

## **F. SENSITIVE PLANTS**

### ***1. INTRODUCTION***

The sensitive plant analysis describes current plant populations in the project area and discusses the anticipated impacts to sensitive plants from taking no management action (Alternative 1) and from implementing Alternative 2. Commercial harvest, non-commercial thinning, and prescribed burning are the management actions being considered in this analysis.

### ***2. REGULATORY FRAMEWORK***

#### **Lewis and Clark National Forest Land and Resource Management Plan**

*Management Standard C-2 (2 & 13):* Conduct biological evaluations of each program or activity carried out on occupied sensitive species habitat to determine whether the activity may affect sensitive species. Assessments of suitable habitats for sensitive plants will be conducted before surface disturbing activities are permitted (USDA Forest Service 1986).

#### **Forest Service Manual – FSM 2672.41**

Ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant or contribute to trends toward Federal listing of any species (USDA Forest Service 2005).

### ***3. AREA OF ANALYSIS***

The sensitive plant analysis area is limited to treatment units and any activity areas associated with the proposed action alternative. The analysis area for the no action alternative would be the same locations as described above.

### ***4. EFFECTS ANALYSIS METHODS***

This effects analysis is based on known sensitive plant occurrences, as provided by the Montana Natural Heritage Program (MNHP 2005a; MNHP 2005b; MNHP 2006) and the Lewis and Clark National Forest plant atlas (USDA Forest Service 2006), and on potential habitat, as displayed in the Forest's geographic information system (GIS) sensitive plant model and from current site conditions. A preliminary analysis of the project area to determine potential habitat was conducted using information available from color aerial and National Agriculture Imagery Program photography, topographic and landtype maps, the timber stand management record system database, and the inventory of known sensitive plant populations. Habitat requirements for each of the sensitive plant species were compared with habitat occurring in the project area. Field surveys were conducted during 2006 in proposed activity areas with potential habitat.

## 5. EXISTING CONDITION

### a. Natural characteristics

The Lewis and Clark National Forest Plan provides Forest-wide management direction in regards to sensitive plants stating “Conduct biological evaluations of each program or activity which is Forest Service funded, authorized, or carried out on occupied Threatened, Endangered, or Sensitive species habitat, to determine whether the activity may effect Threatened and Endangered or Sensitive species” (USDA Forest Service 1986). The three plants listed on the Endangered Species List as “threatened” and occurring in Montana are water howellia (*Howellia aquatilis*), Spalding’s catchfly (*Silene spaldingii*), and Ute ladies’-tresses (*Spiranthes diluvialis*). Slender (linearleaf) moonwort (*Botrychium lineare*) is listed as a “candidate” species (USDI Fish and Wildlife Service 2006). Species occurrences and suitable habitat are only known on Forests west of the Lewis and Clark National Forest. No further analysis will be conducted for the threatened and candidate species.

The current Northern Region sensitive plant species list (Kimbell 2004) was reviewed as it pertains to the project area. There are currently twenty sensitive plant species that either occur or are suspected to occur on the Rocky Mountain Ranger District, Lewis and Clark National Forest. The presence or absence of plant populations or habitat is summarized in Table 3-19 and discussed below. Fourteen species are known to occupy habitat and have documented occurrences on the Rocky Mountain Ranger District. These sensitive plant species are round-leaved orchis (*Amerorchis rotundifolia*), Lackschewitz’ milkvetch (*Astragalus lackschewitzii*), upward-lobed moonwort (*Botrychium ascendens*), peculiar moonwort (*Botrychium paradoxum*), small yellow lady’s-slipper (*Cypripedium parviflorum*), sparrow’s-egg lady’s-slipper (*Cypripedium passerinum*), Northern wild-rye (*Elymus innovatus*), giant helleborine (*Epipactis gigantea*), Lackschewitz’ fleabane (*Erigeron lackschewitzii*), Macoun’s gentian (*Gentianopsis macounii*), stalked-pod crazyweed (*Oxytropis podocarpa*), Austin’s knotweed (*Polygonum douglasii ssp. Austinae*), blunt-leaved pondweed (*Potamogeton obtusifolius*), and five-leaved cinquefoil (*Potentilla quinquefolia*). Six species, English sundew (*Drosera anglica*), linear-leaved sundew (*Drosera linearis*), Hall’s rush (*Juncus hallii*), Barratt’s willow (*Salix barrattiana*), water bulrush (*Scirpus subterminalis*), and alpine meadowrue (*Thalictrum alpinum*), are suspected to be present on the Lewis and Clark National Forest.

**Table 3-19. Sensitive Plant Species Habitat and Occurrence in the Analysis Area**

Species Name	Habitat Preference and Occurrence in Analysis Area
round-leaved orchis ( <i>Amerorchis rotundifolia</i> )	Moist to wet coniferous forests in full or partial shade, seepy areas, and along stream habitat on limestone substrate. Associated vegetation includes spruce and horsetail species. Elevations range from 4,900 to 5,900 feet. <i>Potential habitat occurs in Mule Creek Unit 2 and Double Falls Unit 2. No plants occur in these units.</i>
Lackschewitz’ milkvetch ( <i>Astragalus lackschewitzii</i> )	Open, gravelly calcareous soils and talus on ridgetops and slopes in alpine and subalpine zones. <i>No habitat exists in the analysis area.</i>
upward-lobed moonwort ( <i>Botrychium ascendens</i> )	Alpine meadows, grassy openings in open subalpine forests at about 7200 feet elevation. Scree, alpine turf, and whitebark pine-subalpine fir habitat types. <i>No habitat in the analysis area.</i>
peculiar moonwort ( <i>Botrychium paradoxum</i> )	Open meadows or dense stands of tall forbs in the foothill to alpine zone. Associated with spruce and lodgepole pine forests in the montane and

Species Name	Habitat Preference and Occurrence in Analysis Area
	subalpine zones. Elevations range from 5,520 to 7,330 feet. <i>No habitat in the analysis area.</i>
small yellow lady's-slipper ( <i>Cypripedium parviflorum</i> )	Bogs, damp mossy woods, seepage areas, and moist forest meadow ecotones. Spruce and horsetail habitat. Elevations range from 4,400 to 5,000 feet on RMF. <i>All elevations are too high in the analysis area. No habitat exists.</i>
sparrow's-egg lady's-slipper ( <i>Cypripedium passerinum</i> )	Mossy, moist, seepy places in coniferous forests, often on calcareous substrates. Frequently co-occurs with round-leaved orchis, spruce, and horsetail species. Elevations range from 4,900 to 5,700 feet. <i>Potential habitat occurs in Glade Creek Unit 2, Mule Creek Unit 2, Fairmule Unit 4, and Double Falls Unit 2. No plants occur in these units.</i>
Northern wild-rye ( <i>Elymus innovatus</i> )	Sandy meadows, streambanks, and rocky hillsides to open lodgepole pine or spruce forests. Elevations range from 4,600 to 5,200 feet. <i>No habitat exists in the analysis area.</i>
giant helleborine ( <i>Epipactis gigantea</i> )	Streambanks, lake margins, seeps, and springs, often near thermal waters. Elevation is about 4,560 feet. <i>All elevations are too high in the analysis area. No habitat exists.</i>
Lackschewitz' fleabane ( <i>Erigeron lackschewitzii</i> )	Open, gravelly calcareous soils and talus ridge-tops and tundra in the alpine zone. Elevations range from 7,500 to 8,400 feet. <i>No habitat exists in the analysis area.</i>
Macoun's gentian ( <i>Gentianopsis macounii</i> )	Wet, organic soils of calcareous fens in the valley and foothill zones. <i>No habitat exists in the analysis area.</i>
stalked-pod crazyweed ( <i>Oxytropis podocarpa</i> )	Alpine ridge and slope habitats, often on limestone substrates. Elevations range from 7,900 to 8,200 feet. <i>No habitat exists in the analysis area.</i>
Austin's knotweed ( <i>Polygonum douglasii</i> ssp. <i>Austinae</i> )	Barren to sparsely vegetated, dry, gravelly, often shale-derived soils of eroding slopes and banks in the montane zone. <i>No habitat exists in the analysis area.</i>
blunt-leaved pondweed ( <i>Potamogeton obtusifolius</i> )	Shallow water of lakes, ponds, and sloughs in the valley, foothill, and montane zones, usually at lower elevations. <i>No habitat exists in the analysis area.</i>
five-leaved cinquefoil ( <i>Potentilla quinquefolia</i> )	Dry, gravelly soils of exposed ridges and slopes in the montane to alpine zones. <i>No habitat exists in analysis area.</i>
English sundew (S) ( <i>Drosera anglica</i> )	Sphagnum moss in wet, organic soils of fens in the montane zone. <i>No habitat exists in the analysis area.</i>
linear-leaved sundew (S) ( <i>Drosera linearis</i> )	Sphagnum moss bogs, organic soils of nutrient-poor fens at mid-elevations in the montane zone. <i>No habitat exists in the analysis area.</i>
Hall's rush (S) ( <i>Juncus hallii</i> )	Montane to subalpine, wet sloughs to moist or dry meadows and open, grassy slopes. Often associated with fescue grasslands or more moist meadows, sometimes partially shaded. Elevations 6,900 to 8,400 feet. <i>No habitat exists in the analysis area.</i>
Barratt's willow (S) ( <i>Salix barrattiana</i> )	Cold, moist soils near or above timberline. <i>No habitat exists in the analysis area.</i>
water bulrush (S) ( <i>Scirpus subterminalis</i> )	Shallow fresh water and boggy margins of ponds, lakes, and sloughs in valley, foothill, and montane zones. <i>No habitat exists in the analysis area.</i>
alpine meadowrue (S) ( <i>Thalictrum alpinum</i> )	Hummocks, often beneath low shrubs in moist, alkaline meadow in the montane to alpine zone. <i>No habitat exists in the analysis area.</i>

The Montana Natural Heritage Program sensitive plant database of known plant populations and the Lewis and Clark GIS potential plant habitat model were used to determine the existence or probability of sensitive plants or suitable habitat in the Benchmark analysis area. No known populations are present in or adjacent to proposed treatment units. However, a known population of sparrow's-egg lady's-slipper, observed in 1988, exists in the project area southwest of Benchmark Unit 3. GIS data received from the Montana Natural Heritage Program placed a buffer around the population that encompasses Benchmark 1, 2, and 3;

Glade Creek 1 and 2; and Fairmule 4. Based on pre-field office review to determine habitat suitability, numerous locations in the original project proposal were determined to contain potential sensitive plant habitat. These locations were then field surveyed in July 2006. No sensitive plant species were identified during the field survey. No sparrow's-egg lady's-slipper was found in the Benchmark, Glade Creek, or Fairmule units within the Montana Natural Heritage Program buffer. However, potential habitat for round-leaved orchis and sparrow's-egg lady's-slipper occurs in and adjacent to streams and wetlands (i.e. wet, seepy areas) in Glade Creek Unit 2, Fairmule Unit 4, Mule Creek Unit 2, and Double Falls Unit 2. Proposed treatment units were modified in late-fall 2006. Although pre-field office work demonstrated potential for suitable plant habitat in Aspen 1 and Double Falls 1 and 2, no field surveys were completed for the modified treatment areas because plants would be difficult to identify during the fall. Field surveys were not completed in 2007 due to adjacent wildfire activity. Aspen 1 and Double Falls 1 and 2 would be surveyed prior to project implementation to determine presence or absence of sensitive plant species. Invasive species such as houndstongue (*Cynoglossum officinale*), leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense*), and Dalmatian toadflax (*Linaria dalmatica*) are known to occur throughout the project area. Infestations are primarily adjacent to existing roads with heavier concentrations near Benchmark and from Double Falls east to the Forest boundary. Minor infestations are present in Aspen 1, Double Falls 1 and 2, and Benchmark 2. The Rocky Mountain Ranger District has an active invasive species education, prevention, and control program to reduce the impacts of invasive plant species.

## **b. Desired condition**

One of the long-range goals of the Lewis and Clark National Forest is to promote wildlife, fish, and high quality habitat to insure a desired mixture of well-distributed species and numbers for public benefit with special emphasis given to sensitive plant, animal, and fish species management. A Forest-wide management objective is to insure maintenance of sensitive species populations through inventory data collection and program area coordination. Special consideration may be given in land management to maintain genetic diversity (USDA Forest Service 1986). Based on the Forest Plan goals, objectives, and management standards, viable populations of sensitive plant species would be maintained across the Forest, and Forest populations would contribute to a viable Regional population (USDA Forest Service 1993).

## ***6. EFFECTS BY ALTERNATIVE***

### **a. Alternative 1 - No Action**

#### **1. Direct and Indirect Effects**

No sensitive plant species occur in the analysis area. Implementation of the no action alternative would have no effect on either sensitive plant habitat or individuals.

#### **2. Cumulative Effects**

There are no cumulative effects to sensitive plant habitat or individuals under this alternative.

## **b. Alternative 2**

### **1. Direct and Indirect Effects**

The effects of ground disturbing activities on sensitive plant populations is generally negative due to the potential to directly disturb plants and alter habitat within and adjacent to plant populations. No sensitive plant populations were located during the original field surveys in 2006 and there are no known occurrences in the analysis area. Although no populations were identified, some suitable habitat is present in the treatment units. Glade Creek Unit 2, Fairmule Unit 4, Mule Creek Unit 2, and Double Falls Unit 2 support some habitat characteristics favorable for round-leaved orchis and sparrow's-egg lady's-slipper. These units contain high water, wetlands, or bogs. Based on streamside management zone (SMZ) guidelines, at least a 50-foot SMZ where no machinery is allowed would be needed. Winter harvest will also occur in units with commercial harvest prescriptions. SMZs and winter harvest would remove much of the potential sensitive plant habitat from ground disturbing activities. If any sensitive plant populations were located before or during project implementation, they would be evaluated, appropriately delineated, and avoided during harvest and prescribed burning activities.

Invasive plants are strong competitors with native vegetation and are most likely to establish in disturbed locations. Mechanical harvest equipment and fire have the potential to create bare soil favorable for rapid invasive species establishment. Harvest equipment and other motorized vehicles also have the ability to transport invasive species seed into disturbed areas, especially since weed seed sources are readily available. Any increase in bare soil that is likely to cause an increase in invasive plant species may have a long-term negative effect on sensitive plants and potential sensitive plant habitats. The best method of prevention is to minimize ground disturbance and reestablish desirable vegetation promptly when ground disturbance leaves bare soil. Harvest operations would occur under winter conditions (frozen soils and/or snow cover) to minimize soil disturbance and, therefore, invasive species establishment. Invasive species do not currently threaten sensitive plant populations in the project area since no sensitive plant populations were located. However, establishment of invasive species could potentially occur in suitable habitat and reduce the ability of sensitive plants to successfully grow there.

### **2. Cumulative Effects**

All past project areas with ground disturbing actions would have been field surveyed to determine the presence or absence of sensitive plants and/or suitable habitat. If present, the activities would have avoided plant populations and no effects would have occurred. The complete list of past, present, and reasonably foreseeable projects is displayed in Chapter 3, Section A. Because no sensitive plants were documented in the analysis area; past, present, and reasonably foreseeable activities would have no effect on sensitive plants. Therefore, implementation of the Benchmark Fuels Reduction Project would not have cumulative effects on sensitive plant species.

### 3. Forest Plan and Other Regulatory Framework

Table 3-20 briefly states management direction applicable to this project and describes how Alternative 2 complies with that direction.

**Table 3-20. Compliance with Management Direction**

Management Direction	Compliance with Management Direction
Management Standard C-2 (2 & 13): Conduct biological evaluations for sensitive species. Assess potential for suitable habitat prior to surface disturbing activities.	Pre-field reviews and field surveys were completed in 2006. No sensitive plant populations were detected. Harvest activities would occur under winter conditions. This report constitutes the sensitive plant species biological evaluation.
FSM 2672.41 – Ensure Forest Service actions do not contribute to loss of viability.	No sensitive plant species were documented in the analysis area; therefore, implementation of Alternative 2 would not contribute toward a loss of sensitive plant viability.

### 7. MITIGATION MEASURES

- Complete field surveys in Aspen 1 and Double Falls 1 and 2 prior to project implementation to determine presence or absence of sensitive species or habitat.
- If a new sensitive plant population is located in a treatment area prior to or during project implementation, the population would be evaluated, delineated, and avoided during all ground disturbing activities.

### 8. DETERMINATION OF EFFECTS

It is my determination that implementation of the Benchmark Fuels Reduction Project would have **no impact** upon plant species the Northern Region’s Regional Forester deems sensitive.

## **G. SCENERY RESOURCE**

### ***1. INTRODUCTION***

The visual quality (scenery) of the Benchmark Vegetation project area may be affected by actions proposed by this project. These effects would vary in duration and intensity depending upon where on the landscape the proposed activities take place. Most of the proposed activities are visible from the viewpoints identified as important. Many of the visual effects of these proposed activities will not meet the Forest Plan visual standards in the short term (less than 5 years) but will meet the long term Forest Plan visual quality objectives. Several mitigation measures are recommended to soften potentially negative visual effects.

### ***2. REGULATORY FRAMEWORK***

The Lewis and Clark National Forest Plan provides overall direction for visual quality (scenery) on the forest. Forest-wide Management Standard A-8 states that “Landscape management principles will be applied to all activities on the Forest. This will be accomplished by implementing the procedures defined in National Forest Landscape Management, Volume 2, Chapter I, The Visual Management System (Agricultural Handbook No. 462).” (Lewis and Clark Forest Plan, pg. 2-28).

The Forest Plan also “states a Visual Quality Objective (VQO) for each management area. These VQOs provide the guideline for altering the landscape.” (Lewis and Clark Forest Plan, pg. 2-28) The Benchmark Fuels project is located within Management Areas E, G, H, and O. The VQOs assigned to these MA’s are Retention, Partial Retention and Modification. The designation of the VQO relates strongly to the distance from the significant sensitive viewpoint(s) that might be within the project area. The Benchmark Road (Forest Road #235) has been identified as the sensitive viewpoint for the Benchmark fuels project area. The VQOs for the project are foreground Retention and middleground Partial Retention as viewed from Forest Road #235.

Additionally, other sensitive viewpoints were identified during project review and were also considered in this analysis. Those other important viewpoints would be from developed campgrounds and trailheads, resorts and lodges, and recreation residences within the project area. Similar to the VQO strategy for sensitive viewpoints above, the VQOs shall generally be foreground Retention and middleground Partial Retention. Guidelines for meeting VQOs are described in Forest Service Handbook 462, National Forest Landscape Management, Volume 2.

### ***3. AREA OF ANALYSIS***

The analysis area used for the visual/scenic resource analysis is the same as the project area boundary. This boundary is sufficient to cover all related visual features of this landscape and to allow for proper analysis of direct, indirect, and cumulative visual effects.

## **4. ANALYSIS METHODS**

A visual resource analysis is conducted for all proposed projects on the Lewis and Clark National Forest. This analysis is accomplished by implementing the procedures defined in National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System (Agriculture Handbook No. 462).

Proposed activities in the Benchmark Vegetation project area may impact visual/scenic quality by introducing colors, lines, textures, and patterns that contrast with the existing landscape character of the project area. The measurement indicator for these effects will be the visible effect of proposed activities as seen from Forest Road #235 and from heavily used recreation areas and recreation residences within the identified analysis area.

This analysis includes both short-term (less than 5 years) and long-term (greater than 5 years) visual effects. These effects will be analyzed to determine whether or not they meet the Visual Quality Objectives identified for each of the Management Areas that lie within the project and project area. Specifically, visual effects of the Benchmark Fuels project will be measured using the VQO's outline in Management Areas E, H, and O. Even though it is included in the project area boundary, there are no treatments planned for Management Area G, so visual effects to this management area will not be analyzed.

Analysis was done by visiting the proposed treatment areas and viewing the project from the roads, recreation residences and recreation sites within the project area. Observations regarding the existing situation of the landscape were made, and determinations made on the possible effects of the treatment from these viewpoints. A Forest Service landscape architect, who is trained in the study of scenery and visual resource management, conducted this analysis.

## **5. EXISTING CONDITION**

### **a. Natural characteristics**

The Benchmark Fuels project is located on the Rocky Mountain Ranger District of the Lewis and Clark National Forest, just west of Augusta, Montana. This project area is located in the Columbia Rockies Sub region, (Visual Character Types and Variety Class Descriptions of the Northern Region, R1 80-11, pgs. 38-41.). In this area, the steeply mountainous landforms of the project area contrast dramatically with the prairie landscapes that lie just to the east. These mountainous landforms are further defined by geologic reef formations, large outcrops, talus slopes and high, sparsely vegetated, alpine peaks.

The characteristic vegetation of the Benchmark project area varies, with some slopes covered with a more continuous forest canopy of conifer trees while other areas have produced a more diverse vegetative mosaic of mixed aspen and conifer forest. The more alpine and rocky areas contain sparser vegetation and there are many natural grassy openings on the more southern and western slopes.

The proposed Benchmark Fuels project units lie within the forested bottomlands near Wood, Ford, Benchmark, and Straight Creeks. The topography in these bottom lands ranges from flat to gently rolling. Vegetation along these creek bottoms tends to primarily be of conifer

forest and is fairly continuous. Much of the coniferous vegetation is approaching an age where tree stands are becoming more susceptible to insect and disease infestations. As a result, there is a fairly noticeable contingent of dead and dying trees in some of the more dense forest stands. Additionally, fire has been largely excluded from the area over the last several decades, resulting in stands that often have heavy fuel concentrations and are dense and visually difficult or impossible to look through. There are few park-like stands in the area.

### **b. Past Events and Conditions and Human Influence**

The primary road of access in the Benchmark Fuels project is Forest Road #235. This road receives considerable public recreational traffic. The Lewis and Clark Forest Plan recognizes the importance of scenery as viewed from Forest Road #235 and has identified it as an important viewpoint for considering visual effects (Lewis and Clark Forest Plan, pg. 2-29).

The proposed Benchmark project area also contains three campgrounds, two recreational ranches/lodges, and three wilderness trailheads. The Benchmark Administrative site is also located within the project boundary. Views of scenery from all of these developments have been recognized as important by the Forest Plan through the allocation of Management Area H.

There are also approximately 45 recreation residences built in tracts along the creek bottoms in the project area that are primarily unseen from Forest Road #235. These residences, while they are not recognized specifically by the Forest Plan, are considered important viewpoints. Several residents contacted the district during the comment period with concerns about the scenery and potential changes to their views from their recreation residences. Numerous small roads provide access into the tracts.

Some timber management has occurred in the area but there is little to no visual evidence from Forest Road #235 of this past timber harvest. Some timber stands were mechanically thinned during the 2007 fire season when the area was threatened by wildfire. These stands appear natural to the casual forest visitor using Forest Road #235. Other than private and recreation developments along the bottom of the drainage, to the untrained eye, most of the scenery in the project area appears to be natural.

### **c. Desired Condition**

The Lewis and Clark Forest plan establishes the Desired Future Condition of the visual quality for this area. As stated above under the regulatory framework, the visual quality of the Benchmark Fuels project will be managed around the visual sensitivity of Forest Road #235. Seen areas goals from this visually sensitive viewpoint will be to meet the Retention VQO in the foreground (less than ¼ mile from viewpoint) and the Partial Retention VQO in the middleground (between ¼ mile and 2 miles from the viewpoint). This direction also applies to views from developed campgrounds, trailheads, recreation lodges and recreation residences (Management Area H). In general, this means that immediately adjacent to these viewpoints, management activities should not be obvious as to the casual forest visitor. Farther from the viewpoints (middleground) management activities may be visually evident, but should not dominate and should blend well with the characteristic patterns on the

landscape. All management activities should remain visually subordinate to the existing natural-appearing landscape of the area.

## **6 . EFFECTS COMMON TO BOTH ALTERNATIVES**

For the past several years most of Montana has been under drought conditions. These drought conditions have stressed the forest communities in the Benchmark Vegetation project area to the point where they are very vulnerable to the impacts of insect, disease, and wildfire. As a result of insect and disease in the project area, many trees are dying. This mortality will continue to have a dynamic effect on the visual (scenic) quality of the area. Insect and disease problems will continue to kill trees in the area leaving the vegetation on these landscape prime for a natural wildfire event that could threaten and impact the recreational use in this area. These effects are expected to happen to a certain degree in both of the alternatives, but to a lesser degree in the proposed action alternative, where efforts will be made to reduce the impact of these disturbances by reducing fuels and improving overall forest health and vigor.

### **a. Alternative 1 - No Action**

This is the no action alternative and proposes no changes to the existing visual/scenic condition of the Benchmark Vegetation project area. No fuel reduction treatments will be scheduled.

#### **1. Direct and Indirect Effects**

As described in the Existing Condition, the primary viewpoints for the project area are Forest Road #235, the campgrounds, trailheads, recreation lodges and 45 recreation residences located along this route. The visual quality/scenery from these viewpoints has been determined to be very important to both the recreation residences permit holders and to recreational visitors to the project area.

Fire suppression in the past 80+ years has had an impact on the scenic integrity of the vegetative condition in the Benchmark Vegetation project area. In the drier habitat types, naturally occurring fires would have periodically burned through these stands and an “open grown” forest condition, with far fewer under story trees would have existed. Currently, these forests have developed dense patches of younger-aged trees that dominate these sites.

The risk of stand replacement fire in forests with dense under stories is of concern. This concern is amplified with dispersed and developed recreational use and recreational residence developments. As both the recreational use and vegetative under story growth increase, so does the risk of higher intensity fire activity. Higher intensity burns, such as stand replacing fires, have potential visual effects that would take 50-60 years to recover as standing dead trees fall and new younger trees grown to adult size.

#### **2. Cumulative Effects**

The visual effects of existing recreation, grazing, and wildlife projects in the Benchmark Fuels project area are minimal. These effects meet the Forest Plan VQO's established for this

area. Past timber harvesting north of Benchmark remains visible but meets the suggested Visual Quality Objective of middleground Partial Retention in this area.

## **b. Alternative 2 - Proposed action**

### **1. Direct and Indirect Effects**

Most of the proposed activities may be viewed from points along the Benchmark Road, Forest Road #235. Additionally, several of the proposed units lie immediately adjacent to campgrounds, trailheads, recreation lodges, and recreation residences. Other units are located higher up on slopes or are further back in the drainages and are screened from immediate views by intervening topography and vegetation.

The following vegetative treatments will be utilized to accomplish the fuels reduction in these areas. These treatments will have some effects to the visual quality/scenery of the area and these effects are described in more detail below.

#### ***A) Hand treatment utilizing power saws and possible broadcast/jackpot burning***

This proposed treatment will be applied to the following units: Ford Creek #1, Ford Creek #2, Aspen Creek #1, Mule Creek #1, Benchmark #1 and Benchmark #5.

Forest Service crews would treat these units by hand, thinning portions of these units with power-saws. The vegetative treatments would include felling of lodgepole pine and Douglas fir of less than 40 feet in height. Once these down trees cure, the units would then be treated with fire, either jackpot or broadcast burning. Where continuous or heavy fuels preclude jackpot or broadcast burning, downed fuels would be piled and burned.

The visual effects of these proposed hand treatments will be minimal and most evident in the short term (less than 5 years). Felled trees will be most noticed as red slash on the forest floor. A slight textural change in the remaining forest canopy may also be visible. However, these units already contain a diverse and varied tree structure so changes to the canopy texture may go unnoticed. Broadcast, jackpot, or burn piles may be noticed as blackened ground surfaces for the first year and should recover within the year by a flush green growth the following spring.

Immediately after implementation, these proposed treatments will not meet the foreground Retention VQO but will easily meet the middleground Partial Retention VQO. However, within 1-3 years after the project has been implemented, both the Forest Plan foreground Retention and middleground Partial Retention VQO's will be met.

#### **Mitigation Measures:**

The following mitigation effects will aid in the quick recovery of the visual quality of the following units: Ford Creek #1, Ford Creek #2, Aspen Creek #1, Mule Creek #1, Benchmark #1 and Benchmark #5.

- Provide complete slash cleanup within 75 feet of recreation residence lots, access roads, system trails and Forest Road #235.

- Keep stump heights as low as possible within 75 feet of recreation residences, access roads and Forest Road #235.
- Return all system trail surfaces to pre-treatment condition.

***B) Commercial thinning with 20 to 30 foot crown spacing utilizing mechanical equipment***

This proposed treatment will be applied to the following units: Double Falls #1, Double Falls #2, Aspen #2, Green Timber #1, Lick Creek #1, Lick Creek #2, Mule Creek #2, Fairmule #1; Fairmule #4, Benchmark #2, Benchmark #3, Benchmark #4, Glade Creek #1, and Glade Creek #2.

The goal of these units is to create breaks in the existing tree canopy with 20 to 30 foot spacing between tree groups or clusters of conifers. The remaining tree clusters will vary from 5 to 40 full grown individuals with scattered smaller trees and shrubs remaining intact within these groups. The tree group size and location would be naturally varied and dependant upon the health and vigor of the various trees within the stands. The most noticeable visual effects created by these units will be small openings in the canopy, fresh stumps, bruised tree bark, ground disturbance, and slash. Overall, the forest in these areas will appear lighter as the removal of some trees will allow for more sunlight to permeate the forest canopy and reach the forest floor. Since a varied number and size of trees and tree groups will be left, the final vegetative treatment will result in a forest with small patchy-shaped openings scattered throughout.

The units proposed for these patchy openings are all located directly adjacent to recreation residence tracts and within the foreground views (less than ¼ mile) of Benchmark Campground. Immediately after implementation, the visual effects of the foreground treatments would be very noticeable to the residents and recreation users of these areas. The VQO's established for these areas by the Forest Plan are foreground Retention and middleground Partial Retention. Initially, the visual effects created by these treatments would not meet the foreground Retention VQO in the short term (less than 5 years). However, as the ground surface recovers and the remaining trees respond to additional sunlight and growing space, the forest is expected to recover quickly. The VQO of foreground Retention will be met after 5 years time.

The effects to visual quality as observed from the Benchmark Road, Forest Road #235, would be minimal. Some noticeable effect to the existing forest canopy may be noticed in Benchmark #4, Mule Creek #2, Lick Creek #1, and Double Falls #1. These treatments may create a noticeable textural change in the existing tree canopy as seen from these viewpoints. Additionally, slash, stumps, and ground surface disturbance may also be noticeable in the short term.

**Mitigation Measures:**

The following mitigation effects will aid in the quick recovery of the visual quality of the following units: Benchmark #2, Benchmark #3, Benchmark #4, Glade Creek #1, Glade Creek #2, Fairmule#1, Fairmule #4, Mule Creek #2, Lick Creek #1, Lick Creek #2, Green Timber #1, Aspen #2, Double Falls #1 and Double Falls #2.

- Provide complete slash cleanup within 75 feet of recreation residence lots, access roads, system trails, Forest Road #235 and Benchmark Campground.
- Minimize ground disturbance within 75 feet of recreation residents, Forest Road #235, and Benchmark Campground.
- Keep stump heights as low as possible within 75 feet of recreation residences, Forest Road #235, and Benchmark Campground.
- Avoid abrupt treatment edges or all units through feathering or transitioning intensity of treatment.
- Vary sizes of leave groups and distances between trees and groups, seeking to keep a random, natural appearing forest that from the road never looks managed.
- Return all system trail surfaces to pre-treatment condition.

***C) Commercial harvest with ½ - 2 acre openings on 50% of the unit***

This proposed treatment will be applied to Fairmule #2 and Fairmule #3.

The goal of these units is to create ½ to 2 acre openings on 50% of the unit. These openings would be irregular in shape and distributed unevenly over the treatment area. Fairmule #2 lies on relatively flat to gently sloping terrain directly adjacent to Forest Road #235. Views of the Fairmule #2 would be across the unit and the most noticeable visual effect would be a textural change of the existing forest canopy. Additionally, slash and stumps may be noticeable in the immediate foreground viewing distance. Overall, the forest in these areas will appear lighter as the removal of some trees allows for more sunlight to permeate the forest canopy and reach the forest floor. Since the openings created will vary in size and shape, the final vegetative treatment will result in a forest with small patchy openings scattered throughout.

Immediately after implementation, the visual effects of the foreground treatments of Fairmule #2 would be very noticeable to users of Forest Road #235. The VQO's established for the route by the Forest Plan are foreground Retention and middleground Partial Retention. Initially, the visual effects created by Fairmule #2 would not meet the foreground Retention VQO in the short term (less than 5 years). However, as the ground surface recovered and the remaining trees responded to additional sunlight and growing space the forest is expected to recover quickly. The VQO of foreground Retention will be met after 5 years time.

Fairmule #3 lies on steeper slopes just to the east of Fairmule #2. Views of this unit are oblique from Forest Road #235 and are somewhat screened from view by intervening vegetation and topography. The irregular shape and patchy distribution of the openings planned for this unit will blend well with the surrounding forest vegetation. This unit will meet the Forest Plan VQO of middleground Partial Retention planned for this area.

## **Mitigation Measures:**

The following mitigation effects will aid in the quick recovery of the visual quality in Fairmule #2. No mitigation is required for Fairmule #3.

- Provide complete slash cleanup within 75 feet from Forest Road #235.
- Minimize ground disturbance within 75 feet of Forest Road #235.
- Keep stump heights as low as possible within 75 feet of Forest Road #235.
- Avoid abrupt treatment edges or both units through feathering or transitioning intensity of treatment.
- Vary sizes of leave groups and distances between trees and groups, seeking to keep a random, natural appearing forest that from the Forest Road #235 never looks managed.

## **b. Cumulative Effects**

Visual effects of recreation, grazing, and wildlife projects listed for cumulative effects consideration are minimal to non-existent. Proposed vegetative treatments will add to the past cumulative effects of prescribed fire and wildfire, but will be done in ways that meet suggested VQO's in the long term. Past timber harvesting north of Benchmark remains visible and the proposed activities will add to the amount of harvesting within the area but will still meet suggested VQO's in the long term.

## **H. HERITAGE RESOURCES**

### ***1. INTRODUCTION***

Heritage resources or cultural resources are broad and synonymous terms referring to cultural, historic, archaeological, and ethnographic properties and traditional lifeway values representing past, and in some cases, continuing human activities or uses. By their nature, historic resources are nonrenewable, easily damaged, and with few exceptions, considered irreplaceable.

### ***2. REGULATORY FRAMEWORK***

The National Historic Preservation Act (NHPA) and its implementing regulations require that federal agencies consider the effects of their undertakings on historic properties. The term ‘historic’ in this context refers to cultural properties that have been determined eligible for inclusion in the National Register of Historic Places (NRHP). Properties that have not yet been evaluated must be treated as potentially significant until the Agency reaches an agreement with the Montana State Historic Preservation Office (SHPO) or the Keeper of the National Register on ineligibility.

Historic properties may be the result of aboriginal use (prior to Euro-American influence) or historic period use. They may represent a single event or a complex system. They may be an object, feature, site, or district. And, they must meet the criteria outlined in 36CFR60.4 to qualify for the National Register. The consideration of effects previewed in NEPA is formalized through the National Historic Preservation Act (NHPA) Section 106 review process. Section 106 review is a ‘cultural-resource-specific’ process that is completed concurrent with NEPA; it is generally finalized for a selected alternative, and *must* be concluded prior to implementing the undertaking. NHPA Section 106 review is the subject of both National and Regional Programmatic Agreements (PA), and is included in federal policy, direction and guidance.

Federal agencies carry out their responsibilities for compliance with heritage laws and regulations by conducting documentary research, consulting with Indian Tribes, the SHPO, possibly the Advisory Council on Historic Preservation (ACHP), and others, and often by field-surveying to identify cultural properties. Site-specific effects analysis and the resolution of effects are ensured by following the NHPA regulatory review process at 36CFR800. For the Lewis and Clark National Forest, this process is further guided by the Region One Policy for integrating NEPA and NHPA (1991), the Region One Programmatic Agreement for Cultural Resources (USDA Forest Service et. al. 1995), and the Lewis and Clark National Forest Site Identification Strategy (SIS, 1995). Through the Section 106 process, all undertakings are identified and addressed, and any necessary mitigation measures incorporated into project design, the NEPA document, or other appropriate heritage resource agreement. The goal is to avoid, minimize, or mitigate impacts to significant heritage properties.

Both NHPA and the Archaeological Resources Protection Act (ARPA) contain provisions for the confidentiality of certain cultural resource information. Site-specific locations and other sensitive site data are not disclosed to the public. Documents containing this information are

marked with an asterisk (\*) in the bibliography and retained in the cultural resource project file. This information is exempt from public disclosure and not available under the Freedom of Information Act.

### **3. AREA OF ANALYSIS**

For the purposes of this analysis, the *general* “heritage analysis area” includes the entire area within the Forest Boundary along the Benchmark Road 235. This area is researched for contextual information and for the existence of, or potential for the occurrence of cultural resources.

Within this broader analysis area, a site-specific “area of potential effect” (APE), is intensively analyzed under NHPA Section 106 review. The APE for each alternative varies, and is dependent on the location and nature of proposed treatments and of cultural resources. For this project, the APE only applies to Alternative 2. The APE for Alternative 2 includes the proposed 21 units, approximately 1800 feet of temporary road and 22 landings adjacent to the Benchmark road, with a buffer zone of 50 feet around these areas. When a cultural resource site falls within or overlaps (even partly) with the APE, regulations require that the effects analysis be expanded to include consideration of that entire site (often including a buffer).

Heritage field work was completed by an archaeology technician in accordance with the Lewis and Clark National Forest Site Identification Strategy (SIS, 1995) in 2005 and 2006.

### **4. EFFECTS ANALYSIS METHODS**

The key indicators for heritage resource analysis are generally: 1) the list of sites (and types of sites) that are eligible for or included in the National Register of Historic Places, or those that have not been evaluated, which overlap with proposed activities; 2) the potential for the occurrence of cultural resources in areas that have not previously been surveyed; and 3) the nature of the proposed treatments. Undertakings (actions) which produce ground disturbance or may adversely affect the character of significant heritage resources are primary factors in the NEPA effects analysis. Sites that have been evaluated and found ‘not eligible’ (insignificant) according to criteria of 36CFR60.4 are reviewed for context, but not otherwise carried forward into the analysis.

The Regional PA and the Forest-specific SIS address details of NHPA/Sec. 106 compliance. They prescribe certain percentages of survey coverage for various types of undertakings, in order to adequately complete Sec. 106 effects analysis. The amount of survey and research anticipated depends on the NEPA alternative selected. Information from this portion of the analysis assigns the ‘potential for the occurrence of cultural resources’ used in both NEPA and NHPA review.

To date, 396 acres within or bordering proposed impact areas have been surveyed for heritage resources to prepare for this EA. In addition, previous cultural resource inventories for non-recreation residence-related projects have covered 127 acres within or immediately adjacent to project units. Recreation residence-related cultural resource inventories have recorded 22 of the 48 recreation residence cabins in the Benchmark area.

These total inventoried acreages include 194 survey acres for this project and 31 previous survey acres for the commercial thinning and timber harvest units. This survey acreage represents over 100% of the total 197 acres of these proposed commercial harvest units because it includes areas adjacent to the units. A stratified survey strategy was used for these units, with areas with low probability for having cultural resources not necessarily surveyed, and with higher probability areas receiving intensive survey, and areas of high probability adjacent to the units also receiving survey.

Hand treatment and prescribed burn units received overall 35% survey, with the survey strategy focusing on areas of higher probability for cultural sites with sampling in between.

For the purposes of NEPA analysis, this percentage is adequate to describe the type and nature of sites expected. There is no further cultural resource survey required for either Alternative 1 or 2, as the completed survey meets the requirements of both the Regional PA and the Forest-specific SIS for Section 106 Compliance.

Information from historic maps, the heritage resource database, and from numerous surveys done in the project area identifies specific locations of prehistoric and historic sites relative to proposed impact areas. This information provides historic context and helps identify both specific sites present and the kind of sites which may exist across the project area.

## ***5. EXISTING CONDITION***

### **a. Natural characteristics**

Environmental factors, such as wildfire, erosion, snow load, and wind/sun exposure contribute to the natural deterioration of various types of cultural sites.

### **b. Human Influence**

#### ***Prehistoric Context***

Prehistoric (aboriginal) activities are known to have occurred in the general project vicinity; however evidence of this use is not highly visible on the landscape. Aboriginal use of wildfire, resource procurement, occupation, and established travel routes are the activities most likely to have affected patterns of subsequent use, the condition and remaining evidence of prehistoric sites, and in a subtle way the landscape. Aboriginal subsistence on the Northwestern Plains, which extended into the adjacent mountain ranges, relied on a semi-nomadic hunter and gatherer strategy. The choice of plants and animals used, and methods to obtain and process them varied by cultural group and throughout time. Evidence of use and occupation is manifest in the Rocky Mountains in such site types as lithic scatters and rock art. Two (2) prehistoric sites – both lithic scatters – have been previously identified within the greater heritage analysis area, but both are outside the APE for the project. These sites are identified by their Smithsonian numbers, 24LC1286 and 24LC0108. Neither site has yielded artifacts that would provide indications of a specific time period of use.

### ***Traditional Cultural Use***

In 1995 an ethnographic overview for the Forest was completed under contract to identify locations of traditional cultural concern from American Indians (Deaver 1995). Information accumulated to date demonstrates a long and diverse sequence of prehistoric human activities across the Lewis and Clark National Forest spanning at least 12,000 years (Deaver 1995:9). A review of this document indicated that while several Tribal entities ascribe sacredness to the Rocky Mountains, no specific locations of traditional cultural use have been identified within the project area.

### ***Historic Context***

There are several known historic uses and site types within the broad heritage analysis area subscribed by the valleys surrounding the Benchmark Road 235. Known historic uses of the project area included tie hacking (cutting of railroad ties), Forest Service administrative activities, hunting and fishing, cattle grazing, recreation, and logging and milling. The historic site types associated with these activities include recreation residence cabins and their associated outbuildings; Forest Service administrative sites; linear sites, such as trails and roads; grazing-related sites such as fences, corrals, and water developments; and remnants of logging-related activities.

There are numerous recorded historic sites within the general project area, most of them recreation residence cabins. Only two recorded sites are located within the APE: One Forest Service trail, 24LC1250 and an historic route that may have been a wagon road (24LC2049). The trail remains unevaluated as per the Programmatic Agreement Regarding Cultural Resources Management on National Forests in the State of Montana between the Region One national forests, the ACHP and the Montana SHPO. The wagon route has been evaluated as ineligible by heritage personnel and SHPO consultation on a 'No Historic Properties Affected' will be completed prior to project implementation.

Several sources were researched to help develop the historic context for the analysis area, including General Land Office (GLO) Plats, Lewis and Clark National Forest document archives, photos and maps, and the Regional Historical Society book *In the Shadow of the Rockies: Augusta Area History Book*. An interview/oral history of the area was also conducted with Ernest Kind, longtime Fairfield resident, past Glade Creek sawmill operator, and co-owner of a cabin in the Glade Creek Tract. These sources suggested that historic site types in the greater analysis area could include historic roads, trails, cattle grazing-related sites, cabins and resorts, graves or memorial markers, as well as evidence of hunting camps and Civilian Conservation Corps (CCC) activities.

### ***On-going Human Influences***

Cultural resources are the ultimate product of human activities, yet these resources are also subject to the effects of human activities. Most of the historic resources in the project area, including trails, roads, and cabin sites, have been in continuous use by humans since their construction. This continuous use has the potential to both maintain these sites but also to degrade their historic character with modern improvements. Neglect and removal of features from the historic landscape also continue to influence the cultural resources within the project area.

Prehistoric sites are also influenced by contemporary human use of the landscape. Prehistoric material scatters are often ‘multicomponent,’ a result of use during more than one time period (e.g. prehistoric and historic), and many such sites on national forest lands have continuing, contemporary human use. Cultural (human) –influenced changes and site alterations are varied; in general they may include such things as prehistoric site disturbance from traffic, resource utilization, and recreational activities.

### **c. Desired Condition**

The desired future condition for heritage/cultural resources is that they are evaluated for eligibility to the National Register of Historic Places, nominated to the National Register (if appropriate), and managed in such a way as to prevent adverse effects. Providing for public enjoyment of historic resources is also a desired condition articulated in the Forest Plan and other policy.

## ***6. ENVIRONMENTAL CONSEQUENCES***

### ***Heritage Analysis Area***

The effects area for heritage is the same as the heritage analysis area as described above, with the exception of where site boundaries reach beyond the analysis area (such as historic trails), in which case the analysis area is expanded to consider the effects of the project on the entire site.

### **a. Effects Common To All Alternatives**

#### **1. Direct and Indirect Effects**

For sites in the analysis area, the No Action and Action Alternatives would have no direct or indirect effects in common.

#### **2. Cumulative Effects**

Connected past, present, and reasonably foreseeable actions or events that have altered or could alter the project area landscape relevant to heritage resources include grazing policies and developments, timber harvests and planting, prescribed burning and wildfire suppression, travel planning, and recreation. These actions have the potential to cause disturbances related to natural vegetative cover for sites, soil compaction and erosion, changes to routes and use patterns of historic linear features, and other effects to site integrity. Actions and events not initiated by the Forest also affect sites. They include weather, wildfires, and some aspects of grazing and recreation.

There are no common cumulative effects between the Action and No Action alternatives.

## **b. Alternative 1 - No Action Alternative**

### **1. Direct and Indirect Effects**

Under this alternative no commercial harvest, prescribed burning, temporary road construction or fireline construction would occur at this time. The No Action Alternative has the indirect effect of allowing for the continued presence of combustible fuel-loads around combustible historic sites (structures). Current environmental and social impacts to all site types, such as building maintenance, erosion and weathering would likely continue. The continued presence of heavy fuel loads around historic recreation residence cabins may have the indirect effect of speeding such cabin alterations as installation of metal roofs and requests by cabin owners to replace combustible siding with less-flammable material.

### **2. Cumulative Effects**

The No Action Alternative, along with a Forest Service policy over the last 100 years of attempted comprehensive wildfire suppression in the analysis area, would have the cumulative effect of continuing the presence of and potential increase of fuel buildup in an area with multiple combustible historic sites, leading to the potentially greater risk to those structures of being disturbed or destroyed by wildfire. There are no additional cumulative effects on cultural resources for the No Action Alternative.

## **c. Alternative 2 – Proposed Action**

### **1. Direct and Indirect Effects**

Direct and indirect effects to cultural resources may result from soil compaction and erosion, which are the by-product of logging activities and increased traffic related to logging and prescribed burning. Indirect effects to sites could also result from logging, burning, and traffic-related loss of vegetative cover. These indirect effects include increased visibility of sites and increased exposure to the elements, resulting in a greater chance of looting and artifact displacement from erosion.

Background research identified one historic trail and one historic road, both with segments inside a proposed hand cutting/burning unit (Benchmark #1). Indirect effects of the thinning, hand piling and burning of the unit to the routes is thought to be negligible because of their locations directly on the boundaries of the unit and the protection that the trail will receive during project implementation to keep it useable as a trail resource. The historic road also traverses a commercial cutting unit (Benchmark #4); the road has been evaluated as ineligible for listing on the National Register of Historic Places, and a “No Historic Properties Affected” finding will be consulted on with SHPO prior to project implementation. If the ineligibility of the site is concurred upon with SHPO, then the project will have no impact on historic resources; if SHPO disputes the eligibility of the site the site will either be avoided during project implementation, or a mitigation plan worked out with SHPO prior to project implementation. Table 3-21 lists the heritage sites within the APE of Alternative 2, and the proposed action’s potential impacts on and required mitigation for those sites.

**Table 3-21. Effects of Proposed Treatments for Alternative 2**

Treatment Units (Ac)	Heritage sites (Smithsonian number, type)	National Register of Historic Places Eligibility	Potential Impacts of the Action Alternative on NRHP Eligible Sites	Mitigation Measures
Benchmark #1 (236)	24LC1250 (Historic trail #256)	Unevaluated	None expected. ½ mile of trail is within the unit near the eastern boundary but the treatment (hand felling with jackpot or broadcast and/or pile burning) is unlikely to impact the trail corridor.	None required. The project will not impact any potential eligibility of the site.
	24LC2049 (Historic road)	Recommended Ineligible, SHPO consultation in progress	None	Consultation with Montana SHPO* must be completed prior to project implementation; if consensus is reached on ineligibility of site, then the site will no longer be considered; if consensus is not reached and SHPO deems the site eligible, then measures to avoid the site during implementation will be put into place.
Benchmark #4 (6)	24LC2049 (Historic road)	Recommended Ineligible, SHPO consultation in progress	None	See discussion above.

\*State Historic Preservation Office

## 2. Cumulative Effects

The Action Alternative of the project, when considered along with other fuel-reducing projects and events such as prescribed burns and several nearby wildfires, has the cumulative effect of reducing the combustible fuel buildup in the analysis area, thereby potentially reducing the impacts of wildfire to the multiple historic structures within the Ford Creek-Wood Creek drainages.

The projects and landscape-scale events such as wildfire that have taken place within the larger heritage analysis area have all had some indirect impact on the setting of the historic sites within the area; overall, the results of these projects to that historic setting have been negligible, as the setting changes are largely outside the viewsheds of historic sites, and have changed settings that may not reflect the historic settings in which the historic sites were constructed. The Action Alternative of this project is not expected to have a significant cumulative effect on the setting of any cultural sites when considered additively with past projects and events, other than the continued decreased risk of large wildfire events disturbing or destroying combustible cultural sites.

### **3. Forest Plan and Other Regulatory Framework**

Federal Agencies carry out their responsibilities under heritage laws and regulations by conducting documentary research, consulting with Indian Tribes, the Montana SHPO, the ACHP, and others, and by field-surveying to identify cultural properties. Disclosure of potential effects is initiated with the NEPA analysis, and finalized through compliance with NHPA Section 106 for the preferred or selected alternative. Site-specific effects analysis and the resolution of effects, is ensured by following the regulatory review process at 36CFR800. This process is further guided by the Region One Programmatic Agreement for Cultural Resources (USDA Forest Service et. al. 1995), and the Lewis and Clark National Forest Site Identification Strategy (1995). Through the Section 106 process, all undertakings are identified and addressed, and mitigation measures incorporated into the project design, the EA/Decision Notice, or other appropriate heritage resource agreement. The goal is to avoid, minimize, or mitigate impacts to significant heritage properties.

Both NHPA and ARPA contain provisions for the confidentiality of certain cultural resource information. Site-specific locations and other sensitive site data are not disclosed to the public. Documents containing this information are filed separately in the project planning record and are marked with an asterisk (\*) in the EA bibliography; certain details regarding site location and characteristics is not available under the Freedom of Information Act.

The Lewis and Clark National Forest Plan (FP) provides standards for Cultural Resource Management, reiterating compliance with the above-mentioned laws and regulations. The FP also stipulates that interpretation of cultural resources be carried out in appropriate areas, provides for heritage-related public education, and outlines the need for preparation of a Forest Cultural Resources Overview. Context information gathered in the course of research, inventory, and analysis for the Section 106 process and NEPA is added to the growing research toward such a comprehensive overview. Forest Plan Amendment Number 10 (Lewis and Clark NF 1993) provides for the monitoring of past project inventories and previously recorded cultural sites to see if prescribed mitigation measures are adequate and impacts accurately assessed.

#### **Mitigation Measures and Monitoring**

Mitigation measures for the project as a whole to ensure meeting cultural resource regulatory and Forest Plan requirements are:

One of the cultural resource mitigations stipulated in NEPA is that no ground disturbing actions would occur until Section 106 compliance is finalized. In this manner, adverse effects would be avoided, minimized, or mitigated. Site-specific forms of site avoidance or mitigation, if necessary to comply with Section 106 will include completion of the Section 106 process prior to any ground-disturbing implementation. For this project, the completion of Section 106 process requires consultation with Montana SHPO regarding site 24LC2049; avoidance of the site or a mitigation plan agreed upon with SHPO may be necessary depending on outcome of consultation.

# **I. ECONOMICS**

## **1. INTRODUCTION**

The management of the Lewis and Clark National Forest (LCF) has the potential to affect local economies. People and economies are an important part of the ecosystem. Use of resources and recreational visitation to the Forest generate employment and income in the surrounding communities and counties and generate revenues that are returned to the federal treasury.

## **2. REGULATORY FRAMEWORK**

The preparation of NEPA documents is guided by CEQ regulations for implementing NEPA. NEPA requires that consequences to the human environment be analyzed and discussed in relation to public comments received during scoping. NEPA does not require monetary cost/benefit analysis. If an agency prepares an economic efficiency analysis, then one must be prepared and displayed for all alternatives.

OMB Circular A-94 promotes efficient resource use through well-informed decision-making by the Federal Government. It suggests agencies prepare an efficiency analysis as part of project decision-making. It prescribes present net value (PNV) as the criterion for an efficiency analysis.

The development of timber sales is guided by agency direction found in Forest Service Manual (FSM) 2430. Forest Service Handbook (FSH) 2409.18 guides the financial and if applicable, economic efficiency analysis for timber sales. The 2005 regulations at 36 CFR 219 replace, with few exceptions, all previous versions of section 219 relative to project decisions made after January 5, 2005. The regulations promulgated in 1982 and in 2000 have been superceded and are no longer in effect. As such, they are not cited or referred to. In addition the 2005 rule states, "Except as specifically provided, none of the requirements of 36CFR 219 (2005) applies to projects or activities" (219.2(c)).

### **Forest Plan Consistency**

Several economic standards are identified in Forest-wide management standard E-4 in the Lewis and Clark Forest Plan (pg 2-45). Standard E-4 (12) requires a timber harvest economic assessment when sales are planned for an undeveloped area. An economic assessment is also required where previous sales have shown substantial economic problems. There have been no such problems with previous sales in this area. A feasibility (cash flow) analysis is required on this Forest for sales over 1 million board feet. The harvest associated with this project is less than 1 million board feet so analysis is not required. The TE appraisal indicates it is likely to sell. Standard E-4 (13) talks about deferring sales during periods of poor market conditions. This applies only when anticipated costs may prevent a project from being implemented. The predicted high bid for this project is high enough to cover all *harvest related* costs.

Forest Plan Monitoring item I-1 (page 5-17) calls for annual monitoring of costs and values relative to those identified in the Forest Plan. Following monitoring, both the 95 and 2001 Monitoring reports identified this item as not providing useful information. Most monitoring tools were developed around timber management activities (TSPIRS) and tracking other activities was more difficult. Tracking of costs and target accomplishment for all programs continues but the information is not used for project level decision making. Estimating costs based on the amount of time required for personnel and equipment provides more useful information at the project level.

### **3. AREA OF ANALYSIS**

The analysis area for this project is the project area. All costs and revenues associated with implementing the project decision were included.

#### **Affected Environment**

The combination of small towns and rural settings along with people from some of Montana's largest communities provide a diverse social environment for the geographic region. Local residences pursue a wide variety of life styles, but share a common theme, an orientation to the outdoors and natural resources. This is reflected in both the vocational and recreation pursuits including employment in ranching, lumber milling operations, outfitting, hunting, fishing, hiking, camping and many other recreational activities.

#### **Methodology**

Four measures are appropriate for economic analysis: Project feasibility, financial efficiency, economic efficiency, and economic impacts. Only Project feasibility and financial efficiency will be addressed due to comments received and the small size and scope of this project.

*Project feasibility* is used to determine if a project is feasible – will the sale sell, given current market conditions. The tool used is the Region 1 Transaction Evidence Appraisal (TEA) System. The TEA uses regression analysis of recent timber sales to predict bid prices. The most recent appraisal model for the area of interest was used to estimate the stumpage value (expected high bid resulting from the timber sale auction) for the harvest portion of the project. It takes into account logging system, timber species, quality and volume, market trends, and costs associated with slash treatment and temporary road construction, restoration, log haul and road maintenance. The estimated stumpage value needs to be greater than the essential regeneration costs plus minimum return to the treasury or base rate value. The project is considered feasible if the predicted high bid price exceeds the base rate value. The only essential regeneration costs with this project are regeneration surveys on 41 acres. No surveys are required on commercial thinning treatments. The base rate is well below the anticipated high bid price of \$27.79. A summary of this information is included in the table below.

**Table 3-22. Economic Values of Proposed Action**

<b>Category</b>	<b>Measure</b>	<b>Proposed Action</b>
Harvest	Acres	198
	Volume Harvested (ccf)	1400
	Predicted high Bid (\$/ccf)	\$27.79
Harvest	Discounted Revenue (\$)	\$41,275
Harvest	Costs (Harvest Only) (\$)	-\$39,267
Sale preparation and admin; surveys; and all fuel treatment related costs	Discounted Costs all activities (\$)	-\$184,320
All project costs & revenues	PNV (\$)	-\$143,044

Other factors may compel a buyer to pay more than this indicated high bid price, but a negative value indicates increased risk that the project may not attract bids and may not be implemented. The estimated value of \$41,275 indicates the project is feasible even during the present slump in lumber prices. The revenue estimates from the feasibility analysis are used in the financial efficiency analysis discussed below.

*Financial efficiency* provides information relevant to the future financial position of Forest Service programs if the project is implemented. Financial efficiency considers anticipated costs and revenues that are part of the Forest Service monetary transactions. PNV is used as an indicator of financial efficiency and presents one tool to be used in conjunction with many other factors in the decision-making process. PNV combines benefits and costs that occur at different times and discounts them into an amount that is equivalent for all economic activity in a single year. The negative PNV, for the project as a whole, is due to the high cost of fuel treatments with no direct monetary return.

## **J. INVENTORIED ROADLESS**

### **1. INTRODUCTION**

Seven of the units proposed for treatments within the Benchmark Fuels Project fall within the 866,330 acre Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area (IRA). This is a very large noncontiguous IRA that stretches across the boundaries of six Ranger Districts on four National Forests. Approximately 336,628 acres of this IRA are located on the Rocky Mountain Ranger District of the Lewis and Clark National Forest. The Benchmark Fuels Project boundary intersects portions of the Renshaw and Benchmark/Elk Creek units of the IRA. This fuels reduction project would treat approximately 392 acres within the Renshaw and Benchmark/Elk Creek portions of the Bear-Marshall-Scapegoat-Swan IRA.

There is no road construction or reconstruction of any kind proposed within the boundary of the Bear-Marshall-Scapegoat-Swan IRA as a component of this fuels treatment project.

Of the 10,593 acres Benchmark Fuels Project area boundary, 6,158 acres fall within the boundary of the IRA. Within the overall project area boundary there are approximately 767 acres specifically proposed for the treatment of fuels through a variety of methods described below.

Treatments are delineated into a total of 20 fuel treatment units varying in size from 1 – 236 acres (See Map 2-1). Portions of 7 (of the 20) treatment units fall within the IRA boundary, for a total of approximately 392 acres. This is approximately 51% of the total acreage within units proposed for treatment in the project area.

The following is a summary of the actions by specific fuel treatment that fall within the IRA.

#### **FUEL TREATMENT UNITS:**

Aspen Unit #1 (30 acres within the IRA) / (44 total unit acres) Map 2-5

Ford Creek Unit #1 (68 acres within the IRA) / (193 total unit acres) Map 2-6

Ford Creek Unit #2 (82 acres within the IRA) / (84 total unit acres) Map 2-6

Benchmark Unit #1 (186 acres within the IRA) / (236 total unit acres) Map 2-2

Mule Creek Unit #1 (1 acres within the IRA) / (13 total unit acres) Map 2-3

#### **PROPOSED TREATMENTS FOR TREATMENT AREAS ABOVE:**

These units would be treated by hand, utilizing power saws. Forest Service crews would thin portions of these units. Treatments would include the felling of small diameter lodgepole pine and Douglas-fir trees less than forty feet in height over selected portions of the unit. Individual patches of small diameter trees would be cut to reduce ladder fuels and break up fuel continuity. The mean diameter of the remaining trees would be slightly larger than the mean diameter of the pre-treatment stand. When these downed trees cure, the unit would be treated with prescribed fire, either with jackpot or broadcast burning. Where continuous or heavy fuels preclude jackpot or broadcast burning, downed fuels would be piled and burned.

Approximately 367 acres within the IRA are proposed for the treatment described above. There is approximately 570 acres of the above described fuels treatment within the overall project area.

#### **FUEL TREATMENT UNITS:**

Aspen Unit #2 (22 acres within the IRA) / (39 total unit acres) Map 2-5

Double Falls Unit #1 (3 acres within the IRA) / (42 total unit acres) Map 2-5

#### **PROPOSED TREATMENTS FOR TREATMENT AREAS ABOVE**

Treatment in these units is planned as a commercial thinning, utilizing mechanical equipment. Trees would be removed in a manner that would result in 20-30 foot crown openings to provide a mosaic of fuels in the treatment area. The mean diameter of the remaining trees would be equal to or greater than the mean diameter of the pre-treatment stand. Generally, less than 50% of the trees would be removed. Hand slashing and piling would follow as needed. Piles would be burned once cured.

Approximately 25 acres within the IRA are proposed for the treatment described above. There is approximately 81 acres of the above described fuels treatment within the overall project area.

#### **FUEL TREATMENT OBJECTIVES**

The fuel treatments described in the preceding paragraphs were designed to reduce the potential for crown fire and reduce the intensity of surface fires in the vicinity of recreation residences, permitted lodges, campgrounds, and administrative facilities along the Benchmark Road #235. All proposed treatments identified in this project lie within the Lewis and Clark National Forest's Fire Management Unit (FMU) 1. This FMU "includes wildland/urban interface (WUI) as defined by the Western Foresters & Western Governors Association, and it also includes all Forest Service administrative sites on the Forest." Wildland fire management strategies for this FMU are limited to a complete fire suppression strategy. All wildland fires in the FMU are considered unwanted events. Moreover, private and administrative structures in the Benchmark area are included in the Rocky Mountain Ranger District's Emergency Plan – a plan that has been employed to conduct emergency notifications and evacuations, as well as direct structure protection, along the Benchmark Road #235 during the 2006 and 2007 fire seasons. The Lewis and Clark's Fire Management Plan makes the following observation concerning the treatment of fuels near structures in this FMU: "Mechanical fuel treatments are recommended in areas adjacent to interface areas or administrative structures prior to prescribed burning."

The treatments for the proposed action may be divided into two categories: fuel breaks and community protection zones. Units that may serve as fuel breaks are the larger units identified in this project. These units include Ford Creek #1, Ford Creek #2, and Benchmark #1. The objective of these treatments is to reduce conifer encroachment on openings, promote aspen suckering, and reduce young conifers as an understory component in adjacent stands of mature conifers. Fuels in the units are characterized as moderate to high departure in condition class. The treatments would include the thinning of small diameter conifers, followed by jackpot or broadcast burning, with no commercial use derived from the treated

stands. These treatments were located in close association to recreation residence tracts and the Forest boundary.

The majority of units proposed for the Benchmark fuels project were identified to act as community protection zones (CPZ). These units are located immediately around recreation residence lots, lodges and resorts, campgrounds, and administrative sites. To define the boundaries of CPZs, fire managers referenced parameters define by Brian Nowicki in *The Community Protection Zone: Defending Houses and Communities from the Threat of Forest Fire* (2002). Nowicki's guidelines were adjusted to local conditions. CPZs are designed to provide an area where firefighters can accomplish structure protection work in comparative safety. Under certain environmental conditions, CPZs can provide a safety zone for firefighters or reduce the exposure of members of the public to intense fire. Treatments in the CPZ can also enhance the safety of firefighters entering a residential tract to extinguish persistent fire or to remove hazardous trees following the passage of a fire front. In addition, these zones may reduce the threat to structures posed by lofted firebrands. The majority of treatments identified in the Benchmark Fuels Reduction Project to create CPZs will entail the removal of commercial forest products.

## ***2. REGULATORY FRAMEWORK***

The original inventory of roadless lands took place in the 1970s through the Roadless Area Review and Evaluation (RARE) I process, and then again in the late 1970s during RARE II. The RARE process was intended to evaluate the potential for such roadless areas to be included in the wilderness preservation system. This process was completed through development of the Lewis and Clark National Forest Plan (Forest Plan, 1986), which made recommendations on whether individual inventoried roadless lands should be considered for wilderness designation. The Benchmark/Elk Creek unit of the IRA was not recommended for wilderness inclusion in the Forest Plan. The Forest Plan also provides management direction for IRAs. Although Forest Plan Management Areas (MA) E, G, H, and O are represented within the project area, treatments are only proposed in MA E and O within the IRA boundary. Forest Plan direction for MA E is to “provide sustained high levels of forage for livestock and big game animals Forest Plan direction for MA O is to “protect, maintain, and improve resource quality while providing timber at a low intensity level to meet local needs. Manage forest for livestock at a moderate intensity level.” Vegetation manipulation in both these MAs is not prohibited, but must meet other management area direction.

The Bear-Marshall-Scapegoat-Swan IRA is further described in Appendix C of the Forest Plan EIS (USDA Forest Service 1986). Appendix C contains a site specific wilderness evaluation of IRAs. The 1964 Wilderness Act considered several attributes in determining whether certain lands possessed wilderness characteristics. These include Natural Integrity, Apparent Naturalness, Opportunities for Solitude, and Opportunities for Primitive Recreational Experiences.

Subsequent evaluation of roadless area qualities included attributes of Special Features and Boundary Management (Forest Service Handbook 19098.12 Chapter 70). This analysis includes an evaluation of the proposed vegetation treatments on these roadless characteristics and compares any changes to the current conditions and the effects of the action alternative.

### 3. AREA OF ANALYSIS

The area considered for direct, indirect, and cumulative effects includes the Renshaw and Benchmark/Elk Creek portions of the Bear-Marshall-Scapegoat-Swan IRA.

### 4. EFFECTS ANALYSIS METHODS

Effects analysis methods are based on Forest Plan evaluation and observations of those characteristics within the IRA and include subsequent changes to the Renshaw and Benchmark/Elk Creek portions of the Bear-Marshall-Scapegoat-Swan IRA since development of the 1986 Forest Plan, if any have occurred.

In addition to the direction and wording in the Forest Plan, the following table will be used as a “crosswalk” guide in the analysis of the potential effects from the proposed project activities on Wilderness Attributes and Roadless Characteristics.

**Table 3-23. Wilderness Attributes and Roadless Characteristics**

<b>Wilderness Attributes</b>	<b>Roadless Characteristics</b>
Natural Integrity	High quality or undisturbed soil, water, and air  Sources of public drinking water  Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land  Reference landscapes
Apparent Naturalness	Natural appearing landscapes with high scenic quality
Remoteness and Solitude	Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation
Special Features and Special Places or Values	Other locally identified unique characteristics  Traditional cultural properties and scared sites
Manageability and Boundaries	No criteria

### 5. EXISTING CONDITION

The existing condition descriptions below are based on those attributes evaluated in the 1986 Forest Plan in addition to other changes which have occurred under the October 2007 Rocky Mountain Ranger District Travel Management Plan Final Environmental Impact Statement and the associated 2007 Birch Creek South Record of Decision.

#### **a. Natural Characteristics**

Natural Integrity and Appearance (Apparent Naturalness): Generally, the landscape appears natural and unchanged by human development within the IRA boundary proper in the project area. However, due to the very close proximity of the Benchmark Forest Road #235, past timber cutting, the paved Benchmark air strip, numerous developed campgrounds, picnic areas, trailheads, outfitter corrals, Forest Service administrative sites, special use permit

resorts, recreation residence cabins and driveways accessing these developments, there is no much of a sense of true naturalness or natural integrity. Changes in ecological processes over the decades such as fire suppression, insect and disease outbreaks, and fuel build up continue to affect the natural integrity in this area. Cattle and horse grazing allotments are active and stocked during the summer grazing season within portions of the IRA in the project area. Some impacts to natural integrity have resulted from past grazing activity. Driveways, drift fencing, and watershed protection fencing are located throughout the area and detract from apparent naturalness.

**Opportunity for Solitude:** The Renshaw and Benchmark/Elk Creek portions of the IRA provide some excellent opportunities for solitude and primitive recreation because of the size and proximity to the Bob Marshall and Scapegoat Wilderness Areas. However, opportunities are limited in the area of the proposed action due to the very close proximity to the varied developments described previously under the section on Natural Integrity and Appearance. Sounds of human activity, mostly in the form of motorized vehicle traffic, can be routinely heard from all locations within the project area. From many locations within the project area, including areas within the IRA boundary, motorized vehicle traffic is visible on the road system. There are also several system trails in the area that are open to motorcycle users. For these reasons, opportunities for solitude are very limited within the boundary of the IRA in the project area.

**Primitive Recreation Opportunities:** Primitive recreation opportunities do exist within the IRA boundary. Numerous hiking and stock trails traverse the area and see frequent use during the summer season. During the months of September through November the area receives moderate to heavy day use by big game hunters.

**Special Features:** No special features have been identified in that portion of the IRA that falls within or directly adjacent to the project area boundary.

**Manageability and Boundaries:** The boundaries of the IRA as identified on maps are not clearly defined on the ground in this area and were established by the creation of a “buffer strip” extending out approximately one quarter of a mile from the Benchmark Forest Road #235. Generally the IRA boundary is parallel to the alignment of Benchmark Road #235. There is no defined boundary between the IRA and the general forest area directly adjacent to it. There have been no issues related to the manageability or the boundary of the IRA.

## **b. Human Influences**

Human influence within the IRA is predominately comprised of a number of maintained system trails and barbed wire drift fencing associated with existing permitted cattle allotments and an administrative horse pasture. A number of non-system, user created and special use trails traverse the area. In addition, as already described, significant human influence can be seen and heard from within the IRA boundary in those locations that are in close proximity to the human developments along Benchmark Road #235. When looking at the portion of the project area boundary within the IRA proper little to no direct human influence is noticeable.

### **c. Desired Condition**

This area should offer a range of recreational opportunities with emphasis on semi-primitive non-motorized recreation, big game hunting or other game species hunting opportunities. The IRA should display the roadless characteristics critical to maintaining the areas natural integrity, apparent naturalness, and opportunities for solitude and remoteness. Existing routes should continue to offer limited access and provide for hiking, horseback riding, hunting, sightseeing, or similar activities. No developed recreation facilities are planned within the IRA.

## ***6. EFFECTS COMMON TO ALL ALTERNATIVES***

The following discussion outlines indirect, direct, and cumulative effects to roadless characteristics within the Renshaw and Benchmark/Elk Creek portions of the Bear-Marshall-Scapegoat-Swan IRA.

### **a. Area of Analysis**

The area considered for direct, indirect, and cumulative effects includes the Renshaw and Benchmark/Elk Creek portions of the Bear-Marshall-Scapegoat-Swan IRA.

### **b. Analysis Methods**

The effects are measured against the roadless area values and characteristics found within the Forest Plan for the Bear-Marshall-Scapegoat-Swan IRA. The effects to these attributes from conducting proposed treatments to reduce hazardous fuel loading and bring about other ecological changes within the IRA have been analyzed. The roadless characteristics analyzed include: natural integrity, apparent naturalness, opportunities for solitude, opportunities for primitive recreational experiences, and special features. The project would have no effects on IRA boundaries and manageability. No changes to the boundaries of the IRA are proposed nor will the boundaries be reduced or altered under either alternative. Opportunities to expand the boundaries are limited due to proximity to the developed area along the Benchmark Road. This criteria will not be discussed further.

## ***7. EFFECTS BY ALTERNATIVE***

### **a. Alternative 1 – No Action**

The no action alternative would have no additional immediate effect to the existing roadless character within the project area. The no action alternative, by not manipulating fuels and other vegetation, could affect the ability to suppress wildfire. Chances for the potential of having an uncharacteristic high severity wildfire event would continue to be moderate to high under the no action alternative. The lack of surface fire over time has allowed succession to advance with the establishment of shade tolerant conifer species within the project area of the IRA. Conifer encroachment is evident along the edges and scattered throughout grassland meadows thus reducing both the natural meadow acreage and biological diversity within the IRA.

## 1. Direct and Indirect Effects

Effects to natural integrity: Natural integrity is the extent to which long-term ecological processes are intact and operating. Impacts to natural integrity are measured by the presence and magnitude of human induced change to an area. Fire suppression has resulted in an unnatural build-up of fuels, encroachment into grasslands by conifers, and timber stand that are denser and more decadent than they might be if fire played an active role over the last 100 years. This can lead to change in vegetative composition that could be different under conditions in which fire was allowed to play a larger role. Forest visitors might not be cognizant of these changes, but over time, long-term ecological processes may be affected to the point that forest users would notice (i.e. large-scale insect/disease infestation, poor health of heavily stocked stands, change in species composition, large-scale high severity wildfires). The no action alternative trends toward eliminating the role which fire plays in maintaining a healthy ecosystem and its natural integrity. Long-term negative effects in terms of unnatural ecological conditions are a likely result if no action is taken.

Effects to Apparent Naturalness: Apparent naturalness means that the environment looks natural and provides scenic quality for forest visitors to the area. It is a measure of importance of visitor's perceptions of human impacts to an area. Even though some of the long-term ecological processes of an area may be interrupted, the landscape of the area generally appears to be affected by the forces of nature. If the landscape has been modified by human activity the evidence is not obvious to the casual forest user, or it is disappearing due to natural processes. The no action alternative has no immediate effect to the apparent naturalness of the area, but would trend to continue to move the area toward large-scale uncharacteristic high severity wildfire events if no action is taken to manipulate fuels and vegetation to increase the opportunities and likelihood of successful wildfire suppression and control.

Effects to Opportunities for Solitude, Remoteness, and Primitive Recreation Experience: Solitude is a personal, subjective value defined as isolation from sights, sound, and presence of others, and human development. Remoteness is a perceived condition of being secluded, inaccessible, or out of view. A primitive recreation experience includes opportunities for isolation from evidence of man, a vastness of scale, feeling a part of the natural environment, having a high degree of challenge and risk, and using outdoor skills characterized by meeting nature on its own terms without comfort or convenience of facilities. Opportunities for solitude and sense of remoteness are primarily affected by actions that increase human presence in an area, such as road development, development of recreation sites, changes in types of uses, such as allowing motorized vehicular use in an area that was previously non-motorized. Sights of human civilization can also affect remoteness or opportunities for solitude and primitive and unconfined recreational experiences.

There is little sense of solitude or remoteness in the IRA within the project area presently due to the close proximity of the sights and sounds of the developed Benchmark road corridor. The no action alternative would continue the existing opportunities for solitude, remoteness, and primitive recreation experience.

Special Features: No special features have been identified in that portion of the IRA that falls within or adjacent to the project area boundary.

## **2. Cumulative Effects**

Past historical wildfires within the project area boundary in the IRA have had some minor effects to date in maintaining the natural integrity of the ecosystem. There are no new, significant recreation developments planned in the project area and none have been added in recent years. Cattle and horse grazing allotments in the area would continue to be permitted in the future and would likely see similar stocking levels to those in the past. Special use permits authorizing 48 residence cabins and 2 resorts would be limited to those that have historically existed in the project area. Existing outfitter and guide operations may see increased activity in the future and this use may lead to more use of the system trails within and adjacent to the IRA.

### **b. Alternative 2 – Proposed Action**

The fuel treatments proposed within this project include the removal of vegetation through a variety of means to achieve the stated objectives of the project as outlined in the purpose and need statement. These proposed treatments would have some level of short and long term effects to the characteristics of the IRA within the project boundary. Cut stumps would be visible. There would be evidence of prescribed burning within the IRA in the form of some blackened trees and ground cover. Evidence of blackened ground cover would likely be visible for the first year or two dependent of fire severity and then green up is expected to occur. Blackened tree trunks may be evident for a longer period of time; some burned trees may remain standing for 10-20 year or longer. Natural tree regeneration is expected over time thus creating mosaic patterns, changed stand structure and species composition diversity over the landscape which would emulate natural process's more in line with historical fire patterns. These treatments are expected to help maintain the natural integrity of the IRA by continuing to provide a diversity of plant communities. This alternative would contribute to reducing the potential for and intensity of large scale uncharacteristic wildfire within the IRA.

### **1. Direct and Indirect Effects**

Vegetation removal and prescribed fire would be utilized as a means to modify existing vegetation within the IRA. The removal of some vegetation and the introduction of fire in this alternative would attempt to mimic natural ecological processes to move vegetation and the landscape towards conditions that would likely be found if fire suppression had not occurred. Direct effects would be an incremental reversal of past suppression results. Indirectly, prescribed burning actions would promote utilization of these habitats by wildlife and promote regeneration of other species which have become absent or decadent as a result of conifer encroachment and past fire suppression activities. Direct and indirect effects of this alternative on the characteristics of natural integrity, opportunities for solitude, and primitive recreation opportunities would be minimal and would generally not be noticed by forest users and the effects would be short-term. No temporary or system road construction or reconstruction would be needed within the IRA, so accessibility to the area would not change as a result of this project. The actions are relatively small in scale, not irreversible, and over time would help maintain the natural ecological integrity of the IRA.

Effects to Natural Integrity: The proposed treatments would allow a more natural function of fire to occur on the landscape and maintain the roadless characteristic of natural integrity

within the IRA and surrounding area by continuing to offer a diversity of plant and animal communities and providing habitat for species dependent on large undisturbed areas. The general landscape of the IRA would not be affected.

**Effects to Apparent Naturalness:** Apparent naturalness means that the environment looks natural and provides scenic quality for forest visitors to the area. It is a measure of importance of visitor's perceptions of human impacts to an area. Personal values may lead forest visitors to feel that vegetation manipulation and prescribed burning is an unnatural process which affects naturalness within a roadless area. But others feel that natural fire may also affect the apparent naturalness of an area. In either case, it is difficult to distinguish the effects to apparent naturalness from natural fire from those created through the use of prescribed fire. Vegetation treatments proposed within the project would create the appearance of being manipulated by human activity although the effects are short term and limited in area. Proposed treatments would increase the spacing of trees within the project area and create increased sight distances to some degree. However, topographic variations, and the fact that the treatment areas would be limited in extent would ensure the sights of civilization are not exposed to a notable degree beyond what currently exists. The general forest visitor would likely not readily notice where these treatments have occurred once the area has been treated with prescribed fire and re-growth of grasses and conifers has taken place. For a number of years after project completion, groups of 5-30 cut stumps would be somewhat evident within treatment units where vegetation removal is proposed. In order to lessen the potential negative visible effects to apparent naturalness, it is recommended that all stumps be cut as close to the ground level as possible within the boundary of the IRA.

**Effects to Opportunities for Solitude, Remoteness, and Primitive Recreation Experience:** There is little sense of solitude and remoteness in the IRA within the project area presently due to the close proximity to the sights and sounds of the development along Benchmark Road #235. In the short term, during the implementation phase of the project, there would be some effects to the opportunities for solitude, remoteness, and primitive recreation experiences that do exist in the area. Forest users may be impacted by the sights and sounds of some of the proposed fuels treatments being implemented. These impacts however, would only be evident for a short period of time as vegetation removal or prescribed burning is occurring. After the implementation phase of the project is completed, the opportunities for solitude, remoteness, and primitive recreation experiences would return to a condition similar to those that existed prior to the initiation of the project.

**Special Features:** No special features have been identified in that portion of the IRA that falls within or adjacent to the project area boundary.

## **2. Cumulative Effects**

No cumulative changes in remoteness, opportunities for solitude, or primitive recreational experiences from current conditions are expected in the IRA under Alternative 2. Barring any unforeseen major wildfire, insect epidemic, or large scale blow down event, there are no other known projects or activities being proposed or on-going in the analysis area which would contribute to significant cumulative effects on the roadless area values and characteristics.

## ***8. MITIGATION***

Recommended mitigation is to cut all stumps as close to ground level as possible within the boundary of the IRA in order to lessen the potential negative visual effects to apparent naturalness.

## ***9. CONCLUSION***

This project would implement a variety of fuel reduction treatments as a part of this proposed action within the Bear-Marshall-Scapegoat-Swan IRA. These treatments would help recreate the natural biodiversity that might have been present if fire suppression had not ruled in this area for the past 100 years and reduce the risk of having a high severity wildfire event. Apparent naturalness, solitude, and remoteness are already affected within the IRA boundary in the project area due to the close proximity to significant human developments along the Benchmark Forest Road #235 corridor.

This project would create some effects that would be noticeable to forest visitors within the IRA. However, these effects would be short term in nature and generally would only be much of an impact during the actual implementation of the project and a few years following the treatments.

The long term effects to the characteristics of the Bear-Marshall-Scapegoat-Swan IRA would be insignificant over time.

## **K. RANGELANDS**

### **Existing Condition**

The treatments identified in the Benchmark Fuels Reduction Project, under the “Action Alternative” would carry effects to the following cattle allotments: Ford Basin, Ford Creek, and Willow Creek. In addition, horse allotments for administrative use and the use of a private outfitter in the Benchmark area would be effected. Management of these allotments is in compliance with the Lewis and Clark Forest’s Land Management Plan. Site specific management direction is provided in the Sun Canyon Range Analysis, June 1997. Currently, Ford Basin Cattle Allotment provides for 425 AUMs to be utilized by 134 cow/calf pairs and three horse/mules. The Ford Creek Allotment supports 985 AUMs to be utilized by 320 cow/calf pairs, while the Willow Creek Allotment supports 801 AUMs to be utilized by 260 cow/calf pairs. Benchmark supports a horse allotment for a local outfitter of 74 AUMs to be utilized by 31 horses/mules. In addition, the Forest Service is allotted 10 mules/horses in two administrative pastures in the Benchmark area. The administrative pastures are to be utilized on an alternating basis—twenty days of use is allowed on the Lower pasture on alternating years, and thirteen days of use is allowed in the Upper pasture on the years that the Lower pasture is not utilized.

### **Short Term Effects**

In the short term, adjustments to grazing schedules will be required to create conditions favorable to prescribed fire application. Arrangements with permittees will be made to rest the larger treatment units in the year prior to implementation of jackpot or broadcast burning in order to promote the buildup of fine fuels. These units include Aspen Unit #1, Ford Creek Unit #1, and Ford Creek Unit #2. In addition, managers will rest Benchmark Unit #1 from agency use in the year prior to broadcast burning. Reductions in forage will be experienced immediately after the application of fire to treatment units. This reduction will be the most significant in Benchmark Unit #1, Ford Creek Unit #1, and to a lesser extent in Ford Creek Unit #2. Additional adjustments in grazing schedules will be used to minimize the impacts of prescribed fire in the year following treatment. In particular, grazing schedules will be managed to promote the effectiveness of fireline rehabilitation, ensure the propagation and vigor of native vegetation, and minimize impacts to bighorn sheep wintering in the vicinity of Ford Creek Unit #1.

### **Long Term Effects**

In the long term, treatments in the Benchmark Fuels Reduction Project should increase the quantity and quality of forage in area allotments. The proposed treatments would remove conifer species encroaching on natural openings. This action would promote the reclamation of grasses and forbs in these openings. In addition, the introduction of fire to existing opening will enhance the palatability of grasses.

## **L. NOXIOUS WEEDS**

### **Existing Condition**

A number of noxious weed infestations occur in the project area designated for the Benchmark Fuels Reduction Project (see attached map). Identified infestations occur in areas of impact associated with vehicle traffic, trails, camping, and livestock grazing. The Rocky Mountain District has identified these areas and has an active weed-control program. Identified weed infestations include Spotted knapweed (*Centaurea masculosa*), Houndstongue (*Cynoglossum officinale*), Canada thistle (*Cirsium arvense*), Oxeye daisy (*Chrysanthemum leucanthemum*), and Black henbane (*Hyoscyamus niger*).

### **Short Term Effects**

The use of mechanized equipment and prescribed fire identified in Alternative 2 may promote conditions favorable to the spread of noxious weeds. However, units identified in this Alternative have been located to avoid areas of significant noxious weed infestation. Localized populations of houndstongue and knapweed have been surveyed and treated within the perimeter defined for the Aspen Units and in close association—though not within—a number of other units. The continued control of the spread of these populations of noxious weeds will be dependant on the continued application of herbicides and monitoring following ground disturbance created by vehicle or equipment activity, and following the application of prescribed fire. Noxious Weed Prevention Practices developed for prescribed fire and for harvest operations should be followed.

### **Prescribed Fire**

- Ensure that rental equipment is free of weed seed and propagules before the contracting officers representative accepts it.
- Avoid ignition and burning in areas at high risk for weed establishment or spread due to fire effects. Treat weeds that establish or spread because of unplanned burning of weed infestations.
- When possible use staging areas and helibases that are maintained in a weed-free condition.
- Pre-inventory project area and evaluate weed present with regard to the effects on the weed spread relative to the fire prescription.
- Rehabilitate any constructed fire line to minimize exposed soils.

### **Timber Harvest Operations & Stewardship Contracting**

- Treat weeds on projects used by contractors, emphasizing treatment of weed infestations on existing landings, skid trails, and helibases before activities commence.
- Train contract administrators to identify noxious weeds and select lower risk sites for landings and skid trails.
- Encourage operators to maintain weed-free mill yards, equipment parking, and staging areas.
- Use standard timber sale contract provisions such as WO-C/CT 6.36 to ensure appropriate equipment cleaning (reference Appendix 1 of USDA Forest Service **Guide** to Noxious Weed Prevention Practices).

Due to the annual management of noxious weeds along the Benchmark Road, the identification of noxious weed populations, and the location of project boundaries, the increase and/or spread of noxious weeds in the Project Area should be similar for both Alternatives 1 (No Action), and Alternative 2 (Proposed Action). This result, however, will be dependant on the application of Weed Prevention Practices for Alternative 2 and the continued treatment of existing populations of weeds for Alternatives 1 and 2. Rehabilitation of landing sites and temporary roads—as identified in the Benchmark Project’s Soils Report—will also serve to minimize the potential for noxious weed spread. All seeding of disturbed soils at sites impacted by mechanical harvest should be accomplished using a native seed mix supplied by the Lewis and Clark National Forest.

### **Long Term Effects**

Long term effects for both Alternatives 1 and Alternatives 2 will be similar, dependant on mitigation measures applied for Alternative 2. If mitigation measures are followed for Alternative 2, and monitoring is implemented according to the monitoring plan supplied in the Vegetation/Fuels Report, the long term effects for Alternative 2 could include greater control of noxious weed spread. Currently, the area identified for this project receives annual monitoring and treatment of noxious weeds. Activities associated with Action 2—such as monitoring fuels conditions—would increase the intensity and area monitored for noxious weed propagation. In addition, rejuvenation of native vegetation in the units proposed for Alternative 2 would result in greater resistance to invasion by noxious weeds.

## M. WILDLIFE

Species considered in this analysis include federally listed threatened and endangered species, Forest Service Sensitive Species, and Forest Plan Management Indicator Species (MIS). Table 3-24 provides a list of all wildlife species in the above categories known or potentially occurring on the Rocky Mountain Ranger District. The table lists information on habitat and species occurrence, and lists the determinations of effect for those species along with the rationale for the determinations. Federally listed species (grizzly bear, Canada lynx, and gray wolf) and other species or habitats of particular concern (northern goshawk, old growth, and snag/cavity-nesting habitat) potentially affected by this project will be evaluated in more detail below, as indicated in Table 3-24.

**Table 3-24. Wildlife Species Considered in Benchmark Project Analysis**

Species Name	Habitat Preference and Occurrence in Analysis Area	Determination and Rationale
<i>Threatened and Endangered Species</i>		
<b>Grizzly Bear (T)</b>	Habitat generalist, requires lack of human disturbance (low road density). Analysis area contains mapped spring and denning habitats. Bears may be present at times throughout analysis area.	Refer to analysis in this document and BA in project file. <b>May affect, but not likely to adversely affect (NLAA).</b>
<b>Canada Lynx (T)</b>	Wet subalpine fir/lodgepole pine/Douglas-fir at mid-elevations; vertical understory structure for denning, abundant snowshoe hare prey. Lynx and habitat occur in western 2/3 of analysis area.	Refer to analysis in this document and BA in project file. <b>May affect, but not likely to adversely affect (NLAA).</b>
<b>Gray Wolf (E)</b>	Habitat generalist, requires lack of human disturbance and abundant prey (primarily elk and mule deer). No known dens or rendezvous sites in analysis area. Analysis area has little prey winter range. Occasional use of project area by individuals possible.	Refer to analysis in this document and BA in project file. <b>May affect, but not likely to adversely affect (NLAA).</b>
<i>Sensitive Species</i>		
<b>Bald Eagle (S)</b>	Preferred nesting areas adjoin large bodies of water; nest and perch in large diameter snags or trees. Nesting habitat not present in project area. May forage in project area, especially in winter.	No nesting habitat and no known nests in analysis area. Activity associated with implementing treatments could result in disturbance to foraging bald eagle in the immediate vicinity. <b>No Impact to habitat. May impact individuals, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>

Species Name	Habitat Preference and Occurrence in Analysis Area	Determination and Rationale
<b>Peregrine Falcon (S)</b>	Nests on cliffs adjacent to grassland, riparian openings or bodies of water. Release site near Wood Lake has not documented occupancy since release in late 1990's. Limited suitable habitat in analysis area.	Although very limited habitat is present in the project area, occupancy has not been documented. There will be no change to habitat from this project. <b>No Impact to individuals or habitat.</b>
<b>Flammulated Owl (S)</b>	Semi-arid cool sites of mid-elevation pine communities. Nests in existing cavities. No habitat in analysis area.	No known occurrence or habitat in analysis area. <b>No Impact to individuals or habitat.</b>
<b>Burrowing Owl (S)</b>	Open areas with low ground cover and abandoned small mammal burrows. No habitat exists in the project area.	No known occurrence or habitat in analysis area. <b>No Impact to individuals or habitat.</b>
<b>Black-backed Woodpecker (S)</b>	Primary habitat in post-fire or bark beetle-outbreak areas. Abundant habitat from recent (2006, 2007) large fires adjacent to project area. Habitat abundant and increasing in Northern Region.	Limited individual use of project area possible in pockets of mature forest. Project will not impact post-fire or beetle-infested areas; R1 guidance (USDA 2007d) indicates no further analysis needed. <b>No Impact to habitat. May impact individuals, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>
<b>Townsend's Big-eared Bat (S)</b>	Preferred habitat is caves and on occasion buildings. There is possible habitat in the analysis area, but occurrences have not been documented.	Activity associated with implementing treatments could result in disturbance to individual bats if they occur in the area. Habitat will not be altered. <b>No Impact to habitat. May impact individuals, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>
<b>Wolverine (S)</b>	Wide ranging use of variety of habitats. Natal denning in high-elevation cirques. No denning habitat exists in the analysis area. Possible foraging habitat exists in the project area.	Activity associated with implementing treatments could result in disturbance to individual wolverines if they occur in the area. Habitat will not be altered. <b>No Impact to habitat. May impact individuals, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>
<b>Harlequin Duck (S)</b>	Low-gradient, fast-flowing streams with cobble to boulder substrate. Approximately 300m of habitat (portion of Straight Creek) travels through analysis area. Duck presence in that area unlikely due to proximity to roads, trails, campground, structures, etc.	Implementation of treatments will not affect harlequin duck activity or numbers. Habitat will not be altered. <b>No Impact to individuals or habitat.</b>

Species Name	Habitat Preference and Occurrence in Analysis Area	Determination and Rationale
<b>Fisher (S)</b>	Prefer forested areas of continuous cover; closely associated with riparian areas. Possible habitat occurs in riparian corridors within analysis area. No documentation of fisher presence.	Project implementation may result in disturbance to foraging fisher. Habitat will not be altered. <b>No Impact to habitat. May impact individuals, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>
<b>Northern Bog Lemming (S)</b>	Thick mats of sphagnum moss in bogs, fens, or other wet areas. Habitat occurs in the Wood Creek drainage.	Treatments will not occur in wet areas or where known habitat occurs. Human activity in proximity to those areas during treatment implementation could disturb individual lemmings. <b>May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>
<b>Westslope Cutthroat Trout (S)</b>	Cold streams with high water quality and few competing fish species. Spawn in late spring/early summer in gravel riffles with low sediment levels. Habitat occurs in Straight Creek in NW portion of analysis area, and in Wood Lake, but populations there are hybridized.	Treatment implementation will not occur in vicinity of habitat. Treatments designed to minimize impacts to water quality in analysis area. Distance between treatments and habitat would ensure no changes to habitat. <b>No impact to individuals or habitat.</b>
<b>Western Toad (S)</b>	Breeds in shallow, silt-bottomed ponds with little flow. Uses forested areas for non-breeding activity. There is occupied breeding habitat in the vicinity of Benchmark administrative site and scattered along the Wood Creek drainage within the analysis area.	Treatments will not impact breeding habitat but will affect some timbered areas potentially used by toads for non-breeding activity. <b>May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>
<b>Northern Leopard Frog (S)</b>	Low elevation ponds and slow-moving streams and rivers. Possible habitat in Wood Creek and Ford Creek drainages within analysis area, but presence has not been documented.	Treatments will not impact ponds and streams used by leopard frogs. <b>No impact to individuals or habitat.</b>
<b>Greater Short-horned Lizard (S)</b>	Habitat found on ridge crests between coulees, and in sparse, short grass and sagebrush with sun-baked soil. Habitat does not exist in the project area.	Species not known to occupy the project area. <b>No Impact to individuals or habitat.</b>
<b><i>Management Indicator Species</i></b>		
<b>Northern Goshawk (MIS)</b>	Nests in mature/over-mature forest; forages in variety of successional stages. Habitat exists in the project area. Five territories documented in analysis area.	Refer to analysis in this document. <b>May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.</b>

Species Name	Habitat Preference and Occurrence in Analysis Area	Determination and Rationale
<b>Elk (MIS)</b>	Wide ranging through variety of habitats. Habitat and population exists in the analysis area. Existing elk hiding cover is estimated at about 37% in the analysis area (see project file for details).	Individual elk could be disturbed during treatment implementation. <b>Post-treatment hiding cover is estimated at about 34% in the analysis area, meeting F.Plan Standard C-1-5. Some treatments may improve elk foraging habitat.</b>
<b>Mule Deer (MIS)</b>	Wide-ranging through variety of habitats. Habitat and population exists in analysis area.	Individual deer could be disturbed during treatment implementation. <b>Minor acreage of habitat will be altered by the project; possible improvement of minor acreage of foraging habitat.</b>
<b>White-tailed Deer (MIS)</b>	Deciduous riparian and low-elevation grass and cropland. Primary habitat at lower elevation and private lands. Habitat and population exists in analysis area.	Individual deer could be disturbed during treatment implementation. <b>Minor acreage of habitat will be altered by the project; possible improvement of minor acreage of foraging habitat.</b>
<b>Black Bear (MIS)</b>	Wide ranging through variety of habitats. Habitat and population exists in the analysis area.	Individual bears could be disturbed during treatment implementation. <b>Minor acreage of habitat will be altered by the project; possible improvement of minor acreage of foraging habitat.</b>
<b>Bighorn Sheep (MIS)</b>	Open grassland and savannah in proximity to cliff habitats. Habitat and population exists in the analysis area; important winter range occurs in vicinity of Ford Creek treatment units.	Individual sheep could be disturbed during treatment implementation. <b>Minor acreage of habitat will be altered by the project; possible improvement of minor acreage of foraging habitat.</b>
<b>Mountain Goat (MIS)</b>	High elevation meadows in proximity to cliff habitats. Marginal habitat in upper elevation portions of analysis area; potential for goat presence in margins of analysis area.	May be in project area, but unlikely to occur near treatment units. <b>No habitat will be altered by the project.</b>
<b>Mountain Lion (MIS)</b>	Wide ranging through variety of habitats. Habitat and population exist in analysis area.	Individual lions could be disturbed during treatment implementation. <b>Minor acreage of habitat will be altered by the project; possible improvement of minor acreage of prey foraging habitat.</b>
<b>Blue Grouse (MIS)</b>	High-elevation timber/grassland mosaics. Winter in high elevation conifer stands. Habitat exists in analysis area.	Individual grouse could be disturbed during treatment implementation. <b>Minor acreage of habitat may be altered by the project.</b>

Species Name	Habitat Preference and Occurrence in Analysis Area	Determination and Rationale
<b>Brook, Rainbow Trout (MIS)</b>	Cool streams and rivers with sand or gravel substrate. Brook trout spawn in fall and are less sensitive to effects of roads and trails. Rainbow trout are spring spawners and their redds are vulnerable to damage at stream crossings. Habitat and populations exist in analysis area.	Both species are present in the project area. Primary concern is potential sedimentation of habitat and spawning areas. <b>Implementing mitigation and BMP's will result in minimal impact to individuals or populations.</b>
<b>Beaver Habitat (MIS)</b>	Variety of riparian habitats. Habitat exists in analysis area.	<b>Beaver habitat will not be altered by the project.</b>
<b>Bobcat (MIS)</b>	Prefers rough broken terrain, open or semi-open overstory canopy; use of riparian corridors to link habitat segments. Habitat and population exist in analysis area.	Individual bobcats could be disturbed during treatment implementation. <b>Minor acreage of habitat will be altered by the project; possible improvement of minor acreage of prey foraging habitat.</b>
<b>Golden Eagle (MIS)</b>	Nests on cliffs or open, high-relief areas; forage in open grasslands. Marginal nesting habitat exists in eastern portion of analysis area. Foraging habitat primarily east of analysis area.	<b>Golden eagle nesting and foraging habitat will not be altered by the project.</b>
<b>Prairie Falcon (MIS)</b>	Nests on cliffs adjacent to grasslands and large openings. forage in open grasslands. Marginal nesting habitat exists in eastern portion of analysis area. Foraging habitat primarily east of analysis area.	<b>Prairie falcon nesting and foraging habitat will not be altered by the project.</b>
<b>Northern 3-Toed Woodpecker (MIS)</b>	Mature and old-growth forest. Habitat for this species exists in the analysis area.	Small acreage of habitat may be impacted by treatments, however mature/old-growth nature of habitat will remain largely intact with retention of large-diameter trees. <b>Minor acreage of habitat will be altered by the project.</b>

Past, present, and reasonably foreseeable actions used for Cumulative Effects Analysis are described in a single section below. Cumulative effects for each species that was analyzed in detail are described in that section.

## Threatened and Endangered Species

### *Canada Lynx*

Potential impacts to Canada Lynx have been analyzed in detail in the Biological Assessment. That analysis is summarized below. For more detail please refer to the project file.

## ***1. ANALYSIS AREA AND METHODS***

The lynx analysis was carried out at the scale of two Lynx Analysis Units (LAUs; RM22 and RM23 overlapping the treatment units (see Map A-9). All of RM23 falls within the previously defined Analysis Area, and all Treatment Units except one fall within the RM23 LAU or to the east, outside of mapped suitable lynx habitat. Most of the Benchmark #5 Treatment Unit (approximately 4 acres) falls within the RM22 LAU, so that LAU was included in the analysis for lynx.

Lynx habitat in the affected LAUs was quantified and was adjusted based on expected changes in treatment units. Post-treatment habitat was then compared to standards and guidelines found in the NRLA. The proposed Benchmark Fuels Reduction project is in area considered the Wildland Urban Interface (WUI) according to the definition of WUI in the Healthy Forests Restoration Act. Therefore the analysis of impacts to lynx is based on the application of standards and guidelines in the NRLA for projects in the WUI.

## ***2. HABITAT REQUIREMENTS***

Information regarding lynx habitat presented here was obtained from the Lynx Conservation Assessment and Strategy (LCAS; Reudiger et al. 2000); more detail can be found in that document and in a wide array of published literature.

Lynx generally occur in cool, moist conifer forest types, and they may use aspen forests as well. They require habitat that supports their main prey species, snowshoe hare, and alternate prey such as red squirrels. Snowshoe hares require a dense, multi-layered understory that provides browse opportunities and cover at varying snow depths throughout the winter. Landscapes with varying age classes may support high snowshoe hare populations and therefore provide good lynx habitat.

## ***3. EXISTING CONDITION***

### **a. Legal and Management Status**

The Canada Lynx is listed as Threatened throughout the contiguous United States. The Northern Rockies Lynx Amendment (NRLA) became effective July 16, 2007, amending Forest Plans for 18 National Forests in the Northern Rockies area, including the Lewis and Clark National Forest. Management direction in the NRLA applies to mapped lynx habitat on NFS land presently occupied by Canada lynx.

### **b. Habitat and Population Status**

Lynx have been documented throughout the RMRD, including in the Benchmark area (Tweten 1984 and USFS unpublished data). Potential lynx habitat has been mapped for the entire LCNF, including the RMRD. The Jefferson Division, however, is considered unoccupied by lynx, whereas the RMRD is considered occupied (USDA 2007a).

Mapped potential lynx habitat on the RMRD is entirely within the NF boundary, and is classified as foraging (habitat that could support populations of snowshoe hare and other lynx prey species), denning (habitat with a significant component of down woody debris), or

travel habitat (habitat that does not meet the requirements for denning or foraging habitat but that may serve to connect blocks of those habitat types). Unsuitable habitat is habitat that falls within a Lynx Analysis Unit (see below) but that does not meet the requirements of foraging, denning, or travel habitat.

As part of the requirements of the Lynx Conservation Assessment and Strategy, (LCAS; Reudiger et al. 2000), Lynx Analysis Units (LAUs) were mapped for the RMRD. LAUs are a conceptual framework meant to approximate the home range of a female lynx. The RMRD contains 27 LAUs, encompassing all mapped potential lynx habitat as described above. Portions of the RMRD, including the eastern portion of the Benchmark area, are not within mapped LAUs because they did not contain sufficient potential lynx habitat to consider them as potentially used by lynx. There are two LAUs (RM 22 and RM23) in the Benchmark area that include proposed treatment units (see Map A-9). The RM22 LAU includes a treatment unit in its extreme northeastern corner; the remainder of the LAU is separated geographically from nearly all of the proposed treatment units by a significant hydrologic divide.

Table 3-25 displays acreages of lynx habitat on the entire LCNF as well as on each Division of the Forest and in the Benchmark area LAUs. Figures for LAUs RM22 and RM23 have been adjusted for recent fires in the area, based on estimates derived from draft Ahorn Fire severity maps. Habitat figures for the entire RMRD and LCNF have not because of the large acreage of fires that occurred into the fall of 2007 as this analysis was being carried out.

**Table 3-25. Total Acreage and Percent of Lynx Habitat on the LCNF and by Division and affected LAU**

Habitat	LCNF Total	Jefferson Divison	RMRD	RM22	RM23
<b>Total Acreage in Unit</b>	1,861,274	1,083,640	777,634	24,773	19,467
<b>Total Lynx Habitat</b>	962,882	584,411	378,471	12,785	13,150
<i>% of unit</i>	52%	54%	49%	52%	68%
<b>Lynx Travel Habitat</b>	477,541	367,085	110,456	2,778	2,824
<i>% of unit</i>	26%	34%	14%	15%	15%
<i>% of Total Habitat</i>	50%	63%	29%	28%	23%
<b>Lynx Foraging Habitat</b>	255,652	84,349	171,303	7,940	8,000
<i>% of unit</i>	14%	8%	22%	29%	40%
<i>% of Total Habitat</i>	27%	14%	45%	57%	60%
<b>Lynx Denning Habitat</b>	229,689	132,977	96,712	2,066	2,326
<i>% of unit</i>	12%	12%	12%	8%	12%
<i>% of Total Habitat</i>	24%	23%	26%	15%	17%
<b>Unsuitable Habitat</b>	345,695	34,744	310,951	11,988	6,317
<i>% of unit</i>	19%	3%	40%	48%	32%

## ***4. ENVIRONMENTAL CONSEQUENCES***

### **a. Alternative 1 - No Action Alternative**

#### **1. Direct and Indirect Effects**

Under the No Action Alternative, influences on lynx and snowshoe hare habitat would be restricted almost entirely to natural processes such as disease and fire, discussed below under 'Cumulative Effects'. The potential for fire to influence habitat in the Ford Creek and Wood Creek drainages is discussed more completely under the "Fire, Fuels, and Air Quality" section.

### **b. Alternative 2 – Proposed Action**

#### **1. Direct and Indirect Effects**

All treatments proposed for the Benchmark project would thin or remove ladder fuels (i.e. understory vegetation) within the unit through mechanical treatment and/or burning. Therefore treatments within multi-storied habitat currently suitable for snowshoe hares would render that habitat unsuitable for hares and as lynx foraging habitat. The mature forest overstory, however, would remain largely intact in most units. Treatments are proposed in relatively small areas within a larger forested area, much of which would remain unaffected. Thus treated areas may continue to be used by lynx for movement among foraging habitat areas and for limited foraging for alternate prey species. We have therefore assumed that habitat currently identified as 'foraging' and 'denning' habitat in treatment units will function only as 'travel' habitat post-treatment.

#### **Analysis Area**

No foraging habitat in RM22 would be affected by the proposed treatments. Approximately 373 acres of RM 23 (1.9% of the LAU) would be treated. Of that, approximately 114 acres of foraging habitat (1.5% of the foraging habitat in the LAU) and approximately 14 acres of denning habitat (0.6% of the denning habitat in the LAU) would be affected, converting to travel habitat. Although the acreage figures in Table 3-25 above would be very slightly altered, the percent of RM23 that would be in each habitat category would not change. The remainder of the acreage in the LAU subject to treatment is currently travel habitat and would remain so after treatment. No habitat in either LAU would be rendered completely unsuitable for use by lynx as a result of the proposed treatments.

#### **Rocky Mountain Ranger District**

Approximately 0.07% of the mapped potential lynx foraging habitat and approximately 0.01% of the mapped potential denning habitat on the RMRD would be converted to travel habitat as a result of the proposed treatments. Overall, approximately 0.03% of the total mapped lynx habitat on the RMRD would be affected by the proposed treatments.

#### **Lewis and Clark National Forest**

Approximately 0.04% of the mapped potential foraging habitat and less than 0.01% of the mapped potential denning habitat on the LCNF in its entirety would be converted to travel

habitat as a result of the proposed treatments. Overall, approximately 0.01% of the mapped lynx habitat on the entire LCNF would be affected by the proposed treatments.

## **2. Compliance with the Northern Rockies Lynx Amendment to the Forest Plan**

The NRLA spells out several standards regarding vegetation management activities and practices that apply to this project. Under the provisions of the NRLA, fuel treatment projects occurring within the WUI may violate Standards VEG S1, VEG S2, VEG S5, and VEG S6 as long as they do not occur on more than 6% (cumulatively) of lynx habitat on each administrative unit. Generally an administrative unit is considered a National Forest and the exception is applied at that level. The Benchmark Project will comply with Standards VEG S1 and VEG S2, but will not comply with Standards VEG S5 and VEG S6. This is allowed under the NRLA because the project is occurring in the WUI and less than 6% of lynx habitat on the RMRD and the LCNF as a whole will be affected by fuels projects.

In addition to the Standards listed above the NRLA contains several objectives and guidelines to be applied to vegetation management projects. The Benchmark Project will support Objectives VEG 01, VEG 02, and VEG 03, and Guidelines VEG G4, VEG G5, VEG G11, and indirectly VEG G10. Objective VEG 04 will not be directly supported, and Guideline VEG G1 is not directly applicable to the Wood Creek and Ford Creek drainages.

## **3. Compliance with Proposed Critical Habitat Designation**

The Benchmark area is along the eastern boundary of Unit 3 (Northern Rockies Unit) of the Proposed critical habitat for Canada lynx (Federal Register V.73 No.30). As such, the project area and surrounding lands to the north, west, and south have been identified as containing adequate amounts of boreal forest, with adequate annual snowfall to support viable populations of lynx. The key to maintenance of the principal constituent elements (PCEs) for lynx habitat is connectivity between patches of suitable foraging habitat, maintained at a spatial scale that allows for large disturbances such as fire.

The Proposed Project would alter a very small acreage (128 acres) of foraging and denning habitat in the project area. As noted above, the mature forest overstory would remain intact in most units. Treatments are proposed in relatively small areas within a larger forested area, most of which would remain unaffected. Thus treated areas may continue to be used by lynx for movement among foraging habitat areas and for limited foraging for alternate prey species. The overall amount or characteristics of boreal forest habitat in the LAUs within the area will remain unchanged at the LAU scale. The Proposed Project would not create any new routes available for over-snow travel. Therefore, the Proposed Plan would not affect proposed critical habitat in the Benchmark area.

## **4. Compliance with Other Forest Plan Standards and Guidelines**

The Lewis and Clark National Forest Plan does not specifically address lynx because it was developed many years before lynx were listed as a Threatened species under the Endangered Species Act (ESA). The project meets general Forest Plan guidance regarding Threatened and Endangered and other wildlife species (Forest-Wide Management Standards C-1 and C-2).

#### **4. Project Mitigations for Canada Lynx**

None required

### ***Grizzly Bear***

Potential impacts to grizzly bear have been analyzed in detail in the Biological Assessment. That analysis is summarized briefly here. For more detail please refer to the project file.

#### ***1. ANALYSIS AREA AND METHODS***

The grizzly bear analysis was carried out at the scale of one Bear Management Unit (BMU) Subunit, the South Fork Willow Subunit of the South Fork Sun/Beaver Willow BMU (see Map A-10). This Subunit includes all of the treatment units and surrounding area.

Habitat within treatment units was evaluated based on site visits and on draft VMap data. Assumptions regarding impacts of proposed treatments were based on the type of treatment with reference to appropriate literature regarding impacts of similar treatments in other areas. Details regarding the anticipated effects of proposed treatments by unit can be found in the project file.

#### ***2. HABITAT REQUIREMENTS***

Grizzly bears are opportunistic and adaptable omnivores. Habitat use varies between areas, seasons, local populations, and individuals (Servheen 1983, Craighead and Mitchell 1982 *in* Claar et al. 1999). In Montana, important grizzly bear habitats include coniferous forest for thermal and security cover, and meadows, riparian zones, shrubs, parks, avalanche chutes, and alpine areas for foraging. Grizzly bears frequently exhibit wide-ranging seasonal movements in search of widely dispersed and varying food sources.

#### ***3. EXISTING CONDITION***

##### **a. Legal and Management Status**

The grizzly bear is currently listed as a Threatened species throughout the conterminous United States. The Grizzly Bear Recovery Plan identifies 5 recovery zones, based on ecosystem characteristics, in which grizzly bear populations could be self-sustaining (USDI FWS 1993). The RMRD is entirely within the Northern Continental Divide Ecosystem (NCDE) Recovery Zone. Recovery of grizzly bears in the NCDE is contingent on several indices of occupancy, reproduction, and mortality measured throughout the ecosystem (USDI FWS 1993).

##### **b. Forest Plan Guidance Specific to Grizzly Bears**

The LCNF Forest Plan Forestwide Standards for wildlife direct managers to use the Interagency Grizzly Bear Guidelines to coordinate multiple-use activities with the needs of Threatened and Endangered species (C-2-5), to stratify occupied grizzly bear habitat (C-2-7), and manage problem grizzly bears (C-2-8). Forest Plan Standards for timber state that managers must coordinate timber harvest activities with seasonal grizzly bear habitat use (E-

4-14), must maintain or improve bear food production on harvest sites (E-4-15 through E-4-18), and must maintain escape cover and isolation for grizzly bears (E-4-19).

To protect important seasonal grizzly bear habitat from disturbance, the Lewis and Clark National Forest has relied primarily upon the dates recommended in the RMF Guidelines (USDI BLM 1987) to restrict motorized access in those habitats. Adherence to the RMF Guidelines is incorporated as a Forest-Wide Wildlife Management Standard (C-1) in the LCNF Forest Plan. Thus the LCNF has not adopted formal motorized access route density objectives as have some other national forests in the NCDE and other ecosystems where grizzly bears are present.

Following direction in the Interagency Grizzly Bear Management Guidelines (IGBC 1986), as required by the Forest Plan, the RMRD has been stratified into Management Situations (MS) to prioritize habitat and multiple-use management in relation to grizzly bear recovery. Nearly all (98%, or over 760,000 acres) of the RMRD is classified as MS-1, which contains grizzly bear population centers and habitat key to species survival and recovery. A small portion (2%, or roughly 14,000 acres) of the RMRD is designated MS-3. This habitat is located around existing centers of human activity such as recreation residence tracts, permitted lodges, and campgrounds. Within the South Fork Willow Subunit, approximately 89,920 acres, or 75% of the Subunit is designated as MS-1 habitat, while roughly 6590 acres, or 5% of the Subunit, is designated as MS-3. The remaining 24,190 acres, 20% of the Subunit, is non-NFS lands to the east of the NF boundary and private inholdings within the NF boundary.

The RMRD has been divided into Bear Management Units (BMUs) and Subunits to facilitate analysis of project effects and to evaluate recovery goals. Each BMU Subunit approximates the size of an adult female grizzly bear's annual home range. The Benchmark project units fall within the South Fork Willow subunit of the South Fork Sun/Beaver Willow BMU (see Map A-10).

### **c. Habitat and Population Status**

Population estimates of grizzly bears on the RMRD portion of the NCDE have ranged from 80 to 115 bears (USDI BLM 1992), although these estimates are many years old and based on limited mark-recapture data. An effort is currently underway to estimate the entire population of the NCDE using DNA samples collected systematically across the ecosystem. Grizzly bears on the RMRD are part of a larger population spread throughout the NCDE, which extends north into Canada. The number of grizzly bears in this ecosystem is not currently known, although a population estimate based on DNA sampling conducted in 2003 and 2004 is expected soon. It is believed, however, that grizzly bear numbers have increased in the NCDE since recovery was initiated (USFWS: <http://www.fws.gov/mountain%2Dprairie/species/mammals/grizzly/continental.htm>).

The following information about habitat use specific to the RMRD is derived primarily from Aune and Kasworm (1989). Grizzly bears generally den in higher elevation areas well within the NF boundary. Many grizzly bears then move to low-elevation foothill habitat along the eastern NF boundary as well as to adjacent non-NFS lands in spring to forage on greening vegetation and winter-killed carcasses on ungulate winter ranges. Bears generally use higher elevation forests and meadows during the summer, although they may be found throughout

the RMRD during this time. Many grizzly bears return to lower elevations, including non-NFS lands, in late summer and fall to take advantage of ripening berries. During fall, some bears may shift to areas with concentrations of hunters throughout the RMRD and lands to the east to capitalize on gut piles and carcasses left by big-game hunters.

Potential grizzly bear spring and denning habitats have been mapped for the RMRD based on general habitat and landscape characteristics and information derived from studies of radio-collared bears. Nearly all denning habitat in the area occurs on NFS lands, while a large majority of the spring habitat occurs on non-NFS lands east of the boundary. Table 3-26 displays the total acreage of grizzly bear denning and spring habitats, the amount of each habitat that is on NF lands, and the amount of each habitat that is within the Analysis Area (South Fork Willow Subunit).

**Table 3-26. Total Acreage of Mapped Potential Grizzly Bear Denning and Spring Habitats on and off Forest, and Acreage and Percent of each Habitat within Analysis Area (South Fork Willow Subunit)**

Habitat	Total Acreage on RM Front	Acreage Within NF Boundary <sup>1</sup>	% of Total Habitat Within NF Boundary <sup>1</sup>	Acreage of Habitat in Analysis Area <sup>2</sup>	% of Total NF Habitat in Analysis Area <sup>2</sup>
Grizzly Bear Denning	340,840	333,200	98%	48,890 on NF 1312 off NF	15%
Grizzly Bear Spring	632,870	205,410	32%	21,050 on NF 21,240 off NF	10%

<sup>1</sup>Figures for acreage and percent within NF boundary includes less than 1% of total habitat that occurs on private inholdings that are inside the NF boundary

<sup>2</sup>Figures for acreage and percent in the analysis area include approximately 870 acres of mapped potential spring habitat that occurs on private inholdings within the NF boundary

The Benchmark area in general is not known to be heavily used by grizzly bears. Although some sightings have occurred in the area, the generally thick, closed forest tends to favor use by black bears more than grizzly bears. The presence of a main road, numerous recreation residences, a large paved airstrip, 3 developed campgrounds, 2 permitted lodges, an administrative facility, and commercial packer corrals all contribute to a significant human presence that may currently discourage grizzly bears from using the area.

#### **4. ENVIRONMENTAL CONSEQUENCES**

##### **a. Alternative 1 – No Action Alternative**

##### **1. Direct and Indirect Effects**

Under the No Action Alternative, influences on grizzly bear habitat would be restricted almost entirely to natural processes such as disease and fire, discussed below under ‘Cumulative Effects’. The potential for fire to influence habitat in the Ford Creek and Wood Creek drainages is discussed more completely under the “Fire, Fuels, and Air Quality” section.

## **b. Alternative 2 – Proposed Action**

### **1. Direct and Indirect Effects**

All but 11 acres of the proposed treatments in the Benchmark project would occur in areas mapped as spring grizzly bear habitat. That is, less than 0.5% of the total mapped spring habitat on NF lands of the RMRD, and approximately 4% of the mapped spring habitat in the South Fork Willow Subunit could be affected by the proposed treatments. Spring habitats generally occur at lower elevations and provide early season forage such as grasses, forbs, and roots. Habitat mapping is very general, however, and specific locations within the larger area mapped as spring habitat may vary in suitability. Summer-fall habitat has not been mapped because it is widespread throughout the RMRD, but includes the entire analysis area. Summer-fall habitats generally include a wide variety of habitat types providing food as well as thermal and escape cover for grizzly bears.

Proposed treatments on approximately 592 acres, or 76% of the total acreage to be treated and 0.5% of the South Fork Willow Subunit, are expected to have neutral or possibly beneficial effects on grizzly bear habitat. Soil disturbance associated with timber management can have a negative impact on some bear food species, but in all units with proposed mechanical treatments those treatments are to be carried out in winter to minimize disturbance and to meet soils standards and objectives. Opening of the canopy and removal of competing overstory species can often result in increased productivity of grasses and fruiting shrubs (Zager et al. 1980).

Broadcast burning, proposed for up to about 570 acres (about 74% of the total area to be treated, and less than 0.5% of the South Fork Willow Subunit), does not involve nearly the amount of ground disturbance that mechanical slash piling does and can improve growth and productivity of bear foods (Zager et al. 1980). By creating or enhancing openings that provide foraging opportunities or by increasing productivity of forage species such as grasses and fruiting shrubs, treatments in some units have the potential to be beneficial to grizzly bears. Six of the 21 units fall in this category. These are generally the larger units (averaging just under 100 acres), and include most of the units that are not immediately adjacent to recreation residences. These units may already be more effective as bear habitat than the smaller units in closer proximity to areas of more frequent human disturbance, which limits habitat value regardless of actual quantity or quality of forage. Therefore the potential benefits derived from removing encroachment and stimulating grass and shrub productivity may be more important in the Benchmark 1, Fairmule 2 and 3, and Ford Creek 1 and 2 units than in other units, which are generally closer to the main road and to recreation residences.

Approximately 180 acres (about 24% of the total acreage to be treated, and about 0.2% of the South Fork Willow Subunit) of treatment is expected to have no measurable effects on grizzly bear habitat. Decreasing canopy cover and understory in these units may stimulate some grass and shrub productivity while at the same time potentially removing some hiding cover. Neither of these potential changes is expected to measurably alter grizzly bear use of those units. The units are generally small, averaging 12 acres, and are in close proximity to recreation residences, the main road, campgrounds, administrative facilities, and other areas of human activity. Therefore they are unlikely to provide much value as bear habitat currently or after treatment.

## **2. Compliance with Forest Plan Standards and Guidelines**

The LCNF Forest Plan includes a variety of standards and guidelines that either directly or indirectly address management of grizzly bears and grizzly bear habitat management. The Benchmark project is in compliance with all applicable Forest Plan standards and guidelines (Forest-Wide Management Standard Wildlife and Fish C-1 (1-13); Forest-Wide Management Standard Wildlife and Fish C-2(1-8); Forest-Wide Management Standard Timber E-4 (14-19)).

Approximately 470 acres of the proposed treatments (about 60% of the total proposed treatment area) would occur on lands categorized as MS-3 habitat. The remaining 310 acres (about 40% of the total proposed treatment area) would occur on lands categorized as MS-1 habitat. This means that about 7% of the MS-3 habitat in the Subunit, and less than 0.5% of the MS-1 habitat in the Subunits would be potentially affected by the proposed treatments. All of the acres proposed for treatment in MS-1 habitat would be hand treated with possible jackpot or broadcast burning; no commercial or mechanical harvesting is proposed in MS-1 habitat.

## **3. Compliance with Other Management Guidelines**

As noted above under “Forest Plan Guidance”, the LCNF has relied upon the dates recommended in the RMF Guidelines (USDI BLM 1987) to restrict motorized access in seasonally important wildlife habitats. In the analysis for the October 2007 Travel Plan decision, however, access management for all RMRD Subunits was analyzed based on the 1995 Interim Motorized Access Management Direction for the NCDE (Interim Direction; IGBC1995). For details regarding that process, refer to the Biological Assessment included in the Rocky Mountain Ranger District Travel Management Plan Record of Decision (USDA 2007b). Under the 2007 Travel Plan decision, which is currently being implemented, both subunits meet the Interim Direction for access in their entirety by moving TOTMARD, OPMARD, and CORE closer to the numeric objectives than in the previous (1988) Travel Plan. CORE does not meet numeric objectives primarily because of the presence of high-use non-motorized trails in both subunits (USDA 2007b). Compliance with Interim Direction would not change as a result of the proposed action because no new permanent roads would be created and no closed roads would be opened. The single proposed temporary road would be less than ½ mile in length, would be created and used only during winter months, and would be closed and obliterated when treatment in that unit has been completed.

## **4. Project Mitigations for Grizzly Bear**

Activities associated with treatments must be carried out between July 1 and March 31 to avoid potential disturbance during the period of potentially highest use of spring habitat. This includes road building, road use, and all hand and mechanical cutting. Jackpot or broadcast burning may occur during the key spring time period (April 1 – June 30) if necessary, but should be accomplished in as short a duration as possible during that time.

Any roads constructed in association with the project must follow the above timing restrictions, must be closed to the general public at all times, and must be obliterated when treatment in that unit is completed.

All personnel involved in all aspects of the project, including any contractors, must adhere to the NCDE Special Food Storage Order (current version: Food Storage Special Order LC00-18).

## ***Gray Wolf***

### ***1. ANALYSIS AREA AND METHODS***

Project effects were evaluated for wolves in an area of about 34,000 acres, of which about 32,000 acres are on National Forest System (NFS) lands and about 2200 acres are on adjoining private lands immediately adjacent to two treatment units. The Analysis Area (see Map A-11) was based the area defined for northern goshawk analysis (see below), and used for analysis of potential impacts to wolves because it includes all the treatment units and is large enough to include one or more home ranges of most wolf prey species in the area.

The analysis of potential impacts to wolves focused heavily on potential impacts to wolf prey species. Habitat within treatment units was evaluated based on site visits and on draft VMap data. Assumptions regarding impacts of proposed treatments were based on the type of treatment with reference to appropriate literature regarding impacts of similar treatments in other areas.

### ***2. HABITAT REQUIREMENTS***

Habitat requirements for the gray wolf are extremely general. Wolves require only 2 key habitat components: 1) an adequate year-round supply of wild ungulate prey, and 2) freedom from excessive persecution by humans (Fritts et al. 1994, Fritts and Carbyn 1995 as cited in Claar et al. 1999). Habitat used by wolves in the northern Rocky Mountains has been correlated with ungulate distribution and abundance (Kunkel 1997, Boyd-Heger 1997 as cited in Claar et al. 1999).

### ***3. EXISTING CONDITION***

#### **a. Legal and Management Status**

The RMRD is within the Northwest Montana Recovery Area for the gray wolf. Wolves within this area are classified as Endangered by the USFWS. Wolf populations in the Northwest Montana Recovery area are considered a part of the Northern Rocky Mountains Distinct Population Segment, which includes wolves in Montana, Idaho, and Wyoming. Wolves in the Northern Rockies were removed from the Endangered Species list in March 2008, but as of completion of this report in August 2008, they have been reinstated on the list by court order.

The Forest Plan standard states that the gray wolf will be managed “primarily by maintaining a suitable prey base and important habitat components such as rendezvous sites”, and that management for wolf prey species will follow recommendations for big game in the RMF Guidelines. All wolf sightings, sign, or other activities are to be documented to maintain knowledge of present distribution and population levels.

## **b. Habitat and Population Status**

The RMRD provides abundant habitat for wolf prey species. Winter ranges for some ungulates (elk, mule deer, white-tailed deer) extend to the east of National Forest lands, on private and state-owned lands. There are 3 state-owned Wildlife Management Areas (WMAs) that abut the RMRD to the east, providing winter range for elk and other species. One of these, the Sun River WMA, is located immediately northeast of the Analysis Area. Within the RMRD boundary and to the northwest of the Analysis Area is the Sun River Game Preserve, located west of the North Fork Sun River in the Bob Marshall Wilderness. The Preserve was established in 1913 to provide protection for the Sun River elk herd, which was then in decline. Hunting is not allowed in the Preserve.

One pack (Red Shale) is well established primarily in the Bob Marshall Wilderness portion of the RMRD. Another pack (Monitor Mountain) has spent some time on the RMRD while also moving between the Helena National Forest and private lands to the east of the RMRD boundary. A radio-collared female from elsewhere in Montana appears to have denned in early 2008 on the RMRD north of the Teton River drainage, but no further information is currently available about those wolves. Sporadic observations of individual wolves have been recorded in the non-wilderness portion of the RMRD and on non-NFS lands to the east. It is not known whether these observations represent wolves from the known packs, other wolves traveling through the area, or both. No regular activity, dens, or rendezvous sites are known to occur in the analysis area.

The nearest suspected den site (Monitor Mountain pack) is estimated to be slightly less than 1 mile south of the Double Falls #2 Treatment Unit, and slightly over 1.5 miles from the Ford Creek #2 Unit, but it is separated from both units by a steep, heavily timbered ridge. This area may have been used as a den site in 2007, but management actions were taken to reduce the Monitor Mountain pack in early 2008 as a result of livestock depredations on private land. The den was not used in 2008 and the pack appears to have shifted most of its activity south and west onto the Helena NF.

According to the Montana Fish, Wildlife, and Parks (MFWP) wolf information website (<http://fwp.mt.gov/wildthings/wolf/population.html>), at the end of 2007, in the Northwest Montana Recovery Area there were 36 packs of which 23 met the criteria for breeding pairs, for an estimated total of 213 wolves (Sime et al. 2007). The wolf population in Montana is considered secure (Sime et al. 2007).

## ***4. ENVIRONMENTAL CONSEQUENCES***

### **a. Alternative 1 – No Action Alternative**

#### **1. Direct and Indirect Effects**

Under the No Action Alternative, influences on wolves and the habitat required by their prey would be restricted almost entirely to natural processes such as disease and fire, discussed below under ‘Cumulative Effects’. The potential for fire to influence habitat in the Ford Creek and Wood Creek drainages is discussed more completely under the “Fire, Fuels, and Air Quality” section.

**b. Alternative 2 – Proposed Action**

**1. Direct and Indirect Effects**

Humans are responsible for the majority of mortalities of wolves through shooting and trapping both illegally and for management purposes, through vehicle collisions, and potentially due to den abandonment or displacement of packs due to disturbance (Claar et al. 1999). If wolves were to use the 2007 Monitor Mountain pack den area again, it is highly unlikely that any activity associated with the proposed Benchmark project treatments would be perceived in the den area or would contribute to any change in behavior or activity at the den site.

Activity associated with the treatments could disturb individual wolves traveling in that specific area. No new permanent roads or trails will be constructed for this project, so there will be no change in the access to the area by humans and therefore no change in the potential for mortality by humans.

Humans may impact wolves by altering distribution or abundance of their prey. The Analysis Area includes winter range for elk, bighorn sheep, mule deer, and white-tailed deer, all of which may be prey for wolves. Table 3-27 displays the total amount of each species’ winter range on the Rocky Mountain Front, including both NFS and non-NFS lands, since most winter ranges extend well east of the National Forest boundary. The table also displays the acres of each species’ winter range in the Analysis Area, and the acreage and percent of that amount that would be affected by the project treatments.

**Table 3-27. Ungulate Winter Range and Potential Impacts in the Analysis Area**

<b>Species</b>	<b>Total Winter Range on Rocky Mountain Front*</b>	<b>Acres Winter Range in Analysis Area by Ownership</b>	<b>Acres of Winter Range in Treatment Units</b>	<b>Percent of Winter Range in Analysis Area Potentially Affected</b>
Elk	253,924	8,493 – NF	293	3.4% of NF portion 2.4% of Total in Analysis Area
		3,975 – off NF		
		<i>12,468 Total</i>		
Bighorn Sheep	90,981	11,408 – NF	398	3.5% of NF portion 3.4% of Total in Analysis Area
		319 – off NF		
		<i>11,728 Total</i>		
Mule Deer	143,707	2,674 – NF	308	11.5% of NF portion 4.5% of Total in Analysis Area
		4,158 – off NF		
		<i>6,832 Total</i>		
White-Tailed Deer	185,376	0 – NF	0	na
		4,501 – off NF		
		<i>4,501 Total</i>		

\* Includes mapped winter range between Highway 2 and the southern Falls Creek drainage, and includes all lands (NFS, BLM, State, private).

Some treatments (particularly commercial and non-commercial thinning) may occur in winter to reduce impacts to soil and reduce disturbance to nearby recreation residents. Where

this occurs, ungulates may be temporarily displaced from areas where treatments are occurring, with the extent of displacement depending on terrain, hiding cover, snow conditions, and available forage in the area. Because the treatment units are relatively small, however (average size 37 acres, ranging from 2 to about 240 acres), it may not be possible to differentiate that displacement from normal variations in animal distribution based on weather, snow depth, threat of predation, or other human activities. Most treatments will be occurring in close proximity to the Benchmark Road and to one or more recreation residences, areas where ungulates may have habituated to some level of human activity or have already altered distribution in response to humans.

Treatments will change existing vegetation primarily by removing younger trees, opening canopy, and in some cases broadcast burning. In the short term, these activities may remove some understory or other vegetation normally used by ungulates for forage. In the long term, particularly where burning takes place, grass and browse species used by ungulates in the winter may be stimulated by the treatments and winter forage may improve. This is likely to be the case in the Ford Creek #1 unit, which overlaps all the above ungulate winter ranges except white-tailed deer and includes some meadows currently experiencing significant timber encroachment. Treatment in the Benchmark #1 unit, which is transitional habitat rather than winter range, may improve ungulate forage in the same manner. Because of the relatively small size of each unit, it is unlikely that these changes would change ungulate distribution. Therefore, impacts to wolves are expected to be minimal to nonexistent.

## **2. Compliance with Forest Plan Standards and Guidelines**

The RMF Guidelines have been and continue to be used to restrict motorized access, and therefore reduce potential disturbance, in important ungulate (wolf prey) wintering areas. Restrictions to protect wolf den or rendezvous sites have not been necessary.

Coordination with USFWS and currently MWFP, the agencies previously and presently responsible for wolf monitoring and management, has been ongoing with respect to radio-collaring efforts and information exchange.

## **3. Project Mitigations for Gray Wolf**

None required

## **Management Indicator Species**

### ***Northern Goshawk***

#### ***1. ANALYSIS AREA AND METHODS***

Project effects were evaluated for northern goshawk in an area of approximately 34,120 acres, of which 31,950 acres are on National Forest System (NFS) lands and 2160 acres are on adjoining private lands immediately adjacent to two treatment units. The Analysis Area (see Map A-11) was based on 6<sup>th</sup> field Hydrologic Unit Codes (HUCs), but adjusted to exclude areas that extend well beyond the area in which treatment impacts might be expected to occur. It was also adjusted outside the National Forest boundary to include only the area

for which a partial draft of Region 1 VMap vegetation data was available, which was important for the analysis of potential impacts to northern goshawk. Thus the Analysis Area includes all of HUC 41 and a portion of HUCs 45, 48 and 49, and extends approximately 1200m east of the NFS lands boundary. The Analysis Area was defined as such because it includes all the treatment units and is large enough to potentially include several goshawk home ranges.

Specific habitat characteristics for nesting habitat, PFAs, and foraging habitat were quantified for the existing condition. These characteristics were then quantitatively adjusted in the treatment units based on information derived from other, similar treatment areas and relevant literature to estimate post-treatment habitat condition; assumptions made regarding impacts of specific treatments are found in the Environmental Consequences section below, and in the project file. Both the existing and post-treatment habitat characteristics were compared to ranges identified in the literature for northern goshawk. Specific methods and processes are documented in the project file.

## ***2. HABITAT REQUIREMENTS***

The biology of goshawks has been detailed extensively in the published literature, and summarized thoroughly in Squires and Reynolds (1997) and elsewhere. This analysis will focus more specifically on habitat requirements at several spatial scales.

Goshawk home ranges may vary from 1400 to 8600 acres, depending on habitat conditions and variation among individual goshawks (Hargis et al. 1994). Squires and Kennedy (2006) and others have concluded that at least 3 spatial scales are biologically important to goshawks during the breeding season: the nest area, post-fledging area (PFA), and a more general area used for foraging. There is general agreement that land managers should maintain suitable nest areas and a large landscape for foraging, but the need to manage at intermediate scales, such as the post-fledging area, or at site-specific scales, such as the nest site, remains under debate (Squires and Kennedy 2006).

Goshawk nesting habitat is well described in the literature. Generally, nesting habitat is defined as mature forests with relatively closed canopies (50-90%), and relatively open understories (Squires and Reynolds 1997, Samson 2006, Squires and Kennedy 2006 and others). On the RMRD, goshawk nests have been found in Douglas fir or lodgepole forest stands with canopy closure greater than 40% and diameter at breast height (dbh) of 7 inches or greater. The observed canopy cover may be lower and observed dbh may be smaller on the RMRD than generally reported in the literature, but reflects specific habitat conditions on the RMRD.

The post-fledging area, or PFA, has been described in the literature as the area used by the family group from the time when young are fledged until they are no longer dependent on the adults for food (Reynolds et al. 1992, additional sources summarized in Squires and Kennedy 2006). The PFA is generally considered to represent the defended portion of the home range (Reynolds et al. 1992), and may range from roughly 200 to 500 acres (Squires and Kennedy 2006). Some quantity of mature forest with relatively closed canopy and structure in the understory appears to be an important component of the PFA, although its size, shape, and specific habitat characteristics may vary according to local conditions (Squires and Kennedy

2006). The vegetation composition of PFAs may vary widely across geographic regions (USFS 2007).

Goshawks forage in an area anywhere from 1400 to 8600 acres in size, depending on a number of factors (Squires and Kennedy 2006). Foraging areas are heterogeneous, with a variety of habitat components (Samson 2006, Squires and Kennedy 2006). In some areas composition of the foraging area may be indistinguishable from composition of the overall landscape in which it is situated (McGrath 2003).

### ***3. EXISTING CONDITION***

#### **a. Legal and Management Status**

National Forest Management Act (NFMA) regulations specify that certain species are to be selected as “Management Indicator Species” (MIS), thereby serving as surrogates for evaluation of the particular habitat types required by those species, and for other species dependent in whole or part on those habitats. The LCNF Forest Plan (1986) lists the northern goshawk (hereafter referred to as ‘goshawk’) as a MIS for old growth forest. Although more recent information indicates that the goshawk may not be appropriate for use as a MIS for old growth (USDI BLM 1998), it currently remains an MIS on the LCNF and will be evaluated accordingly. The goshawk was removed from the USFS Northern Region Sensitive Species list in 2007 based on information compiled by Kowalski (2006) and Samson (2006).

#### **b. Habitat and Population Status**

##### ***1. Northern Region***

There has been considerable discussion in the recent literature regarding the degree to which goshawks are dependent on, or indicative of, large, unbroken tracts of mature or old-growth forest (USDI FWS 1998). Samson (2006) examined and summarized information on goshawk habitat in the Northern Region and concluded that northern goshawk habitat is abundant and well distributed and that there is no evidence that goshawks are decreasing in number in the Northern Region. Based on this and other work, a Region 1 team developed the “Northern Goshawk Northern Region Overview; Key Findings and Project Considerations” (USDA. 2007c), which provides recommendations for analysis of project impacts to goshawks and habitat. This document is referred to hereafter as the R1 guidelines

##### ***2. Lewis and Clark National Forest/RMRD***

The LCNF is a disjunct forest, with one District occupying the Rocky Mountain Front east of the Continental Divide, adjoining the Flathead, Helena, and Lolo National Forests, and 4 other Districts occupying portions of central Montana’s isolated mountain ranges. Since 1988 biologists on the LCNF have identified 46 different goshawk nest territories: 28 on the Jefferson Division, which includes portions of the Highwood, Little Belt, Castle, Crazy, and Snowy Mountain ranges, and 18 on the RMRD along the Rocky Mountain Front. Of those, 29 territories were occupied in 2007, the first year of complete monitoring, and 17 active nests were identified. Nest areas have been discovered by either investigating reports of sightings, or by surveying in specific areas related to project or other work. Large areas of the RMRD therefore remain unsurveyed, including approximately 386,000 acres of the 778,000

acre RMRD that are within the Bob Marshall Wilderness Complex. Potential nesting habitat for the entire RMRD has been broadly estimated but has not been specifically mapped due to inconsistencies in availability of vegetation data. However it appears based on known nests and incidental observations that goshawks are well-distributed on the RMRD.

### ***3. Benchmark Analysis Area***

Based on the size of the Analysis Area alone and assuming an average home range of 5000 acres, the analysis area could support 6 goshawk territories. There are a minimum of 5 known goshawk nesting territories within the Analysis Area (see Map A-11), and an additional 2-3 territories suspected within the area. Not all potential habitat within the analysis area has been surveyed.

#### Nesting Habitat

Potential nesting habitat was estimated using draft Region 1 VMap data. The VMap data proved to be the best available data for accurately modeling nesting habitat, based on validation using existing known nests (refer to the project file for information regarding attempts to model habitat using other vegetation data layers).

There are approximately 10,211 acres of potential goshawk nesting habitat in the Analysis Area. Of these approximately 9,983 acres are on National Forest System (NFS) lands, and approximately 229 acres are off Forest on adjoining private land.

Size of nest stands may vary from 1 to 148 acres (USDA 2007c). Larger nest stands appear to be more consistently occupied (Woodbridge and Detrich 1994 as cited in USDI FWS 1998). Reynolds et al. (1992) recommend maintaining nesting habitat in stands of at least 30 acres in the southwestern U.S., while Clough (2000) found nest areas of about 40 acres in west-central Montana, an area which more closely resembles the Benchmark Analysis Area. Based on this and on recommendations in the R1 draft guidelines a nest area size of 40 acres was used in this analysis. The nest habitat model predicts that there are approximately 9193 acres of potential nesting habitat in blocks  $\geq 40$  acres in the Analysis Area. That is, more than 90% of the modeled nesting habitat is in blocks large enough to be consistently used by goshawks (see Map A-11). Roughly 9056 acres (99%) of that potentially useable nesting habitat is on NFS lands. All of this suggests that nesting habitat is not limiting in the Analysis Area. The number of territories in the analysis area and the proximity of some of those to each other also lends weight to that observation.

#### Known Nesting Areas

There are 5 known occupied nesting territories within the Analysis Area. Two of these were known prior to initiation of project planning, and 3 were discovered during surveys conducted in 2006 in the vicinity of proposed treatment areas. These areas were surveyed again in 2007; all 5 nesting territories were occupied in either 2006, 2007, or both years. All 5 known nesting territories are in the vicinity of proposed treatments. A 40 acre buffer was placed around each known nesting area (single nest or grouping of alternate nests) and adjusted using the VMap nesting habitat model to include potential nesting habitat, and to minimize inclusions of habitat the model did not select or that is generally considered unsuitable for nesting (maps and rationale are in the project file). Based on these buffers, several treatment units were altered to exclude the entire 40 acre nest area buffer.

### Post-Fledging Areas (PFAs)

PFAs have been estimated in the literature at anywhere from 200 to 500 acres (Squires and Kennedy 2006). Based on R1 recommendations (USFS 2007), a 420-acre PFA was drawn for each known nesting territory, centered on the known nesting tree or the center of an aggregation of alternate nests. In one case (Fairmule) an alternate nest was found over 1 km from the original nest area. Although we are fairly certain this is a single territory, a separate PFA was created for this alternate nest. This PFA is called 'Fairmule 3' in the analysis, while the PFA surrounding the original nest and alternate was labeled 'Fairmule 1'. Additional information regarding PFAs can be found in the project file.

To maintain consistency throughout the goshawk analysis, the draft R1 VMap data was also used for the PFA analysis. Habitat composition of PFAs was grouped according to R1 recommendations (USDA 2007c) to facilitate comparison with PFA composition found elsewhere and reported in the literature. The existing habitat composition of the known PFAs is displayed below in Table 3-28. The table also displays the range of PFA composition found in the literature as summarized in the R1 guidelines (USDA 2007c), the percent composition of PFAs reported by Clough (2000) for the Beaverhead-Deerlodge NF in south-central Montana, and the recommendations by Reynolds et al. (1992) for the southwestern U.S.. Although Reynolds et al. has been the standard used for goshawk analysis and management for several years, more recent work throughout the western U.S. has provided information about goshawk habitat in a wider variety of areas. Reynolds et al.'s work was in a ponderosa pine dominated southwestern forest, while Clough's study area was in an area much more similar to the RMRD: Douglas fir mix at lower elevations, with Douglas fir, lodgepole pine, and subalpine fir at middle elevations, and subalpine fir, Engelmann spruce, and whitebark pine at higher elevations (Clough 2000). Clough's study area is also closest in proximity to the RMRD of the published studies, and therefore the values reported for that area are likely the most applicable for comparison to the RMRD. Both Clough's and Reynolds et al.'s work was done in relatively heavily managed forests, however, whereas the RMRD, including the Benchmark area, has been very lightly managed except for a general history of fire suppression.

Clough's results are an average over the entire study area, with the standard deviation reported in parentheses in the table. Reynolds et al.' recommendations are provided as values for vegetation structural stages (VSS); differences in size classes used by Reynolds et al. as compared to those in the R1 guidelines and Clough are indicated in parentheses in that column. It should be noted that most of the literature, including Clough (2000), breaks canopy cover at 50% where it is considered, but the Vmap data used for this analysis breaks at 40% and 60%. The lower category was chosen for this analysis based on information from actual nest areas on the RMRD. Despite this difference in method, we expect that the ranges reported in the literature, particularly those in Clough (2000), remain roughly applicable.



**Table 3-28. Habitat composition (expressed in percent of PFA) of PFAs for known nesting territories in the Benchmark Fuels Project Analysis Area and as reported in published literature.**

<b>Vmap Tree Size Class(dbh)/Canopy Cover</b>	<b><i>Double Falls</i></b>	<b><i>Mule Creek</i></b>	<b><i>Fairmule 1</i></b>	<b><i>Fairmule 3</i></b>	<b><i>Ford Creek North</i></b>	<b><i>Ford Creek South</i></b>	<b>% of PFA in Clough (2000); west-central MT (Std. Dev)</b>	<b>Range in Literature – Avg. Percent of PFA<sup>1</sup></b>	<b>Composition recommended by Reynolds et al. (1992)<sup>3</sup></b>
Tree 0” – 4.9”	0.1%	2.1%	2.9%	4.4%	0%	0%	9.3% (1.7)	3.6% – 17.0%	10% (0-5” dbh)
Tree 5” – 9.9”	48.4%	54.9%	60.8%	51.6%	55%	52.2%	65.7% (5.0)	6.0% - 65.7%	20% (5-12” dbh)
Tree 10”+	40.5%	32.8%	30%	37.7%	32.4%	29.8%	11.3% (2.6)	11.3% - 66%	60% (>12”dbh)
Canopy Cover 41%+ <sup>2</sup> and size ≥ 5”	67.4%	65.1%	51.4%	52.4%	55.1%	44.3%	69% <sup>2</sup>	36.5% - 69% <sup>2</sup>	60% (>12”dbh)
Shrub/Forb/Grass	11.1%	10.2%	6.3%	6.3%	10.8%	18%	7.3%	7.3% - 11%	10%

<sup>1</sup> From Table 3 in USFS 2007

<sup>2</sup> Values reported in Clough (2000) and in the R1 Guidelines (USFS 2007) are for Canopy Cover ≥50%, but Vmap data breaks at 40% and 60%. The lower category was used here based on information from actual nest stands.

<sup>3</sup> Values reported in Reynolds et al. (1992) are for generally ponderosa pine dominated forest in the southwestern U.S.

The Benchmark area PFAs vary in some respects from those reported by Clough (2000) for west-central Montana or recommended by Reynolds et al. (1992) for the southwestern U.S., but the values are within the range reported in the literature overall. Differences between Benchmark values and those reported for other areas reflect differences in general habitat type and availability between areas rather than differing selection by goshawks. Some of the values for the Benchmark area may also be influenced by the fact that PFAs that were analyzed were drawn as circular buffers around known nests, and may not exactly capture areas used by goshawks for post-fledging activity in those territories. Despite the differing PFA values as compared to those observed by Clough (2000) or recommended by Reynolds et al. (1992), goshawks in the Benchmark area appear to be well distributed and successfully reproducing based on annual monitoring and other observations.

The Benchmark area has had limited timber harvest in the past and very little fire disturbance in recent decades, resulting in a relatively mature forest. Although there are approximately 50 recreation residences within the Analysis Area, they are all in very close proximity to the main Benchmark Road, and most are immediately surrounded by mature or older forest. The forest in the Benchmark Area is interspersed with openings that result almost entirely from natural features. When compared with the overall composition of the Analysis Area (refer to Table 3-31 below displaying foraging habitat), the Benchmark PFAs have a slightly lower proportion of openings and seed/sapling size class, and a slightly higher proportion of pole size and closed-canopy pole or larger size class components than are available in the Analysis Area as a whole. The percentage of mature timber in the Benchmark PFAs is nearly the same as what is available in the area. These comparisons have not been tested for statistical significance, but seem to indicate that goshawks in the Benchmark area may be selecting areas with more mature timber and closed canopy surrounding their nest areas. This general trend is reflected in other areas as well (Squires and Kennedy 2006, others).

### Foraging Area

To maintain consistency throughout the goshawk analysis, the draft R1 VMap data was also used for the foraging area analysis.

If each of the 5 known goshawk nest territories has an average home range size of approximately 5000 acres, roughly 19,200 acres, or over half of the 34,118 acre analysis area would fall into those home ranges. The central portion of the Analysis Area was not surveyed for goshawks, however, because there are no proposed treatment units in that area. Based on the nesting habitat model and on site visits to the area, however, it is highly likely that there are goshawks nesting in the unsurveyed area. It is therefore also likely that if a home range sized buffer were applied to nests in this area, based on predicted nesting habitat, nearly the entire Analysis Area would be captured by the accumulated home ranges. Therefore we analyzed foraging area habitat at the scale of the entire Analysis Area. Habitat composition categories were based on those recommended in the R1 guidelines (USDA 2007c). Table 3-29 below, under 'Environmental Consequences', displays the composition of foraging habitat under the Existing Condition and the expected composition after treatment.

## **4. ENVIRONMENTAL CONSEQUENCES**

### **a. Alternative 1 – No Action Alternative**

#### **1. Direct and Indirect Effects**

The proposed treatments are designed to modify fire behavior within portions of the analysis area. Without these treatments, it is assumed that there is a greater likelihood that if fire burns through the area it may burn with greater intensity, which could reduce the quantity and distribution of goshawk nesting and post-fledging habitat in the Analysis Area. Whether this might happen would depend on a variety of factors, many of which would not be influenced by the proposed treatments. Please refer to the discussion of the impacts of the proposed project on fire behavior under a separate section in this Chapter.

#### Nesting Habitat

The quantity and distribution of goshawk nesting habitat in the Analysis Area is expected to remain approximately as it is currently, with some changes over time due to disease, insect infestation, succession, and other natural forces.

#### Known Nesting Areas

The location and distribution of goshawk nesting territories in the Analysis Area is expected to remain approximately as it is currently, with some changes over time due to natural changes in vegetation and individual changes in goshawk behavior or mortality of goshawks due to natural or other causes outside the scope of this analysis.

#### Post-Fledging Areas (PFAs)

The location and composition of known PFAs is expected to remain approximately as it is currently, with some changes over time due to natural changes in vegetation and individual changes in goshawk behavior or mortality of goshawks due to natural or other causes outside the scope of this analysis.

#### Foraging Area

The composition of goshawk foraging habitat in the Analysis Area is expected to remain approximately as it is currently, with some changes over time due to disease, insect infestation, succession, and other natural forces.

### **b. Alternative 2 – Proposed Action**

#### **1. Direct and Indirect Effects**

#### Nesting Habitat

In analyzing the potential effects to nesting habitat in the treatment areas, we made the following assumptions based on the prescribed treatments and on literature regarding vegetation outcomes of those treatments (refer to project file for more information):

- Non-Commercial mechanical and hand thinning of younger (<40 ft. trees) are not expected to reduce canopies below roughly 40%.

- Commercial thinning and mechanical treatments designed to create 20-30 ft. crown spacing may not reduce canopies below 40%, but because of uncertainty – particularly regarding precise existing canopy cover – we assume that this treatment will result in canopy  $\leq$  40%. This results in a conservative estimate of remaining goshawk habitat.
- Most treatments will remove younger trees, resulting in potential increased average dbh. However, given the ranges as well as lack of precision in existing average dbh estimates, no changes will be assumed to the average tree size categories.

Of the estimated 9193 acres of potential nesting habitat in  $\geq$ 40 acre blocks within the Analysis Area, approximately 144 acres (1.6%) is in areas proposed for treatment. Not all of those acres will be made unsuitable for nesting, however. We assumed that if a treatment reduced canopy cover below 40%, the minimum canopy cover included in the Vmap-based nesting habitat model and observed on the RMRD, the affected habitat may no longer be suitable as nesting habitat. There are 91.4 acres (<1%) of the mapped potential nesting habitat in blocks  $\geq$  40 acres in units where proposed treatments may reduce canopy cover below 40% and that may therefore be made unsuitable for nesting. In other units thinning to reduce tree density, non-uniform spacing of retained timber, and use of prescribed fire may create stand conditions favorable to goshawk nesting (Reynolds et al. 1992, Squires and Kennedy 2006). These types of treatments are in fact recommended by Reynolds et al. (1992) for producing, enhancing, or maintaining goshawk habitat.

Approximately 9102 acres of nesting habitat would remain within the Analysis Area after the proposed treatment. This habitat would be dispersed throughout the Analysis Area and the several known goshawk home ranges, thereby maintaining 3 or more suitable nesting areas per known or potential goshawk home range as recommended by Reynolds et al. (1992). The small amount of area expected to be impacted, along with the relative abundance of potential nesting habitat that would remain in the Analysis Area after treatments have taken place, suggest that the proposed project will not have a detectable impact on the goshawk population in the Analysis Area.

#### Known Nesting Areas

Goshawks may tolerate some vegetation management activity in the nesting area if conditions such as the amount of canopy cover, mature trees, snags, and downed wood are maintained (USDI FWS 1998) and if treatment activity is avoided during the nesting and fledging period (Penteriani and Faivre 2001 as cited in USDA 2007c). Although thinning and prescribed fire can maintain or promote suitability of habitat for nesting goshawks (Reynolds et al. 1992, Squires and Kennedy 2006), some have recommended that vegetation management activity be avoided within a specified buffer area around active nests (Reynolds et al. 1992, Hargis et al. 1994 USFS 2007).

All treatments occurring within or immediately adjacent to goshawk nest area buffers would be scheduled to occur either before April 15 or after August 15 to avoid potential impacts to nesting goshawks. Therefore there would be no impacts to goshawks from the human activity associated with the proposed treatments.

One known 40-acre goshawk nesting area (Ford Creek North) is outside the boundary of proposed treatment units. Two treatment units (Fairmule #3 and Ford Creek #2) were adjusted during project development so that treatments would not occur within the mapped nest buffer. Two other nest area buffers (Mule Creek and Double Falls) overlap with the proposed treatment units as follows:

- Double Falls: 7.9 acres
- Mule Creek: 0.4 acres

The overlap in the Mule Creek area may have little or no measurable effect since it is restricted to a small sliver along the mapped nest area buffer and the marked treatment unit boundary. Given the limitations of field marking and digitizing treatment unit boundaries there may be little or no overlap in actuality. Furthermore, it is important to remember that the 40 acre buffers may not represent exactly the areas used by goshawks for activities associated with nesting and fledging. The proposed treatment in this unit is hand thinning followed by possible jackpot and/or broadcast burning. This treatment is likely to retain most of the habitat characteristics suitable for nesting, retaining larger diameter trees and overall canopy characteristics while reducing understory. The Mule Creek nest area is contiguous with a large block of potentially suitable nesting habitat to the north and east that is available to goshawks and may in fact contain alternate nests that have not been found. Because of the nature and location of the treatment, the minimal overlap it has with the nest area, and the availability of a significant amount of suitable nesting habitat immediately adjacent to the known nest area, it is unlikely that treatment in the Mule Creek area will affect goshawk nesting activity in that area.

The Double Falls territory has 4 known alternate nests. All nests are at or very near the edge of the proposed treatment area, and are within 80- 150m of several recreation residences and access roads to those residences. The 40 acre nest buffer was drawn to include the 3 nests known when analysis was begun in late 2007; the fourth nest was found in the summer of 2008 after most of the goshawk analysis was completed. The northern edge of the nest buffer was drawn along a topographic break less than 50 m from a recreation residence, splitting the distance between the nearest known nest tree and the residence. The entire area including the recreation residences and access roads was mapped as potential nesting habitat and in fact contains key nesting habitat features. Most recreation residences receive little or no use until July, and some may receive only very sporadic use at all, but we assumed that goshawks were unlikely to nest immediately adjacent to or between residences. The habitat around the residences may be useful for other activities that occur within the nest area, but to be conservative we established the 40 acre nest buffer outside of that immediate area.

The treatment proposed in the Double Falls area is to use commercial thinning to achieve 20-30 foot spacing between groups of tree crowns. While most of the proposed unit is immediately adjacent to recreation residences, the portion that overlaps the mapped nest area buffer is an area that extends just over 200m from the nearest recreation residence and is designed to help modify fire behavior in the direction from which fire is most likely to approach the eastern portion of the recreation residence tract (see Fuels section). Because of overlap with the nest area buffer, consideration was given to dropping that portion of the unit. Doing so, however, would severely compromise the effectiveness of the entire treatment unit. Therefore it was retained.

The proposed treatment would remove less than half the trees in the unit and would retain groups of trees, including the known nest trees, separated by relatively small openings. There is a possibility that canopy cover in the treatment area could be reduced below a threshold suitable for use by goshawks during the nesting season. Goshawks in some areas, however, have shown tolerance for some level of timber harvest near their nesting area (Penteriani and Faivre 2001 in USDA 2007c, McGrath et al. 2003, Mahon and Doyle 2005). Reynolds et al. (1992) recommend thinning of understory with non-uniform spacing of trees for maintaining or enhancing suitable nesting areas, although they also recommend maintaining interlocking crowns in nesting areas. Mahon and Doyle (2005) suggest that fidelity to nest areas may override the effect of changes to habitat in the nest area, at least in the short term. Based on the Vmap nesting habitat model and on site visits, there is an abundance of potential nesting habitat contiguous with the known nest area to the west, south, and east. It is possible that individual goshawks (1 nesting pair) may be adversely affected by the proposed treatments, but because of the limited area of the proposed vegetation change, its similarity to recommended nest area treatments, and the presence of large tracts of suitable nesting habitat in the immediate area that outcome is not at all certain.

### **Post-Fledging Areas (PFAs)**

As explained under 'Existing Condition', we identified 6 PFAs in the Analysis Area. Of those, 5 overlap with proposed treatment units. The assumptions regarding treatment effects on vegetation listed under 'Nesting habitat' above were applied to analysis of PFAs.

Expected results for the 5 PFAs potentially affected by the proposed treatments are displayed in Table 3-29 below by goshawk territory. The table also displays the range of PFA composition found in the literature as summarized in the R1 guidelines (USDA 2007c) and the percent composition of PFAs reported by Clough (2000) and by Reynolds et al. (1992) as above under 'Existing Condition'. The overall average for all PFAs combined is displayed in Table 3-30 to facilitate better comparison with average values reported in the literature. As explained above, we included canopy cover down to 41%, rather than at 50% as generally reported in the literature, based on available V-Map data and on observed goshawk nesting areas on the RMRD.

**Table 3-29. Post-treatment PFA composition by nesting territory and comparison with published PFA composition**

Vmap Tree Size Class(dbh)/Canopy Cover	Fairmule 1	Mule Creek	Double Falls	Ford Creek North	Ford Creek South	% of PFA in Clough (2000); west-central MT (Std. Dev)	Range in Literature – Avg. Percent of PFA <sup>1</sup>	Composition recommended by Reynolds et al. (1992) <sup>3</sup>
Tree 0” – 4.9”	7.5%	2.1%	0.1%	0%	0%	9.3% (1.7)	3.6% – 17.0%	10% (0-5” dbh)
Tree 5” – 9.9”	57.5%	54.9%	48.4%	55%	52.2%	65.7% (5.0)	6.0% - 65.7%	20% (5-12” dbh)
Tree 10”+	28.7%	32.8%	40.5%	32.4%	29.8%	11.3% (2.6)	11.3% - 66%	60% (>12” dbh)
Canopy Cover 41%+* and size ≥ 5”	50%	62.1%	58.8%	55.1%	44.3%	69% <sup>2</sup>	36.5% - 69% <sup>2</sup>	60% (>12” dbh)
Shrub/Forb/Grass	6.3%	10.2%	11.1%	10.8%	18%	7.3%	7.3% - 11%	10%

<sup>1</sup> From Table 3 in USFS 2007

<sup>2</sup> Values reported in Clough (2000) and in the R1 Guidelines (USFS 2007) are for Canopy Cover ≥50%, but Vmap data breaks at 40% and 60%. The lower category was used here based on information from actual nest stands.

**Table 3-30. Average pre- and post-treatment PFA composition for combined Benchmark area PFAs and comparison with published PFA composition elsewhere**

Vmap Tree Size Class(dbh)/Canopy Cover	Avg. Pre-Treatment % of Benchmark PFAs (Std. Dev.)	Avg. Post-Treatment % of Benchmark PFAs (Std. Dev.)	% of PFA in Clough (2000); west-central MT (Std. Dev)	Range in Literature – Avg. Percent of PFA <sup>1</sup>	Composition recommended by Reynolds et al. (1992) <sup>3</sup>
Tree 0” – 4.9”	1.58% (1.9)	1.94% (3.2)	9.3% (1.7)	3.6% – 17.0%	10% (0-5” dbh)
Tree 5” – 9.9”	53.82% (4.2)	53.6% (3.5)	65.7% (5.0)	6.0% - 65.7%	20% (5-12” dbh)
Tree 10”+	33.87% (4.3)	32.84% (4.6)	11.3% (2.6)	11.3% - 66%	60% (>12” dbh)
Canopy Cover 41%+* and size ≥ 5”	55.95% (8.8)	54% (7.1)	69% <sup>2</sup>	36.5% - 69% <sup>2</sup>	60% (>12” dbh)
Shrub/Forb/Grass	10.45% (4.3)	11.28% (4.2)	7.3%	7.3% - 11%	10%

<sup>1</sup> From Table 3 in USFS 2007

<sup>2</sup> Values reported in Clough (2000) and in the R1 Guidelines (USFS 2007) are for Canopy Cover ≥50%, but Vmap data breaks at 40% and 60%. The lower category was used here based on information from actual nest stands.

The proposed treatments are not expected to alter composition of known PFAs in any meaningful way. On average, treatments will result in a change of less than 1% in any habitat category. The largest change in any individual territory is likely to be in the Fairmule 1 PFA, where roughly 20 acres, or 4.7% of the estimated PFA, may be converted from pole or mature timber to seedling/sapling. The 2 nests on which this PFA is based, however, have not been active for several years and it appears that the resident goshawks are now nesting about 1 km northeast of the treatment area (the nest around which the Fairmule 3 PFA is centered; see explanation under the ‘Existing Condition: Post-Fledging Areas’ section). The area around the original (Fairmule 1 area) nests is becoming infested with dwarf mistletoe resulting in significant tree mortality. It is also immediately adjacent to an old cutting unit and very close to an existing road that is frequently used during the summer for personal wood-cutting of standing dead timber. It is highly likely that the Fairmule goshawks will be unaffected by the proposed treatment because they appear to have moved their nesting area well away from the unit proposed for treatment.

Overall, the proposed treatments are not expected to alter any existing PFAs enough to impact individual goshawks or the goshawk population in the area. Composition of PFAs will be very close, if not identical to the Existing Situation, in which goshawks are well-distributed and reproducing in the Benchmark area. Although values in the table above do not exactly mimic those reported by Clough (2000) or recommended by Reynolds et al. (1992), they are within the ranges reported in the literature and in the R1 guidelines. Openings created by treatments would be 1-2 acres in size, which is in line with Reynolds et al.’s (1992) recommendations for management of PFAs. Treatments would allow for non-uniform spacing of clumps of older trees, and would thin younger trees, as recommended by Reynolds et al. (1992). It is worth considering that the management recommendations made by Reynolds et al. (1992), in addition to being based on a different forest type, were intended for application in heavily managed forests and for use in developing larger scale vegetation management projects than that proposed for the Benchmark area. While it is appropriate for treatments in the Benchmark area to consider those recommendations, it is also appropriate to note that the majority of the landscape, and therefore potential goshawk habitat, will continue to be unaffected by vegetation management activity.

#### Foraging Habitat

As discussed above, foraging habitat was analyzed at the scale of the entire Analysis Area – an area expected to be biologically meaningful to goshawks. The assumptions for treatment effect described under the section ‘Environmental Consequences: PFAs’ were applied to the analysis of potential effects on goshawk foraging area habitat. Table 3-31 displays the composition of foraging habitat under the Existing Condition and the expected composition after treatment.

**Table 3-31. Benchmark Analysis Area existing and anticipated post-treatment goshawk foraging area habitat.**

<b>VMap Tree Size Class(dbh)/Canopy Cover</b>	<b>% of Total Acres (Acres) - Existing</b>	<b>% of Total Acres (Acres) – Post-Treatment</b>
Tree 0” – 4.9”	3.4% (1162.9)	3.5% (1182.2)
Tree 5” – 9.9”	42.1% (14,373.5)	42.1% (14,359.8)
Tree 10”+	33.9% (11,550.2)	33.8% (11,544.5)
Canopy Cover 41%+* and size $\geq$ 5”	34.7% (11,825.9)	34.7% (11,820.5)
Shrub/Forb/Grass	15.9% (5435.1)	15.9% (5,435.1)
Sparsely Vegetated	4.7% (1596.3)	4.7% (1,595.6)

\* Canopy Cover in Guidelines suggests using 50%+ as a category, but VMap data breaks at 40% and 60%. The lower category was used here based on information from actual nest stands.

The scale of the proposed treatments is quite small relative to the size of the Analysis Area. The proposed treatments will not have any impact on goshawk habitat at this scale, or on the goshawk population at the scale of the Analysis Area or the entire RMRD.

## **2. Compliance with Forest Plan - -**

Treatments proposed in known PFAs will not be carried out during the nesting season (April 15 – August 15). This adheres to the RMF Interagency Wildlife Guidelines (BLM 1986) as referenced in Forest Plan Wildlife Standard C-1-11.

## **3. Project Mitigations for Northern Goshawk**

No project activities may occur in known goshawk PFAs between April 15 and August 15. Affected treatments include Fairmule #2, Mule Creek, and Double Falls #2, and portions of Aspen #1 and #2, Ford Creek #1 and Ford Creek #2.

Where treatment is to occur within a nesting area (Double Falls #2) the known nest tree and any known alternate nest trees should not be cut. These trees should be retained within the groupings of trees to remain untreated within that unit.

# **SPECIAL HABITATS**

## ***Snags and Cavity-Nesting Habitat***

### **1. ANALYSIS AREA**

The area used for analysis of potential impacts to snags and cavity-nesting habitat is the same as that used for the northern goshawk analysis (see above).

### **2. EXISTING CONDITION**

#### **a. Management Status**

The LCNF Forest Plan includes recommended sizes and numbers of snags (dead trees that are not yet experiencing significant decay) based on timber type (Wildlife and Fish

Management Standard C-4). Snags provide key habitat for a variety of cavity nesting birds, including downy, hairy, three-toed, and black-backed woodpeckers as well as other species. The northern three-toed woodpecker is identified in the LCNF Forest Plan as a management indicator for cavity-dependent species. Habitat for the woodpecker is in generally mature to old coniferous forests with dead or dying trees, and in areas of recent bark beetle infestation. The LCNF Forest Plan does not require monitoring of northern three-toed woodpeckers, however, but relies on implementation of the snag management recommendations to ensure adequate habitat is maintained on all vegetation management projects.

## ***2. ENVIRONMENTAL CONSEQUENCES***

### **a. Alternative 1 – No Action Alternative**

#### **1. Direct and Indirect Effects**

No vegetation management would occur within the project area, and the presence and duration of snags would be determined primarily by natural processes such as disease, bark beetle infestation, and fire.

### **b. Alternative 2 – Proposed Action**

#### **1. Direct and Indirect Effects**

Vegetation management treatments have the potential to impact snag density through removal of snags for access and safety reasons. None of the proposed treatments would remove snags to achieve treatment goals, but some snags could be removed if they pose a hazard to people working in those units. Snags and downed logs could be burned in units where jackpot or broadcast burning occurs, although fire may also kill scattered trees, creating additional snags or downed logs.

#### **2. Compliance with Forest Plan Standards and Guidelines**

The Forest Plan recommended snag densities will be met by ensuring that at least 2 snags of 10”dbh or greater per acre remain in the proposed treatment units to achieve the recommended densities of 135-158 snags per 100 acres. Most of the proposed treatment units are relatively small; therefore the large majority of the Analysis Area will be unaffected by treatments and will retain existing snag densities that have been relatively unaffected by human activity.

#### ***a. Project Mitigations for Snags and Cavity-Nesting Species***

At least 2 snags of 10”dbh or greater per acre will be left or created in proposed treatment units.

## ***Old Growth Habitat***

### ***1. ANALYSIS AREA***

The analysis of potential impacts to old growth habitat was carried out at the timber compartment scale. Five timber compartments (149, 150, 151, 157, and 162) contain proposed treatment units. Analysis of old growth habitat was carried out for all 5 compartments, although fieldwork was limited in compartment 162 due to the 2007 Ahorn Fire. Fieldwork to identify old growth was carried out primarily in 2007, with additional fieldwork occurring in 2008. Assumptions regarding potential impacts of proposed treatments on old growth are described under Environmental Consequences below.

### ***1. EXISTING CONDITION***

#### **a. Management Status**

The Forest-wide Management Standard for Timber in the LCNF Forest Plan identifies the Old Growth Forest Objective (Standard E-4-9) as follows:

A minimum of 5 percent of the commercial forest land within a timber compartment should be maintained in an old growth forest condition. A minimum stand size of 20 acres is recommended for old growth management.

The Forest Plan also identifies the northern goshawk as the management indicator species (MIS) for Old Growth Habitat. Recent work by Samson (2006) and others (USDA 2007c; see goshawk analysis section above) suggests that goshawks may not, in fact, be an appropriate MIS for old growth. Because they remain listed as an MIS in the Forest Plan, however, they are analyzed in detail above. This section analyzes potential impacts to old growth forest with reference to Forest Plan standards for this timber/habitat type.

#### **b. Habitat Status**

Prior to surveys carried out in 2007, no old growth surveys had been completed in the Benchmark area, and no old growth has yet been designated in this area. In 2007 approximately 2169 acres were surveyed for the presence of old growth in the Wood Creek and Ford Creek drainages. Surveys were carried out in all proposed treatment units as well as in other areas within the 5 compartments containing proposed units. Areas to be surveyed were identified using TSMRS and VMap data to determine stands having a likelihood of old growth forest. All proposed treatment units were surveyed, but additional surveys were limited due to ongoing major fire activity on the RMRD. Only a small portion of Compartment 162 could be surveyed safely and time available to complete surveys in additional compartments was curtailed due to fire activity. Some old growth was identified by photo interpretation in stands immediately adjacent to stands that were surveyed. Additional survey work is planned for 2008. Results of the 2007 survey are displayed in Table 3-32 below.

**Table 3-32. Old Growth 2007 Survey Results and Presence by Compartment in the Benchmark Area**

Compartment	Acres Surveyed	Acres of Old Growth	Acres of Commercial Forest in Compartment	% of Commercial Forest in Compartment identified as Old Growth*
149	990.1	192.7	3605.9	5.3%
150	534.5	161.2	2299.0	7.0%
151	267.3	211.5	4465.7	4.5%
157	101.8	176.3	3548.1	5.0%
162	275.3	138.2	3567.5	3.9% **
<i>Total</i>	<i>2169.0</i>	<i>879.8</i>	<i>na</i>	

\* Based on 2007 survey; additional survey work will be completed in 2008.

\*\* Survey in Compartment 162 was extremely limited due to fire activity

## ***2. ENVIRONMENTAL CONSEQUENCES***

### **a. Alternative 1 – No Action Alternative**

#### **1. Direct and Indirect Effects**

Under the No Action Alternative, no vegetation management would occur within the project area. The presence and duration of old growth stands would be determined primarily by natural processes such as fire, insects, and disease. Please refer to the discussion of the impacts of the proposed project on fire behavior in the area under a separate section in this Chapter.

### **b. Alternative 2 – Proposed Action**

#### **1. Direct and Indirect Effects**

Approximately 16.9 acres of old growth would be subject to treatment in one unit, Double Falls #2. The proposed treatment in this unit is commercial thinning with mechanical equipment, removing trees to provide breaks between crowns or groups of crowns of 20-30 feet. Some hand slashing and piling with subsequent burning of piles may occur. Although half or more of the trees in the unit would be retained and thinning would focus on smaller diameter trees, we took a conservative approach and assumed that none of the affected 16.9 acres would retain old growth characteristics after treatment. Therefore, Compartment 149 would have 175.8 acres of old growth post-treatment, which is 4.9% of the commercial forest, based on the limited survey work completed in 2007. This number is 0.1% less than the Forest Plan standard if both unit and analysis mapping are exact. Based on fieldwork and on aerial photos it is very likely that additional old growth will be identified in this compartment in 2008.

#### **2. Compliance with Forest Plan Standards and Guidelines**

Fieldwork will continue in 2008 to identify old growth within the 5 compartments containing proposed treatment units. If fieldwork fails to identify additional old growth in compartment 149, treatment units will be adjusted so that old growth is not affected by the project and the

Forest Plan standard can be met. In all other compartments, treatments will not affect old growth. Nevertheless, fieldwork will continue in all compartments except compartment 162 for safety reasons, to identify additional old growth so that the Forest Plan standard of 5% of commercial forest in old growth per compartment will be met.

### **3. Project Mitigations for Old Growth Habitat**

None required

## **CUMULATIVE EFFECTS**

A number of factors could potentially result in impacts to wildlife resources cumulative to those of the Proposed Travel Plan. Past, present, and reasonably foreseeable actions that could potentially affect the species or habitats analyzed above include developed and dispersed recreational activity, implementation of the 2007 Travel Plan, wildfire and prescribed fire, timber harvest, wildlife habitat management on adjacent lands, and livestock grazing.

### ***1. DEVELOPED AND DISPERSED RECREATIONAL ACTIVITY***

Ongoing recreational activity in the area includes the presence of 3 developed campgrounds, several trailheads, commercial packer corrals, and numerous recreation residences. All of these are concentrated within a few hundred yards of the main Benchmark Road and have been in existence for anywhere from 30 to 80 years. At a larger scale, there are 98 permitted recreation residence cabins on the RMRD, clustered mainly in the Sun Canyon and Benchmark areas. There are also 11 developed campgrounds, as well as numerous dispersed campsites, trailhead facilities, and other recreation sites. Although improvements to some developed recreation areas may occur, there are no plans for expansion or addition of any facilities. A large proportion of visitors to the RMRD travel in the backcountry away from these facilities, where they hike, ride horseback, camp, fish, and hunt.

#### **a. Cumulative Effects on Species Analyzed in Detail**

##### ***1. Canada Lynx***

The impacts that recreation facilities may have had on lynx habitat is long-established, limited to the immediate vicinity of the facility, and are assumed to be a part of the Existing Condition. Existing disturbance that may occur due to recreational activity will not add measurably to the minor disturbance to individuals that may occur during implementation of the Benchmark project.

##### ***2. Grizzly Bear***

The impacts that recreation facilities may have had on grizzly bears and their habitat is long-established, limited to the immediate vicinity of the facility, and are assumed to be a part of the Existing Condition. The degree to which existing recreational facilities have affected grizzly bear habitat was discussed in the BA for the 2007 Travel Plan (USDA 2007b). Existing disturbance that may occur due to recreational activity will not add measurably to the minor disturbance to individuals that could occur during implementation of the

Benchmark project, particularly since many units would be treated in winter when bears are denning and recreational activity is minimal.

One potential impact of the recreational activities listed above is access by grizzly bears to human food sources. The RMRD initiated development of the NCDE Food Storage Special Order (current version: Food Storage Special Order LC00-18) in the late 1980's. Since that time, the RMRD has led efforts in the NCDE to revise the Food Storage Special Order (the Order) to make it both more effective and more enforceable. Several recreation guards are employed to patrol front-country recreation sites, posting signs and contacting the public as well as enforcing the Food Storage Order. Several wilderness guards are employed to carry out the same tasks in the backcountry, and all employees are trained annually in the basics of the Order and enforcing it. The RMRD carries out a hunting camp patrol in the fall with an estimated >80% contact rate. Enforcement of the Food Storage Order is a primary purpose of those patrols. All activities permitted on the RMRD (including grazing, recreation residences, outfitting and guiding, etc.) include consequences of failing to comply with the Order within their permits. Through these combined efforts, the potential for grizzly bears to gain access to human foods is minimized. Implementation of the proposed project will not change the potential for grizzly bears to obtain human food.

### ***3. Gray Wolf***

The impacts that established recreation facilities may have had on wolves and their habitat is long-established, limited to the immediate vicinity of the facility, and are assumed to be a part of the Existing Condition. Existing disturbance that may occur due to recreational activity will not add measurably to the minor disturbance to individuals that may occur during implementation of the Benchmark project.

Dispersed recreational activities, particularly hunting, pose a very slight risk of mortality to wolves because those activities bring humans, some with firearms, potentially in proximity to wolves. Hunters may mistake wolves for coyotes, which are legal to shoot. The potential for illegal mortality exists, as well. The proposed project will not result in added potential for wolf mortality.

### ***4. Northern Goshawk***

The impacts that established recreation facilities may have had on goshawk habitat is long-established and generally limited to the immediate vicinity of the facility. Two goshawk nests in the Double Falls territory are within 50m and 150m of recreation residences; the original Fairmule nest is within 20m of a road that is seasonally open for personal-use firewood cutting. Apparently the presence of some types of human activity may not preclude nesting by goshawks. Most of the recreational activity occurring in the Benchmark area is concentrated in a limited set of areas, has been ongoing for many years, and does not affect the majority of goshawk nesting and foraging habitat in the area. Existing disturbance that may occur due to recreational activity will not add measurably to the minor disturbance to individuals that may occur during implementation of the Benchmark project.

### ***5. Old Growth, Cavity-Nesting Habitat***

There are no anticipated cumulative effects to old growth or cavity-nesting habitat from recreational activity.

## ***2. IMPLEMENTATION OF THE 2007 TRAVEL PLAN***

The 2007 Travel Plan for the Birth-South portion of the RMRD (USDA 2007b) is currently being implemented. This plan reduces the overall mileage of motorized routes, as well as reducing the mileage of motorized routes within important seasonal wildlife habitats (USDA 2007b).

### **a. Cumulative Effects on Species Analyzed in Detail**

#### ***1. Canada Lynx***

There is some evidence that lynx are relatively tolerant of human activity (Reudiger et al. 2000). Over-snow activity such as snowmobiling may be of concern, however, because compacted snow resulting from such activity may allow competing carnivores access to otherwise unavailable areas (Reudiger et al. 2000). Under the 2007 Travel Plan, snowmobile activity in the Benchmark area is limited to the Benchmark Road. This represents a reduction in the acreage in which snowmobile travel is allowed compared to the previous (1988) Travel Plan. The FWS concurred with a “may affect, not likely to adversely affect” determination that was made for the 2007 Travel Plan (USDA 2007b). The proposed project will not alter travel management in the area and will therefore not add to any existing impacts resulting from travel plan implementation.

#### ***2. Grizzly Bear***

The BA for the 2007 Travel Plan found that the plan reduces open and total motorized route densities, increases core habitat (habitat >500 m from a motorized route), and maintains or improves the value of grizzly bear habitat throughout the decision area as compared to the 1988 Travel Plan. The BA reached a determination of “May Affect, Not Likely to Adversely Affect” the grizzly bear, a determination with which the USFWS concurred (USDA 2007b). The proposed project will not alter travel management in the area and will therefore not add to any existing impacts resulting from travel plan implementation.

#### ***3. Gray Wolf***

The BA for the 2007 Travel Plan found that the reduction in mileage of motorized routes and acreage of open snowmobile routes would have little impact on wolves or their prey. Continued travel of humans into habitat occupied by wolves represents an ongoing although low potential for wolf mortality or displacement of wolves or their prey. The FWS concurred with the “may affect, not likely to adversely affect” determination made for the 2007 Travel Plan decision (USDA 2007b). The proposed project will not alter travel management in the area and will therefore not add to any existing impacts resulting from travel plan implementation.

#### ***4. Northern Goshawk, Old Growth Habitat, Cavity-Nesting Habitat***

There are no anticipated cumulative effects to goshawks, old growth, or cavity-nesting habitat from implementation of the 2007 Travel Plan.

### **3. WILDFIRE AND PRESCRIBED FIRE**

Four wildfires have burned in the vicinity of the Benchmark area in the past 20 years: Glade Creek (1996; 43 acres), Cigarette Rock (2006; 2271 acres), Ford Creek (2006; 323 acres) and Ahorn (2007; 52,505 acres). In addition to wildfires, there have been 3 prescribed fires in the general area. The largest of these, the South Fork Sun Prescribed Fire Phase I (2003; 4300 acres) occurred over a mile southwest of the analysis area. Two range improvement fires were ignited within the analysis area in 1988 (800 acres) and 1992 (185 acres). Additional prescribed burning is planned in the South Fork Sun area in the future, and it is likely that wildfires will continue to burn periodically in the area. Past fires, and most likely future fires, have varied effects depending on the intensity and severity of burning. In a general sense, fires have contributed and will continue to contribute to maintaining a mosaic of successional stages and forest types in the area.

#### **a. Cumulative Effects on Species Analyzed in Detail**

##### ***1. Canada Lynx***

Of the fires described above, only portions burned within the analysis area; the Ford Creek fire was entirely out of mapped lynx habitat and LAUs. Impacts to habitat from wildfire and prescribed fires vary depending on the location and severity of burning and on other factors. Fires may alter or remove habitat for lynx prey species in within portions of those fire perimeters. In some areas regeneration of burned forest may result in improved snowshoe hare habitat within several years of burning. Downfall from past fires may contribute to creation of lynx denning habitat. The 2007 Ahorn Fire, affecting approximately 52,000 acres adjoining the Benchmark area to the west, potentially affected up to 18,000 acres of mapped potential lynx foraging habitat and up to 11,000 acres of mapped potential denning habitat in 6 LAUs. More precise estimates of impact to habitat have yet to be assessed. The potential impacts of the Benchmark project are limited and very small in scale, and are therefore not expected to add to the effects of the Ahorn Fire or other recent fires.

##### ***2. Grizzly Bear***

Impacts to grizzly bear habitat have varied and will vary depending on the location and severity of burning and on other factors. Fires regenerate forage or create favorable conditions for growth of grizzly bear forage species. Fires also may alter or remove travel habitat or hiding cover, and large fires such as those in 2007 may temporarily or permanently displace bears from some localized areas. The varied impacts of fire contribute to maintaining a variety of habitats used by grizzly bears. The potential impacts of the Benchmark project are not expected to add to any effects of recent and future area fires.

##### ***3. Gray Wolf***

Impacts on habitat will vary depending on the location and severity of the fires and on other factors. Generally, however, fires result in improved forage for ungulates (i.e. wolf prey) within 1-5 years of their occurrence. The potential impacts of the Benchmark project are not expected to add to any effects of recent and future area fires.

#### ***4. Northern Goshawk***

The Ahorn and Ford Creek fires burned less than 300 acres of mapped potential nesting habitat within Analysis Area; it is unknown how much habitat within the fires' perimeters was rendered unsuitable due to fire. The Cigarette Rock and South Fork Sun fires occurred outside the analysis area, as did most of the Ahorn Fire. These fires likely affected an unknown acreage of potential nesting habitat. Based on known nesting territories and on other observations, however, goshawks appear to remain well distributed on the RMRD. The potential impacts of the Benchmark project are not expected to measurably add to any effects of past or future fires.

#### ***5. Old Growth***

Old growth has not previously been mapped in this area of the RMRD, so it is not possible to determine the impact of past fires on old growth. Wildfires and the larger prescribed fires have burned with varying severity across the landscape. Impacts to old growth would vary according to the nature of the fire in a particular area. Low intensity ground fires can help maintain old growth characteristics by inhibiting succession and removing encroachment of smaller diameter trees into existing old growth or potential old growth stands. Such fires may also kill a small number of larger trees, which then contribute to the dead and downed wood component of old growth. Higher intensity crown and stand-replacement fires may remove old growth. Past fires have burned at a variety of intensities, as will future fires. The potential impacts of the Benchmark project are not expected to add to the effects of recent and future area fires.

#### ***6. Snags and Cavity Nesting Habitat***

Recent fires have created an abundance of snags and cavity-nesting habitat adjacent to the analysis area.

### ***4. TIMBER HARVEST AND VEGETATION MANAGEMENT***

Past vegetation treatment and timber harvest in the Benchmark area has been relatively limited. Since 1982, only about 290 acres have been affected, in units ranging from 1-65 acres. Treatments have included pre-commercial thinning (180 acres total), commercial thinning (60 acres total), selection tree cutting (13 acres total), and clearcutting (33 acres total). All but one of the units are within ½ mile of the Benchmark Road, and all are in the Wood Creek portion of the analysis area.

#### **a. Cumulative Effects on Species Analyzed in Detail**

##### ***1. Canada Lynx***

The cumulative effects of this harvest on lynx habitat have been minimal, creating small pockets of thinned forest as well as regenerating some snowshoe hare habitat. Most of the units were treated 20 or more years ago, and all were treated before potential lynx habitat was mapped. The effects of these treatments are incorporated into the Existing Condition for lynx habitat. The potential impacts of the Benchmark project are small and not expected to add to the effects of past timber harvest. Any future harvest would likely be limited in scale due to a variety of constraints and would adhere to the Northern Rockies Lynx Amendment

in maintaining lynx habitat. The potential impacts of the Benchmark project are not expected to add to any effects of past timber harvest.

## ***2. Grizzly Bear***

The cumulative effects of past harvest on grizzly bear habitat have been minimal, creating small pockets of thinned forest that may provide improved conditions for bear forage species such as grasses and berry-producing shrubs. Most of the units were treated 20 or more years ago and the effects of these treatments are incorporated into the Existing Condition for bear habitat. At a larger scale very little timber harvest has occurred anywhere on the RMRD over the past 20 years. Several small projects in the Beaver-Willow Road area included grizzly bear habitat improvement as an objective, through improving growing conditions for buffaloberry. The sum of these past harvests has likely had no impact on grizzly bear numbers or distribution. The potential impacts of the Benchmark project are not expected to add to any effects of past timber harvest. Any future harvest would likely be limited in scale due to a variety of constraints, and would likely create minimal disturbance to a limited number of grizzly bears while likely enhancing growth of certain forage species.

## ***3. Gray Wolf***

The cumulative effects of past harvest on habitat for wolf prey species has been minimal, and the sum of these past harvests has had no detectable impact on wolf prey numbers or distribution. In general small, limited scale timber harvest and vegetation management projects such as those that have occurred in the past may create favorable conditions for wolf prey species by creating openings that may stimulate forage species. The potential impacts of the Benchmark project are not expected to add to any effects of past timber harvest.

## ***4. Northern Goshawk***

The cumulative effects of past harvest on goshawk habitat have been minimal, creating small pockets of thinned forest as well as regenerating some habitat that may be used by goshawk prey species. The effects of these treatments are incorporated into the Existing Condition for goshawk habitat. The potential impacts of the Benchmark project are not expected to add to any effects of past timber harvest. Any future harvest would likely be limited in scale due to a variety of constraints, and would adhere to appropriate guidance for maintaining goshawk habitat.

## ***5. Old Growth Habitat***

It is not known whether past harvest in the area affected any old growth habitat, since old growth has not been mapped for the area. Harvest units have been small and the Forest Plan direction for old growth has been met as evidenced by the current presence of >5% of old growth in commercial forest in the analysis area. The potential impacts of the Benchmark project are not expected to add to any effects of past timber harvest. Any future harvest or vegetation management would be limited in scale due to numerous other constraints, and would adhere to all Forest Plan direction for retention of old growth.

## ***6. Snags and Cavity-Nesting Habitat***

Most of these treatments occurred since the LCNF Forest Plan was implemented, and therefore they followed the snag management guidelines. Personal use woodcutting likely

reduces the number of snags in proximity to roads, campgrounds, and recreation residences. The impacts of this activity are limited in the Benchmark area to a narrow corridor along the existing main road, however, leaving most of the Wood Creek and Ford Creek drainages almost entirely free of wood cutting activity. The potential impacts of the Benchmark project are not expected to add to any effects of past timber harvest. Any future harvest or vegetation management would be limited in scale due to numerous other constraints, and would adhere to all Forest Plan direction for retention of snags.

## **5. LIVESTOCK GRAZING**

Portions of two cattle grazing allotments overlap with part of the analysis area. These allotments are grazed on a rest-rotation basis, as they have been for decades. At a larger scale, most of the non-wilderness area of the RMRD is permitted for livestock grazing on defined allotments. Several allotments also exist for limited outfitter/guide horse and mule grazing, most of which are in wilderness.

### **a. Cumulative Effects on Species Analyzed in Detail**

#### ***1. Canada Lynx***

Grazing by livestock may impact snowshoe hare, and therefore lynx, habitat most in aspen stands and in high elevation riparian willow communities (Ruggiero et al. 2000). The cumulative effect of grazing on snowshoe hare and lynx habitat in the analysis area is likely limited to portions of the area where those conditions occur. The majority of the analysis area, however, is generally Douglas-fir or lodgepole pine dominated forest where cattle are unlikely to impact regeneration of conifer species used by hares for food and cover. The potential impacts of the Benchmark project are not expected to add to any effects of livestock grazing.

#### ***2. Grizzly Bear***

The LCNF Forest Plan (see Table 3-24 above) requires, through incorporation of the RMF Guidelines and the Interagency Grizzly Bear Guidelines, that grizzly bear-livestock conflicts be resolved in favor of grizzly bears. Known conflicts have been minimal and where they have occurred, livestock permittees have been advised to move cattle from the area to reduce likelihood of further conflict. The potential impacts of the Benchmark project are not expected to add to any effects of livestock grazing.

#### ***3. Gray Wolf***

The LCNF Forest Plan states that “the Interagency Wildlife Guidelines [will be used] to avoid or mitigate conflicts between livestock razing [sic] and T&E Species”. The RMF Guidelines do not specifically address wolves, but guidelines for grizzly bear/livestock conflict would likely be used as a basis by which to manage wolf/livestock conflicts. The Guidelines stress that any actions taken as a result of conflict should minimize disturbance to bears, and that in general, management of multiple-use activities on the RMRD should favor bears. It is likely that the same or similar direction would be followed in the event of wolf/livestock conflict. Known past conflicts with wolves and livestock, and all removals of

wolves for conflicts in the area have all occurred on private land. The potential impacts of the Benchmark project are not expected to add to any effects of livestock grazing.

#### ***4. Northern Goshawk, Old Growth, Snags and Cavity-Nesting Habitat***

There are no anticipated cumulative effects to goshawks, old growth, or cavity-nesting habitat from livestock grazing.

### ***6. WILDLIFE HABITAT MANAGEMENT ON ADJACENT LANDS***

The area to the west of the project area is the heart of the Bob Marshall Wilderness Complex. Wildlife habitats there are subject almost exclusively to natural forces, such as climate and fire, and receive only minimal influence from human activity. Lands east of the NF boundary are largely privately-owned ranch lands, where livestock husbandry is the primary activity. Although there are 3 state-owned Wildlife Management Areas (WMAs) that provide key ungulate winter range, large numbers of elk and deer also winter on private lands. Grizzly bears, wolves, and other wildlife species are known to frequent lands east of the National Forest boundary.

#### **a. Cumulative Effects on Species Analyzed in Detail**

##### ***1. Canada Lynx***

Canada lynx habitat does not extend east of the National Forest boundary, where montane forest rapidly transitions to open limber pine savannah and short grass prairie interspersed with managed agricultural land. Management of wildlife habitat outside the NF boundary is not expected to impact lynx.

##### ***2. Grizzly Bear***

Grizzly bears are known to frequent lands east of the NF boundary, particularly in spring and late summer/fall. Nearly all grizzly bear-human conflicts occurring in the area known as the Rocky Mountain Front for the past 10+ years have been on private land. All but one permanent management-related removal (via relocation or killing) from the area have been from private lands. Although significant efforts have been made by agencies and private groups, private lands east of the NF boundary are likely to continue to be a source of grizzly bear mortality. The potential impacts of the Benchmark project are not expected to add to any effects of wildlife management on non-NFS lands.

##### ***3. Gray Wolf***

The Monitor Mountain Pack has engaged in livestock depredation on private land immediately east of the NF boundary, in the early winter and late fall of 2007 and the spring of 2008. In December 2007 and again in May 2008 some animals were removed from the pack as a result of those depredations. In 1993 the Sawtooth Pack established a territory on private land in the Smith Creek area very near where the Monitor Mountain pack first appeared in 2007. Eventually the entire Sawtooth Pack had to be removed (in 1996-97) after a series of livestock depredations. As this history shows, despite the presence of the WMAs and of a large block of land owned by The Nature Conservancy, it is unlikely that wolves would exist for long east of the NF boundary without eventually coming into conflict with

livestock operations and suffering mortality as a result. The potential impacts of the Benchmark project are not expected to add to any effects of wildlife management on non-NFS lands.

#### ***4. Northern Goshawk***

Northern goshawk habitat extends east of the National Forest boundary only in very small, localized areas generally connected to larger patches of habitat on adjoining Forest land. Management of goshawk habitat on non-National Forest lands is not likely to affect the goshawk population in the analysis area, on the RMRD or in the Region.

#### ***5. Old Growth, Snags and Cavity-Nesting Habitat***

Minimal if any old growth or snag habitat extends east of the National Forest boundary.

## **Summary of Mitigations for Wildlife**

### ***GRIZZLY BEAR***

Activities associated with treatments must be carried out between July 1 and March 31 to avoid potential disturbance in spring habitat during its period of concentrated use. This includes road building, road use, and all hand and mechanical cutting. Jackpot or broadcast burning may occur during the key spring time period (April 1 – June 30) if necessary, but should be accomplished in as short a duration as possible during that time.

Any roads constructed in association with the project must follow the above timing restrictions, must be closed to the general public at all times, and must be obliterated when treatment in that unit is completed.

All personnel involved in all aspects of the project, including any contractors, must adhere to the NCDE Special Food Storage Order (current version: Food Storage Special Order LC00-18).

### ***NORTHERN GOSHAWK***

No project activities may occur in known goshawk PFAs between April 15 and August 15. Affected treatments include Fairmule #2, Mule Creek, and Double Falls #2, and portions of Aspen #1 and #2, Ford Creek #1 and Ford Creek #2.

Where treatment is to occur within a nesting area (Double Falls #2) the known nest tree and any known alternate nest trees should not be cut. These trees should be retained within the groupings of trees to remain untreated within that unit.

### ***SNAG AND CAVITY-NESTING HABITAT***

At least 2 snags of 10" dbh or greater per acre will be left or created in proposed treatment units.

## **Big Game (Bighorn Sheep, Elk and Mule Deer)**

Involve State Wildlife Biologist in Prescribed Fire application To Ford Creek Unit #1.

To avoid disturbances to elk, mule deer, and bighorn sheep on wintering ranges, it is recommended that hand treatment in the Ford Creek #1 and Ford Creek #2 Units not occur between December 1 and May 1.

Spring burning is recommended in the Ford Creek #1 and Ford Creek #2 Units to 1) mitigate short-term impacts on bighorn sheep and elk winter browse plants; 2) maximize opportunities for plant recovery post treatment; and 3) improve the forage base on winter range over the long term. Fall burning is not recommended because of the potential impacts to needed winter forage.

To mitigate adverse livestock grazing impacts, consideration should be given to putting grazing in the Ford Basin pasture of the Ford Basin allotment in “non-use” status for at least one year following burn treatments.

## **N. ENVIRONMENTAL JUSTICE**

Examination of community composition, as required under E.O. 12898, found no minority or low income communities or groups to be disproportionately affected under any of the vegetation alternatives. This was not raised as an issue during public scoping.