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Department of  
Agriculture

Forest  
Service

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# Environmental Assessment

## Forest-wide Hazardous Tree Removal and Fuels Reduction Project

### Medicine Bow-Routt National Forests

Albany and Carbon Counties, Wyoming  
Routt, Jackson, Grand, Moffat, Rio Blanco, and Garfield Counties, Colorado



Rabbit Ears Pass – Routt National Forest

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# INTRODUCTION

## Summary

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The Medicine Bow-Routt National Forests are proposing to fell and/or remove hazardous trees that are within 1 ½ tree heights (up to 150 feet) of the centerline of: 1) National Forest System Roads (NFSRs) open to public travel; and 2) state and county roads that cross the National Forests. The proposal also includes felling and/or removing hazardous trees in and adjacent to Forest Service campgrounds, administrative sites, and trailheads. Standing dead and dying trees could be felled, but not removed, along Forest Service trails. Healthy live trees (e.g., spruce, fir, aspen, and lodgepole pine), clumps of regeneration, and dead and dying trees leaning away from roads and trails and other aforementioned sites would be retained unless the trees pose a safety hazard in the felling/removal operation. The analysis area includes National Forest System lands in Albany and Carbon Counties in southern Wyoming and Routt, Jackson, Grand, Rio Blanco, Moffat, and Garfield Counties in northern Colorado.

An Environmental Assessment (EA) is not a decision document. It is a document disclosing the environmental effects of implementing a Proposed Action and alternatives to that action. This EA describes and compares the environmental effects of implementing a Proposed Action - Modified<sup>1</sup> and a No Action alternative. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations, including the Healthy Forests Restoration Act (HFRA). The HFRA was signed by President Bush in 2003 and contains a variety of provisions to expedite environmental analysis and treatment of lands that are at risk of wildland fire, have experienced windthrow or blowdown, or are impacted by insect and disease epidemics. On October 4, 2007, the Forest Supervisor of the Medicine Bow-Routt National Forests determined that the *Forest-wide Hazardous Tree Removal and Fuel Reduction Project* is an “authorized project” under the HFRA because of an ongoing mountain pine beetle epidemic.

Projects authorized under the HFRA are subject to a “Predecisional Administrative Review Process” (36 CFR 218) instead of the “Notice, Comment, and Appeal Procedures for National Forest System Projects and Activities” (36 CFR 215) as is typically the case. Under the Administrative Review process, individuals or agencies who commented on the proposal during the formal comment periods initiated in June and October of 2007 will have 30 days to submit written objections to the Proposed Action - Modified. The objection-filing period will begin the day after a legal notice announcing the availability of the EA is published in the Laramie Boomerang.

A Decision Notice and Finding of No Significant Impact (DN/FONSI) for this project will not be issued by the Forest Supervisor of the Medicine Bow-Routt National Forests until the Forest Service responds, in writing, to all objections received within a subsequent 30-day time period. The DN/FONSI will specify which alternative is selected for implementation and the rationale for the decision.

## Foreword

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The Forest Service is responsible for implementing the Revised Land and Resource Management Plan (Forest Plan) for the Medicine Bow National Forest (2003) and for the Routt National Forest

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<sup>1</sup> The Proposed Action was modified slightly following initial public scoping and subsequent interdisciplinary team review.

(1997) by completing analysis and evaluation of site-specific project proposals. The Forest Plans contain direction to guide natural resource management activities and to provide the Forest Service, forest users, and the public with an overall strategy for managing the National Forests. Designing and implementing projects consistent with this direction helps move the Forests toward the desired future condition as described in the Forest Plans. The *Forest-wide Hazardous Tree Removal and Fuels Reduction Project* is one such project.

## **Hazardous Tree Definition**

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**Hazardous Tree:** A hazardous tree is defined as any tree that may fail due to a structural defect and, as a result, may cause property damage or personal injury. Tree failure is difficult to predict with certainty due to the complex interaction between a tree and its environment. Every tree will eventually fail; therefore, knowledge of tree species, site characteristics, and local weather conditions and patterns are essential when evaluating tree hazards. A defective tree is hazardous only when its failure could result in damage to something of value.

The following tree specific criteria will be used to identify hazardous trees for this project. Any one or more of these criteria will qualify a tree as hazardous.

1. Dead trees of any species
2. Trees with significant defects:
  - a. Canker rots
  - b. Root rots
  - c. Trunk injuries (mechanical damage, stem decay, etc.)
  - d. Crown defects (broken or damaged branches, forked tops, dead tops, etc.)
3. Dying trees
  - a. About 1/3 + dead limbs and branches
  - b. Foliage transparency 40% + (thin crown, off-color or dwarfed foliage)
  - c. Borer attacks obvious and abundant - *the presence of insect activity, such as bark beetles or mountain pine beetles, may indicate that a tree has been weakened by other agents*

Research shows that dead, mature lodgepole pine trees begin to fall after three years and that the majority of trees fall within 14 years (Mitchell and Preisler 1998). It is anticipated that many of the dead trees on the Medicine Bow and Routt National Forests (NFs) will fall across roadways, in administrative sites, across trails, and in developed recreation sites. This situation will create threats to public safety either directly or indirectly (i.e. access into or out of areas may be blocked by fallen trees) and/or will increase the potential for property damage.

## **Scheduling Priorities**

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If approved, the Forest Service would like to begin implementing the Proposed Action - Modified during the summer of 2008 and continue implementation over the next 10 years. See EA pages 15 - 20 for a detailed description of the Proposed Action – Modified. Priority for scheduling treatments would be determined annually by: a) the severity of bark beetle infestation, tree mortality, the severity of safety hazard posed; b) maintaining safe access to important public recreation sites and trails; c) maintaining requested ingress/egress to private inholdings; d) public desires for maintaining access into the NFs; e) protection of facilities listed on the National Register of Historic Places; and f) protection of administrative sites, particularly those used to house seasonal employees.

## Document Structure

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The EA is organized into five sections:

- **Introduction:** The 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. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Comparison of Alternatives:** This section provides a more detailed description of the Proposed Action - Modified and the No Action alternative. It also provides a summary table of the environmental consequences associated with each alternative.
- **Affected Environment and Environmental Consequences:** This section describes the environmental effects of implementing the Proposed Action - Modified and the No Action alternative. This analysis is organized alphabetically by resource area (e.g., botany, engineering, fisheries, etc.). Within each section, the affected environment is described first, followed by the effects of the proposed alternatives.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Medicine Bow-Routt National Forests, Supervisor's Office at 2468 Jackson Street, Laramie, WY 82070.

## Analysis Area and Project Area Location

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The Forest-wide Hazardous Tree Removal and Fuels Reduction Project is located on the Medicine Bow-Routt National Forests (see Map 1). The Analysis Area includes National Forest System (NFS) lands in Routt, Jackson, Grand, Rio Blanco, Moffat, and Garfield Counties in northern Colorado and Albany and Carbon Counties in southern Wyoming. The potential Project Area includes only those acres that could be directly impacted by project implementation. The potential Project Area is approximately 43,614 acres and makes up roughly 2.2 percent of the forested lands on the Medicine Bow-Routt NFs.

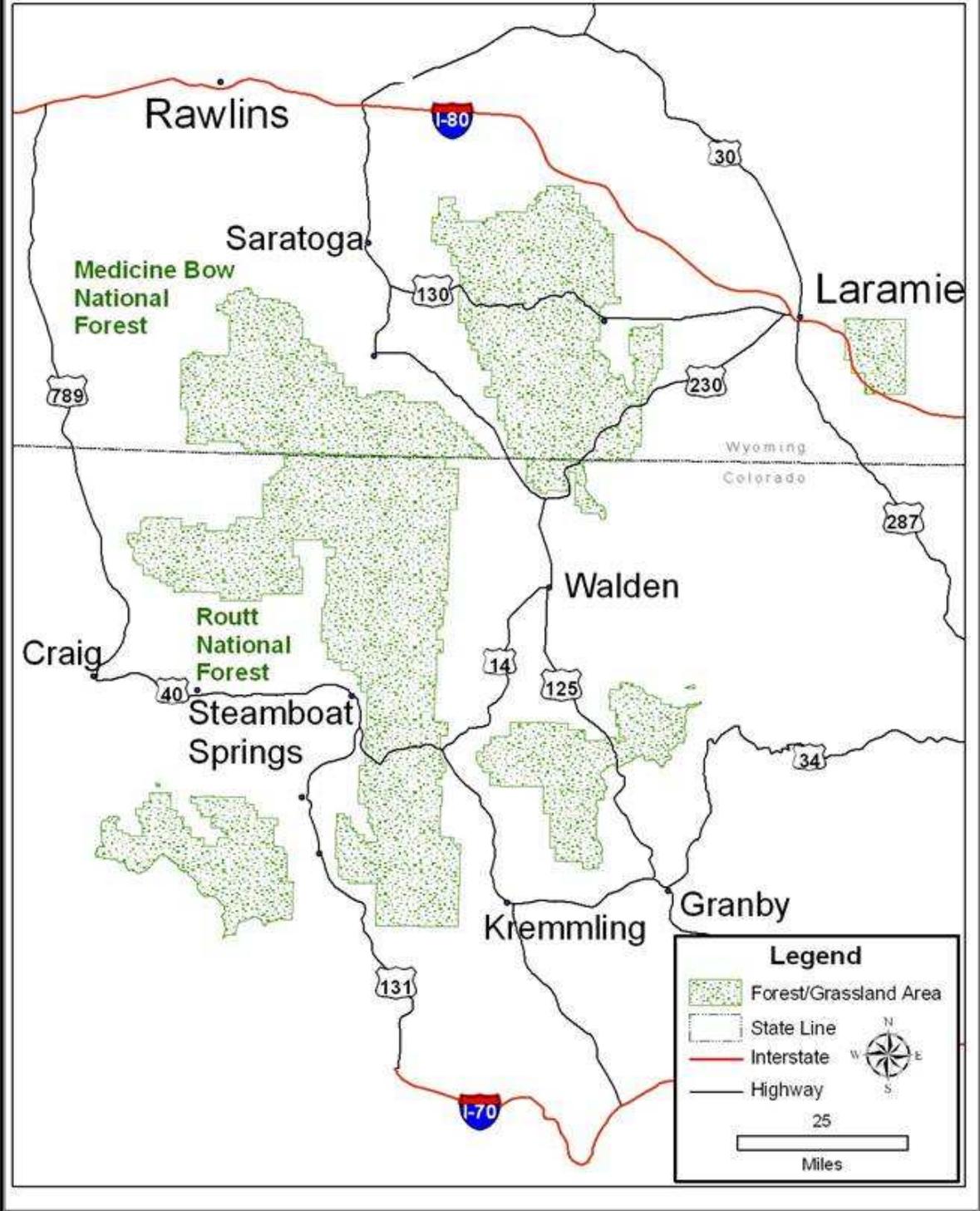
The potential Project Area map is available at your local Medicine Bow-Routt National Forests office or on the web at <http://www.fs.fed.us/r2/mbr/projects/foresthealth/index.shtml>.

## Background Information

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Recent years have seen a dramatic increase in mountain pine beetle (MPB) activity and conifer tree mortality in northern Colorado and southern Wyoming. In an attempt to define and track the effects of the infestation, entomologists from the Lakewood Service Center in Lakewood, Colorado analyzed aerial and ground survey data sets of national forests containing lodgepole pine at risk for MPB infestations. The analysis included all or portions of the White River, Arapaho, and Routt NFs in northern Colorado and portions of the Medicine Bow NF in southern Wyoming. Results of the analysis, as documented in Report LSC-07-06, confirmed the following: 1) MPBs are at epidemic levels in northern Colorado and southern Wyoming; and 2) they are not likely to depart from their

# Analysis Area Map for Medicine Bow - Routt National Forests



current course unless a period of prolonged and severe low temperatures (<-30° F) occurs during late fall-winter-early spring months.

Information contained in Report LSC-07-06 provided the technical basis for the Rocky Mountain Regional Office of the USDA Forest Service to issue a Mountain Pine Beetle Epidemic Declaration for northern Colorado and southern Wyoming. The declaration was issued on June 25, 2007 and allows Forest Supervisors of the affected NFs to implement streamlined NEPA authorities offered by HFRA if they determine that ecosystem components are threatened by the beetles.

On October 4, 2007, Mary H. Peterson, Forest Supervisor of the Medicine Bow-Routt National Forests, made the following determinations for the *Forest-wide Hazardous Tree Removal and Fuels Reduction Project*:

- 1) Ecosystem components associated with Routt and the Medicine Bow NFs are threatened by the beetle infestation. Between 1996 and 2006, aerial survey data showed that over 223,000 acres on the Routt NF and 75,000 acres on the Medicine Bow NF were impacted by MPBs. By 2007, acres impacted by the beetles had escalated to 350,000 acres on the Routt NF and 178,000 acres on the Medicine Bow NF. This widespread loss of mature lodgepole pine stands has the potential to negatively impact physical and biological resources.
- 2) Tree mortality from the beetle infestation poses a significant threat to public safety along travel corridors and in and adjacent to developed recreation sites and administrative sites. Dead and dying trees increase the potential for: a) persons or property being struck by falling trees; and b) trees falling and blocking roadways, thus preventing both emergency and non-emergency ingress and egress.
- 3) The amount of dead and dying trees poses a significant threat for more catastrophic fire events due to increased fuel loads.

Based on these determinations, the Forest Supervisor concluded that the *Forest-wide Hazardous Tree Removal and Fuels Reduction Project* is an authorized project under Section 102(a)(4) of the HFRA. Accordingly, the environmental analysis for the project was completed under the HFRA, Title I, Section 104.

## **Purpose and Need for Action**

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The HFRA recognizes healthy forests or forest health as an important part of forest management. This project responds directly to forest health objectives as described in the HFRA. Thus, its purpose is to reduce threats to public safety by felling and/or removing dead and dying trees impacted by the MPB epidemic along roads and trails and in and adjacent to Forest Service developed recreation sites and administrative sites.

Given the widespread tree mortality associated with the MPB epidemic, the project is needed to:

- 1) Ensure public and firefighter safety by: a) reducing the risk of persons or property being struck by falling trees; and b) keeping travel corridors open with adequate clearance for the combination of traditional firefighting equipment (e.g., heavy equipment transport trucks, crew carriers, busses, and fire engines), recreational vehicles, and automobiles. The combination of such vehicles is typical during an emerging fire emergency when fire resources are arriving and the general public is evacuating;

- 2) Reduce the risk of high intensity/high severity wildfires within treatment areas by reducing hazardous fuel loadings associated with treatments and beetle killed trees;
- 3) Minimize the effects of tree mortality on the overall health, scenic quality, and condition of forested areas along roads and trails and in and adjacent to developed recreation sites and administrative sites; and
- 4) Partially offset the cost of treatments by salvaging forest products.

The action responds to the goals and objectives outlined in the Revised Routt and the Medicine Bow National Forest Plans (1997 and 2003, respectively). Forest Plan goals and objectives for this analysis include:

### **Routt National Forest Plan**

**GOAL 1:** 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 (pg. 1-2).

**GOAL 2:** Provide a wide variety of outdoor recreational opportunities and experiences to meet the full range of visitor expectations (pg. 1-2).

### **Medicine Bow National Forest Plan**

**GOAL 1 - Ensure Sustainable Ecosystems:** Promote ecosystem health and conservation using a collaborative approach to sustain the Nation's forests, grasslands, and watersheds.

**Subgoal 1.c:** When appropriate or where necessary to meet resource management objectives, increase the amount of forests and rangelands restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases, and invasive species (pg. 1-5).

**Objective 3:** Within 10 years, implement vegetation management activities in areas most susceptible to losses from insects and disease as directed in management area and geographic area direction (pg. 1-6).

- **Strategy d:** Reduce activity fuels resulting from all projects/activities to acceptable levels in a cost effective manner, in consideration of wildlife and soil direction for retention of downed wood (pg. 1-6).
- **Strategy g:** Plan management activities by considering the potential for insect and disease outbreaks. Design management activities to meet or enhance management area objectives (pg. 1-6).
- **Strategy h:** Manage vegetation in high-use areas to provide for public safety, to improve forest health, and to maintain or improve the desired recreation setting (pg. 1-6).

**GOAL 4 - Effective Public Service:** Ensure the acquisition and use of an appropriate corporate infrastructure to enable the efficient delivery of a variety of uses.

**Subgoal 4a:** Improve the safety and economy of Forest Service roads, trails, facilities, and operations, and provide greater security for the public and employees (pg. 1-12).

## Proposed Action - Modified

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Under the Proposed Action - Modified, the Forest Service could fell and/or remove hazardous trees that are within 1 ½ tree heights (up to 150 feet) from the centerline of: 1) Forest Service system roads open to public travel (Maintenance levels 2 – 5); and 2) state and county roads that cross the Forest. Hazardous trees in and adjacent to Forest Service campgrounds, administrative sites, and trailheads could also be felled and/or removed. Finally, hazardous trees could be felled, but not removed, along trails. Healthy, stable, live trees (e.g., spruce-fir, aspen, and lodgepole pine), clumps of regeneration, and dead and dying trees leaning away from roads and trails and other aforementioned sites would be retained unless they pose a safety hazard in the felling/removal operation.

Design criteria would be applied to protect sensitive areas including, but not limited to, streamside management zones, old growth and late succession forests, and wildlife resources. Winter logging may also be considered in specific areas, on a case-by-case basis, to further protect sensitive resource areas.

If approved, the Forest Service would begin implementing the Proposed Action - Modified during the summer of 2008 and continue implementation over the next 10 years. Priority for scheduling treatment would be determined by the severity of bark beetle infestation and the severity of safety hazards posed. A more detailed description of the Proposed Action – Modified, including the modifications, may be found on EA pages 15 – 20.



Hinman Campground – Routt NF



**Hazardous trees along a motorized trail - Parks Ranger District, Routt NF**



**Pelton Creek trailhead along NFSR 898 – Laramie Ranger District, Medicine Bow NF**

## **Forest Plan Direction**

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In addition to goals and objectives, the Forest Plans provide guidance at three different geographic scales. The broadest scale, which outlines the most general and basic direction, is applicable to the entire forest (Forest-wide Standards and Guidelines). From there, the direction becomes more focused and applies to Geographic Areas and Management Areas, respectively. Any proposal to implement the Forest Plans, including the Forest-wide Hazardous Tree Removal and Fuels Reduction proposal, must consider the direction provided at each scale. The following information identifies how the Proposed Action - Modified responds to direction provided at the three Forest Plan geographic scales.

### **Forest-wide Standards and Guidelines**

Forest-wide standards and guidelines are listed in the Routt National Forest Plan on pages 1 - 4 through 1 - 26 and in the Medicine Bow National Forest Plan on pages 1 - 25 through 1 - 64. Forest Service resource specialists analyzed the standards and guidelines, as they relate to the Forest-wide Hazardous Tree Removal and Fuels Reduction proposal, to determine compliance with Forest Plan direction. Forest Plan compliance determinations are included under each resource section in the "Affected Environment and Environmental Consequences" section of this EA.

### **Geographic Area Direction**

A geographic area (GA) is a watershed or aggregation of watersheds, 125,000 acres or smaller, in which management is directed toward achieving a specified desired condition. GAs contain standards and guidelines designed to achieve the desired conditions and to link the Forest Plan to management at a landscape or watershed scale. The Forest-wide Hazardous Tree Removal and Fuels Reduction project affects portions of all 29 GAs on the Routt National Forest (Plan pages 3 - 6 through 3 - 94) and portions of 21 GAs in the Sherman Mountains, the Sierra Madre Mountains, and the Snowy Range Mountains on the Medicine Bow National Forest (Plan pages 3 - 5 through 3 - 95).

#### **• Routt National Forest Plan**

The Routt National Forest Plan includes the following guideline:

"In Management Area 5.13, late successional habitats should be provided and well distributed so that individuals of species requiring those habitats can interact with others in the planning area."

This guideline applies to the Arapahoe Creek, Corral Peaks, Encampment River, Owl Mountain, Pinkham Mountain, Willow Creek, Little Snake, Sand Mountain, Slater Creek, Upper Elk River, Gore and Red Dirt GAs. The Forest Plan does not contain any other GA direction specific to this analysis.

#### **• Medicine Bow National Forest Plan**

The Medicine Bow National Forest Plan does not contain GA direction specific to this analysis.

### **Management Area Direction**

Management emphasis within the analysis area and larger geographic areas is distributed among several Forest Plan Management Area (MA) prescriptions. Application of standards and guidelines associated with MA prescriptions help move specific portions of each geographic area toward the desired condition. The descriptions of each MA prescription include: theme, setting, desired

condition, and standards and guidelines. This information can be found in the Routt Forest Plan, Chapter 2, pages 2-1 through 2-57 and in the Medicine Bow Forest Plan, Chapter 2, pages 2-1 through 2-80. Table 1 depicts MAs and acres that could potentially be impacted by implementation of the Proposed Action – Modified.

## **Decision Framework**

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The Forest Supervisor of the Medicine Bow-Routt National Forests is the Responsible Official for this project. Given the purpose and need for the project, the Forest Supervisor will review the Proposed Action – Modified, the No Action alternative, issues identified during scoping, and the environmental consequences associated with implementing each alternative. This information will form the basis for the Forest Supervisor to make the following determinations:

- Whether or not the information contained in this EA is sufficient to make an informed decision.
- Whether or not the vegetative treatments should be implemented and, if so, in what manner and in which locations.

## **Public Involvement**

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On June 29, 2007, the Forest Service mailed a Scoping (40 CFR 1501.7) letter describing the Proposed Action and Purpose and Need for the Project to 154 individuals, organizations, and agencies. A news release describing the proposal was also mailed to local media stations that same day. Both the Scoping letter and the news release indicated that the comment period would end on July 13, 2007. The Forest Service received 13 comment letters in response to the June 29, 2007 Scoping effort.

On October 19, 2007 the Forest Service re-initiated Scoping for two reasons: 1) the Proposed Action had been modified slightly; and 2) the Forest Supervisor had determined that the proposal is an “authorized project” under the HFRA, Title I, Sec. 102(a)(4) (insect and disease epidemics). Therefore, the project was transitioned from the NEPA analysis currently underway to the environmental analysis process authorized under Section 104 of the HFRA.

The October 19, 2007 Scoping letter was mailed to 234 individuals, organizations, and agencies. The letter outlined the modifications to the Proposed Action and indicated that the Scoping period would be the only opportunity for the public to comment on the proposal. The 30-day comment period was initiated on October 29, 2007 following publication of a legal notice in the Laramie Boomerang on October 28, 2007.

During the October 2007 comment period the Forest Service hosted five public field trips and two Open House meetings. Field trips were held in Laramie, WY and Yampa, CO on November 6; Steamboat Springs, CO on November 7; Walden, CO on November 8; and Saratoga, WY on November 9. The Open House meetings took place on November 15, 2007 in Steamboat Springs, CO and in Laramie, WY.

**Table 1: Management Areas and Acres within the Potential Project Area**

Management Area	Description	Routt NF Acres	Medicine Bow Acres	Total Acres
1.2	Recommended for Wilderness	--	97.5	97.5
1.31	Backcountry Recreation, Year-round Nonmotorized	--	761.7	761.7
1.32	Backcountry Recreation, Nonmotorized with Winter Limited Motorized	1,089.8	--	1,089.8
1.33	Backcountry Recreation, Summer Nonmotorized with Winter Snowmobiling	--	170.8	170.8
1.5	National River System, Wild Rivers Designated and Eligible	142.6	--	142.6
2.1	Special Interest Areas	117.4	373.4	490.8
2.2	Research Natural Areas	1.0	--	1.0
3.23	Municipal Watersheds – Water Quality	16.2	--	16.2
3.31	Backcountry Recreation, Year-round Motorized	650.8	782.1	1,432.9
3.33	Backcountry Recreation, Summer Motorized with Winter Nonmotorized	--	290.5	290.5
3.4	National River System, Scenic Rivers Designated and Eligible	21.9	41.5	60.5
3.5	Forested Flora or Fauna Habitats, Limited Snowmobiling	--	402.8	402.8
3.54	Special Wildlife Areas (Sheep Mountain)	--	303.2	303.2
3.56	Aspen Maintenance and Enhancement	--	171.3	171.3
3.58	Crucial Deer and Elk Winter Range	--	644.9	644.9
4.2	Scenery	687.3	1,005.5	1,692.8
4.3	Dispersed Recreation	1,239.6	307.3	1,546.9
5.11	General Forest and Rangelands – Forest Vegetation Emphasis	4,443.5	--	4,443.5
5.12	General Forest and Rangelands – Range Vegetation Emphasis	372.4	237.3	609.7
5.13	Forest Products	6,726	7,111.3	13,837.3
5.15	Forest Products, Ecological Maintenance and Restoration, Considering the Historic Range of Variability	--	13,646.2	13,646.2
5.41	Deer and Elk Winter Range	430.4	420.4	850.8
7.1	Residential/Forest Interface	121.3	--	121.3
8.21	Developed Recreation	--	501.5	501.5
8.22	Ski-based Resorts, Existing and Potential	72.6	171.5	244.1
8.6	Administrative Sites	--	40.5	40.5
<b>TOTALS</b>		<b>16,132.8</b>	<b>27,481.2</b>	<b>43,614</b>

By the close of the comment period on November 27, 2007 the Forest Service had received an additional 23 public comment letters for a total of 36 letters between the two Scoping efforts. The comment letters were reviewed by the Responsible Official and the Interdisciplinary Team and a list of issues to address during the analysis process was developed. The public comment letters were also formally responded to in Appendix A of this EA.

## Issues

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The Forest Service generally separates environmental issues into two groups:

- 1) **Key Issues:** Environmental issues used to develop alternatives that meet the purpose and need of the Proposed Action (Forest Service Handbook 1909.15, Section 12.32-33).

Public comments related to this project were reviewed by Forest Service resource specialists and the Responsible Official. This review did not identify any key issues that necessitated the development of alternatives to the Proposed Action – Modified.

- 2) **Non-key Issues:** Non-key issues can be addressed by using Best Management Practices (BMPs), alternative design features, Forest Plan standards and guidelines, or other mitigation measures. Several non-key issues were identified during the review of public comments and have been responded to as follows:

- **Corridor Width:** Public comments indicated that the corridor width for felling and/or removing hazardous trees was excessive. The Proposed Action - Modified represents a 25 percent reduction in potential corridor width (from 400 feet to 300 feet).
- **Old Growth and Late Succession Forest:** Public comments indicated that the proposal would not be consistent with Forest Plan direction for mapped and inventoried old growth and late succession forests. Design criteria specifically addressing old growth and late succession forest (#'s 9 and 10, EA page 17) were developed and are included as part of the Proposed Action - Modified.
- **Wildlife:** Public comments indicated that project implementation would result in unacceptable forest fragmentation, increased edge effect, and a reduction in hiding cover. Design criteria addressing wildlife protection were developed (#'s 37 and 38, EA page 20) and are included as part of the Proposed Action - Modified.
- **Private Lands and Wildland Urban Interface (WUI) Areas:** Public comments indicated that the proposal is too limited in scope to address wildfire potential adjacent to private lands and WUIs. This issue is beyond the scope of this particular analysis, but will be addressed through on-going and future site-specific salvage and fuels reduction projects.

# ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This section describes and compares the alternatives considered by the Forest Service for the analysis area. It provides a detailed description of the No Action alternative and the Proposed Action – Modified; it also provides a description of the original Proposed Action that was eliminated from detailed study. This section is intended to present the alternatives in comparative form, sharply defining the differences between the alternatives and providing a clear basis for choice among options by the Responsible Official.

## Alternative Development Process

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The Forest Service interdisciplinary team (IDT) used all known sources of resource information, field-related surveys, Forest Plan direction, professional knowledge, and public concerns identified during scoping when developing the Proposed Action – Modified. Design criteria were built into the Proposed Action – Modified to resolve issues and concerns raised internally by agency resource specialists and externally by the public. Scoping efforts did not identify a need to analyze an additional alternative for this analysis; therefore, the Proposed Action – Modified, the No Action alternative, and the original Proposed Action, which has been eliminated from detailed study, constitute the range of alternatives for this analysis.

## Alternatives Considered but Eliminated from Detailed Study

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Federal agencies are required by NEPA to rigorously explore and objectively evaluate a range of reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not considered in detail (40 CFR 1502.14). The Proposed Action, as described in the June 29 and October 19, 2007 scoping letters, was considered but dismissed from detailed consideration based on the reasons summarized below.

### Proposed Action (June 29 and October 19, 2007)

The Proposed Action described in the **June 29, 2007 scoping letter** indicated that hazardous trees would be felled and/or removed up to 200 feet from the centerline of: 1) National Forest System Roads (NFSRs) and trails; and 2) state and county roads that cross the National Forests. Public comments received in response to this scoping effort indicated that the 200 foot corridor was excessive. Consequently, the Forest Service re-evaluated this aspect of the Proposed Action and determined that a felling distance of 1 ½ tree heights (up to 150 feet) from the centerline of travel corridors would be sufficient to ensure public safety and would result in fewer impacts to natural resources. The Forest Service also determined that the “150 feet from the centerline” of travel corridors would be the basis for determining the area impacted and the direct and indirect effects from project implementation.

The Proposed Action described in the **October 19, 2007 scoping letter** indicated that “...standing dead and dying trees would be felled and/or removed adjacent to communities surrounded by National Forest system (NFS) lands and adjacent to Special Use Permit areas including, but not limited to, ski areas, lodges, resorts, and special use cabin groups.” This statement was removed from the Proposed Action for the following reasons: 1) although felling and/or removing standing dead and dying trees adjacent to Special Use Permit areas and communities is important, such actions are beyond the scope of the initial proposal; 2) given the more remote nature of their boundaries, they are qualitatively

different than removing hazard trees along designated roads and trails and from developed recreation sites, trailheads, and administrative sites. Therefore, these areas would be better addressed through separate site-specific project level analyses; and 3) public comments relative to Special Use Permit areas and communities dealt specifically with reducing fuel loading and wildfire potential, not the removal of hazard trees per se. Whereas these are certainly benefits associated with project implementation, they are not the primary purpose and need for the project.

The Proposed Action outlined in the October 19, 2007 scoping letter also clarified that hazardous trees would be felled and/or removed along roads (Maintenance levels 2-5) and trails open to public travel (i.e., they would not be felled and/or removed along closed or gated roads). This aspect of the Proposed Action was carried forward into the Proposed Action – Modified.

## **Alternatives Considered In Detailed Study**

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### **ALTERNATIVE 1: No Action**

National Environmental Policy Act (NEPA) regulations require analysis of a No Action alternative; they also require that it be used as a baseline for comparing the environmental consequences of the other alternatives (40 CFR 1502.14(d) and Forest Service Handbook 1909.14.1).

Under Alternative 1: No Action, hazardous trees along NFSRs, trails, and state and county roads within the Forest boundary would not be felled and/or removed. Hazardous trees in and adjacent to Forest Service trailheads and administrative sites would also not be felled and/or removed. No attempt would be made to respond to the purpose of and need for the proposal; in essence, nature would be allowed to take its course.

As required by Forest Service Manual (FSM) 2332.11 (Public Safety, Hazard Trees), the Forest Service would continue to fell and remove hazardous trees in developed recreation sites (e.g., campgrounds, picnic grounds) prior to their being opened to public use. As budgets allow, the Forest Service would also continue to remove trees as they fall across NFSRs and trails or the routes would be closed to motorized or other public access for safety reasons, as required by the Highway Safety Act of 1966 and FSM 7733.

### ***ALTERNATIVE 2: Proposed Action - Modified***

#### **Modifications from the Initial Proposed Action:**

- The felling corridor has been reduced from up to 200 feet from the centerline of roads and trails to 1 ½ tree heights (up to 150 feet) from the centerline of roads and trails.
- The statement, "...standing dead and dying trees would be felled and/or removed adjacent to communities surrounded by National Forest system (NFS) lands and adjacent to Special Use Permit areas including, but not limited to, ski areas, lodges, resorts, and special use cabin groups" has been removed.
- Design criteria to protect mapped and inventoried old growth, late succession forest, and wildlife habitat were added to the alternative description.

Under the Proposed Action - Modified, the Forest Service could fell and/or remove hazardous trees that are within 1 ½ tree heights (up to 150 feet) from the centerline of: and 1) NFSRs open to public travel (Maintenance levels 2 – 5); and 2) state and county roads that cross the Forest. Hazardous trees in and adjacent to Forest Service campgrounds, administrative sites, and Forest Service

trailheads could also be felled and/or removed. Hazardous trees could be felled, but not removed, along Forest Service trails. These activities could occur over a 10-year period. Healthy, stable, live trees (e.g., spruce-fir, aspen, and lodgepole pine), clumps of regeneration, and dead and dying trees leaning away from the roads and trails and other aforementioned sites would be retained unless they pose a safety hazard in the felling/removal operation.

The majority of the salvage treatments (i.e. dead tree removal) would impact lodgepole pine trees, although small amounts of Engelmann spruce, sub-alpine fir, and aspen could also be felled and/or removed. Depending on the severity of the beetle infestation and the resultant tree mortality, salvage treatments could include: removal of individual hazardous trees; removal of overstory trees infested with MPB while leaving the understory vegetation; removal of clumps of hazardous trees; or removing all hazardous trees up to 150 feet from the centerline of roads and trails. In all cases, treated areas would be allowed to regenerate naturally.

Forest products would be removed (where feasible) from treated areas or fuels would be treated on site. Fuel treatments along road ways and in campgrounds and administrative sites could include chipping, lopping and scattering slash to an 18 or 24 inch depth, roller chopping, machine trampling, and/or broadcast burning. Hand piling, pile burning or mulching may occur in select units to mitigate fuels or visual concerns. Where feasible, fuel treatments along trails would consist of hand piling the felled material and burning it.

Commercial timber sale contracts, non-commercial service contracts, free use permits and contracts, Forest Service "Force Account" projects, and Stewardship contracts could be used to fell and/or remove the hazardous trees. Appendix B contains a description of the various permit/contract types.

Design criteria would be applied to protect sensitive areas including, but not limited to, streamside management zones, old growth and late succession forests, wildlife resources, and Special Interest Areas during felling and/or removal operations. Winter logging may also be considered in specific areas, and on a case-by-case basis, to further protect sensitive resource areas.

If approved, the Forest Service would like to begin implementing the Proposed Action - Modified during the summer of 2008 and continue implementation over the next 10 years. Priority for scheduling treatments would be determined annually by: a) the severity of bark beetle infestation, tree mortality, the severity of safety hazard posed; b) maintaining safe access to important public recreation sites and trails; c) maintaining requested ingress/egress to private inholdings; d) public desires for maintaining access into the NFs; e) protection of facilities listed on the National Register of Historic Places; and f) protection of administrative sites, particularly those used to house seasonal employees.

## **Design Criteria: Proposed Action – Modified** \_\_\_\_\_

The Interdisciplinary Team (ID Team) identified design criteria to reduce or prevent undesirable effects resulting from management activities. Design criteria include such measures as Best Management Practices (BMPs), Watershed Conservation Practices (WCPs), Forest Plan standards and guidelines, and other environmental protection required by laws and regulations. They are as follows:

### **Developed Recreation Sites, Trails, Trailheads, and Administrative Sites**

1. Minimize damage to designated infrastructure from tree felling operations.

2. Felled hazard trees and slash shall be removed from the corridor of roads and other mowed or maintained areas within developed recreation sites and scattered outside the developed site in areas designated by the Forest Service. Felled trees will be whole tree skidded to designated landings outside of the developed site.
3. Coordinate closure of heavily used trailheads, administrative sites, campgrounds, and travel corridors with District recreation staffs to minimize impacts to the public. Provide information to the recreating public on the purpose and duration of the closure as well as on alternative recreation opportunities in the vicinity.
4. Where feasible, fresh cut ends of logs that are felled, but not removed, will not be visible from the trail in MA 1.2. When cutting trees that fall naturally across trails in MA 1.2, lop and scatter logs and limbs outside the corridor as to provide and maintain the naturalness of trail corridor and meet Preservation VQO and Very High SIO.

### **Heritage Resources**

5. Heritage resource sites that are discovered within areas identified for mechanical treatment will be evaluated for National Register eligibility. Sites that are eligible for, or listed on, the National Register of Historic Places will not have mechanical treatment occur within the site boundary plus a 50 foot buffer around the site. If treatment is necessary these sites, and the 50 foot buffer, will be hand-treated for hazard trees and accumulated fuel build up.

### **Invasive Species**

6. Off-road equipment shall not be moved onto the sale area without having first taken reasonable measures to make sure each piece of equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold invasive seeds.
7. Revegetation on any area may be required where ground cover is disturbed (e.g. landings, burned slash pile sites, skid trails, etc.). As a general guideline, ground cover should recover to its normal range of variability for the landtype and geoclimatic area by the end of the third growing season. Native plant species should ultimately dominate the site, although introduction of non-persistent species may be used to ensure vegetation cover initially.

### **Inventoried Roadless Areas (IRAs)**

8. Hazard trees may be felled but left in place in all IRAs. Lop and scatter slash to a height of 24 inches above the ground.

### **Old Growth and Late Succession Forest**

9. Hazard trees within mapped and inventoried old growth areas and in those polygons identified in the old growth strategy on the MBNF will be hand felled and left in place. If necessary, felled trees may be stabilized to prevent movement onto a roadway. Lop and scatter slash to a height of less than 24 inches above the ground. Do not designate landings in these areas.
10. This design criterion applies to the following Geographic Areas on the Routt National Forest: Arapahoe Creek, Corral Peaks, Encampment River, Owl Mountain, Pinkham Mountain, Willow Creek, Little Snake, Sand Mountain, Slater Creek, Upper Elk River, Gore and Red Dirt. In MA 5.13, dead and dying trees will be hand felled and left in place on 35 percent of the total treatment area of the lodgepole pine and spruce-fir stands with trees of larger diameter (trees mostly > 9" dbh). If necessary, fallen trees may be stabilized to prevent movement onto a roadway. These areas of "hand fall and leave in place" can be located mostly within spruce-fir stands where there will be more residual green timber after hazard tree removal and/or combined with wildlife connectivity needs. Lop and scatter slash to a height of less than 24 inches above

ground. Do not designate landings in these areas. Trees will be felled adjacent (or on top of each other) to each other wherever possible to reduce movement impacts to elk.

### **Public Safety**

11. On Level 3 – 5 roads and on county and state highways, warning signs and traffic control shall be in accordance with the “Manual of Uniform Traffic Control Devices.”
12. Level 2 roads will be temporarily closed to general public access during felling and/or removal operations.
13. Erect barricades and/or proper signs at any traffic hazards left in or adjacent to the road at the end of each workday. All felled trees and slash shall be removed from the bladed, mowed, or brushed road corridor each day before crews leave the work area for the day.

### **Riparian Areas/Aquatic Protection**

14. Locate staging areas and refueling locations at least 100 feet away from streams and wetlands.
15. The Forest Service will designate heavy equipment crossings for streams that have definable beds and banks.
16. Stream crossings and other instream structures will be designed to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life.
17. Any hazard tree and associated debris cut down or lying within 200 feet upstream of a perennial or intermittent stream/road culvert crossing, that has the potential to obstruct a bridge or culvert, will be moved at least 100 feet upslope away from the stream. Ground based equipment can be used up to the edge of, but not within riparian areas, wetlands or hydric soils. This design criterion takes precedence over design criteria 8 and 31.
18. Trees within 100 feet of tie driven streams will not be removed if they provide a potential source of large woody debris to the stream system. Felled hazard trees should be left in place.
19. Ground based equipment will not be permitted within 100 feet of identified riparian areas or within 200 feet of identified wetlands/fens (by GIS or located on ground during implementation); hand felling of hazard trees is permitted in the 100 foot riparian buffer and the 200 foot wetland buffer. Felled trees will either be left in place in riparian areas or may be removed by winching where there will be no disturbance such that bare ground is exposed. If tree removal (including whole tree yarding) is not possible, slash may be lopped and scattered to a height of less than 24 inches above ground level.
20. Ground based equipment will not be permitted on identified hydric soils<sup>2</sup> (by GIS or located on ground during implementation); hand felling of hazard trees is permitted in the hydric soils. Felled trees will either be left in place on hydric soils or winched as specified by the Forest Service. If tree removal is not possible, slash may be lopped and scattered to a height of less than 24 inches above ground level.

### **Roads**

21. No new specified road or temporary road construction will be authorized. No excavated skid trails will be authorized except where necessary to gain access up the cut slope or down the fill slope of an existing road.
22. Decking and landing areas will be designated by the Forest Service.
23. Minimize damage to drainage structures and road features. Repair any damaged drainage structures and road features and rehabilitate any damage to cut and fill slopes.

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<sup>2</sup> Hydric soils are defined as “a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, July 13, 1994).”

24. When operating on or along the road prism, do not skid within or across drainage ditches; limit impacts to road surface. When damage is unavoidable, reconstruct and/or replace surfacing as necessary. Engineering will determine post-operation/haul road maintenance, repair, reconditioning, or resurfacing needs on an individual basis.
25. Honor existing seasonal road closures and other road restrictions during hazard tree removal operations for species or resources that are sensitive to disturbance.
26. Remove felled hazard trees and slash from wing ditches, lead-off ditches, tail ditches, and culvert outlets. Place all slash such that it will not fall, roll, or be blown into these areas.

### **Slash Disposal/Fuels Treatments**

27. The preferred slash treatment method for the majority of the potential project area is to whole tree skid and/or removal of the whole tree where the entire tree, including the top and limbs, is removed. The limbs and tops are to be cut off at designated landings and piled for later burning by the Forest Service or chipped and hauled off-site by the Contractor.
28. Where terrain and topography allow: for road clearing operations and at all trailheads, the limbs may also be chipped on-site with the chips left in place; the depth of the chips cannot exceed three inches above the surface. At administrative sites and developed recreation areas, chips resulting from chipping operations must be hauled off-site for disposal.
29. Remove slash from felled hazard trees from stream channels unless otherwise specified by the Forest Service. Lop and scatter slash to a height of less than 24 inches above the ground.
30. After slash piles are initially burned, plan on follow-up re-piling or scattering<sup>3</sup> of the pile remnants by a dozer equipped with a brush rake. Where re-piling occurs, the piles will be re-burned.
31. Slash treatment shall include lopping/scattering outside the developed area or cut and piled for rental property firewood. Lop and scatter slash to a height of less than 24 inches above ground level.

### **Special Interest Areas (SIAs), Research Natural Areas (RNAs), and Wilderness Areas**

32. Trees may be hand felled in SIAs and boles must be left in place; ground skidding may not occur. Lop and scatter limbs to a height of less than 24 inches above the ground. This design criterion applies to the following SIAs on the Medicine Bow National Forest: Cinnabar Park, Medicine Bow Peak, White Rock Canyon, Kettle Ponds, Sunken Gardens, Ribbon Forest, Platte Canyon, and Brown's Peak. It also applies to the following SIAs on the Routt National Forest: Black Mountain, Oliphant and Welba Peaks, California Park, Camp Creek, Little Snake, and Kettle Lakes.
33. Hazard trees will not be felled and/or removed in RNAs.
34. No active treatments will occur along trails in Wilderness Area boundaries; warning signs identifying potential risks associated with hazardous trees will be posted at Wilderness Area trailheads. Fallen trees may be cleared from Wilderness trails during routine trail maintenance activities, per Forest Service Manual direction.

### **Visuals**

35. Minimize damage to natural features such as rock outcrops, young healthy trees, and understories of trees and shrubs; cut stumps as low to the ground as feasible and remove heavy slash within the immediate foreground (approximately 25 to 200 feet from edges of road) roads

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<sup>3</sup> Whether a pile is re-piled for later burning or the pile remnants are scattered is determined by how much unburned slash is left.

and trails located in MAs that are assigned Retention and Partial Retention Visual Quality Objectives and High and Moderate Scenic Integrity Objectives.

- 36. Within developed recreation areas and administrative sites, cut stumps as low to the ground as feasible and remove heavy slash to designated slash piles. Minimize damage to all retaining mature trees that were sprayed, young healthy trees of lodgepole pine and spruce-fir, and the understory of trees and shrubs from ground based equipment within developed campsites and administrative sites for present and future shade and screening, and to maintain high quality recreational setting and desired scenic condition.

**Wildlife and Botany**

- 37. Prior to each field season, district wildlife biologists and botanists will be provided with GIS layers and hardcopy maps of potential treatment areas. Proposed Endangered, Threatened, and Sensitive (PETS) species and species of local concern (known or discovered during project layout or implementation) will be individually evaluated as they occur within proposed hazard tree removal projects.
- 38. District wildlife biologists and botanists will determine consultation and site protection needs on an individual and as needed basis. For any PETS species or species of concern with identified viability concerns, the wildlife biologist and/or botanist will identify activity restrictions (area, timing, retaining felled trees on-site to provide connectivity/linkage of habitats, etc.) such that implementation will not result in a trend toward Federal listing or loss of population viability.

**Winter Logging**

- 39. Conduct winter logging operations when the ground is frozen to a depth of six inches or more or when snow cover is adequate to minimize site disturbance.
- 40. Plow or pack snow in the operating area to minimize the insulation value and facilitate ground freezing; clear enough area to accommodate future snow plowing.
- 41. When hauling on constructed specified roads, haul only on roads that have been cleared, allowing the ground to freeze and snow to compact on top.
- 42. Monitor the operating conditions closely after consecutive nights of above freezing temperatures; cease operations on roads and in salvage units if resource damage begins to occur.
- 43. When daytime temperatures are above freezing, but nighttime temperatures remain below freezing, plan to operate only in the morning; cease operations when ground temperature is above freezing.
- 44. Return the following summer and build drainage features on any skid trails that are steep enough to erode or over 10 percent.
- 45. When plowing snow for winter operations, provide breaks in the snow berm to allow road drainage.

**Monitoring: Proposed Action - Modified**

Monitoring is done to assure that Forest Plan standards and guidelines are being met and adhered to during project implementation. The following specific items were identified by the ID Team as needing monitoring during preparation and implementation of potential projects:

**Table 2: Monitoring Requirements**

Monitoring Requirement	Monitoring Type	Responsibility	Frequency
BMP and Design Criteria effectiveness	Ocular	Contract Administrator and IDT members	Annual through project completion

## Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the tables is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. Table 3 compares alternative components; Table 4 compares how the alternatives address the Purpose and Need for the Proposal; and Table 5 compares how the individual resource areas would be affected by the alternatives. The information presented in Table 5 represents a summary of the Environmental Consequences information presented in the “Affected Environment and Environmental Consequences” section of this EA.

**NOTE:** The information provided in the **Table 3 reflects the maximum treatment potential** for the Proposed Action - Modified. The numbers provided reflect an analysis assumption that all trees within 150 feet from the centerline of road and trail corridors would be felled and/or removed. This approach was taken for analysis purposes to ensure that the cumulative effects of project implementation would be analyzed in a comprehensive and systematic manner. Taking this approach also means, however, that the acreages, mileages, and effects displayed in Tables 3 and 5 have likely been overstated. Actual acres and miles treated could be much less depending on: 1) budgetary constraints; 2) workforce limitations; 3) purchaser and/or contracting limitations; 4) site limitations; and 5) extent of hazardous trees (i.e., in some areas, only a few trees may need to be felled whereas in others, all trees may need to be felled).

**Table 3: Alternative Components**

	<b>Alternative 1: No Action</b>	<b>Alternative 2: Proposed Action - Modified</b>
<b>Maximum Acres Treated</b>		
Routt NF	0 acres	16,132.8 acres
Medicine Bow NF	0 acres	27,481.2 acres
<b>TOTAL</b>	<b>0 acres</b>	<b>43,614 acres</b>
<b>Maximum Road Miles Treated</b>		
Routt NF	0 miles	806 miles
Medicine Bow NF	0 miles	1,598 miles
<b>TOTAL</b>	<b>0 miles</b>	<b>2,404 miles</b>
<b>Maximum Trail Miles Treated</b>		
Routt NF	0 miles	719 miles
Medicine Bow NF	0 miles	404 miles
<b>TOTAL</b>	<b>0 miles</b>	<b>1,123 miles</b>
<b>Maximum Developed Recreation/Trailhead/Administrative Sites Treated</b>		
Routt NF	0 sites	170 sites
Medicine Bow NF	0 sites	104 sites
<b>TOTAL</b>	<b>0 sites</b>	<b>274 sites</b>

**Table 4: Comparison of Alternatives - Purpose and Need**

Purpose & Need	Alternative 1: No Action	Alternative 2: Proposed Action - Modified
<b>Minimize Risks to Public Health and Safety</b>	No	Yes. Removal of dead and dying trees would reduce the potential for: a) persons or property being struck by falling trees; and b) trees falling and blocking roadways, thus preventing both emergency and non-emergency ingress and egress.
<b>Minimize Risk of High Intensity Wildfire by Reducing Fuel Loading</b>	No	Yes. In a linear fashion, treatments may provide avenues to segment the forest landscape and provide lines of defense to fire activity. On the larger landscape, fuel loads would be reduced in most treatment areas, thereby minimizing the risk of high intensity wildfire (EA page 36).
<b>Minimize Effects of Tree Mortality on Forest Resources</b>	No	Yes. The positive effects of hazardous tree removal are outlined in the <i>Affected Environment and Environmental Consequences</i> section (EA pgs. 24 – 71).
<b>Partially Offset Treatment Costs</b>	N/A	Yes. Revenues collected from potential timber sale contracts would partially offset treatment costs.

**Table 5: Comparison of Alternatives – Resource Impacts**

Resource	Alternative 1: No Action	Alternative 2: Proposed Action - Modified
<b>Amphibian, Fisheries, and Aquatic Habitat</b>	<b>Biological Determinations:</b> “No Effect” to Federally listed fish species (EA page 27). Environmental effects would be relatively few and would result from dead trees falling naturally and either crushing amphibians or creating log jams that may cause channel scouring.	<b>Biological Determinations:</b> “No Effect” to Federally listed fish species (EA page 27). “May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing” for Region 2 Sensitive Species (EA page 27).
<b>Botany</b>	<b>Biological Determinations:</b> There are no known occurrences or potential habitat for federally listed species (EA page 28). “May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend toward federal listing” for Sensitive Species (EA page 30). No effect for Species of Local Concern (SLC) (EA page 32).	<b>Biological Determinations:</b> There are no known occurrences or potential habitat for federally listed species (EA page 28). “May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend toward federal listing” for Sensitive Species (EA page 30). Some impact to individuals, but no loss of species viability for SLC (EA page 32).
<b>Engineering/Public Access</b>	Roads and trails deemed unsafe because of hazardous trees would be closed. Closures could impact a single road/trail or an entire system of roads/trails (EA page 34).	Use of timber sales and service contracts would allow removal of dead and dying trees along transportation corridors. The result would be more areas maintained and open to public access (EA page 34).
<b>Fire and Fuels</b>	Fuels would increase and fire behavior could be extreme. Access could be compromised during wind events and/or over time as stand deterioration occurs along roadways (EA page 36).	Treatments may provide lines of defense to potential fire activity. On the larger landscape, fuel loads would be reduced, thereby minimizing the risk of high intensity wildfire (EA page 36).

**Table 5 (Cont'd): Comparison of Alternatives – Resource Impacts**

<b>Resource</b>	<b>Alternative 1: No Action</b>	<b>Alternative 2: Proposed Action - Modified</b>
<b>Forested Vegetation</b>	Large amounts of dead fall could delay or prevent future regeneration. Commercial forest products and biomass for energy production would not be utilized (EA page 38).	Commercial forest products and biomass for energy production could be utilized. Dead tree removal would allow for preparation of a seed bed for regeneration (EA page 38).
<b>Heritage Resources</b>	Heritage structures and features could be damaged as hazardous trees associated with the bark beetle epidemic fall (EA page 39)	Project implementation is not expected to result in adverse effects to heritage resources. Removal of hazardous trees around historic buildings would result in beneficial effects to the resource. (EA pages 39 – 40).
<b>Hydrology</b>	Tree mortality would increase large woody debris loading in riparian areas, wetlands, and floodplains through natural processes. Increased sedimentation could affect water quality and community water supplies (EA page 40).	Riparian areas, wetlands, and floodplains would be protected. Water quality would be maintained and community water supply uses of water would not be adversely impacted (EA page 41).
<b>Inventoried Roadless Areas (IRAs)</b>	No significant, adverse impacts to any of the nine features that characterize IRAs (see EA page 49).	No significant, adverse impacts to any of the nine features that characterize IRAs (see EA page 49).
<b>Recreation</b>	More developed and dispersed recreation sites would be closed than under the Proposed Action – Modified (EA page 51).	More developed and dispersed recreation areas would be open to the public after the hazardous trees have been removed (EA page 52).
<b>Scenery</b>	In certain areas, scenery would be impacted by evidence of heavy jackstraw timber. Downed trees cut to open travelways would impact scenic quality due to the evidence of cut ends of logs (EA page 54).	Visual changes of treated sites would be noticed by forest visitors due to the removal of mature trees that once dominated the forest landscape (EA page 55).
<b>Soils</b>	No changes to the soil resource and no effects to soil productivity (EA page 56).	Minor increases in rates of soil displacement, erosion, compaction, and burning (EA pages 56 – 58).
<b>Special Areas – Special Interest Areas and Old Growth/Late Successional Forest</b>	Large, live standing lodgepole pine trees would be a rare occurrence on the post-epidemic landscape. Native plant communities that thrive on an increase in sunlight could increase as trees die and fall (EA page 60).	Effects to Special Interest Areas would be minimal (see EA page 60). Roughly 3,791 acres of mapped and inventoried old growth would be treated on the Medicine Bow NF. On the Routt NF, roughly 2,228 road side acres would be treated within geographic areas that recommend late successional forest protection. Design criteria (#'s 9 and 10) have been developed to minimize impacts.
<b>Wildlife</b>	Habitat would continue to be provided for Management Indicator Species, Region 2 Sensitive Wildlife Species, and Threatened, Endangered, and Proposed Species (EA pages 63 – 70).	<b>Biological Determinations:</b> Water, foraging habitat, roosting habitat, breeding/nesting habitat, and prey animals would be sufficient to support populations for MIS (EA page 63). “May affect but is not likely to cause a trend toward federal listing or a loss of viability” for Region 2 Sensitive Species (EA page 66). “May affect but is not likely to adversely affect” federally listed species (EA page 70).

# AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, and social environments of the project area and the effects of implementing each alternative on that environment. The affected environment (or existing condition) for each resource is described first and establishes a baseline for comparison of the alternatives. The second part of each resource section describes the analysis of environmental effects (or consequences) of the No Action alternative and the Proposed Action – Modified on that resource. The information contained in this section presents the scientific and analytical basis for the comparison of alternatives presented in Tables 4 and 5 above. Complete copies of the resource reports are available for public review and are located in the project file.

**NOTE:** The **Environmental Consequences information is based on the maximum treatment potential** identified for the Proposed Action – Modified (i.e., resource analyses were conducted assuming that all trees would be felled and/or removed within 150 feet from the centerline of travelways). This approach was used for analysis purposes to ensure that the cumulative effects of project implementation were analyzed in a comprehensive and systematic manner. However, taking this approach means that that the acreages, mileages, and effects displayed in the resources sections described below have likely been overstated. **In reality, actual acres treated and anticipated environmental consequences could be much less and will depend on: 1) budgetary constraints; 2) workforce limitations; 3) purchaser/contractor limitations; 4) site limitations; and 5) the extent of hazardous trees (i.e., in some areas, only a few trees may need to be felled whereas in others, all trees may need to be felled).**

## A. AMPHIBIAN, FISHERIES, and AQUATIC HABITAT

### Affected Environment

Fish and amphibian species are abundant throughout the analysis area’s streams and ponded and impounded water ecosystems. These species fall into two categories: 1) native (occurred in the area prior to European settlement); or 2) naturalized, non-native (species that were introduced from other parts of the U.S. or from other countries that have established naturally-reproducing, self-sustaining populations). The following tables depict the aquatic species known or suspected to occur in the analysis area and their management status (e.g., sensitive species, management indicator species, and native/non-native).

**Table 6: Fish Species Known or Likely to Occur in the Analysis Area**

Common Name	Scientific Name	Native or Non-native	Management Indicator Species	USFS, R2 Sensitive Species
Speckled dace	<i>Rhinichthys osculus</i>	Native	No	No
Mottled sculpin	<i>Cottus bairdi</i>	Native	No	No
Bluehead sucker	<i>Catostomus discobolus</i>	Native	No	No
Longnose sucker	<i>Catostomus catostomus</i>	Native	No	No
Mountain Whitefish	<i>Prosopium williamsoni</i>	Native	No	No
Hornyhead chub	<i>Nocomis biguttatus</i>	Native	No	Yes
Creek chub	<i>Semotilus atromaculatus</i>	Native	No	No
Longnose dace	<i>Rhinichthys cataractae</i>	Native	No	No

**Table 6 (Cont'd): Fish Species Known or Likely to Occur in the Analysis Area**

Common Name	Scientific Name	Native or Non-native	Management Indicator Species	USFS, R2 Sensitive Species
White sucker	<i>Catostomus commersoni</i>	Native	No	No
Mountain sucker	<i>Catostomus platyrhynchus</i>	Native	No	Yes
Colorado River Cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Native	Routt	Yes
Brook trout	<i>Salvelinus fontinalis</i>	Non-native	Medicine Bow/Routt	No
Brown trout	<i>Salmo trutta</i>	Non-native	Medicine Bow	No
Rainbow trout	<i>Oncorhynchus mykiss</i>	Non-native	Medicine Bow	No

**Table 7: Amphibian Species Present in the Analysis Area**

Common Name	Scientific Name	Native species	Management Indicator Species	USFS R2 Sensitive Species
Boreal toad	<i>Bufo boreas boreas</i>	Yes	No	Yes
Boreal chorus frog	<i>Pseudacris triseriata maculata</i>	Yes	No	No
Northern leopard frog	<i>Rana pipiens</i>	Yes	No	Yes
Wood frog	<i>Rana sylvatica</i>	Yes	No	Yes
Tiger salamander	<i>Ambystoma tigrinum</i>	Yes	No	No

**Table 8: Region 2 Sensitive Species Present in the Analysis Area**

Species	Scientific Name
<b>Amphibians</b>	
Boreal Toad	<i>Bufo boreas boreas</i>
Northern Leopard Frog	<i>Rana pipiens</i>
Wood Frog	<i>Rana sylvatica</i>
<b>Fish</b>	
Colorado River Cutthroat Trout	<i>Oncorhynchus clarki pleuriticus</i>
Mountain Sucker	<i>Catostomus platyrhynchus</i>
Hornyhead chub	<i>Nocomis biguttatus</i>
<b>Insects</b>	
Hudsonian Emerald	<i>Somatochlora hudsonica</i>
<b>Mollusk</b>	
Rocky Mountain Capshell Snail	<i>Acroloxus coloradensis</i>

## Environmental Consequences

The Environmental Consequences section includes three “sub-sections”: 1) General Effects; 2) Effects to Federally Listed Fish; and 3) Effects to Region 2 Sensitive Species.

### 1) General Effects

#### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** The No Action alternative would result in few impacts to aquatic species and their associated habitats. It is possible that dead and dying trees could unintentionally crush amphibians and fish when they fall as a result of degradation, decay, snow loading, and wind. It is also possible that fallen trees could inundate riparian habitats used by fish and amphibians for reproduction and rearing. However, it is impossible to accurately predict to what extent the aforementioned possibilities would occur in space and time.

The indirect effects of No Action alternative may yield substantial benefits to aquatic species' habitats due to the recruitment of large, woody debris (wood greater than 10.0 cm (3.9 inches) in mean diameter and 1.0-2.0 meters (3.28 – 6.6 feet) in length). Large woody debris is currently lacking in many streams that were historically tie driven.

**Cumulative Effects:** Several situations occurred prior to the development of the Proposed Action – Modified; they have and continue to impact aquatic species and their habitats: 1) non-native trout introductions have dramatically decreased available habitats for native trout such as the Colorado River cutthroat trout (CRCT). In some cases, this has altered their genetic purity; 2) water diversions have altered natural flows and fragmented habitats in many of the CRCT habitats on the Routt National Forest; 3) Whirling disease has been detected in some Forest streams; however, this pathogen has been restricted to non-native trout; 4) a lethal pathogen, *Batrachochytrium dendrobatidis* (Bd), appears to be fairly well distributed among Forest amphibians and their habitats. All of these factors have the potential to negatively impact aquatic species and their habitat.

Most of the aforementioned impacts have been ongoing for well over 100 years indicating that aquatic, riparian, and wetland ecosystems have developed some resilience to multiple uses. As such, the No Action alternative is not expected to make a noticeable contribution to past, present, and reasonably-foreseeable cumulative effects.

#### ALTERNATIVE 2: Proposed Action - Modified

**Direct and Indirect Effects:** Riparian and wetland habitats are not expected to be directly impacted by the Proposed Action – Modified due to implementation of project design criteria. Except for possible amphibian mortality due to crushing (e.g. heavy equipment) and trampling (e.g. humans), this alternative should not directly impact amphibian populations. Fisheries and aquatic habitats should not be negatively impacted if there is compliance with project design criteria. Indirect effects of this alternative would be similar to those described under the No Action alternative.

**Cumulative Effects:** Please refer to the Cumulative Effects discussion presented under the No Action alternative.

## 2) Effects to Federally Listed Fish

### ALTERNATIVE 1: No Action and ALTERNATIVE 2: Proposed Action – Modified

**Direct and Indirect Effects:** Federally-listed fish (Table 9) and their designated, critical habitats would not be affected by implementation of either the No Action alternative or the Proposed Action - Modified. Neither alternative would result in measurable changes to water yield in treated watersheds or to downstream watersheds in the Colorado and Platte River basins. No alterations to downstream habitats would occur.

**Table 9: Federally Listed Fish within the Colorado River and Platte River Basins**

Species	Scientific Name	River System	Federal Status
Bonytail	<i>Gila elegans</i>	Colorado	Endangered
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Colorado	Endangered
Humpback Chub	<i>Gila cypha</i>	Colorado	Endangered
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Platte	Endangered
Razorback Sucker	<i>Xyrauchen texanus</i>	Colorado	Endangered

**BIOLOGICAL DETERMINATION:** “No Effect.”

## 3) Effects to Region 2 Sensitive Species

### ALTERNATIVE 1: No Action

**Direct, Indirect, and Cumulative Effects:** Please refer to the discussions presented under subsection “1) General Effects.”

### ALTERNATIVE 2: Proposed Action – Modified

**Direct and Indirect Effects:** Direct effects to Region 2 sensitive species and their preferred habitats would be minimal. Sensitive amphibians (see Table 8) and the CRCT are either associated with aquatic, riparian, and wetland ecosystems or they are restricted to aquatic ecosystems. Pertinent design criteria adequate to protect aquatic, riparian, and wetland species and their habitats are in place and should be adequate to provide reasonable protection.

Dead and dying trees would provide structural elements to help form instream habitat such as pools. Pool habitats would benefit CRCT, mountain suckers, and desired, non-native trout by providing additional hiding, resting, foraging, and over-wintering habitats.

Amphibians are not expected lose potential or actual riparian-breeding habitats (backwaters) assuming that design criteria 17, 18, 20, and 30 are implemented. No amphibian wetland habitats are expected to be disturbed. Finally, aquatic and wetland habitats that may support the Rocky Mountain Capshell snail and the Hudsonian Emerald dragonfly are not expected to be impacted by project activities.

**Cumulative Effects:** Please refer to the Cumulative Effects discussion presented under the No Action alternative.

**BIOLOGICAL DETERMINATION:** “May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.”

## FOREST PLAN CONSISTENCY

Both alternatives would comply with Water and Aquatic standards and guidelines in the Medicine Bow and Routt National Forest Plans (pgs. 1-28 to 1-30 and pgs. 1-6 to 1-7, respectively). Compliance in the context of the Proposed Action – Modified is based on implementation of pertinent, project design criteria.

## B. BOTANY

The Botany section is divided into two “sub-sections” including: 1) Proposed, Endangered, Threatened & Sensitive (PETS) Plant Species; and 2) Plant Species of Local Concern. Both sub-sections describe the affected environment first, followed by the effects associated with the alternatives.

### 1) Proposed, Endangered, Threatened & Sensitive (PETS) Plant Species

#### Affected Environment

**Federally Listed Species:** Areas that could potentially be impacted by project implementation do not contain known occurrences or potential habitat for federally threatened, endangered, or proposed plant species (Smith and Proctor 2008). Therefore, **federally listed species are excluded from analysis and are not discussed further in this EA.**

**Region 2 Sensitive Species:** The Region 2 sensitive plant species list includes 41 species that are documented or likely to occur within the Medicine Bow-Routt National Forests. Of the 41 species, 13 were dropped from further consideration because they do not have potential habitat within the project area. Of the remaining 28 species, 15 were dropped from further consideration because project design criteria were developed to ensure protection of their habitats. In sum, of the original 41 sensitive plant species, 13 were evaluated in detail during the analysis process. They include eight riparian or riparian transitional plant species and five upland plant species. Table 10 (EA page 29) lists the sensitive plant species analyzed in detail this EA.

#### Environmental Consequences – Sensitive Species Only

### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** In the short-term, continued lodgepole pine mortality would result in periodic felling and/or bucking of hazard trees by hand crews in an effort to keep the forest transportation and trail system open and operational. There may be an increase in the issuance of small scale firewood permits. Minimal ground disturbance would be associated with these activities. Assuming presence, occupied sites would continue to experience current levels of disturbance.

In the long term, forest succession would proceed without direct management intervention. Insect and disease outbreaks are natural events that occur periodically, although current levels are more intense than in recent history. Such outbreaks lead to tree mortality, creation of forest-gap habitats, opening of meadow habitats, and potentially to stand-replacing fires. The vast majority of these beetle-killed trees would eventually fall and be incorporated into forested stands as coarse woody debris.

**Cumulative Effects:** Cumulative effects would be similar to those described under “direct and indirect effects.”

## **ALTERNATIVE 2: Proposed Action - Modified**

**Direct and Indirect Effects:** Direct impacts to sensitive plant species could include trampling, smothering, or being burned under slash piles. Impacted individuals may experience reduced growth and development as well as reduced or eliminated seed-set and reproduction. Such impacts may cause mortality of individuals or populations. The timing of impacts can be critical for sensitive plant species. Impacts occurring in spring, prior to the release of spores or seeds, could reduce population size and change meta-population structure and species viability on the planning unit or range-wide.

The Proposed Action - Modified would present the greatest risk to the five upland plant species since most activity would occur in dry, upland areas. Implementation of design criteria 13 and 14 would lessen potential negative impacts to occupied habitat; these criteria allow botanists to conduct rare plant surveys in high potential habitat prior to ground disturbing activities. Design criterion 14, in particular, requires consultation and site protection needs on an individual and as needed basis.

Indirect impacts to sensitive plant species could occur as a result of changes to vegetation cover and structure. By felling and removing overstory trees, treatment areas would receive more sunlight and may become warmer, drier, and have lower humidity. By contrast, if trees are dropped, lopped, and scattered, the impact is less clear. Depending on the amount of slash left on the ground, sites may become warmer and drier; if slash loads are heavy, the ground may be shaded with an increase in moisture and humidity.

Sensitive plant species could also be impacted by competitive invasive plant species. Design criterion 9 was developed to reduce this risk. Therefore, effects are expected to be minimal.

**Cumulative Effects:** Past and current activities have altered sensitive plant species occurrences and their habitats. These activities include: livestock grazing, timber harvest and thinning, motorized and non-motorized recreational use, road/trail construction and maintenance, insect and disease outbreaks, fire suppression, fire (prescribed and wildfire), mining, urban development (sub-dividing and development of private land), and noxious weed infestation. Other ongoing impacts include those associated with wildlife and climate changes.

Policies and standards and guidelines that limit cumulative effects to sensitive plant species' habitat are in place; therefore, project implementation is not expected to contribute to an increase in any current or predicted downward trend in population numbers or density. It is also not expected to contribute to current or predicted downward trends in habitat capability that would reduce the existing distribution of any of the R2 sensitive plant species carried forward into this analysis.

**BIOLOGICAL DETERMINATIONS:** Table 10 displays biological determinations for sensitive plant species by alternative.

**Table 10: Habitat Information for Sensitive Plant Species Evaluated in Detail**

Species	Common Name	Alternative 1: No Action	Alternative 2: Proposed Action - Modified
<i>Astragalus leptaleus</i> (R)	park milkvetch	MAII*	MAII*
<i>Botrychium ascendens</i> (R)	trianglelobe moonwort	MAII*	MAII*
<i>Botrychium furcatum</i> (U)	Fork leaf moonwort	MAII*	MAII*
<i>Botrychium lineare</i> (U)	narrow-leaved moonwort	MAII*	MAII*
<i>Botrychium paradoxum</i> (U)	peculiar moonwort	MAII*	MAII*
<i>Cypripedium parviflorum</i> (R)	yellow lady’s slipper	MAII*	MAII*
<i>Festuca halli</i> (U)	Hall fescue	MAII*	MAII*
<i>Ipomopsis aggregate</i> (U)	Rabbit Ears gilla	MAII*	MAII*
<i>Malaxis brachypoda</i> (R)	White adder’s mouth orchid	MAII*	MAII*
<i>Mimulus gemmiparus</i> (R)	Rocky mountain monkey flower	MAII*	MAII*
<i>Pamassia kotzebuei</i> (R)	Kotzebue’s grass-of-parnassus	MAII*	MAII*
<i>Rubus arcticus</i> ssp. <i>Acaulis</i> (R)	dwarf raspberry	MAII*	MAII*
<i>Viola selkirkii</i> (R)	Selkirk’s violet	MAII*	MAII*

\* May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend toward federal listing or a loss of species viability range wide

(R) - Riparian and riparian transitional species

(U) - Upland species

***RATIONALE FOR BIOLOGICAL DETERMINATIONS***

**Riparian and Riparian Transitional Species**

- While no populations of these species are known to occur within identified treatment areas, they do have potential habitat within the project area.
- Design criteria 37 and 38 allow botanists to mitigate potential adverse impacts to habitat occupied nearby. They also allow botanists to conduct rare plant surveys in nearby like habitat or otherwise high potential habitat prior to project implementation.
- Design criteria 14, 15, 16, 19, 20, 23, 37, and 38 minimize the intensities of impacts that could occur in riparian and riparian transitional habitats.
- The majority of the treatments would impact lodgepole pine trees; therefore, less risk would be presented to sensitive plant species that are associated with other cover types. These include park milkvetch (riparian transitioning to aspen and/or sagebrush), trianglelobe moonwort (riparian and/or forest meadow), yellow lady's slipper (mesic aspen or aspen transition to riparian), White adder's mouth orchid (spruce-fir), Rocky mountain monkey flower (spruce-fir), Kotzebue's grass-of-parnassus (spruce-fir), dwarf raspberry (spruce-fir) and Selkirk's violet (spruce-fir).

**Upland Species**

- Of the acres identified for hazardous vegetation treatment, approximately **33,215 acres (72%)** are associated with upland roadsides where ground based skidding and concentrated landing activities could occur. Assuming presence, direct and indirect impacts to these species are expected to occur.
- To date there are no documented occurrences of Fork leaf moonwort, narrow-leaved moonwort, or peculiar moonwort in the analysis area. Of the acres identified for vegetation

treatment, an estimated **5% or 2,300 acres** would be considered potential habitat for moonwort species. Of the **2,300 acres**, roughly **1,661 acres** are located where treatments would be accomplished using mechanized timber harvest methods.

- Design criteria **37** and **38** would allow botanists to conduct rare plant surveys in high potential habitat prior to project implementation.
- Design criteria **21**, **23**, **24**, and **35** may reduce the amounts and the intensity levels of disturbance within select areas of potential habitat.
- Design criteria **8**, **9**, **10**, and **32** afford additional protection to sensitive plant species that may occupy hazardous vegetation treatment areas within research natural areas, special interest areas, inventoried roadless areas, Old Growth, and within 5.13 Management Areas on the Routt National Forest.

## **FOREST PLAN CONSISTENCY**

Both the No Action alternative and the Proposed Action - Modified would comply with PETS standards and guidelines in the Medicine Bow and Routt National Forest Plans (pages 1 - 44 and 1 - 14 respectively). Compliance in the context of the Proposed Action – Modified is based on implementation of pertinent project design criteria.

### **2) Species of Local Concern (SLC)**

#### **Affected Environment**

SLC are documented or suspected to be at risk at a forest-wide scale but do not meet the criteria for regional Sensitive Species designation because they are reasonably secure within parts of their range within Region 2. There are 95 plant SLC that either have potential habitat or known occurrences within the analysis area. Of the 95 species, 39 were not analyzed because they do not have potential habitat within the project area and 20 were not analyzed because design criteria were developed to ensure their protection. Of the original 95 SLC, 36 were evaluated in detail during the analysis process. They include 20 riparian and riparian transitional plant species, 6 upland interior forest plant species, and 10 upland forest meadow and forest clearing species. Table 11 displays the SLC analyzed in detail in this EA.

#### **Environmental Consequences**

##### **ALTERNATIVE 1: No Action**

**Direct, Indirect, and Cumulative Effects:** Effects listed for PETS plant species (EA pages 27 - 28) also apply here.

##### **ALTERNATIVE 2: Proposed Action - Modified**

**Direct and Indirect Effects:** Direct impacts to sensitive plant species could include trampling, smothering, or being burned under slash piles. Impacted individuals may experience reduced growth and development as well as reduced or eliminated seed-set and reproduction. Such impacts may cause mortality of individuals or populations. The timing of impacts can be critical for these plant species. Impacts occurring in spring, prior to the release of spores or seeds, could reduce population size and change meta-population structure and species viability on the planning unit or range-wide.

Alternative 2 would present the greatest risk to the 16 upland SLC (see Table 11) since most activity would occur in dry, upland areas. If moderate to intense ground disturbances or slash piling and burning occurs in occupied habitat, individuals or whole populations of several species could be eliminated.

Indirect impacts to SLC could occur as a result of changes to vegetation cover and structure. Such habitat modifications may cause shifts in hydrologic, solar, and soil characteristics of plant habitats and may also impact pollinators or mycorrhizae associated with SLC. Indirect impacts can have positive or negative effects and are often species-specific, being positive for some species and negative for others.

SLC could also be indirectly impacted by competitive invasive plant species. Design criterion 9 was developed to reduce this risk. Therefore, effects are expected to be minimal.

**Cumulative Effects:** Policies and standards and guidelines that limit cumulative effects to SLC habitat are in place; therefore, project implementation is not expected to contribute to an increase in any current or predicted downward trend in population numbers or density. They are also not expected to contribute to current or predicted downward trends in habitat capability that would reduce the existing distribution of any SLC carried forward into this analysis.

**BIOLOGICAL DETERMINATIONS:** The No Action alternative would not negatively impact any of the 36 SLC analyzed in detail in this EA. The Proposed Action - Modified would result in some impact to individuals, but would not result in loss of species viability. Table 11 displays SLC analyzed in detail in this EA.

### ***RATIONALE FOR DETERMINATIONS - Proposed Action - Modified***

- Design criteria 37 and 38 allow botanists to identify activity restrictions to mitigate any potential negative impacts in occupied habitat or high potential habitat during project implementation. They also allow botanists to conduct rare plant surveys in high potential habitat prior to project implementation.
- Design criteria 6, 18, 21, 22, and 35 afford general protection all the plant SLC carried forward into analysis. Design criteria 8, 9, 10, 32, and 33 afford additional protection of SLC which may occupy hazardous vegetation within research natural areas, special interest areas, inventoried roadless areas, Old Growth, and within MA 5.13 on the Routt National Forest.
- Design criteria 14, 15, 16, 19, 20, 23, 37 and 38 would generally avoid or at least minimize the intensities of impacts that could occur in riparian habitats.

### ***FOREST PLAN CONSISTENCY***

Both alternatives would comply with standards and guidelines in the Medicine Bow National Forest Plan (pgs. 1-30 and 1-44) and the Routt National Forest Plan (pg. 1-14) for PETS. Compliance in the context of the Proposed Action – Modified is based on implementation of pertinent project design criteria.

**Table 11: SLC Evaluated in Detail**

<b>Name</b>	<b>Common Name</b>	<b>Species Type</b>
<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives	Riparian and Riparian Transition
<i>Athyrium felix-femina</i>	Common ladyfern	Riparian and Riparian Transition
<i>Bahia dissecta</i>	Dissected bahia	Riparian and Riparian Transition
<i>Botrychium echo</i>	Reflected moonwort	Upland Forest Meadow/Clearing
<i>Botrychium hesperium</i>	Western moonwort	Upland Forest Meadow/Clearing
<i>Botrychium lanceolatum</i> var. <i>lanceolatum</i>	Lanced-leaved moonwort	Upland Forest Meadow/Clearing
<i>Botrychium lunaria</i>	Common moonwort	Upland Forest Meadow/Clearing
<i>Botrychium minganense</i>	Mingan moonwort	Upland Forest Meadow/Clearing
<i>Botrychium multifidum</i> var. <i>coulteri</i>	Leathery Grapefern	Riparian and Riparian Transition
<i>Carex stenoptila</i>	Riverbank sedge	Upland Forest Meadow/Clearing
<i>Cypripedium fasciculatum</i>	Purple lady's slipper	Upland Interior Forest
<i>Draba spectabilis</i> var. <i>oxyloba</i>	Showy draba	Riparian and Riparian Transition
<i>Gentiana affinis</i> var. <i>bigelovii</i>	Bigelow's prairie gentian	Riparian and Riparian Transition
<i>Goodyera oblongifolia</i>	Western rattlesnake plantain	Upland Interior Forest
<i>Iliamna crandallii</i>	Crandall's wild hollyhock	Upland Forest Meadow/Clearing
<i>Iliamna rivularis</i>	Streambank wild hollyhock	Upland Forest Meadow/Clearing
<i>Iliamna grandiflora</i>	Large-flower wild hollyhock	Upland Forest Meadow/Clearing
<i>Juncus filiformis</i>	Thread rush	Riparian and Riparian Transition
<i>Ligularia bigelovii</i> var. <i>hallii</i>	Bigelow's groundsel	Riparian and Riparian Transition
<i>Ligusticum tenuifolium</i>	Slender-leaved loveage	Riparian and Riparian Transition
<i>Listera convallarioides</i>	Broad-leaved twayblade	Riparian and Riparian Transition
<i>Listera cordata</i>	Heartleaf twayblade	Riparian and Riparian Transition
<i>Lycopodium annotinum</i>	Staff clubmoss	Riparian and Riparian Transition
<i>Packeria crocata</i>	Saffron groundsel	Riparian and Riparian Transition
<i>Packeria pseud aurea</i> var. <i>flavulus</i>	Streambank groundsel	Riparian and Riparian Transition
<i>Petasites sagittatus</i>	Arrowleaf sweet coltsfoot	Riparian and Riparian Transition
<i>Platanthera obtusata</i>	Bluntleaved orchid	Upland Interior Forest
<i>Platanthera stricta</i>	Slender bog orchid	Upland Interior Forest
<i>Polypodium saximontanum</i>	Rocky mountain polyploidy	Upland Interior Forest
<i>Pyrrocoma crocea</i>	Western goldenweed	Upland Forest Meadow/Clearing
<i>Pyrola picta</i>	White-veined wintergreen	Upland Interior Forest
<i>Rhododendron (Azaleastrum) albiflorum</i>	Cascade azalea	Riparian and Riparian Transition
<i>Sagittaria calycina</i> var. <i>calycina</i>	Hooded arrowhead	Riparian and Riparian Transition
<i>Sparganium natans</i>	Small bur-reed	Riparian and Riparian Transition
<i>Trillium ovatum</i>	Western wake robin	Riparian and Riparian Transition
<i>Viburnum edule</i>	Squashberry	Riparian and Riparian Transition

## C. ENGINEERING/PUBLIC ACCESS

### Affected Environment

The National Forest Transportation System consists of roads and trails that are on, or provide access to, National Forest System lands (36 CFR 212.2). Forest Service Manuals and Handbooks and the Highway Safety Act of 1966 are clear that the Forest Service has a responsibility to maintain the

safety of its roads and trails. These documents “Authorize State and local governments and participating Federal agencies to identify and survey accident locations; to design, construct and maintain roads in accordance with safety standards; and promote pedestrian safety.” Forest Service Manual 7731.1 states, “Manage forest development roads that are not subject to the Highway Safety Act (those not suitable for passenger car traffic) so they are safe for the planned use.”

The affected environment for this analysis includes; (1) all State and County roads that cross National Forest System lands, (2) National Forest System Roads under Forest Service jurisdiction that are open to public travel, and (3) National Forest System Trails. Based on an assessment of the current bark beetle infestation, Table 12 provides the miles of roads and trails that could potentially be impacted by the Proposed Action – Modified or the No Action alternative.

**Table 12: Potential Miles of Impacted Roads and Trails**

Unit	Miles of Roads	Miles of Trails
Medicine Bow NF	1,598	404
Routt NF	806	719
<b>TOTAL</b>	<b>2,404</b>	<b>1,123</b>

## Environmental Consequences

### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** Fallen trees would continue to be removed from roads and trails as in the past. As time and funding allow, Forest Service crews would remove downed trees that impede traffic and/or safe travel. Roads and trails deemed unsafe due to the presence of hazard trees would be closed. Closures could impact a single road/trail or potentially an entire system of roads/trails. Fewer legal and/or open access routes to National Forest lands could increase use on other system roads/trails, possibly increasing safety concerns along those routes. Fewer legal and/or open access routes to National Forest lands could also increase the illegal use of unauthorized routes thereby increasing resource damage.

**Cumulative Effects:** As mentioned above, roads and trails or an entire system of roads/trails could be closed if they are deemed unsafe because of the presence of hazardous trees. While this would not impact the transportation system itself, it would affect people’s ability to use that system.

### ALTERNATIVE 2: Proposed Action - Modified

**Direct and Indirect Effects:** Use of timber sales and service contracts would allow removal of dead and dying trees along transportation corridors. The result would be more areas open to public access. The large scale removal of hazard trees along roads would require intermittent and/or temporary closures to facilitate safe operations. These closures could result in increased traffic on other Forest routes and/or use of unauthorized routes. Closures would be minimized so as to limit the disruption to the public and private landowners.

Post-use maintenance would be required on all haul routes; some roads may require little or no work while others may require more extensive maintenance to return them to pre-haul condition. Post haul maintenance could include minor drainage maintenance, surface blading, or resurfacing. Only those sections of the roads used for hauling timber would be eligible for post haul maintenance.

Design criteria would be used to mitigate the potential impacts to the transportation system from tree felling and hauling operations.

**Cumulative Effects:** The Proposed Action – Modified would not change the existing transportation system. No new roads or trails would be created and no roads or trails would be decommissioned. Any road or trail maintenance/repair needed as a result of the hazard tree removal project(s) would be dealt with through timber/service contracts or by Forest Service personnel.

## **FOREST PLAN CONSISTENCY**

Both alternatives would comply with Infrastructure standards and guidelines in Medicine Bow and Routt National Forest Plans (pages 1-59 to 1-61 and 1-22 to 1-24, respectively). Compliance in the context of the Proposed Action – Modified is based on implementation of pertinent project design criteria.

## **D. FIRE and FUELS**

### **Affected Environment**

Fire hazards associated with MPB infestations change over time. Potential hazards of spread rate, fire line intensity, and flame length differ in endemic (low levels), epidemic, and post-epidemic conditions (Jenkins et al., 2008). During bark beetle epidemics, rates of surface fire spread and fire line intensity increase, but the magnitude of the increase varies substantially. For example, in selected lodgepole pine stands, average potential rate of spread increased approximately 3 to 6 times in epidemic stands when compared to endemic stands (Page and Jenkins, 2007).

During the red needle stage, a crown fire may transition to and move through the canopy more easily than normal due to the low moisture content of the dead needles. After needles fall there is little or no crown fire potential as no fine fuels are left to support canopy fire behavior. However, there is an increase in wood and needle litter on the forest floor; this will eventually increase surface fuel loading and subsequently increase surface fire intensity.

Roughly 6 to 15 years after the initial infestation, dead trees begin to fall to the forest floor. During this time, particularly in lodgepole pine, the stand will have started to regenerate. Dead, fallen trees, coupled with the regeneration, dramatically change the fuel loading and fire behavior. Dead fuel loading becomes very high with varying size classes, and the young regeneration now growing through the down fuels may contribute to the surface fire intensity. Because of the heavy fuel load now present on the forest floor, much of which is made up of larger diameter dead trees, the severity of a fire will be much higher.

Research conducted in Utah (Page, et. al. 2006) measured changes in the fuels profile with endemic, epidemic, and post epidemic bark beetle populations. The research also compared the quantity and quality of fuels and predicted the potential fire behavior based on average worst case fire weather. Some general conclusions about relationships between the MPB, fuels, and fire behavior in the lodgepole pine forest type include:

#### **Epidemic vs. Endemic Stands**

- 1) Dead and down, woody, fine fuel loadings (litter and 1 hour fuels) were significantly greater in current epidemic stands.
- 2) The only significant differences detected for the aerial fuels were the amounts of dead foliage in the overstory.

- 3) Current epidemic stands had increased rates of spread and fire line intensities than the endemic stands
- 4) Chances for crown fire initiation were greater due to large amounts of dead aerial fuels in the overstory.

### **Post-Epidemic vs. Endemic Stands**

- 1) Greater than 80 percent MPB mortality produced significant increases in dead and down woody fuels in all but the smallest size classes.
- 2) Small fuels decayed over time and returned to background levels after about 20 years.
- 3) Post-epidemic stands had significantly lower available canopy fuels, crown base heights, and crown bulk densities.
- 4) The live shrubs, total live understory fuels, and sub-alpine fir regeneration were significantly greater in the post-epidemic stands.
- 5) Post-epidemic stands had increased rates of surface fire spread, fire line intensity, and total heat release.
- 6) Post-epidemic stands had increased chances for crown fire initiation but decreased chances for active crown fire spread.

## **Environmental Consequences**

### **ALTERNATIVE 1: No Action**

**Direct and Indirect Effects:** There would be no cutting of dead trees along roads, trails, and at administrative sites. Consequently, the conditions related to fuels would increase and fire behavior could potentially be extreme. In addition, with all the standing dead along the road ways, access could be compromised during any wind event and/or over time as stand deterioration occurs.

**Cumulative Effects:** There would not be cumulative effects associated with the No Action alternative because project implementation would not occur.

### **ALTERNATIVE 2: Proposed Action - Modified**

**Direct and Indirect Effects:** Varying fire scenarios could be possible given a fire start. In most cases, removal of hazardous trees in the treated areas would reduce the overall fire carrying capacity, fuel continuity, and fire hazard in the timber component.

Many of the areas treated under this alternative would tend to be linear in fashion (i.e. occurring along roads). In the overall fire/fuels environment, these treatments would provide a positive influence and benefit to fuel and fire scenarios; in linear fashion, treatments may provide avenues to segment the forest landscape and provide lines of defense to fire activity. In the context of the larger landscape, the identified treatment areas would benefit from the lessening of future fuel loads.

In the short-term, individual stands may see an increase in surface fuel loading due to harvest activities (especially in areas where the trees and slash are not removed from the site). Over time, however, this would be significantly less than in the untreated stands. Nonetheless, even the short-term increase activity slash can be mitigated through specific design criteria and timber sale contract provisions such as lop and scatter or other similar slash treatment options.

The Proposed Action - Modified includes the burning of slash piles. Smoke emissions from the burning, while considered an indirect effect, can be mitigated. Burning would be completed only

after a smoke permit is received by either the Colorado or Wyoming Department of Environmental Quality and only on good to excellent smoke dispersal days. Further, any pile burning would be carried out under the guidance of an approved Burn Plan. No significant negative effects are anticipated.

**Cumulative Effects:** Cumulative effects would occur where the cutting and/or removing of dead timber overlap with some other vegetative treatment such as an ongoing timber sale or fuels project. Cumulatively, the fuel load may have already been reduced in the overlap areas. Therefore, cumulative effects from project implementation are expected to be minimal.

## **FOREST PLAN CONSISTENCY**

Both alternatives would be consistent with Disturbance and Fuel Treatment direction found in the Routt National Forest Plan (pg. 1-15) and the Medicine Bow National Forest Plan (pgs. 1-48 – 1 - 49). Consistency in the context of the Proposed Action – Modified is based on implementation of project design criteria.

## **E. FORESTED VEGETATION**

### **Affected Environment**

While bark beetles are always present in low numbers, recent years have seen a dramatic increase in bark beetle activity and conifer tree mortality on the Medicine Bow-Routt National Forests. The current mountain pine beetle infestations and their impact on lodgepole pine forests have likely been influenced by a number of factors, including: 1) an abundance of older, dense, large diameter lodgepole pine stands; 2) prolonged drought; 3) earlier melting of the smaller, drought-influenced snowpacks, resulting in extended and more severe drought conditions; 4) higher temperatures, allowing for an expansion of the one-year mountain pine beetle lifecycle into areas of lodgepole pine forests at higher elevations (>9,500 feet elevation); and 5) greater survival of mountain pine beetle broods in the high elevation lodgepole pine forests. Unless a period of prolonged and severe low temperatures (<-30° F) occurs during late fall-winter-early spring months, the beetle epidemic is likely to continue and increase.

Aerial surveys conducted annually for the Medicine Bow-Routt National Forests show that losses of lodgepole pine to mountain pine beetles have increased significantly in extent and number over the past 12 years, with the largest losses occurring between 2006 and 2007. For example, in 1996 roughly 230 acres of lodgepole pine trees on the Routt National Forest showed evidence of beetle-caused mortality as compared to 223,000 acres in 2006. By 2007, this number had increased to 341,750 acres, representing a 65 percent increase in mortality in a single year. On the Medicine Bow National Forest in southern Wyoming, aerial survey data from 1996 showed only 10 acres impacted by mountain pine beetles as compared to 75,000 acres in 2006. By 2007 that number had increased to 170,600 acres; these figures represent a 128 percent increase in mortality in a single year. Given the rate and extent of the epidemic, entomologists estimate that within 3 years, almost 80 percent of all lodgepole pine over 5 inches in diameter will be dead on both forests.

## Environmental Consequences

### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** The No Action alternative would allow heavy fuels to accumulate until wildfire removed the accumulated biomass from the sites. The impacts of the accumulated large amounts of woody biomass could mean delays in re-establishing or exclusion of regeneration from lack of an exposed bare mineral seed bed or excessive fuel bed accumulation. The No Action alternative would not provide for the utilization of commercially valuable wood products such as lumber, house logs, post & poles, and biomass for energy production.

**Cumulative Effects:** Both the Medicine Bow and the Routt National Forest Land and Resource Management Plans establish minimum requirements for snag & woody debris retention. The No Action alternative would provide an opportunity to significantly exceed those Forest Plan requirements. Retention of snags adjacent to National Forest System Roads (NFSRs) could, however, compromise public safety standards established in the Highway Safety Act, Occupational Safety and Health Act standards, and Forest Service Manual 7700 thereby requiring some roads to be closed to public travel.

### ALTERNATIVE 2: Proposed Action - Modified

**Direct and Indirect Effects:** The Proposed Action – Modified would allow for the utilization of woody biomass for commercially valuable forest products and energy production. Further, the removal of the dead trees would allow for preparation of a seed bed which is beneficial for regeneration of vegetation that is dependant on a bare mineral seed bed and abundant sun light.

**Cumulative Effects:** As mentioned above, the Medicine Bow and Routt National Forest Plans state minimum requirements for snag and down, woody debris retention. Implementation of the Proposed Action - Modified would treat hazard trees up to 150 feet along NFSRs and trails, thus removing snags that could contribute to those Forest Plan standards. However, given the wide-spread nature of the beetle epidemic, snags and coarse woody debris should be abundant in other areas of the Forests. NFSRs that are maintained for public travel would be in compliance with the Highway Safety Act, Occupational Safety and Health Act, and Forest Service Manual 7700.

### FOREST PLAN CONSISTENCY

Both alternatives would be consistent with Silvicultural direction found in the Routt National Forest Plan (pgs. 1-10 to 1-13) and the Medicine Bow National Forest Plan (pgs. 1-35 to 1-40).

## F. HERITAGE RESOURCES

### Affected Environment

Heritage resources inventory surveys for the project area have focused on those stands and areas in which activities are proposed that have the potential to affect archaeological sites. Based on our most current available data, just over 130,000 acres have been surveyed for heritage resources on the Medicine Bow – Routt National Forests. These surveys have been conducted for reasons not associated with the Hazard Tree Project. Examples include surveys for vegetation management, range use, recreation projects, and prescribed burning.

Based on the most current information, 2,403 archaeological sites have been identified in the Medicine Bow – Routt National Forests. Of these sites, nine are currently listed on the National Register of Historic Places; 149 are considered eligible for listing; 1,679 are currently considered Not Eligible for listing; and 566 have not been fully evaluated for listing and are considered unevaluated.

## **Environmental Consequences**

### **ALTERNATIVE 1: No Action**

**Direct and Indirect Effects:** Under this alternative, hazardous trees in and adjacent to eligible or unevaluated heritage properties would not be felled and/or removed. This would likely result in an adverse effect to those sites containing features that could be impacted by dead trees falling naturally on the features, by the accumulation of heavy fuels around them, or both. Heavy fuel loading could result in catastrophic fires which are known to affect both historic and prehistoric resources through direct and indirect methods. Fire can and does consume wood and other organic materials that are on the ground surface. It can also alter the condition of stone tools, organic materials, and historic artifacts. Direct effects would include: rendering many dating methods inaccurate, visual alteration, and the physical destruction of materials. In addition, rain and snow after a fire can cause severe erosion on heritage properties.

The majority of the sites listed on the National Register of Historic Places are located in areas where hazard trees exist, thus putting them at risk. Without treatment, all of our listed sites would also be at risk of catastrophic fire resulting from the increased fuel loading in and around these nationally significant sites.

**Cumulative Effects:** The loss of archaeological resources has happened in the past and would continue to happen regardless of project implementation. Over time, fewer archaeological resources would be available for study and interpretation if they are not afforded adequate protection.

### **ALTERNATIVE 2: Proposed Action - Modified**

**Direct and Indirect Effects:** Direct effects on heritage resources are expected to be as follows:

- (1) No effect to heritage properties in project areas where no historic properties are present.
- (2) No effect to heritage properties in project areas where historic and/or unevaluated properties are present, but where site avoidance is feasible and implemented.
- (3) Design criterion 10 would be applied where heritage resources occur and site avoidance is not feasible. Accordingly, activities that may affect the resource would be halted immediately, and the resource would be evaluated by a professional archaeologist. Consultation would be initiated with the appropriate State Historic Preservation Officer (SHPO), as well as with the Advisory Council on Historic Preservation, if necessary. Project activities would not be resumed until the resource is adequately protected and agreed-upon mitigation measures are implemented with SHPO approval. Application of this design criterion would ensure that historic properties are protected and would, in fact, be beneficial to the resource. Without treatment, the risk of adverse effects would be increased due to damage by unrestricted falling trees and catastrophic fire.

Based on the above information, no adverse effects to heritage resources are expected. The proposed activities are not expected to have indirect effects on heritage resources.

**Cumulative Effects:** As mentioned above, adverse effects to heritage resources are not expected. Accordingly, cumulative adverse effects to heritage resources are also not expected.

**FOREST PLAN CONSISTENCY**

Both alternatives would be consistent with Heritage direction found in the Routt National Forest Plan (pg. 1-16) and the Medicine Bow National Forest Plan (pg. 1-51). Consistency in the context of the Proposed Action – Modified is based on implementation of project design criteria.

**G. HYDROLOGY**

**Affected Environment**

The analysis area is located within four major watersheds including the South Platte, North Platte, White-Yampa, and the Colorado River Headwaters. There are over 3,300 miles of perennial streams within this area, with 80 miles of these occurring in areas that may be directly affected by project implementation. The total number of road/stream crossings on the Forest, and the number that may be affected by the project are shown by stream type in Table 13.

**Table 13: Road/Stream Crossings by Stream Type on the Forest**

Stream Type	Number of Stream/Road Crossings on the Forest	Number of Stream/Road Crossings in the Project Area	% of Stream/Road Crossings Potentially Affected
Perennial	6,885	184	2.6%
Intermittent	7,016	275	3.9%
<b>TOTAL</b>	<b>13,901</b>	<b>459</b>	<b>3.3%</b>

There are approximately 136,000 acres of riparian and wetland areas between the two Forests (USDA Forest Service 1998b, pp.3-43; USDA Forest Service 2003b, pp.3-100). Riparian areas are associated with lands adjacent to perennial and some intermittent streams while shrublands and coniferous forests comprise the majority of wetlands. Approximately 1,076 of the 136,000 acres of riparian areas/wetlands that exist between the two forests may be directly affected by project implementation.

Floodplains are associated with most of the analysis area’s perennial and intermittent streams. Floodplains tend to be quite narrow in most of the area that could potentially be impacted by project implementation.

**Environmental Consequences**

**ALTERNATIVE 1: No Action**

**Direct and Indirect Effects:** Tree mortality associated with the bark beetle epidemic would increase large woody debris loading in riparian areas, wetlands, and floodplains through natural processes. There would be no direct effects to community water supplies as there would be no effects to water quality from increased sedimentation or turbidity associated with ground disturbing activities. There may be potential indirect effects to water quality and community water supplies as the potential for a large scale wildfire would be slightly higher under this alternative. A large scale wildfire could degrade water quality through ash and sediment loading, although that is largely dependant on local factors including the location, extent, duration, and intensity of the fire.

There would be no potential for ground based activities to increase sedimentation. There would be a higher potential for large wood and debris to block culvert inlets which could lead to increased sedimentation due to culvert failures. Culvert failures could erode road fills and increase sedimentation to the stream network.

There would be no direct effects to bed and bank stability under this alternative. There may be a slight increase in the potential loss of bed and bank stability due to culvert blockages and failures. Such occurrences would redirect flows such that bed and bank stability could be affected.

**Cumulative Effects:** The effects of past road construction would not be increased under the No Action alternative. Over time, dead trees falling over could cause culvert blockages which could result in culvert failures. Plugged and failed culverts would likely cause increased sedimentation to the stream network which could affect community water supplies and decrease bed/bank stability.

The potential for controlling a future large-scale wildfire would be slightly lower under this alternative as there would not be as many firebreaks created along the road system. Depending on the duration and intensity, large-scale wildfires could have adverse effects on water quality for community water supplies. They could also significantly increase sedimentation to the stream network and reduce bed/bank stability. The potential for these adverse effects to occur would be slightly higher under this alternative.

## **ALTERNATIVE 2: Proposed Action - Modified**

**Direct and Indirect Effects:** Design criteria have been developed to protect riparian areas, wetlands, and floodplains. While significant impacts to these resources are not expected, minor impacts to wetlands may occur as a result of dead and dying trees being cut and/or removed from some wetlands during project implementation. Tree removal would reduce the amount of large organic material in wetland areas that are adjacent to roads.

No developments are planned in project area floodplains; however, hazard tree felling and/or removal may occur in these areas. Removal of hazard trees in floodplains adjacent to roads would reduce the risk of debris accumulation plugging culverts; therefore, the risk of culvert failure and associated minor flooding would be reduced as compared to the No Action alternative. Beneficial effects to floodplains may occur; no significant adverse effects to floodplains are anticipated.

Removal of hazardous trees is not expected to have any direct impact to municipal water systems downstream of the Forest. Project design and Best Management Practices (BMPs) would minimize the risk of potential effects to water quality such as increased turbidity. Water quality is expected to be maintained such that community water supply uses of water would not be adversely affected.

Sediment effects include the potential for increased sediment delivery to streams from removal of hazard trees. Direct effects may result from ground disturbance associated with cutting or, more likely, removal of trees with ground based equipment. Indirect effects are not anticipated.

The Proposed Action – Modified is expected to have minor effects on streambed or bank stability. Use of motorized equipment for temporary access across streams is the primary mechanism by which streambeds and banks could be affected – this use would be limited and would be mitigated with design criteria. Project BMPs, which limit or preclude the use of motorized equipment in and near streams and swales, have been recommended for implementation. These BMPs have been shown to be effective in protecting streambed and bank stability.

**Cumulative Effects:** Implementation of the Proposed Action - Modified would not contribute to significant adverse cumulative effects. The treatment areas represent the maximum disturbance area; actual treatment areas are likely to be less than what has been identified due to budget constraints and site-specific limitations. The maximum area of ground disturbance in any sixth level watershed is 11 percent. The majority of the watersheds would have a maximum area of potential ground disturbance of less than two percent. With implementation of design criteria and BMPs, ground disturbance would be minimized, particularly where there would be potential to increase the connected disturbed area. Connected disturbed areas are defined as ‘high runoff areas like roads and other disturbed sites that have a continuous surfact flow path into a stream or lake (FSH 2509.25). Minimizing connected disturbed areas would minimize the contribution of this project to overall cumulative effects to the water resources.

## **FOREST PLAN CONSISTENCY**

Both alternatives would comply with Medicine Bow and Routt National Forest Plan standards and guidelines pertinent to Water and Aquatics (pgs. 1-28 to 1-30 and pgs. 1-6 to 1-7, respectively). Compliance in the context of the Proposed Action – Modified is based on implementation of project design criteria.

## **CONSISTENCY WITH OTHER LAWS AND REGULATIONS**

- **Consistency with Wetlands/Floodplains Executive Orders:** This project would be consistent with pertinent executive orders.
- **Clean Water Act:** This project would comply with the Clean Water Act and States of Wyoming and Colorado State Water Quality Standards through the use of BMPs and associated monitoring.
- **State of Wyoming Turbidity Waiver:** A waiver is not necessary for this project.
- **Stormwater Discharge Permit:** A stormwater discharge permit is not necessary for the non-point source pollution aspects (site preparation, thinning, and harvest operations) of this project (40 CFR 122.3). Any point source silvicultural ground disturbing activities (40 CFR 122.27) associated with this project (e.g. log sorting or log storage facilities) may require a stormwater discharge permit before project implementation.

## **H. INVENTORIED ROADLESS AREAS (IRAs)**

### **Affected Environment**

IRAs are undeveloped areas typically exceeding 5,000 acres that meet the minimum criteria for wilderness consideration under the Wilderness Act of 1964. Although the Medicine Bow NF contains 25 IRAs within the analysis area, only 14 of those may be impacted by project implementation (see Table 14). The Routt NF contains 29 IRAs, 22 of which may be impacted by project implementation (see Table 14). Neither the Routt NF Plan nor the Medicine Bow NF Plan contain Management Area direction specific to IRAs.

**Table 14: IRAs that May be Impacted by Project Implementation**

IRA	Total IRA Acres	Acres Along Roads	Acres Along Trails	Total Acres
<b>Routt NF</b>				
Black Mountain	22,750	0	4.9	4.9
Sugarloaf North	15,094	0	1.5	1.5
Mad Creek	25,149	0	114.9	114.9
Kettle Lakes	11,303	7.8	357.7	365.5
Long Park	43,979	29.2	217.4	246.6
Bunker Basin	12,814	3.0	29.5	32.5
Pagoda Peak	57,789	9.3	33.0	42.3
Troublesome North	32,836	97.4	187.9	285.3
Troublesome South	47,018	0	521.6	521.6
Never Summer South	7,633	0	32.4	32.4
Never Summer North	3,672	1.3	15.1	16.4
Nipple Peak North	6,307	0	9.4	9.4
Elkhorn	11,048	8.7	13.7	22.4
Dome Peak	36,760	2.9	221.8	224.7
South Fork	4,727	0	93.5	93.5
Grizzly Helena	6,376	0	35.8	35.8
Walton Peak	5,339	13.4	61.8	75.2
Little Green Creek	844	0	24.0	24.0
Morrison Creek	8,456	0	67.0	67.0
Bushy Creek	11,386	2.6	99.0	101.6
Chatfield	11,273	0	80.0	80.0
Shield Mountain	10,156	0	10.5	10.5
<b>Routt Total</b>	<b>392,709</b>	<b>175.6</b>	<b>2,232.4</b>	<b>2,408</b>
<b>Medicine Bow NF</b>				
Little Snake	9,920	1.2	16.7	17.9
Solomon Creek	5,756	1.4	155.2	156.6
Huston Park Addition	8,401	0	2.3	2.3
Encampment River Addition	4,983	0	5.9	5.9
East Fork Encampment	7,429	0	132.7	132.7
Snowy Range	29,637	0	2.6	2.6
Libby Flats	11,082	0	77.2	77.2
Middle Fork	13,232	0	170.8	170.7
Sheep Mountain	17,614	0	302.3	302.3
Savage Run Addition	2,370	0	43.7	43.7
Illinois Creek	6,707	0	14.8	14.8
Bear Mountain	9,426	4.1	67.1	71.2
Pennock Mountain	9,592	0	74.4	74.4
Platte River Addition	7,947	0	3.1	3.1
<b>Medicine Bow Total</b>	<b>144,096</b>	<b>6.7</b>	<b>1,068.8</b>	<b>1,075.5</b>
<b>TOTAL – Medicine Bow and Routt</b>	<b>536,805</b>	<b>182.3</b>	<b>3,301.2</b>	<b>3,483.5</b>

## Environmental Consequences

The Environmental Consequences section includes three “sub-sections”: 1) General Effects; 2) Effects to Inventoried Roadless Area Features; and 3) IRA Conclusions.

### 1) General Effects

#### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** Hazardous trees would not be mechanically felled within IRAs. Without management action, dead trees would continue to stand for a few to many years (Johnson and Green 1991). As the standing dead trees fall, they may damage live trees or cause live trees to fall over. Large, live standing lodgepole pine trees would be a rare occurrence on the post-epidemic landscape.

#### ALTERNATIVE 2: Proposed Action – Modified

**Direct and Indirect Effects:** On the Medicine Bow NF, roughly 1,175 acres of analysis area IRAs could be impacted by the Proposed Action – Modified (0.75 percent). Of these acres, 6.7 are along roads and 1,068.8 are along trails. On the Routt NF, approximately 2,408 IRA acres (0.7 percent) of analysis area IRAs could be impacted. Of these acres, 175.6 are along roads and 2,232.4 are along trails. Design criterion 13 would be applied and would limit activities in these areas.

### 2) Effects to IRA Features

The effects of the alternatives on the nine features that characterize IRAs<sup>4</sup> were considered. Following is documentation of that analysis.

#### 1. High Quality or Undisturbed Soil and Air

**Existing Condition:** Bedrock geology in the IRAs is dominated by Precambrian metamorphic and granitic rocks. Most soils developed in residual surfaces of these parent materials. These rocks are highly resistant to physical and chemical weathering and typically form very stable landforms.

The Medicine Bow airshed encompasses the entire Medicine Bow NF and roughly 70 percent of the Routt NF. The remaining 30 percent of the Routt NF is located in two airsheds: Grand Junction and Granby. No Class I (high protection) areas are contained within the project area. Air resource impacts from current management within and adjacent to IRAs are localized and temporary. Currently, the entire project area is in attainment for criteria pollutants.

**Effects on Characteristic from the Project:** The No Action alternative would not change soil and air resources. There would be no changes to soil productivity or air quality. The same can be said for the Proposed Action – Modified.

#### 2. Sources of Public Drinking Water

**Existing Condition:** The Routt NF contains 8 IRAs and the Medicine Bow NF contains 7 IRAs that include source water areas for community water supplies (see Table 15).

<sup>4</sup> The nine characteristics are outlined in 36 CFR Part 294 Special Areas; Roadless Area Conservation; Final Rule 2001, page 3245.

**Table 15: IRAs Containing Source Water Areas for Community Water Supplies**

IRA	Total IRA Acreage	Acres of IRA Identified for Community Water Supplies	% of IRA Contributing to Community Water Supplies	Proposed Treatment Adjacent to Roads (Acres)*	Proposed Treatment Adjacent to Trails (Acres)
<b>Routt NF</b>					
Bunker Basin	12,814	1,158	9%	0	3
Bushy Creek	11,393	67	<1%	0	0
Chatfield	11,273	5,770	51%	0	80
Long Park	43,979	15,655	36%	0	21
Mad Creek	25,149	252	1%	0	0
Morrison Creek	8,456	353	4%	0	21
Nipple Peak North	6,307	4,798	76%	0	9
Nipple Peak South	13,852	308	2%	0	0
<b>TOTAL</b>	<b>138,693</b>	<b>30,886</b>	<b>n/a</b>	<b>0</b>	<b>134</b>
<b>Medicine Bow NF</b>					
Sheep Mtn	17,614	3,439	19%	0	145
Snowy Range	29,637	8,175	28%	0	0
Rock Creek	18,859	12,753	68%	0	44
Huston Park Addition	6,300	4,582	73%	0	55
Little Snake	9,920	312	3%	0	0
Solomon	5,757	1,381	24%	0	55
Elkhorn	11,051	761	7%	2	4
<b>TOTAL</b>	<b>99,138</b>	<b>31,403</b>	<b>n/a</b>	<b>2</b>	<b>303</b>

\*Only acres within areas identified for community water supplies are identified.

**Effects on Characteristic from the Project:** There would be no potential for increased sedimentation and turbidity associated with ground disturbing activities under the No Action alternative. The potential for a large-scale wildfire would be slightly higher since trees would not be felled along roads; therefore, the roads would not serve as an effective fuel break.

The Proposed Action – Modified includes 2 acres of proposed treatment along roads (Elkhorn IRA) and 303 acres of proposed treatment along trails that contribute to community water supplies on the Medicine Bow NF. It also includes 134 acres of proposed treatment along trails that contribute to community water supplies on the Routt NF.

Ground disturbance from felling operations associated with the Proposed Action – Modified would result in the potential for a slight increase in sedimentation and turbidity, although design criteria would minimize this potential. Consequently, a community’s ability to treat or use water for domestic purposes would not be significantly impacted. There would be a slightly lower potential for a large scale wildfire under this alternative as the roads adjacent to the IRAs would have a higher potential for acting as an effective fire break.

### 3. Diversity of Plant and Animal Communities

**Existing Condition:** Forested cover types within project area IRAs consist primarily of lodgepole pine and spruce-fir, with smaller percentages of aspen, Douglas-fir, limber pine, and ponderosa pine. IRAs on the Medicine Bow NF include approximately 90,815 acres of lodgepole pine, with

approximately 53,262 acres in mature or high risk stands<sup>5</sup>. IRAs on the Routt NF include approximately 104,431 acres of lodgepole pine, with approximately 74,318 acres in mature or high risk stands. Entomologists estimate that within 3 years approximately 80 - 90 percent of the lodgepole pine over 5 inches diameter will be dead as a result of the beetle epidemic.

IRAs on both the Medicine Bow and Routt NFs include habitat for many of the more common types of wildlife on the Forest, including deer, elk, and mountain lions. They also contain habitat for Forest Service Sensitive Species including boreal owls, wood frogs, northern goshawk, boreal toads, and American marten. They also contain habitat for Canada lynx, a federally listed species.

**Effects on Characteristic from the Project – Botanical Species:** Under the No Action alternative, dead trees would remain standing for 3-15 years or longer. As the dead trees fall, they may damage live trees or cause live trees to fall over. Large, live standing lodgepole pine trees are expected to be a rare occurrence on the post-epidemic landscape. Native plant communities that thrive on an increase in sunlight would be expected to increase as trees die and fall.

Under the Proposed Action – Modified, dead standing trees would be felled and left in place; dead woody material would be lopped and scattered. Plant communities would be affected by changes in shading from dead wood on the ground. Plant species that need more light would not be expected to increase because tree trunks lying on the forest floor would create a shaded condition similar to a closed forest canopy. None of the IRAs within the analysis area would experience much change in plant community diversity.

**Effects on Characteristic from the Project – Wildlife Species:** Both the No Action alternative and the Proposed Action – Modified would provide habitat for terrestrial wildlife Management Indicator Species, Region 2 Sensitive Species, and Threatened, Endangered, and Proposed Species that could occur in the IRAs.

**No Action alternative:** The effects to terrestrial wildlife species and their habitat would be similar to those described in the BEs, BAs, and MIS reports (see EA pages 63 - 70) prepared for this analysis. Under No Action, the beetle outbreak could create an immediate (1-10 years), substantial loss of mature and older aged lodgepole forest important to many Forest terrestrial wildlife. Over time, perhaps two decades, these stands would have a high density of large snags and coarse woody debris from beetle-killed trees. This is not a common characteristic across the Forest and could provide unique habitat opportunities for cavity-nesting, denning, many small mammals, and several furbearing wildlife.

The habitat of particular interest to this project is beetle-killed or dying lodgepole along existing open roads, trails, and surrounding administrative and developed recreation sites. Abundant research indicates that habitat quality for many of the Forest's wildlife is already reduced along roads (see wildlife reports). Effects are usually identified as direct loss of habitat, changing landscape pattern of habitat, increased predation, parasitism, reduced fitness from disturbance, collision with vehicles, harassment or other disturbance. By definition, IRAs have few roads or trails in their interior. So, the extent of road effects to wildlife are minimal within IRAs.

**Proposed Action – Modified:** Effects to terrestrial wildlife species within IRAs would be similar to, but at a much lower intensity, than those described in the BEs, BAs, and MIS reports prepared

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<sup>5</sup> Lodgepole pine stands with an average stand diameter of 8 inches DBH or greater, average age greater than 80 years, and a stand density greater than 120 square feet basal area per acre are considered high risk for beetle attack.

for this analysis. There are relatively few roads and trails in the IRAs, so the effects to species are expected to be minimal. In addition to the few acres that could be affected in the IRAs, IRA boundaries are mapped 300 ft from open roads. Since proposed actions could be within 150 feet of roads and trails, noise and other disturbance effects would be at least 150 feet from IRA boundaries.

Assuming that all hazardous trees are removed within 150 feet of the centerline of roads and trails, the Proposed Action – Modified could affect 3,484 acres of lodgepole pine habitat within Medicine Bow and Routt NF IRAs. These acres would be scattered across the IRAs in small strips adjacent to roads and trails where habitat quality is already reduced. The effects of the Proposed Action – Modified to terrestrial wildlife in IRAs would be extremely small for the following reasons: the project would affect a small portion of IRAs; a small portion of wildlife habitat within IRAs would be impacted; actions would occur along existing roads and trails; and the habitat would already be affected by pine beetles. The number of terrestrial wildlife species on the Forest should remain consistent over time; however, the abundance of individual species would change with or without implementation of the Proposed Action - Modified.

#### **4. Habitat for Proposed, Endangered, Threatened, and Sensitive (PETS) Species and those Species Dependent on Large Undisturbed Areas of Land.**

**Existing Condition:** There are not any identified threatened, endangered, proposed or candidate botanical species known to occur in the project IRAs or within the Medicine Bow and Routt NFs as a whole (EA page 28). The only wildlife species on the Threatened, Endangered, or Proposed species that has the potential to be affected by the alternatives analyzed in this EA is the *Canada lynx*.

**Effects on Characteristic from the Project – Botanical Species:** The beetle epidemic will continue to impact thousands of acres of lodgepole pine regardless of project implementation. Consequently, both the No Action alternative and the Proposed Action – Modified would likely result in increases in fragmentation and decreases in connectivity. Under the Proposed Action – Modified, there would be minor disturbances to botanical species along the sides of roads and trails in affected IRAs which would emphasize the corridor effects in these areas.

**Effects on Characteristic from the Project – Wildlife Species:** Both the No Action alternative and the Proposed Action – Modified would provide habitat for Threatened, Endangered, and Proposed Species that could occur in the IRAs.

**No Action alternative:** Most sensitive and federally listed species that use mature and older lodgepole forest also depend on mature or older spruce-fir forest. Spruce-fir habitat is not being impacted by MPBs across the Forests and would continue to provide habitat for these species. Habitat for TES would be provided for the following reasons: dying lodgepole pine provides varying terrestrial wildlife habitat characteristics over time; the outbreak will occur over many years; and mature or older spruce-fir will be available for TES wildlife.

**Proposed Action – Modified:** As mentioned above, affected acres would be along roads or trails where habitat quality is already reduced, thus changing habitat usefulness. The effects of the Proposed Action – Modified to terrestrial wildlife habitat and TES in IRAs would be extremely small for the following reasons: the project would affect a small portion of IRAs; a small portion of wildlife habitat within IRAs would be impacted; actions would occur along existing roads and trails

where disturbance currently exists; habitat would already be affected by MPBs; and spruce-fir habitat would still be available.

## **5. Primitive, semi-primitive, non-motorized, and semi primitive motorized classes of dispersed recreation.**

**Existing Condition:** Recreation opportunities in IRAs are managed according to assigned Management Area (MA) prescriptions. Analysis area IRAs include an array of different MA prescriptions that allow for either winter motorized use with summer-nonmotorized use, year-round motorized use, or year-round non-motorized use. Winter motorized activities generally include snowmobiling while summer motorized activities include on-road vehicle use and off-road vehicle use on designated roads and trails. Winter non-motorized activities include cross-country skiing, snowshoeing, and sledding while summer non-motorized activities include hiking and biking.

**Effects on Characteristic from the Project:** Under the No Action alternative, hazardous trees would not be felled in IRAs. Consequently, fallen trees could limit or prohibit the use of both summer and winter motorized and non-motorized activities.

Implementation of the Proposed Action – Modified would allow more roads and trails to remain open and available for use in IRAs. Design criterion 8, which would permit felling but not removal of hazardous trees, would be implemented under this alternative. This criterion was developed to afford more protection to IRA resources while protecting the recreating public.

## **6. Reference Landscapes**

**Existing Condition:** Reference landscapes are generally large undisturbed areas that provide the basis for developing management strategies and developing an understanding of what an undisturbed landscape looks like and how it might function. Reference landscapes need to be larger than the predicted size of natural disturbances (e.g., fire, insects, diseases) to provide information to managers on the scale and effect of natural disturbances.

**Effects on Characteristic from the Project:** Under the No Action alternative, IRAs would remain undisturbed from the felling of hazardous trees and the lopping and scattering of slash. Therefore, they would retain their current value as reference landscapes.

Under the Proposed Action – Modified, hazardous trees would be felled in IRAs but they would not be removed. Given the fact that the majority of the dead and dying trees would likely fall naturally within the next 3 – 14 years (Mitchell and Preisler 1998), felling the trees and leaving them in place should not detract from the ability of the affected IRAs to function as reference landscapes.

## **7. Natural Appearing Landscapes with High Scenic Quality**

**Existing Condition:** A landscape character description was developed with associated scenic integrity objectives for the Medicine Bow NF and visual quality objectives for the Routt NF (See EA page 53). Existing Scenic Integrity in analysis area IRAs is Very High, High, and Moderate while Existing Visual Condition is Type I (Preservation), Type II (Retention), and Type III (Partial Retention).

**Effects on Characteristic from the Project:** Either alternative would result in some changes on the landscape as trees are either felled or fall naturally along road and trail corridors in IRAs. Scenic

quality would be reduced because of potentially large amounts of standing dead or because of fallen trees on the ground. Over time scenic quality would improve as felled trees naturally decompose and new trees are established.

## 8. Traditional Cultural Properties and Sacred Sites

**Existing Condition:** Traditional cultural properties are places, sites, structures, art, or objects that have played an important role in the cultural history of a group. Sacred sites are places that have special religious significance to a group. Please refer to EA page 39 for a description of heritage (cultural) resources. To date, the Forest Service is not aware of any sacred sites being located within analysis area IRA boundaries (pers. comm. Bean 2008).

**Effects on Characteristic from the Project:** Neither the No Action alternative nor the Proposed Action – Modified are expected to adversely impact traditional cultural properties and sacred sites.

## 9. Other locally identified unique characteristics

**Existing Condition:** An example of a locally identified unique characteristic includes unique wetland complexes such as fens. Fens are wetlands with water-saturated substrates and an accumulation of about 30 cm or more of peat (organic soil material). The analysis area includes an unquantified number of these areas.

**Effects on Characteristic from the Project:** Fens would not be impacted under the No Action Alternative. Design criterion 19, which would not allow mechanized equipment within 200 feet of fens, would be implemented under the Proposed Action – Modified; therefore, these areas would not be impacted by project implementation.

### 3) IRA Conclusions

The information presented above indicates that neither the No Action alternative nor the Proposed Action – Modified would result in a significant, adverse impact to any of the nine features that characterize Inventoried Roadless Areas.

## I. RECREATION

### Affected Environment

Recreation use on the Medicine Bow and Routt National Forests, as determined by the National Visitor Use Monitoring (NVUM 2002) project, is listed as 929,230 visits and 1,689,001 visits, respectively. Roughly 10 percent of the use across both Forests occurs in developed campgrounds, another 10 percent occurs in developed day use areas (e.g. picnic grounds), and another 10 percent occurs via dispersed camping. Approximately 50 percent of the use on the Routt NF comes from the Steamboat Springs Ski Area. A majority of the remaining visitor use relates to use of roads and trails, wildlife related activities, and viewing of scenery.

**Developed Recreation:** Developed Recreation sites in the analysis area include 57 Campgrounds, 3 Day Use Areas, 11 Rental Cabins, 19 Picnic Areas, and 45 Trailheads. Collectively, these sites occupy 1,870 acres and can accommodate up to 18,000 people. Most of the sites either have timber within or adjacent to them; thus, hazardous trees are typically removed annually for public safety and to provide access. Normally the amount of trees removed is a few trees per site with some areas having as many as 50 trees removed. Over the last 10 years the number of trees being removed

annually has grown significantly and, in many cases, is now beyond the capability to be removed by forest recreation crews.

**Dispersed Recreation:** Dispersed camping (outside of developed campgrounds) is very popular on the Medicine Bow and Routt National Forests. The Medicine Bow National Forest Plan (2003) identifies approximately 3,000 dispersed camp sites within the analysis area. Although the Routt National Forest Plan does not list dispersed campsites, the NVUM indicates that each Forest has approximately the same number of recreation visitors using dispersed campsites. Many of the dispersed campsites in the analysis area occur in a spruce-fir or lodgepole timber type. Other popular dispersed recreation activities include mountain biking, horseback riding, driving for pleasure, wildlife viewing, hunting, fishing, etc.

**Trails:** The Medicine Bow and Routt NFs contain 404 and 719 miles of summer recreation trails respectively (1,123 total miles). The majority of these trails are used for hiking, horseback riding, and mountain biking, with a lesser amount being used for motorized recreation (e.g. All-terrain Vehicles and motorcycles). There are also over 600 miles of groomed snowmobile trails on the Medicine Bow and Routt NFs, most of which are located on existing roads. Some routes do go cross-country but they usually come back to the road location to go through timbered areas. A majority of the groomed snowmobile routes are located outside of the lodgepole pine timber type or they are in open areas of the forest where impacts from fallen trees could be managed. An exception to this may be in the Fox Park area where clearing limits for roads through thick lodgepole pine stands are minimal.

Non-motorized routes groomed for skiing and snow shoeing account for 146 miles of winter trails. Most of the trails are located in timbered stands or along the edge of parks. The Rabbit Ears trails on the Routt NF are located in the spruce-fir zone. The spruce bark beetle is killing trees in this area, but not to the extent of the MPB in the lodgepole pine areas. A majority of the trails in the Medicine Bow NF are located in the lodgepole pine zone.

**Recreation Special Uses:** There are approximately 320 recreation use permits on the Medicine Bow and Routt NFs. Some of the permitted activities include outfitter and guide activities (hunting, fishing, etc.) and recreation events such as gatherings, bike races, horse events, etc. Given the brief and mobile nature of these permits, permittees are often able to relocate to other areas if on-the-ground conflicts exist, such as hazardous tree conditions. Others permitted activities involve structures that are immobile and more permanent in nature, such as recreation residences, ski areas, and resorts. Consequently, the potential for these permitted activities to be impacted by hazardous trees is greater, particularly in terms of access if hazardous trees fall and block roadways.

## Environmental Consequences

### Alternative 1: No Action

#### Direct and Indirect Effects

**Developed Recreation:** Under the No Action alternative, hazardous trees would be felled and removed from developed recreation areas and administrative sites as they have been in the past, as required by FSM 2332.11 (Public Safety, Hazard Trees). Forest Service crews would continue to fell and remove trees from areas that have small amounts of hazardous trees; however, the crews would not have the manpower or equipment to fell and remove larger numbers of trees. Consequently, certain developed sites may have to be temporarily closed to public use until funds

are available for hazardous tree removal. Others may experience opening delays while still others may even be reduced to having only one loop open. Between potential closures, delays, and reduced occupancy, revenues from fee collections are expected to be reduced by 25 percent. Fees from developed sites are used to pay for operation costs and to make improvements to infrastructure.

Current inventories indicate that 10 developed campgrounds would be closed during the summer of 2008 with another eight campgrounds having one or more loops in the site closed. Several more would have delayed openings because of the magnitude of the work to remove the hazard trees with forest crews. Infrastructure in closed campgrounds, such as toilets and picnic tables, could be damaged by falling trees if the sites are closed and hazardous trees are not removed.

**Dispersed Recreation:** Most of the popular dispersed recreation or primitive campsites are located next to roads and trails. Consequently, use of these areas would be limited by access in getting to the area or by physical closure of the site from fallen trees. As trees continue to fall across NFSRs, access in many parts of the forest would also be limited, thus having an adverse impact on other dispersed recreation activities such as driving for pleasure, hunting, wildlife viewing, fishing, etc.

**Trails:** Hiking on trails in lodgepole pine areas of the forest would be limited once trees start to fall. Motorized trails and the back-country roads (Level 2 roads) may also be blocked by fallen trees. It is anticipated that unauthorized routes would be created around stretches of roads and trails that are blocked which could lead to soil erosion and compaction and watershed damage from trails created without a design. Although the Forest Service could clear trees that fall across the trails, as required by the Highway Safety Act and FSM 7733, it is not likely that sufficient funding would be available to be constantly clearing the same trails; thus, many of them would have to be closed to public use.

Groomed winter snowmobile trails in the Fox Park area of the Medicine Bow NF would be heavily impacted when trees start to fall since many of the trails follow roads through thick stands of lodgepole pine. If the roads are closed by fallen trees, it would be difficult to get a trail groomer through the area. Other areas, such as on the Snowy Range, Rabbit Ears, and California Park, would not be impacted to the same extent. Trails in these areas are either in different timber types or they are in open areas of the forest. However, some tree removal would still be necessary to get a snow cat groomer through these areas.

Groomed ski trails, especially those on the Medicine Bow NF, are expected to be heavily impacted once trees start to fall. Access to the trails with a snowmobile and grooming attachment would be difficult across fallen trees.

If hazardous trees along the snowmobile and ski trails are not felled before the winter snow season, there is a potential for dead trees to fall throughout the winter. This situation would create hazardous conditions for winter recreationists. It would also require groomers and others to constantly remove the fallen trees, which is unlikely due to funding constraints, or the trails would have to be closed until the trees could be cleared.

**Recreation Special Uses:** Road and trail access is the main factor in determining if special use activities would be impacted by hazardous trees. Permit holders may not be able to get to their use areas because of down trees on roads and trails, particularly permits involving permanent structures (e.g. resorts and recreation residences). Outfitters clients who have licenses for specific areas would find they may not be able to get to the areas because of roads closed by fallen trees.

## **Alternative 2: Proposed Action – Modified**

### **Direct and Indirect Effects**

**Developed Recreation:** Implementation of the Proposed Action - Modified would allow timber sales and service contracts to be used in developed sites and administrative sites where greater numbers of hazardous trees exist. Forest crews would concentrate on areas requiring few trees to be removed. Consequently, more areas would be open to the public after the hazardous trees have been felled and removed and more recreation revenues could be generated to help cover the costs of site management. Removal of the hazardous trees in these areas before they fall would also help protect the infrastructure (e.g. picnic tables, outhouses, etc.).

**Dispersed Recreation:** Dispersed campsites that are located within 150 feet of roads may still be available for public use after hazardous trees have been felled and removed from the road leading to them. However, dispersed campsites beyond the road clearing limits would not be available for use unless a timber salvage sale or fuels reduction project is proposed. Since hazardous trees would be felled but not removed within 150 feet of trails, many dispersed campsites located in these areas would be inaccessible. Consequently, there may be a significant decrease in the number of dispersed campsites available for public use under both the Proposed Action-Modified and the No Action alternative.

Felling hazardous trees along NFSRs would allow more access to the forest for such activities as driving for pleasure, wildlife viewing, hunting, fishing, etc.

**Trails:** Felling trees within 150 feet of summer and winter recreation trails would allow more trails to remain open for public use. Public safety would also be greatly improved by allowing the dead trees to be cut at one time rather than allowing them to fall continuously and haphazardly. Once the dead trees are felled, future clearing should be minimal.

**Recreation Special Uses:** Although hazardous tree removal would occur under the Proposed Action – Modified, special use permit activities may still be limited in lodgepole pine areas; limitations would increase as activities move farther away from major roads and trails. Adverse impacts to the more mobile and temporary activities would not be as great due to their ability to relocate to other areas of the forest. Adverse impacts to those permitted activities involving structures (e.g., resorts and recreation residences), however, would be much greater due to their permanent nature. Projects to remove hazardous trees along access routes would need to be prioritized within available funding and time constraints so as to lessen the impacts to these permitted activities.

### ***CUMULATIVE EFFECTS: No Action and Proposed Action – Modified***

Implementation of the Proposed Action – Modified would allow more dispersed and developed recreation sites to be open to the public than the No Action alternative. However, under either alternative, travel would be so difficult in much of the lodgepole pine area of the forest that recreation use patterns could change. New dispersed camping sites would be developed by the public when they can no longer get to the sites they have used in the past.

Use in developed recreation sites that remain open is expected to increase. Other forests have reported seeing more camp trailers and motor homes as compared to tent camping after a majority of trees have been removed at recreation sites.

## FOREST PLAN CONSISTENCY

Both alternatives would comply with Medicine Bow and Routt National Forest Plan standards and guidelines pertinent to Recreation (pgs. 1-52 to 1-55 and pgs. 1-16 to 1-20, respectively). Under the No Action alternative, however, more recreation sites would have to be closed to comply with Forest Plan and Forest Service Manual direction.

## J. SCENERY

### Affected Environment

The revised Medicine Bow Forest Plan adopted Scenic Integrity Objectives (SIOs) and the revised Routt Forest Plan adopted Visual Quality Objectives (VQOs) provide Forest Plan objectives to achieve the desired scenic condition and landscape character of the Forest. Acres within each SIO and VQO category are listed in Table 16. SIO and VQO categories are as follows:

- **High SIO/Retention VQO** provides the landscape character to appear intact.
- **Moderate SIO/Partial Retention VQO** allows the valued landscape character to appear slightly altered.
- **Low SIO/Modification VQO** provides the valued landscape character to appear moderately altered.
- **Very Low SIO/Maximum Modification VQO** refers to landscapes where the valued landscape character appears heavily altered. The revised Medicine Bow Forest Plan and the revised Routt Forest Plan do not include this objective as a management objective.

**Table 16: Acres of SIO and VQO Categories within the Potential Project Area**

SIO/VQO Category	Routt NF (VQO acres)	Medicine Bow NF (SIO Acres)	Total Acres
Retention VQO/ High SIO	1,372.7	1,877.9	5,620.7
Partial Retention VQO/ Moderate SIO	3,145.6	3,895	7,040.6
Modification VQO/ Low SIO	445	950.8	1,395.8
Maximum Modification VQO/Very Low SIO	--	--	--
Moderate SIO in foreground of roads/trails; Low SIO in all other areas	--	20,757.5	20,757.5
Partial Retention VQO in foreground of roads/trails; Modification VQO in all other areas	11,169.5	--	11,169.5
<b>TOTAL</b>	<b>16,132.8</b>	<b>27,481.2</b>	<b>43,614</b>

SIOs and VQOs are identified as guidelines in the Forest Plans. Guidelines are advisable courses of action that should be followed to achieve forest goals; however, they are optional. Deviations from guidelines must be analyzed during project level analyses and documented in project decisions; they do not require a Forest Plan amendment. A grace period of one year is provided to meet the SIOs of High and Moderate and VQOs of Retention and Partial Retention after project completion. A grace period of three years is provided to meet Low SIOs and Modification VQOs after project completion.

## Environmental Consequences

### Alternative 1: No Action

**Direct and Indirect Effects:** Only the forces of natural events such as wildfires, winds, insects and disease would change the scenic landscapes. There would be no removal or felling of standing dead and dying trees along roads and trails, trailheads, and administrative sites. Hazardous trees would be cut and removed in developed campgrounds and picnic grounds as required in the FSM 2332.11 (Public Safety, Hazard Trees).

Most standing dead and dying trees would remain standing up to a decade or so and would be a hazard to forest users and travelers. Natural forces and strong winds could blow dead and dying trees across trails and roads, dispersed campsites, trailhead parking areas and administrative sites. It is likely that the dead trees would fall one at a time rather than all at once, thus creating continuously hazardous conditions.

When trees fall naturally across NFSRs or Forest trails, the routes would be cleared by Forest Service workers to open access as time and funding allows. Some travelways may, however, be closed temporarily or for periods of several years due to the amount of fallen trees. Forest Service Manuals and Handbooks and the Highway Safety Act of 1966 are clear that the Forest Service has a responsibility to maintain the safety of its roads and trails. If roads and trails are not deemed safe, they would be closed to public use.

Downed trees cut to open travelways would not be removed and would impact scenic quality due to the evidence of cut ends of logs when viewed from the immediate foreground of travelways. In certain areas, visitors would notice heavy jackstraw of downed lodgepole pine trees within travel corridors and recreation areas and would impact scenery. Travelers could create new paths around roads or trails that are blocked by naturally falling trees that have not yet been removed by Forest Service workers; this would cause visible resource damage of the landscape. Over time, when new young trees are established along travel corridors, the scenic impact would be lessened.

**Cumulative Effects:** The existing landscapes of the two Forests have been shaped primarily by human and natural events. The existing landscape characteristics remain in place with some changes resulting from human activities such as timber cutting, road construction, trail construction, etc. as well as changes from natural events such as insects and diseases and wildland fires.

The No Action alternative would adversely affect scenic quality within travel corridors, administrative sites and trailheads situated in the lodgepole pine forest landscape. Developed campgrounds and picnic grounds would continue to have hazardous trees cut and removed to meet the public safety requirement. Trees that fall across NFSRs and Forest trails would be cut but not removed. Many dead and dying trees would fall down in a decade or so and would litter the forest floor. It is likely that these fallen trees would present an undesirable appearance to forest visitors when viewed from travel corridors and recreation areas. It would take a longer period of time for new trees to regenerate on a forest floor covered with heavy downed trees. The scenic quality would be enhanced when new green trees begin to dominate the landscape again.

## **ALTERNATIVE 2: Proposed Action - Modified**

**Direct and Indirect Effects:** After hazardous tree removal, visual changes of treated sites would be noticed by forest visitors due to the removal of mature trees that once dominated the forest landscape. Visitors would notice created openings resulting from removal of hazardous trees in various sizes and shapes when traveling along the road and trail corridors and camping in the developed campgrounds. Felled trees would remain on the ground to protect sensitive plants, hydric soils, and wildlife habitats in identified sites and adjacent to all trails. Some sections of trail corridors would have large amounts of felled trees on the ground; the felled trees would be visible when viewed from the trail and would impact the scenery. Over time, when new young trees are established along trail corridors, the scenic impact would be lessened.

Visitors may also find dead standing trees (snags) left to provide for wildlife denning, nesting, and feeding habitat. In developed campgrounds, there would be some loss of shade and screening but existing trees that were sprayed and young healthy trees would remain to provide present and future shade and screening. Some administrative sites may become more visible due to removal of screening trees. Removal of dead and dying trees would allow remaining young healthy trees to grow faster with less competition for light and moisture. In 10 to 20 years of tree growth, the green healthy trees would begin to dominate the forest landscape and provide a more pleasing visual experience for future generations.

Indirect effects could result when some larger treated sites include adjacent green trees with shallow root systems not adapted to created openings. These trees could naturally blow down by strong winds resulting in downed trees with exposed roots dominating the opening. This could lower the scenic integrity when viewed from recreation areas and scenic corridors.

**Cumulative Effects:** Cumulative effects would be similar to those described under the No Action alternative. However, the Proposed Action – Modified would allow for quicker regeneration of new trees within travel corridors and within recreation areas thereby shortening the duration of undesirable effects to scenery.

### **FOREST PLAN CONSISTENCY**

The No Action alternative would be consistent with the revised Medicine Bow National Forest Plan adopted SIOs and the revised Routt National Forest Plan adopted VQOs. The Proposed Action - Modified would comply with the adopted SIOs and VQOs in most areas when the design criteria on scenic/visual resources are followed. Trail sections with large amounts of felled trees on the ground that are visible when viewed from trail would appear as Low or Very Low SIO instead of High or Moderate SIO, and Modification or Maximum Modification VQO instead of Retention or Partial Retention VQO. Sections of road corridors where heavy felling and removal of dead and dying trees would occur would appear as Low SIO instead of Moderate SIO and Modification VQO instead of Partial Retention VQO. Neither alternative would result in irreversible or irretrievable effects on scenic resources.

## **K. SOILS**

### **Affected Environment**

Generally, soils occurring on forested slopes and ridge-tops within the project area are shallow, rocky, and coarse textured. Most are characterized by thin surface layers, low water holding

capacity, and low nutrient availability status. These soils are not usually susceptible to deep compaction, but compaction of surface layers has been observed in highly trafficked areas. Many soils have high potential for erosion if protective ground cover is removed; they are also particularly susceptible to lost productivity if the surface organic horizon is displaced, removed, or consumed by fire. Riparian area soils and/or seasonally wet soils are highly susceptible to damage caused by operation of heavy equipment or other vehicular traffic.

Effective ground cover within the proposed treatment units is high (> 90% effective ground cover). Active erosion rates are low except for some roads and other highly disturbed sites. Detrimental compaction within the project would generally be limited to highly disturbed sites.

Adequate amounts of coarse woody debris (CWD) and fine woody debris (FWD) provide for sustainable rates and levels of nutrient cycling in most areas. Long-term nutrient cycling in the project areas is dependant on a continual supply of FWD and CWD. Project area soils are relatively sensitive to ground disturbance and other impacts to nutrient cycling because a high proportion of their productivity is concentrated in thin, nutrient rich surface layers. Decomposition of FWD and CWD is relatively slow due to cold winter temperatures and limited moisture availability over much of the year.

## Environmental Consequences

### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** This alternative would not change the existing condition (affected environment). There would be no changes to the soil resource and no effects to soil productivity.

Continued lodgepole pine mortality would result in periodic falling and/or bucking of hazard trees by hand crews in an effort to keep the forest transportation and trail system open and operational. The vast majority of these beetle-killed trees would eventually fall and be incorporated into the stand as CWD. There would be no additional erosion, compaction, displacement or detrimental burning above the existing condition.

Mechanical or hand treatments would be not implemented. Project-related ground disturbance and direct effects to soil resources would not occur and natural recovery of previously impacted areas would continue. FWD and CWD would continue to accumulate and decompose at natural rates.

**Cumulative Effects:** Implementation of the No Action alternative would not cumulatively impact soil resources within the analysis area.

### ALTERNATIVE 2: Proposed Action - Modified

**Direct and Indirect Effects:** Direct and indirect effects of the Proposed Action - Modified include increased rates of soil displacement, erosion, compaction, and burning. The removal of vegetative cover (canopy and surface) would reduce interception and expose the soil surface to the erosive forces of rainfall. Ground disturbing activities associated with mechanized timber harvest would increase soil surface exposure and erosion rates and may also result in soil displacement and rutting. The potential to increase erosion rates would be more pronounced as slope steepness increases.

Areas where all hazardous trees are removed would have the highest probability of soil erosion. Design criteria for CWD retention would reduce post-harvest soil erosion rates. Aggressive slash treatments could significantly reduce CWD and result in detrimental accelerated soil erosion,

especially on steep, erodible soils. Treatments along Forest Service trails would have the lowest rates of effective ground cover reduction and the lowest probability of soil erosion due to retention of felled trees on site. Erosion hazard ratings for the proposed treatment areas are summarized in Table 17.

**Table 17: Hazard Tree Erosion Hazard Summary**

Unit	Class	Erosion Hazard	Acres	Unit Treatment Area Percent
Medicine Bow	Road	Moderate	12,033.76	42.4%
		Slight	9,759.07	34.4%
		Severe	806.48	2.8%
	Trail	Moderate	3,103.22	10.9%
		Slight	2,077.62	7.3%
		Severe	627.90	2.2%
Routt	Road	Moderate	6,749.48	38.4%
		Slight	2,937.21	16.7%
		Severe	907.45	5.2%
	Trail	Moderate	4,315.97	24.6%
		Slight	1,538.83	8.8%
		Severe	1,115.06	6.3%

Mechanized timber harvest methods increase soil bulk density and may lead to detrimental compaction within treatment areas. Concentrated landing activities can also create detrimental soil compaction. Detrimental soil compaction may require mechanical treatments to increase infiltration, especially on high traffic areas such as main skid trails and landings. Compaction hazard ratings for the proposed treatment units are summarized in Table 18.

**Table 18: Hazard Tree Compaction Hazard Summary**

Unit	Class	Compaction Hazard	Acres	Unit Treatment Area Percent
Medicine Bow	Road	Moderate	10,067.21	35.4%
		Slight	8,935.57	31.5%
		Severe	3,596.53	12.7%
	Trail	Slight	3,650.47	12.9%
		Moderate	1,200.98	4.2%
		Severe	957.28	3.4%
Routt	Road	Moderate	4,526.81	25.8%
		Severe	3,208.66	18.3%
		Slight	2,858.68	16.3%
	Trail	Moderate	3,488.12	19.9%
		Slight	2,016.28	11.5%
		Severe	1,465.46	8.3%

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 through layout and design would help prevent increases in detrimental impacts in excess of the 15 percent Regional and Forest Plan soil quality standard.

Proposed slash treatments would include chipping, lopping, and scattering slash to an 18 or 24 inch depth, roller chopping, machine trampling, and/or broadcast burning. Hand piling, pile burning, or mulching may occur in select units to mitigate fuels or visual concerns. Direct effects of machine trampling and roller chopping are increased soil compaction and some soil displacement. However, practices to prevent detrimental soil compaction have been included in project design.

The effects of slash disposal activities on soil resources could be beneficial or harmful, depending on the amount, size, and spatial distribution of material retained. Retention of chipped slash may benefit soil resources by providing protective ground cover. Microbes decomposing this material would immobilize nitrogen and reduce soil nutrient availability. When the wood becomes mostly decomposed it should begin to release nitrogen and increase soil nutrient availability.

Lopping and scattering harvest-generated slash in the treatment units would provide post-harvest ground cover as well as woody debris and soil organic material (SOM) contributions. The effectiveness of ground cover in reducing post-harvest erosion is well documented.

Burn pile effects on soil productivity range from moderate to severe, depending on burn severity, soil type, and site history. Typical effects on soils would be loss of litter layer, soil organic matter, soil structure, and introduction of hydrophobicity. In the short term, fire may sterilize soils although natural recovery is expected to occur over time.

The use and maintenance of system roads for project implementation may generate additional short-term ground disturbance and sediment production. Road stability and current conditions would determine the degree of the impact. Maintenance and use of roads that are lightly used, well-vegetated, and stable would generate additional watershed impacts such as sediment production and runoff. On heavily used, poorly maintained and unstable roads, maintenance actions concurrent with management activities may benefit watershed functions by reducing runoff and sediment production.

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

**Cumulative Effects:** Areas that were compacted or eroded by past activities, such wildfires, timber harvest, and hazardous fuel treatments, are in various stages of recovery. Field reconnaissance, review of aerial photography, and the location of proposed treatment units indicates that the extent of past impacts, coupled with the proposed treatment areas, would be low. Through prevention, the sum of past impacts and project-related direct effects would be below 15 percent of any given activity area.

Repeated harvest activity within the same activity area can lead to detrimental loss of topsoil or excessive compaction and displacement. Forest Plan standards and guidelines call for minimizing soil compaction by reducing vehicle passes and skidding on snow, frozen, or dry soil conditions. Soils are considered to be detrimentally compacted if there is a 15 percent increase in bulk density. Harvested stands would not be re-entered for at least 20 years or more; therefore any cumulative compaction or displacement should be minimized.

## **FOREST PLAN CONSISTENCY**

Both alternatives would comply with Medicine Bow and Routt National Forest Plan standards and guidelines pertinent to the soil resource (pg. 1-28 and pg.1-6, respectively). Compliance in the context of the Proposed Action – Modified is based on implementation of pertinent project design criteria.

## L. SPECIAL AREAS

The Special Areas section is divided into two “sub-sections” including: 1) Botanical Special Interest Areas; and 2) Old Growth – Late Successional Forest. Each sub-section describes the affected environment first, followed by the effects associated with the alternatives.

### 1) Botanical Special Interest Areas (SIAs)

#### Affected Environment

SIAs are managed to protect or enhance the special values for which they were designated. They are generally designated to protect and manage threatened, endangered, and sensitive species and other elements of biological diversity or for their emotional significance, scenic values, or public popularity. The Medicine Bow NF contains six botanical SIAs within the analysis area<sup>6</sup> totaling 10,873 acres and the Routt NF contains five botanical SIAs totaling 26,700 acres. On the Medicine Bow NF, four of the six SIAs could be impacted by project implementation (Table 19), and two of the five botanical SIAs on the Routt NF could be impacted (Table 20).

**Table 19: Medicine Bow NF – Potentially Impacted Botanical SIAs**

SIA Name	Acres	Unique Feature
Cinnabar Park	204	Ribbon forest/snow glade complex.
White Rock Canyon	684	Geologic, scenic, and wildlife values - it contains carbonate soils which provide a rare and unique plant habitat.
Kettle Ponds	4,721	Geological, botanical, and zoological values - it includes numerous glacial relic kettle ponds and an abundant population of wood frogs. Indian pond lily ( <i>Nuphar polysepalum</i> ), a beautiful, flowering aquatic plant is more abundant in this SIA than in any other location on the Forest.
Sunken Gardens	236	Botanical, wildlife, and scenic values - it is a wet drainage containing numerous small ponds important for amphibians.
<b>TOTAL</b>	<b>5,845</b>	

**Table 20: Routt NF – Potentially Impacted Botanical SIAs**

Name	Acres	Unique Feature
California Park	22,970	Geological, zoological, historical, paleontological, and scenic values - It contains unique features such as sulphur springs that provide a rare habitat feature for plants.
Little Snake	1,770	Botanical values due to relic stands of Ponderosa pine.
<b>TOTAL</b>	<b>24,740</b>	

<sup>6</sup> The analysis area does not include the Laramie Peak unit on the Medicine Bow National Forest.

## Environmental Consequences

### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** Effects to botanical SIAs would be similar to those described under section “H. Inventoried Roadless Areas (IRAs)” (see EA page 44).

### ALTERNATIVE 2: Proposed Action - Modified

**Direct and Indirect Effects:** On the Medicine Bow NF, roughly 194 acres of hazardous tree treatments would occur within botanical SIAs; roughly 41 acres of hazardous tree treatments would occur within botanical SIAs on the Routt NF. These acreages represent about 1.8 percent of total botanical SIA acres within the analysis area on the Medicine Bow NF and less than 0.01 percent of total botanical SIA acres on the Routt NF. Design criterion 32 would apply and would limit activities in these areas (i.e., ground skidding would not be allowed and trees would be left where they fall).

The remaining effects would be similar to those described under section “H. Inventoried Roadless Areas” (EA page 44).

### **CUMULATIVE EFFECTS: No Action and Proposed Action – Modified**

Past actions within the project area include road and trail construction and maintenance, personal use firewood gathering, fire suppression, livestock grazing, dispersed camping, other recreation, special uses and noxious weed treatment (herbicides). Ongoing actions are similar to past actions and do not differ between two alternatives. Reasonably foreseeable actions include timber sales in specific locations; these do not differ between the No Action alternative and the Proposed Action - Modified.

Other ongoing circumstances include the effects of insects and diseases. The situation created by the MPB epidemic represents a cumulatively significant impact to live, large older lodgepole pine. However, this is a natural occurrence and not a management action. Implementation of either alternative analyzed in this EA is not expected to add to the effects of the MPB epidemic in the SIAs. However, resulting stand conditions would be different between the No Action alternative and the Proposed Action – Modified.

Timber sale planning for reasonably foreseeable timber sales and planning for reasonably foreseeable fuel treatments would take the Proposed Action – Modified into consideration during the completion of the project planning. In some cases, actions selected in this project would be combined with actions currently proposed and considered as reasonably foreseeable in this analysis.

## 2) Old Growth - Late Successional Forest

### Affected Environment

The Forest Service recognizes the importance of retaining older forests to improve biodiversity and to provide key habitat conditions for maintaining viable populations of flora and fauna species across the Forest. Old growth forests are defined as “...ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics that may

include tree size, accumulations of large dead woody material, number of tree top layers, species composition, and ecosystem function” (USDA 2003, p. G-26). This term may be used to describe late successional forests as well.

The Medicine Bow Forest Plan contains direction for old growth protection at both the Forest-wide and Management Area level:

- Manage old forest to retain or achieve at least the minimum percentages of old growth by cover type by mountain range... (*Biological Diversity Standard, pg. 1-31*);
- Limit vegetation treatment in inventoried and mapped spruce-fir or lodgepole pine old growth stands (*Management Area 3.5, Vegetation Guideline 4, pg. 2-43*); and
- Prohibit vegetation treatment in inventoried and mapped spruce-fir or lodgepole pine old growth stands (*Management Area 5.15, Vegetation Standard 2, pg. 2-63*)

The Routt National Forest Plan contains a Geographic Area guideline for protection of late successional forests:

- In Management Areas 5.13, late successional habitats should be provided and well distributed so that individuals of species requiring those habitats can interact with others in the planning area.

The above guideline applies to the Arapahoe Creek, Corral Peaks, Encampment River, Owl Mountain, Pinkham Mountain, Willow Creek, Little Snake, Sand Mountain, Slater Creek, Upper Elk River, Gore and Red Dirt GAs.

## Environmental Consequences

### ALTERNATIVE 1: No Action

**Direct and Indirect Effects:** There would no tree felling in inventoried and mapped old growth forests on the Medicine Bow NF or in late successional forests on the Routt NF. Trees would fall naturally over time. On occasion, the natural falling of dead standing trees would cause the death and/or fall of live standing trees. This occurrence would not, in and of itself, remove a stand from consideration for old growth.

Late successional forests on the Routt NF and mapped and inventoried old growth on the Medicine Bow NF would remain unchanged. Forest fragmentation would not be increased; core areas (interior portion) of large patches would remain unchanged.

**Cumulative Effects:** The No Action alternative is not expected to add to the effects of the MPB epidemic in late successional and mapped and inventoried old growth forests.

### ALTERNATIVE 2: Proposed Action – Modified

**Direct and Indirect Effects:** Approximately 3,791 acres of mapped and inventoried old growth would be treated on the Medicine Bow NF. Of these acres, 2,990 are along roads and the remaining 801 are along trails. Approximately 2,047 acres of mapped and inventoried old growth are located within MA 5.15; this MA has specific direction for old growth retention.

Design criterion 11, which requires trees to be hand felled and left in place, would be applied to minimize impacts to old growth. This criterion could be waived in stands that have lost old growth

character (less than 8 live trees per acre over 8" dbh) unless it is determined that the remaining stand characteristics contribute to meeting old growth recruitment criteria (MBCNF LRMP biological diversity standard 1).

The Proposed Action - Modified is not designed to maintain or restore old growth character; it would only change the fall rate of dead and dying trees while retaining the trunks on site. For this reason, it is not considered a vegetation treatment.

On the Routt NF, approximately 2,228 acres would be treated along roads within geographic areas that recommend late successional forest protection. As required by design criterion 12, tree trunks would be left in place on 35 percent of these acres (780 acres) to retain late successional character. However, this criterion could be waived in stands that no longer exhibit late successional characteristics (live trees with at least 30% crown cover over 7" dbh). An additional 202 acres of late successional forest would be treated along trails. Tree trunks would not be removed along trails; therefore, these acres would retain late successional character.

The Proposed Action - Modified would change the status of standing dead trees to down dead material. This would occur more rapidly than would occur with natural fall rates. The differences between what would occur under this alternative and what would occur with natural fall rates would decrease as time progressed; they would never entirely vanish as some snags are noted to stand indefinitely (Lowery 1982, Mielke 1950, Hinds et al. 1965, Lyon 1977).

Late successional forests on the Routt NF and mapped and inventoried old growth on the Medicine Bow NF would be modified somewhat by the felling of hazard trees next to roads and trails. There would be a slight increase in fragmentation in these areas due to changes in density of standing dead from one area to another (untreated) area. The core area (interior portion) of large patches would not be reduced.

**Cumulative Effects:** Implementation of the Proposed Action – Modified would add emphasis to the corridor effect of roads and trails adjacent to or within mapped and inventoried old growth and late successional forests.

## **FOREST PLAN CONSISTENCY**

Based on the analysis presented above, both alternatives would comply with Medicine Bow and Routt National Forest Plan standards and guidelines pertinent to SIAs, mapped and inventoried old growth (Medicine Bow Forest Plan, page 1-31), and late successional forests (GA Direction). Compliance in the context of the Proposed Action – Modified is based on implementation of pertinent project design criteria.

## **M. WILDLIFE**

The Wildlife section is divided into three "sub-sections" including: 1) Management Indicator Species (MIS); 2) Region 2 Sensitive Species; and 3) Proposed, Endangered, and Threatened Species. Each sub-section describes the affected environment first, followed by the effects associated with the alternatives.

## 1) Management Indicator Species (MIS)

### Affected Environment

The Forest Service Manual defines Management Indicator Species (MIS) as “...plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during Forest Plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent” (USDA Forest Service 1991). The National Forest Management Act (NFMA) requires that MIS be selected as part of the Forest Plan to estimate the effects of planning alternatives on fish and wildlife populations. Essentially, MIS are used as barometers to evaluate the effects of forest management on wildlife within the Forest.

### Environmental Consequences

Terrestrial MIS assessments relative to this project were prepared for both the Medicine Bow and the Routt NFs. The assessments discuss distribution and status, habitat, existing conditions, direct, indirect, and cumulative effects as well as the rationale for the conclusions for each species. The MIS Assessments are on file at the Medicine Bow-Routt National Forest Supervisor’s office, 2468 Jackson Street, Laramie, Wyoming. They are also available on the Forest Service website at <http://www.fs.fed.us/r2/mbr/projects/foresthhealth/index.shtml>.

Table 21 lists the MIS established for the Medicine Bow and Routt NFs. This table identifies primary habitat and addresses whether or not impacts from the project proposal are relevant to the Forest-wide trend for the species. Forest-wide trends were determined following an extensive review of each species’ life history, habitat availability across the forest, and available population data. This table also provides a synopsis of the effects to each MIS from project implementation.

### ALTERNATIVE 1: No Action AND Proposed Action - Modified

**Direct and Indirect Effects:** Both the No Action alternative and the Proposed Action – Modified would provide habitat for MIS. Proposed Actions must follow Forest Plan standards and guidelines for water and aquatics, biological diversity, wildlife, and threatened, endangered, and sensitive species (USDA 2003). These requirements would provide water, foraging habitat, roosting habitat, prey animals, and breeding/nesting habitat sufficient to support populations for MIS. Thus, these requirements would support the Forest Plan objective for MIS of “...maintain or improve habitat for Management Indicator Species (MIS) across the Forest in the long-term.”

### FOREST PLAN CONSISTENCY

Both alternatives would comply with Medicine Bow and Routt National Forest Plan standards and guidelines pertinent to wildlife and MIS (pgs. 1-40 to 1-48 and pgs. 1-14 to 1-15, respectively). Compliance in the context of the Proposed Action – Modified is based on implementation of project design criteria.

**Table 21: Management Indicator Species Summary**

MIS	National Forest	Primary Habitat	Is proposal relevant to forest-wide trends?	Assessment of impacts to the MIS?	Conclusions
Northern Goshawk	Medicine Bow and Routt	Large diameter lodgepole pine or aspen for nesting. Mixed habitat structural stages for foraging.	Yes	Yes	Project specific design criteria have been established to locate and protect nest sites and nesting birds from disturbance and impacts to habitat within nesting stands. The Proposed Action – Modified ‘may affect individual northern goshawks, but is not likely to cause a trend towards federal listing or a loss of population viability on either the Routt or Medicine Bow NFs.’
American Marten	Medicine Bow	Late successional forest, particularly spruce-fir stands.	Yes	Yes	The Proposed Action – Modified is expected to have a small effect on marten numbers across the analysis area and an immeasurable effect on the Forest-wide population. The Forest-wide population trend should remain stable.
Snowshoe Hare	Medicine Bow	Habitats with dense understory	Yes	Yes	The Proposed Action – Modified is expected to have a small, immeasurable effect on hare numbers across the Forest. The Forest-wide population trend should remain stable.
Golden-crowned Kinglet	Medicine Bow and Routt	High elevation coniferous forests. Nest and forage within the interiors of dense, mature spruce-fir habitats having heavy canopy cover.	Yes	Yes	The Proposed Action – Modified would impact minimal amounts of habitat for this species. The amount of impact anticipated could reduce some habitat in the short and mid-term, but statistically significant changes to the Forest-wide population trend are not anticipated.

**Table 21 (Cont'd): Management Indicator Species Summary**

MIS	National Forest	Primary Habitat	Is proposal relevant to forest-wide trends?	Assessment of impacts to the MIS?	Conclusions
Three-toed woodpecker	Medicine Bow	Mature and old growth conifer forest.	Yes	Yes	The Proposed Action – Modified would impact minimal amounts of habitat for this species. The amount of impact anticipated could reduce some habitat in the long-term (4.2%), but statistically significant changes to the Forest-wide population trend are not anticipated.
Lincoln’s Sparrow	Medicine Bow	High elevation riparian zones with willows.	No. The project is not expected to change the primary habitat components or affect individuals.	No. The project will not affect willow riparian zones or herbivory in willow communities.	Neither the No Action alternative nor the Proposed Action – Modified would impact the Lincoln’s sparrow.
Wilson’s Warbler	Medicine Bow and Routt	High elevation riparian zones with willows. Primarily nest off the ground within the shrub canopy.	No. The project is not expected to change the primary habitat components or affect individuals.	No. The project will not affect willow riparian zones or herbivory in willow communities.	Neither the No Action alternative nor the Proposed Action – Modified would impact the Wilson’s Warbler.
Vesper Sparrow	Routt	Rangeland and residual forest	No. The project is not expected to change the primary habitat components or affect individuals.	No. The project will not measurably affect the condition of rangelands or residual forest.	Neither the No Action alternative nor the Proposed Action – Modified would impact the Vesper Sparrow.

## 2) Region 2 Sensitive Species

### Affected Environment

It is Forest Service policy to protect the habitat of species listed as Forest Service Region 2 Sensitive Species (Rocky Mountain Region) from adverse modification or destruction and to protect individual organisms from harm or harassment as appropriate (FSM 2670.3). Biological Evaluations (BEs) are prepared for each project authorized, funded, or conducted on National Forest land to determine the possible effects the proposed activity may have on sensitive species (FSM 2672.43). The BE process is intended to analyze and document those activities necessary to ensure management actions will not likely jeopardize the continued existence of the species.

All species on the Rocky Mountain Regional Sensitive Species List were reviewed for the Hazardous Tree Removal and Fuels Reduction analysis. A number of species were eliminated from further analysis because the pre-field review determined that project implementation would have no impact on these sensitive species or their habitat (i.e. habitat for these species is either not present or would not be impacted by the project proposal). The BEs are on file at the Laramie Ranger District office, 2468 Jackson Street, Laramie, Wyoming. They are also available on the Forest Service website at <http://www.fs.fed.us/r2/mbr/projects/foresthealth/index.shtml>.

### Environmental Consequences

#### ***BIOLOGICAL DETERMINATION and RATIONALE***

It has been determined that the Proposed Action - Modified *may impact* individual northern goshawk, American three-toed woodpeckers, black backed woodpeckers, olive-sided flycatchers, boreal owls, pygmy shrews, American marten, and wolverine *but is not likely to cause a trend toward federal listing or a loss of viability*. Table 22 describes the rationale supporting this determination for each species.

#### ***FOREST PLAN CONSISTENCY***

Both alternatives would comply with Medicine Bow and Routt National Forest Plan standards and guidelines pertinent to wildlife and Sensitive (pgs. 1-40 to 1-48 and pgs. 1-14 to 1-15, respectively). Compliance in the context of the Proposed Action – Modified is based on implementation of project design criteria.

**Table 22: Rocky Mountain Region Sensitive Species and Rationale Supporting Determinations**

Species	Habitat	Rationale Supporting Determinations
Northern goshawk	Spruce-fir, aspen, and lodgepole pine forests; riparian areas	<ul style="list-style-type: none"> <li>• Forest Plan standards for snags, recruitment trees, and coarse woody debris are included in project design, thus providing prey habitat.</li> <li>• Forest Plan standards to ensure the protection of nesting goshawks will be met with call-back surveys (Kennedy and Stahlecker 1993) in treatment sites.</li> <li>• Vegetative treatments will meet suggestions by Graham et al. (1997) to maintain mosaic forest conditions that would sustain the goshawk and its suite of prey species.</li> <li>• Forest Plan guideline to consult Partners-in-Flight Conservation Plans (p. 1-40) for additional guidance was accomplished. Goshawk is a level I priority species.</li> <li>• The proposed activities will be consistent with the revised Forest Plan (2003) when Design Criteria are followed.</li> </ul>
American three-toed woodpecker	Spruce-fir, lodgepole pine, and aspen forests	<ul style="list-style-type: none"> <li>• Management actions will result in a small potential for noise or commotion disruption at nests.</li> <li>• Forest Plan standards for snags and coarse woody debris are included in project design, thus providing woodpecker and prey habitat.</li> <li>• Medicine Bow Forest Plan guideline to consult Partners-in-Flight Conservation Plans (p. 1-40) for additional guidance was accomplished. Three-toed woodpecker is a Level II priority species.</li> <li>• The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.</li> </ul>
Black backed woodpecker	Spruce-fir, ponderosa pine, and recently burned conifer forests	<ul style="list-style-type: none"> <li>• Management actions will result in a small potential for noise or commotion disruption at nests.</li> <li>• Forest Plan standards for snags and coarse woody debris are included in project design, thus providing woodpecker and prey habitat.</li> <li>• Medicine Bow Forest Plan guideline to consult Partners-in-Flight Conservation Plans (p. 1-40) for additional guidance was accomplished. Three-toed woodpecker is a Level II priority species.</li> <li>• The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.</li> </ul>
Olive-sided flycatcher	Spruce-fir and lodgepole pine forests; wetlands, and forest meadows	<ul style="list-style-type: none"> <li>• Benefits to flycatchers would likely accrue because reduced canopy cover (from beetle mortality, logging or both) would improve breeding habitat suitability. In corridors where all trees are removed, reserved single trees and tree groups may provide attractive foraging and singing perches following completion of treatments.</li> <li>• The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.</li> <li>• Project design criteria that retain snags and replacement snags as well as BMPs for watershed protection are likely to help maintain habitat for this species within the management units.</li> </ul>

**Table 22 (Cont'd): Rocky Mountain Region Sensitive Species and Rationale Supporting Determinations**

Species	Habitat	Rationale Supporting Determinations
Boreal owl	Spruce-fir and lodgepole pine forests	<ul style="list-style-type: none"> <li>• Forest Plan standards for recruitment trees, snags and coarse woody debris are included in project design, providing perch sites and habitat for prey insects.</li> <li>• Forest Plan guideline to consult Partners-in-Flight Conservation Plans (p. 1-40) for additional guidance was accomplished. Olive-sided flycatcher is a Level II priority species.</li> <li>• The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.</li> <li>• Design Criteria have been identified as a part of project implementation to address possible effects to this sensitive species.</li> <li>• Decrease in prey abundance or availability caused indirectly by habitat alteration from partial cutting.</li> </ul>
Pygmy shrew	Wetlands in spruce-fir above 9,000 feet	<ul style="list-style-type: none"> <li>• Forest Plan standards for recruitment trees, snags and coarse woody debris are included in project design to provide cover that retains forest floor moisture and provide coarse woody debris habitat characteristics.</li> <li>• Design criteria in the Proposed Action - Modified, specifically 3, 8, 11, 31 and 32, limit activities in pygmy shrew habitat.</li> <li>• The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.</li> <li>• The Proposed Action – Modified prohibits logging within 100 feet of water (300 feet if riparian dependent species are present) and provides for retention of downed wood in logged area (USDA 2003, p. I-121).</li> </ul>
American marten	Spruce-fir and lodgepole pine forests	<ul style="list-style-type: none"> <li>• Forest Plan standards for recruitment trees, snags and coarse woody debris are included in project design, thus providing foraging and future denning habitat.</li> <li>• Forest Plan guidelines for maintaining or increasing security areas will be met since no harvest is proposed in security areas, ensuring that interior forest habitat will continue to be provided for martens.</li> <li>• The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.</li> </ul>
Wolverine	Spruce-fir and lodgepole pine forests; alpine and rock/cliff/caves	<ul style="list-style-type: none"> <li>• Forest Plan standards for recruitment trees, snags and coarse woody debris are included in project design, providing foraging and future denning habitat.</li> <li>• Forest Plan guidelines for maintaining or increasing security areas will be met since no harvest is proposed in security areas, ensuring that more remote, interior forest habitat will be provided.</li> <li>• The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.</li> </ul>

### 3) Proposed, Endangered, and Threatened Species

#### Affected Environment

Section 7 of the Endangered Species Act of 1973, as amended, requires federal agencies to use their authorities to carry out programs to conserve threatened, endangered, and proposed species (TEPS). Federal agencies are to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of listed or proposed species or result in the destruction or adverse modification of TEPS critical habitat.

The U.S. Fish and Wildlife Service (USFWS) provided the Forest Service with a list of TEPS that may occur on the Medicine Bow and Routt National Forests (USFWS 2007 and 2008, respectively). A review of these species and the effects determinations can be found in the Biological Assessments (BAs) prepared for this EA. The BAs are on file at the Medicine Bow-Routt National Forest Supervisor's office, 2468 Jackson Street, Laramie, Wyoming. They are also available on the Forest Service website at <http://www.fs.fed.us/r2/mbr/projects/foresthealth/index.shtml>. The only species on the Threatened, Endangered, or Proposed species that has the potential to be affected by the alternatives analyzed in this EA is the *Canada lynx*.

#### Environmental Consequences

##### ALTERNATIVE 1 – No Action

**Direct and Indirect Effects:** In many cases, No Action concerning lynx reflects the existing conditions and forest succession within the Lynx Analysis Units (LAUs) and linkage corridors. In this case, however, it is expected that the MPB epidemic would cause changes to existing lynx habitat. Observations on the Forest so far indicate that almost all lodgepole pine trees greater than 6 inches diameter at breast height within a stand are killed when the beetles hit. Surveys through 2007 indicate that roughly 350,000 acres on the Routt National Forest and 178,000 acres on the Medicine Bow National Forest have been hit by pine beetles.

Expectations are that emerging pine beetles from the existing epicenters would continue to spread into and attack green, standing lodgepole pine. The likely epidemic has the potential to affect thousands of acres of lodgepole-dominated forests across the lower and middle elevations of the Forest. Under a worst-case scenario, 50 to 90 percent of the trees could be killed by a subsequent beetle epidemic within these stands. This has occurred recently on other nearby Forests such as the Arapaho-Roosevelt National Forests in Colorado.

The widespread outbreak has the same likelihood of occurring on the Forest despite implementation of the Proposed Action - Modified. Further, the Proposed Action – Modified only improves human health and safety; it would not change the course of the outbreak. So, results from the Proposed Action – Modified and No Action would be similar except that the Proposed Action would remove dead and dying hazard trees from roads and administrative sites. Comparatively, the Proposed Action – Modified would change <2 percent of lynx habitat in any LAU. This is a minute change for lynx or lynx habitat relative to the thousands of acres of lynx habitat that could be changed by the beetle outbreak.

The final extent of beetle caused changes to lynx habitat is unknown. Where pine beetle outbreaks occur, other habitat is likely to be converted to currently unsuitable habitat and winter foraging

habitat will probably convert to other habitat. There could be sufficient loss of cover above the snow (crown cover within the lower 15 feet to provide snowshoe hare habitat (Ruediger et al. 2000, p. 1-3)) that remaining trees would be too widely spaced to provide useful habitat for snowshoe hares, red squirrels, or blue grouse. Regenerated winter foraging habitat would be expected within 20 years as unaffected trees grow to fill in open spaces above the snow.

## **ALTERNATIVE 2: Proposed Action - Modified**

### ***BIOLOGICAL DETERMINATION and RATIONALE***

A determination of “*May affect but is not likely to adversely affect*” has been made the Proposed Action – Modified. The rationale for this determination is as follows:

- Lynx hair surveys, tracking results from the Wyoming Game and Fish Department and Colorado Division of Wildlife, and other wildlife surveys indicate that lynx exist at a very low density on the Forests.
- The project has been designed in association with the Canada Lynx Conservation Assessment and Strategy (CLCAS) (Ruediger et al. 2000) and is consistent with the CLCAS guidance.
- The proposed activities are consistent with both the Medicine Bow (2003) and the Routt (1997) National Forest Plans.
- Standards and guidelines in the Forest Plan pertaining to lynx were incorporated almost verbatim from the CLCAS.
- Informal consultation for this project occurred with the US Fish and Wildlife Service (USFWS) on May 14, 2008; informal concurrence regarding the above determination was received at that time.

## **N. UNAVOIDABLE ADVERSE EFFECTS**

The application of the Forest Plan standards and guidelines and the listed design criteria would limit the extent and duration of any adverse environmental effects due to this project. However, it is impossible to avoid all potential impacts completely. Refer to the discussion of Environmental Consequences for each resource in the preceding sections of this document for the disclosure of all the environmental effects.

## **O. SHORT-TERM USES / LONG-TERM PRODUCTIVITY**

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Short-term uses are those expected to occur on the Forest during the next ten years. These include, but are not limited to; recreation use, grazing, mineral development, timber harvest, and prescribed burning. Long-term productivity refers to the capability of the land to provide resource outputs beyond the ten-year period. For the purposes of this analysis, short-term uses include harvesting

timber and disturbance of the land surface for the associated equipment and travelways. These areas would be returned to vegetative cover and would not reduce the long-term productivity of the land.

The ecological, social, and economic sustainability requirement established by 36 CFR 219.19 provide for long-term productivity of the land. Minimum management requirements prescribed by Forest Plan standards and guidelines help to assure that long-term productivity of the land will not be impaired by any of the short-term uses that are proposed by any of the activities of this project. Forest Plan standards and guidelines will be met under both alternatives analyzed in this EA.

## **P. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

The irreversible commitment of resources means that non-renewable resources are consumed or eliminated. Examples include coal extraction which consumes a non-renewable resource, or the potential elimination of an historical site due to some management activity on the ground.

The irretrievable commitment of a resource is an opportunity that is foregone as a result of implementing some activity. They often represent a trade-off in the use and management of forest resources. An example of this would be the expenditure of funds, loss of wood production, or a permanent restriction on the use of a resource.

None of the alternatives analyzed in this EA have any identifiable irretrievable or irreversible commitment of resources, as determined by the Interdisciplinary Team.

## **CONSULTATION AND COORDINATION**

In accordance with 40 CFR 1501.2a, the Forest Supervisor selected a team of resource specialists to utilize a systematic, interdisciplinary approach in planning and analyzing projects that may have an impact on the human environment. The following ID Team members participated in the analysis process:

### ***ID TEAM MEMBERS:***

Melissa Martin	Project Leader
Johnny Proctor	Botany
Jim Myers	Forested Vegetation
Kathy Roche	Ecology
Claudia Hill	Engineering
Kolleen Bean	Heritage Resources
Dave Gloss	Hydrology
Liz Schnackenberg	Hydrology
Greg Eaglin	Fisheries
Ray George	Recreation
Marcia Pfleiderer/	Wildlife
Steve Loose	
Jeff Tupala	Scenery
Derek Milner	Soils/Geology

Between the scoping letter and the public field trips, the Forest Service consulted over 250 individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the

development of this Environmental Assessment. Only those entities that provided comments on the proposal are listed below.

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

Board of Public Utilities  
Department of Road and Bridge  
Little Snake River Conservation District  
County of Jackson (2 letters)  
Wyoming Department of Agriculture  
Wyoming Game and Fish Department

**OTHERS:**

Biodiversity Conservation Alliance (2 letters)  
Dan Jago  
Janet Lux  
Focused on the Forest, LLC (2 letters)  
Sigrid Mayer (2 letters)  
Donald Read (3 letters)  
Delta Timber Company  
Colorado Wild (2 letters)  
Susan Peirce  
Dinda Evans  
Peggy La Point  
Daniel Dale  
Lydia Garvey  
Marilyn Kenny  
Margaret Garner  
Jim Bennett  
James Rittmueller  
Steven and Sandra Timmermeyer  
Bob and Ann Wensky  
Don Kosnik  
Michael and Barbara Hohnholz  
Martha Christensen

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**Appendix A**  
**Response to Public Comments**  
**(Separate Document)**

## Appendix B

### Hazardous Tree Removal Contracts and Permits

Since removal or just felling of hazardous trees will be scattered across two Forests, it is anticipated that many separate projects of various size will be needed to complete the work. Published and experiential information shows that there is a rapid degrade of beetle-killed wood in the first 1-2 years post mortality due to bluestain, reduced moisture content, and checking. (Lewis, K.J. and Hartley I.D. 2006) Implementation of the hazard tree removal projects will be problematic due to the low value of the dead material being removed. Since all of the material has been beetle killed, all of the material will have been infected with bluestain. Even though bluestain has no effect on wood quality, it is less desirable to consumers who prefer unblemished white wood, therefore lowering the value of beetle killed sawtimber. In addition, many of the trees that will be removed will have been dead for more than three years. Most lodgepole pine that have been dead for three or more years are no longer of sawtimber quality due to checking and cracking caused by the wood drying. Older dead trees will be useable only as fuelwood, biomass and house logs. It is anticipated that the removal of older dead trees will be more costly than the value of the tree. Quick action to remove the trees while they still have value as sawtimber would help in implementation of this project.

Currently the Forest Service's ability to remove a large volume of hazard trees is limited due to the lack of processing plants and contractors. The majority of the volume removed from the Forests now is sawtimber and a smaller volume of pole and post material. There is much activity in the biomass industry; two wood pellet mills may be moving into the area and perhaps as many as four mills may move into the area. The introduction of pellet mills into the area would greatly increase the Forest Services ability to market low value material. Pellet mills do not require high quality sawtimber in order to produce their product. Beetle hit trees would be useable to a pellet mill long after the tree has lost its value as sawtimber.

There are several tools available to the Forest Service for treating hazard trees; commercial timber sale contracts, service contracts, free use permits and contracts, Forest Service "Force Account" projects, and stewardship contracts. Prior to initiating a project, an appraisal of the project will be conducted using standard Forest Service methods to determine which tool would be the most effective for implementing the project. Removal of hazard trees may be completed as a commercial operation in which the Forest Service will receive payment for the value of the material removed or as a service operation in which the Forest Service will have to pay a contractor to have the material removed. Free use authorities allow the Forest Service to give away the material to individuals or organizations that would remove the material and not have to pay the Forest Service for it. Finally, Forest Service employees may perform the work required to mitigate the hazard trees.

#### **Commercial Timber Sale Contract:**

If the appraisal indicates that the hazard trees have a positive commercial value, the trees will be sold as a commercial product using standard Forest Service timber sale procedures. Contracts would be awarded to purchasers who are willing to purchase the products and pay the Forest Service for the material.

#### **Non-Commercial Service Contracts:**

If the appraisal indicates that the costs of removing the hazard trees is greater than the value of the trees, the Forest Service will have to pay a contractor in order to have the work performed. Since the

cost of performing such work varies depending on many variables such as the product the trees can be manufactured into, location of the stand, stand characteristics, work required to harvest the trees, and current market prices; a firm cost per acre is not possible to derive on a Forest wide bases. Each contract will require its own appraisal based on a more refined set of contract requirements and stand characteristics.

### **Free Use Permits or Contracts:**

If the appraisal indicates that removal of the material is more costly than the value of the material, and there are permittees or contractors willing to perform the work for free, the Forest Service may facilitate the completion of the work by issuing free use permits or contracts. These permits or contracts will be issued using authorities regulating free use to individuals or organizations, or as administrative free use. Free use permits do not allow the permittee to sell the product removed; administrative free use contracts allow the resale of the product removed. The permittee or contractor will be required to perform the work and will be given the trees free of charge.

### **Forest Service “Force Account” Projects:**

If the hazard trees in question have no commercial value, they are too expensive to remove in a service contract, and there is no interest in free use, Forest Service employees will have to complete the work.

### **Stewardship Contracts:**

Public Law 108-7, section 323, June 27, 2003, grants the BLM and Forest Service ten year authority to enter into stewardship contracts or agreements to achieve agency land management objectives and meet community needs. Stewardship contracts may be used for treatments to improve, maintain, or restore forest or rangeland health; restore or maintain water quality; improve fish and wildlife habitat; and reduce hazardous fuels that pose risks to communities and ecosystem values.

Stewardship contracting differs from other existing contracting authorities in the following manner:

- Contracts are selected on a “best value” basis;
- Designation by Description or Prescription can be used to identify material to be removed;
- Less than free and open competition can be used in contract award;
- Contract length may exceed five years but will not exceed ten years;
- The agencies may apply the value of vegetative products removed as an offset against any services received;
- Any excess offset value of vegetative products removed may be applied to other stewardship contracts;
- Revenue derived from the sale of any by-product or other materials designated for removal that results from these restoration activities will be a secondary object to the restoration goals;
- An open, local collaborative process will be used to identify projects, restoration goals, priorities and end-results; and
- All projects will comply with applicable environmental laws and regulations and land use plan direction.

Stewardship contracts are an important tool that will facilitate the implementation of hazard tree removal. If by using stewardship contract authority, more work can be completed than by using standard timber sale or service contracting authorities, the contracts will be offered as stewardship contracts. There are two types of stewardship contracts; they are the Integrated Resource Timber Contract and the Integrated Resource Service Contract.

Integrated Resource Timber Contract:

If the initial appraisal indicates that the value of the hazard trees to be removed is greater than the cost of removing them (a positive timber value) **and** the associated required service work, than the contract type that will be offered is the Integrated Resource Timber Contract (IRTC). There are two types of IRTC; if it would be more cost efficient to measure the trees removed in the mill yard, the sale will be offered as a scaled sale; if it will be more cost efficient to measure the tree in the field, the sale will be offered as a tree measurement sale. In an IRTC, the timber sale purchaser pays the Forest Service for the material removed.

Integrated Resource Service Contract:

If the initial appraisal indicates that the value of the hazard trees to be removed is less than the cost of removing them (a negative timber value) **and** the associated required service work, than the contract type that will be offered is the Integrated Resource Service Contract (IRSC). There are two types of IRSC; if it would be more cost efficient to measure the trees removed in the mill yard, the service contract will be offered as a scaled service contract; if it will be more cost efficient to measure the tree in the field, the service contract will be offered as a tree measurement service contract. In an IRSC, the Forest Service pays the contractor to remove the hazard trees and for the service work provided.