

United States  
Department of  
Agriculture

Forest Service

November 2007



# Environmental Assessment

## Larson II Timber Sale and Fuels Reduction Project

Hahn's Peak/Bears Ears Ranger District, Routt National Forest  
Routt County, Colorado

T. 9 & 10 N., R.86 W.



Responsible Official:

Jamie Kingsbury  
District Ranger

For Information Contact:

Brian L. Waugh  
925 Weiss Drive, Steamboat Springs, CO 80477  
970-870-2185  
[bwaugh@fs.fed.us](mailto:bwaugh@fs.fed.us)

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (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 to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, DC 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer

## TABLE OF CONTENTS

Document Structure.....	4
Introduction and Background.....	4
Vicinity Map.....	6
Purpose and Need for Action.....	7
Proposed Action.....	7
Forest Plan Direction.....	8
Decision Framework.....	10
Public Involvement.....	10
Issues.....	11
Alternatives.....	11
Comparison of Alternatives.....	15
Vegetation Treatments.....	16
Design Criteria.....	18
Forest Plan Consistency.....	21
Affected Environment and Environmental Consequences.....	21
Consultation and Coordination.....	42

# INTRODUCTION

## Document Structure

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

- *Introduction:* This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. The introduction also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Affected Environment and Environmental Consequences:* This section describes the affected environment and the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the alternatives that follow.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the Environmental Assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Hahns Peak/Bears Ears Ranger District Office in Steamboat Springs, CO.

The format and content of this EA was guided also by direction by the Presidents Council on Environmental Quality (CEQ) to the Secretaries of Interior and Agriculture on September 9, 2002.

## Introduction and Background

The Forest Service has the responsibility to implement the Land and Resource Management Plan for the Routt National Forest (Forest Plan) by analyzing and evaluating site-specific projects. This includes project identification and design, determination of Forest Plan consistency, and conducting environmental and economic analyses. We also have the responsibility of implementing ecosystem management on National Forest lands. Ecosystem management means that we use an ecological approach to achieve multiple-use management. It also means that we blend the needs of people and environmental values in such a way that the National Forests represent diverse, healthy, productive, and sustainable ecosystems.

Site-specific data and a more complete discussion of the valuation of effects for the individual resources can be referenced in the specialist reports. The project file containing these reports is located at the District office in Steamboat Springs, Colorado. This is not a decision document and does not contain the Deciding Officer's decision. Based upon this effects analysis of the alternatives and public comments on the proposal, the responsible official will decide to implement the proposed action or another alternative. The decision will be stated and explained in a future Decision Notice.

This Environmental Assessment (EA) describes the environmental effects of a proposal to treat hazardous fuels and provide forest products and where possible address a widespread bark beetle outbreak with a commercial timber sale in the Sand Mountain Geographic Area portion of the Hahns Peak/Bears Ears (HPBE) Ranger District, Medicine Bow/Routt National Forests. The EA discloses the project's foreseeable environmental effects for consideration in determining whether to prepare an Environmental Impact Statement.

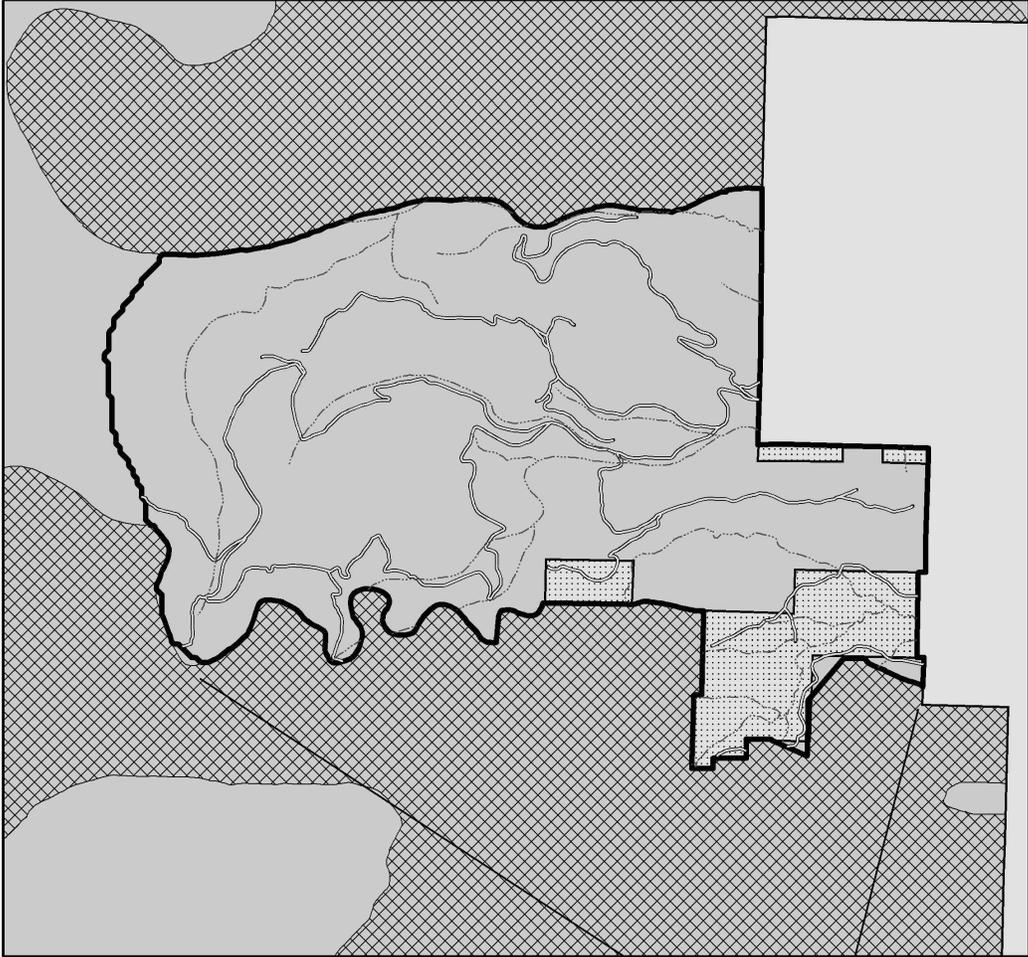
The Larson II analysis area is approximately 6,570 acres and is located in the Sand Mountain Geographic Area, which encompasses approximately 43,971 acres of National Forest System lands on the northwest portion of the HPBE Ranger District. The proposed project is located in T9&10N, R86W, specifically west and southwest of Steamboat Lake State Park and private lands, bounded on the north by Larson Creek, the south by Red Creek, and the west by Diamond Peak. Private residences are scattered along the National Forest Service Road (NFSR) 42, which accesses the project area from the east (See Map 1 – Vicinity Map).

The analysis area was assessed in 2005 with the Sand Mountain Geographic Area Rapid Assessment. The assessment was conducted with Forest Service specialists and county and state partners. The Routt County Fire Management Plan was completed approximately four years ago (2003), which identified communities in the area as Wildland Urban Interface areas, and areas concerned about wildfires. Local interests with support from state and federal agencies and non-governmental stakeholders have completed (2007) the North Routt Community Wildfire Protection Plan that provided input for this proposal. The proposed Larson II Timber Sale and Fuels Reduction Project (Larson II Project) is one of several projects that are expected to be analyzed based on the Sand Mountain Assessment.

The area consists of management areas 5.13 Forest Products (61%) and 7.1 Residential/Urban Interface (39%), as described in the Forest Plan.

# Map 1 – Vicinity Map

## Larson II TS & Fuels Reduction Project - Vicinity Map



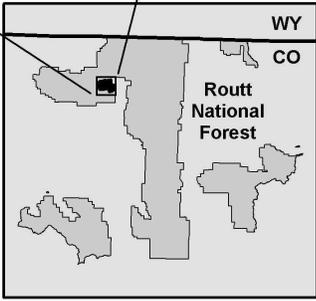
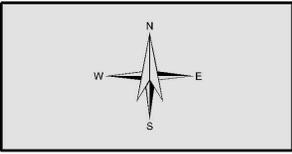
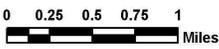
**Legend**

- Streams
- Roads
- Larson Analysis Area
- Roadless Inventory

**Status**

**Owner**

- National Forest
- Private



## **Purpose and Need for Action**

The purpose of the Larson II Project is to improve forest health conditions, regenerate stands, and reduce hazard fuels within the analysis area. Maintenance and improvement of forested stands' growth and vigor in the project area through silvicultural methods is prescribed through the Forest Plan in 5.13 management areas. In 7.1 management areas hazard fuel reductions are prescribed around the growing residential/forest interface in the project area to reduce potential fire line intensities and provide for safe and effective suppression strategies.

There is a need to work with state and private partners to reduce hazard fuels to develop adequate defensible space, while protecting the scenic values of the area. There is also a need to maintain and improve aspen stand health, to provide roundwood and sawtimber products for sale, to thin overstocked sawtimber stands and release regeneration, and to remove beetle-infested and high-hazard trees.

## **Proposed Action**

The HPBE Ranger District proposes to treat approximately 711 acres of mature and overmature forested stands in the analysis area where the emphasis is to reduce hazard fuels, improve forest health conditions and provide forest products. The proposed action includes hazard fuel vegetation treatments occurring on approximately 290 acres. This would include shaded fuel breaks of approximately 140 acres, aspen maintenance and release and weed treatments on approximately 89 acres, canopy density reduction along selected roadsides to create potential fire control lines on approximately 28 acres, and a Christmas tree cutting area of approximately 36 acres. The timber harvest would include selective harvest of approximately 222 acres, overstory removal on approximately 116 acres, and clearcuts of approximately 83 acres.

Hazard fuel treatments include shaded fuel breaks which may involve mechanically removing or altering the vegetation, whether live or dead, to provide a zone of lessened fuel loading in close proximity to the forest boundary and existing structures. The action typically would be accomplished by hand, using chainsaws for bucking, limbing and felling of small live trees or treating dead and down material. The stand characteristics are typically pole-sized younger lodgepole pine with minor amounts of aspen, spruce and fir. The created slash would either be hand piled for later burning, used as firewood by the public, or chipped. Much of the treated live vegetation would be small diameter (< 7" diameter at breast height) trees that may be removed and/or pruned, thus decreasing interlocking crowns and reducing ladder fuel components in the urban interface. The selection criteria for removal of larger trees would be diseased, suppressed or otherwise poorly formed trees, balanced with the need to reduce interlocking crowns and ladder fuels.

Downed woody material would be treated similarly. The remaining stand may appear more open with visual quality and screening of high consideration. The defensible space treatments would work in conjunction with similar efforts occurring on adjacent private and state lands. Canopy treatments along certain roadways would include thinning along a road corridor to create additional space between tree canopies to provide a potential fire break. Aspen treatments would include conifer removal and regeneration to promote aspen stands which provide natural fire breaks in the area.

Silvicultural treatments of clearcut, overstory removal, and selective harvest would be used for the Larson II Project. Clearcut treated stands are those that have already reached their full growth potential, are decadent or dying, or are heavily infested/infected with insects or disease. Overstory removals typically remove an older overstory with poor form, disease and/or infestations while leaving an already established more advanced regeneration of a desirable tree species. Selective harvesting (shelterwood cuts, group selection, salvage, and sanitation) is designed to enhance growth, quality, vigor, and composition of the stand between regeneration periods.

**Forest Plan Direction**

The Routt National Forest 1997 Revised Land and Resource Management Plan (Forest Plan) guides natural resource management activities and provides an overall strategy for managing the Routt National Forest. The intent of the direction in the Forest Plan is to manage National Forest System lands for multiple uses. The Forest Plan includes specific direction about how to manage different land areas, or management areas.

A desired condition is developed based on what exists now, knowledge of how it got that way, what is ecologically possible, what is economically feasible, and what is socially desirable. Goals for each resource are based on the general desired condition discussed in the Forest Plan (pp. 1-1 through 1-26).

Direction in the Forest Plan is identified at several levels, including:

- **Forest-wide level Management Direction** (Desired Conditions, Goals & Objectives, Standards & Guidelines)
- **Management Area Direction** (Management Area Desired Conditions, Standards & Guidelines)
- **Geographic Area Direction** (Desired Condition, Standards & Guidelines)

Forest Plan direction is implemented with the most site-specific direction (i.e., Geographic Area Direction) taking precedence over the more general direction (i.e., Forest-wide Direction).

**Management Area Direction**

Management emphasis within the analysis area and larger geographic areas is distributed among two Forest Plan management area prescriptions (see table 1 and 2). Application of management area prescriptions and associated standards and guidelines will move specific portions of each geographic area towards the desired condition (Forest Plan p. 3-1). The descriptions of each management area prescription include: theme, setting, desired condition, and standards and guidelines. This information can be found in the Forest Plan Chapter 2, pp. 2-44 through 2-52.

**Table 1 - Management Area Acres in Geographic Area**

<b>Management Area</b>	<b>Description</b>	<b>Acres in Geographic Area</b>
5.13	Forest Products	4891
7.1	Residential/Urban Interface	1000
PVT	Private Lands	679
<b>TOTAL</b>		<b>6570</b>

**Table 2 – Management Area Acres in Analysis Area**

<b>Management Area</b>	<b>Description</b>	<b>Acres in Proposed Action</b>
5.13	Forest Products	433
7.1	Residential/Urban Interface	278
<b>Total</b>		<b>711</b>

The current spruce and pine beetle infestations are negatively impacting suitable timber stands in the 5.13 Forest Products management areas (61% of proposed action). These forested areas are managed to meet a variety of ecological and human needs. They are intensively used, have a high density of dispersed recreation sites and roads, and display significant evidence of vegetation manipulation. Users expect to see other humans and evidence of human activities. The 5.13 management area is the main management area under the Revised Forest Plan that contains suitable timberlands that contribute towards the Forest’s allowable sale quantity.

The fuel treatment areas are located mainly in the 7.1 Residential/Forest Interface management area (39%) and are located adjacent to developed residential areas. In this area residential use blends into relatively undeveloped natural environments. Management actions will influence the vegetation composition and structure to promote visual screening and minimize risks of catastrophic fires and insect epidemics. Wildlife habitat will provide adequate cover for big game species between winter and summer ranges. The Larson II Project has 7.1 MA along the south and east edges of the project area.

**Geographic Area Direction**

Analyses at the geographic area level provide a framework for short and long-term projects, for monitoring the effectiveness of Forest-wide goals and management area standards and guidelines, and for achieving Forest-wide goals and objectives. A geographic area is a piece of land, 100,000 acres or less, in which management is directed toward achieving a specified desired condition. Geographic areas link the Forest Plan to management at a landscape or watershed scale. Application of management area prescriptions and associated standards and guidelines would move the geographic area towards the desired condition (LRMP p. 3-1). The analysis area is situated on the west side of the Sand Mountain Geographic Area. It involves 6,570 acres or 14.9% of the 43,971 acre geographic area.

***The Routt National Forest Land and Resource Management Plan (LRMP) contains the following direction that is pertinent to this proposal:***

- Use the scientifically defined silviculture systems which meet the management objectives for the landscape or individual stands of trees within a landscape setting. (LRMP, 1-10).
- Use a full range of biologically appropriate silvicultural practices to emphasize the production of sawtimber. Timber harvest is scheduled and does contribute towards the allowable sale quantity (LRMP, 2-45).
- Manage stands using treatments that maintain acceptable rates of growth, and favor commercially valuable tree species (LRMP, 2-45).
- Plan management activities with consideration for potential insect or disease outbreaks. Design management to meet or enhance management area objectives (LRMP, 1-15).
- Use integrated pest management techniques, including silvicultural treatments, to meet management area objectives (LRMP, 1-15).

- Use preventive vegetation management practices to meet objectives and reduce the risk of insects and disease. Give priority to cover types identified as high risk (LRMP, 1-15).
- In project plans, consider existing infestations of insects and disease within the project area. Design activities to minimize the risk of spreading the infestation while still providing habitat for those wildlife species dependent upon the presence of insects and disease (LRMP, 1-15).
- Manage forested areas such that insect infestations and disease outbreaks remain locally restricted (LRMP, 2-46).
- Cooperate with local governments and communities to develop opportunities that contribute to economic viability (LRMP, 1-2).
- Support development and maintenance of a sustained flow of market and non-market products to regional and local economies (LRMP, 1-2).
- Develop programs and projects that are complementary to local community objectives and plans (LRMP, 1-2).
- On lands suitable for timber production, manage to produce sawtimber-size trees in an economically efficient manner (LRMP, 2-45).
- Ecosystem management on the Routt National Forest shall provide for multiple-use outputs and the habitats and processes necessary to maintain the biological diversity found on the forest (LRMP, 1-2).
- Use only vegetation management practices necessary to meet specific resource management objectives other than wood production (LRMP, 2-51).
- Use direct control, perimeter control, or prescribed control as the wildland fire management strategy (LRMP, 2-52).

### **Decision Framework**

Given the purpose and need, the deciding official reviews the proposed action, the other alternatives, and the environmental consequences in order to make the following decisions:

- which alternative best addresses the purpose and need for the proposal and the significant issues and concerns for the Larson II Analysis Area;
- rationale for the decision and
- design criteria, and monitoring requirements necessary for project implementation.

### **Public Involvement**

The proposal was listed in the Schedule of Proposed Actions during the last two quarters (4/1/07 – 9/30/07). The proposal was provided to the public and other agencies for comment during the formal comment period that began on 11/19/2007. Five comment letters were received addressing the proposed project. On August 4, 2007, the Hahns Peak/Bears Ears District Ranger met with homeowners and concerned citizens from the Steamboat Lake Subdivision Homeowners Association (HOA), Red Creek HOA, and Hahns Peak Village HOA to discuss the Larson II Project. Approximately 50 people attended the meetings and gave positive input regarding the proposed project, with no concerns or issues expressed. Using comments from the public, other Federal and State Agencies, and local groups, the interdisciplinary team developed a list of issues to address.

## **Issues With Proposed Action**

The Forest Service received 5 comment letters regarding the Larson II Project. These letters were reviewed and 24 concerns/issues were derived from the letters.

The Forest Service separated the issues into two groups: significant and non-significant. Significant issues were defined as those directly or indirectly caused by implementing the proposed action.

- No public comments identified any significant issues.

Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural in nature and not supported by scientific or factual evidence. The CEQ NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review." (Sec. 1506.3)

The specific comments and reasons for the categorization as non-significant are available in the Larson II Timber Sale and Fuels Reduction Project file at the Hahns Peak/Bears Ears Ranger District, Steamboat Springs, Colorado.

- No comments generated a need for additional analysis.
- Two comments were determined to be outside of the scope of the proposed project.
- Four comments were addressed by one or more of the following: laws, regulations, and Forest Plan standards and guidelines.
- Three comments would be addressed in the timber sale contract.
- The remaining comments (15) were addressed in specialist reports, specialist comment responses and/or by design criteria developed for the proposed action.
- The District Wildlife Biologist identified an issue with the release and weed portion of the proposed action. This action is inconsistent with the Canada Lynx Conservation Assessment and Strategy. This issue was identified as a significant issue and triggered the development of Alternative 3.

## **ALTERNATIVES, INCLUDING THE PROPOSED ACTION**

This chapter describes and compares the alternatives considered for the Larson II Project, including maps. This section presents the alternatives in comparative form, sharply defining the differences among alternatives and providing a clear basis for choice by the decision maker. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., helicopter logging versus the use of skid trails) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the amount of erosion or cost of helicopter logging versus skidding).

## **Alternatives**

### **Alternative 1 - No Action**

Under the No Action alternative, previously approved management actions would continue to be implemented in the analysis area. However, the Forest Service would not implement the proposed action that would address stand health, timber products, and the ongoing mountain pine beetle (*Dendroctonus ponderosa*) epidemic. No actions would be taken now to reduce the numbers of lodgepole pine killed by mountain pine beetle infestations or to make stands less susceptible to future beetle infestations on national forest lands. The spruce beetle and mountain pine beetle would continue to spread until host material is completely gone or populations begin to decline naturally.

This alternative is used as a basis of comparison and requires a NEPA analysis. With this alternative, no management actions are proposed and the alternative represents the existing condition of the area.

### **Alternative 2 - The Proposed Action**

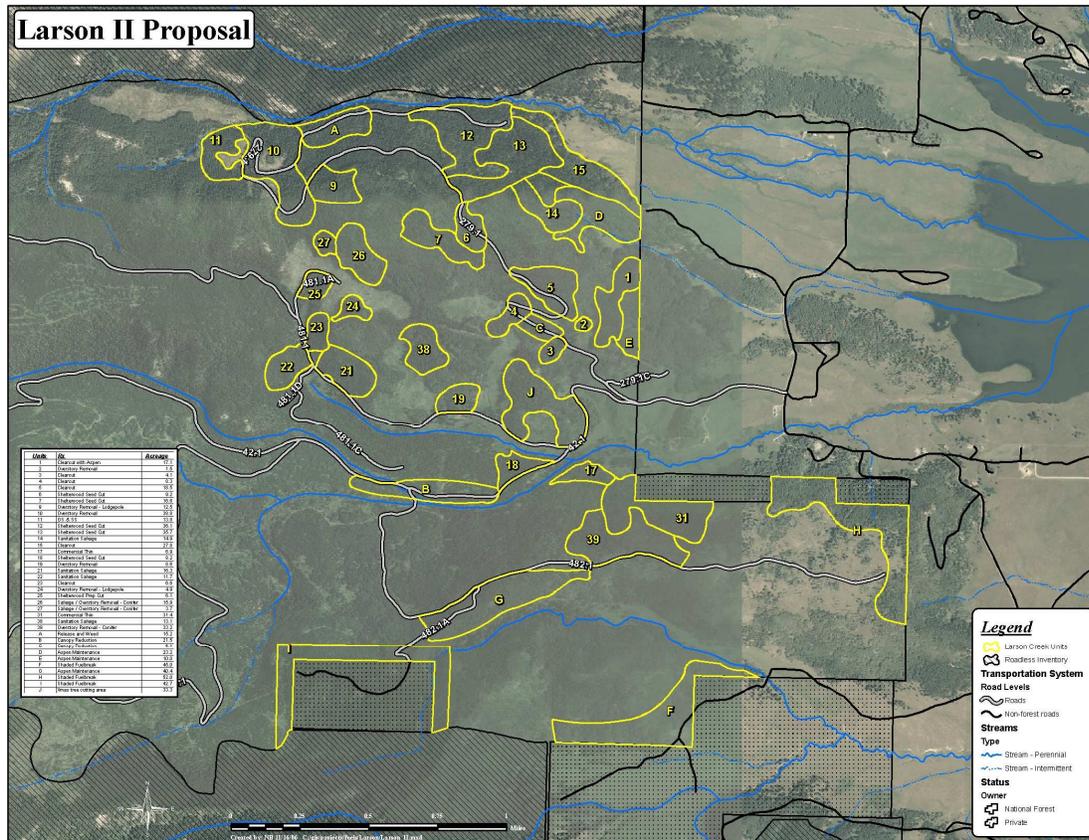
The HPBE Ranger District proposes to treat approximately 711 acres of mature and overmature forested stands in the analysis area where the emphasis is to reduce hazard fuels, improve forest health conditions and provide forest products. The proposed action includes hazard fuel vegetation management occurring on approximately 290 acres. This would include shaded fuel breaks of approximately 140 acres, aspen maintenance and release and weed treatments on approximately 89 acres, canopy density reduction along selected roadsides to create potential fire control lines on approximately 28 acres, and a Christmas tree cutting area of approximately 36 acres. The timber harvest would include selective harvest of approximately 222 acres, overstory removal on approximately 116 acres, and clearcuts of approximately 83 acres.

Hazard fuel treatments include shaded fuel breaks which may involve mechanically removing or altering the vegetation, whether live or dead, to provide a zone of lessened fuel loading in close proximity to the forest boundary and existing structures. The action typically would be accomplished by hand, using chainsaws for bucking, limbing and felling of small live trees or treating dead and down material. The stand characteristics are typically pole-sized younger lodgepole pine with minor amounts of aspen, spruce and fir. The created slash would either be hand piled for later burning, used as firewood by the public, or chipped. Much of the treated live vegetation would be small diameter (< 7" diameter at breast height) trees that may be removed and/or pruned, thus decreasing interlocking crowns and reducing ladder fuel components in the urban interface. The selection criteria for removal of larger trees would be diseased, suppressed, or otherwise poorly formed trees, balanced with the need to reduce interlocking crowns and ladder fuels.

Downed woody material would be treated similarly. The remaining stand may appear more open with visual quality and screening of high consideration. The defensible space treatments would work in conjunction with similar efforts occurring on adjacent private and state lands. Canopy treatments along certain roadways would include thinning along a road corridor to provide additional space between tree canopies to provide a potential fire break. Aspen treatments would include conifer removal and regeneration to promote aspen stands which provide natural fire breaks in the area.

Silvicultural treatments of clearcut, overstory removal, and selective harvest would be used for the Larson II Project. Clearcut treated stands are those that have already reached their full growth potential, are decadent or dying, or are heavily infested/infected with insects or disease. Overstory removals typically remove an older overstory with poor form, disease and/or infestations while leaving an already established more advanced regeneration of a desirable tree species. Selective harvesting (shelterwood cuts, group selection, salvage, and sanitation) is designed to enhance growth, quality, resiliency, vigor, and composition of the stand between regeneration periods.

**Map 1 – Alternative 2 - Proposed Action**



**Alternative 3**

The District wildlife biologist determined that the proposed action (alternative 2) was inconsistent with the direction in the Lynx Conservation Assessment and Strategy due to the proposed release and weed treatments that may negatively affect snowshoe hare habitat. This concern generated Alternative 3 which dropped the proposed release and weed treatments.

Alternative 3 also included minor changes to stand polygons to make the analysis more efficient and to more accurately depict field verified stand conditions. Prescription changes were made to unit 15 to reduce visual impacts and unit 4 was split into two units to address changing stand conditions (mountain pine beetle infestation) in the east half of the unit.



**Alternative 1 - no action and involves no proposed treatments.**

**Alternative 2 - proposed action with approximately 711 acres of treatment which includes release and weed treatments.**

**Alternative 3 - approximately 647 acres of treatment with no release and weed treatments and prescription adjustments to two units.**

**Table 3 - Comparison of alternatives**

<b>Treatment and Units ( )</b>	<b>No Action Alternative 1</b>	<b>Proposed Action Alternative 2</b>	<b>No Release &amp; Weed Alternative 3</b>
Shaded Fuel Break (3)	0	140	150
Aspen Maintenance (3)	0	55	55
Release and Weed (1)	0	34	0
Canopy Reduction (2)	0	28	28
Clearcut (6)	0	83	38
Overstory Removal (8)	0	116	121
Shelterwood Preparatory Cut (2)	0	48	48
Shelterwood Seed Cut (6)	0	97	97
Sanitation/Salvage (6)	0	68	68
Group Selection (3)	0	6	6
Christmas Tree Cutting Area (1)		36	36
<b>Total Acres</b>	<b>0</b>	<b>711</b>	<b>647</b>

## Vegetation Treatments Common to All Action Alternatives

The following are descriptions of the silvicultural and fuel treatment prescriptions:

**CLEARCUT** - Under this treatment, all dead, diseased, beetle-infested, merchantable trees (timber at least eight feet in length and six inches in diameter, and larger) will be harvested (100 percent). The need to start a new forest on some sites is anticipated because high tree mortality from mountain pine beetle or spruce beetle, mistletoe or other intrinsic stand factors would leave too few mature, large trees to justify continued management of surviving trees. The clearcut creates open, full sunlight ground conditions for new regeneration and favors the establishment of early successional species such as lodgepole pine and aspen. The primary objective of clearcutting is the regeneration of a healthy new stand. This treatment would reduce the build up of forest fuels and regenerate a new lodgepole pine stand.

Slash (leftover tree limbs and branches) is typically lopped and scattered. Heavy slash is piled for burning to reduce fuel accumulations. The equipment used to pile the slash also disturbs the ground surface, actually preparing the ground surface for seed to help regenerate the stands. Natural regeneration is anticipated but occasionally seeding or planting may be necessary.

Clearcutting has been proposed for units with current mountain pine beetle infestations, high mortality levels and/or moderate to high levels of dwarf mistletoe infection.

**SANITATION/SALVAGE** - Under this treatment, 20 to 50 percent of the existing overstory in a stand would be cut and removed. This treatment is an intermediate harvest system that consists of 2 connected actions.

*Salvage* is the cutting and removal of dead, dying, currently-infested or deteriorating trees primarily to put the wood to use before it becomes worthless.

*Sanitation* is used to harvest insect or disease infested trees before death occurs. The purpose for removing some susceptible trees is to impair beetle spread in the stand by decreasing the availability of suitable brooding habitat. A special emphasis is placed on harvesting mistletoed lodgepole that are adjacent to healthy lodgepole regeneration. The principle aim of this prescription is to create more growing space for retained trees to produce a healthier future stand, while maintaining the existing big tree character. This treatment can also be used to create a more balanced mix of conifer tree species within a stand.

A combination of sanitation/salvage will be applied to stands having moderate to high incidence of mountain pine beetle and generally low to moderate dwarf mistletoe levels. The objective is to open the stand up by removing dead and dying trees and healthy trees (beetle brood) in the larger diameter classes. Removing these trees will help lower the basal area per acre and average tree diameter per acre producing a healthier stand. Stands with proportionately bigger than small diameter trees are most likely to be infested and suffer greater losses. Slash is typically lopped and scattered.

**SHELTERWOOD - PREPARATORY CUT** - In this preliminary (first) step of stand regeneration, 25 to 35 percent of existing overstory trees would be cut to promote good seed-bearing qualities of the remaining trees. Along with improving the health of the stand, this step is often prescribed to test wind firmness and not to develop it. It is also often prescribed to avoid the appearance of sudden changes in existing stand conditions. This first entry concentrates on removing trees that are diseased and/or of poor form, leaving the healthiest trees. This treatment would be aimed at forest stands where few pines are infested with beetles. Additionally, this treatment is designed to reduce stand density and thus reduce the likelihood of future attack by mountain pine beetle or spruce beetle. The emphasis for tree cutting in this treatment is to harvest merchantable timber that would be most susceptible to future mountain pine beetle or spruce beetle attack and to leave trees believed to be the most vigorous or resilient. Slash is typically lopped and scattered.

**SHELTERWOOD - SEED TREE CUT** - The seed cut (second) step of the shelterwood regeneration system is aimed at getting the new crop of trees established by providing growing space while simultaneously maintaining shelter for developing seedlings. A shelterwood seed cut applies to stands which have an established conifer understory. To accomplish this, approximately 40 to 60 percent of the remaining overstory would be felled and removed with this treatment, retaining healthy lodgepole pines, spruces and other overstory tree species to act as seed source for new regeneration and to protect seedlings. An emphasis is made on harvesting diseased, infested, and trees of poor form. Additionally, this treatment reduces stand density, thus decreasing the likelihood of attack by mountain pine beetle. Along with improving the resiliency of the stand to insects and disease this treatment provides growing space for new and existing regeneration in the understory. Slash is typically lopped and scattered.

**OVERSTORY REMOVAL** - As its name would suggest, the overstory removal prescription involves the harvest (80%) of a stand's overstory. This prescription is used for stands that have a sufficient amount of regeneration or young trees growing under an overstory of mature trees. The objective of this prescription is to remove the inhibiting mature overstory trees so that the regenerated understory trees can grow freely. Removing the overstory has the advantages of improving the growth of the residual stand, removing trees susceptible to mountain pine beetle, and reducing the spread of dwarf mistletoe. Slash is typically lopped and scattered.

**OVERSTORY REMOVAL OF LODGEPOLE FROM ASPEN** – As with a formal overstory removal, all or most of the dead and/or beetle infested, merchantable lodgepole pine in the overstory would be salvaged and/or harvested (80%), retaining the stand's overstory and understory of aspen. As with the clearcut prescription, this treatment is designed to reduce the build up of forest fuels. Slash is typically lopped and scattered.

**GROUP SELECTION** - Under this uneven-aged treatment, 20 to 30% of the overstory is removed in small groups, one to two tree lengths in diameter. An emphasis is made on harvesting groups of diseased trees and trees of poor form. Along with improving the resiliency of the stand to insects and disease this treatment provides growing space for new and existing regeneration in the understory. Slash is lopped and scattered. During the first entry groups containing beetle infested, diseased, dead, and or defective trees would be targeted to create healthier stand conditions. In addition a sanitation salvage would be implemented between groups to salvage imminent mortality (those trees not expected to survive to the next entry).

**SHADED FUEL BREAKS** - may involve mechanically removing or altering the vegetation, whether live or dead, to provide a zone of lessened fuel loading in close proximity to the forest boundary and existing structures. The action typically would be accomplished by hand, using chainsaws for bucking, limbing and felling of small live trees or treating dead and down material. The stand characteristics are typically pole-sized younger lodgepole pine with minor amounts of aspen, spruce and fir. The created slash would either be hand piled for later burning, used as firewood by the public, or chipped. Much of the treated live vegetation would be small diameter (< 7" diameter at breast height) trees that may be removed and/or pruned, thus decreasing interlocking crowns and reducing ladder fuel components in the urban interface. The selection criteria for removal of larger trees would be diseased, suppressed, or otherwise poorly formed trees, balanced with the need to reduce interlocking crowns and ladder fuels.

**CANOPY REDUCTION** – These treatments would occur along certain roadways and would include thinning along a road corridor to provide additional space between tree canopies to provide a potential fire break.

**ASPEN MAINTENANCE** - These treatments would include removal of encroaching conifers and cutting to stimulate regeneration to promote healthier aspen stands to improve natural fire breaks.

## **DESIGN CRITERIA COMMON TO ACTION ALTERNATIVES**

In response to internal and public comments on the proposal, design criteria were developed to moderate some of the potential impacts the various alternatives may cause.

### **Vegetation: Plants, Forage, and Timber**

#### ***Plants***

- Locate and identify the occurrence of squashberry in unit 31 and buffer it from management actions that would result in direct and indirect negative impacts.
- The botanist, wildlife biologist and timber layout coordinator will revisit the four documented clustered lady's slipper orchid occurrences in unit 10 to assess if site conditions in occupied habitat would facilitate designation as wildlife - snag/retention areas (Individuals would be lost, others would be avoided in snag retention areas, but management actions would not result in loss of viability to species).
- Have specified road construction locations reviewed by a watershed specialist.

#### ***Forage***

- Ensure protection or replacement of existing range improvements and structures.
- Survey and treat yellow toadflax or any additional priority species on National Forest land in the project area, in accordance with the Noxious Weed Implementation Plan. The range management staff would coordinate treatments of the known toadflax in the sale area with the timber sale administrator to ensure treatments are carried out before logging activities occur near the existing infestations.
- In order to prevent the spread of yellow toadflax, equipment used off-road in Unit B, or any unit where toadflax is found, would be cleaned before moving into units without any toadflax, as described in the timber contract.

#### ***Timber***

- Design criteria will be addressed in marking guides and timber sale contract.

## **Water**

- Associated operational equipment not specifically identified in the proposed action will be required to stay out of riparian areas and maintain buffer strips along any stream courses. There will be no equipment on any slopes within 100 feet of a water course or water body. Slash resulting from the mechanical treatments must be prevented from entering stream channels minimizing the connected disturbed area. When not operating, all equipment requiring fuel must be parked or stored 200 feet from any water and have on-site fuel spill containment equipment.
- Buffer strips were used for planning purposes only, and may be adjusted on the ground where natural topographic breaks or changes in vegetation communities would be more effective than the identified distances. In all cases, the purpose would be to minimize increases in stream sedimentation, turbidity, and delivery of nutrients to the stream network.

## **Fire and Fuels**

- Design criteria will include appropriate slash treatment and disposal methods to allow for direct or perimeter attack as fire suppression options in management area prescriptions 5.13 and 7.1. These LRMP Standards can be met using typical contract provisions associated with timber harvesting activities. For locations adjacent to areas of concern, such as private lands, trail systems, cultural sites or other areas of concern (i.e. dispersed camping,) additional or more thorough slash treatment may be considered.

## **Human Resources: Recreation, Scenery, Cultural Resources, & Roads**

### ***Recreation***

- Establish closures for limiting travel on temporary roads to logging operations only, and have appropriate signing in place during the lifetime of any temporary roads. Require purchaser to construct physical road closures, install gates, and install signing at the completion of logging on all temporary roads. Sign to inform the public of road and area closures.
- If access roads are plowed in the winter install warning signs at key locations to adequately warn snowmobilers who use this area. Alternative temporary snowmobile trails will be identified to access snowmobile terrain. A temporary parking area will need to be established past the plowed portion of the road(s) with consultation with the recreation staff.
- An information kiosk will be established in a visible location at the forest boundary on FDR 42 to give forest visitors information about vegetation treatments and alternative recreation areas. Other signs and information kiosks will be erected with consultation from the recreation staff.

### ***Scenery***

- Lay out clearcut units to mimic natural openings by following natural contour lines creating irregular and undulating edges. Locate edge of clearcut unit adjacent to existing aspen stands as feasible.
- Retain and protect natural features such as rock outcrops, young healthy trees, understory trees of lodgepole pines, aspen and spruce/fir and shrubs; cut stumps low to the ground as feasible; remove heavy slash and locate and screen slash piles and landings approximately 25 to 100 feet from edges of road.
- Revegetate disturbed soils on landings, burned slash pile sites, skid trails and temporary roads with native seed mixture after the completion of treatments to reduce contrast.

### ***Cultural Resources***

- Cultural resource surveys are required for any new road construction not previously surveyed before project activities can proceed. If the construction of new roads is proposed and the locations are known, we recommend flagging the proposed route for archaeologists to survey areas not previously cleared for cultural resources. If road surveys are required, the results will be included in an addendum that may or may not require State Historic Preservation Office concurrence, depending on the results and the number of acres surveyed. Therefore, cultural resource surveys are required for any new road construction not previously surveyed before project activities can proceed.
- A historic mining camp (5RT670) is located between Unit 7 and NFSR 279.1 and may potentially be impacted by project activities. While the site is officially evaluated as not eligible the site should be avoided if possible.
- All persons associated with operations under this authorization must be informed that any objects or sites of cultural, paleontological, or scientific value such as historic or prehistoric resources, graves or grave markers, human remains, ruins, cabins, rock art, fossils, or artifacts shall not be damaged, destroyed, removed, moved, or disturbed. If any of the above resources are encountered, all activities in the immediate vicinity of the discovery that might further disturb such materials shall immediately be suspended. The discovery must be protected until notification is received in writing from an authorized officer (36 CFR 800.110 & 112, 43 CFR 10.4).

### **Soils**

- Control the use of equipment. Restrict skidding to designated skid trails to the best degree possible.
- Subsoil or scarify detrimentally compacted areas of temporary roads, landings, and main skid trails. A map of soil units having severe compaction potential is available from the soil scientist.
- If subsoiling is necessary, lift teeth every 75 to 100 feet so as to not introduce a continuous furrow.
- Scatter slash on skid trails to provide groundcover and minimize surface erosion. Ensure at least 50% groundcover on skid trails following completion of use. Close all skid trails in the same season of use if unit completed.
- Slash piles not located on landings or designated slash disposal areas will be limited to approximately 300 square feet. This size limit will prevent excessive soil heating from the burn piles. After the piles are burned, they will be spread out.
- Chipped material should be applied at a rate of no more than 3 inches depth at 25-50% ground cover within the activity area. Areas exceeding depth and cover limits should be re-spread using hand tools.
- Establish or maintain ground cover on disturbed areas (i.e., native surface roads, landings, skid trails). These actions will be current with purchaser's operations and will be completed immediately preceding seasonal periods of precipitation or runoff to reduce erosion and the spread of noxious weeds.

- Skid trails water bars should have the following spacing:

<u>Slope</u>	<u>Average water bar spacing</u>
0-10%	300 feet
10-20%	200 feet
20-30%	100 feet
30%	50 feet

These are average spacing criteria only. The actual location for each water bar is dependant on the site-specific topography. In some instances the water bar spacing may actually be closer or farther apart, but overall the average spacing between water bars should meet the above guidelines.

## **Wildlife**

- Retain on average 2 existing ‘hard’ snags per acre within all treatment units.
- Retain on average 2 live character trees per acre in all intermediate harvest treatment units.
- Retain on average 4 live character trees per acre on regeneration harvest units.
- Where treatment management actions are proposed within a 3/8-mile radius of a known goshawk nest site, a wildlife biologist will delineate three 30-acre nesting habitat protection areas.
- Where treatment management actions are proposed within a 3/8-mile radius of a known raptor nesting site, a wildlife biologist will establish one nesting habitat protection area of no more than 30 acres in size.
- Prohibit all logging-related operations or activities, including long haul, within 1/4-mile of an active raptor nest between March 15 and September 15.
- Between May 1 and July 31<sup>st</sup> of each year, a wildlife biologist or trained crew will conduct goshawk inventory (detection) surveys in areas scheduled for treatment during the upcoming operating season if adequate surveys have not been completed to the degree to evaluate goshawk occupancy.
- Upon discovery of a new goshawk nest location or other TES wildlife species nesting/breeding (or other essential) site, suspend any active logging or other contract operations underway in the immediate vicinity until a wildlife biologist assesses the situation and determines appropriate action(s) to take for protection of habitat or individual animals.
- Retain all old-growth lodgepole pine trees not infested (at time of timber marking) with mountain pine beetle.
- To the extent practicable, and where available, retain in place within timber harvest units some existing deadfalls (whole trees) or logs (portions of tree boles) measuring  $\geq 16$  inches in diameter and that are  $\geq 20$  feet in length.

For more detailed information on wildlife design criteria see wildlife specialist report.

## FOREST PLAN CONSISTENCY

All activities, as embodied in the proposed action described above, are planned consistent with applicable Forest-wide resource standards defined within the Routt National Forest Land and Resource Management Plan. The proposed action is also consistent with the desired conditions for all resources specific to the management area 7.1 and management area 5.13 land allocations and conforms to the desired condition identified for the Sand Mountain Geographic Area.

*There are no identified inconsistencies with the Forest Plan or other direction when specified design criteria are incorporated into the proposed project. Additionally by following Forest Plan standards and guidelines, best management practices, and specified design criteria there would be no irreversible or irretrievable impacts to any resources.*

Resource specific Forest Plan Consistency Determinations can be found in each specialist report.

## AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Historical and existing information about an area or affected environment helps to explain how ecological conditions have changed over time as a result of human and natural disturbance. The historic information also provides a reference for later comparison with existing conditions, although it is not always possible to obtain historical information for all resources. Existing conditions describe the current status of the environment within the area. The information displayed in this section includes pertinent excerpts from various resource specialist reports that were completed for the Larson II Project. **See specialist reports for detailed discussion. Specialist reports not attached to this document can be found in the project file at the Hahns Peak/Bears Ears Ranger District in Steamboat Springs, Colorado.**

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives.

### Economics

The analysis area is located on the HPBE Ranger District of the Medicine Bow-Routt National Forests in Routt County, Colorado. The proposed project is located in close proximity to the communities of Columbine and Hahns Peak Village with an increasing number of high value residential dwellings scattered around Steamboat Lake State Park and adjacent to the project area. These areas have the greatest potential to be directly affected by the project activities because of their proximity to the analysis area and the poor health condition of the forest. Therefore, they are the focus of the following social and economic analysis.

Some residents of these communities depend upon a variety of forest resource-related activities, and access to resources, for their economic livelihood. These forest resource-related activities include: wood products, mining, hunting, fishing, outfitter guiding, grazing, tourism, snowmobiling, and other recreation activities. The majority of those potentially affected who live around the project area may also consider the forest resources and access an important part of their quality of life.

The main criteria used in assessing economic efficiency are Present Net Value (PNV), which is defined as the value of discounted benefits minus discounted costs. An economic analysis includes all outputs and costs, including timber, grazing, and recreation, for which monetary values are available. The monetary values include both market and non-market values. A financial efficiency analysis was also completed to determine the financial returns of each alternative. A financial efficiency analysis is the PNV of agency revenues and costs.

For the Larson II Project, the output level of nonmarket goods (e.g. recreation, hunting, water production) is not expected to change in any of the alternatives. Any impact on recreation opportunities due to this project would be a temporary shifting of use from one area to another, with no overall increase or decline. In addition, there are no non-Forest Service costs associated with this project. Thus, for all alternatives the economic efficiency analysis is the same as the financial efficiency analysis.

The efficiency analysis for the Larson II Project was conducted over ten (short-term) and forty-three (long-term) year periods, from 2007 through 2017, and 2007 through 2050. All costs and timing of the activities and outputs were developed by the specialists on the interdisciplinary team.

Table 4 and 5 below display the PNV and benefit/cost ratio for each alternative. All monetary values are expressed in constant dollars with no allowance for inflation. A 4% discount rate was used. The reduction of PNV in any alternative as compared to the most efficient solution is the economic trade-off, or opportunity cost, of achieving that alternative.

**Table 4: Short-term Economic Efficiency by Alternative**

<b>10-Year Period</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2</b>	<b>Alternative 3</b>
Present Net Value	N/A	-\$232,588	-\$197,639
Benefit/Cost Ratio	N/A	0.55	0.57

**Table 5: Long-term Economic Efficiency by Alternative**

<b>43-Year Period</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2</b>	<b>Alternative 3</b>
Present Net Value	N/A	-\$267,667	-\$229,570
Benefit/Cost Ratio	N/A	0.57	0.60

*Source: Quicksilver Economic Analysis*

Tables 4 and 5 indicate that Alternative 3 has a higher PNV and benefit/cost ratio than Alternative 2 and is the most efficient alternative. Under Alternative 1 there are no costs and no benefits, therefore the benefit/cost ratio is not applicable and the PNV is zero.

When evaluating trade-offs, the use of economic efficiency measures is one tool used by the decision maker in making the decision. Many things cannot be quantified, such as effects on wildlife, forest health, potential future management of the area, soil productivity and water quality. The decision maker takes these and many other factors into account in making the decision.

*Cumulative Effects* - There are many elements that influence and affect local economies including population growth, economic growth, and economic diversity and dependency of individual counties and communities. Due to the relatively small scope of this project, it is not expected to add any existing cumulative effect to the economy.

## **Vegetation: Plants, Forage, & Timber**

### ***Plants***

Elevations in the project area range between 8200 and 9200 feet. The cover types are predominately dry spruce/fir, lodgepole pine forests that support grass and forbs and minor amounts of aspen. Drainages here support alder thickets and the bottoms and toe slopes support coniferous forests with moist soils. The main watersheds drain into the Yampa River which ultimately drains into the Colorado River main stem ecosystem.

The analysis area has no known occurrences or potential habitat for plant species formally listed or officially proposed under the Federal Endangered Species Act (Clayton 2006, CNHP 2005).

There are 88 plant species listed on the 2005 R2 sensitive plant species list (Riordan 2005), of which 29 are known or likely (biologically or geographically) or are suspected to occur on the Routt National Forest. Of these 29 species, 23 are unlikely to occur within or near the analysis area and have been dropped from further consideration (Barmann 2006, Spackman *et al.* 1997, Fertig *et al.* 1994, USDI 2002, Species Conservation Project Website 2003).

The area of influence of the proposed action supports potential habitat for **6** of the **29** Region 2 Forest Service Sensitive plant species which are known or likely to occur on the Routt NF (Barmann 2006).

The following species were carried forward into the field reconnaissance portion of the analysis:

1. Botrychium lineare,
2. Botrychium multifidum var. coulteri,
3. Festuca hallii,
4. Rubus articus var. acaulis,
5. Selaginella selaginoides,
6. Viola selkirkii.

No R2 sensitive status plant species were found as a result of the field reconnaissance specific to this project (Barmann and Brown 2006). Of the **6** plant species evaluated in the field reconnaissance portion of this report, **5** were dropped from further consideration because adequate surveys were conducted to determine that they or their habitats are absent from the area of influence of the proposed action.

The following plant species was further analyzed:

- *Botrychium lineare* (slender moonwort). The Rocky Mountain Regional Office Direction allows for “assuming presence” when surveys have not been completed or when species presence cannot be reasonably determined in surveys (R2 Supplement 2600-2006-1 2672.43). Of the proposed treatment units within the analysis area, an estimated 5% is considered habitat that *Botrychium lineare* is likely to occupy.

It is biologically and geographically likely that this species occurs on the planning unit. However, there are currently no documented occurrences of *Botrychium lineare* on the Routt NF and none were found as a result of the field reconnaissance specific to this project (CNHP 2005, Barrman and Brown 2006). Assuming presence, *Botrychium lineare* populations would be expected to be small and discontinuous as is typical.

The Proposed Action ***may adversely affect individuals but is not likely to result in a loss of viability on the planning area, nor cause a trend towards federal listing or a loss of species viability*** for *Botrychium lineare*.

Of the 29 plant species considered in this biological evaluation, implementation of the proposed action is anticipated to have **No Impact for 28** and a **May Adversely Impact Individuals on 1**.

*Alternative 1*-Under the No Action Alternative, no fuels reduction or commercial timber treatments would be implemented in overstocked stands which are in poor health including stands at risk of bark beetle infestation and/or stands already infested by bark beetles. Therefore, no direct or indirect effects to *Botrychium lineare* are expected to occur as a result of management actions under the No Action Alternative. Assuming presence, occupied sites of slender moonwort would, at least for the short term, continue to experience any current levels of disturbance.

*Alternative 2*- Under the Proposed Action, in the short term, approximately 35 acres of habitat potentially occupied by slender moonworts would be disturbed. Of those acres approximately 21 acres associated with commercial timber harvest are likely to receive ground disturbance at moderate to high intensities. Approximately 15 acres associated with fuels treatment reductions are likely to receive ground disturbance at moderate intensities and are at risk of being covered by hand piles and burned.

Under the Proposed Action, in the long term, approximately 711 acres of potential future habitat could be created.

*Alternative 3*- Under alternative 3, in the short term, 32 acres of potential habitat would be disturbed, and approximately 647 acres of future habitat could be created.

*Cumulative Effects* - Cumulative effects are not expected contribute to any change in status or viability. Also, the cumulative effects are not expected contribute to an increase in any current or predicted downward trend in population numbers or density or to current or predicted downward trends in habitat capability that would reduce the existing distribution of *B. lineare*.

The ongoing, proposed and reasonably foreseeable actions can continue to provide disturbances that allow for *Botrychium lineare* establishment and growth. These actions can also provide disturbances that reduce the growth of existing plants.

## Forage

*Existing Condition-* The timber harvest units B, C, F, G, J, H I, 3, 4, 17, 18, 19, 21, 22, 23, 24, 25, 31, 38, 39 are located within the Devils Slide cattle and sheep (C&S) allotment. Units A, D, 1, 6, 7, 9, 10, 11, 12, 13, 14, 15 are within the Floyd Creek cattle and horse (C&H) allotment. Units 1, 2, 5, 26, and 27 are in both allotments. See table 5 for current permitted livestock use on each allotment.

**Table 5 – Permitted Livestock Use**

<b>Allotment</b>	<b>Permittee</b>	<b>Season of Use</b>	<b>Permitted Livestock</b>
Floyd Creek C & H allotment	Jay Fetcher	7/1 – 7/21	90 cow/calf pairs
		8/14 – 9/15	120 cow/calf pairs
Devils Slide C&S allotment	Chew Ranch	7/16 – 9/30	2790 ewe/lamb pairs
		7/10 – 10/25	88 cow/calf pairs

*Alternative 1-* Under the no action alternative livestock grazing management would continue without any modifications. No change in the existing vegetative, structure, cover, or composition would occur. The current noxious weed management as outlined in the Noxious Weed Implementation Plan (NWIP) for the Medicine Bow-Routt National Forest would continue.

*Alternatives 2 and 3-* The proposed timber units would have little effect on livestock grazing management or activities. The proposed units are in timbered areas that provide little desirable forage for grazing and are not significantly used for range. Livestock would tend to avoid areas where harvesting work is occurring.

For units 15, D, 1, E, 2, and 5, in the Floyd Creek C&H allotment, there could be an impact to the existing drift fence in these units, and the purchaser of the timber would be required to repair the fence as needed.

Unit D is proposed as an aspen maintenance harvest. Aspen maintenance involves the removal of encroaching conifers and this would likely allow better access to the stock tank.

Livestock may be attracted to the openings created following the removal of timber. The permittee may be instructed to avoid grazing or setting up camps in or near these areas. This would be determined by site specific needs.

Most of the proposed units will have little to no effect on existing rangeland vegetation. For those areas within the project area where rangeland utilization is occurring, it is expected that the proposed actions have the potential to help maintain and attain desired rangeland conditions.

Noxious weeds are known to increase their populations with disturbances such as: overgrazing, fire, recreation activities, and timber harvesting. There would likely be a slight increase in existing populations of houndstongue, Canada thistle and oxeye daisy. The two known patches of yellow toadflax may increase. Annual weeds, not considered noxious, may increase on skid trails, landings and roadsides.

Use of the outlined designed criteria would limit the long-term establishment of new noxious weed infestations, and treatment and monitoring of noxious weeds would continue as outlined in the NWIP.

*Cumulative Effects* - No significant cumulative effects to the permitted livestock use are anticipated. No significant cumulative changes to the rangeland resource are reasonably anticipated. No cumulative adverse effects are anticipated for this project. The District will continue its noxious weed management program whether this project is implemented or not, including monitoring and managing for new noxious weed species.

### **Timber**

*Existing Condition*-The Larson II Project is comprised of approximately (41%) lodgepole pine, (39%) spruce, (18%) aspen and (2%) shrub/forb/grassland. The existing timber stands are dominated by old aged dry lodgepole and mixed stands dominated by Englemann spruce. Stands dominated by spruce are typically on moister sites, and are only slightly less abundant than lodgepole stands. Stands are typically single storied dense, mature to over mature with insect and/or disease infestations affecting a minority of the stands at this time.

Much of this area is declining due to accumulated forest health problems magnified by dense overstocked stands. Dwarf mistletoe, in approximately one-fifth of the stands under consideration for treatment, has Hawksworth (1977) dwarf mistletoe rating for the stand of 2 or more which is indicative of high stand infection.

A few of the stands are already past the point of optimal growth due to high stand densities; poor site conditions; and stress from insects, disease, and drought. As stands pass their optimal growing point, they begin to deteriorate and become dominated by spiked-top trees, mistletoe infected trees, trees with stump rot, and dead/dying trees falling to the ground. Both management areas in the proposed project, 7.1(39%), and 5.13(61%) have stands as described above and need treatment.

A typical mixed conifer understory is dominated by true fir with a few stands having a larger component of spruce. The more moist sites have a better mix of age classes with multi-storied understories of fir and spruce. The pure lodgepole stands typically have little regeneration underneath and a ground cover dominated by grouse wartleberry (*Vaccinium*), heartleaf arnica (*Arnica*), and/or elk sedge (*Carex*).

The most recent timber harvested in the project area recorded in the Forest Service Activities Tracking System (FACTS) was in 1991 with 155 acres harvested on eight units with regeneration treatments. Prior to that time treatments for spruce beetle occurred in the late '50s early '60s in a small portion along the southwest edge of the analysis area. The 1991 harvested stands are regenerating and are fully stocked with some supplemental plantings completed to get the stands back to timber production management objectives.

Stand ages range from approximately 90 to 160 years in age. Basal areas ranged from 112 to 280 square feet, with the average for the proposed area of approximately 176 square feet. Optimal basal area for healthy stands is approximately 80 to 120 square feet. The terrain is moderately steep in areas with up to 40% slope with flat areas scattered throughout the project area. The steeper areas are usually small portions of a stand with the remaining stand area usually below 30% slope.

Lodgepole pine stands that are highly susceptible to mountain pine beetle typically have the following characteristics: average diameter at breast height >8 inches, average age > 80 years, and a suitable climate for beetle development determined by elevation and latitude (Amman et al. 1977).

Lodgepole pine mortality due to mountain pine beetle has been increasing for several years in and around the analysis area. Widespread epidemic populations of both mountain pine beetle and spruce beetle are occurring on surrounding National Forest Lands.

Lakewood Service Center-Forest Health Protection (LSC-FHP) personnel used aerial survey information for the analysis area and ground survey for 20 of the 46 proposed management units of the analysis area to determine the level of beetle infestation in these areas. Aerial survey results of the analysis area show an increase in the number of trees killed and the size of the infestation since 2001. The estimated area affected by mountain pine beetle-caused mortality increased from 0.3 acres in 2001 to 448 acres in 2006.

Ground surveys recorded the number of trees infested with mountain pine beetle and spruce beetle in 2005 and 2006. Ground survey data for the sampled units within the analysis area indicate that the mountain pine beetle and spruce beetle infestations are increasing.

From 2005 to 2006, the number of mountain pine beetle-infested trees within the proposed treatment areas ranged from 0 to 75 newly infested trees per acre, and the number of spruce beetle-infested trees ranged from 0 to 7 newly infested trees per acre.

Variable radius plots measured during ground surveys and available stand exam data were used to determine stand susceptibility to MPB and SB. Average stand diameters, age, tree density, elevation and proximity of MPB populations indicate many stands in the proposed treatment units surveyed are highly susceptible to MPB outbreaks. Given the trend of increasing MPB activity and the concurrence of stand characteristics that favor MPB infestation, these units are likely to sustain significant losses in the future. Most spruce stands were rated medium risk for spruce beetle using a rating system developed by Schmid and Frye (1976).

A lightning fire started in unit 27 in 2005 and is planned for a salvage treatment. This stand may be an optional stand due to the potential that the wood may not have much commercial value by the time it is harvested.

*Alternative 1*-Under the no action alternative no silvicultural treatments would occur to address poor stand conditions or the ongoing beetle epidemic and no fuel treatments would be used to address hazardous fuel conditions.

*Alternative 2 and 3*-The proposed treatments would provide an opportunity to reduce hazard fuels by removing infested, dead and dying trees, improve forest health conditions to enhance a stand's ability to ward off beetles, and provide forest products. Silvicultural treatments of clearcut, sanitation /salvage, overstory removal, group selection, and shelterwood cuts would be used to address forest production, health, and insect and disease infestations.

Clearcuts and group cuts would remove all dead, diseased, beetle-infested timber, and merchantable trees (timber at least eight feet in length and six inches in diameter, and larger) to regenerate a new stand and reduce accumulating fuels. Sanitation/salvage treatments would remove dead, dying, beetle-infested, mistletoe-diseased, and high-risk trees and will remove 20 to 50% of the overstory. Overstory removal would be used only if a regenerated understory was present under the stand. This removal would allow the understory to release and grow after the overstory is removed. The overstory removal treatment would remove 20 to 40% of the overstory and would target bark beetle infested and high hazard trees. Shelterwood preparatory cuts would remove approximately 30% of the existing overstory concentrating on removing beetle infested, diseased trees and trees with poor form. This would determine wind firmness of the remaining trees while providing shelter for the trees regenerating in the disturbed soils from the harvest. Shelterwood seed cuts would remove a portion of the overstory to promote growth of the understory. Beetle infested diseased trees would be the first removed.

Slash in clearcuts would be piled and burned and snags, retention trees, and coarse woody debris would be left to Forest Plan standards or greater. Slash in partial cutting units would be lopped and scattered with some pile burning if necessary to reduce fuels. Slash treatments along private property boundaries and near some recreation sites may include whole tree skidding to reduce slash visibility and fuels buildup next to private property, and/or recreation features.

Temporary roads would be necessary to access proposed action units and would be closed after harvest, these roads would be ripped and slashed over to reduce erosion and expedite soil and vegetation recovery. Some temporary roads would require design by the engineering department to reduce potential impacts.

*Cumulative Effects* - The No Action Alternative would allow areas to remain overstocked with trees with poor health and vigor and bark beetle infestations would continue to spread. It is expected that bark beetles would continue to spread and decrease the productivity of forested stands in the proposed project and adjacent areas into the near future. Over time there is potential for the no action alternative to negatively affect management areas 5.13, Forest Products, with increasing mortality in conifers and regeneration of undesirable timber species for productive management.

*Alternatives 2 and 3* - Healthy stands provide several management options into the future, but dead stands offer fewer options. The suitable timber sites in 5.13 timber management areas are important for their near or long-term contribution to the goals for production of commercially valuable wood products and timber sustainability. Susceptible stands are, almost by definition, the more productive, higher value, and higher volume stands. Past timber harvest since 1950 in combination with the proposed action treatments would cumulatively reduce beetle spread and hazard risk in the analysis area.

Past timber management practices that have occurred on adjacent ownerships and on the Forest in the 5.13 and 7.1 management areas have had a positive influence on the current situation. Areas that have been regenerated (clearcut) or that have received partial harvest treatments (thinning, sanitation/salvage, etc.) are less susceptible to bark beetle attack and aggregation. Those practices reduce the stand age, basal area, trees per acre, and arrangement of host trees, all of which reduce the attractiveness to beetles. Although many of the past treatments were not specifically designed to reduce bark beetle habitat, they accomplished that effect to some degree. The last harvest was approximately 16 years old and green trees are regenerating in the units. The action alternatives proposed would improve the existing condition by providing additional treated areas with less bark beetle susceptibility while generally improving health and vigor of the forest. Due to the small size of the actions and the time period between previous and future projected projects in the analysis area there would be no known adverse cumulative effects, and no irreversible or irretrievable effects directly related to this project. This project would improve forest health, and would not contribute to additional cumulative effects associated with the proposed fuel treatments and timber harvests.

## **Aquatic Resources- Water & Fish**

### ***Water***

*Existing Condition-* The Larson II Project watershed analysis area is located on the west side of the Continental Divide within two hydrologic unit code (HUC) 6 watersheds, Upper and Lower Willow Creek watersheds of which three discrete HUC 7 (smaller) watersheds make up the watershed analysis area. These three watersheds are Mill Creek, Upper Floyd Creek, and Red Creek which together are approximately 14,300 acres. This area west of Steamboat Lake consists of three major perennial systems from which the HUC 6 watersheds are named. Floyd Creek is the farthest north followed by Mill Creek and then Red Creek in the south. Both Floyd and Mill Creek drain into Steamboat Lake while Red Creek enters into Willow Creek below the outlet of Steamboat Lake.

The project area is relatively small and the corresponding watershed analysis area lies in a portion of three HUC 7 watersheds. Annual precipitation within the analysis area averages between 25-30 inches. The annual precipitation is typical of a snowmelt dominated system, although severe thunderstorms during the summer months can elevate base flows.

The majority of the stream channels are unconfined, low gradient drainage systems with a relatively high water table. The riparian corridors are typically small composed largely of a mosaic of some aspen, lodgepole, spruce, willow, and alder. The side slopes are typically low gradient. The more identifiable riparian areas are located in the low channel gradient portions of the watershed and are composed largely of willows, grasses, and some aspen and often contain a large woody debris component in the stream channel.

*Alternative 1 -* There would be no change from the existing condition under this alternative. There would be no change in the hydrologic and sediment regime, and no impacts to water quality or watershed condition.

*Cumulative effects -* The potential for a landscape scale wildfire would still exist as well as continued mountain pine beetle stand mortality, which could potentially degrade watershed condition by increasing water and sediment yields. Although the predictions of high stand mortality rates with a no action scenario are variable, increases in lodgepole pine mortality is very likely.

*Alternative 2 and 3*- The alternative treatments would remove less than 2 % of the total basal area within the analysis watersheds, and therefore would not significantly increase water yield or significantly contribute to any cumulative effects of increased water yield resulting from past and proposed timber harvest activities.

There would be some potential for increases in sediment loads and turbidity from runoff events on disturbed land. However, due to the relatively small percent of the watersheds to be treated, and design criteria measures, delivery of sediment to the stream network would be minimal. With design criteria implemented, there would be no significant effects to water quality.

Cumulative effects - There would be no significant adverse cumulative effects from this proposed action. Water yield increases are not generally detectable until at least 25 percent calculated equivalent clearcut acres. This alternative includes temporary road construction which has the potential for short-term increase in sedimentation, but the lack of new road/stream crossings limits this potential. Reducing the fuel load and providing strategic fuel treatment zones would reduce the potential for a major wildfire to carry across the landscape which, depending on the duration and intensity, could result in irreversible effects to the water resource. The size and types of proposed treatments within this watershed in conjunction with design criteria will limit the potential for cumulative impacts. This project would improve watershed health.

### ***Fish/Amphibians***

*Existing Condition*- Streams in the Larson II Project area include Floyd Creek, Mill Creek and Red Creek. Floyd Creek and Mill Creek flow into Steamboat Lake. Red Creek is a tributary to Willow Creek, which is a tributary to the Elk River. Steamboat Lake is routinely stocked with rainbow trout and Snake River cutthroat trout (Foster 2007).

Floyd Creek has had no recent surveys. Information from the Colorado Division of Wildlife database identifies brook trout as the only game fish in Floyd Creek. Mill Creek was sampled in August 2005 approximately ¼ mile and 3 miles upstream from the forest boundary. Brook trout, cutthroat trout and mottled sculpin were sampled at the lower site. Brook trout had a density of 377 fish per mile. Given that Steamboat Lake is stocked with Snake River cutthroat trout it is presumed that the 5 cutthroat sampled in Mill Creek were Snake River subspecies that had migrated from Steamboat Lake. The upper site contained only brook trout with a density of 84 fish per mile. Red Creek has had no recent surveys. Information from the Colorado Division of Wildlife database identifies brook trout as the only game fish in Red Creek (Foster 2007).

The project area does not offer much amphibian habitat. Amphibians require standing water habitat for breeding. In the project area, standing water habitat would be provided by beaver dams. The streams are rather steep and wooded and thus there are not many beaver dams. The most likely habitat for amphibians is closer to the forest boundary where the gradient is low and willow stands are present. Amphibian surveys were done in August 2005 and no amphibians were found although the tiger salamander and chorus frog are likely to occur within the analysis area. A review of the Colorado Natural Heritage Program (CNHP) database and Colorado Division of Wildlife Amphibian database identifies chorus frogs and leopard frogs on private land near Steamboat Lake. All amphibian are cryptic species and a one time survey does not confirm or deny presence or absence (Foster 2007).

There are no records of reptiles occurring in the analysis area although it is likely that the common garter snake and possibly the smooth green snake occur within the analysis area.

*Alternative 1* – With the No Action Alternative there would be no direct effects to fisheries resources. Indirect effects may result if a large scale natural disturbance such as a large scale wild fire occurred in the project area. This indirect effect scenario is speculative and the amount of impact would vary depending on the scale of the natural disturbance. There are no cumulative effects anticipated with the No Action Alternative.

*Alternative 2 and 3* – No impacts; direct, indirect or cumulative are anticipated to the fish species from implementation of the Proposed Action or alternative 3 as the project is designed.

Watershed best management practices (BMPs) should adequately protect aquatic species habitat and populations (Foster 2007).

There are no water-depletions associated with this project and thus ‘No Effect’ to the endangered river fishes of the Platte and Colorado River basins is anticipated.

- Bonytail – No Effect
- Colorado Pikeminnow – No Effect
- Razorback sucker – No Effect
- Humpback chub – No Effect
- Pallid sturgeon – No Effect

*Cumulative Effects* - Implementation of an action alternative is not anticipated to result in any cumulative effects to fish.

## **Fire and Fuels**

*Existing Condition*- Typical lodgepole pine and Engelmann spruce/subalpine fir forests exist within most of the analysis area. A long return interval fire regime has dominated and determined this landscape. Large-scale fires, or other disturbance events, likely played a very large role in creating the forests we see today. Furthermore, large-scale disturbances will continue to heavily influence, predetermine, and regenerate our forests in the future. The disturbances currently at work in and near the project area (the mountain pine beetle, the spruce beetle, mistletoe, and nearby recent large scale fires) and the mean age of the stand, all suggest a forest that is nearing its culmination or stand turnover interval.

Modern fire history records identify 37 fire starts within the analysis area from 1970 until present. The study of fire history not only identifies specific vegetation patterns and fire adaptations, it can provide insight into potential future events and likely outcomes. Of considerable consequence is the on-going mountain pine beetle population outbreak. In lodgepole pine, population outbreaks are often stand-replacing events, as fire usually follows the outbreak within 15 years (Samman et al 2000). Other disturbance such as dwarf mistletoe, drought conditions, average stand age, and nearby large scale blowdown, spruce bark beetle, and wildfire events suggest numerous forest conditions in the greater area nearing culmination or stand turnover interval.

*Alternative 1-* Under the No Action Alternative, no treatments would be implemented. The current forest stand conditions would be left to natural disturbances and ecological processes would continue. The processes of forest maturation and the impacts of large-scale MPB and other associated natural disturbances (spruce bark beetle, dwarf mistletoe, Western balsam bark beetle, Armillaria root disease, etc.) will continue to affect stand characteristics by increasing fuel loading (materials available for burning) and subsequent potential fire behavior. It is anticipated these natural events will increase the hazard of potential fires in the area and increase the potential for a large-scale stand replacement fire. It is important to note that these conditions are well within the historic and natural conditions for this ecosystem. However, it has also been recognized that many human values such as infrastructure, residential development, and timber values may be at greater risk to adverse affects from the fire and fuels environment under the No Action Alternative.

*Alternatives 2 and 3-* The action alternatives would result in the removal and reduction of fuels and in most cases will reduce fuel accumulation that would occur through natural deterioration processes of the standing timber component, especially as ongoing beetle infestations continue in the mature forested stands. In the context of the overall larger landscape, the identified treatment areas will result in a beneficial effect by lessening future fuel loading on a site-specific or stand basis. The proposed treatments would increase the diversity in age stand structure; and maintain diversity in forested species composition. This would potentially result in an improvement in general biodiversity, forest health and resiliency, and a greater overall component of heterogeneity. A mosaic of different age classes and species creates habitat is created for a wider range of plant and animal species, providing the forest with a greater ability to recover after a disturbance such as stand-replacing fire. The proposed action will have a positive effect in reducing the extent of standing beetle hit “red needled” conifer in the near term and will reduce the extent of long term future fuel loads associated with beetle killed stand that will accumulate on the forest floor as trees start to deteriorate and collapse.

*Cumulative Effects* - Cumulative effects to the fire /fuels resource may be an increased need for suppression actions and heavier tactics with less potential for success over time, as full suppression will likely remain the desired management response. Past actions have generally had a positive influence on the area from a fire safe perspective. The current proposal would only add to the positive effects of past vegetation management. No differences in cumulative impacts are identified when comparing Alternative 3 to Alternative 2.

## **Human Resources – Recreation, Scenery, Cultural Resources & Roads**

### ***Recreation***

*Existing Condition-*The analysis area is categorized as Roded Modified or Roded Natural in the 1997 Forest Plan Revision. These Recreation Opportunity Specturm (ROS) designations support recreation opportunities that can be found in areas of more intensive vegetative management. These areas often have a good system of roads and trails, providing access for the public, yet they are often located farther from more popular recreation attractions.

Light recreation use occurs during the summer with moderate use during the fall and winter. Summer use includes dispersed camping along system roads and associated activities such as ATV and motorcycle riding, driving for pleasure and horseback riding. Private landowners access the forest from their land. There are no system trails in the analysis area.

Fall use is primarily associated with hunting with heavy use of dispersed campsites along system roads. Hunters travel by ATV, horseback, and foot.

There are three outfitter/guide permittees within or adjacent to the analysis area. Two permittees provide guided horseback riding, hunting, and cross-country skiing trips. One permittee grooms FDR 42 for snowmobile use from approximately mid-December to mid-April.

*Alternative 1-* Under this alternative, there would be no change to the existing recreation opportunities, patterns and trends. The expected increase in spruce and pine tree mortality will likely negatively affect the visual quality in much of the analysis area. Recreation use would continue to increase. Illegal motorized use would likely continue in some areas closed to motorized recreation. Beetle killed trees will become hazard trees.

*Alternative 2 and 3 -* Logging can impact existing recreation settings and opportunities. Dispersed campsites can be impacted by loss of screening and increased sun and wind exposure by moderate tree removal, and destroyed with heavy tree removal. Landscapes can be changed from a natural appearance to substantially modified appearance. Logging debris, stumps, new roads and skid trails can detract from the visual appeal and overall aesthetics of an area. However, without treatments spruce and pine tree mortality would continue to increase, affecting the visual attractiveness of many dispersed campsites and increasing the safety hazard of more dead trees.

Logging operations may temporarily displace campers who use the dispersed sites in the analysis area. Since it is unlikely all the dispersed camping areas would be impacted at the same time, it is expected that these campers would move around as the logging progresses from one area to another. This would result in higher than usual concentrations of campers and associated impacts in some areas on a short-term basis.

If treatments occur during the winter months, access to snowmobile trails would be affected. The trenches formed by plowing deep snow can create safety hazards for snowmobilers, especially during whiteout conditions. Grooming by the permittee would also be affected. If FDR 42 is used for winter treatments, an alternative route will be identified for the permittee to groom for winter recreation access.

Illegal ATV/motorcycle use may occur on roads created for access to logging units. While these roads will be closed and/or decommissioned after treatments, some motorized users may go around gates and access closed roads. This may lead to an increase in off-road impacts.

There will be impacts to some outfitter-guide permit holders who operate in the summer and fall. These permittees will need to be informed of vegetation treatments, operational periods, and potential impacts to their designated routes/areas. If necessary, alternative trails and areas will be identified to allow permittees to continue their operations with the least possible impact.

*Cumulative Effects* – Past, present, and foreseeable future activities, primarily vegetation management, will alter the backdrop but will not impact the recreational uses of the area. Recreation opportunities, primarily roaded recreation and hunting, will not be adversely affected in the long term.

## *Scenery*

*Existing Condition-* The project area is located within the Sand Mountain Geographic Area. Nipple Peak South and Nipple Peak North Inventoried Roadless Areas are located north and south of the proposed project area. The characteristic landscape includes spruce/fir, aspen, lodgepole pine, shrubs, grasses and forbs. The proposed timber sale and fuel reduction treatment areas can be viewed from County Road 129, County Road 62, Steamboat Lake State Park, NFSR 42 and several other low-use forest roads. Numerous private homesites are located adjacent to the project area.

The project area's characteristic landscape has been modified by human activities such as logging and associated road construction, livestock grazing, mining and recreation activities for several decades. Natural events of wildfires, winds, insects and disease also have played a role in the natural changes of the landscape. There is an evidence of beetle-killed trees within the project area.

*Alternative 1-* There would be no direct and indirect effects, as there would be no management activities. Only the forces of natural events such as wildfires, winds, insects and disease would change the visual landscapes.

*Alternative 2-* There would be some short-term direct effects on visual resources when forest visitors recreating within the project area would notice forest ground disturbed by mechanical treatments that contrast with the surrounding undisturbed landscape. Several of the proposed overstory removal and clearcut units would be noticed from certain viewing points within and adjacent to the project area. Treatment units would be designed to blend with the surrounding characteristic landscape. Treating aspen stands would allow maintenance of vegetation diversity and scenic quality. Some treated sites would not be noticed or partially noticed due to the vegetative and landform screening. Over time when treated sites are greened up and covered with new healthy vegetation, visual impacts would be lessened. Fuel treated stands with little or no slash on the ground and more open space between live standing large green trees would enhance scenic quality.

The timber harvest and fuel reduction treatments would maintain and meet the desired scenic condition of the characteristic landscape of the Sand Mountain Geographic Area and benefit scenic values in the long term.

Indirect effects could occur when Forest visitors ride OHVs off improved access road or trail and enter treated sites and cause visible resource damage of the landscape.

*Alternative 3 -* Direct and indirect effects would be similar to Alternative 2 except that there would be less noticeable visual change of the landscape. Approximately 38 acres would be clearcut instead of 83 acres in Alternative 2.

*Cumulative Effects-* Past, present and future management activities were reviewed for cumulative effects on visual resources. Past harvest activities and road construction have been implemented within and adjacent to the analysis area. Most of the past cut units are covered with new vegetation of various ages and heights, and blend well with the surrounding forest landscape. Timber harvest and fuel reduction treatments would allow the existing characteristic landscape of the Sand Mountain Geographic Area to be maintained for present and future generations. Cumulative effects would be negligible for no action and proposed action alternatives. The No Action Alternative meets the revised Forest Plan adopted visual quality objectives and Alternatives 2 and 3 would meet the adopted visual quality objectives when mitigation measures are followed.

### ***Cultural Resources***

*Existing Condition-* In 2006, Routt National Forest archaeologists performed a small intensive cultural resource survey of 16.5 acres for the Larson II Project. In 2002, Routt National Forest archaeologists performed an intensive cultural resource survey of 669 acres for the proposed commercial thinning project of beetle-damaged areas for the Red Creek Beetle Suppression Project (Trook et. al 2003). The latter project was never implemented, and overlaps much of the Area of Potential Effect (APE) of the proposed project. Thus, the current project will draw substantially on the previous work and data collected for the Red Creek Beetle Suppression Project. A total of 333 acres have been previously surveyed within the 711 acre proposed project. Seven isolated finds have been identified within the APE and one site (5RT.670) was re-evaluated during the 2002 survey.

All cultural resources identified and recorded within the current project are *ineligible* for the National Register of Historic Places (NRHP).

Colorado State Historic Preservation Office (COSHPO) concurrence for the units cleared by the Red Creek Beetle Suppression project will stand for this project if stipulations are followed.

A determination that sites 5RT2404, 5RT2405 and 5RT670 are not eligible for the NRHP was received from COSHPO. As a result, they concurred with the finding of “**no historic properties affected**” for the proposed project.

Should unidentified archaeological resources be discovered during the course of the project, work must be interrupted until the resources have been evaluated in terms of the NRHP eligibility criteria (36CFR 60.4) in consultation with COSHPO.

*Alternative 1-*If there is no federal action, then there is no undertaking, as defined in 36 CFR 800.2(o), for Section 106 of the National Historic Preservation Act (16 U.S.C. 470f). This alternative has no potential to affect cultural resources.

*Alternative 2 and 3 -*Under the implementing regulations of Section 106 of the National Historic Preservation Act (36 CFR 800), sites considered not eligible to the NRHP may be directly impacted once adequately recorded, evaluated, and concurrence is received from the State Historic Preservation Office regarding NRHP eligibility. SHPO has concurred with site eligibility for those sites currently identified within the project area.

An historic mining camp (5RT670) is located between Unit 7 and NFSR 279.1 and may potentially be impacted by project activities. While the site is officially evaluated as *not eligible* an effort would be made to avoid the site if possible.

Direct effects to significant cultural resources could also occur in areas that have not been previously surveyed or to buried cultural deposits. The discovery and education stipulation placed in permits helps mitigate direct effects to unidentified cultural resources in unsurveyed areas, or unidentified deposits in surveyed areas, by requiring that all persons associated with operations under the authorization be informed that cultural resources cannot be damaged or moved and must be reported when found.

Increased project activity may increase the potential for site vandalism and collection. The discovery and education stipulation when placed in contracts and permits may reduce these potential indirect effects.

Erosion as a result of clear-cutting and road construction may increase, potentially resulting in the exposure and destruction of buried cultural deposits.

*Cumulative Effects-* The loss of archaeological resources has happened in the past and will happen in the future. The cumulative effect is that over time fewer archaeological resources will be available to learn about past human lifeways, to study changes in human behavior through time, and to interpret the past to the public. During this project, the loss is limited to sites now considered not very important, or the effect is considered to not affect those characteristics of a site that make it important, or the potential for effect is considered very low. In surveyed areas, recording and archiving basic information about each site for future reference serves to partially mitigate potential effects to cultural resources. If stipulations are followed, the project will comply with Section 106 of the National Historic Preservation Act.

### **Roads**

*Existing Condition-* The access into the area is from paved County Road 129 which starts in Steamboat Springs at the intersection of U.S. Highway 40, west of town through the town of Hahns Peak (approximately 25 miles); north to County Road 62 for approximately 3 miles to National Forest Service Road (NFSR) 42.

The transportation plan within the analysis area was developed to manage timber resources back in the early '80s. These roads were built with drainage structures (rolling dips, culverts, low water crossing, leadoff ditches) and the vegetation cleared on native surface. The only road that has aggregate is the first section of NFSR 42.1 which accesses private property.

Within the analysis area each NFSR has a designated maintenance level. Maintenance levels range from a low of "1" (closed to motorized vehicles) to a high of "3" (suitable for passenger cars – aggregate surface). Combined maintenance levels may exist on the same road.

The Proposed Action would use the existing transportation system. If road maintenance or road reconstruction (grading; clean ditches, low water crossings, and drainage structures; roadside clearing; etc.) is necessary the commercial operator shall be responsible for this work, as specified in the timber sale contract before timber haul is permitted. All drainage structures in the area will be evaluated and replaced or maintained under the timber sale contract. The timber purchaser is required to install highway safety signs, warning the public of timber activities.

Where no resource issues or concerns exist and a long term transportation system is not needed, temporary roads or snow roads may be built to facilitate timber operations, and are subsequently obliterated, reclaimed and seeded.

*Alternative 1-* Under this alternative the road maintenance would be accomplished by the Forest Service when needed.

*Alternative 2 and 3-* The Proposed Action or Alternative 3 have less than two miles of temporary road construction and use the existing transportation system to access the timber units. Temporary roads would be closed after completion of treatments.

The only section of road that has an aggregate surface is the first 0.70 miles (level 3) of NFSR 42.1. The rest of the existing transportation systems are level 1 and 2 roads that will facilitate the timber operations. Typically the roads are rocky in nature and may require minor road maintenance or reconstruction to improve the drainage structures, reduce sedimentation and erosion that may occur.

All level 1 segments of NFSR, 279.1, 481.1, 481.1A, and 482.1 are gated and closed to vehicular traffic, except during administrative use and shall remain closed to the public during and after timber activities.

*Cumulative Effects* - This would not increase the number of system roads in the area, since the Proposed Action will be using the existing transportation system. Any road maintenance that is needed will be facilitated through the timber sale contract.

## **Soils**

*Existing condition* - The upland forest communities within the analysis area are dominated by coarse textured soils. These soils typically have sandy loam or loam surface horizon textures with high percentages of rock fragments in the soil profile. Most soils in the riparian areas are composed of reworked alluvium, have poor drainage, and are frequently saturated, especially during spring.

Soil management concerns are landscape stability, erosion hazard, compaction hazard, and reforestation potential.

*Alternative 1-* This alternative would not change the existing condition. There would be no changes in the soil resource and no additional effects to soil productivity relative to those described under existing condition.

*Alternative 2-* Direct and indirect effects of the proposed action include increased rates of soil displacement, erosion, compaction, and burning above existing condition. The removal of vegetative cover exposes the soil surface to the erosive forces of rainfall. Ground disturbing activities associated with mechanized timber harvest increase soil surface exposure and erosion rates and may also result in soil displacement and rutting.

Landscape stability ratings for the proposed Larson II Project do not exceed 30 percent slope steepness. No unstable slopes were identified during field examinations. Proposed units within the project avoid areas with high mass movement potential.

By implementing the specified design criteria erosion and compaction impacts would remain below Forest Plan requirements.

Based on regeneration success of past harvest units on the same soil types within the analysis area, reforestation should not be a limiting factor for this project.

Mechanized timber harvest methods rearrange soil grains, resulting in a decrease in void space causing closer contact with one another which may lead to detrimental compaction within an activity area. Landings may also create detrimental soil compaction. Minor increases in bulk density will decrease over time. Detrimental soil compaction may require mechanical treatments to reduce bulk density and increase infiltration. Forest Plan standards and guidelines call for minimizing soil compaction by reducing vehicle passes and skidding on dry or frozen soil conditions.

Designating landings and spacing skid trails approximately 100 feet apart would result in 11 percent of the each proposed unit being in skid trails and landings (Garland 1997). Childs et al. (1989) found increased compaction from timber harvest largely confined to skid trails. Limiting skid trail related impacts would help prevent increases in detrimental impacts in excess of the 15% Regional and Forest Plan soil quality standard.

Hazardous fuel treatments will be accomplished with hand crews. These treatments should not result in any significant ground disturbance.

Lop and scatter of harvest-generated slash in the silviculture treatment units will provide more post-harvest ground cover and greater woody debris and soil organic material (SOM) contributions than in whole tree harvest units.

The impacts of slash pile burning include soil heating, reduction of soil productivity, and the potential for the introduction of hydrophobicity. There will also be some localized soil displacement where slash is machine piled.

Additional indirect effects include probable short-term decreases in soil productivity within the treatment area, most specifically in association with skid trails and landings.

*Alternative 3-* This alternative is the implementation of a variety of treatments on a total of 647 acres within the analysis area. Direct and indirect effects would be similar to the proposed action but on fewer acres.

*Cumulative Effects* – The No Action Alternative would not add measurable cumulative effects within the analysis area into the foreseeable future.

The time frame for consideration of cumulative effects to soils includes the past 10-15 years, along with present and future effects expected within the next 10 years. The past, present, and reasonably foreseeable future actions considered include timber harvest, off-highway vehicle (OHV) use, and domestic livestock grazing.

Minor amounts of detrimental soil impacts were observed as a result of past timber harvest activities within the project area. Soil productivity within the past harvest sites were stable to increasing with active regeneration and visual indicators of good soil quality.

The loss of soil organic material contributions over the long-term due to the removal of live biomass, especially in clearcut prescriptions, may lead to decreases in soil moisture holding capacity, nutrient availability, and microbial activity.

Repeated harvest activity within the same activity area can lead to detrimental loss of topsoil or excessive compaction and displacement. Harvested stands would not be re-entered for 20 years or more; therefore any cumulative compaction or displacement would be minimized.

Currently, OHV use within the project area is restricted to the Forest Service Road (FSR) system. Within the project area, observed OHV impacts were minimal and were not exceeding forest plan standards for the soil resource.

Domestic livestock grazing in the proposed units was minimal. Livestock utilization in non-timbered lands in and around the project area did not contain any evidence of detrimental soil impacts.

## **Wildlife**

*Existing Condition-* The analysis area contains cover types typical of the forested portions of the Routt National Forest. The forests in the analysis area are dominated by a mix of aspen, lodgepole pine, and spruce-fir. Other designated cover types found in the analysis area include forbs, grasses, rock, shrubs, and willows.

Some timber cutting has occurred in the analysis area in the past, but generally the area has not been managed heavily or entered in recent years. Most of the forest types are mature and in size classes 3 & 4. The bulk of the proposed management units in Alternatives 2 and 3 are located in lower-elevation portions of the analysis area closer to the Forest boundary. In the analysis area this coincides with a greater relative abundance of the aspen cover type.

Mammals known to occur in the area include: elk, mule deer, moose, bear, American marten (4 records), snowshoe hare, pine squirrels as well as many other species of smaller mammals (bats, mice, shrews, etc.).

Bird species that occur in the area are typical of those occurring in the cover types found in the analysis area. The Forest Service wildlife database (Fauna database) has 10 records of the greater sandhill crane along with 6 nesting locations for this Colorado species of local concern, 4 records of the golden-crowned kinglet and 1 historic (1983) record of two osprey soaring in the analysis area.

*Alternative 1-* With No Action there would be no direct effects to wildlife resources. Indirect effects may result if a large scale natural disturbance such as a large scale wild fire occurred in the project area. This indirect effect scenario is speculative and the amount of impact would vary depending on the scale of the natural disturbance. There are no cumulative effects anticipated with the No Action Alternative.

*Alternative 2- MIS* - The Management Indicator Species (MIS) analysis prepared for this project indicates that implementation of an action alternative may impact habitat for 2 Routt National Forest Management Indicator Species: the golden-crowned kinglet and the northern goshawk. The action alternatives are anticipated to have no-impact to the other 4 Routt National Forest Management Indicator species (Wilson's warbler, vesper sparrow, brook trout and Colorado River cutthroat trout).

Impacts to the golden-crowned kinglet and northern goshawk from implementation of an action alternative are not anticipated to affect forest-wide population trend. Project design criteria have been established to reduce impacts to the northern goshawk. Impacts to both species habitat are considered within the range of natural variability. Habitats that are affected will recover for these species in the long-term. Impacts are anticipated to be less with Alternative 3 as fewer acres of habitat for goshawks and golden-crowned kinglets would be affected by the project implementation. Please refer to the MIS report prepared for this project for more detail.

### *Sensitive Species*

Implementation of the an action alternative “**may impact individuals , but is not expected to cause a trend toward federal listing or a loss of viability**” for the American marten, fringe-tailed myotis, Townsend’s big-eared bat, pygmy shrew, boreal owl, flammulated owl, northern goshawk, olive-sided flycatcher, purple martin, American three-toed woodpecker and the boreal toad. Implementation of an action alternative would have “**No Impact**” on all other Region 2 sensitive species. Additional detail on these findings can be found in the Biological Evaluation prepared for this project.

This determination would not differ between alternatives 2 and 3, however the scope of the potential for impact would be reduced in alternative 3.

### *Threatened and Endangered Species*

A Biological Assessment was prepared for federally the listed species for Alternative 3. These findings and determinations are anticipated to be the same for listed species with Alternative 2 for all species except the Canada lynx. Alternative 2 is not consistent with the Canada Lynx Conservation Agreement and Strategy in that it proposes unit A which is release and weed (pre-commercial thinning) of a lynx winter foraging habitat area.

Bald eagles may soar over the analysis area, but the analysis area and the associated management actions are not anticipated to affect bald eagles or any habitat that this species may use. Canada lynx habitat exists in the project area and would be affected by implementation of an action Alternative. Please refer to the Biological Assessment prepared for this project for additional detail regarding the project’s effects to threatened and endangered species.

- Bald Eagle – No Effect
- Canada Lynx –
  - May Affect, Likely to Adversely Affect (Alternative 2)
  - May Affect, Not Likely to Adversely Affect (Alternative 3)
- Yellow-billed cuckoo – No Impact (Biological Evaluation determination)

Field surveys did not result in the detection of any nesting raptors. Project design criteria have been developed to ensure protection of raptor nest areas and thus raptor nest sites will be protected in both Alternative 2 and 3. There is no difference between the alternatives in regard to the protection of raptor nest sites.

The alternatives developed for this project do not change seasonal restrictions on NFSR 42 that are in effect from May 1 to July 1 to help protect important elk calving areas.

Although there are timber management actions occurring along roads, much of the activity would occur off NFSR 481 and NFSR 482 which are currently gated closed to the public. These existing gates would be maintained following implementation to minimize disturbance and harassment to deer and elk. Harassment to deer and elk would be eliminated between May 1 and July 1 during the calving period on all the rest of the areas through the seasonal closure of NFSR 42. Some areas along roads would be managed that may affect hiding cover; however with the relatively low road density in this geographic area this is not anticipated to affect hiding cover over time.

Elk habitat effectiveness is driven by changes in the hiding cover index as well as the road density index. The road density index applies to roads open to the general public. The action alternative will not result in an increased open road density within the geographic area and thus changes to the road density index would not occur. Actions that affect the habitat structural stages (timber and fuels management) will affect hiding cover. Since there has been very little recent vegetation management in the Sand Mountain Geographic Area and the proposed action would mostly affect hiding cover behind closed roads, elk habitat effectiveness is not anticipated to change significantly at either the geographic area scale or within the 5.13 management area within the geographic area.

Timber cutting and management actions that open the canopy cover will increase summer foraging habitat quality, which is the primary use of the analysis area for elk.

The sandhill crane is a species of local concern for the Colorado Division of Wildlife. There are 10 observation records for this species as well as 6 documented nesting locations within the analysis area. In order to protect this nesting migratory bird, implementation of an action alternative should be avoided within ¼ mile of an active nest site until after July 1. Since NFSR 42 is closed until July 1 and this closure will be maintained during project implementation disturbance to this species during its critical nesting period is unlikely. This would not differ among alternatives.

Implementation of an action alternative will result in some disturbance to wildlife in the analysis area and effects to existing habitat conditions. Effects of management actions will impact some species and be beneficial to other species.

*Cumulative effects* - Implementation of an action alternative is not anticipated to result in any cumulative effects to wildlife.

## **Consultation and Coordination**

The Forest Service consulted the following individuals; Federal, State, and local agencies; and non-Forest Service persons during the development of this Environmental Assessment:

### **ID TEAM MEMBERS:**

#### **Core Team Members**

- Brian Waugh Interdisciplinary Team Leader/Silviculture
- Robert Skorkowsky - Wildlife
- Rachel Franchina - Recreation
- Jody Kougoulis – Water

#### **Resource Personnel**

- Jeff Tupala – Scenery
- Angie KenCairn – Cultural Resources
- Derek Milner - Soils
- Robert Skorkowsky – Fish & Amphibians
- Erik Taylor and Matt Custer - Forage
- Mark Cahur – Fire and Fuels
- John Proctor – Plants
- Gary Gray - Roads
- Brian Waugh – Economics
- Diann Pipher – Public Affairs
- Rebecca Roof – Lands and Minerals

### ***FEDERAL, STATE, AND LOCAL AGENCIES:***

Lakewood Service Center - Entomologists Cheryl Costello and Jeff Wytcosky

### ***TRIBES:***

None

### ***OTHERS:***

Steamboat Lake Subdivision HOA

Hahns Peak Village HOA

North Routt Community Wildfire Protection Plan Participants

### **Larson II Scoping Commenters:**

Paul Silvon

Wendell Funk

Colorado Wild – Rocky Smith, John Spezia, Jacob Smith, and Rich Levy

Wyoming DEQ

Tom and Anita Stauch