilitate the road proposal improvements of reconstruction and spot graveling.

Indicator: number of miles of road improvements: Total road improvements (approximate mileages) of construction and reconstruction for Alternatives 3 are 5.5 miles, 1.5 miles of temporary road construction, with a total of 2.2 miles of road obliteration, and 0.1 miles of road converted to trail.

Cumulative Effects: The same as Alternative 2.

Alternative 4

The effects of Alternative 4 would be approximately the same as Alternative 2 with the following exceptions that accommodate the Goshawk alternative.

Direct and Indirect

Effects: There would be 0.6 miles less road reconstructions and 0.4 miles less temporary road construction. Approximately 1.0 miles of road

Status	Current		Post Alternative 4	
	Miles	Miles/Sq Mile	Miles	Miles/Sq Mile
Square Miles	4.03		4.03	
Open	14.71	3.65	13.41	3.33
Closed	3.24	0.80	4.84	1.20
Total	17.95	4.45	18.25	4.53

reconstruction (road # 480) is on a road that is maintained as closed currently and will be maintained as open after the project is completed, and will have no net effect on public access.

There is an economic need to identify and develop a gravel source near or within the project area to facilitate the road proposal improvements of reconstruction and spot graveling.

Indicator: number of miles of road improvements: Total road improvements (approximate mileages) of construction and reconstruction for Alternatives 4 are 5.1 miles, 1.4 miles of temporary road construction, with a total of 2.2 miles of road obliteration, and 0.1 miles of road converted to trail.

Cumulative Effects: The same as Alternative 2.

Irreversible and Irretrievable Resource Commitments: Irreversible commitments would be the area permanently taken out of production for system roads which is documented within the *Soils* section of this chapter. There are no irretrievable resource commitments.

4.8 Soda Point Roadless Area

The direct, indirect, and cumulative effects disclosed below are done with project design and mitigation measures in place (see Chapter 2).

The entire Soda Point IRA was chosen to disclose the cumulative effects on the wilderness attributes and Roadless Area Conservation Rule Characteristics. The entire IRA was chosen because it is an administrative unit. Developments that occur would reduce the size of the entire IRA.

Past, present, and future foreseeable actions that affect Wilderness Attributes and Roadless Area Conservation Rule Characteristics are displayed in Chapter 3

Alternative 1 (No Action) and Alternative 3 No logging, road building, or associated activities in Soda Point IRA

The only Alternative 3 activity that occurs in the IRA is reconstruction of the 480 road, the road sections that are within the IRA are within 40 meters of the boundary, therefore the affects are so similar that the two alternatives are displayed together. As described in chapter 3 (also highlighted in this section) the portion of the IRA affected by Alternative 3 would not be included in the IRA if re-inventoried using the latest information. The protrusion affected by the 480 reconstruction contributed to the **low** manageability rating identified in the RFP.

Wilderness Attributes

Natural Integrity

Direct/Indirect Effects

Under these two Alternatives there would be no proposed project actions in the Soda Point IRA. There would be no direct/indirect effects.

Cumulative Effects

Past and present human influences have brought about the moderate rating. There are no future foreseeable actions that would impact natural integrity. Cumulative effects are from past and present actions. A **moderate** rating should be maintained.

Apparent Naturalness

Direct/Indirect Effects

Since there are no activities planned under Alternatives 1 and 3 there would be no direct/indirect effects.

Cumulative Effects

The cumulative effects are from past and present actions. The Revised Forest Travel Plan is the only known foreseeable action that could impact apparent naturalness. At this time it is not known what those impacts would be. The present rating of **moderate** should be maintained.

Remoteness

Direct/Indirect Effects

Under Alternative 1 and 3 there would be no project activities within the boundary of the IRA. Visitors within the IRA boundary may encounter sights and sounds of civilization but most would come from activities outside the IRA boundary.

Cumulative Effects

Past and present actions have brought about a moderate rating. Some of these sights and sounds are associated with truck/sedan traffic, motorized vehicle traffic along trails, fuel wood gatherers, hikers and various other visitor related sights and sounds. These would continue in the future. The only future foreseeable action that could influence sights and sounds would be the Revised Travel Plan. The existing **moderate** rating should be maintained.

Solitude

Direct/Indirect Effects

There are no direct/indirect effects to the entire Soda Point IRA since there are no project activities under Alternatives 1 and 3.

Cumulative Effects

The moderate rating is a result of past and present actions. Criteria, such as size of the IRA, screening, distance, and degree of intrusion have been determined in the RFP. At the present time visitors would have to move into the core area to escape most of the sights, sounds and presence of humans. The existing **moderate** rating should be maintained.

Opportunity for Primitive Recreation

Direct/Indirect Effects

The lack of project actions under Alternatives 1 and 3 would not impact the opportunity of primitive recreation. There would not be a change in or a limit on the number and types of activities, change the challenge of opportunities and would not add any facilities.

Cumulative Effects

The cumulative effects are from past and present actions. There is nothing in the foreseeable future that would adversely impact the opportunity for primitive recreation. The existing **low** rating should be maintained.

Special ecological, geological or cultural features

Direct/Indirect Effects

There are no known special ecological, geological or cultural features. There are no proposed actions within the Soda Point IRA. Therefore, there are no direct/indirect effects.

Cumulative Effects

There are no known foreseeable future actions. There are no cumulative effects.

Manageability

Direct/Indirect Effects

Since there are no proposed actions under both Alternative 1 and 3 there would be no direct/indirect effects.

Cumulative Effects

The **poor** manageability rating along inventoried boundaries is a result of past and present actions. There are no known foreseeable future actions. Manageability would continue to be **poor** along inventoried boundaries. As noted in chapter 3 if the Roadless boundary was re-inventoried using the more accurate past harvest and road inventories the southern protrusion would not meet the criteria used in the 1996 inventory. A re-inventory would likely improve the manageability rating.

Revised Forest Plan Roadless Area Re-Evaluation Criteria

Cultural Resources, Traditional Cultural Properties, and Sacred Sites

Direct/Indirect Effects

There are no known sites in the Soda Point IRA. There would be no direct/indirect effects on cultural resources, traditional cultural properties, or sacred sites.

Cumulative Effects

There are no foreseeable futures actions. There are no cumulative effects.

Soil Resources

Direct/Indirect Effects

There would be no proposed actions under Alternative 1 and 3 in the Soda Point IRA. None of the areas identified as an erosion hazard would be adversely impacted.

Cumulative Effects

Soils surveys have identified areas that have an erosion hazard in the Soda Point IRA. Past and present activities have occurred on these lands. Under the Alternatives 1 and 3, no actions would occur in these areas within the IRA boundary. The only know foreseeable future action is the Revised Travel Plan. A decision concerning this document has not been made. Cumulative effects are from past and present actions.

Air Quality

Direct/Indirect Effects

Air quality should remain excellent over the IRA. Burning of logging slash under Alternative3 would be allowed only when favorable meteorological conditions and air quality conditions exist and when federal ambient air quality standards would not be exceeded and sensitive receptors would not be impacted based on site-specific analysis.

This burning would occur adjacent to the IRA not within the boundary. Therefore there would be no direct/indirect effects on air quality.

Cumulative Effects

The present air quality is excellent. There would no prescribed aspen burn and the burning of logging slash outside the IRA would not affect air quality in the IRA. There are no known foreseeable future actions that would impact air quality. There are no known cumulative effects.

Municipal Watersheds, Sources of Public Drinking Water, Watershed Condition, and Water Quality

Direct/Indirect Effects

No timber harvest, road building, or burning would occur within these drainages of the IRA. There would be no direct/indirect effects of the City of Grace water supply and transmission systems described in Chapter 3. The watershed should remain in moderate condition.

The portion of the IRA that is rated to be in poor or deteriorated condition would continue in that trend due to conditions located off Forest Service lands.

Cumulative Effects

The only known foreseeable future action is the Travel Plan Revision. The outcome of that plan has not been determined. The cumulative effects would be from past and present actions.

Ecosystem Disturbances

Aspen Decline Rating

Direct/Indirect Effects

Under Alternative 1 and Alternative 3 no aspen would be treated. The aspen decline rating would remain **high**. Aspen within the IRA would continue toward maturity/over maturity.

Cumulative Effects

Past and present actions have led to the **high** aspen decline. The proposed action would not change the high rating and nothing in the foreseeable future would change aspen decline.

Insect Hazard

Direct/Indirect Effects

The **low** rating would be maintained in the short term since no cutting of DF would occur under either Alternative 1 or Alternative 3. In the long term, as the Douglas-fir trees age and density increases, the risk for a DF bark beetle attack would increase. Management of Douglas-fir forests offers the best method of preventing or minimizing damage by the Douglas-fir beetle, stands should be thinned periodically to maintain vigorous growth and to reduce moisture stress. (USDA 1978)

Mountain Pine Beetle risk will remain high in 63% of the stands susceptible to MPB, approximately 8% of the IRA is susceptible.

Cumulative Effects

The existing low insect rating (based on Douglas-fir bark beetle) is a result of past and present activities within the IRA boundary (i.e. 1990's infestation and salvage within the IRA). The in the Bailey Creek area are relatively young (resulting from turn of the century harvest) and dense, the risk to these stands will increase as they continue to mature. Under Alternative 1 and 3 there would be no harvest. There are no foreseeable future actions that would impact the insect hazard rating. Since the Douglas-fir stands would not be treated, the insect hazard rating would increase as trees become mature to over mature.

Fire Hazard

Direct/Indirect Effects

With no treatments proposed, the fire hazard would remain high. Over the long term down fuel would continue to accumulate maintaining at least a **high** fire hazard. Succession will continue, sub alpine fir will increase, adding to the continuity of the ladder and aerial fuels.

Cumulative Effects

Past and present actions have brought us to the existing condition. There are no foreseeable future actions that would reduce the fuel loading, succession will continue to increase it. Therefore the effects would be the past, present actions, lack of treating aspen under Alternatives 1 and 3, and the future action of no treatments and succession would continue to maintain a **high** fire hazard rating.

Invasive Plant Species

Direct and Indirect Effects

There would be no ground disturbing activities from logging or burning to encourage an increase in noxious weed populations within the IRA boundary. Noxious weed populations especially dyers woad would continue to increase as in the past.

Cumulative Effects

Past and present actions have brought us to the existing condition. Present activities such as recreation, livestock grazing, fuel wood gathering and big game hunting could continue the spread noxious weeds. The only foreseeable future action would be the implementation of the Travel Plan. Cumulative effects are from past and present actions.

Threatened, Endangered, Proposed, Candidate and Sensitive Animal Species

Direct/Indirect Effects

The rating of **moderate** for lynx and **low** for wolves and wolverines would not be changed.

Cumulative Effects

Past and present actions have brought us to the existing condition. There are no future foreseeable actions except the Travel Plan Revision. No decision has been made about the travel plan at this time. The cumulative effects are the past and present actions.

Biological Conservation Assessment

Direct/Indirect Effects

Alternative 1 and Alternative 3 would have no adverse impacts on the **moderate** rating for forest associated species, Noss' Bear River Range or **high** departure from PFC.

Cumulative Effects

There are no known foreseeable future actions except the Travel Plan Revision. The preferred alternative has not been determined. The past and present actions are the cumulative effects.

Fisheries Biological Strongholds

Direct/Indirect Effects

There are no strongholds within the Soda Peak IRA. Alternative 1 and Alternative 3 should not change this situation.

Cumulative Effects

Cumulative effects are a result of past and present actions. Alternative 1 and Alternative 3 would not change this condition. There are no known future foreseeable actions that would change the stronghold situation.

Rare Plants, Rare Plant Communities and Plant Communities

Direct/Indirect Effects

Since there are no known rare plants, rare plants or plant communities, there would be no direct/indirect effects. Alternative 1 and Alternative 3 should not change the status of no rare plants or rare plant communities in the long term.

Cumulative Effects

Because there are no rare plants or plant communities there would be no known cumulative effects.

Reference Landscapes

Direct/Indirect Effects

There would be no change in the **moderate** to **high** rating for the criteria for reference landscapes. Soda Point IRA would still remain the fourth largest IRA on the Montpelier Ranger District, remain **low** for lynx linkage and **low** for wolverine and wolves, and provide opportunity for large-scale vegetation restoration projects.

Cumulative Effects

The existing condition is a result of past and present actions. Alternative 1 and 3 would not change this condition. The Travel Plan Revision is the only known future foreseeable action. How the Travel Plan Revision would impact reference landscapes is not known at this time. The cumulative effects are from past and present actions.

Semi-Primitive Recreation, Summer and Semi-Primitive, Winter

Direct/Indirect Effects

There would be no direct/indirect effects on the number of acres in semi-primitive non-motorized; semi-primitive motorized, Roaded Natural, both summer and winter.

Cumulative Effects

Direct and indirect effects have been determined by past and present actions. Alternatives 1 and 3 should not change the designations. The only known foreseeable

future action that may have impacts is the Travel Plan Revision. At this time it is too early to determine its impacts.

Landscape Character and Scenic Integrity

Direct/Indirect Effects

Under Alternatives 1 and 3 there would be no change in landscape character and scenic integrity in the short term. In the long term as plant succession continues to occur, there would be a change in plant species composition that could affect landscape character, i.e. alpine fir would continue to take over Douglas-fir, lodgepole pine and aspen stands. In the long term scenic integrity should be maintained. The risk of an uncharacteristic wildfire will continue to increase; an uncharacteristic wildfire has the potential to affect the scenic integrity of the IRA.

Cumulative Effects

The existing landscape character and scenic integrity condition has been determined by past and present actions. Alternative 1 and 3 do not propose any actions in the IRA. The only foreseeable future action is the Travel Plan Revision. The outcome of Travel Plan Revision action is not known at this time. The cumulative effects are the past and present actions and from not altering the species composition under Alternative 1 and 3..

Oil/Gas and Phosphate Leases, Locatable Minerals and Minerals Materials

Direct/Indirect Effects

Alternatives 1 and 3 would have no impacts on the above since there no existing leases or known potential for any in the future. There would be no direct/indirect effects on leases or minerals.

Cumulative Effects

There are no future foreseeable actions that would impact oil/gas, phosphate or minerals. There no known cumulative effects.

Special Uses Permits, Utility Corridors and Other Features

Direct/Indirect Effects

With no project activities proposed in either Alternatives 1 or 3, there would be no adverse impacts.

Cumulative Effects

Alternatives 1 and 3 would not impact the above features. There are no known future foreseeable actions. The cumulative effect is from past and present actions.

Alternative 2 & 4(Activity in Roadless)

Although alternatives 2 and 4 are not exactly the same the consequences on IRA resources are very similar. The affects to Wilderness Characteristic and RFP Roadless Characteristics are so similar we did not feel that we need to report them separately. The discussion of affects below uses the harvest and road numbers for alternative 2. Below is a list of the exact differences between the two alternatives.

For **Alternative 2** the following activities occur within the Soda Point IRA:

- Regeneration harvest and subsequent activities on 80 acres of mature lodgepole pine
- Prescribed burning of 118 acres of mature aspen/conifer
- Fifty-two contingency acres of mountain brush adjacent to the aspen prescribed burn acres (these acres are within the primary control lines but will not be ignited on purpose.
- Temporary road construction equal to 0.3 miles
- Reconstruction of 1.0 miles of road # 480. (Road 480 winds in and out of the Soda Point IRA along the IRA boundary, approximately 0.4 mile is within the IRA. None of the sections inside the boundary are more than 40 meters from the boundary.
- Reconstruction of road X480A (approximately 0.2 miles).

For **Alternative 4** the following activities occur within the Soda Point IRA:

- Regeneration harvest and subsequent activities on 64 acres of mature lodgepole pine
- Prescribed burning of 118 acres of mature aspen/conifer
- Fifty-two contingency acres of mountain brush adjacent to the aspen prescribed burn acres (these acres are within the primary control lines but will not be ignited on purpose.
- Temporary road construction equal to 0.3 miles (this alternative is slightly shorter but still rounds to 0.3)
- Reconstruction of 1.0 miles of road # 480. (Road 480 winds in and out of the Soda Point IRA along the IRA boundary, approximately 0.4 mile is within the IRA. None of the sections inside the boundary are more than 40 meters from the boundary.
- Reconstruction of road X480A (approximately 0.2 miles).

Wilderness Characteristics

Natural Integrity

Direct/Indirect Effects

Implementing Alternative 2 would have a slight change to the long term ecological processes of the entire IRA. Conifer succession would be set back by removing the mature lodgepole creating an area that would contrast with the surrounding natural succession of conifer. The prescribed aspen burn should mimic a wildfire. The fire would appear to be natural with the long-term ecological processes in tact and operating. The existing **moderate** rating would remain unchanged over the entire roadless area.

Cumulative Effects

The moderate rating is a result of past and present human activities over the entire IRA. The impacts of Alternative 2 are described in the above direct and indirect effects. The only known foreseeable action that could affect apparent naturalness is the Travel Plan Revision. How the implementation of the plan would impact apparent naturalness is not known. The cumulative effects are from past, present and actions described in Alternative 2.

Apparent Naturalness

Direct/Indirect Effects

The regeneration harvesting, skidding, loading, hauling, slash treatment and road building would be obvious to the casual observer from the Highline Trail in the short term. It would not be visible from US Highway 30 or from State Highway 34. The cutting units are adjacent to existing harvest units which already have a managed appearance. Most of the viewing of the prescribed aspen burn would be from State Highway 34. With the possible exception of hand constructed fire lines, the hand of man would not be evident. It is doubtful that the hand constructed fire lines could be seen from Highway 34. A **moderate** rating would be maintained for the entire roadless area.

Cumulative Effects

The moderate rating is a result of past and present activities. Under the RFP these present activities would continue. The direct/indirect effects are described above. The only foreseeable future activity that may impact this wilderness attribute is the Revised Travel Plan. At this time it is not known what the impacts might be. The cumulative effects are from past, present and the proposed action under this alternative.

Remoteness

Direct/Indirect Effects

Sights and sounds of logging and burning operations would be evident in the short term. There would be no impacts in the long term. Access to the area would remain unchanged. These activities would not change the **moderate** rating assigned to the IRA.

Cumulative Effects

The present and past sights and sounds of civilization have determined the existing moderate rating. The direct/indirect effects are described above. It is not known how the foreseeable Travel Plan Revision could affect remoteness. The cumulative effects are from past, present and proposed actions.

Solitude

Direct/Indirect Effects

The area proposed for harvest is located near the boundary of the IRA where sight and sounds of civilization are common. Since logging activities would occur in a narrow protrusion of the IRA, visitors could escape sights and sounds of logging operations by moving into the core of the IRA. Screening would help to eliminate some of the sights and sounds of project activities. Timber harvest activities or prescribe burning would impact solitude in the short term on a portion of the IRA. There would be no long term impacts on solitude. Logging and burning activities should not change the existing **moderate** rating over the entire IRA.

Cumulative Effects

Past and present activities have brought us to the existing condition of a moderate rating. The short term impacts on solitude are described above. The only known foreseeable future activity is the Travel Plan Revision. How this would impact solitude is not known at this time. Cumulative effects are from past, present and activities associated with timber harvest under this alternative.

Opportunity for Primitive Recreation

Direct/Indirect Effects

Timber harvest and prescribed burning would not have an adverse impact on the size of the IRA in relation to opportunity for primitive recreation. It would have little affect on the number or types of activities. It would not change the challenge of these opportunities. The proposed management of roads would have adverse impact on opportunities for primitive recreation. The overall rating for the entire roadless area would remain **low**.

Cumulative Effects

The present and past actions have contributed to the opportunities for primitive recreation. The direct/indirect effects are explained above. The only foreseeable future activity is Revised Travel Plan. At this time it is not know how the final decision would impact the opportunity for primitive recreation. The cumulative effects are past, present and proposed activities.

Special ecological, geological or cultural features

Direct/Indirect Effects

There are no special features in the IRA. There are no direct or indirect affects.

Cumulative Effects

There are no special features therefore, there are no cumulative effects.

Manageability

Direct/Indirect Effects

This alternative proposes to harvest 80 acres within the IRA; this proposed harvest would be removed from wilderness consideration due to regeneration cutting. Redrawing the IRA boundary is not part of the decision to be made, however as described in the existing condition if the boundary was redrawn approximately 420 acres of the southern protrusion would be dropped based on the 1996 criteria. Using this logic only 9 acres

would be affected, the remaining 72 acres is in the protrusion. The 9 acres is along the boundary of an existing regeneration harvest unit. Road reconstruction of road 480, X480A and the 0.3 miles of temporary road (T480A) are within the protrusion, as noted before 480 and X480A already exist within the current IRA boundary. The prescribed aspen burn would not affect the manageability rating. An overall rating of **poor** along current inventoried boundaries would remain for the entire roadless area.

Cumulative Effects

The poor manageability is a result of past and present actions. The direct/indirect effects are displayed above. There is nothing in the foreseeable future that would adversely impact the manageability. The cumulative effects are from past, present, and proposed actions under Alternative 2.

Revised Forest Plan Roadless Area Re-Evaluation Criteria

Cultural Resources, Traditional Cultural Properties, and Sacred Sites

Direct Effects/Indirect Effects

A cultural resource survey has been completed and no sites were found in the Soda Point IRA. Therefore, there are no direct or indirect effects.

Cumulative Effects

Since the potential rating for cultural resources is low and there are no future foreseeable actions in the IRA, there are no cumulative effects.

Soil Resources

Direct/Indirect Effects

In the portion of the IRA proposed for logging there are no soils that have an erosion hazard rating (hhm).

The RFP designates the area of the aspen burn as having an erosion hazard rating (hhm). However, an on the ground analysis of this area by the forest soil scientist discloses that it is not “hhm” and that burning aspen would not have an adverse effect on the soil resource. (Lott 2004) There are no direct/indirect effects

Cumulative Effects

The direct/indirect effects are displayed above. There are no known future foreseeable action high erosion areas. Past and present actions that have occurred in these high erosion areas are the cumulative effects.



Figure 4.8-1 Soil Pit in Unit 14: This is a site previously mapped as a soil hazard rating of hmm. Lott during field visit determined that the site was incorrectly mapped.

Air Quality

Direct/Indirect Effects

Air quality should remain excellent over the IRA. All burning under Alternative 2 would be allowed only when favorable meteorological conditions and air quality conditions exist and when federal ambient air quality standards would not be exceeded and sensitive receptors would not be impacted based on site-specific analysis.

Cumulative Effects

Air quality is presently good. Implementing Alternative 2 would not impact air quality. There are no known future foreseeable actions that would impact air quality. There are no cumulative effects.

Municipal Watersheds, Sources of Public Drinking Water, Watershed Condition, and Water Quality

Direct/Indirect Effects

There is no municipal watershed/public drinking water or domestic culinary/irrigation located in the portion of the IRA proposed for harvest or aspen burning. The portion of IRA purposed for logging is located in the 97% of the IRA rated “yellow” meaning it is in moderate condition for watershed disturbance. Harvesting the purposed 80 acres and burning the 118 acres of aspen would have no direct/indirect effect on public drinking water.

That portion of the IRA purposed for logging is internally drained. There would be no direct/indirect effects on watershed condition and water quality to Eightmile Creek or any other perennial streams.

Cumulative Effects

Past and present actions have brought us to the existing condition. There are no foreseeable actions that would adversely impact public drinking water, watershed conditions or water quality. The cumulative effects are from past and present actions.

Ecosystem Disturbance

Aspen Decline Rating

Direct Effects Indirect Effects

The proposed 118 acre aspen/conifer burn would be a minor positive impact on aspen restoration. Additionally, aspen is present in the 80 acres proposed for harvest in the IRA, other past harvests next to these stands have resulted in excellent aspen regeneration. The net affect would be aspen restoration on 199 acres within the IRA

Cumulative Effects

Direct/Indirect effects are displayed above. Lack of past and present disturbances has brought on the **high** decline aspen rating. There are no foreseeable future actions that would change the overall rating. The small acreage treated under this alternative would have little change in aspen restoration over the entire IRA. Aspen is currently present on approximately 9,000 acres of the IRA, this action would only affect about 2%.

Insect Hazard

Direct Effects

The **low** rating would be maintained in the short term since no cutting of DF would occur under Alternative 2. Management of Douglas-fir forests offers the best method of preventing or minimizing damage by the Douglas-fir beetle, stands should be thinned periodically to maintain vigorous growth and to reduce moisture stress. (USDA 1978)

The percent stand acres at high risk to mountain pine beetle will drop from 63% to 58%. Approximately 8% of the IRA is susceptible to MPB.

Indirect Effects

As Douglas-stands age and densities increase, the risk of a beetle attack will increase. Eventually the rating of **low** would change to moderate or high depending on the age of the stands.

Cumulative Effects

The existing low insect rating (based on Douglas-fir bark beetle) is a result of past and present activities within the IRA boundary (i.e. 1990's infestation and salvage within the IRA). The stands in the Bailey Creek area are relatively young (resulting from turn of the century harvest) and dense, the risk to these stands will increase as they continue to mature. Alternative 2 would harvest/treat only a small percent of the forested acres. There are no foreseeable future actions that would impact the insect hazard rating. Due to forest succession, the insect hazard rating will increase with time.

Fire Hazard

Direct Effects

Logging the mature lodgepole pine stand and burning the mature aspen/conifer would reduce the fire hazard by reducing the long term fuel buildup and setting back succession on 199 acres.

Indirect Effects

Succession will continue, sub alpine fir will increase, adding to the continuity of the ladder and aerial fuels. Long term fuel buildup would continue as stands within the IRA are not treated. A high rating would be maintained.

Cumulative Effects

The past and present actions of fire suppression, lack of prescribed fire and treatment of mature/over mature stands by other methods have led to the present fuel loading. Logging the 80 acres and burning 118 acres of aspen/conifer would slightly reduce the fuel loading/fire hazard. The portion of the IRA outside RFP Rx 5.2 will likely be included in a Wildland Fire Use Plan in the future, which could further reduce fire hazard across IRA. The cumulative effects are from past and present actions.

Invasive Plant Species

Direct Effects

Logging would create 80 acres of new disturbance within the IRA and 0.3 miles of temporary road and associated landing would affect an additional 0.5 acres which would be contained in the harvest unit. This new disturbance would create a potential for noxious weeds to become established. The disturbance from the prescribed fire operation also is at increased risk. Noxious weeds has been identified and included on the Sale Area Improvement Plan (KV plan). Past projects indicate that KV dollars will be available to mitigate these affects.

Indirect Effects

Noxious weeds will likely continue to spread in the area on acres not treated under this alternative. There is also the potential for spreading of noxious weeds in the harvest units and burn unit. The District weed control program would continue to target priority weed species and areas.

Cumulative Effects

Populations of noxious weeds have been steadily increasing especially dyers woad. Treatment of noxious weeds in the areas to be logged and burned would help to control weed populations. The Revised Travel Plan is the only foreseeable future action. The plan has not been finalized at this time. Cumulative effects would be from past, present, and proposed actions.

Threatened, Endangered, Proposed, Candidate and Sensitive Animal Species

Direct/Indirect Effects

Harvest activities or burning would slightly alter the amount of forested cover and lower security in the short term. In the long term the harvest and burn area would be regenerated, restoring the needed cover. It would not affect the presence of a north south

ridge that may function as a travel corridor. Thus the rating of **moderate** for lynx linkage and **low** for wolverine and wolves would remain the same in the short and long term.

Cumulative Effects

The Revised Travel Plan is the only known foreseeable action. The plan has not been finalized at this time. Cumulative effects are past and present actions.

Biological Conservation Assessment (Wildlife Biological Strongholds)

Direct Effects

Timber harvest and aspen burning would reduce cover in the short term. This would not have an impact on Noss' Bear River Range rating. The rating would remain **moderate**. The **moderate** rating for high departure from PFC would not change. The RFP recommends that a prescription that allows restoration of aspen to help reduce the high departure from PFC. There are no grouse leks in the IRA.

Indirect Effects

In the long term a **moderate** rating for Noss' Bear River Range and a rating of **high** departure from PFC would continue.

Cumulative Effects

The existing ratings have been brought about by past and present conditions. Treatments under this alternative would maintain these ratings. There are no future foreseeable actions that would change these ratings. Cumulative effects are from past, present and actions under Alternative 2.

Fisheries Biological Strongholds

Direct Effects/Indirect Effects

There are no fisheries biological strongholds within the Soda Point IRA. Therefore, there are no direct or indirect effects.

Cumulative Effects

The lack of fisheries strongholds could be a result of past and present actions. This information is not available. Actions under Alternative 2 would not impact fisheries strongholds if they were present. The Travel Plan Revision is the only known foreseeable future action. The plan has not been implemented, therefore its future impacts are no known.

Rare Plants, Rare Plant Communities and Plant Communities

Direct Effects/Indirect Effects

There are no known rare plants, rare plant communities, or plant community reference in the IRA boundary therefore there are no direct or indirect effects.

Cumulative Effects

There are no cumulative effects.

Reference Landscapes

Direct Effects/Indirect Effects

Harvesting 80 acres of lodgepole and burning 118 acres of aspen/conifer would not have an adverse impact on the unique reference landscape of Burton Canyon RNA, the Grace Municipal watershed and the large scale aspen restoration areas. Regenerating the aspen by burning would enhance the restoration effort. However, there would not be an overall

change in the IRA or on the broader landscape. An over all rating of **moderate to high** would be maintained due to the size of the IRA. A **moderate** rating for lynx linkage habitat and **low** for wolverine and wolves would be maintained.

Cumulative Effects

The existing condition is a result of past and present actions. The proposed action would not change the overall ratings. There are no foreseeable future actions that would adversely impact reference landscape. The cumulative effects are the past, present and actions under Alternative 2.

Semi-Primitive Recreation Summer, and Semi Primitive Winter

Direct and Indirect Effects

Timber harvest with its associated activities and the prescribed aspen/conifer burn would not have very little effect semi-primitive recreation summer and semi primitive winter. The areas designated for logging is along the edge of existing past harvest units and would not currently be considered semi-primitive. Due to the over all size of the IRA and the location of the activities, this alternative would not have an affect on semi-primitive recreation opportunities within the IRA.

Cumulative Effects

Past and present management activities have established the existing recreation uses and demands. Activities under this alternative would have no impact on future recreation uses. The only known future action that could impact semi-primitive recreation is the Travel Plan Revision. Since the plan is in the planning stage, its outcome is not known. Cumulative effects are from past and present actions.

Landscape Character and Scenic Integrity

Direct Effects

Mature lodgepole pine and aspen would be replaced by seedlings/saplings in the short term. This would be obvious to the casual observer. This age difference would be apparent in the long term but not as obvious to the casual observer. Over the entire IRA it would have little impact. Vegetation in this IRA would remain similar to that found in the remainder of the Bear River Range and would not be considered unique. The landscape would continue to have the appearance of both direct and indirect human activities. These deviations would appear to be part of the landscape for the majority of the viewers.

Harvest activities in the designated portion of the IRA would not be visible from US Highway 30 or State Highway 34. Harvest activities would be noticeable from the Highline Trail in the North Cheatbeck Basin area in the short term. To some viewers the cutting unit could mimic natural openings that are present in the existing landscape. Past cutting units are currently visible on the fringes of the boundary. See VQO section for more specifics.

Indirect Effects

Over time as the lodgepole pine is regenerated the impacts of harvest would diminish. As trees occupy the site, harvest activities may not be as obvious to the casual observer.

Cumulative Effects

Past and present harvest activities have created openings in the conifer canopy adjacent to and within the current IRA boundary. Direct/indirect effects are explained above. None of the past, present, or proposed cutting units are visible from U.S. Highway 30 or State Highway 36. There are no known future foreseeable actions that would impact landscape character or scenic integrity. The cumulative effects are from past, present and actions proposed under Alternative 2.

Oil/Gas and Phosphate Leases,

Direct Effects/Indirect Effects

Since there are no existing leases for oil/gas, no known potential for phosphate ore, and no active mining or exploration for locatable minerals, there would be no direct/indirect effects.

Cumulative Effects

No cumulative effects are known.

Special Uses Permits, Utility Corridors and Other Features

Direct Effects/Indirect Effects

The area within the IRA that includes the special use permits (electronic site, culinary water source for the city of Grace, Idaho, and domestic culinary and irrigation sources) does not occur in that part portion of the IRA proposed for timber harvest. There would be no direct/indirect effects.

Cumulative Effects

There are no known cumulative effects.

4.9 Economics

Direct, Indirect, and Cumulative Effects **Comparisons of All Alternatives**

Timber Harvest:

ASQ Volume (allowable sale quantity) is the total estimate of sawlog volume to be offered from 5.2 Forest Vegetation Management lands, and is included in the suitable timber base as prescribed by the RFP.

Indicator: The extent of economic value captured from acres assigned the prescription of 5.2 by timber harvest is the number of millions of board feet (MMBF) harvested.

Table 4.9-1 is an estimate of sawlog volume which would be offered for each alternative. Past timber sale cruised volumes were used to generate an estimate of 8 thousand board feet (MBF) per acre for conifer regeneration and 3 MBF/acre for aspen restoration and thinning. Actual volume will be determined during sale preparation.

Table 4.9-1 Forest ASQ Volume Offered by Alternative:

Alternative	Acres Proposed for Timber Harvest	ASQ Volume * Thousands of Board Feet (MBF)	ASQ Volume * Millions of Board Feet (MMBF)
1	0	0	0
2	590	4,195	4.2
3	510	3,735	3.7
4	399	2,839	2.8

* This is the total estimate of sawlog volume to be offered.

Proposed activities may not occur on every acre within every proposed treatment unit, but for analysis and reporting purposes; the entire unit acreage will be assumed treated. Acreages are approximate and have been rounded.

PILT Payments:

Congress has not appropriated sufficient funds to fully pay counties since 1994, thus PILT payments would not change significantly between any alternatives.

25% Fund:

There would be no changes in the 25% Fund payments to states as a result of any of the alternatives selected because all counties within the CNF analysis area have chosen stable payments under the Secure Payments legislation.

Alternative 1*Direct, Indirect and Cumulative Effects*

There would be no volume offered for sale, no contribution towards the Forest ASQ targets of volume offered and as such no economic value from commercial timber to any markets.

Alternative 2*Direct, Indirect and Cumulative Effects*

An estimated ASQ volume of approximately 4,195 MBF (4.2MMBF) would be offered by this alternative. This represents the greatest amount of volume and potentially the greatest economic value to commercial timber markets of all the alternatives.

Alternative 3*Direct, Indirect and Cumulative Effects*

An estimated ASQ volume of approximately 3,735 MBF (3.7 MMBF) would be offered by this alternative. This is the second highest amount of ASQ volume that could be offered for sale. This represents the second greatest amount of volume and potential economic value to commercial timber markets.

Alternative 4*Direct, Indirect and Cumulative Effects*

An estimated ASQ volume of approximately 2,839 MBF (2.8 MMBF) would be offered by this alternative. This represents the lowest amount of ASQ volume that could be offered for sale by any action alternative and as such, the lowest potential economic value to commercial timber markets.

Irreversible and Irretrievable Resource Commitments: There are no irreversible or irretrievable resource commitments from an economic perspective by any of the alternatives.

4.10 Air Quality

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

Direct and indirect effects were evaluated using USFS R1/R4 NEPA evaluation procedures for prescribed fire projects (Acheson et. al., 2000). This document can be downloaded from the USFS R1 air quality website at <http://www.fe.fes.us/r1/gallatin/air.index.shtml>. The decision analysis in the procedure document was used to evaluate the emissions for each treatment unit per year.

Alternative 1

Direct and Indirect Effects

There would be no impact to air quality. Impacts from current dust, domestic wood smoke, burn permits, local industry, and vehicle emissions in the area would continue to occur. Air quality may be adversely affected in the short-term in the event of wildfire, prescribed fire or agricultural burning.

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.

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. Based on the second level of the Decision Analysis, no violations of National Ambient Air Quality Standards (NAAQS) would occur. However, based on local experience, a one to two day degradation of air quality would be expected in local communities. Prevailing daytime winds are west to southwest, which flows towards the communities of Bailey Creek and Soda Springs. Early morning smoke intrusions would be anticipated in these areas during the ignition periods.

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

Direct and Indirect Effects

The amount of PM₁₀ and PM_{2.5} emissions resulting from burning would be approximately 208 and 175 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 three years with an average annual PM₁₀ and PM_{2.5} emission of 69 to 58 tons.

Table 4.10-1: Emissions for Alternative 2.

Activity Units	Category	Acres	PM ¹⁰ (Tons)	PM ^{2.5} (Tons)
7 & 10 ¹	Hand & Landing Piles	Various	17	14
1-6, 8-9, & 11-13 ² (Harvest and Burn)	Lodgepole Pine	475	143	121
	Aspen/Conifer	69	11	9
	Douglas-fir	36	12	10
14 & 15 ² (Prescribed Burn)	Aspen/Conifer	118	23	19
	Mountain Brush ³	52	6	5
Total Emissions			212	178

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

² FOFEM model was used to estimate emissions for these activity units.

³ This cover type is within the contingency boundary.

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, this alternative 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/contingency units (14 and 15) are not included in this alternative. The amount of PM₁₀ and PM_{2.5} emissions resulting from burning would be approximately 152 and 130 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 three years with an average annual PM₁₀ and PM_{2.5} emission of 51 to 43 tons. No violations of NAAQS would occur according to the second level of the Decision analysis (Acheson et. al., 2000).

Table 4.10-2: Emissions for Alternative 3.

Activity Units	Category	Acres	PM ¹⁰ (Tons)	PM ^{2.5} (Tons)
7 & 10 ¹	Hand & Landing Piles	Various	15	13
1-6, 8-9, & 11-13 ² (Harvest and Burn)	Lodgepole Pine	395	119	101
	Aspen/Conifer	69	11	9
	Douglas-fir	36	12	10
Total Emissions			157	133

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

² FOFEM model was used to estimate emissions for these activity units.

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. The amount of PM₁₀ and PM_{2.5} emissions resulting from burning would be approximately 151 and 128 tons respectively. 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 three years with an average annual PM₁₀ and PM_{2.5} emission of 50 to 43 tons respectively. No violations of NAAQS would occur according to the second level of the Decision analysis (Acheson et. al., 2000).

Table 4.10-3: Emissions for Alternative 4.

Activity Units	Category	Acres	PM¹⁰ (Tons)	PM^{2.5} (Tons)
7 & All Harvest Units ¹	Hand & Landing Piles	Various	15	13
1-6, 8-10, & 11-13 ² (Harvest and Burn)	Lodgepole Pine	319	96	82
	Aspen/Conifer	69	11	9
14 & 15 ² (Prescribed Burn)	Aspen/Conifer	118	23	19
	Mountain Brush ³	52	6	5
Total Emissions			151	128

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

² FOFEM model was used to estimate emissions for these activity units.

Cumulative Effects
See Alternative 2

Irreversible and Irretrievable Resource Commitments: There are no irreversible or irretrievable resource commitments from an air quality perspective for any of the alternatives.

4.11 Heritage Resources

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

Effects Common to All Alternatives

The potential impacts to cultural resources may include the proposed project, grazing, water developments, recreation, and road construction projects. The effect of all impacts will require complete cultural resources review prior to additional undertakings which have the potential to affect cultural resources either independently or cumulatively.

No significant cultural resource properties fall within the area of potential effects. As such, no further analysis of heritage resources is necessary. Nothing beyond project design features will be recommended in order to achieve a “no adverse effect” determination.

Irreversible and Irrecoverable Resource Commitments

There are no irreversible or irretrievable resource commitments to heritage resources.

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, and 4 would enhance those rights by improving the resources upon which they rely. Timber harvest and burning would increase the number acres converted to early seral stages 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 Indians 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 treaty 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 760 acres total by a combination of commercial and personal-use harvest and prescribed burning. This proposed action would convert the greatest number of acres back to early successional stage classes. This alternative would show the greatest acreage net benefit to the habitat of big game species within the project area.

No fish habitat exists within the project area; as such, 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 510 acres total by a combination of commercial and personal-use harvest and prescribed burning. This alternative would convert the least number of acres back to early successional stage classes. This alternative would show the least acreage net benefits, of all the action alternatives, to the habitat of big game species 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 569 acres total by a combination of commercial and personal-use harvest and prescribed burning. This alternative would convert the second greatest number of acres back to early successional stage classes. This alternative would show the second greatest acreage net benefits, of all the action alternatives, to the habitat of big game species 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.

Irreversible and Irrecoverable Resource Commitments: There are no irreversible or irretrievable resource commitments from the tribal treaty rights perspective by any of the alternatives.

4.13 Visuals

Cumulative Effects Analysis Area: The project area and the two haul routes is the cumulative effects area.

Visuals indicator: The measure of effects by alternative for visuals will be if the VQO's (visual quality objectives) assigned this prescription area are met in the short term verses the long term.

Alternative 1

Direct, Indirect, and Cumulative Effects

Resource management activities presently occurring within the project area are; cattle grazing, firewood gathering, post and pole cutting, fire suppression, road and trail maintenance, research, range improvement maintenance and allotment administration, upland bird and big game hunting, camping, dispersed recreational activities such as; motorized trail riding, snowmobiling, cross-country skiing, hiking, and berry picking. These activities would continue to occur under this and all action alternatives.

VQO's of retention are not met in the short and long term. Evidence of previous harvest units do not mimic natural openings as viewed from the Highline Trail.

Alternative 2

Direct, Indirect and Cumulative Effects

Implementing Alternative 2 would, in the short term, not meet the VQO of retention and may never meet because of the scale of the affected area. This however provides opportunity to mimic the landscape in form, line, color and pattern common to the landscape character.

The regeneration cutting, skidding, loading, hauling, slash treatment and road building would be obvious to the casual observer from the Highline Trail in the short term. It would not be visible from US Highway 30 or from State Highway 34. The cutting units would be difficult to view from Forest roads in the area, due to the vegetative screening. Most of the viewing of the prescribed aspen burn would be from State Highway 34. With the possible exception of hand constructed fire lines, the hand of man would not be evident. It is doubtful that the hand constructed fire lines could be seen from Highway 34.

Alternative 3

Direct, Indirect and Cumulative Effects

VQO of retention is not met short term, long term met.

The regeneration cutting, skidding, loading, hauling, slash treatment and road building would be obvious to the casual observer from the Highline Trail in the short term. It would not be visible from US Highway 30 or from State Highway 34. The cutting units would be difficult to view from forest roads in the area, due to the vegetative screening.

Alternative 4

Direct, Indirect and Cumulative Effects

Implementing Alternative 4 would, in the short term, not meet the VQO of Retention and may never be met because of the scale of the affected area. Modifications may draw attention of visitors in the short term as viewed from 200 yards of the Highline Trail in the Soda Peak area. The modifications would be of a lesser scale than Alternative 2 yet still may be at such a scale as to draw the attention of the casual observer due to the amount of edge. The opportunity to mimic the landscape in form, line, color and pattern common to the landscape character will be diminished due to patch size limitations. This would increase the amount of edge which tends to capture the viewer's eye. Regardless of the shape of created openings, if all units are approximately the same size, the viewer's eyes will be drawn to the openings.

Most of the viewing of the prescribed aspen burn would be from State Highway 34. With the possible exception of constructed fire lines, the hand of man would not be evident. It is doubtful that the constructed fire lines could be seen from Highway 34

The regeneration cutting, skidding, loading, hauling, slash treatment and road building would be obvious to the casual observer from the Highline Trail in the short term. It would not be visible from US Highway 30 or from State Highway 34. The cutting units would be difficult to view from forest roads in the area, due to the vegetative screening.

Irreversible and Irrecoverable Resource Commitments

There are no irreversible or irretrievable resource commitments to the VQO's of the project area. In the very long term, over 150 years, the hand of man would be almost imperceptible. VQO's are affected in all alternatives because they do not meet full retention currently and will not meet them in any alternative for the short term.

4.14 Recreation

Cumulative Effects Analysis Area: The project area and the two haul routes is the cumulative effects area.

Recreation indicator The indicator of effects upon recreation will be the change in the ROS (Recreational Opportunity Spectrum) for the cumulative effects area.

Alternative 1

Direct and Indirect Effects

Resource management activities presently occurring within the project area are; cattle grazing, firewood gathering, post and pole cutting, fire suppression, road and trail maintenance, research, range improvement maintenance and allotment administration, upland bird and big game hunting, camping, dispersed recreational activities such as; motorized trail riding, snowmobiling, cross-country skiing, hiking, and berry picking. These activities would continue to occur under this and all action alternatives.

ROS characteristics remain the same in roaded natural (RN), semi-primitive non-motorized (SPNM), and semi-primitive motorized (SPM).

The RFP has designated this area to motorized travel restriction status. Currently the Caribou National Forest is undergoing a travel plan revision process that may affect the ROS for the analysis area. However, there is nothing in the foreseeable future from this alternative that would adversely impact the opportunity for recreation.

Haul routes remain unaffected.

Cumulative Effects

The cumulative effects are from past and present actions. There is nothing in the foreseeable future that would adversely impact the opportunities for recreation.

Alternative 2

Direct, Indirect and Cumulative Effects

There would be a 1.3 miles net loss of roads, thereby having little or no effect on Open Road Motorized Densities. Improving 4.8 miles of haul routes and roads should provide a safer and more enjoyable experience to recreationists.

The Revised Forest Plan (RFP) has designated this area to motorized travel restriction status. The ongoing Caribou Travel Plan analysis and the resulting decision would still address motorized route density

ROS characteristics for Roaded Natural, (RN) remain intact, Characteristics for Semi-primitive non-motorized (SPNM) remains unaffected. Characteristics for Semi-primitive motorized (SPM) affected by modifications that may draw attention of visitors in the short term as viewed from 200 yards of the Highline Trail in the Soda Peak area.

Haul routes will have increased heavy vehicle traffic past dispersed and developed recreation sites. More interaction between heavy vehicles and motorized recreation will be evident. Haul Routes will have some reconstruction and improvements

Alternative 3

Direct, Indirect and Cumulative Effects

There would be a 1.3 miles net loss of roads, thereby having little or no effect on Open Road Motorized Densities. Improving 4.6 miles of haul routes and roads should provide a safer and more enjoyable experience to recreationists.

ROS characteristics remain the same in Roaded Natural, (RN) and Semi-primitive Non-motorized, (SPNM). Semi-primitive Motorized (SPM) characteristics would be affected by modifications that may draw attention of visitors in the short term as viewed from 200 yards of the Highline Trail in the Soda Peak area. The modifications would be of a lesser scale than Alternative 2 yet still may be at such a scale as to draw the attention of the casual observer.

The Revised Forest Plan (RFP) has designated this area to motorized travel restriction status. The ongoing Caribou Travel Plan analysis and the resulting decision would still address motorized route density. Improving 4.6 miles of haul routes and roads should provide a safer and more enjoyable experience to recreationists.

Haul routes will have increased heavy vehicle traffic past dispersed and developed recreation sites. More interaction between heavy vehicles and motorized recreation will be evident.

Alternative 4

Direct, Indirect and Cumulative Effects

There would be a 1.3 miles net loss of roads, thereby having little or no effect on Open Road Motorized Densities. Improving 4.6 miles of haul routes and roads should provide a safer and more enjoyable experience to recreationists. The Revised Forest Plan (RFP) has designated this area to motorized travel restriction status. The ongoing Caribou Travel Plan analysis and the resulting decision would still address motorized route density

ROS characteristics for Roaded Natural, (RN) remain intact, Characteristics for Semi-primitive non-motorized (SPNM) remains unaffected. Characteristics for Semi-primitive motorized (SPM) affected by modifications may draw attention of visitors in the short term as viewed from 200 yards of the Highline Trail in the Soda Peak area. Haul routes will have increased heavy vehicle traffic past dispersed and developed recreation sites. More interaction between heavy vehicles and motorized recreation will be evident. Haul routes will have some reconstruction and improvements.

Haul routes will have increased heavy vehicle traffic past dispersed and developed recreation sites. More interaction between heavy vehicles and motorized recreation will be evident.

Irreversible and Irretrievable Resource Commitments

There are no irreversible or irretrievable resource commitments of recreational opportunities within the cumulative effects area.

4.15 Irretrievable/Irreversible Effects

Irreversible commitments of resources refer to non-renewable resources, such as heritage resources, or those factors that are renewable only over long periods, such as soil productivity. Irretrievable commitment applies to losses of production, harvest or use of renewable natural resources.

There would be an irretrievable loss of forage on roads and the gravel pit area, and mature forested habitat until rehabilitation occurs.

If aspen dies out and is not regenerated it will be an irretrievable loss.

Irreversible commitments (area permanently taken out of production for system roads, facilities, etc.) of 1.5 acres (0.9 miles of system roads) to the soil resource have been identified. An additional 3 acres will be used as a gravel pit. Irretrievable commitments are detrimental disturbance on 2.7 acres of temporary road construction/reconstruction in addition to 5 acres of existing non-system trails that occur outside activity areas. These acres in roads would have an irretrievable loss of site production until rehabilitation occurs.

There would be no other irretrievable or irreversible effects of other resources as a result of implementation of the project alternatives.

4.16 Required Disclosures and Potential Conflicts with Plans and Policies of other Jurisdictions

Air Quality

Project activities would comply with all State and Federal air quality regulations. Fuel management activities would use practices that minimize impacts to air quality. This project complies with air quality standards; refer to Chapter 4, Air Quality and the effects analysis for each alternative.

Conflicts with Plans and Policies of Other Jurisdictions

There are no conflicts with plans or policies of other jurisdictions.

Endangered Species Act (ESA)

This act provides for the protection, conservation and recovery of threatened and endangered wildlife, fish, and plant species. Contact with the U.S. Department of

Interior's Fish and Wildlife Services (U.S. Fish and Wildlife) was initiated through the scoping process and annual coordination meetings. The impacts of the proposed project on threatened and endangered (T&E) species was discussed and preliminary determinations made at the Section 7 Streamlining meetings with the U.S. Wildlife Service on February 28, 2003. The Biological Assessment for these species is located in the project file and summarized in Chapter 4. There are no T&E plants identified within the project area.

Energy Requirements and Conservation Potential of Alternatives

The energy consumption associated with the alternatives, as well as the differences between the alternatives, is not significant.

Environmental Justice in Minority Populations and Low-income Populations

In accordance with Executive Order 12898, Environmental Justice, no adverse environmental effects would occur from implementation of this project or any alternative in this analysis that would have a disproportionate effect on minority or low-income populations.

Federal Licenses and Permits

No federal licenses or permits would be required by this project. A State of Idaho Mining Development and Reclamation Plan permit for the gravel source planned within North Cheatbeck Basin will be obtained before the source is developed.

Floodplains and Wetlands (E.O 11988 & 11990)

There would be no negative effect under any alternative on wetlands as defined by Executive Order 11990 or to floodplains as defined in EO 11988. All wetlands would be protected through project design features and standards and guidelines in the RFP. Stream protection zones (aquatic influence zones) comply with Executive Order 11990. Any activities within wetlands or floodplains would require consultation with the Army Corps of Engineers and/or the Idaho Department of Water Resources.

Forest Practices Act

This act provides for the protection of water quality through specific restrictions on forest management activities. Project activities are designed to meet the requirements of this law through standard project design features and timber sale contract provisions. Natural regeneration is planned in all proposed harvest units. All proposed harvest units are within 5.2 Forest Vegetation Management Prescription areas.

Invasive Species

In accordance with Executive Order 13112, Invasive Species, implementation of any project alternative with design features in place, is not anticipated to cause or promote the introduction or spread of invasive species. See project design features listed in Chapter 2, and the analysis of effects in Chapter 4.

Migratory Bird Treaty Act and Executive Order on Migratory Birds # 13186

This act provides for the protection of migratory birds. The Executive Order # 13186, outlines the responsibilities of Federal agencies to protect migratory birds. The January 17, 2001 MOU (memorandum of understanding) between the USDA – Forest Service – and the USDI – Fish and Wildlife Service directs the Forest Service to incorporate management objectives from comprehensive planning efforts for migratory birds. The 2000 Idaho Bird Conservation Plan (IBCP) is the comprehensive planning effort that the Caribou National Forest is using in the interim until the MOU with the Fish and Wildlife Service, as required by the executive order, is developed to promote the conservation of migratory bird populations. The IBCP and RFP objectives for birds are being met, see Chapters 3 and 4 for more information.

National Forest Management Act (NFMA) (36 CFR 219.27)

This act establishes guidelines for National Forest management. The project is consistent with these guidelines as follows:

Consistencies with the RFP – Exceptions to RFP direction have been noted earlier within this analysis.

Suitability for Timber Production – All proposed timber harvest activities are proposed on timber suitable lands, lands with a 5.2 prescription.

Even Aged Management – NFMA requires the disclosure of any silviculture prescription that creates an opening larger than 40 acres, using even-aged management. RFP direction states “Openings may exceed 40 acres in aspen and lodgepole pine type’s contingent upon Regional Forester approval, or as a result of natural catastrophic conditions, such as fire, insect and disease, or windstorm.”(RFP 3-45). Two action alternatives propose to exceed the maximum size limit for forested vegetation openings created, within aspen and lodgepole pine cover types, in one commercial harvest operation by even-aged silvicultural systems and would be contingent upon approval from the Regional Forester.

Created openings – All created openings are scheduled to be restocked within 5 years following harvest. Stocking surveys will begin the year following the burning phase.

Economic Outputs – This proposal has benefits to multiple management areas as well as producing economic outputs.

Site productivity, Soil, Water and Other Resources – The project is designed to provide beneficial objectives with minor or no effects to most resources.

Practical Implementation and Costs – The project activities and design features were designed by Forest specialists. The District has the expertise to accomplish the activities proposed. All action alternatives would produce positive timber sale receipts but cannot be used to fund costs associated with improvements outside the project area. Only those projects which have been analyzed and that are within the project area can receive timber sale receipt funds through the Knudsen-Vandenburg Act (K-V).

Native American Tribal Treaty Rights

No alternatives proposed will violate or reduce the rights Native Americans are entitled to by their respective treaties. Refer to Chapters 2, 3 and 4 Tribal Treaty Rights. Notification and involvement of the Shoshone-Bannock Tribes and Northwest Band of Shoshone concerning Native American cultural resource matters was conducted in the spring of 2004 for coordination of proposed actions specific to the proposed Three Basins timber sale project, and in accordance with 36 CFR 296.7, 36 CFR 800 section 101(d)(6)(B) and in accordance with Presidential Memorandum concerning Government-to-Government consultation signed April 29, 1994.

National Historic Preservation Act

This Act establishes a requirement for consideration of potential impacts to historic properties. A cultural resource survey/inventory was conducted and no sites were found.

Prime Rangeland, Farm land and Forest Land

All alternatives evaluated comply with Federal Regulations for prime land. The definition of “prime” forest land does not apply to lands within the National Forest System. No prime range land or farm land is contained within the project area.

Roadless Areas

The Soda Point IRA is within the proposed project area. The proposed action and one other action alternative propose management activities within this IRA. Refer to Chapters 3 and 4 for detailed analysis of this IRA. No large blocks of unroaded areas would be fragmented by this proposal.

Roads Rule, Title 36, CFR part 212.

These rules establish requirements for the administration of the Forest development transportation system. A Roads Analysis has been completed for the project area affected by proposed road building, reconstruction, or decommissioning.

Water Quality

The Clean Water Act – Section 303(d) of the Clean Water Act requires all States to list water bodies that have been determined to be water quality limited in that they do not support designated beneficial uses or exceed State or Federal water quality standards.

There are no 303(d) designated streams within the project area.

A matrix of beneficial uses that have been identified by the Idaho Department of Environmental Quality (IDEQ) in the project area and selected streams downstream of the project area are shown in Table 3.2-2 Identified Beneficial Uses, located in Chapter 3 of this analysis. The data presented comes from the latest Integrated 305(b) Report (IDEQ, 2003), and from Appendix F forms completed after Beneficial Use Reconnaissance Project (BURP) surveys. All streams are covered by the Idaho anti-degradation water quality policy (IDAPA 58.01.02.051).

Refer to Chapter 3 for a more detailed description of the existing conditions for water quality and Chapter 4 for effects to water quality by each alternative.

Forest Service Non-point Source Management System This program provides for the protection of Idaho's waters from non-point source water quality provisions of the Federal Clean Water Act for the State of Idaho as agreed to in a Memorandum of Understanding (MOU) between the responsible State of Idaho and Federal land management agencies. Application of this program to this proposal consists of:

- BMP (Best Management Practices) selection and design based upon site-specific conditions; technical economic and institutional feasibility; and the designated beneficial uses of the stream.
- BMP application.
- BMP monitoring to ensure compliance and effectiveness in protecting the beneficial uses.
- Evaluation of the BMP monitoring results.
- Feedback the results into current/future activities and BMP design.

5. Lists – Including Prepares, Scoping, and Bibliography

5.1 *Interdisciplinary Team (IDT) and Consultants*

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

Ken Klingenberg	IDT Leader
Wayne Beck	Forester/Vegetation Specialist
John Lott	Soil Scientist
Dylan Johnson	Fuels Specialist
Jim Laprevote	Hydrologist
Ann Keysor	Wildlife Biologist
Heidi Heyrend	Range Management Specialist
Louis Berg	Fisheries Biologist
Maury Young	Recreation Technician
Eric Mattson	Forestry Technician
Randy Thompson	Archeologist
Cheryl Beck	Cartographic Technician
Rose Lehman	Botanist
Dave Strahl	Civil Engineer

5.2 *Public Involvement*

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

Greater Yellowstone Coalition
Western Watershed Project
The Ecology Center, Inc.
United States Environmental Protection Agency
Idaho Conservation League
The Wilderness Society
Idaho State Parks and Recreation
Alliance for the Wild Rockies
Don and Joanie Wind
Jerry Jayne
B. Sachav

5.3 Bibliography

This document is built on and tiered to the Caribou National Forest Revised Forest Plan (RFP). References to the RFP and the supporting analysis (EIS and appendix material) are found through out this document. Copies of the RFP are available at: Caribou-Targhee National Forest, 1405 Hollipark Dr., Idaho Falls, ID.

1. USDA. 2003a. Final Environmental Impact Statement for the Revised Land and Resource Management Plan for the Caribou National Forest, Forest Service. Idaho Falls, Idaho.
2. USDA. 2003b. Land and Resource Management Plan for the Caribou National Forest, Forest Service.

Vegetation

Forest Insect and Disease Information

1. Bennett & Hoffman, 2003. Trip Report: BFO-TR-03-07 Insect and Disease Functional Assistance, Montpelier Ranger District, Caribou-Targhee National Forest. Copy filed in project record.
2. GTR-INT-262, 1981. Proceedings – Symposium on the Management of Lodgepole Pine to Minimize Losses to the Mountain Pine Beetle. USDA Forest Service. Gen. Tech. Rept. INT-262.
3. RMRS-GTR-62, 2000. Assessment and Response to Bark Beetle Outbreaks in the Rocky Mountain Area. Report to Congress, (Edited by Samman & Logan), RMRS-GTR-62
4. Steele, R.; Williams, R.E.; Weatherby, J.C.; Reinhardt, E.D.; Hoffman, J.T.; Thier, R.W. 1996. Stand hazard rating for central Idaho forests. USDA Forest Service. Intermountain Res. Station. Gen. Tech. Rpt. INT-GTR-332. 29p.
5. USDA Forest Service. Forest Insect and Disease Leaflets .
<http://www.na.fs.fed.us/spfo/pubs/fidl.htm>

Silvics

6. Burns, R.M., Honkola, B.H., Silvics of North America. USDA Forest Service. Agriculture Handbook 654.
http://na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm
7. Long, J. N., 1994. The Middle and Southern Rocky Mountain Region. In: Regional Silviculture of the United States, 3rd ed., (Edited by John Barrett), John Wiley & Sons, Inc, pp. 335-386
8. SAF., 1980. Forest Cover Types of the United States and Canada. F.H. Eyre, Editor

FRCC

9. Barrett, S.W., 1994. Fire regimes on the Caribou National Forest, Southeastern Idaho. (Unpublished report available in project file)
10. [FRCC.gov], 2004. *Interagency Fire Regime Condition Class Guidebook*, version 1.1. Interagency and The Nature Conservancy fire regime condition class website .USDA Forest Service, US Department of the Interior, The Nature

Conservancy, and Systems for Environmental Management. Hann, Wendel, Havlina, D., Shlisky, A., et al. Available at <http://frcc.gov>

11. FRCC website: <http://frcc.gov>

12. Hann, W.J., 2004. Mapping fire regime condition class: a method for watershed and project scale analysis. Pages 000–000 *in* R.T. Engstrom, K.E.M. Galley, and W.J. de Groot, editors. Proceedings of the 22nd Tall Timbers Fire Ecology Conference: Fire in Temperate, Boreal, and Montane Ecosystems. Tall Timbers Research Station, Tallahassee, FL. Available at <http://frcc.gov>

Terms & Words

13. Society of American Foresters (SAF) (J.A. Helms editor), 1998. The Dictionary of Forestry.

Forest Ecology

14. Barrett, S.W., 1994. Fire regimes on the Caribou National Forest, Southeastern Idaho. (Unpublished report available in project file)

15. Bartos, D.L., 2001. Landscape Dynamics of Aspen and Conifer Forests. In: RMRS-P-18, Sustaining Aspen in Western Landscapes: Symposium Proceedings. May 2001, pp. 5- 14

16. Campbell, R.B., and Bartos, D.L., 2001. Aspen Ecosystems: Objectives for Sustaining Biodiversity. In: RMRS-P-18, Sustaining Aspen in Western Landscapes: Symposium Proceedings. May 2001, pp. 299- 307

17. Jenkins, M., 2004. Field notes of Dale Bartos field trip. Copy filed in project record.

18. Kay, C.E. 1997. Is Aspen Doomed? J. Forestry, May issues, pp 4-11

19. Long, J. N., 2003. Diversity, complexity and interactions: an overview of Rocky Mountain forest ecosystems. *Tree Physiology* 23, 1091-1099

20. MRD., 2004. Forest Stand Structure White Paper. Compiled by W. Beck. A summary and interpretation of forest structure references in the RFP. Copy filed in project record.

Hydrology

1. Belt, G.H, J. O'Laughlin, and T. Merrill. 1992. Design of Forest Riparian Buffer Strips for the Protection of Water Quality: Analysis of Scientific Literature. Idaho Forest, Wildlife and Range Policy Analysis Group. Report No. 8.

2. Bureau of Land Management. 1998. A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. TR-1737-15. Denver, CO.

3. Burroughs, E.R. and J.G. King. 1989. Reduction of Soil Erosion on Forest Roads. General Technical Report INT-264. USDA-FS Intermountain Research Station, Ogden, UT.

4. Clean Water Act, Section 303. <http://www.usda.gov/rus/water/ees/pdf/cwa3.pdf>

5. EO 11990. Executive Order 11990, Protection of Wetlands. Issued May 24, 1977 by President Jimmy Carter. <http://www.fs.fed.us/r6/water/rules.htm>

6. EO 11988. Executive Order 11988. Floodplain Management. Issued May 24, 1977 by President Jimmy Carter. <http://www.fs.fed.us/r6/water/rules.htm>

7. IDAPA (Idaho Administrative Procedures Act). State legal code by section, Boise, Idaho.

8. IDAPA. 2000. Rules Pertaining to the Idaho Forest Practices Act. Office of the Administrative Rules Coordinator, 700 W. State St (4th Floor), Boise, ID 83720-0011.
9. IDEQ (Idaho Department of Environmental Quality). June 2, 2003. Principles and Policies for the 2002/2003 Draft Integrated (303(d)/305(b)) Report. Boise, ID.
10. IDEQ 1994-2003. Project Field Forms (unpublished). Beneficial Use Reconnaissance Project (BURP). Idaho Department of Water Quality. Pocatello Field Office, Pocatello, ID.
11. Leffert, R.L. 2005. Personal Communication about ongoing watershed BMP reviews for the Forest. Caribou-Targhee Forest Hydrologist & Program Leader for Watershed. Idaho Falls.
12. Pfankuch, D.J. 1978. Stream Reach Inventory and Channel Stability Evaluation. USDA, Forest Service Northern region; Missoula, MT. 26 pages.
13. Philbin, M. 2003. Hydrology Specialist Report for North Bear AMP EIS (unpublished). Caribou-Targhee National Forest, Idaho Falls, ID.
14. Rosgen, D.L. 1994. A classification of Natural Rivers. http://www.wildlandhydrology.com/html/references_.html
15. Rosgen, D.L. 1996. Applied Fluvial Geomorphology. Pagosa Springs, CO. Table 8-1.
16. Seyedbagheri, K.S. 1996. "Idaho Forestry Best Management Practices: Compilation of Research on Their Effectiveness." USDA Forest Service, Intermountain Research Station, General Technical Report INT-GTR-339, Ogden, UT. 89 p.
17. USDA-FS. 1999. Roads Analysis: Informing Decisions about Managing the National Forest Transportation System. Misc. Rep. FS-643. Washington, D.C.: U.S. Dept. of Agriculture Forest Service. 222 p. Available at: http://www.fs.fed.us/eng/road_mgt/DOCSroad-analysis.shtml
18. USDA. 2003. Revised Forest Plan for the Caribou National Forest. Caribou-Targhee National Forest. Idaho Falls, ID.
19. USDA-FS. Date. Forest Service Handbook Section 2509.25. <http://www.fs.fed.us/im/directives/>

Soils

1. Alexander, E.B. 1985. Soil Disturbance and Compaction in Wildland Management. In Earth Resources, Monograph 8. USDA Forest Service, Region 5, San Francisco, California. 170 p.
2. Belnap, J., R. Rosentreter, S. Leonard, J.H. Kaltenecker, J. Williams, and D. Eldridge. 2001. Biological Soil Crusts: Ecology and Management. USDI Bureau of Land Management, National Science and Technology Center. Denver, CO 80225-0047. 110 p.
3. Blake, J.I. and G.A. Ruark. 1992. Soil Organic Matter as a measure of forest productivity: some critical questions. In: Proceedings of the soil quality standards symposium. SSA meeting. San Antonio, TX, 21-27 October 1990. USDA Forest Service, Watershed and Air Management Staff. Washington DC WO-WSA-2, pp. 29-40.

4. Burroughs, Jr., E.R. and J.G. King. 1989. Reduction of Soil Erosion on Forest Roads. General Technical Report INT-264. Intermountain Research Station, USDA Forest Service, Ogden, UT. 21 p.
5. Cline, R., G. Cole, W. Megahan, R. Patten and J. Potyondy. 1981. Guide for Predicting Sediment Yields from Forested Watersheds. Intermountain Region, Ogden, UT.
6. CNF Lab Data. 1992. Soils lab data on file at Caribou-Targhee National Forest, 1405 Hollipark Dr., Idaho Falls, ID.
7. Cromack, Jr., K., F.J. Swanson and C.C. Grier. 1978. A Comparison of Harvesting Methods and Their Impact on Soils and Environment in the Pacific Northwest. From: Forest Soils and Land Use, Proc. Fifth North Amer. For. Soils Conf., Aug. 6-9, 1978, Chester T. Youngberg, Ed. Colorado State Univ.. 1979. 449-476 pp.
8. DeBano, L.F., D.G. Neary, and P.F. Ffolliott. 1998. Fire's Effects on Ecosystems. John Wiley and Sons, c1998, 333 p.
9. Draft Caribou National Forest Revised Forest Plan. 2001. Caribou-Targhee National Forest, 1405 Hollipark Dr., Idaho Falls, ID.
10. Dyrness, C.T. 1972. Soil Surface Conditions Following Balloon Logging. Research Note PNW-182. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station. Portland, Oregon. 7 p.
11. Elliot, W.J., D. Page-Dumroese and P.R. Robichaud. 1996. The Effects of Forest Management on Erosion and Soil Productivity. Symposium on Soil Quality and Erosion Interaction, July 7, 1996. Soil and Water Conservation Society of America. Keystone, CO. 19 p.
12. Forest Service Handbook FSH 2509.18. Soil Management Handbook, Soil Quality Monitoring. Intermountain Region, Ogden, UT.
13. Froehlich, H.A. 1978. Soil Compaction from Low Ground-Pressure Torsion-Suspension Logging Vehicles on Three Forest Soils. Forest Research Laboratory, Oregon State University, Corvallis, Or. Research Paper 36. 12 p.
14. Graham, R.T., A.E. Harvey, M.F. Jurgensen, T.B. Jain, J.R. Tonn, and D.S. Page-Dumroese. 1994. Recommendations for managing coarse woody debris in forests of the Rocky Mountains. USDA Forest Service, Intermountain Research Station, Draft. 39 p.
15. Graham, R.T., A.E. Harvey, M.F. Jurgensen, D.S. Page-Dumroese, J.R. Tonn, T. B. Jain and K.Geier-Hayes. 1991. Sustaining Soil Productivity of Forest Soils in the Inland Northwest. USDA Forest Service, Report on File at Caribou-Targhee National Forest Headquarters, 1405 Hollipark Drive, Idaho Falls, Idaho. 41 p.
16. Graham, R.T., A.E. Harvey, M.F. Jurgensen, T.F. Jain, J.R. Tonn and D.S. Page-Dumroese. 1994. Managing Coarse Woody Debris in Forests of the Rocky Mountains. USDA Forest Service, Research Paper, INT-RP-477, September 1994. Intermountain Research Station, Ogden, UT. 13 p.
17. Greacen, E.L. and R. Sands. 1980. Compaction of Forest Soils. A Review. Aust. Journal of Soil Resources:18, 163-189.
18. Grier, C.C., K.M. Lee, N.M. Nadkarni, G.O. Klock, and P.J. Edgerton. 1989. Productivity of Forests of the United States and Its Relation to Soil and Site

- Factors and Management Practices: A Review. Gen. Tech. Rep. PNW-GTR-222, USDA Forest Service, Pacific Northwest Research Station, Portland, OR. 51 p.
19. Harvey, A.F., J.M. Geist, G.I. McDonald, M.F. Jurgensen, P.H. Cochran, D. Zabowski and R.T. Meurisse. 1994. Biotic and abiotic processes in eastside ecosystems: the effect of management on soil properties, processes, and productivity. Gen. Tech. Rep. PNW-GTR-323. Portland, OR. USDA Forest Service, Pacific Northwest Research Station. 71 p.
 20. Harvey, A.E., M.F. Jurgensen, M.J. Larsen and R.T. Graham. 1987. Decaying Organic Materials and Soil Quality in the Inland Northwest: A Management Opportunity. USDA Forest Service General Technical Report INT-225. Intermountain Research Station, Ogden, UT. 15 p.
 21. Harvey, A.E., M.J. Larsen, and M.F. Jurgensen. 1979. Interactive Roles Regulating Wood Accumulation and Soil Development in the Northern Rocky Mountains. USDA Forest Service Research Note INT-263. Intermountain Forest and Range Experiment Station, Ogden, Ut. 4 p.
 22. Idaho Forest Practices Act. 1992. Rules and Regulations Pertaining to the Idaho Forest Practices. Title 28, Chapter 13, Idaho Code. State Board of Commissioners Department of Lands, Boise, ID. 52 p.
 23. Jurgensen, M.F., A.E. Harvey, R.T. Graham, M.R. Gale, and D. Page-Dumroese. 1990. Timber Harvest and Site Preparation Effects on Soil Organic Contents. In: Bo-Qun, Lin, ed., Forest soil and modern forest management; July, 22-27; Harbin, China, Publishing House of Northeast Forestry University: 229-236.
 24. Laiho, R. and C.E. Prescott. 1999. The contribution of coarse woody debris to carbon, nitrogen, and phosphorous cycles in three Rocky Mountain coniferous forests. Can. J. For. Res. Vol. 29, 1999. 1592-1603 pp.
 25. Field Notes. 2002. Soil pedon field notes collected in 2002. On file at Caribou-Targhee National Forest, 1405 Hollipark Dr., Idaho Falls, ID.
 26. Noble, E.L. 1963. Sediment Reduction Through Watershed Rehabilitation. From proceeding of the Federal Sedimentation Conference, Jackson, Mississippi, Jan. 28-31, 1963. 29 p.
 27. NSSH. 1993. National Soil Survey Handbook. USDA Natural Resource Conservation Service. Washington D.C.
 28. Meeuwig R.O. and P.E. Packer. 1975. Erosion and runoff on forest and rangelands. From Proceedings of the Fifth Workshop of the United States and Australia Rangelands Panel, Boise, Idaho. Utah Water Research Laboratory, College of Engineering, Utah State University, Logan, Utah. 105-116 pp.
 29. Megahan, W.F. 1977. Reducing Erosional Impacts of Roads. Reprinted from: Guidelines for Watershed Management. FAO Conservation Guide. Food and Agriculture Organization of the United Nations, Rome. 237-261 pp.
 30. Mitchell, V.E. and E.H. Bennett. 1979. Geologic Map of the Driggs Quadrangle, Idaho. Idaho Department of Lands, Bureau of Mines and Geology. Moscow, ID. Map Scale 1:250,000.
 31. Nakamura, G.M. Sustaining Site Productivity on Forestlands, A Users Guide to Good Soil Management. University of California, Division of Agriculture and Natural Resources. Publication 21481. 10-30 pp.

32. Oztas, T. and F. Fayetorbay. 2003. Effects of freezing and thawing on soil aggregate stability. *Catena* 52, (2003) 1-8 pp.
33. Packer, P.E. and G.F. Christensen. 1977. Guides for controlling sediment from secondary logging roads. Intermountain Forest and Range Experiment Station, Ogden, UT. 42 p.
34. Page-Dumroese, D. 1996. Evaluating Management Impacts on Long-term Soil Productivity: A Research and National Forest System Cooperative Study. Proceedings of the Western Regional Soil Survey Conference, June 2-7, 1996. Bozeman, Montana. 15 p.
35. Page-Dumroese, D., M. Jurgensen, W. Elliot, T. Rice, J. Nesser, T. Collins and R. Meurisse. 2000. Soil Quality standards and guidelines for forest sustainability in northwestern North America. *Forest Ecology and Management* 138:445-462.
36. Seyedbagheri, K.A. 1996. Idaho Forestry Best Management Practices: Compilation of Research on Their Effectiveness. Gen. Tech. Rep. INT-GTR-339, Ogden, UT: USDA Forest Service, Intermountain Research Station. 89 p.
37. Stone, E. 1973. The Impact of Timber Harvest on Soils and Water. Reprint from the Report of the President's Advisory on Timber and the Environment. USDA Forest Service. Report on File at Caribou-Targhee National Forest Headquarters, 1405 Hollipark Drive, Idaho Falls, Idaho. pp 427-467.
38. USDA Forest Service. 1997. A Hierarchical Stratification of Ecosystems on the Caribou National Forest. Caribou-Targhee National Forest, 1405 Hollipark Dr., Idaho Falls, Idaho 83401. 92 p.
39. USDA Forest Service. 1990. Soil Survey of the Caribou National Forest, Idaho. Caribou-Targhee National Forest, 1405 Hollipark Dr., Idaho Falls, Idaho. 424 p.
40. USDA Forest Service. 1995. Intermountain Region Soil Interpretation Guide. Intermountain Region, Ogden, UT. 132 p.
41. USDA Forest Service. 1994. Ecological Subregions of the United States: Section Descriptions by W.H. McNab and P.E. Avers. Administrative Publication WO-WSA-5. Washington D.C. 267 p.
42. USDA Soil Conservation Service. 1973. Georgetown Creek Watershed Project Final Environmental Impact Statement. Room 345, 304 No. 8th Street, Boise, ID 83702. 20 p.

Wildlife

1. Atkinson, Eric C. and Melonie L. Atkinson, 1990, Distribution and status of harlequin ducks (*Histrionicus histrionicus*) on the Targhee National Forest, October 1990, IDFG.
2. Connelly, John W., Michael A. Schroeder, Alan R. Sands, Clait E. Braun. 2000. Guidelines to manage sage-grouse population and their habitats. *Wildlife Society Bulletin*, 28(4):967-985.
3. Gillies, K. E. 2004. Idaho Bat Conservation Plan. *DRAFT (December 04)*. R. Dixon and C. Harris, eds. Nongame and Endangered Wildlife Program Technical Report. Idaho Department of Fish and Game, Boise, ID. (12-01-04)
4. Greater Yellowstone Bald Eagle Working Group. 1996. Greater Yellowstone bald eagle management plan: 1995 update. Greater Yellowstone Bald Eagle Working Group, Wyoming Game & Fish Dept., Lander, WY 82520. 47pp.

5. Hayward, G.D. Tech Ed. 1994. Flammulated, Boreal, and Great Gray Owls in the United States: A Technical Conservation Assessment. USDA-FS GTR RM-253
6. IDFG. 2004a. Sage-grouse lek Database. Idaho Department of Fish and Game Unpublished document.
7. IDFG. 2004b. Sharp-tailed grouse lek Database. Idaho Department of Fish and Game Unpublished document.
8. IDFG. 2005b. Fish and game works for more sage-grouse. Headquarters News Release 02-01-05. Idaho Dept. of Fish and Game. Boise, ID.
<http://fishandgame.idaho.gov/news/releases/view.cfm?NewsID=2474>
9. IDFG. 2005c. fish and game works for more mule deer. Headquarters News Release 02-22-05. Idaho Dept. of Fish and Game. Boise, ID.
<http://fishandgame.idaho.gov/news/releases/view.cfm?NewsID=2511>
10. Inman, Robert M. Rachel R. Wigglesworth, Kristine H. Inman, Michael K. Schwarts, Brent L. Brock, Jon D. Rieck. 2004. Wolverine Makes Extensive Movements in the Greater Yellowstone Ecosystem. Northwest Science 78(3) 261-266.
11. MRD. 2004 Wildlife Map; know wildlife sightings on the Caribou NF, GIS map, unpublished document.
12. MRD. 2005. Montpelier Ranger District Wildlife Project Record Documents and White Papers
13. Pierson, E. D., M. C. Wackenhut, J.C. Altenbach, P. Bradley, P. Call, D. L. Genter, C. E. Harris, B. L. Keller, B. Lengus, L. Lewis, B. Luce, K. W. Navo, J. M. Perkins, S. Smith, and L. Welch. 1999. Species conservation assessment and conservation strategy for the Townsend's big-eared bat (*Corynorhinus townsendii*). Idaho State Conservation Effort, Idaho Department of Fish and Game, Boise, Id.
14. Reynolds, R.T. et al. 1992. Management recommendations for the northern goshawk in the southwestern United States, USDA FS Southeastern Region (R3) GTR RM 217
15. Ritter, Sharon. 2000. Idaho Bird Conservation Plan (IBCP), Version 1.0, January 2000, prepared by: Idaho Partners in Flight. 156p.
16. Roberts, Hadley B. 2003. Status Pygmy Rabbit (*Brachylagus idahoensis*) in Idaho. Technical Bulletin No. 03-6. Idaho Bureau of Land management April 2003. http://www.id.blm.gov/techbul/03_06/index.htm
17. Ruediger, Bill, Jim Claar, Steve Gniadek, Bryon Holt, Lyle Lewis, Steve Mighton, Bob Naney, Gary Patton, Tony Rinaldi, Joel Trick, Ann Vandehey, Fred Wahl, Nancy Warren, Dick Wenger, and All Williamson. 2000. Canada Lynx Conservation Assessment and Strategy. USDA Forest Service, US Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication #R1-00-53, Missoula, MT. 142 pp. (2nd Edition)
18. Thomas, J.W. 1979. Wildlife Habitats in Managed Forest - the Blue Mountains of Oregon and Washington. USDA-FS. Ag Hb 553.
19. Trec, Inc. 2004. A survey for yellow-billed cuckoo in recorded historic and other likely locations in Idaho. Rigby, Id

20. Trec, Inc. 2005 Northern Goshawk monitoring and Inventory on the Caribou-Targhee national Forest, Final Report. February, 2005. Submitted by TREC, inc. 4276 E 300 N Rigby, ID 83442 (208)745-6913. Timothy D. Reynolds, President.
21. Ulliman, M.J., A.Sands and T.Hemker. 1998. Conservation Plan for Columbian Sharp-tailed Grouse and Its Habitats in Idaho – *Draft*
22. USDA. 2003a. Final Environmental Impact Statement for the Revised Land and Resource Management Plan for the Caribou National Forest, Forest Service. Idaho Falls, Idaho.
23. USDA. 2003b. Land and Resource Management Plan for the Caribou National Forest, Forest Service.
24. USFWS. 1994a. The Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho - Final Environmental Impact Statement. Helena, MT.
25. USFWS. 1994b. Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of Gray Wolves in Yellowstone national Park in Wyoming, Idaho, Montana; Central Idaho and Southwestern Montana; Final Rules. Federal Register, 59(224):60252 to 60281. (November 22 1994)
26. USFWS. 1999c. Endangered and Threatened Wildlife and Plants; Final rule to remove the American Peregrine Falcon from the federal list of endangered and threatened wildlife, and to Remove the Similarity of Appearance Provision for Free-Flying Peregrines in the Conterminous United States; Final Rule. Federal Register, 64(164):46542-46558 (August 25, 1999).
27. USFWS. 2004c. Trumpeter Swan Survey of the Rocky Mountain Population, U.S. Breeding Segment, Fall 2004, U.S. Fish and Wildlife Service, Migratory Birds and State Programs, Mountain-Prairie Region, Lakewood, Colorado, November 29, 2004.
28. USFWS, 2005b. 90-Day Species List Updates of Threatened and Endangered Species found on the Montpelier RD and Soda Springs RD, from the US Fish and Wildlife Service enclosed with letter to the Caribou-Targhee National Forest (File #116.0000)
29. Wisdom, M.J., et al. 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin: Broad-scale trends and management implications. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-485. 156 pp.

Fisheries

1. Berg, L. N. 2004. Fish and Amphibians Report for Three Basins Timber Sale. USDA Forest Service, Caribou-Targhee National Forest, Montpelier Ranger District, Montpelier, Idaho.

Fire/Fuels/Air Quality

1. Acheson, A, C. Stanich, and M. Story. 2000. Describing Air Resource Impacts from Prescribed Fire Projects in NEPA Documents, USFS Region 1 and 4.
2. Reinhardt, E. R. E. Keane, and J. Brown. FOFEM Users Guide, 1996, Us Forest Service Intermountain Research Station p. 61-67.

3. Brown, James K. and Dennis G. Simmerman. 1986. Appraising Fuels and Flammability in Western Aspen: A Prescribed Fire Guide. USDA, For. Serv. Gen. Tech. Rep. INT-205. Intermt. Res. Sta., Ogden, UT.
4. Ottmar, Roger D.; Vihnanek, Robert E.; Wright, Clinton S. 2000. Stereo Photo Series for Quantifying Natural Fuels. Volume III: Lodgepole Pine, Quaking Aspen, and Gambel Oak Types in the Rocky Mountains. PMS 832. Boise, ID: National Wildfire Coordinating Group, National Interagency Fire Center.

Roadless

3. USDA. 2003a. Final Environmental Impact Statement for the Revised Land and Resource Management Plan for the Caribou National Forest, Forest Service. Idaho Falls, Idaho.
4. USDA. 2003b. Land and Resource Management Plan for the Caribou National Forest, Forest Service.

Recreation/Visuals

1. "Off – Highway Vehicle Use on National Forests: Volume and Characteristics of Visitors." Special Report to the National OHV Implementation Team, 5 August 2004.
2. Agriculture Handbook 701. "Landscape Aesthetics A handbook for Scenery Management" AH 701.

Index

3

303 (d) limited streams · 3-27
303(d) listed streams · 1-8

5

5.2 prescription area · 1-12
5.2 Prescription Area · 1-2, 1-4, 1-7, 3-62

A

Access · 3-45
Age class structure · 3-8, 4-6, 4-9, 4-11, 4-13
Air quality · 1-9, 3-57, 3-64, 4-50, 4-59, 4-67
Allowable sale quantity · *See* ASQ, *See* ASQ, *See* ASQ
Alternative 1 · 2-4
Alternative 2 · 2-4
Alternative 3 · 2-13
Alternative 4 · 2-18
Alternatives considered but eliminated · 2-2
Aspen · 3-11, 3-58, 4-8, 4-12, 4-14, 4-51, 4-60
Aspen restoration · 1-4, 1-8, 2-5, 2-6, 2-29
Average stand size · 4-10, 4-12, 4-14

B

Beneficial uses · 3-26
Best Management Practices · *See* BMP
beyond the scope · 1-12
Big game · 3-38, 4-41
Biological assessment · *See* BA
Biological strongholds · 3-60, 4-62
Bonneville cutthroat trout · 3-40, 4-43

C

Comparison of effects · 2-32
Cost effective need · 1-5
Cultural resources · 1-9, 2-27, 3-56, 3-67, 4-50, 4-58, 4-70
Current recreational use · 3-68
Current trail/road system · 3-68

D

Decision criteria · 2-1
Decisions to be made · 1-14
Desired future condition · *See* DFC
Detrimental soil disturbance · 3-29, 4-20, 4-22, 4-23, 4-25, 4-27, 4-29, 4-30
Detrimentially disturbed soils · 1-8, 2-25, 3-29
DFC · 2-1, 3-33, 4-5, 4-6, 4-10

E

Ecological subsection · 1-10
Economic feasibility · 3-63, 4-66
Elk · 2-28

F

Fire as disturbance agent · 3-5
Fire hazard · 3-59, 4-52, 4-61
Fire regime condition class · 1-4, 3-2, 3-6, 3-19, 3-20, 3-59
Fisheries strongholds · 3-60, 4-53, 4-62
Forest cover types · 3-4
Forest insects · 3-7, 3-58, 4-51, 4-60
Forest vegetation condition · 3-19
Forested stand size · 3-18
Future activities · 4-4

G

GIS data · 1-3
goshawk · 2-28, 3-36, 4-14, 4-33, 4-35, 4-39

H

Herbivory · 3-12
Heritage resources · 3-67
Highline Trail · 2-6, 3-68
hydrologically disturbed · 1-8, 3-21, 3-28, 4-16, 4-17, 4-18, 4-19

I

IDF&G Mule Deer Initiative · 3-38, 4-42
IDT · 1-11
Inventoried Roadless Area · *See* IRA
IRA
 Soda Point Inventoried Roadless Area · 3-46
IRA characteristics · 3-56, 4-53, 4-54
IRA past, present, future actions · 3-49
IRA policy · 3-48
IRA Revised Forest Plan direction · 3-48
issue effects to be analyzed · 1-14
Issues · 1-11

L

Landscape character · 3-61, 4-63
Large down woody requirements · 1-8, 2-25, 3-31
Livestock grazing · 2-30, 3-65
Lodgepole pine · 3-16

M

Main haul route · 1-3
Management Indicator species · 3-38, 4-39
Migratory birds · 3-38, 4-40
Mixed severity fire · 1-2, 2-5, 2-6
Monitoring · 2-31
Mountain pine beetle
 MPB · 3-7, 4-7, 4-8, 4-10, 4-12, 4-14

N

Natural regeneration · 2-24
NEPA · 1-10
New road construction · 4-45
New roads · 2-2
Non-forested vegetation · 3-4
Noxious weeds · 1-9, 2-25, 3-59, 4-15, 4-52, 4-61
Number of miles of road improvements · 4-46, 4-47

O

Objectives of Proposed Action · 1-6
Old growth · 1-8, 3-10
Operating season · 2-28
Owls · 2-28

P

Past and present activities · 4-2
Personal use · 1-2
Prescribed burn · 1-2, 2-28
prescribed fire · 1-9
Project area · 1-1
Project area road descriptions · 3-43
Proposed action · 1-2
Public involvement · 1-10
Purpose and need · *See* Chapter 1, *See* Chapter 1

R

Rare plants · 3-60, 4-53, 4-62
Recreation opportunity spectrum · 1-9, 3-69, 4-53, 4-63, 4-75
Recreation types · 3-61, 3-70
Recreational trends · 3-70
Reference landscapes · 3-60, 4-62
Regeneration harvesting · 1-2
Reserve trees · 1-2, 2-24
Revised Forest Plan direction · 1-7, 3-32
RFP · 1-12
Road decommissioning · 1-3
Road proposal description · 2-12, 2-30
Road proposals · 1-2, 2-10, 2-17, 2-23
Road reconstruction · 4-45
Roads analysis · 1-9, 3-45

S

Safe drinking water · 1-8
Scenic character · 4-63
scoping · 1-10
sedimentation · 4-16, 4-18, 4-20
Sensitive species · 3-35, 4-33, 4-34, 4-37
Serial species · 4-6, 4-8, 4-11, 4-13
significant · 1-11
Smoke management · 3-64, 4-67
Snags · 2-28, 4-37
Soda Point IRA · 1-11
Soil erosion · 1-8, 3-56, 4-50, 4-58
Soil productivity · 3-31, 4-24, 4-26, 4-28, 4-32
Special ecological, geological or cultural features · 4-57
Species composition · 3-11
Standards and guidelines · 2-5, 2-13, 2-18
Streams · 3-23, 3-57
Succession · 4-5, 4-7, 4-34

T

Temporary roads · 1-3
TES Species
 plants · 3-39
 wildlife · 3-34, 3-59, 4-33, 4-34, 4-52, 4-61
Transportation system needs · 1-5, 3-42
travel plan revision · 4-3, 4-4, 4-75
Tribal Treaty Rights · 1-9, 2-26, 3-66, 4-70

V

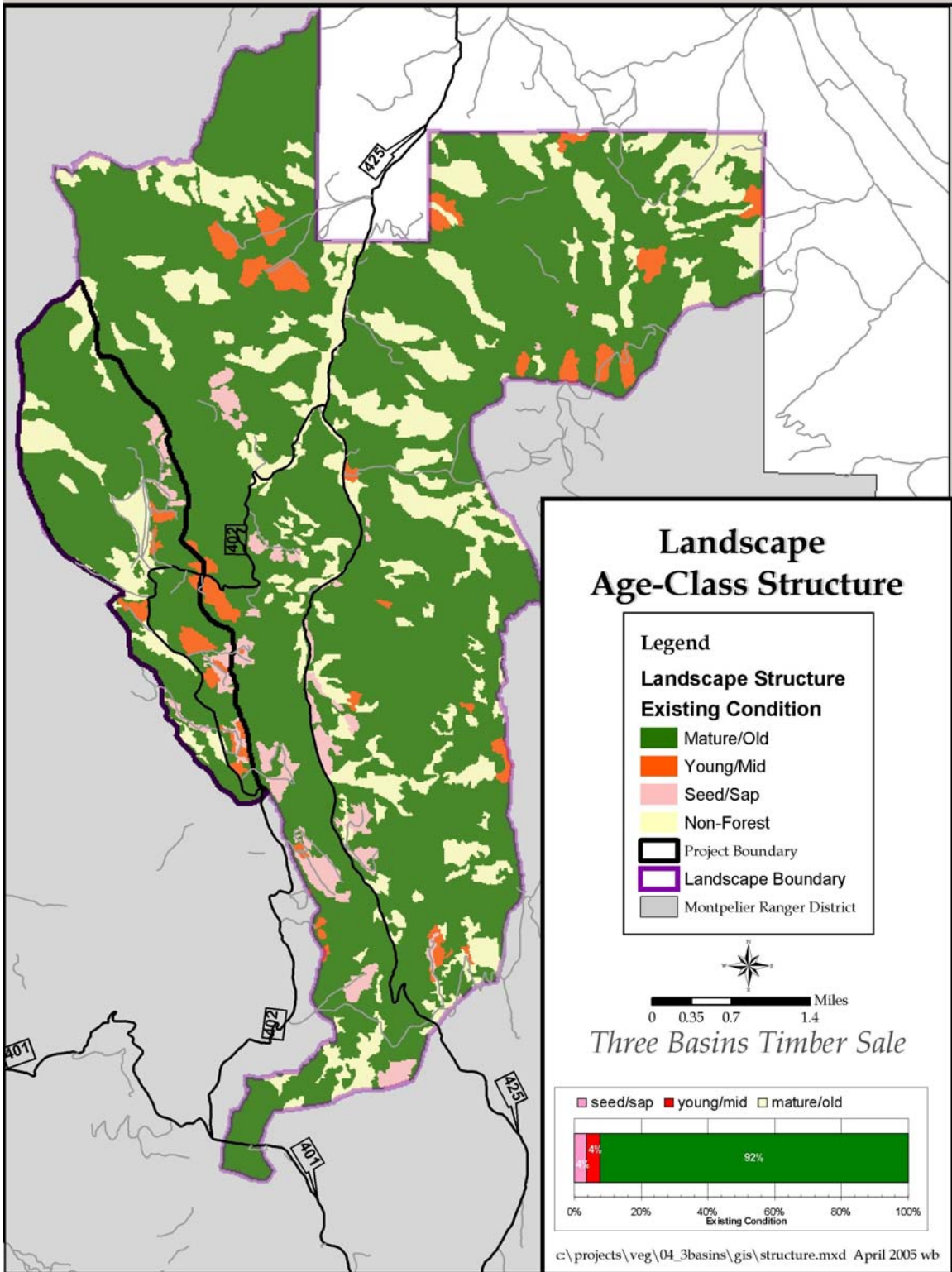
Visual quality objectives · 1-9, *See* VQOs, *See* VQOs
VQOs · 3-71, 4-73

W

water quality · 3-57, 4-51, 4-59
Wilderness characteristics · 3-54, 4-48, 4-56
winter range · 3-38

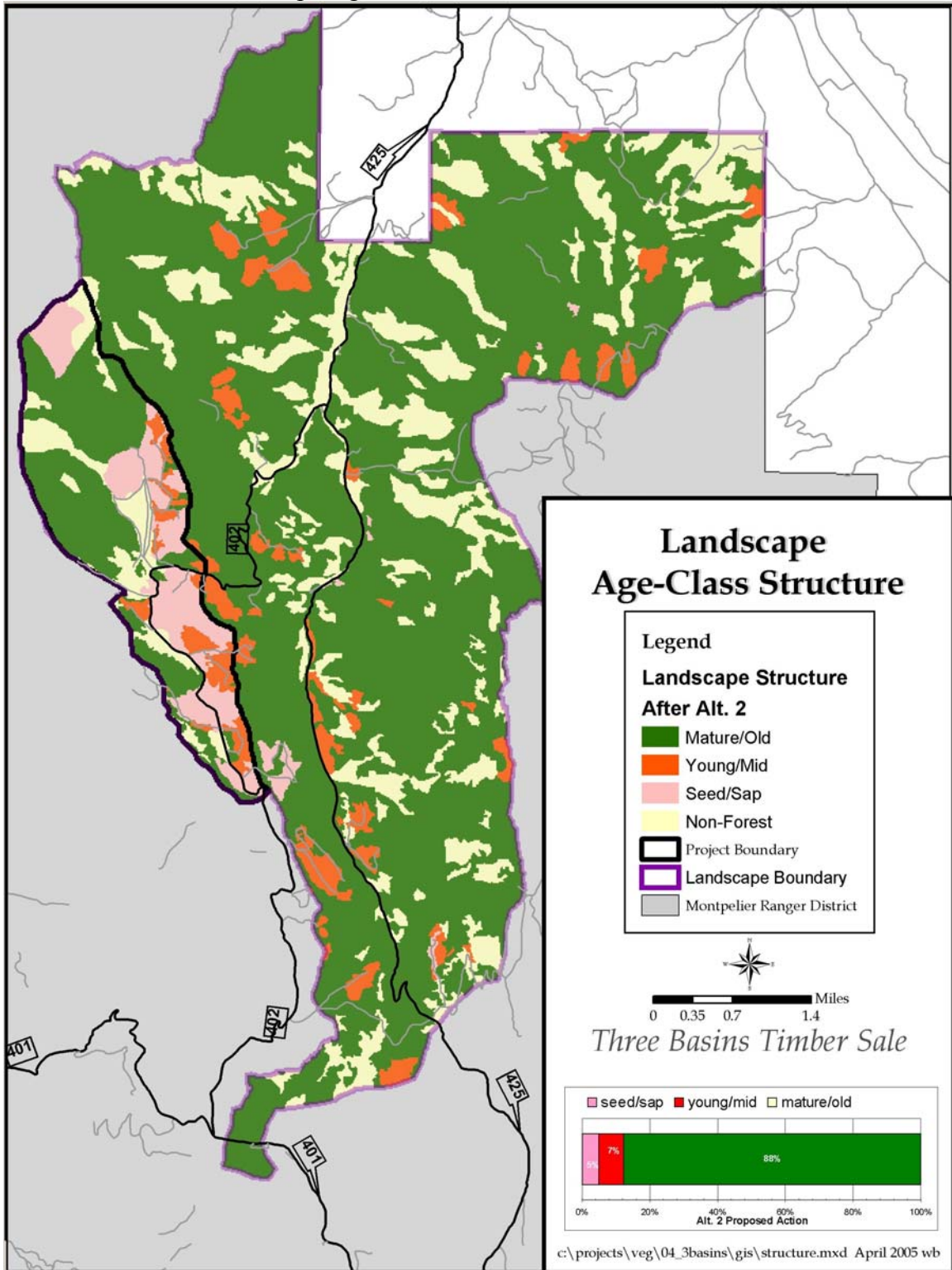
APPENDIX A

No-Action Landscape Age-Class Structure



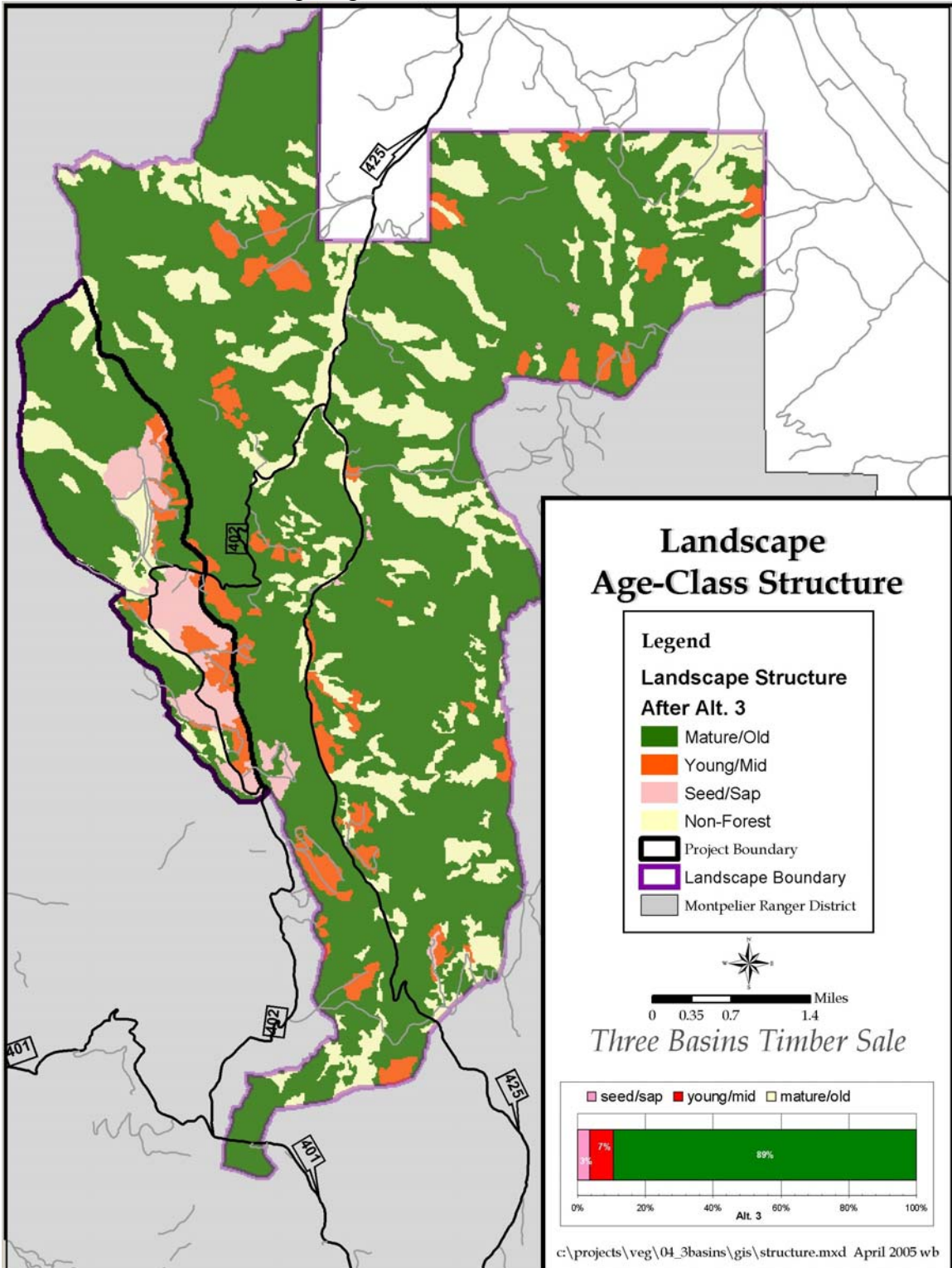
APPENDIX A

Landscape Age-Class Structure After Alternative 2



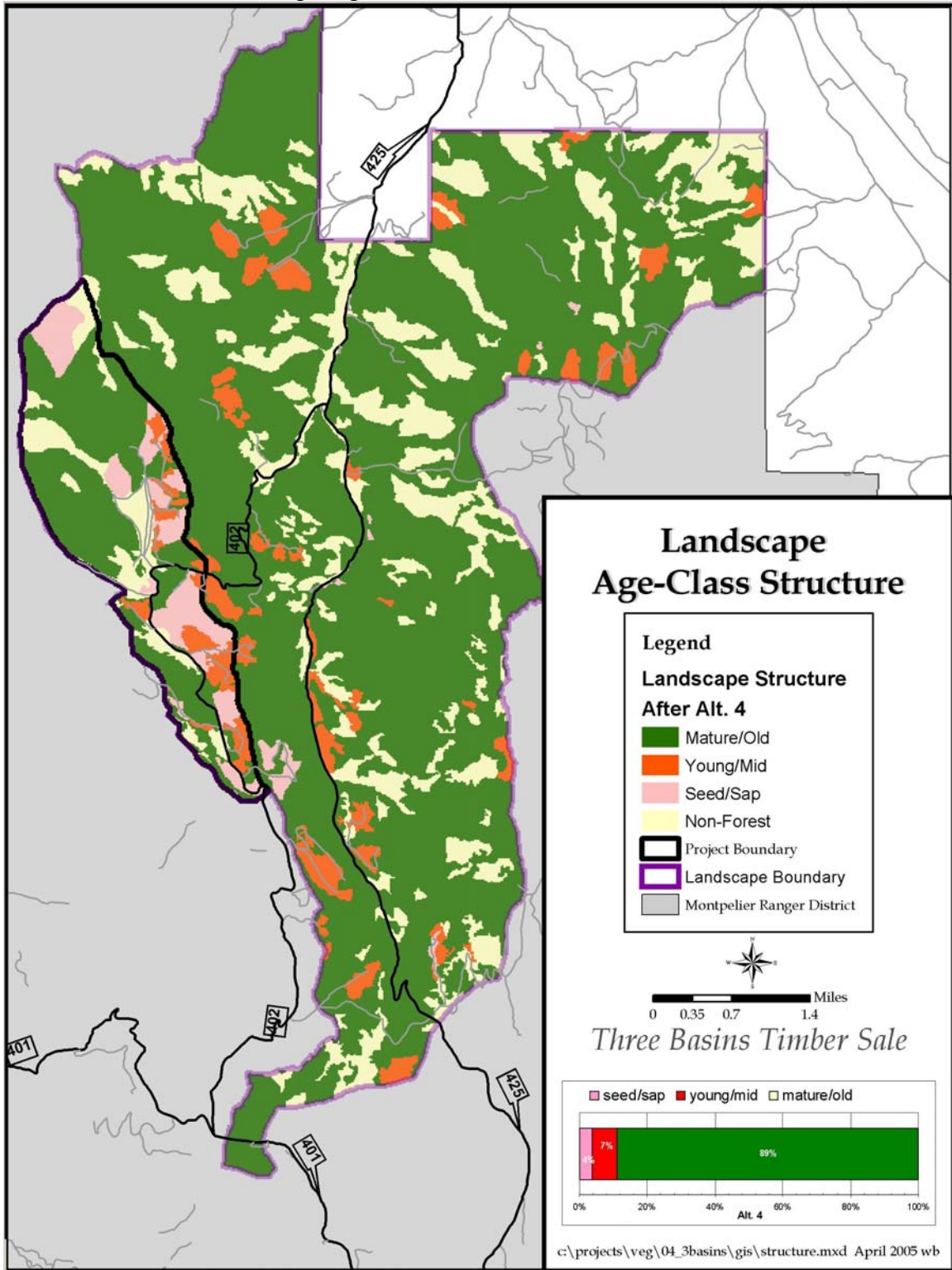
APPENDIX A

Landscape Age-Class Structure After Alternative 3



APPENDIX A

Landscape Age-Class Structure After Alternative 4



C. Additional Road Information

Alternative 2 proposes approximately 4.8 miles of road reconstruction, 0.9 miles of road construction and about 1.8 miles of temporary road construction. It also includes approximately 2.2 miles of existing road obliteration and conversion of 0.1 miles of road to trail.

Table 1 Road Proposal Descriptions: Below is a description of each road and the work that is proposed.

Road	Description (lengths are approximate, mileages have been rounded)
<p>281 The Cheatbeck Ridge Road (2081) Reconstruction</p>	<p>This is an existing system road constructed for the Cheatbeck Ridge timber sale during the mid 1990s. It is a dead end road 0.2 miles in length and is used for dispersed recreation. It will be reconstructed to facilitate resource management and to allow for continued dispersed recreation use.</p>
<p>T281 Temporary construction</p>	<p>This is a proposed temporary road that will branch from road # 281, to be constructed for the project to access harvest unit # 13, then decommissioned and returned to production by ripping, slashing, and seeding after the burning phase is completed. It will be 0.1 miles in length. Its purpose is for short term resource management.</p>
<p>402 The Cheatbeck Road (20402) Reconstruction</p>	<p>This road is the main haul route from north to south through the project area. It begins approximately 1.5 miles from the Forest boundary from road # 425 Eightmile Road, at the Cold Springs campground. It then climbs up the Cow Fork drainage of Eightmile and passes through the project area, the three basins of Cheatbeck. It then goes south and forms a junction with road # 439 “The Cutoff Road”. This roads peak use is during the hunting season. It is in relatively good shape, but portions through the project area need reconstruction.</p> <ul style="list-style-type: none"> • A portion within the project area, 1.7 miles in length is in need of some reconstruction which could include blading, reshaping, construction of turnouts, culvert installation, proper drainage structures, ditches, and/or spot graveling where needed.
<p>T402-A Temporary construction</p>	<p>This is a proposed temporary road that will begin from the end of road X402A, constructed for the project to access harvest units # 6, 8, 9, then decommissioned and returned to production by ripping, slashing, and seeding after the burning phase is completed. It will be 0.3 miles in length. Its purpose is for short term resource management.</p>

APPENDIX C

Road	Description (lengths are approximate, mileages have been rounded)
<p>T402-1 Temporary construction</p>	<p>This is a proposed temporary road that will branch off road # 402 in Middle Cheatbeck Basin and be constructed for the project to access harvest unit # 8. It will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be 0.1 miles long. Its purpose is for short term resource management.</p>
<p>T402-2 Temporary construction</p>	<p>This is a proposed temporary road that will branch off road # 402 between Middle and South Cheatbeck Basins. It will be constructed for the project as one of two temporary roads to access harvest unit # 11 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be 0.1 miles long. Its purpose is for short term resource management.</p>
<p>T402-3 Temporary construction</p>	<p>This is a proposed temporary road that will branch off road # 402 between Middle and South Cheatbeck Basins. It will be constructed for the project, south of temporary road # T402-2, to access harvest unit # 11 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be approximately 0.1 miles long. Its purpose is for short term resource management.</p>
<p>X402-A Reconstruction and closure</p>	<p>This road originates from road # 402 and serves as a woodcutting and ATV road and is in need of reconstruction. Approximately 0.3 miles will need reconstruction to provide clearance, drainage, minor realignment, and access to harvest unit # 6. After the logging and burning phase of the project is completed this road will be closed to motorized travel. The primary purpose of this road is resource management.</p>
<p>478 (20478) Reconstruction and closure and Road decommissioning</p>	<p>This road originates from road # 402 at the southern most end of North Cheatbeck Basin, and is a parallel access route through North Cheatbeck Basin. It served as a haul route for the Eightmile timber sale of the early 1980s.</p> <ul style="list-style-type: none"> • The first 0.1 mile of the road has deteriorated severely and has deep rutting, multiple braided and parallel routes for this initial 0.1 miles where the road is in the drainage bottom. When conditions are wet drivers attempt to detour around this bad section and are causing additional damage. The proposal is to reconstruct this portion of road # 478 to the north and west where it will join in with the proposed new road construction of N479. The reconstruction will raise the road and provide for proper drainage while eliminating the parallel routes and providing a road surface which will be safer, and better able to withstand travel during wet conditions. The primary purposes of this section of road will be to provide access to the Highline Trail and for resource management.

APPENDIX C

Road	Description (lengths are approximate, mileages have been rounded)
	<ul style="list-style-type: none"> • The adjacent 0.7 miles immediately to the north that travels through the center of North Cheatbeck Basin, and parallels road # 480, is to be decommissioned. This segment of road lacks drainage, is heavily rutted, and promotes resource damage during wet conditions. The proposal is to decommission this portion of road by ripping, slashing and seeding to native vegetation and thus place it back into a productive state, while providing an alternate access route to the Highline Trail. • Road # 478, or the northerly most segment of road # 478 at the extreme north end of North Cheatbeck Basin, 0.2 miles in length, is proposed to be reconstructed for access to harvest unit # 2. Instead of being a portion of the road which bisected the basin it will be joined onto the reconstructed road # 480. After the logging and burning phase of the project is completed this road will be closed to motorized travel by ripping, slashing and seeding. The primary purpose of this road is resource management.
T478-1 Temporary construction	This is a proposed temporary road that will branch off road # 478 for access to harvest unit # 1 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be 0.2 miles long. Its purpose is for short term resource management.
T478-2 Temporary construction	This is a proposed temporary road, 0.1 miles long, that will branch off road # 478 for access to harvest unit # 2 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. Its purpose is for short term resource management.
X478-A Decommissioning of existing	This road was constructed for past timber harvest and is 0.2 miles in length. It is proposed to be decommissioned and returned to production by ripping slashing and seeding.
479 (20479) Decommissioning of existing	Currently this road is a portion of the Highline Trail along the western edge of North Cheatbeck Basin. Under the previous Caribou Travel Plan, truck traffic was permitted along this route and north of North Cheatbeck Basin into the timber along the base of Soda Peak for some distance; it also accessed a dispersed camping site adjacent to the Highline. It is a native surfaced road, which is heavily rutted in places and does not provide adequate drainage. Travel during wet conditions promotes resource damage. This road is proposed to be decommissioned for 0.6 miles within the basin, and returned to production by ripping, slashing and seeding.

APPENDIX C

Road	Description (lengths are approximate, mileages have been rounded)
<p>N479 New Road Construction with a portion converted back to trail</p>	<p>This is proposed new road construction, 0.8 miles in length, to replace road # 479 and provide access to a Highline trailhead.</p> <ul style="list-style-type: none"> • The proposed location is within the timbered edge of North Cheatbeck Basin upon the old Highline Trail prism. This road will link up with the newly reconstructed segment of road # 478 at the southern most end of North Cheatbeck Basin. • Associated actions proposed once the harvest and burning phases have been completed are to convert approximately 0.1 miles of this road back to motorized Highline Trail, and establish a trailhead with turn-around for the Highline Trail. This road will then be a section of the Highline Trail.
<p>T479 Temporary construction</p>	<p>This is a proposed temporary road, 0.2 miles long that will branch off proposed new road construction N479 for access to harvest unit # 1. After harvest and burning phases are completed this road will be decommissioned and returned to production by ripping, slashing and seeding. Its purpose is for short term resource management.</p>
<p>480 (20480) Reconstruction</p>	<p>This road was constructed for timber harvest in the early 1970s and was closed after the timber sale. Reconstruction is planned for 1.0 miles for access to harvest units # 3 and 5 and will form junctions with roads # 480B and 20478. This road is intended to be used for long term resource management and Forest user access.</p>
<p>480-B Reconstruction and closure</p>	<p>This road originates from road # 480 and was constructed to access a timber sale from the early 1980s, it is 0.4 miles in length. It will be reconstructed to provide access to harvest units # 2 and 4. After the logging and burning phase of the project is completed this road will be closed to motorized use by ripping, slashing and seeding. The primary purpose of this road is resource management.</p>
<p>N480-C New Road construction</p>	<p>This is proposed new road construction to access a proposed gravel source within the southern edge of North Cheatbeck Basin. This road is 0.1 miles in length, would branch from road # 480 and terminate within the confines of the gravel pit. Upon depletion of the gravel source this road would be decommissioned, by ripping and placement of rock and seeded to native vegetation. This road is not shown on either Alternative 2 or 3 maps as the combination of a small mapping scale and the gravel source symbol block this road location from view.</p>

APPENDIX C

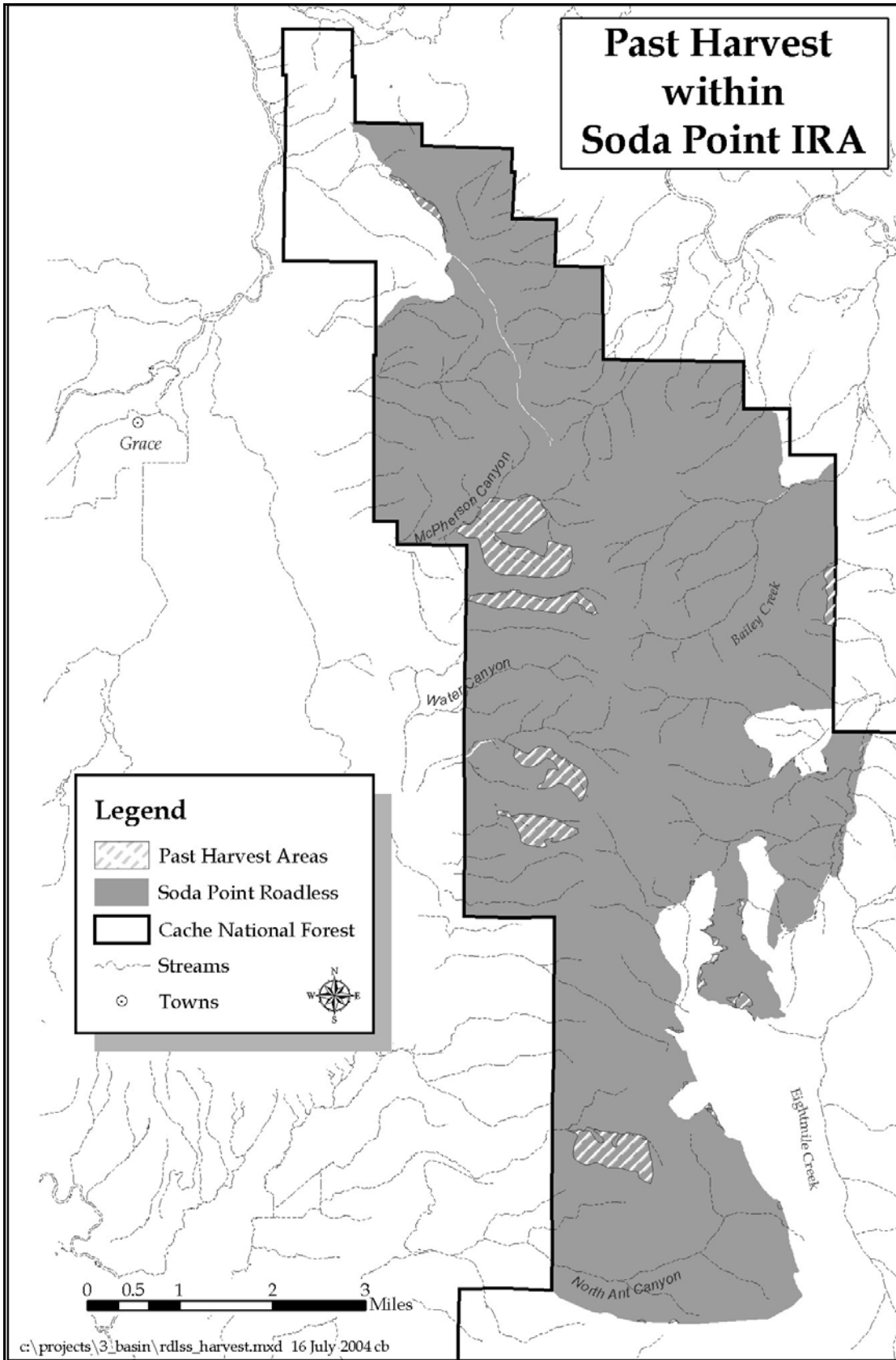
Road	Description (lengths are approximate, mileages have been rounded)
T480-A Temporary Construction	This is a proposed temporary road that will originate from the end of road # X480A to access harvest unit # 5 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be 0.3 miles long. Its purpose is for short term resource management.
T480-B Temporary construction	This is a proposed temporary road that will originate from the end of road # 480B to access harvest unit # 2 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be 0.1 miles long. Its purpose is for short term resource management.
X480 Decommissioning of existing	This road originates from road # 20478 at the southern end of North Cheatbeck Basin, and parallels road # 478 through the length of the basin. This segment of road # 480 lacks drainage, is rutted, and is used heavily during the hunting season. The proposal is to place this section back into production, by decommissioning with ripping, slashing and seeding to native vegetation, 0.7 miles.
X480-A Reconstruction and closure	This proposed road reconstruction of 0.2 miles will branch from road # 480 in order to access harvest unit # 5. It is intended for resource management use for the harvest and burning phases of the proposal and will be closed to motorized travel by ripping, slashing and seeding.
741 The Middle Cheatbeck Road (20741) Reconstruction and closure	This is an existing system road which branches from road # 402 in Middle Cheatbeck Basin. It was constructed for past timber harvest in the very early 1970s and used for subsequent timber sales. This is a dead end road in need of reconstruction due to water flowing down the road prism and causing erosion. It will be reconstructed for 0.3 miles to facilitate timber harvest and burning of units # 9 and 10 and to improve hydrologic function. After the burning phase is completed it will be closed off at approximately 0.2 miles in length for dispersed recreation use.
T741 Temporary construction	This is a proposed temporary road that will branch off road # 741 to access harvest unit # 9 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be 0.1 miles long. Its purpose is for short term resource management.
967 (20967) Reconstruction	This is an existing system road originating from road # 402 in South Cheatbeck Basin, originally constructed for timber harvest, and was reconstructed for the Cheatbeck Ridge timber sale during the mid 1990s. Approximately 0.4 miles need reconstruction to access harvest unit # 12. . It will be reconstructed to facilitate resource management and for continued Forest user access.

APPENDIX C

Road	Description (lengths are approximate, mileages have been rounded)
T967 Temporary construction	This is a proposed temporary road that will branch off road # 967 to access harvest unit # 12 and will be decommissioned and returned to production by ripping, slashing and seeding after the burning phase of the project is completed. It will be 0.1 miles long. Its purpose is for short term resource management.
All mileages in this table are approximate; all lengths have been round to tenths of miles.	

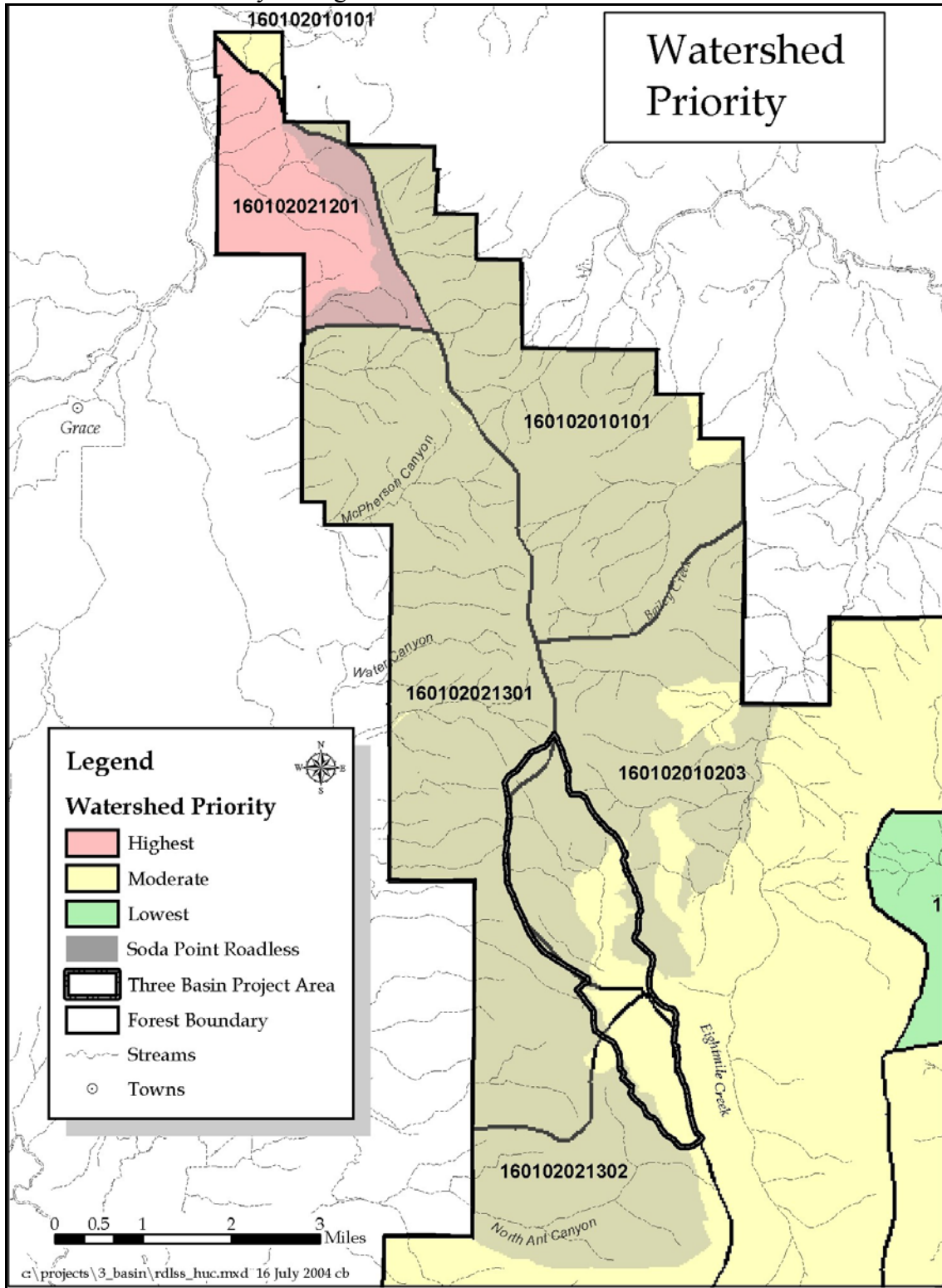
APPENDIX D

Past Harvest Areas within Roadless



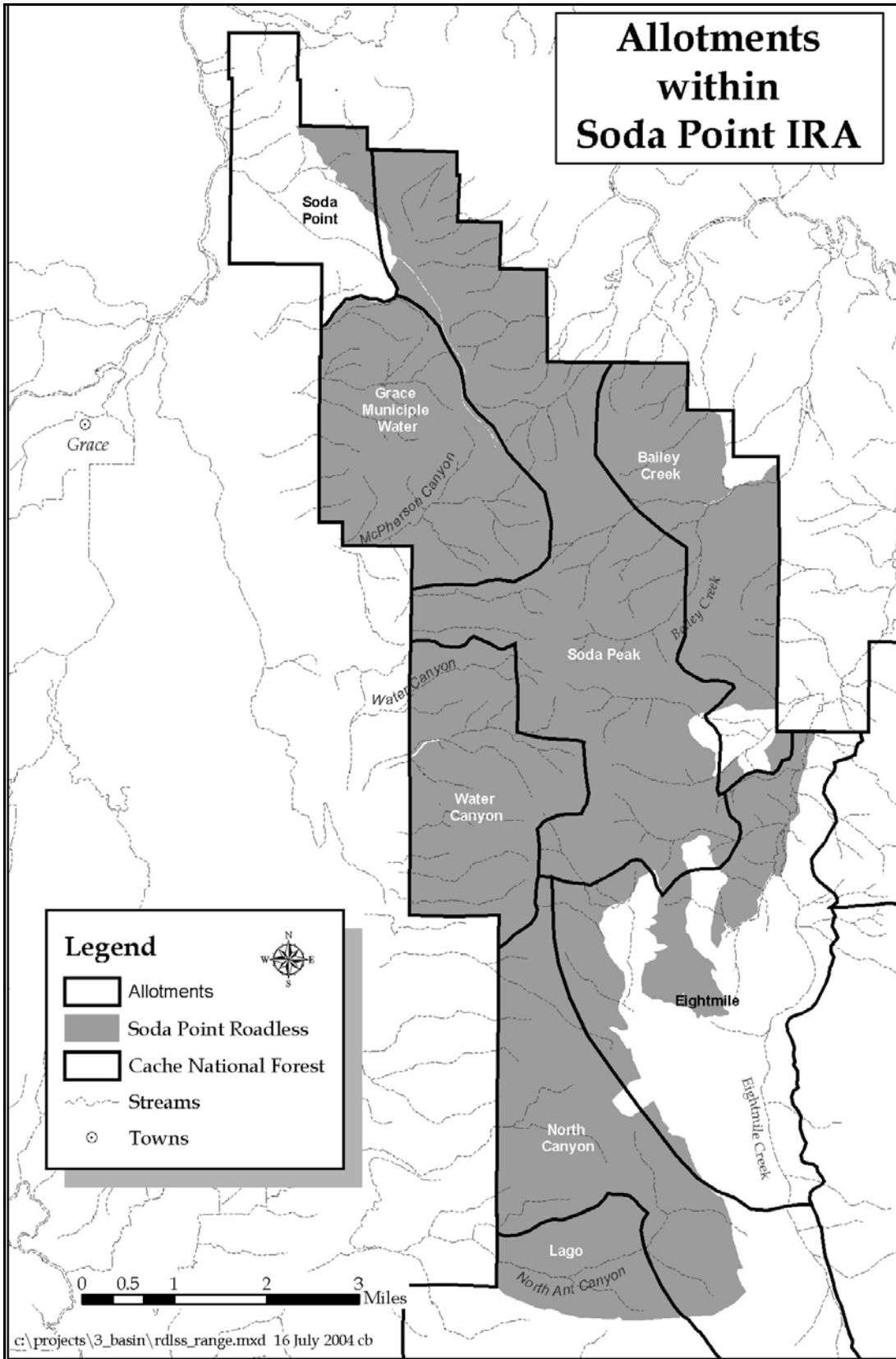
APPENDIX D

Priority Rating for Watersheds within Soda Point IRA



APPENDIX D

Allotments that fall within the Soda Point IRA



APPENDIX D

Soil Hazard Rating within Soda Point IRA

