Biological Assessment
for the

Hazard Tree and Fuels Reduction Project–
Routt National Forest (NF) Portion and Those Acres of the Arapaho-Roosevelt National Forest Administered by the Routt NF of the Medicine Bow – Routt NF's Hazard Tree/Fuels Reduction Project.

This includes the Parks, Hahn's Peak/Bears Ears and Yampa Ranger Districts located throughout Garfield, Grand, Jackson, Moffat, Rio Blanco and Routt Counties

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Prepared by: Marcia L. Pfleiderer _____ Date_____
Parks RD Wildlife Biologist

Meets the standards for both a Biological Evaluation (FSM 2672.42) and Biological Assessment (50 CFR 02.12(f)).

I. INTRODUCTION

The USDA Forest Service (FS) is proposing an array of treatments to address *hazardous trees and fuel loading that include lodgepole pine, Engelmann spruce, sub-alpine fir and aspen throughout the Routt National Forest, which lies within the counties of: Garfield, Grand, Jackson, Moffat, Rio Blanco, and Routt. This project excludes wilderness areas. The majority of the treatments would impact lodgepole pine.

Federal land management agencies must consult on any action that may affect a federally listed species. Section 7(c) (1) of the Act requires a Biological Assessment (BA) be prepared if a listed species and/or critical habitat may be present in the action area (USDI-FWS-NMFS 1998). The Endangered Species Act (ESA) requires the Forest Service to develop information about the potential impacts of its proposed activities on threatened and endangered species before the agency commits itself to a particular course of action. Section 7(a) (2) of the ESA obligates all federal agencies to: "ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species…" This Biological Assessment is prepared in compliance with Section 7 (Interagency Cooperation) of the Endangered Species Act and 50 CFR 402.12, Biological Assessments.

The ESA imposes an affirmative obligation on federal agencies to "conserve" endangered or threatened species and strictly prohibits any person from "take [of] any such species within the United States... [Prohibited Acts, Sec. 9(a) (1) (B)]." Therefore, agency actions must at all times avoid harm or harassment to any listed species except that "incidental" take may be granted for "any taking otherwise prohibited by section 9(a)(1)(B) if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity [Exceptions, Sec. 10(a)(1)(B)]." The Forest Service Manual (section 2671.44) directs forests to make full use of consultation with the Fish and Wildlife Service to reach supportable effect determinations on species listed or proposed under the Endangered Species Act.

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

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

1. Dead trees of any species

2. Trees with significant defects:
   a. Canker rots

b. Root rots
c. Trunk injuries (mechanical damage, stem decay, etc.)
d. Crown defects (broken or damaged branches, forked tops, dead tops, etc.)

3. Dying trees
   a. About 1/3 + dead limbs and branches
   b. Foliage transparency 40% + (thin crown, off-color or dwarfed foliage)
   c. Borer attacks obvious and abundant - *the presence of insect activity, such as bark beetles or mountain pine beetles, may indicate that a tree has been weakened by other agents*

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

Consistency Determination between the Proposed Action(s) and Wildlife Standards Described in the Routt National Forest Plan

All activities, as embodied in the proposed action described above, are planned consistent with applicable Forest-wide threatened, endangered, sensitive species (TES) and wildlife standards defined within the *Routt National Forest Land and Resource Management Plan* (USDA 1997, p. 1-14 and 1-15). The proposed action is also consistent with the desired conditions for wildlife habitat specific to the Forest-Level, Management Area, and Geographic Area Direction as long as site-specific Wildlife Conservation Measures/ Project Design Criteria have been incorporated into the proposed action and these measures support the requirements and goals and objectives of the wildlife direction defined within the *Plan*.

The U.S. Fish and Wildlife Service (USFWS) provided the Forest Service with a list of threatened, endangered, candidate and proposed (TEPC) species that might occur on or within the vicinity of influence of the Routt National Forest**.** This list was provided by USFWS to MBR, Routt National Forest via email from Kurt Broderdorp on January 10, 2008. This list was re-confirmed in an email from USFWS Biologist Kurt Broderdorp on January 14, 2008 after a discrepancy in dates was clarified. The species on the updated TEPC are presented in Table 1.

Purpose and Need:
The HFRA recognizes healthy forests or forest health as an important part of forest management.
This project responds directly to forest health objectives as described in the HFRA. Thus, its <u>purpose</u> is to reduce threats to public safety by felling and/or removing dead and

dying trees impacted by the MPB epidemic along roads and trails and in and adjacent to Forest Service developed recreation sites and administrative sites.

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

1) Ensure public and firefighter safety by: a) reducing the risk of persons or property being struck by falling trees; and b) keeping travel corridors open with adequate clearance for the combination of traditional firefighting equipment (e.g., heavy equipment transport trucks, crew carriers, busses, and fire engines), recreational vehicles, and automobiles. The combination of such vehicles is typical during an emerging fire emergency when fire resources are arriving and the general public is evacuating;
2) Reduce the risk of high intensity/high severity wildfires within treatment areas by reducing hazardous fuel loadings associated with treatments and beetle killed trees;
3) Minimize the effects of tree mortality on the overall health, scenic quality, and condition of forested areas along roads and trails and in and adjacent to developed recreation sites and administrative sites; and
4) Partially offset the cost of treatments by salvaging forest products.

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

Note: Amphibian, fish, and plant species are considered in separate biological evaluations prepared by the Fisheries Biologist and Botanist, respectively. Their determinations are summarized in Table 1 under *Habitat and Presence* and *Proposed Action.*

Table 1. Federally Listed Species for the Routt NF, Colorado

Common Name	Species	Status	County Presence						Habitat and Presence	Proposed Action
			Garfield	Grand	Jackson	Moffatt	Rio Blanco	Routt		
Canada lynx	*Lynx canadensis*	T	x	x	x	x	x	x	Resident in forested types. Most likely to occur within established Lynx Analysis Units (LAUs).	Not Likely to Adversely Affect (See analysis and determination later in this document)
Black-footed ferret	*Mustela nigripes*	E				x	x		Prairie dog towns Suitable habitat not present near proposed actions.	No Impact.

Least Tern	*Sternula antillarum*	E			x				Lower Platte River Drainage Suitable habitat not present near proposed actions.	No Effect. Project activities will have no impact or depletion to Platte River water supply. Species not present in project area.
Mexican Spotted Owl	*Strix occidentalis lucidda*	T	x			x			Older Growth Forests and Canyons. Suitable habitat not present near proposed actions.	No Effect. Does not occur on Forest
Pallid Sturgeon	*Scaphirhync -hus albus*				x				Lower Platte River Drainage	Project activities will have no impact or depletion to Platte River water supply. Species not present in project area. No water depletion. In Fisheries BA.
Piping Plover	*Charadrius Melodus*	T			x				Lower Platte River Drainage Suitable habitat not present near proposed actions.	No Effect. Project activities will have no impact or depletion to Platte River water supply. Species not present in project area.
Whooping Crane	Grus Americana	E			x				Lower Platte River Drainage Suitable habitat not present near proposed actions.	No Effect. Project activities will have no impact or depletion to Platte River water supply. Species not present in project area.
Yellow-billed cuckoo[1]	Coccyzus americanus	C	x	x			x	x	See Footnote	See Footnote
Bonytail	*Gila elegans*	E	x	x		x	x	x	Yampa, Green, and Colorado River systems	Project activities will have no impact or depletion to Colorado River water supply.

[1] Candidate species are organisms being evaluated for listing as threatened or endangered under ESA. While these species presently have no legal protection under ESA, it is within the spirit of the Act to consider project impacts on candidates. These species are not addressed in detail in this Biological Assessment, but rather were evaluated in the framework of the Biological Evaluations prepared for this project. The BE prepared for this project reached a conclusion of "no effect" for the western yellow-billed cuckoo based on the criteria that the project area has a lack of available habitat.

										Species not present in project area. No water depletion. In Fisheries BA.
Colorado pikeminnow	*Ptychocheilus lucius*	E	x	x		x	x	x	Yampa, Green, and Colorado River systems	No effect. Project activities will have no impact or depletion to Colorado River water supply. Species not present in project area. No water depletion. In Fisheries BA.
Humpback chub	*Gila cypha*	E	x	x		x	x	x	Yampa, Green, and Colorado River systems	No effect. Project activities will have no impact or depletion to Colorado River water supply. Species not present in project area. No water depletion. In Fisheries BA.
Razorback sucker	*Xyrauchen texanus*	E	x	x		x	x	x	Yampa, Green, and Colorado River systems	No effect. Project activities will have no impact or depletion to Colorado River water supply. Species not present in project area. No water depletion. In Fisheries BA.
Western prairie fringed orchid	*Planthera praeclara*	T							Downstream riparian and riverine habitat of the Platte River system	No alterations to downstream habitats will occur due to Hazard Tree Removal activities
De Beque phacelia	*Phacelia submutica*	C	x						No plants or suitable habitat in action area	No plants or suitable habitat in action area
Dudley Bluffs bladderpod	*Lesquerella congesta*	T					x		No plants or suitable habitat in action area	No plants or suitable habitat in action area
Dudley Bluffs twinpod	*Physaria obcordata*	T					x		No plants or suitable habitat in action area	No plants or suitable habitat in action area
Graham beardtounge	*Penstemon grahamii*	C					x		No plants or suitable habitat in action area	No plants or suitable habitat in action area

North Park phacelia	*Phacelia formosula*	E			x				No plants or suitable habitat in action area	No plants or suitable habitat in action area
Osterhout milkvetch	*Astragalus osterhoutii*	E		x					No plants or suitable habitat in action area	No plants or suitable habitat in action area
Penland beardtongue	*Penstemon penlandii*	E		x					No plants or suitable habitat in action area	No plants or suitable habitat in action area
Parachute beardtounge	*Penstemon debilis*	C	x						No plants or suitable habitat in action area	No plants or suitable habitat in action area
Uinta Basin hookless cactus	*Sclerocactus glaucus*	T	x						No plants or suitable habitat in action area	No plants or suitable habitat in action area

Canada lynx habitat exists in the project area and would be affected by implementation of the proposed project. Therefore the analysis of this projects effect to the Canada lynx is the focus of this Biological Assessment.

II. DESCRIPTION OF THE PROPOSAL

PROJECT BACKGROUND AND DESCRIPTION OF THE ALTERNATIVES (and PROPOSED ACTION)

PROJECT BACKGROUND

Recent years have seen a dramatic increase in mountain pine beetle (MPB) activity and conifer tree mortality in northern Colorado and southern Wyoming. In an attempt to define and track the effects of the infestation, entomologists from the Lakewood Service Center in Lakewood, Colorado analyzed aerial and ground survey data sets of national forests containing lodgepole pine at risk for MPB infestations. The analysis included all or portions of the White River, Arapaho, and Routt NFs in northern Colorado and portions of the Medicine Bow NF in southern Wyoming. Results of the analysis, as documented in Report LSC-07-06, confirmed the following: 1) MPBs are at epidemic levels in northern Colorado and southern Wyoming; and 2) they are not likely to depart from their current course unless a period of prolonged and severe low temperatures (<-30º F) occurs during late fall-winter-early spring months.
The analysis included all or portions of the White River, Arapaho, and Routt NFs in northern Colorado and portions of the Medicine Bow NF in southern Wyoming. Results of the analysis, as documented in Report LSC-07-06, confirmed the following: 1) MPBs are at epidemic levels in northern Colorado and southern Wyoming; and 2) they are not likely to depart from their current course unless a period of prolonged and severe low temperatures (<-30º F) occurs during late fall-winter-early spring months.

Information contained in Report LSC-07-06 provided the technical basis for the Rocky Mountain Regional Office of the USDA Forest Service to issue a Mountain Pine Beetle Epidemic Declaration for northern Colorado and southern Wyoming. The declaration was issued on June 25, 2007 and allows Forest Supervisors of the affected NF's to implement

streamlined NEPA authorities offered by HFRA if they determine that ecosystem components are threatened by the beetles.

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

The extent and numbers of beetle-caused mortality can pose significant threats to public safety for a variety of reasons. For example, there is an increased risk: 1) for persons or property being struck by falling trees; 2) of wildland fire from lightening striking dead trees vs. live green trees; 3) for more catastrophic fire events due to increased fuel loads; and 4) of trees falling and blocking roadways, thus preventing both emergency and non-emergency ingress and egress. All of these factors can be mitigated by the removal of dead and dying trees along roadways and trails and in areas that receive concentrated public use.

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

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

Based on these determinations, the Forest Supervisor concluded that the Forest-wide Hazardous Tree Removal and Fuels Reduction Project is an authorized project under

Section 102(a)(4) of the HFRA. Accordingly, the environmental analysis for the project was completed under the HFRA, Title I, Section 104.

DESCRIPTION OF THE ALTERNATIVES

The action alternatives developed for this project, as described and designed with project design criteria are consistent with applicable Forest-wide threatened, endangered, sensitive species and wildlife standards and guidelines defined within the *Routt National Forest Land and Resource Management Plan* (USDA Forest Service 1998a). The proposed action is also consistent with the desired conditions for wildlife habitat specific to the management area prescription land allocations and it conforms to the desired wildlife habitat conditions identified for the Routt NF, geographic areas.

Alternative 1 – No Action

This 'alternative' is used as a basis of comparison for this analysis and is required to be analyzed in a NEPA analysis. With this alternative, no management actions are proposed and the alternative represents the existing condition of the area.

PROPOSED ACTION – Alternative 2

Under the Proposed Action - Modified, the Forest Service could fell and/or remove hazardous trees that are within 1 ½ tree heights (up to 150 feet) from the centerline of: and 1) NFSRs open to public travel (Maintenance levels 2 – 5); and 2) state and county roads that cross the Forest. Hazardous trees in and adjacent to Forest Service campgrounds, administrative sites, and Forest Service trailheads could also be felled and/or removed. Hazardous trees could be felled, but not removed, along Forest Service trails. These activities could occur over a 10-year period. Healthy, stable, live trees (e.g., spruce-fir, aspen, and lodgepole pine), clumps of regeneration, and dead and dying trees leaning away from the roads and trails and other aforementioned sites would be retained unless they pose a safety hazard in the felling/removal operation.

The salvage harvest will consist of clearcutting dead trees, or the removal of individual trees with clearcutting methods. Seedlings and saplings will be allowed to regenerate throughout the life of the project.

The majority of the treatments would impact lodgepole pine trees, although small amounts of Engelmann spruce, sub-alpine fir, and aspen could also be felled and/or removed. Depending on the severity of the beetle infestation and the resultant tree mortality, harvest treatments could include removing individual hazardous trees, sanitation/salvage (removing overstory trees infested with MPB and leaving the understory vegetation), patch clearcutting (removing clumps of hazardous trees), or clearcutting (removing all hazardous trees up to 150 feet from the centerline of roads and trails). In these situations, forest products would be removed (where feasible) or fuels would be treated on site. Fuel treatments along road ways and in campgrounds and administrative sites could include chipping, lopping and scattering slash to an 18 or 24 inch depth, roller chopping, machine trampling, and/or broadcast burning. Hand piling, pile burning or mulching may occur in select units to mitigate fuels or visual concerns.

Where feasible, fuel treatments along trails would consist of hand piling the felled material and burning it.

Small personal use sales, timber sales, free personal use and administrative use permits, Forest Service crews, service contracts, and Stewardship contracts are all examples of instruments that could be used to implement the hazard tree removal project.

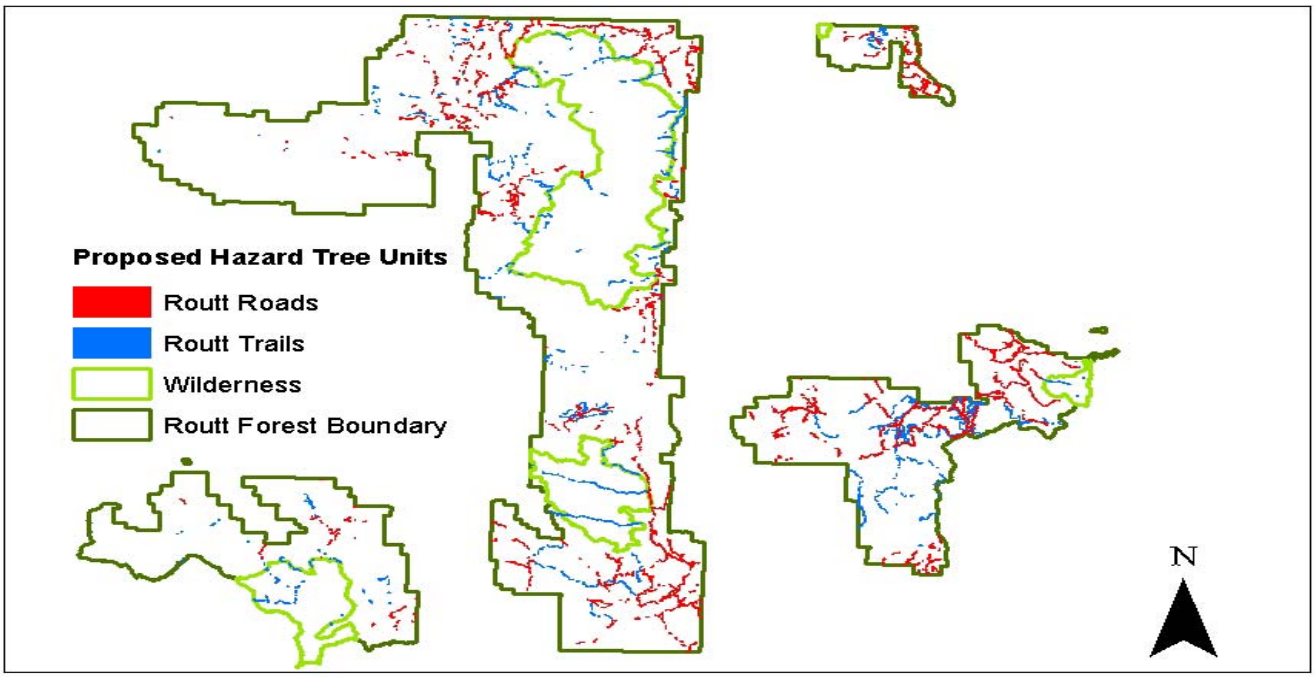
Design criteria would be applied to protect sensitive areas, such as streamside management zones. Priority for scheduling treatment would be determined by the severity of bark beetle infestation, mortality of trees, and the severity of safety hazard posed.

Following is a summary of the roads and trails potentially affected by this project:

> **Acres potentially affected:**
> Along roads, approximately 10,932 acres on the Routt portion of the Forest could be affected by project implementation.
>
> Along trails, approximately 7,368 acres on the Routt portion of the Forest could be affected by project implementation.
>
> **Miles of road potentially affected:**
> 817 on the Routt
>
> **Miles of trail potentially affected:**
> 720 on the Routt

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

Map of the Proposed Action –Fig. 1



EXISTING CONDITION

Aerial surveys conducted annually for the Medicine Bow-Routt National Forests show that losses of lodgepole pine to mountain pine beetles have increased significantly in extent and number over the past 11 years. For example, on the Routt National Forest, roughly 230 acres of lodgepole pine trees showed evidence of beetle-caused mortality in 1996. By 2006, that number had increased to 223,000 acres. On the Medicine Bow National Forest in southern Wyoming, aerial survey data from 1996 showed only 10 acres impacted by mountain pine beetles. By 2006, that number had increased to 75,000.

Data from ground surveys conducted between 2002 and 2006 were also summarized to augment the analysis of aerial survey data. In all cases, mountain pine beetle populations exceeded endemic levels (<0.5 infested trees per acre), and ranged from 2.8 to 89.4 newly infested trees per acre, with an average of 24.5 newly infested trees per acre (Lakewood Service Center Report, LSC-07-06). Data from both surveys clearly indicates that a mountain pine beetle epidemic is underway on the Medicine-Bow Routt National Forests.

General Setting:
The analysis area for proposed hazard tree treatments is the Routt National Forest in northwest Colorado. Approximately 20% of the Routt National Forest is designated wilderness.

About 78% of the Forest is classified as forested. Most of the forested land is composed of spruce/fir, lodgepole pine and aspen. Most of the Forest (60%) is in a mature condition. The nonforested land makes up about 22% of the Forest. It includes grassy meadows, shrubs such as sagebrush and oakbrush, and rock/talus slopes.

Average annual precipitation totals anywhere from 9.7 inches east of the Continental Divide to 67.4 inches west of the Continental Divide. (LRMP) Most incident moisture arrives in winter as snow but some precipitation falls during spring and summer thunderstorms. **Table 2** represents a summary of the plant habitat structure stages by cover type.

Table 2.	**Acres in Habitat Structure Stage**									
Cover Type	**0**	**1**	**2**	**3a**	**3b**	**3c**	**4a**	**4b**	**4c**	**5**
Aspen	0	0	14.5	21,023	91,079	13,417	14,822	76,042	22,425	0
Blue Spruce	0	0	0	0	0	0	11	0	0	0
Cottonwood	0	0	0	0	0	0	46	8	0	0
Douglas-fir	0	0	0	252	1,615	202	268	1,966	490	0
Gambel oak	0	0	1,858	0	0	0	0	0	0	0
Limber pine	0	0	0	196	119	0	0	0	0	0
Lodgepole pine	0	0	1,890	19,113	122,993	18,932	5,988	177,043	44,611	0
Ponderosa pine	0	0	0	0	0	0	30	7	0	0
Spruce/fir	0	0	570	14,646	64,237	8,484	12,049	145,845	30,281	0
Juniper	0	0	0	53	117	0	0	0	0	0
Other	0	0	0	35	112	0	0	0	0	0
Total Forested (914,771)	**0**	**0**	**4,333**	**57,318**	**280,153**	**41,035**	**33,214**	**400,911**	**97,807**	**0**
HSS as % of Routt Total Forested	**0%**	**0%**	**.473%**	**6.2%**	**30.6%**	**4.4%**	**3.6%**	**43.8%**	**10.6%**	**0%**
Total Non-forested (342,238)	**15,195**	**327,042**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
HSS as %Routt for Non-Forested	**1.6**	**96**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**15,195**	**327,042**	**4,333**	**57,318**	**280,153**	**41,035**	**33,214**	**400,911**	**97,807**	**0**
HSS as % of Total (1,257009.00)	**1.2**	**26**	**.034**	**4.6**	**22.2**	**3.2**	**26.4**	**32.**	**7.8**	**0**

Plant Cover Type Summary
Plant cover types (current vegetation communities) that are expected to be present in the analysis area include lodgepole pine forests, Engelmann spruce (*Picea engelmannii*)/subalpine fir (*Abies lasiocarpa*) forests, quaking aspen (*Populus tremuloides*) groves and woodlands, open parklands and riparian areas (including seeps, fens, and carrs). On some lower-elevation south and west-facing slopes, Douglas-fir (*Pseudotsuga menziesii*) dominates in limited areas that have shallow soil or are rocky. Generally, forests below 9800 feet elevation are dominated by lodgepole pine while forests above 9800 feet are wetter and support mainly Engelmann spruce and subalpine fir. These plant communities are segregated along gradients of elevation, aspect, soils and topography and are directly affected by vital plant growth determinants such as temperature, effective precipitation and hydrologic regime.

Plant Cover Types

1. ***Medium and large-sized Lodgepole Cover Types***
   Lodgepole pine is the prevalent tree within this cover type; sometimes it is the only tree found in a local area. Lodgepole pines grow at lower elevations on warm to cold sites that are dry to moderately dry. Those stands having a 5 to 8.9 inch average girth at breast height are categorized as medium-sized whereas large-sized lodgepole stands have trees that average 9 to 15.9 inches in diameter at breast height (dbh). Although there are very large (16+ inch dbh) lodgepole pine individuals scattered within this cover type, there are limited, if any stands, in the action areas that have an average dbh that meets the minimum diameter for very large trees.

   Lodgepole pines usually comprise 80 percent or more of the basal area in areas of this cover type. Other conifers present in lodgepole stands include subalpine fir, Engelmann spruce and Douglas-fir. Where firs and spruces occur in lodgepole stands, they are seldom members of the (dominant or codominant) overstory. On the other hand, Douglas-firs growing among lodgepole pines are usually the largest trees in the stand and the Douglas-fir crowns typically extend above the overstory, occupying the super-dominant canopy position.

   Most medium or large-sized-tree lodgepole stands in the analysis area are even-aged, mature and are at the mid-seral stage of forest development. With few exceptions, lodgepole stands within proposed activity areas have a single-story canopy. Individual boles are separated somewhat from neighboring stems; only infrequently are there couplet or triplet sets of stems growing closely together. Stem diameters among most dominant and codominant trees frequently vary within a relatively narrow range of 2 to 5 inches. It is suspected that in nearly all stands, there are occasional wolf trees that are larger and occupy substantially more growing space than neighboring trees of similar age. Mature lodgepole stands with 2 distinct age-classes and 2 canopy layers are rarely present. However, where 2-story stands exist in the analysis area they are, almost without exception, the result of past logging.

Very rarely, remnant old-growth pines (trees 150 years old or older with characteristics as described in Mehl 1992) endure locally as individuals or in small groups. These old trees persist in current forest stands because they survived the last stand replacement (disturbance) event. However, old age pine trees are few in number in activity areas generally and their distribution is widely dispersed and irregular within lodgepole pine stands.

Most stands in this cover type had a natural genesis following the last stand-replacement disturbance (a forest fire preceded, perhaps, by a MPB outbreak). Most lodgepole pine stands present today are the result of natural succession, where trees regenerated from seed and stem density was not manipulated by people, at least until stands matured adequately for trees to reach a commercially valuable size. There are numerous areas of medium-sized trees (40 to 55 years old) that regenerated following clearcut harvesting in the middle part of the last century.
Although most medium and large-sized tree stands in the analysis area did have a natural origin, the majority of both natural and human-created lodgepole stands have been manipulated in the recent past through tree cutting. Thins or other partial cut treatments have typically been completed during the last 50 years in many stands adjacent to roads. Nonetheless, these stands are not much different from adjacent un-thinned lodgepole stands except, perhaps, there are fewer multiple-topped trees and the average trunk diameter is larger in cut stands.

In most cases, stands with a somewhat open canopy are the result of previous tree cutting. In nearly all previously thinned stands, the overhead tree canopy is not as highly interlaced as the tree canopy found in natural stands. In contrast to partially cut stands, un-manipulated natural stands are quite crowded with mature lodgepole and have a higher tree density. In these dense stands, small trees, shrubs and other forest floor vegetation is usually depauperate beneath the dominant canopy.

Where stands were previously cut, and there is sufficient light reaching beneath the dominant canopy, lodgepole pine seedlings and saplings can be moderately abundant in the understory. Aspens are the next most common understory trees growing in these stands. Subalpine firs, and to a lesser extent Engelmann spruces, can be common in some stands but they are typically not abundant within many mature lodgepole stands in the action area. Neither of these species generally occupies a dominant or codominant position in the upper canopy.

Understory plants can be common too, if not abundant, in stands with an open canopy. Herbaceous plants commonly found in most analysis area pine stands include various grasses, sedges (*Carex* spp.) and forbs (herbs other than grasses, grass-likes, and ferns). Common graminoids include bluegrass (*Poa* spp.), mountain brome (*Bromus marginatus*), elk sedge (*Carex geyeri*) and Ross sedge (*C. rossii*). Prevalent forbs include lupine (*Lupinus argenteus*), strawberry

(*Fragaria* spp.), pussytoes (*Antennaria rosea, A.* spp.), wintergreen (*Pyrola chlorantha*), heartleaf arnica (*Arnica cordifolia*), hawkweed (*Hieracium* spp.) and Parry's golden-weed (*Oreochrysum parryi*).

Woody plants are common in many stands as well. The most ubiquitous shrub occurring on cold and moderately dry sites is grouse whortleberry (*Vaccinium scoparium*). On warmer and drier sites, the following shrubs occur variably but commonly, depending on openness of the tree canopy and other factors: common juniper (*Juniperus communis*), kinnikinnick (*Arctostaphylos uva-ursi*), creeping Oregon grape (*Berberis repens*), mountain boxwood (*Pachistima myrsinites*) and russet buffaloberry (*Sheperdia canadensis*).

Large-sized snags (*i.e.*, snags with diameters larger than 9 inches dbh) are typically infrequent but are an increasingly common feature of many large-sized lodgepole pine stands in the analysis area. This growing number of snags is directly attributable to the current outbreak of Mountain Pine Beetle (MPB). Because nearly all existing large snags are trees that died only recently (within the last 4 years), they are labeled "hard (*i.e.*, the heartwood and sapwood is sound with little decay or deterioration evident)" snags. In contrast, large standing-dead trees in an advanced state of decomposition, usually described as "soft (rotten)" snags, are uncommon enough in this cover type as to be considered rare.

The explanation for the general lack of hard and soft snags in natural stands is related to the mid-seral development, relative vigor and middle age of lodgepole pine in this cover type. Until now, through what is termed by Oliver and Larson (1996) as the stand initiation and stem exclusion phases of stand development, there simply has not been sufficient time, or loss of tree vigor, for mortality agents (insects, disease, wind, *etc.*) to act upon and kill dominant and codominant trees. Of course, without standing-tree mortality (hard snags) in the overstory, there is no current source for creation of large soft snags.

With the expected increases in large tree mortality occurring (as MPB kills more and more overstory pines), hard snags, soft snags and coarse woody debris quantities are expected to increase considerably. If fire or human intervention does not change the trajectory of lodgepole stands toward increased losses of overstory trees, the beetle outbreak could be seen as the nexus for the onset of the next phase in mature lodgepole pine succession: the understory reinitiation stage of stand development (Oliver and Larson 1996).

Dwarf mistletoe (*Arceuthobium americanum*) is prevalent in many mature lodgepole stands within the analysis area. Mistletoe control efforts have been an ongoing management activity, scattered across the analysis area, for many years. Some stem decays have been identified, during stand examinations, but the extent is quite limited.

Timber harvesting is the primary extractive use that occurs in mature lodgepole pine stands. Logging mature or old age trees has been ongoing within this cover type for many years.

2. ***Seedling and Small-sized Lodgepole Pine Cover Types***
Stands in this cover type (within the analysis area) are mostly plantations that developed following clearcut harvesting. A few young stands have regenerated following fire. For the most part these stands are relatively uniform, human-created forests of even-aged trees. Lodgepole pine predominates and typically composes more than 80 percent of all trees growing on a site. Other tree species scattered amongst the lodgepole are spruce, subalpine fir and aspen. Seedlings are less than 1 inch dbh and small-sized trees of this cover type are 1 to 4.9 inches dbh and 10 to 25 feet tall. In many plantations, large or very large live trees or snags are seldom present.

In thinned plantations, understory vegetation is responding to the more open tree canopy. Elk sedge, shrubs and grasses, as described for the medium and large-size lodgepole pine cover type, are growing in these stands. In plantations where no thin has yet taken place, crowns of interior trees often persist to the ground but stem densities are generally less than 1000 trees per acre.

3. ***Quaking Aspen Cover Type***
Individual aspen trees, aspen groves or both can be expected to be scattered among and within conifer forests. Where moisture and soil productivity are good, groves of tall, straight white-barked trees develop. Where quaking aspen groves are located within or next to lodgepole stands, the aspens are typically similar in diameter and height to the conifers surrounding them. However, some aspen patches (often associated with sagebrush areas) consist of stems that are clearly subordinate in size to neighboring conifer forests. On rocky slopes, hot aspects or on poor soil, aspens form scrubby thickets and large aspen stems may be few or even absent. Aspens also occur in stringers along the banks of streams and in regenerating forest areas.

In groves of either large or small-sized aspens, conifers have often established themselves in the aspen understory and, many times, there are lodgepole pines overtopping the aspen. This is a visible indication of succession from aspen toward conifer dominance. Ingrowth of conifers into an aspen-dominated stand is commonly termed "conifer encroachment" and is a slow but inexorable vegetative progression that can ultimately result in supplanting of aspens by lodgepole altogether.

Understory vegetation in aspen stands is typically richer and more diverse than in neighboring conifer stands. Common herbaceous understory plants in the larger aspen stands include American vetch (*Vicia americana*), aspen peavine (*Lathyrus leucanthus*), Oregon fleabane/aspen daisy (*Erigeron speciosus*), yarrow (*Achillea millefolium*), Porter loveage (*Ligusticum porteri*), blue wildrye (*Elymus glaucus*),

brome (*Bromus* spp.), Colorado columbine (*Aquilegia coerulea*), Fendler meadow-rue (*Thalictrum fendleri*), Richardson geranium (*Geranium richardsonii*) and strawberry.

4. ***Spruce/fir Cover Type***

The spruce/fir cover type occurs on mesic sites at higher elevations and at lower elevations on northerly aspects or other sites of greater moisture retention. Where aspect or riparian moisture creates a mesic to wet environment, spruce can comprise the majority of basal area in the forest while subalpine fir, lodgepole pine and aspen may make up less than 50 percent of remaining trees. Conversely, where less moisture is retained on upland slopes due to aspect or soil porosity, lodgepole pine may compose upwards of 50 percent of the trees in these stands and spruce may be a minor component. In spruce/fir stands generally, increased variety of tree species and the typically longer subsistence of these stands provides for greater structural complexity than is found in the lodgepole cover type.

Spruce and subalpine fir regeneration is often abundant in the understory. Aspen groves are occasionally encountered in these stands. Grouse whortleberry is a ubiquitous shrub in the understory. Other prevalent shrubs or sub-shrubs include russet buffaloberry, mountain boxwood (*Pachistima myrsinites*) and prince's pine/pipsissewa (*Chimaphila umbellata*). Common forbs include heartleaf arnica, wintergreen, twinflower (*Linnaea borealis*), sweetroot (*Osmorhiza* ssp.), arrowleaf groundsel (*Senicio triangularus*) and bluejoint reedgrass (*Calamagrostis canadensis*).

Timber harvesting is the primary extractive use that occurs in mature spruce/fir stands. Logging mature or old age trees and regeneration of new forests has been ongoing within this cover type for many years.

5. ***Riparian Bottomlands Cover Type (Willow Carrs, Seeps, Springs and Fens)***

Generally diverse plant communities occur along streams and in or near seeps, springs, fens and carrs in the analysis area. Several environmental factors contribute to the patchy, highly variable plant assemblages found adjacent to these wet areas: duration of soil saturation, soil depth and texture, frequency of flooding, depth to the water table, soil oxygen availability, duration of snow cover, growing season length and temperature, animal browsing, and ice damage in the spring (Knight 1994). Terrain features, such as valley width and orientation, drainage basin area, stream gradient and sinuosity in turn influence the importance and primacy of these environmental factors.

Tall willow (*Salix* spp.) plant communities occur along numerous perennial streams forming a riparian greenbelt separate from mesic upland forests or sagebrush parks. Here, centuries of beaver activity have created relatively flat, stair-stepped mountain streams in what might have been a steep-sloping valley. The most frequent willows occurring in the tall willow carrs are planeleaf willow

(*Salix planifolia*), Drummond willow (*Salix drummondiana*) and Geyer willow (*Salix geyeriana*). Other willows that are present but less abundant include Booth willow (*Salix boothii*), mountain willow (*Salix monticola*) and Wolf's willow (*Salix wolfii*). Occasionally, thinleaf (or mountain) alder (*Alnus incana*) is encountered.

Sedge/forb-dominated openings are commonly interspersed with riparian willow areas. Frequently encountered sedges associated with streamside areas and seeps/springs/fens are beaked sedge (*Carex utriculata*) and water sedge (*C. aquatilis*). Other sedges present include bighead sedge (*C. pachystachya*), alpine nerve sedge (*Carex nuerophora*), Nebraska sedge (*C. nebrascensis*), smallwing sedge (*C. microptera*) and slender-beaked sedge (*C. arthrostachya*). Rush species found here include longstyle rush (*Juncus longistylis*), swordleaf rush (*Juncus ensifolius*), Colorado rush (*Juncus confusus*) and small-flowered woodrush (*Luzula parviflora*). Other species observed are panicled bulrush (*Scirpus microcarpus*) and burr reed (*Spraganium emersum*).

Wet meadows and short willow shrublands support other plants. Lush forbs and grasses frequently encountered here include arrowleaf groundsel, gentian family members (*Gentianella* spp., *Pneumonanthe parryi* and *Swertia perennis*), slender hairgrass (*Deschampsia caespitosa*) and bluejoint reedgrass. Bog birch (*Betula nana*) grows in scattered streamside locations in the analysis area, along upland forest edges where soils are seasonally saturated, usually forming complex, low stature, open shrubland mosaics.

6. Open Parkland/Sagebrush Steppe Cover Type

The non-forested park areas of the analysis area include sagebrush and grass dominated communities. Compared to grasslands, the distinguishing features of sagebrush ecosystems are the presence of a conspicuous shrub and a larger proportion of the annual precipitation occurring during winter. In addition, a prominent characteristic of these mountain parks is deep, well-drained soils.

Within parks of the analysis area, silver sagebrush (*A. cana* subsp. *viscidula*) and mountain big sagebrush (*Artemisia tridentata* subsp. *vaseyana*) are the predominant shrubs. Frequently, these two sagebrush varieties grow side by side. Other associated shrubs include fringed sagebrush (*A. frigida*), shrubby cinquefoil (*Dasiphora floribunda*) and common rabbitbrush (*Chrysothamnus nauseosus*). Silver sagebrush is normally less than 0.5 meter tall and typically occupies low-lying areas, swales or ephemeral draws. Mountain big sagebrush can attain a height of about 1 meter tall and thrives at higher elevations along forest edges where upland sites provide cooler conditions. Some of the common grass species associated with the sagebrush cover type is Idaho fescue (*Festuca idahoensis*), Thurber fescue, western wheatgrass (*Pascopyron smithii*), prairie junegrass (*Koleria cristata*), needle grass (*Stipa* spp.) and Sandberg bluegrass (*Poa sandbergii*).

Other General Setting:

Vegetation Disturbance

In the Routt analysis area ecosystem, disturbance is the critical factor in maintaining the natural diversity of species. Without disturbance, subalpine fir and Engelmann spruce would eventually replace disturbance dependent species such as lodgepole pine and aspen. The presence of these species at the middle and lower elevations of the analysis area is reflective of disturbance in the form of fire. Natural and human caused wildfires have been a major factor in forming the forests we see today in this ecosystem. It is known that fires burned large portions of this range, playing an important role in the appearance of the landscape, and maintaining a mix of tree species in various successional stages. Stand origin dates, estimated from tree growth ring data, provide a map of where and approximately when stand replacing/regenerating fires occurred. A trend that has been found across the Forest, due to the high amount of fires that occurred around 1900, there is a relatively high amount of stands that are between 80 to 120 years old within the AA.

Forest Insects and Disease

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

Aerial surveys conducted annually for the Medicine Bow-Routt National Forests show that losses of lodgepole pine to mountain pine beetles have increased significantly in extent and number over the past 11 years. For example, on the Routt National Forest, roughly 230 acres of lodgepole pine trees showed evidence of beetle-caused mortality in 1996. By 2006, that number had increased to 223,000 acres. On the Medicine Bow National Forest in southern Wyoming, aerial survey data from 1996 showed only 10 acres impacted by mountain pine beetles. By 2006, that number had increased to 75,000.

Data from ground surveys conducted between 2002 and 2006 were also summarized to augment the analysis of aerial survey data. In all cases, mountain pine beetle populations exceeded endemic levels (<0.5 infested trees per acre), and ranged from 2.8 to 89.4 newly infested trees per acre, with an average of 24.5 newly infested trees per acre (Lakewood Service Center Report, LSC-07-06). Data from both surveys clearly indicates that a mountain pine beetle epidemic is underway on the Medicine-Bow Routt National Forests.

The extent and numbers of beetle-caused mortality can pose significant threats to public safety for a variety of reasons. For example, there is an increased risk: 1) for persons or property being struck by falling trees; 2) of wildland fire from lightening striking dead trees vs. live green trees; 3) for more catastrophic fire events due to increased fuel loads; and 4) of trees falling and blocking roadways, thus preventing both emergency and non-emergency ingress and egress. All of these factors can be mitigated by the removal of dead and dying trees along roadways and trails and in areas that receive concentrated public use.

Past Timber Harvest

There has been harvest in some portions of the Routt National Forest in the past. Vegetation changes caused by these actions and the subsequent regeneration are reflected in Table 2. Habitat Structure Stages by Cover Type. Routt-wide projects, and acres, that have been planned, but have not yet been treated are not reflected in Table 2. Future habitat changes caused by these projects are included in the cumulative effects analysis for the appropriate sensitive species.

Livestock Grazing

Grazing of domestic livestock is the primary extractive use that occurs Routt, NF-wide. Livestock are grazed in park and sagebrush areas for only a portion of the year, typically from early summer through early fall. Use of these types of areas for feeding domestic livestock has likely taken place across the Forest for more than a century.

There are several allotments or portions of allotments in the analysis used for domestic sheep or cattle grazing. USDA (1995) included a series of Biological Evaluations that analyzed the effects of livestock grazing to endangered, threatened, proposed, and sensitive species across the Rocky Mountain Region. These Regional BE's addressed many of the species that will be included in this analysis. These BE's were reviewed and were verified to be appropriate and accurate for this analysis area.

Recreation

Several multiple use trails (to include motorized and non-motorized) can be found within the analysis area. Used mostly for hiking in the summertime, the higher elevations contain portions of the trail systems—including the Continental Divide National Scenic Trail (CDNST), which access the Mt. Zirkel Wilderness area. There are nine million acres of National Forest System lands on the Routt NF. All Terrain Vehicle (ATV) use on existing travel ways is high. Area National Forest System Roads (NFSR's) are used by snowmobilers during the winter. Many of the major area Forest roads are groomed for snowmobiling. A non-motorized trail system is also groomed for cross country skiing and snow-shoeing. Parking lots and campgrounds provide parking for snowmobilers and skiers using the extensive area trail system. In addition to the numerous trail opportunities, the area contains a number of developed campgrounds and picnic areas. Other major recreational uses in the area include big game hunting, dispersed camping, ATV/ORV use, driving for pleasure, and personal use firewood cutting.

Although mining activities could be considered insignificant at this time, Routt-wide activity may increase in the future. There is possibly some infrequent, personal use

panning by the public but this is not sufficient to disturb individual wildlife species or their habitat.

Roads

The Travel Management roads analysis for the Routt revealed that there are a number of roads within the project area requiring maintenance or closure and rehabilitation to reduce soil erosion and sediment entering area creeks. In addition, high open road density could potentially be degrading wildlife security areas and habitat. The popularity of ATV use in the vicinity has led to the creation of a number of user created trails throughout the area—including ones that have encroached into areas that are currently off limits to motorized use.

Project Design Criteria-Proposed Action

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

The action alternatives for this project were developed with the inclusion of project design criteria as fundamental and integral to the design of the action alternatives. This section describes Design Criteria specifically developed for the Hazard Tree and Fuels Reduction Project for the combined Medicine Bow - Routt National Forests. The identified actions are expected to be implemented at the Forest/project level. They are as follows:

Developed Recreation Sites, Trails, Trailheads, and Administrative Sites

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

Heritage Resources

5. Heritage resource sites that are discovered within areas identified for mechanical treatment will be evaluated for National Register eligibility. Sites that are eligible for, or listed on, the National Register of Historic Places will not have mechanical treatment

occur within the site boundary plus a 50 foot buffer around the site. If treatment is necessary these sites, and the 50 foot buffer, will be hand-treated for hazard trees and accumulated fuel build up.

Invasive Species

6. Off-road equipment shall not be moved onto the sale area without having first taken reasonable measures to make sure each piece of equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold invasive seeds.

7. Revegetation on any area may be required where ground cover is disturbed (e.g. landings, burned slash pile sites, skid trails, etc.). As a general guideline, ground cover should recover to its normal range of variability for the landtype and geoclimatic area by the end of the third growing season. Native plant species should ultimately dominate the site, although introduction of nonpersistent species may be used to ensure vegetation cover initially.

Inventoried Roadless Areas (IRAs)

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

Old Growth and Late Succession Forest

9. Hazard trees within mapped and inventoried old growth areas and in those polygons identified in the old growth strategy on the MBNF will be hand felled and left in place. If necessary, felled trees may be stabilized to prevent movement onto a roadway. Lop and scatter slash to a height of less than 24 inches above the ground. Do not designate landings in these areas.

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

Public Safety

11. On Level 3 – 5 roads and on county and state highways, warning signs and traffic control shall be in accordance with the “Manual of Uniform Traffic Control Devices.”

12. Level 2 roads will be temporarily closed to general public access during felling and/or removal operations.

13. Erect barricades and/or proper signs at any traffic hazards left in or adjacent to the road at the end of each workday. All felled trees and slash shall be removed from the

bladed, mowed, or brushed road corridor each day before crews leave the work area for the day.

Riparian Areas/Aquatic Protection

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

Roads

21. No new specified road or temporary road construction will be authorized. No excavated skid trails will be authorized except where necessary to gain access up the cut slope or down the fill slope of an existing road.
22. Decking and landing areas will be designated by the Forest Service.
23. Minimize damage to drainage structures and road features. Repair any damaged drainage structures and road features and rehabilitate any damage to cut and fill slopes.
24. When operating on or along the road prism, do not skid within or across drainage ditches; limit impacts to road surface. When damage is unavoidable, reconstruct and/or replace surfacing as necessary. Engineering will determine post-operation/haul road maintenance, repair, reconditioning, or resurfacing needs on an individual basis.
25. Honor existing seasonal road closures and other road restrictions during hazard tree removal operations for species or resources that are sensitive to disturbance.

26. Remove felled hazard trees and slash from wing ditches, lead-off ditches, tail ditches, and culvert outlets. Place all slash such that it will not fall, roll, or be blown into these areas.

Slash Disposal/Fuels Treatments

27. The preferred slash treatment method for the majority of the potential project area is to whole tree skid and/or removal of the whole tree where the entire tree, including the top and limbs, is removed. The limbs and tops are to be cut off at designated landings and piled for later burning by the Forest Service or chipped and hauled off-site by the Contractor.

28. Where terrain and topography allow: for road clearing operations and at all trailheads, the limbs may also be chipped on-site with the chips left in place; the depth of the chips cannot exceed three inches above the surface. At administrative sites and developed recreation areas, chips resulting from chipping operations must be hauled off-site for disposal.

29. Remove slash from felled hazard trees from stream channels unless otherwise specified by the Forest Service. Lop and scatter slash to a height of less than 24 inches above the ground.

30. After slash piles are initially burned, plan on follow-up re-piling or scattering3 of the pile remnants by a dozer equipped with a brush rake. Where re-piling occurs, the piles will be reburned.

31. Slash treatment shall include lopping/scattering outside the developed area or cut and piled for rental property firewood. Lop and scatter slash to a height of less than 24 inches above ground level.

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

32. Trees may be hand felled in SIAs and boles must be left in place; ground skidding may not occur. Lop and scatter limbs to a height of less than 24 inches above the ground. This design criterion applies to the following SIAs on the Medicine Bow National Forest: Cinnabar Park, Medicine Bow Peak, White Rock Canyon, Kettle Ponds, Sunken Gardens, Ribbon Forest, Platte Canyon, and Brown's Peak. It also applies to the following SIAs on the Routt National Forest: Black Mountain, Oliphant and Welba Peaks, California Park, Camp Creek, Little Snake, and Kettle Lakes.

33. Hazard trees will not be felled and/or removed in RNAs.

34. No active treatments will occur along trails in Wilderness Area boundaries; warning signs identifying potential risks associated with hazardous trees will be posted at Wilderness Area trailheads. Fallen trees may be cleared from Wilderness trails during routine trail maintenance activities, per Forest Service Manual direction.

Visuals

35. Minimize damage to natural features such as rock outcrops, young healthy trees, and understories of trees and shrubs; cut stumps as low to the ground as feasible and remove heavy slash within the immediate foreground (approximately 25 to 200 feet from edges of road) roads and trails located in MAs that are assigned Retention and Partial Retention Visual Quality Objectives and High and Moderate Scenic Integrity Objectives.

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

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

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

III. THREATENED SPECIES CONSIDERED AND ANALYZED IN FURTHER DETAIL

Canada Lynx (*Lynx canadensis*) Federal Status: Threatened.

The Canada lynx (*Lynx canadensis*) was listed as threatened on March 24, 2000 (Federal Register: March 24, 2000 [Volume 65, Number 58]). Information on species status and ecology of the Canada lynx was obtained from *Ecology and Conservation of Lynx in the*

United States (Ruggerio *et al.* 1999), and the *Lynx Conservation Assessment and Strategy* (LCAS; Ruediger *et al.* 2000). This information is summarized below for key factors in this analysis. Information specific to particular areas of the Forest are provided in the Lynx Analysis Units (LAU) section of this Assessment.

Table 3. Impact analysis summary for Canada lynx

Species	Status	Determination
Canada Lynx (*Lynx canadensis*)	ESA Threatened	Not likely to adversely affect.

Background Biological Information on the Canada Lynx

Description

Canada lynx are described as medium-sized cats, 30-35 inches and weighing 18-23 pounds (Quinn and Parker 1987). Their large feet are adapted to walking on snow; they have long legs, tufts of hair on the ears, and black-tipped tails. Their historical range extends from Alaska across most of Canada (except for coastal forests) and southern extensions into parts of the western United States, the Great Lakes states, and New England (McCord and Cardoza 1982).

Breeding occurs through March and April in the north (Quinn and Parker 1987). Kittens are born in May to June in south-central Yukon (Slough and Mowat 1996). The male lynx does not help with rearing young (Eisenberg 1986).

Movement and Dispersal

Studies in Montana, Wyoming, and southern British Columbia have documented exploratory movements by resident lynx during the summer months (Apps 2000, Squires and Laurion 2000). Aubry *et al.* (2000) described this type of movement as long-distance movements beyond identified home range boundaries, then returning to the original home range. Distances of exploratory movements in Montana ranged from about 9 miles to 25 miles, and duration away from the home range was one week to several months (Squires and Laurion 2000). This type of movement was not detected during the study in north-central Washington (Koehler 1990), nor has it been recorded from the taiga (Mowat *et al.* 2000). Aubry *et al.* (2000) speculated that these movements might be more likely to occur in areas with high spatial heterogeneity, especially montane systems.

Many of the lynx habitats in the Rocky Mountains occur as islands of coniferous forest surrounded by shrub-steppe habitats. Lynx have been documented in shrub-steppe habitats adjacent to western boreal forests (within approximately 25 miles) during a peak in the jackrabbit population (Lewis and Wenger 1998). It is not known whether these shrub-steppe habitats are important to lynx persistence at the southern edge of their range, or whether they are only used opportunistically (Ruggiero *et al.* 2000).

Diet

Foraging habitat consists of early successional forests where snowshoe hares are plentiful, especially at northern latitudes. These are the habitats that lynx favor for hunting. Such forests may result from fires, timber harvesting, or windthrow and disease (numerous citations in Koehler and Aubry 1994). Late successional conifer stands also provide important foraging habitat for lynx. An important characteristic of both is dense branching of conifer species where tree crowns touch the ground, and the persistence of the canopy above winter snow levels. Regenerating lodgepole pine (or Douglas fir) provides short to moderate term cover and forage for lynx, but primarily provides high-density food for snowshoe hare (Koehler 1990). Mature, dense Engelmann spruce/fir forest provides long-term cover and forage opportunities for both lynx and snowshoe hare.

Conifer stands provide greater concealment from predators, lighter snowpacks, and warmer temperatures during winter than hardwood stands. Dense stands of aspen in the Rocky Mountains represented marginal foraging habitat for lynx because such stands do not provide adequate cover for hares, suggesting that conifer cover is critical for hares during winter. In Colorado and Utah, dense stands of subalpine fir and Engelmann spruce and Douglas-fir were used most frequently by hares (Dolbeer and Clark 1975). Stem height is also an important component of winter foraging habitat. In the Rocky Mountains, where snow depths may exceed 1.5 m, Dolbeer and Clark (1975) found that sparsely stocked stands provided little food or cover for hares, and Wolfe et al. (1982) reported that 85% of habitats used by hares had a horizontal cover density of 40% at a height of 1.0 - 2.5 m above the ground.

Clarification for the northern Rockies lynx amendment (Bertram and Claar 2008) indicated that "mature multistoried forests provide important winter snowshoe hare habitat and are more important than younger stands. Corresponding research results from Squires and DeCesare (2008) indicates that snowshoe hares were most abundant in these stands with >35% horizontal cover in winter or >48% horizontal cover in summer.

The primary prey of lynx is snowshoe hares; this species comprises 35-97 percent of the diet throughout the range of the lynx (Koehler and Aubry 1994). Other prey species include red squirrel, grouse, flying squirrel, ground squirrel, porcupine, beaver, mice, voles, shrews, fish, and ungulates as carrion or occasionally as prey (Saunders 1963, van Zyll de Jong 1966, Nellis *et al.* 1972, Brand *et al.* 1976, Brand and Keith 1979, Koehler 1990, Staples 1995, O'Donoghue *et al.* 1998).

During the cycle when hares become scarce, the proportion and importance of other prey species, especially red squirrel, increases in the diet (Brand *et al.* 1976, O'Donoghue *et al.* 1998, Apps 2000, Mowat *et al.* 2000). However, Koehler (1990) suggested that a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens.

Most research has focused on the winter diet, and diets in the summer may include a greater diversity of prey species (Quinn and Parker 1987, Koehler and Aubry 1994).

Mowat *et al.* (2000) reported that summer diets have less snowshoe hare and more alternative prey, possibly because of a greater availability of other species.

Population Distribution

Density of lynx in an area is highly dependent on prey abundance. Home ranges of lynx are generally larger in southern habitats, where snowshoe hare densities are low. In western Wyoming, home ranges are approximately 42 square miles for males and 35 square miles for females (Squires and Laurion 2000). Lynx appear to remain close to their established home ranges in the winter and exhibit more extensive exploratory movements in the summer (Squires and Laurion 2000, Shenk 2001).

Until recently, it was assumed that the historic distribution of lynx was sparse in mountainous areas above 9,000 feet in the Park, Gore, San Juan, and La Plata mountains, and the White River Plateau (Fitzgerald *et al.* 1994). However, recently recovered trapping records indicate that lynx may have been relatively common in Colorado in the early 1900s. Since 1925, less than ten lynx records have been verified in Colorado (CDOW 1995), excluding reintroduction efforts. Excluding the recent lynx reintroduction effort and despite large-scale snow-tracking efforts, there were no verified records of lynx in Colorado since 1974, when a pair of lynx was trapped at the Vail ski area (CDOW 1995, McKelvey *et al.* 2000).

In an effort to establish a viable population of lynx in Colorado, 218 lynx were reintroduced into southwestern Colorado between 1999-2006. As of July 1, 2007, the CDOW was tracking 71 of the 120 reintroduced lynx still possibly alive. Forty nine lynx are considered missing (untrackable-out of range, or dead collar batteries). (CDOW lynx website, accessed 1/29/08.)

Lynx denning was last assessed in July 2007. No dens were found, 34 females were tracked with 0 kittens found. Up until 2007 released female lynx raised successful litters for four years in a row for a total of 116 kittens found over the five year period. (CDOW lynx website, accessed 1/29/08.)

CDOW tracks reintroduced lynx to identify areas that animals travel through or are using on a more regular basis. Generally, tracking results (CDOW 2005) indicate a decrease in use with increased distance from the southwest Colorado release sites. On the Routt National Forest (RNF), the CDOW results indicate the presence of 10 lynx from 1999 through 2005.

Generally consistent with the CDOW findings, the MBRNF maintains a geographic information system (GIS) database of documented special status species observations on the forest. For lynx, the database indicates that eight observations have been documented from 1905 through 2002. Three occurred prior to 1912, the remaining five after 1992.

Landscape Connectivity

Activities, especially human-caused activities that change vegetation patterns of the natural landscape, affect ecological processes (competition, dispersal and predation) in various ways (Wilcove 1985). Landscape connectivity can be provided by narrow forested mountain ridges or plateaus connecting more extensive mountain forest habitats. Wooded riparian communities may provide travel cover across open valley floors

between mountain ranges, or lower elevation shrub lands that separate high elevation spruce-fir forests.

It is expected that landscape connectivity will be maintained through; the retention of some understory, continual regeneration of seedling/saplings over the minimum ten year process, riparian vegetation will be maintained and provide cover, implementation of the project will be sporadic as budget and funding will dictate, and *Design Criteria* are incorporated into the project that will assure the maintenance of connectivity corridors.

Habitat

Mature to late-successional spruce-fir forests have been described as suitable foraging habitat for Canada lynx in the southern portion of their range. These forests can support snowshoe hares, the primary prey species for lynx, as well as red squirrels, an important alternative prey species. Conifer-aspen forests, particularly those with dense regeneration or an extensive shrub and woody debris understory component, may also be important for prey species. Mature forest stands are used for denning, cover for kittens and travel corridors. Denning habitat has been described as areas having dense downed trees and root wads, or dense live vegetation (Koehler 1990, Mowat *et al.* 2000). For denning habitat to be functional, it must be in or adjacent to large areas of quality foraging habitat (Ruediger *et al.* 2000).

Lynx habitat in the Southern Rocky Mountains is naturally fragmented, a function of elevation, aspect, and local moisture regimes. Primary lynx habitat is likely found within the subalpine and upper montane forest zones, typically between 8,000 and 12,000 feet. High alpine tundra environments and lower, open valleys define the upper and lower elevational boundaries of this habitat. Drier, south- and west-facing slopes may also break up the continuity of the cooler, mesic high elevation forest habitat utilized by lynx (Ruediger *et al.* 2000). Site-scale habitat data collected for lynx in Colorado indicate that lynx commonly use forest stands that have live foliage of Englemann spruce present in the understory from the snow surface to at least 3.8 feet above the snow; thus lynx are using areas that provide winter browse for snowshoe hare (Shenk 2001). Additional forest types, high elevation sagebrush and mountain shrub communities found adjacent or intermixed with forest habitats, and riparian and wetland shrub communities are also potentially important habitat in many parts of the Southern Rockies, as they may support alternative prey species.

Denning habitat consists of mature forest habitats that contain large woody debris, such as fallen trees or upturned stumps, to provide security and thermal cover for kittens (several citations in Koehler and Aubry 1994). In north central Washington, lynx denned in spruce/fir/lodgepole stands having N-NE aspects and a high density of downed trees. The availability of alternate den sites may be an important determinant of habitat quality. In low quality habitat, the inability of females to move kittens to alternate dens when danger threatens may increase mortality rates for kittens (Koehler and Aubry 1994). Travel corridors between den sites are important to permit females to move kittens to areas where prey is more abundant or to avoid disturbance (Koehler and Brittell 1990). Den sites are also selected based on their proximity to foraging habitats. Den sites consisting of mature forest habitat are also important for lynx as refugia from inclement winter weather or drought.

Environmental Baseline

The Routt National Forest has modeled lynx habitat based on Regional Office advice. Modeling is a tool to approximate the amount and distribution of different habitat types over large areas. Lynx habitat modeling has undergone several changes since the listing of the Canada lynx as a threatened species in 2000. In February 28, 2003 the 2001 modeling effort was updated, and is summarized in *Routt National Forest Rationale for the Designation of Lynx Analysis Units and Habitat Mapping Criteria* (Skorkowsky 2003). This rationale document explains how lynx habitat was mapped and the assumptions associated with the criteria used in the lynx habitat model parameters. The 2003 lynx habitat model parameters were revised again in 2006 based on several factors: an improved understanding of lynx habitat, field verification of previously modeled lynx habitat, the desire to improve consistency in modeling between administrative units, refinement of GIS vegetation data as a result of moving from resource information system (RIS) to common vegetation unit (CVU), and to facilitate the implementation of the Region 2 Interagency Lynx Habitat Database. The updated habitat codes are outlined in Skorkowsky (2006).

The Routt National Forest completed the Bark Beetle EIS in 2002. This project authorized several thousand acres of pine and spruce beetle treatment in high value areas including campgrounds, scenic corridors, ski area, urban interface, and some wood production areas. Treatment includes preventative thinning and spraying. Much of the actions would not change lynx habitat, few of the actions have been implemented, and current Forest priorities to address effects of the expanding pine beetle outbreak have precluded greater implementation of this project.

More recent vegetation changes, most notably a result of wildfires, are not captured in the models. Recent wildfires are discussed for the LAU's in which they occurred.

CONSERVATION MEASURES

Canada Lynx Conservation Assessment and Strategy

The Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger *et al.* 2000) provides guidance for various management activities (recreation, forest roads and trails, highways, as well as oil and gas leasing) to provide a consistent and effective approach to conserve the lynx and its habitat on federal lands in the United States. Conservation measures are provided to assist federal agencies in seeking opportunities to benefit lynx and to help avoid negative impacts through the thoughtful planning and implementation of activities. Plans and projects that incorporate this guidance are generally not expected to have adverse effects to lynx, and implementation of these measures across the range of lynx is expected to lead to conservation of the species (Ruediger *et al.* 2000).

The Canada Lynx Conservation Agreement (CA) was initiated and signed in February of 2000 to promote the conservation of the Canada lynx and its habitat on federal lands managed by the USDA Forest Service in Regions 1, 2, 4, 6 and 9. The CA was revised in 2005. The 2005 revision stipulated that the CA applies only to 'occupied' lynx habitat.

In Region 2, all National Forests within the Southern Rockies Lynx Amendment Area, including the Routt National Forest are considered occupied lynx habitat. The CA identifies actions agreed on to reduce or eliminate adverse effects or risks to Canada lynx or its habitat, and to maintain the ecosystems on which Canada lynx depend. These actions are a result of the new information about the Canada lynx in the Science Report (Ruggerio *et al*. 1999) and LCAS. (The Science Report, was prepared by an international team of experts on Canada lynx biology and ecology, is a synopsis and interpretation of current scientific knowledge about Canada lynx, its primary prey and habitat relationships. This document serves as the scientific foundation for management of Canada lynx habitat on NFS lands). The original CA was to expire in December 2004, but has been extended. The CA specifies that the Forest Service (FS) shall use the direction in the LCAS in the interim as programmatic planning processes (Southern Rockies Lynx Amendment) are completed. For actions which are proposed by and/or involve third parties, the FS agrees to review and consider the new information on the lynx included in the LCAS and Science Report, and appropriate local information to ensure compliance with all applicable federal laws, including ESA, National Environmental Policy Act (NEPA) and National Forest Management Act (NFMA) during analysis and decision-making process.

Specific to timber management, the LCAS (Ruediger et al. 2000, page 2-2) identifies that timber management could affect Canada lynx by:

- Removal of most standing biomass, especially larger size classes of trees, from the site
- Smaller, more dispersed patch sizes and concentrated harvest at lower elevations, resulting in a greater degree of habitat fragmentation
- Selective removal of particular tree species
- Soil disturbance and compaction by heavy equipment, which may result in increases of exotic plants that can compete with native vegetation
- Harvest, planting and thinning treatments that may give a competitive advantage to certain tree species
- Construction of roads that may be used during winter as designated or groomed travel routes for snowmobiles or cross-country skiers

Conservation Measures (Standards) and Design Criteria

The LCAS (Ruediger et al. 2000, pages 7-4 – 7-6) identifies the following conservation measures (standards) specific to timber management activities:

<u>Project planning – standards</u>

1. Management actions (e.g. timber sales, salvage sales) shall not change more than 15 percent of lynx habitat within a LAU to an unsuitable condition within a 10-year period.
    - **Currently implementation of management actions has not changed more than 15% of lynx habitat within a LAU to an unsuitable condition within a**

10-year period, nor at the this time is expected to change more than 15% of lynx habitat within a LAU to an unsuitable condition within a 10 year period.

2. Following a disturbance, such as blowdown, fire, insects/pathogens mortality that could contribute to lynx denning habitat, do not salvage harvest when the affected areas is smaller than 5 acres. Exceptions to this include: 1) Areas such as developed campgrounds; 2) LAU's where denning habitat has been mapped and field validated (not simply modeled or estimated), and denning habitat comprises more than 10% of lynx habitat within a LAU; in these cases salvage harvest may occur, provided that at least the minimum amount s maintained in a well-distributed pattern.
   - **Natural disturbance actions across the Forest and within the identified LAU's are currently broad scale in nature with relatively high amounts of bark beetle mortality occurring. With this broad scale mortality occurring, actual (not simply modeled) denning habitat is anticipated to increase in each LAU.**

3. In lynx habitat, pre-commercial thinning will be allowed only when stands no longer provide snowshoe hare habitat (e.g. – self pruning processes have eliminated snowshoe hare cover and forage availability during winter conditions with average snowpack).
   - **Pre-commercial thinning as well as 'release and weed management actions' are not part of the proposed action/Alternative 2.**

4. In aspen stands within lynx habitat in the Cascade Mountains, Northern Rocky Mountains and Southern Rocky Mountains Geographic Areas, apply harvest prescriptions that favor regeneration of aspen
   - **The proposed management actions are designed to remove lodgepole pine; incidental aspen could regenerate in aspen dominate areas.**

The LCAS (Ruediger et al. 2000, pages 7-3 – 7-4) identifies the following conservation measures (standards) applicable to all programs and activities:

<u>Project planning - standards.</u>

1. Within each LAU, map lynx habitat. Identify potential denning habitat and foraging habitat (primarily snowshoe hare habitat, but also habitat for important alternate prey such as red squirrels), and topographic features that may be important for lynx movement (major ridge systems, prominent saddles, and riparian corridors). Also identify non-forest vegetation (meadows, shrub-grassland communities, etc.) adjacent to and intermixed with forested lynx habitat that may provide habitat for alternate lynx prey species.
   - **Lynx habitat within the project area has been mapped for all areas.**

2. Within a LAU, maintain denning habitat in patches generally larger than 5 acres, comprising at least 10 percent of lynx habitat. Where less than 10 percent denning habitat is currently present within a LAU, defer any management actions that would delay development of denning habitat structure.

- **The proposed action is to address hazard lodgepole pine (standing) adjacent to existing roads and trails (motorized, and non-motorized). Lodgepole pine (specifically mountain pine beetle killed, MBP) is typically not considered denning habitat, and is considered "unsuitable" habitat. However project felling of dead lodgepole pine and the natural felling of mpb killed lodgepole would serve to provide coarse woody debris once felled.**

3. Maintain habitat connectivity within and between LAU's.
   - **See comments under *Landscape Connectivity.***

5 … limit disturbance with each LAU as follows: if more than 30 percent of lynx habitat with a LAU is currently in unsuitable condition, no further reduction of suitable conditions shall occur as a result of vegetation management activities by federal agencies.
   - **No reductions of suitable conditions will occur as a result of vegetation management activities.**
   - **Refer to Table 5 for a listing of LAU's that are at or above the 30% currently unsuitable condition.**

The Routt Forest Plan (USDA 1997) contains standards and guidelines that will provide habitat features for lynx in the future. These represent management direction in the LCAS. The Plan also requires that snags and live recruitment trees and coarse woody debris be retained in harvest units for wildlife needs. These requirements will be met easily since removal targets only hazard trees. No hazard tree removal is scheduled in denning habitat. These standards will aid connectivity among stands and will provide future foraging and denning structure for lynx.

The proposed action includes a series of Design Criteria (see Proposed Action) that limit the extent of treatment and tree removal near wetlands, riparian areas, hydric soils and within old growth, SIA's and RNA's. In these areas, individual hazard trees can be felled but not removed. From discussion with Kurt Broderdrop (5/14/08), the tree boles, limbs and coarse woody debris will provide substrate and cover for lynx movement. These design criteria will aid connectivity among stands and will provide future foraging and denning habitat structure for lynx.

Lynx Analysis Units and Existing condition of Canada Lynx Habitat

A Lynx Analysis Unit (LAU) is a project analysis unit upon which direct, indirect, and cumulative effects analyses are evaluated for Canada lynx. An LAU provides a constant area for comparison of effects to lynx over time. While an LAU is not intended to depict an actual lynx home range, LAU's were established to approximate the size of area needed by an individual lynx. LAU's were established and lynx habitat was mapped for the Routt National Forest in 2001 following the listing of the Canada lynx as a threatened species. The original LAU designations were updated in 2003 and habitat modeling/tracking was refined in 2003, 2006, and January of 2008. The R2VEG Forest Vegetation database tracking program (2001) was also used to assist with the habitat

tracking program. The Lynx Baseline Data –Lynx Database and Reporting Tools information was obtained from Cheron Ferland, USDA, HPBE Biological Technician, who ran the program on January 29, 2008; thus producing the most current information on the LAU's and existing condition..

The **Hazard Tree and Fuels Reduction Project** occurs in the following lynx analysis units:

*Bears Ears	*Sand Mountain	*Quaker Mountain	*Little Snake River
*Encampment River	*Upper Elk	*Lower Elk	*Red Canyon
*Middle Yampa	*Rabbit Ears	*Sarvis	*Green Ridge
*Gore	*Pagoda	* Dunkley	*Sheep Mountain
*Troublesome	*Owl Mountain		

DESCRIPTION OF LYNX ANALYSIS UNITS AND LINKAGE ZONES

LAU's have been developed as fixed areas on the landscape, against which to measure and track changes and impacts to lynx habitat. Ten of the Lynx Analysis Units (all or parts) were considered in the Bark Beetle Analysis (BBA) that was completed in 2001. The LAU's affected by this proposed project include: Bears Ears, Quaker Mountain, Little Snake River, Sand Mountain, Encampment River, Upper Elk River, Red Canyon, Lower Elk River, Middle Yampa, and Rabbit Ears. Bark Beetle Analysis information in these particular LAU's are represented, respectively, as a separate table titled *Lynx Habitat after Forest Management Activities and Beetle-kill (acres).*
While these acres (BBA) were consulted on with the USFWS, completion of BBA activities is not expected to occur on the majority of LAU's. This is due to a shift in; funding, priorities and impacts from the MPB epidemic. It should be noted that where BBA activities have been completed; it is disclosed under the individual LAU sections discussion under *Past, Current and Planned Federal Land Management Activities.* These acres are not included in the *Acres of Lynx Habitat Tables.*

BBA treatments are not expected to impact the lynx because the suppression activities consist of spraying and/or thinning select, mature, trees (lodgepole pine) around high value developments (housing urban, administrative).

Bears Ears LAU

Description of the Bears Ears LAU
The Bears Ears LAU is located in the northwest portion of the Routt National Forest. This LAU is 97,753.68 acres in size (excluding BLM acres) and contains lynx habitat as described below.

Bears Ears LAU: Past, Current and Planned Federal Land Management Activities
The Bears Ears LAU has been logged in many areas in the past. All of the past logging has occurred in first growth timber stands. Most of the cutting that occurred in the LAU

took place approximately 40 years ago. Within the past 14 years there has been approximately 4,169 acres of timber harvest in the spruce-fir, lodgepole pine and aspen cover types. All timber sales have closed and there is currently no logging occurring within this LAU. Timber management activities have influenced approximately 5% of the Forest Service lands in lynx habitat in the LAU within the past 14 years. The most recent timber sale was the 'North Ears Timber Sale.'

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 19,069 acres of denning habitat, 22,451 acres of winter foraging habitat and 4,310 acres of 'other' lynx habitat. To date, only 23 lodgepole pine have been cut in a 125-acre area around the Sawmill Creek Campground and 58 trees have been sprayed near the campground. No suppression actions outside of this area have been implemented due to higher priorities forest wide and lack of available funding. Overall, the Bears Ears LAU has a much lower level of spruce bark beetle activity as compared to other portions of the National Forest.

This area has been historically used by the general public for outdoor recreation. There are many miles of roads, motorized trails and non-motorized trails. Recreational uses include driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. Fall hunting activity is considered high in this area. Similarly winter snowmobile activity is considered moderate. Currently the Forest Service permits several recreational outfitters including hunting and snowmobiling outfitters.

There are several grazing allotments within the LAU for both cattle and sheep. This area has been grazed consistently by domestic ungulates for over 100 years. These include Johnson-Oliver, Slater, Lost Park and Stewardship range allotments. Currently the California Park Analysis Area is under revision and contains portions of four allotments in the Bears Ears LAU; Adams Creek, Saddle Mountain, Stukey Creek and California Park.

Potential Cumulative Effects Associated With Non-Federal Actions:
Some logging has occurred on the BLM LAU portion of the Bears Ears LAU on the private land of Wilderness Ranch adjacent to the National Forest. This portion of the LAU also contains extensive summer home development. No other effects to lynx or lynx habitat are anticipated to be cumulative from non-federal actions. These non-federal actions do not substantively affect the condition of lynx habitat or Canada lynx.

Sand Mountain LAU

Description of the Sand Mountain LAU

The Sand Mountain LAU is located in the north-central portion of the Routt National Forest. This LAU is 74,447 acres in size and contains lynx habitat as described below.

Sand Mountain LAU: Past, Current and Planned Federal Land Management Activities
The Sand Mountain LAU has been logged multiple times in the past. All of the past logging has occurred in first growth timber stands. There has not been a lot of timber cutting in this area in recent years. Timber management activities have influenced less than 1% of the FS lynx habitat in the LAU within the past 10 years. The Bark Beetle Environmental Impact Statement proposed the Diamond Lopez and Red Creek timber

sales which have never been implemented as a result of the potential for an Adverse Effect to lynx.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 10,933 acres of denning habitat, 1,414 acres of winter foraging habitat and 7,430 acres of 'other' lynx habitat. From 2003 to 2005, suppression and prevention actions have focused only on campgrounds and administrative sites. This includes suppression on 62 lodgepole pine trees and one Englemann spruce across 125 acres and preventative spraying on 119 lodgepole pine trees at these administrative sites. No actions outside of these administrative sites have been implemented due to higher priorities forest wide and lack of available funding.

The Bark Beetle EIS made the determination that implementation or proposed preventative thinning actions (Diamond Lopez and Red Creek) in the LAU was likely to have an Adverse Affect. As a result of the agreement between the FWS and the FS to not implement actions that were likely to Adversely Affect, formal consultation for this aspect of the project was not completed and the decision did not include the Diamond Lopez preventative thinning proposals. The Red Creek preventative thinning project has not moved forward and a separate consultation and concurrence would be needed prior to implementation.

A decision on the Larson II project was recently completed within this LAU (Consultation completed August 24, 2007). This project has not been implemented, but these effects are incorporated into the existing condition of the LAU, as if the project had been implemented.

This area has been historically used by the general public for outdoor recreation. There are many miles of roads, motorized trails and non-motorized trails. Recreational uses include driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. Fall hunting activity is considered high in this area. Similarly winter snowmobile activity is considered moderate. There is a high level of motorized trail use that occurs in this part of the Forest during the snow free seasons. Currently the Forest Service permits several including hunting and snowmobiling outfitters. This portion of the Forest has a very high level of summer and winter recreational use.

There are several grazing allotments within the LAU for both cattle and sheep. This area has been grazed consistently by domestic ungulates for over 100 years. The California Park Rangeland Analysis Area has all or portions of 6 allotments within the Sand Mountain LAU. These include Adams Creek, Diamond Peak, Meaden Peak, California Park, Sand Mountain and Armstrong Creek.

There are currently all or portions of 26 pending oil and gas lease requests in the Sand Mountain LAU from the BLM comprising a total of 45,374 acres, or 61% of the LAU.

Potential Cumulative Effects Associated With Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within the Sand Mountain LAU.

Little Snake River LAU

Description of the Little Snake River LAU
The Little Snake River LAU is located in the northern portion of the Routt National Forest. This LAU is 77,255 acres in size and contains lynx habitat as described table below. This LAU includes National Forest System Lands on both the Routt and Medicine Bow National Forests.

Little Snake River LAU: Past, Current and Planned Federal Land Management Activities

The Little Snake LAU has been logged extensively in the past. All of the past logging has occurred in first growth timber stands. Cutting within this LAU has occurred consistently since logging started in the area. Within the past 14 years there has been approximately 905 acres of timber harvest in the spruce-fir, lodgepole pine and aspen cover type. All timber sales have closed and there is currently no logging occurring within this LAU. Timber management activities have influenced approximately 2% of the FS lynx habitat in the LAU within the past 14 years.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 10,552 acres of denning habitat, 9,816 acres of winter foraging habitat and 14,383 acres of other lynx habitat. Preventative thinning actions were authorized on 218 acres of denning habitat and 332 acres of other lynx habitat. To date, no suppression actions have been implemented due to higher priorities forest wide and lack of available funding. Bark beetles, particularly mountain pine beetle, are at pandemic levels in the Little Snake River LAU.

In 2005, a Decision Notice for the Little Snake Timber Sale was approved. This project reached a 'not likely to adversely affect' determination for lynx and was programmatically screened (Wells 2005). The BA estimated the project would impact 122 acres of denning and winter foraging habitat and 496 acres of 'other' lynx habitat. The Little Snake Timber sale has not yet been implemented (Wells 2005). The Little Snake Timber Sale has not been implemented but effects anticipated and consulted on are incorporated into existing condition of the LAU.

There are no recent vegetation management actions on the Medicine Bow portion of the LAU; however the recent Prospector Timber Sale (Routt-side)acreages are included in Table 4 and Table 5 calculations.

There are several grazing allotments within the LAU for both cattle and sheep. This area has been grazed consistently by domestic ungulates for over 100 years.

This area has historically been used by the general public for outdoor recreation. There are many miles of roads, motorized and non-motorized trails. Recreational uses include driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. Fall hunting activity is considered high in this area. Winter snowmobile activity is considered moderate. There is a high level of motorized trail use that occurs in this part of the Forest during the snow free seasons. Currently the Forest Service permits several recreational outfitters including hunting and snowmobiling outfitters.

Potential Cumulative Effects Associated With Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within the Little Snake River LAU. There are several large private land

inholdings in this area of the Forest; however management of these private lands is not changing significantly. Some oil and gas activity has been implemented on the BLM lands adjacent to this LAU near Three Forks Ranch. These non-federal actions do not substantively affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Quaker Mountain LAU

The Quaker Mountain LAU is located in the northwest portion of the Routt National Forest. This LAU is 8,101.78 acres in size (excluding BLM) and contains lynx habitat as described below. Some summer home development has occurred in the private lands portion of the LAU.

Quaker Mountain LAU: Past, Current and Planned Federal Land Management Activities

The Quaker Mountain LAU has had very little past timber management. Within the past 14 years there have been only 17 acres of timber harvest in the spruce-fir, lodgepole pine or aspen cover type on Forest Service lands.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 2,500.52 (all actions combined) acres of lynx habitat. To date, no suppression actions have been implemented due to higher priorities forest-wide and lack of available funding.

This area has historically been used by the general public for outdoor recreation. There are few roads or trails in the LAU. Recreational uses include driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. Fall hunting activity is considered high in this area. Winter snowmobile activity is considered moderate. Currently the Forest Service permits several recreational outfitters including hunting outfitters.

There are grazing allotments within the LAU. This area has been grazed consistently by domestic ungulates for over 100 years. The California Park Rangeland Analysis Area has all or portions of two allotments within the Quaker Mountain LAU. These include East Quaker and Sand Mountain.

In addition to the California Park Rangeland and Allotment Management Plan the BLM is proposing to exchange the BLM lands within the BLM portion of the Quaker Mountain LAU (part of the Emerald Mountain Land Exchange).

Potential Cumulative Effects Associated With Non-Federal Actions:

Recent logging operations were implemented on the private land portions of the Quaker Mountain LAU. The extent of the logging operations is not clear. The level of effect this private land logging has had on the associated lynx habitat is unknown.

Encampment River LAU

Description of the Encampment River LAU

The Encampment River LAU is located in the north/northeast portion of the Routt National Forest. This LAU is 67,262 acres in size and contains lynx habitat as described

below. This LAU includes National Forest System Lands on both the Routt and Medicine Bow National Forests.

Encampment River LAU: Past, Current and Planned Federal Land Management Activities

The Encampment River LAU has had logging in the past; however it has not been extensive. All of the past logging has occurred in first growth timber stands.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 20,876 (all actions combined) acres of lynx habitat. To date, no suppression actions have been implemented due to higher priorities forest-wide and lack of available funding.

Planning on the Sierra Madre Bark Beetle Project was just recently completed. This timber sale proposes to log 1,676 acres of beetle infested or killed timber, and these acres are represented in Table 42. The Big Creek/Pear Fuels Reduction project is being planned and proposes to burn and mechanically treat 285 acres of standing and down woody material. Smaller proposed projects include the Grizzly Helena Trail Reroute and the Recreation Residence Special Use permits project was completed in 2007. Ongoing projects include the Big Creek recreation residence domestic water use; outfitter permitting for big game hunts, horse and camp trips, fishing and the Winston private road easement.

There are several grazing allotments within the LAU. This area has been grazed consistently by domestic ungulates for over 100 years.

This area has historically been used by the general public for outdoor recreation. Summer activities include one large developed campground associated with several trailheads. There are many miles of roads, motorized trails and non-motorized trails. Recreational uses include driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. There are several summer homes located within the LAU. Fall hunting activity is considered moderate in this area. Winter recreation includes snowmobiling and cross-country skiing; these activity levels are considered low compared to the rest of the Forest. While this area does get some recreational use, outdoor recreation is generally considered to occur at low levels.

Potential Cumulative Effects Associated with non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. There are 611 acres of state land in the Encampment River LAU. These acres have been used for timber harvest in the past. This use is part of the environmental baseline. These acres are not identified as lynx habitat. These non-federal actions do not substantively affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Upper Elk River LAU

Description of the Upper Elk River LAU

The Upper Elk River LAU is located in the north-central portion of the Routt National Forest. This LAU is 89,089 acres in size and contains lynx habitat as described below.

In 2002 the Hinman Fire converted 1,624 acres of denning and winter foraging habitat, 499 acres of additional winter foraging habitat and 2,653 acres of other lynx habitat to unsuitable condition. The 2002 Burn Ridge Fire converted 201 acres of denning and winter foraging habitat, 61 acres of additional winter foraging habitat and 350 acres of other lynx habitat to an unsuitable condition. A field review of burn severity areas indicated that moderate and high severity areas were largely converted to unsuitable and low severity areas were considered lowered in habitat quality. Additionally (2001 habitat models) 2,958 acres of winter foraging habitat, 2,937 acres of denning habitat and 3,619 acres of other lynx habitat was lowered in habitat quality as a result of low severity fire.

In 2004 the Sawtooth Fire converted 165 acres of denning and winter foraging habitat and 51 acres of other lynx habitat to an unsuitable condition. This fire did not have a fire severity measurement, however since it was largely a stand replacing fire the fire perimeter has been used to estimate the acres converted to an unsuitable condition.

In 2005 the Wolverine Fire burned 166 acres of denning and winter foraging habitat, two acres of additional winter foraging habitat and 150 acres of other lynx habitat to an unsuitable condition. This fire did not have a fire severity measurement, however since it was largely a stand replacing fire the fire perimeter has been used to estimate the acres converted to an unsuitable condition.

<u>Upper Elk River LAU</u>: Past, Current and Planned Federal Land Management Activities

The Upper Elk River LAU has been logged multiple times in the past. All of the past logging has occurred in first growth timber stands. Within the past 14 years there has been approximately 4,695 acres of timber harvest in the spruce-fir, lodgepole pine and aspen cover type. Past forest management has occurred with the Coulton Creek Timber Sale (600 acres), Floyd Peak Timber Sale (683 acres), the Lester Mountain Timber Sale (265 acres) and Bark Beetle EIS Preventative thinning (250 acres). The preponderance of these sales involved cutting mature lodgepole pine to the amounts of 332 acres, 430 acres, and 80 acres, respectively. Portions of these sales (233 acres, 279 acres, and 185 acres, respectively) did harvest in spruce-fir which were suitable for lynx and hare. Overall, 2,897 salvage acres plus 1,798 acre of past decisions yield approximately 4,695 acres of short and mid-term effects of forest management to lynx and hare habitats within the past 14 years (1992-2005). Past forest management represents a 6.4% change in lynx habitat from a suitable to an unsuitable condition during the last 14 years.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 37,008 (all actions combined) acres of lynx habitat. From 2003 to 2005, there was suppression on 485 lodgepole pine trees and six Englemann spruce across 375 acres and preventative spraying on 735 trees at administrative sites. Additionally 0.78 miles of road have been constructed to allow for preventative thinning on 250 acres.

The Big Creek Ridge Prescribed Fire Partnership Project has also been approved and partially implemented on portions of the LAU. The project is targeting mountain shrub and aspen vegetation types for regeneration using prescribed fire. Implementation of this decision is ongoing and results in short term (one year) conversion of areas to an unsuitable condition. Currently all burned areas have regenerated back to other lynx habitat. This project authorized prescribed fire on 200 acres in the LAU.

The Seedhouse Fuels reduction project is currently being planned in this LAU and proposed some prescribed fire and timber thinning to reduce fuel loads near the urban interface with the National Forest.

There are several grazing allotments within the LAU. This area has been grazed consistently by domestic ungulates for over 100 years.

This area has historically been used by the general public for outdoor recreation. There are many miles of roads, motorized trails and non-motorized trails. Recreational uses include: driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. Fall hunting activity is considered high in this area. Winter snowmobile activity is considered moderate. There is a high level of motorized trail use that occurs in this part of the Forest during the snow free seasons. Currently the Forest Service permits several recreational outfitters including hunting and snowmobiling outfitters as well as four recreation residences. The recreation residences are currently under a permit re-authorization NEPA review.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-Federal actions occurring within this LAU. There are several large private land inholdings in this area of the Forest, however management of these private lands is not changing significantly. These non-federal actions do not substantively affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Lower Elk River LAU

Description of the Lower Elk River LAU

The Lower Elk River LAU is located in the north-central portion of the Routt National Forest. This LAU is 77,566.40 acres in size (excluding BLM) and contains lynx habitat as described below. This LAU includes the 409 acre BLM addition to the Lower Elk River LAU. This LAU was recently affected by the 2001 Mad Creek fire and the 2002 Burn Ridge Fire as well as pandemic bark beetle activity following the 1998 Routt Divide Blowdown.

Lower Elk River LAU: Past, Current and Planned Federal Land Management Activities

The Lower Elk River LAU has had very little logging activity. Within the past 14 years there has been five acres of timber harvest. There is currently no timber sales planned or being implemented in this LAU.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 52,906.06 (all actions combined) acres of lynx habitat. To date, no suppression actions have been implemented due to higher priorities forest-wide and lack of available funding.

The Big Creek Ridge Prescribed Fire Partnership Project has also been approved and partially implemented on portions of the LAU. The project is targeting mountain shrub and aspen vegetation types for regeneration using prescribed fire. Implementation of this decision is ongoing and results in short term (one year) conversion of areas to an

unsuitable condition. Currently all burned areas have regenerated back to other lynx habitat. This project authorized prescribed fire on 2,300 acres in the LAU.

The Big Creek Ranch Land Exchange has recently been implemented in this LAU. This decision only resulted in the transfer of land ownership only and has not result in changes to land management.

This LAU contains grazing allotments. This area has been grazed consistently by domestic ungulates for over 100 years.

This area has been historically used by the general public for outdoor recreation. There are few roads, but many miles of non-motorized trails. Recreational uses include: hiking, biking, horseback riding and hunting. Fall hunting activity is considered moderate in this area. Winter snowmobile activity is essentially non-existent due to restriction implemented on big game winter range on most of the LAU, although a portion of the LAU receives high winter recreational activity due to its proximity to Buffalo Pass. In 2005 the Winter Recreation EA was completed. It included the southern portion of the Lower Elk River LAU. This decision separated motorized and non-motorized recreational uses. Currently the Forest Service permits several recreational outfitters. Summer and fall recreational use is considered to occur at moderate levels.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Red Canyon LAU

Description of the Red Canyon LAU

The Red Canyon LAU is located in the northeast portion of the Routt National Forest. This LAU is 80,616.33 acres in size and contains lynx habitat as described below. This LAU was affected by the 2002 Burn Ridge Fire.

Red Canyon LAU: Past, Current and Planned Federal Land Management Activities

The Red Canyon LAU has very little history of logging activity. Within the past 14 years there has been no timber harvest. No timber harvest is currently planned for this LAU.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 3,299.62 (all actions combined) acres of lynx habitat. From 2003 to 2005, there was suppression on 104 Englemann spruce trees and preventative spraying on 167 trees at the Summit Creek Campground. Overall suppression actions have been implemented at a low level in the Red Canyon LAU.

This area has been grazed consistently by domestic ungulates for over 100 years. Planned projects include the North Lone Pine, Big Park, Livingston, Brown Creek and North Fork allotment management plans.

Ongoing projects include outfitter and guides for backpacking and fishing as well as a SnoTel remote weather station. The remote weather station includes a visit once a year for annual maintenance.

This area has historically been used by the general public for outdoor recreation. Recreational uses include driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. Fall hunting activity is considered moderate in this area. Winter recreational activity is considered moderate. In 2005 the Winter Recreation EA was completed. It included the southern end of the Red Canyon LAU. This decision separated motorized and non-motorized recreational uses. Summer recreation is considered high, as the LAU has several trailheads for backcountry motorized and non-motorized use.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Middle Yampa LAU

Description of the Middle Yampa LAU

The Middle Yampa is located in the central portion of the Routt National Forest. This LAU is 75,486 acres in size and contains lynx habitat as described below.

Middle Yampa LAU: Past, Current and Planned Federal Land Management Activities

While some portions of the Middle Yampa LAU have been logged in the past, historic logging activity would be considered low for this LAU. All of the past logging has occurred in first growth timber stands. Approximately 50 years ago there was a high level of beetle killed timber salvage occurring within the LAU. Within the past 14 years there has been a moderate level of timber harvest in the LAU. Timber management in the last 14 years has modified 2,319 acres or 4.1%.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 30,948 (all actions combined) acres of lynx habitat. From 2003 to 2005, there was suppression on 1,101 Englemann spruce trees and 772 lodgepole pine trees across over 3,956 acres and preventative spraying on 432 trees at the ski area and administrative sites. Some of the suppression has been implemented by logging activity on the Steamboat Ski Area. This LAU has had the highest level of suppression efforts of all the LAU's on the Forest.

There are several grazing allotments within the LAU for both cattle and sheep. This area has been grazed consistently by domestic ungulates for over 100 years. The LAU contains the Buffalo Pass and Rabbit Ears Allotments. Planned projects include the Sawmill Creek AMP.

The Middle Yampa LAU has the highest levels of recreational activity occurring on the Forest. This LAU is in close proximity to the resort town of Steamboat Springs, has one

large ski resort and very high levels of recreational activity during all seasons. This LAU has a high level of urban/wildland interface along the western boundary of the LAU and development is occurring on the private lands at a tremendous rate. The Buffalo Pass and Rabbit Ears Pass areas have the highest level of winter motorized and non-motorized recreational use on the Forest. Currently the Forest Service permits several recreational outfitters including hunting and snowmobiling outfitters. In 2005 the Winter Recreation Environmental Analysis was completed. This included the entire the Middle Yampa LAU. This decision separated motorized and non-motorized recreational areas and also created a suggested non-use area near the Muddy Pass linkage zone to maintain the functioning of the linkage zone and the effectiveness of the lynx underpasses located on US highway 40. Refer to the 2005 Routt Winter Recreation EA and BA for more detail regarding this project.

Other recreational projects include the 2006 Steamboat Ski Area Master Plan amendment NEPA project which was recently consulted on with the FWS. The only other large scale project occurring within this LAU is continued implementation of the Dry Lake Fuels Analysis.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Outdoor recreation is very high in this LAU, but is being effectively managed by the Forest Service. Non-federal actions are not anticipated to substantively affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Rabbit Ears LAU

Description of the Rabbit Ears LAU

The Rabbit Ears LAU is located in the central portion of the Routt National Forest. This LAU is 46,422 acres in size and contains lynx habitat as described below. This LAU was impacted by the stand replacing Green Creek Fire in 2002.

Rabbit Ears LAU: Past, Current and Planned Federal Land Management Activities

The Rabbit Ears LAU has had very little past timber management. Within the past 14 years there has been 64 acres of timber harvest in the spruce-fir, lodgepole pine or aspen cover type. Timber management has influenced 0.2% of the available lynx habitat in the LAU in the last 14 years.

The 2002 Bark Beetle EIS (2001 habitat models) authorized beetle suppression actions on 13,472 (all actions combined) acres of lynx habitat. To date, no suppression actions have been implemented due to higher priorities forest-wide and lack of available funding. From 2003 to 2005, there was suppression on 70 lodgepole pine trees at the Walton Creek and Meadows campgrounds. This LAU has had a low level of suppression efforts focused on campgrounds because of a lack of funding and higher priorities.

There are grazing allotments within the LAU, including the Rabbit Ears allotment. This area has been grazed consistently by domestic ungulates for over 100 years.

The Rabbit Ears LAU has a high level of recreational activity occurring. This LAU is in close proximity to the resort town of Steamboat Springs and has a very high level of recreational activity during all seasons. The Rabbit Ears Pass area has the highest level of winter motorized and non-motorized recreational use on the Forest. In 2005 the Winter Recreation EA was completed. It included over half of the Rabbit Ears LAU. This decision separated motorized and non-motorized recreational uses and also created a suggested non-use area near the Muddy Pass linkage zone to maintain the functioning of the linkage zone and the effectiveness of the lynx underpasses located on US highway 40.

Currently the Forest Service permits several recreational outfitters including hunting and snowmobiling outfitters. Recreational uses include driving, hiking, biking, horseback riding, hunting, snowmobiling and gathering firewood. Fall hunting activity is considered moderate to high in this area.

Other projects include the proposed Windy Ridge Trailhead realignment and the Mountain Parks Electric powerline replacement. The powerline replacement is currently being implemented on one portion of the line and an Environmental Assessment (EA) will be prepared prior to completing the second portion.

Potential Cumulative Effects Associated with Non-Federal Actions:

Winter recreational use is increasing in both the Buffalo Pass and Rabbit Ears Pass areas. High levels of urban development are occurring on the private lands adjacent to the LAU. Non-federal actions are not anticipated to substantively affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Sarvis LAU

Description of the Sarvis LAU

The Sarvis LAU is located in the south central portion of the Routt National Forest. This LAU is 43,333 acres in size and contains lynx habitat as described below. This LAU was impacted by the stand replacing Green Creek Fire in 2002.

Sarvis LAU: Past, Current and Planned Federal Land Management Activities

The Sarvis LAU is 87.5% wilderness and includes all of the Sarvis Creek Wilderness area. The LAU is primarily used for outdoor recreation. There are some permitted outfitters and guides that operate in the LAU for big game hunting and also snowmobile grooming and guiding. The Red Dirt Timber Assessment occurs partially in the Sarvis LAU and is in the NFMA assessment phase.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Green Ridge LAU

Description of the Green Ridge LAU

The Green Ridge LAU is located in the south-central portion of the Routt National Forest. This LAU is 49,946 acres in size and contains lynx habitat as described below. This LAU includes a 6,314 acre BLM addition to the National Forest portion of the LAU.

Green Ridge LAU: Past, Current and Planned Federal Land Management Activities

The Green Ridge LAU has been used for domestic livestock grazing for over 100 years. Recently the Coberly Maudlin Blacktail and Bobcat grazing plans were completed. The Western Area Power Authority is proposing to clear trees under their power line and has prepared a draft BA. The Stagecoach fuels reduction project has been completed in the analysis area. Other projects include road easements and bridge replacements. A portion of the Rock Creek EIS included the Green Ridge LAU. Refer to the Rock Creek EIS and BA for more detail on that project.

Potential Cumulative Effects Associated with Non-Federal Actions

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. This LAU contains a high percentage of private lands (over 25%). It is not known what management actions are occurring on these private lands or how they may affect the lynx habitat in the LAU

Gore LAU

Description of the Gore LAU

The Gore LAU is located in the south central portion of the Routt National Forest. This LAU is 83,327 acres in size (excluding BLM) and contains lynx habitat as described below.

Gore LAU: Past, Current and Planned Federal Land Management Activities

The Gore LAU has had a very high level of prior timber harvest and continues to be the focus of major timber management projects. Recently the East Gore and Long Park timber sales have been implemented in the LAU. Most recently the Rock Creek EIS was completed. This EIS proposes extensive timber management to respond to pandemic bark beetle populations. Refer to the Rock Creek EIS and BA for more detail on the effects of this project to lynx habitat.

Other projects include the Western Area Power Authority proposal for clearing trees in the power line right of way. A draft BA is being reviewed for this project. The Gore Lakes fuels reduction project has recently been implemented in the LAU and the Red Dirt Analysis is currently in the NFMA assessment phase.

There are several permitted outfitter and guides for hunting and recreation (snowmobiling and grooming) in the LAU.

The LAU has been used for domestic livestock grazing for over 100 years. Recently the Coberly Maudlin Blacktail and Bobcat range allotment management plans has been completed in the LAU.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Pagoda LAU

Description of the Pagoda LAU

The Pagoda LAU is located in the south-central portion of the Routt National Forest. This LAU is 104,399 acres in size and contains lynx habitat as described below. The Pagoda LAU includes a 410 acre BLM addition to the National Forest portion of the LAU. This LAU was impacted by the stand replacing Lost Lake Fire in 2002.

Pagoda LAU: Past, Current and Planned Federal Land Management Activities

The Pagoda LAU is largely roadless. The primary permitted federal activity for this area is hunting outfitters and guides. Domestic livestock grazing also occurs in the LAU and the Williams Fork grazing allotment AMP is currently being developed for the area.

The Federal Highway Administration is resurfacing the Dunkley Pass road that runs through the LAU.

The Indian Run prescribed fire project is currently in the planning phase and is being designed for wildlife (elk and deer) habitat improvements.

Fall hunting is very high in this portion of the forest and the area boasts the largest elk herd in Colorado and possibly North America.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Dunkley LAU

Description of the Dunkley LAU

The Dunkley LAU is located in the south-central portion of the Routt National Forest. This LAU is 87,538 acres in size and contains lynx habitat as described below.

Dunkley LAU: Past, Current and Planned Federal Land Management Activities

The Dunkley LAU is a focus for recreational activity because of the relatively easy access t the Flattops Wilderness along the Bear River corridor. There are high levels of summer recreational activity as well as fall elk hunting. The Bear River Assessment is currently being completed for this area.

The area has been used for domestic livestock grazing for over 100 years. Recently the Egeria grazing allotment analysis has been initiated.

There are several permitted recreational outfitter and guides that use the area.

The Dunkley prescribed fire fuel reduction project was recently implemented in the LAU.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Sheep Mountain LAU

Description of the Sheep Mountain LAU
The Sheep Mountain LAU is located in the south-eastern portion of the Routt National Forest. This LAU is 106,051 acres in size and contains lynx habitat as described below.

Sheep Mountain LAU: Past, Current and Planned Federal Land Management Activities

Planned projects in this LAU include West Carter, East Carter, Antelope, Rabbit Ears, Parkview, and Little Buffalo AMPs.

Ongoing projects in this LAU include the Enduro, a one day motorcycle event that involves approximately 350 riders on system roads. This event has occurred almost annually, since 1980.) Other ongoing projects include outfitters and guides for big game hunts and the annual maintenance of the SnoTel remote weather station.

The Green Ridge Timber Sale is the most significant ongoing timber management project in the LAU. Between 5,400-8,100 acres of timber would be logged between 2003-2010 with this project. Refer to the Green Ridge EIS and BA for more detail on this project.

Projects that are currently being implemented include the Julson private property access project. This project involves the construction of ¼ miles of new road in lodgepole pine to allow landowner access that was eliminated when FS closed the road.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Troublesome LAU

Description of the Troublesome LAU
The Troublesome LAU is located in the south-eastern portion of the Routt National Forest. This LAU is 49,875 acres in size and contains lynx habitat as described below.

Troublesome LAU: Past, Current and Planned Federal Land Management Activities

Currently there are no planned projects in the Troublesome LAU. Ongoing projects include outfitters and guides for big game hunts, day horse trips and day hikes. Projects

being implemented include the Monument, Corral Creek and Pete Gulch grazing allotment analysis. These grazing allotment projects have had scoping initiated.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Owl Mountain LAU

Description of the Owl Mountain LAU

The Owl Mountain LAU is located in the south-eastern portion of the Routt National Forest. This LAU is 57,407 acres in size and contains lynx habitat as described below.

Owl Mountain LAU: Past, Current and Planned Federal Land Management Activities

Projects currently being implemented include the Teller City salvage project (salvage of 617 acres of windblown timber).

Projects currently being planned in this LAU include the Owl Mountain Timber Sale. The Parks Ranger District proposes to treat approximately 2,577 acres of mature and overmature forested stands in the analysis area where the emphasis is to reduce hazardous fuels, improve forest health conditions, regenerate dead and dying stands, and provide forest products. This would include numerous silvicultural treatments specifically designed to address fuel hazards adjacent to or near private and federal infrastructure including the community of Gould, the municipal watershed of Walden, and developed recreational sites. Additionally all treatments, whether near infrastructure or in the greater analysis area, contribute towards the salvage and regeneration of dead and dying stands.

Owl Mountain North sale treated 614 acres through clearcut harvesting. Logged from 1994 to 1996, the Silver Creek sale treated 443 acres, including: 94 acres of clearcut, 92 acres of overstory removal, and 257 acres of individual tree selection. The Gould Stewardship sale is currently treating 148 acres including 133 acres of commercial thin and 15 acres of overstory removal. Due to increased mountain pine beetle mortality in the sale area, it is anticipated that the 133 acres of commercial thin will change to clearcut, as analyzed in the Gould Hazardous Fuels Reduction Supplemental Information Report.

Ongoing projects include: The Colorado Blizzards and North Park Snowsnakes Poker Runs. Both are one day snowmobile events on groomed trails involving 100 to 150 participants. Other ongoing projects include the Robert Burr summer ditch access, snowplowing of 0.2 miles of the FDR reciprocal right of way and annual maintenance of the SnoTel remote weather station.

Potential Cumulative Effects Associated with Non-Federal Actions:

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the LAU nor are they likely to influence Canada lynx.

Williams Fork LAU of the Arapaho-Roosevelt NF, administered by the Routt NF. There are no activities proposed in this lynx LAU.

LINKAGE ZONES:

Linkage zones are areas that generally do not provide denning or winter forage; however potentially serve as a lynx travel corridor between LAU's (Forests).

Egeria Linkage Zone

Description of the Egeria Linkage Zone
The Egeria Creek linkage zone connects the Dunkley LAU (along with LAUs on the White River NF to the Gore LAU on the RNF. The Egeria Creek linkage zone crosses mostly forested private, state and BLM lands.

Lynx habitat has not been mapped for the Egeria linkage zone because it is outside of an LAU and not on Forest Service lands

***Egeria Linkage Zone*: Past, Current and Planned Federal Land Management Activities**

There is no Forest Service past, current or planned management actions, including oil or gas leasing, in the Egeria Linkage Zone, as the linkage zone does not contain Forest Service lands.

It is not known what BLM past, current or planned management actions may occur in the linkage zone, although livestock grazing is likely.

***Egeria Linkage Zone*: Potential Cumulative Effects Associated with Non-Federal Actions**

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. It is not known what actions besides livestock grazing may be occurring on private lands within this linkage zone. Non-federal actions are not anticipated to substantively affect the condition of lynx habitat in the linkage zone nor are they likely to influence Canada lynx.

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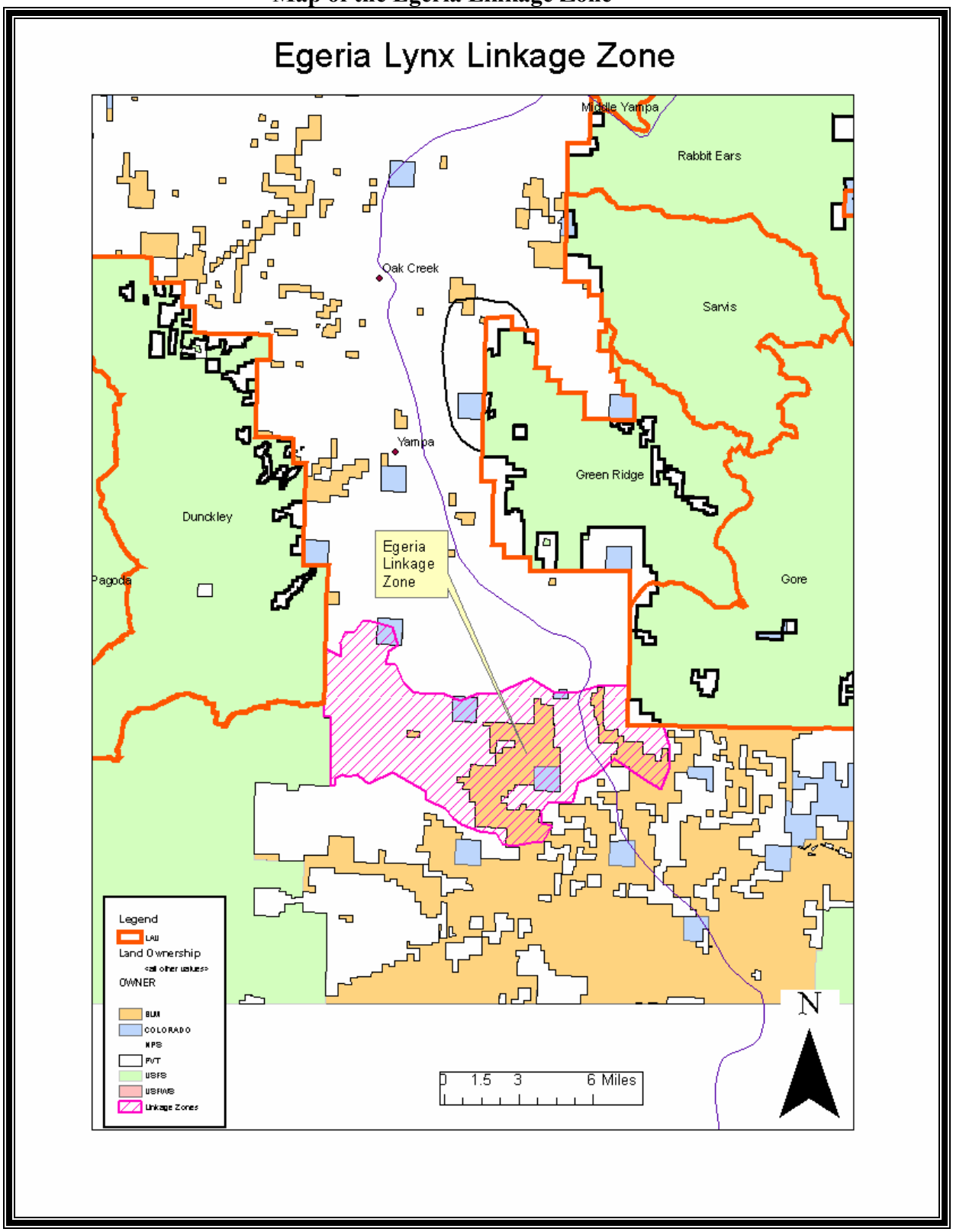
Figure 2
Map of the Egeria Linkage Zone



Muddy Pass Linkage Zone

Description of the Muddy Pass Linkage Zone

The Muddy Pass linkage zone connects the Middle Yampa and Rabbit Ears LAUs with the Sheep Mountain LAU via mostly forested private, state and BLM lands. Lynx Habitat has not been mapped for the Muddy Pass linkage zone because it is outside of an LAU and not on Forest Service Lands.

Muddy Pass Linkage Zone: Past, Current and Planned Federal Land Management Activities

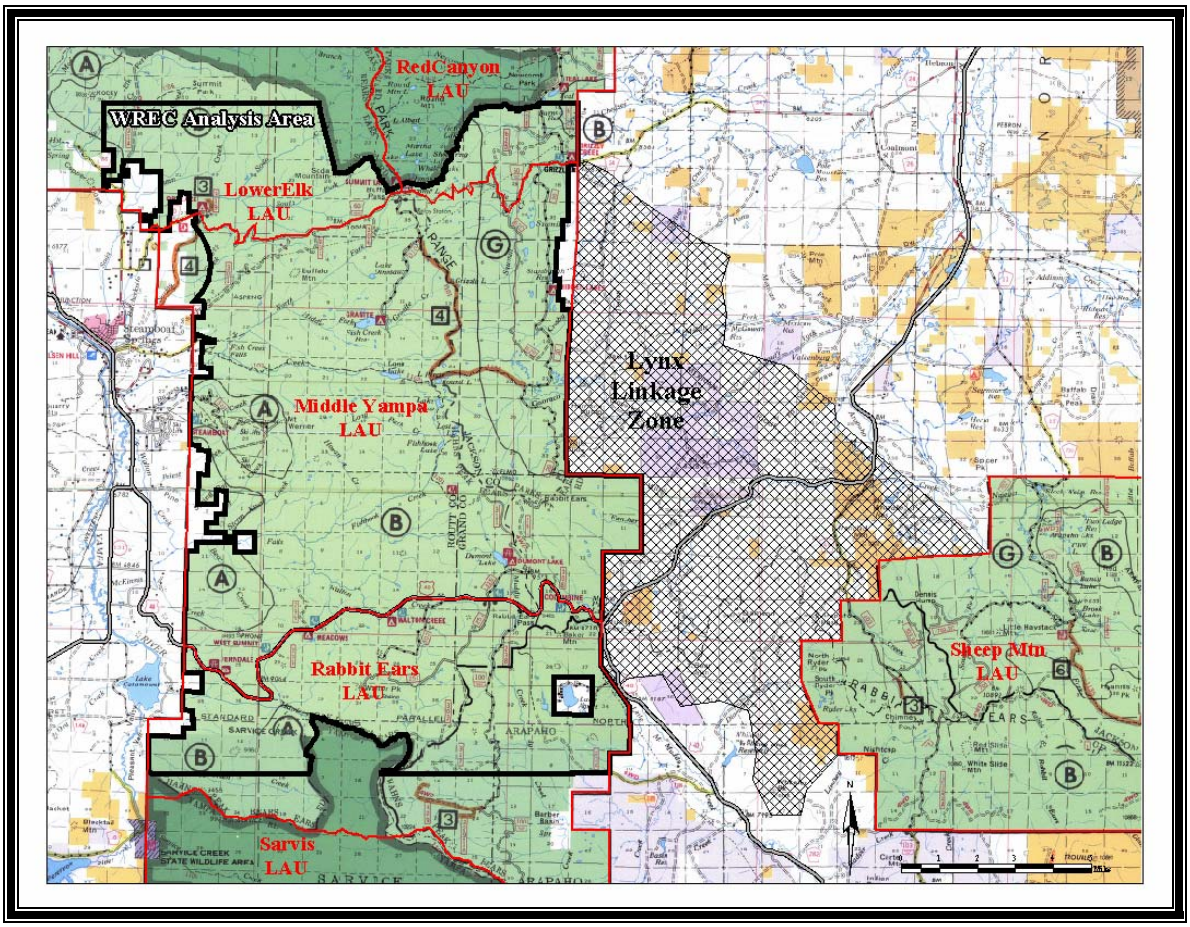
There is no Forest Service past, current or planned management actions, including oil and gas development in the Muddy Pass linkage zone, as the linkage zone does not contain Forest Service lands. The 2005 Winter Recreation EA designated over 1,600 acres in the Middle Yampa and Rabbit Ears LAU as a suggested winter non-use area to help maintain the functioning of the Muddy Pass linkage zone. Refer to the 2005 Routt Winter Recreation EA and BA for more detail regarding this project.

It is not known what BLM past, current or planned management actions may occur in the linkage zone, however livestock grazing is likely.

Muddy Pass Linkage Zone: Potential Cumulative Effects Associated with Non-Federal Actions

Currently there are proposals for oil and gas development off Forest that would occur in the Muddy Pass linkage zone. The scope of these proposals and how they might affect lynx or lynx habitat is not known.

Figure 3 - Map of the Muddy Pass Linkage Zone



Sierra Madre Linkage Zone

Description of the Sierra Madre Linkage Zone

The Sierra Madre Linkage Zone is 32,699 acres in size and connects both the Encampment River and Little Snake River LAUs of the Routt National Forest with LAUs on the Medicine Bow National Forest. This linkage area is not part of an LAU because it is dominated by dry lodgepole stands with minimal understory, sagebrush hillsides, and narrow stringers of aspen forest. Therefore, it is unlikely that the area supplies adequate amounts and distribution of denning and winter foraging habitat to support a resident lynx.

Sierra Madre Linkage Zone: Past, Current and Planned Federal Land Management Activities

The Blackhall/McAnulty vegetation treatment includes 139 acres of shelterwood harvest in the linkage zone, affecting 0.4% of the linkage corridor. This project has been approved but not yet implemented on the ground.

Other ongoing projects include permitted outfitter and guides for fishing, hunting and jeep tours.

There are currently no oil or gas developments that occur in the Routt National Forest portion of the Sierra Madre Linkage Zone.

***Sierra Madre Linkage Zone*: Potential Cumulative Effects Associated with Non-Federal Actions**

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. Non-federal actions are not anticipated to affect the condition of lynx habitat in the linkage zone nor are they likely to influence Canada lynx.

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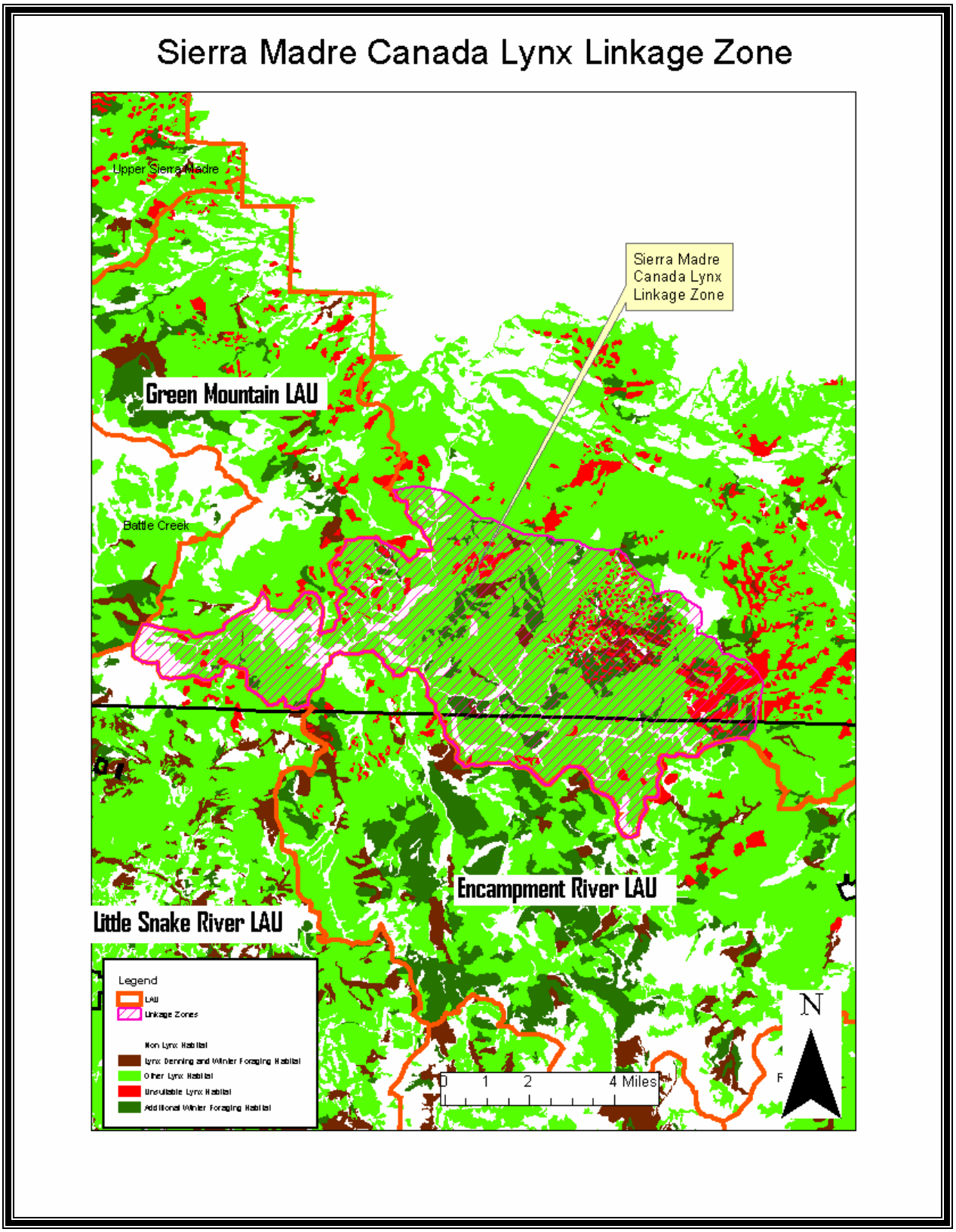
Fig. 4 Lynx Habitat Map for the Sierra Madre Linkage Zone



North Gate Linkage Zone

Description of the North Gate Linkage Zone

The North Gate linkage zone is 72,462 acres of which 28,833 acres are within the administrative boundary of the Routt National Forest. This linkage zone connects LAUs on the RTNF to LAUs on the Arapaho Roosevelt NF. The LAU includes both FS and non-FS lands. The non-FS lands contain a large proportion of forested BLM lands. The RNF system lands within the North Gate linkage contain the areas that are referred to as Pinkham Mountain and Kings Canyon. The National Forest portion of the area was not of sufficient size to stand alone as an LAU and did not have adequate amounts of primary lynx habitat types. This linkage zone also abuts the Snowy Range linkage zone that leads to the LAUs on the Medicine Bow National Forest.

The National Forest portion of the North Gate linkage zone includes 766 acres that are unavailable and 27,306 acres where site specific analysis is required.

North Gate Linkage Zone: Past, Current and Planned Federal Land Management Activities

There are 29.2 acres of motorized trail and 697 acres of roads of dry lodgepole pine designated for treatment in this linkage area.

This area does not provide preferred denning habitat or winter forage; is surrounded by low elevational grassland, and is not likely part of lynx's home range. The area does provide potential travel cover and is mapped as a lynx linkage corridor to provide connectivity between the Snowy Range and the Arapaho/Roosevelt LAU's, and linkage to the Sierra Nevada Range to the west. Skorkowsky 2003.

On the National Forest portion of the linkage zone, there are permitted outfitter and guides for big game hunting. Also the Camp Creek fuels reduction and habitat enhancement project was completed in October of 2007. This project was a 1500 acre prescribed fire targeting aspen and sagebrush that was implemented between 2004 and 2007.

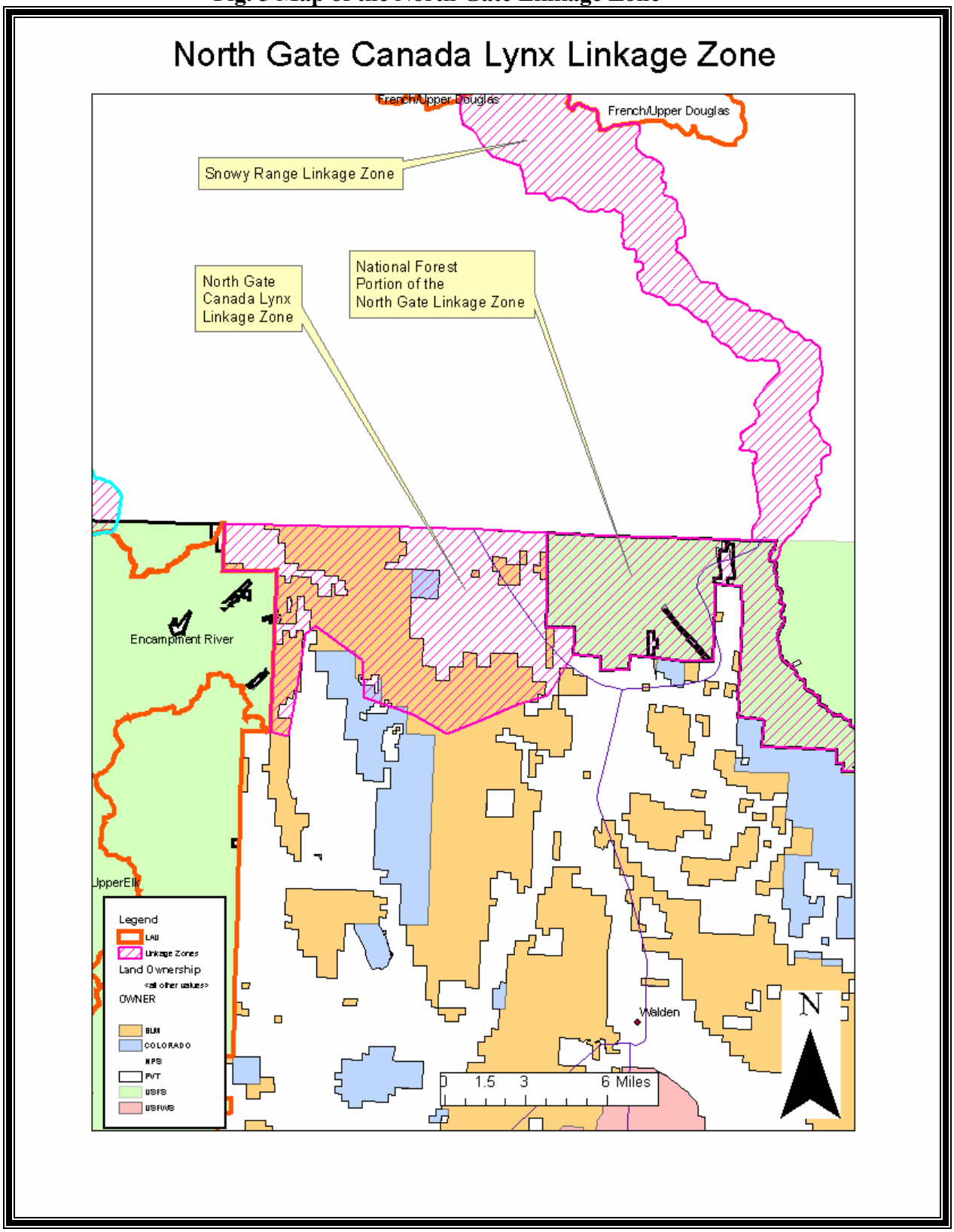
It is not known what activities occur on the BLM portions of the linkage zone, although it is anticipated that livestock grazing does occur.

There are currently no oil or gas developments on the National Forest portion of the North Gate linkage zone.

North Gate Linkage Zone LAU: Potential Cumulative Effects Associated with Non-Federal Actions

There are no anticipated cumulative effects to lynx as a result of non-federal actions occurring within this LAU. It is not known what actions besides livestock grazing may be occurring on private lands within this linkage zone. Non-federal actions are not anticipated to affect the condition of lynx habitat in the linkage zone nor are they likely to influence Canada lynx.

Fig. 5 Map of the North Gate Linkage Zone



This report includes 2 LAUs, the Little Snake River and the Encampment River, both of which predominantly occur in Colorado on the Routt National Forest. Approximately 5% of each of these LAUs occurs in Wyoming on the Medicine Bow National Forest. Projects that have occurred on either Forest will be included in calculations for these LAUs. These LAUs are included in the BA for the Medicine Bow Forest and in the BA for the Routt Forest.

Table 4. Lynx Habitat after Forest management activities and beetle-kill (acres)

Lynx Habitat	Environmental Baseline	Previous Projects	Changes from Beetle-killed lodgepole	Hazard Tree Project	Cumulative Changes
BEARS EARS (97,753.68)					
Den/W. forage	16,426,96	-	15,227.60	-	15,227.60
Non Habitat	26,052.59	-	25,282.70	-	25,282.70
Other (summer)	47,921.32	-3.00	44,044.70	-	44,044.70
C. Unsuitable	1,979.16	+3.00	3,085.60	5.6	3,085.60
Addt'l W. forage	10,004.65	-	10,112.70	-	10,112.70
Totals Minus Non-Habitat, % Unsuitable	76,332.08 2.5%		72,470.60 4.2%		72,476.20 4.2%
SAND MOUNTAIN (74,447)					
Den/W. forage	11,628	-	9,520.10	-	9,520.10
Non Habitat	14,133	-	14,044.60	-	14,044.60
Other (summer)	43,697	-	41,036.10	188.3	41,036.10
C. Unsuitable	1,587	-5.00	5300.60	55.3	5300.60
Addt'l W. forage	2,801	-	4,544.60	-	4,544.60
Totals Minus Non-Habitat, % Unsuitable	59,713 2.6%		60,401.40 8.7%		60,645.00 8.7%
LITTLE SNAKE RIVER (77,255)					
Den/W. forage	7802	-17	5,995.20		5995.00
Non Habitat	14,877	-16	14,267.80	13.0	14,252.00
Other (summer)	51,002	-103	41,119.40	454	41,120.00
C. Unsuitable	1495	+242	13,010.50	441	13,131.00
Addt'l W. forage	2040	-104	2861.00	-	2757.00
Totals Minus Non-Habitat, % Unsuitable	62,339.00 2.3%		62,986.10 20.6		63,003.00 20.8%
		*Includes proposed harvest in the Medicine Bow Forest portion of the LAU			
QUAKER MOUNTAIN (8,101.78)					
Den/W. forage	5,242.11	-	1,312.70	-	1,312.70
Non Habitat	5,675.10	-	2,117.10	-	2,117.10
Other (summer)	30,103.83	-	4,222.10	-	4,222.10
C. Unsuitable	0	-	143.50	-	143.50
Addt'l W. forage	274.74	-	306.50	-	306.50
Totals Minus Non-Habitat, % Unsuitable	35,620.68 0%		5,984.40 2.3%		5984.80 2.3%

Lynx Habitat	Environmental Baseline	Previous Projects	Changes from Beetle-killed lodgepole	Hazard Tree Project	Cumulative Changes
ENCAMPMENT (67,262)					
Den/W. forage	3,523.90	-	1,994.40	-	1,994.40
Non Habitat	13,843.09	-	14,593.10	-	14,593.10
Other (summer)	37,230.58	-3061	21,209.30	153.5	21,125.00
C. Unsuitable	2,063.64	+3065	22,808.30	690.1	22,892.00
Addt'l W. forage	10,600.57	-	6,656.50	-	6,656.50
Totals Minus Non-Habitat, % Unsuitable	53,418.69 3.8%		52,668.50 43.3%		52,667.90 43.4%
*Includes proposed harvest in the Medicine Bow Forest portion of the LAU					
UPPER ELK RIVER (89,089)					
Den/W. forage	9,869.21	-	5,270.30	-	5,270.30
Non Habitat	27,616.14	-	28,141.20	-	28,141.20
Other (summer)	32,704.84	-185	29,940.20	247.6	29,940.20
C. Unsuitable	16,059.63	+185	22,494.10	149.6	22,494.10
Addt'l W. forage	2,655.18	-	3,243.90	9.5	3,243.90
Totals Minus Non-Habitat, % Unsuitable	61,288.86 26.2%		60,948.50 36.9%		60,948.50 36.9%
LOWER ELK RIVER (77,566.40)					
Den/W. forage	4,464.05	-	2,911.10	-	2,911.10
Non Habitat	29,658.15	-	30,446.00	-	30,446.00
Other (summer)	35,711.99	-17	33,979.00	18.9	33,979.00
C. Unsuitable	3,456.8	+17	5,580.40	4.5	5,580.40
Addt'l W. forage	4,683.40	-	4,649.50	-	4,649.50
Totals Minus Non-Habitat, % Unsuitable	48,316.24 7.1%		47,120.00 11.8%		47,120.00 11.8%
RED CANYON (80,616.33)					
Den/W. forage	1,672.83	-	1,078.10	-	1,078.10
Non Habitat	31,432.86	-	32,610.30	-	32,610.30
Other (summer)	38,310.83	-222	25,237.60	89.3	25,237.60
C. Unsuitable	2,256.06	+222	17,008.00	301.3	17,008.00
Addt'l W. forage	6,943.75	-	4,682.00	-	4,682.00
Totals Minus Non-Habitat, % Unsuitable	49,183.47 4.5%		48,005.70 35.4%		48,005.70 35.4%
MIDDLE YAMPA (75,486)					
Den/W. forage	7,319.75	-	5,735.70	-	5,735.70
Non Habitat	28,807.91	-	28,577.70	-	28,577.70
Other (summer)	29,879.86	-130	25,560.10	98.6	25,560.10
C. Unsuitable	1,174.79	+130	9,227.60	194.6	9,227.60
Addt'l W. forage	8,304.81	-	6,385.70	-	6,385.70
Totals Minus Non-Habitat, % Unsuitable	46,679.21 2.5%		46,909.10 19.6%		46,909.10 19.6%

Lynx Habitat	Environmental Baseline	Previous Projects	Changes from Beetle-killed lodgepole	Hazard Tree Project	Cumulative Changes
RABBIT EARS (46,422)					
Den/W. forage	3,464.95	-	1,418.70	-	1,418.70
Non Habitat	11,442.86	-	11,638.80	1.3	11,638.80
Other (summer)	26,048.53	-129	14,462.10	103.2	14,462.10
C. Unsuitable	2,429.33	+129	16,503.40	278.1	16,503.40
Addt'l W. forage	3,020.47	-	2,398.70	-	2,398.70
Totals Minus Non-Habitat, % Unsuitable	34,963.28 6.9%		34,782.90 47.4%		34,782.90 47.4%
SARVIS (43,333)					
Den/W. forage	2,586.12	-	925.70	-	925.70
Non Habitat	3,086.39	-	3,150.20	-	3,150.20
Other (summer)	35,167.07	-32	9,782.90	-	9,782.90
C. Unsuitable	821.95	+32	27,186.40	57.7	27,186.40
Addt'l W. forage	1,672.40	-	2,288.60	-	2,288.60
Totals Minus Non-Habitat, % Unsuitable	40,247.54 2.0%		40,183.60 67.6%	-	40,183.60 67.6%
GREEN RIDGE (49,946)					
Den/W. forage	7,043.89	-28	2,891.40	-	2,891.40
Non Habitat	12,807.65	-7.35	10,527.70	.9	10,527.70
Other (summer)	32,872.09	-269.1	23,008.60	146.6	23,008.60
C. Unsuitable	1,282.91	+297.1	10,489.90	201.7	10,489.90
Addt'l W. forage	2,246.09	-9.4	3,028.20	18.5	3,028.20
Totals Minus Non-Habitat, % Unsuitable	43,444.98 2.9%		39,418.10 26.6%		39,418.10 26.6%
GORE (83,327)					
Den/W. forage	3,561.56	-4.64	2,242.10	-	2,242.10
Non Habitat	10,712.19	44.39	15,585.10	8.2	15,585.10
Other (summer)	49,792.64	-4294.73	33,752.30	548.4	33,752.30
C. Unsuitable	8,556.96	+4358.37	28,474.50	1104.7	28,474.50
Addt'l W. forage	2,999.23	-107.12	3,272.90	3.5	3,272.90
Totals Minus Non-Habitat, % Unsuitable	64,910.39 13.1%		67,741.89 42.0%		67,741.89 42.0%
PAGODA (104,399)					
Den/W. forage	11,875.74	-	9,597.00	-	9,597.00
Non Habitat	27,602.50	-	28,016.20	-	28,016.20
Other (summer)	57,541.63	-	48,076.10	5.1	48,076.10
C. Unsuitable	160.72	-	10,868.50	32.2	10,868.50
Addt'l W. forage	7628.39	-	7,840.80	-	7,840.80
Totals Minus Non-Habitat, % Unsuitable	77,206.48 .002%		76,382.40 14.2%		76,382.40 14.2%

Lynx Habitat	Environmental Baseline	Previous Projects	Changes from Beetle-killed lodgepole	Hazard Tree Project	Cumulative Changes
DUNKLEY (87,538)					
Den/W. forage	12,132.87	-	10,425.20	-	10,425.20
Non Habitat	24,581.97	-	24,874.50	-	24,874.50
Other (summer)	38,509.68	-	32,219.00	78.3	32,219.00
C. Unsuitable	115.20	-	8,069.30	155.5	8,069.30
Addt'l W. forage	12,198.29	-	11,949.70	3.2	11,949.70
Totals Minus Non-Habitat, % Unsuitable	62,956.04 .001%		62,663.20 12.8%		62,663.20 12.8%
SHEEP MOUNTAIN (106,051)					
Den/W. forage	15,127.51	-	7,991.60	-	7,991.60
Non Habitat	13,918.58	-	14,635.90	30.0	14,635.90
Other (summer)	60,151.65	-8078	55,449.20	1486.7	55,449.20
C. Unsuitable	11,402.77	+8078	20,948.80	575.6	20,948.80
Addt'l W. forage	5450.01	-	7,024.60	.8	7,024.60
Totals Minus Non-Habitat, % Unsuitable	92,131.94 12.3%		91,414.20 22.9%		91,414.20 22.9%
TROUBLESOME (49,875)					
Den/W. forage	9,420.60	-	5,280.30	-	5,280.30
Non Habitat	6,455.94	-	6,574.50	-	6,574.50
Other (summer)	30,172.50	-	16,031.70	223.4	16,031.70
C. Unsuitable	1316.20	-	17,745.30	-	17,745.30
Addt'l W. forage	2,509.27	-	4,242.50	.8	4,242.50
Totals Minus Non-Habitat, % Unsuitable	43,418.57 3.0%		43,299.80 40.9%		43,299.80 40.9%
OWL MOUNTAIN (57,407)					
Den/W. forage	6,926.23	-	5,159.00	-	5,159.00
Non Habitat	9290.29	-	9,565.60	30.5	9,565.60
Other (summer)	35,223.68	-133	36,315.20	1087.00	36,315.20
C. Unsuitable	3620.26	+133	4,106.80	-	4,106.80
Addt'l W. forage	3214.08	-	2,259.80	-	2,259.80
Totals Minus Non-Habitat, % Unsuitable	48,984.25 7.3%		47,840.80 8.5%		47,840.80 8.5%
WILLIAMS FORK- NO ACTIVITY PROPOSED IN THIS LAU					

Denning and winter foraging habitat can overlap, so changes will not add to 100%

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Table 5 – Beetle-killed and Management Action Caused Currently Unsuitable Habitat (acres)

LAU	% Currently Unsuitable (After Cumulative Change)	% Currently unsuitable from pre-existing conditions and beetle kill	% currently unsuitable by mgt. actions in 10 years
Bears Ears	4.2	4.2	.00004
Sand Mountain	8.7	8.7	.00008
Little Snake River	20.8	20.6	.003
Quaker Mountain	2.3	2.3	0
Encampment	43.4	43.3	5.8
Upper Elk River	36.9	36.9	.003
Lower Elk River	11.8	11.8	.0003
Red Canyon	35.4	35.4	.004
Middle Yampa	19.6	19.6	.002
Rabbit Ears	47.4	47.4	.003
Sarvis	67.6	67.6	.0007
Green Ridge	26.6	26.6	.007
Gore	42	42	6.4
Pagoda	14.2	14.2	0
Dunkley	12.8	12.8	0
Sheep Mountain	22.9	22.9	8.8
Troublesome	40.9	40.9	0
Owl Mountain	8.5	8.5	.002

A hardcopy map is provided with this report that reflects the Hazard Tree Reduction Project Area. *See Exhibit A*. This map reflects the proposed activity across the Routt. Proposed activities (hazard tree reduction along roads and/or trails) that are in a Management Area (within a geographic Area), and that do not have a *Design Criteria* associated with the hazard tree reduction area are indicated in white. All other areas incorporate *Design Criteria* and/or are in an *Inventoried Roadless Area.*

IV. EFFECTS OF THE ALTERNATIVES

Proposed Action

Direct Effects

Lynx habitat for each LAU on the Forest is summarized in Table 4. This summary includes considering all lodgepole pine stands potentially affected by pine beetles as dead in 2008, according to direction from K. Broderdorp identified in "Consultation History", and includes the results of the Hazard Tree project analyzed in this document. Medium-sized and larger lodgepole pine trees (≥ 5" dbh) will be affected by pine beetles. There have been no projects in a few of the LAUs since lynx was listed as threatened until this Hazard Tree project.

In several LAUs, timber harvest or fuels treatments have already occurred in stands that would have been attacked by pine beetles. In these LAUs, lynx habitat could be changed to currently unsuitable by either activity (forest management or beetles). Table 4 displays this situation.

In a few LAUs, timber harvest or fuels treatment converted lynx habitat to currently unsuitable habitat. However, these stands would not have been also converted to currently unsuitable by pine beetles. Therefore, harvest and beetle-kill changes are sometimes additive. This is displayed, for example, in the Little Snake River LAU where previous projects and beetle-kill additively determined the cumulative amount of currently unsuitable habitat.

Proposed actions that can affect lynx include harvest of beetle-killed lodgepole stands within 150 ft. of open roads, trails, trailheads, parking lots, and administrative features (collectively admin sites) that are also within LAUs or linkage corridors. All stands proposed for harvest are lodgepole stands originally characterized as lynx other (summer) habitat due to limited amounts of understory vegetation, limited coarse woody debris, and lack of multiple tree layers. None of these stands have sufficient horizontal cover to provide habitat for snowshoe hares in winter. Following direction from K. Broderdorp, all medium or larger sized lodgepole pine trees within these stands will be considered dead for this and future analyses due to the beetle outbreak killing the lodgepole overstory. Assuming this much lodgepole pine mortality will cause these stands to convert to nonhabitat, currently unsuitable habitat, or will retain the stands as other habitat before hazard trees are removed. Table 4, Column 5 displays the amount of each type of beetle-killed habitat that will be affected by hazard tree removal.

Beetle mortality converts "other" lynx habitat to non habitat when the understory is a rock outcrop, for example. Beetle mortality converts "other" lynx habitat to currently unsuitable when there is not sufficient understory to provide even summer foraging habitat. Beetle mortality areas provide "other" lynx habitat (summer foraging) when there is a small amount understory spruce, fir, or lodgepole trees, for example. None of the stands proposed for harvest have sufficient horizontal cover to support snowshoe hares during winter, either before or after pine beetles kill the overstory; therefore, winter foraging habitat would not be decreased. The lodgepole stands proposed for harvest do not have >35% horizontal cover (if measured in winter) or >48% horizontal cover (if measured in summer (Bertram and Claar 2008) needed to provide snowshoe hare habitat in winter.

Removing the dead or dying hazard trees from within stands will not change the category of lynx habitat for which the stand is identified. For example, a stand categorized as lynx "other" habitat after beetle-kill will remain "other" habitat after hazard trees are removed. Only the dead and dying hazard trees will be removed by management actions; these were already considered dead relative to lynx habitat following Broderdorp's direction. The proposed action states that *Healthy, stable, live trees (e.g., spruce-fir, aspen, and lodgepole pine), clumps of regeneration…would be retained unless they pose a safety hazard in the felling/removal operation*. So, the understory that remains and categorizes the lynx habitat following Broderdorp's direction is the understory that will also remain

after hazard tree removal. This is displayed in Table 4 with the Upper Sierra Madre LAU, for example. Hazard tree removal will occur in 762 acres of other habitat and 394 acres of currently unsuitable habitat. There are still 24,474 acres of other habitat and 10,624 acres of currently unsuitable habitat after hazard tree removal, the same amounts in these habitat categories before hazard tree removal.

There are a few stands proposed for harvest that could remain as "other" habitat after pine beetles kill the overstory but before harvest. These lodgepole stands occur on moister sites, higher elevations, or cooler aspects or terrain. These stands have some understory vegetation or multiple canopy layers that would still provide some summer habitat for snowshoe hares and lynx after the overstory is dead. These stands are generally identified as having ≥10% spruce-fir component in the stand.

Medium sized or larger lodgepole pine trees provide habitat for red squirrels for shelter or cones for food. Dead and dying beetle affected trees no longer produce cones. Within a few years, falling limbs and needles no longer provide cover for shelters. So, removing these dead and dying medium sized trees along open roads and admin sites will only remove these habitat features a few years before these features would have been lost naturally. Red squirrels are not expected to use stands medium or larger sized lodgepole trees after beetle-kill. Red squirrels will not use these stands for several decades until the existing understory matures enough to produce cones abundantly and provide the cover for shelter protection. Spruce-fir and, to a limited extent, younger lodgepole (cone production) will continue to provide red squirrel habitat across the Forest. Declines in red squirrel availability as prey will be determined overwhelmingly by where habitat exists after the pine beetle outbreak and only insignificantly by where hazard trees are removed at specific sites. Hazard tree removal is not expected to noticeably affect survival or reproduction for red squirrels.

None of the stands proposed for harvest provide winter habitat for snowshoe hares before or after harvest. For the northern Rockies lynx amendment, Bertram and Claar (2008) clarified that stands providing winter habitat for snowshoe hares have >35% horizontal cover in winter or >48% horizontal cover in summer. Generally speaking proposed hazard tree removal areas (bordering roads and trails) are not the "mature multistoried forests" that "provide important winter snowshoe hare habitat". Removal of hazard trees will not change winter habitat available to snowshoe hares; so, will not affect prey density for lynx during winter.

Proposed actions include nonmotorized trails (i.e. hiking and horseback) across the Forest. Many of these are in roadless areas, Special Interest Areas, Research Natural Areas, and Wilderness Areas. For these trails, the existing trail path will continue to be cleared of falling trees. There would be no change from the existing condition of lynx habitat at these trails.

Noise, Commotion or Other Disruption Effects—
In the *Lynx Conservation Assessment and Strategy*, Ruediger *et al*. (2000) describe lynx as "…being generally tolerant of humans. Other anecdotal reports also suggest that lynx

are not displaced by human presence, including moderate levels of snowmobile traffic [p. 1-13]." This perspective is shared by Ruggiero *et al*. (2000) who contend: "Lynx readily move across landscapes fragmented by conventional industrial forestry [p. 451]" and further, "limited anecdotal observations do not support the hypotheses that snowmobiling, ski touring, or hiking result in significant behavioral disturbance to lynx [p. 453]." Local information provided by Fitzgerald *et al.* (1994) also suggests lynx have some tolerance for people: "The species may not be entirely intolerant of humans, as tracks were observed around garbage dumps at a central Colorado ski area [p. 369]."

As importantly, lynx are unlikely to be in or near activity areas during treatment operations. The low likelihood for lynx to be in the vicinity when logging is in progress is due to two aspects of this cat's existence in Colorado: 1), the inherent rarity of lynx on the landscape generally, and 2), its nocturnal tendency (which does not coincide with proposed daytime activities). Therefore, no disruptive impacts to lynx are anticipated from short-term noise, commotion or smoke produced by proposed treatment actions. The proposed actions occur on existing open roads, are distributed widely across the Forest and will occur over approximately ten years.

With regard to exploitation (food resource) competition impacts postulated by Buskirk *et al.* (2000) to occur between lynx and coyotes, bobcats (*Lynx rufus*) or mountain lions (*Felis concolor*) in winter, no such effects would result due to the proposed action. Hypothetically, compaction of unconsolidated soft snow by over-snow machines could allow access of competing large carnivores into snowshoe hare habitats. In turn, Buskirk *et al.* (2000) suggest predation by these sympatric carnivores might detrimentally decrease hare numbers and thus impact the primary food resource lynx rely upon during winter. However, even should interspecific exploitive competition occur between lynx and other large carnivore species in winter, no actions are proposed that would purposely induce changes in snow-machine use within the Analysis Area and no increase in "groomed or designated over-the-snow routes [Ruediger *et al.* 2000, p. 7-9]" are included as part of proposed activities. Moreover, the Fish and Wildlife Service (Nordstrom 2003) has recently concluded: "[t]here continues to be no data on the role of competition between lynx and other species…" and "[a]t this time there is no evidence that, if competition exists between lynx and any of these species, it exerts a population-level impact on lynx; therefore, we do not consider competition to be a threat to lynx [p. 40097]."

Vegetation management actions are anticipated to impact habitats that lynx would use for foraging by impacts to snowshoe hare habitat. The amounts of snowshoe hare habitat would be reduced from the implementation of the proposed action and thus that would reduce foraging habitat for lynx both in primary lynx habitat as well as other lynx habitat. Implementation of the proposed action would result in disturbance to individual lynx occurring in the project area. Disturbance may result in lynx avoiding the project area during implementation. Disturbance effects are considered short-term and relatively insignificant.

The specific management actions and anticipated impacts are described below.

Fuel Break: Treatments include removing all species of standing dead trees, fallen logs and sound course woody debris to maintain defensible space along the private boundary where human disturbance, development and unsuitable habitat is at a high level, while suitable lynx habitat is expected to be at a low level. This treatment would likely occur over time as conifer species succumb to beetle pressure and mortality affects the stand. Permitted or free use fire wood gathering opportunities will be encouraged and will likely be accomplished by local residences due to the vested interest in removing fuels in the area and probable access issues to other general publics. All treated fuels not removed for personal use would be piled and burned at a later date. All live aspen and spruce/fir will be maintained.

Clearcut*:* Clearcutting involves the (salvage) harvesting of all trees, or individual select trees in a designated area. Clearcutting is used primarily to regenerate plant species less tolerant to regeneration in more shaded conditions. Slash treatments may be by any of the following methods: machine pile and burn, machine trampling or roller chopping. Slash treatment is dependent on the density of the stand and the average crown ratio of the trees. Snags and down woody debris would be retained as specified in project design criteria.

Clearcuts would eliminate suitable (other) habitat in the intermediate-term because a high proportion of existing vegetation would be completely removed. The interior of newly-created clearcuts are unsuitable for lynx use chiefly because vegetative cover is important for lynx (Koehler and Aubry 1994). The temporary lack of trees and other plants would neither support preferred prey (red squirrels and snowshoe hares) nor provide the cover needed by lynx for hunting. Clearcuts (and other nearly-complete tree removals) applied under the Hazard Tree proposal, even though they would include reserve trees, would have inadequate overhead or ground cover for lynx to feel secure or stalk prey. Similar to the behavior seen in most cats, lynx tend to avoid largely open environments where there is little or no cover for hiding from danger or to ambush its quarry. Thus, all regeneration harvest areas represent a temporary but complete habitat loss for lynx. Nevertheless, most clearcuts would be less than 25 acres and so would be travel impediments of limited extent. While the interiors of clearcuts offer little short- or intermediate-term value as lynx habitat, clearcuts do represent opportunity for lynx long-term.

The future opportunity that clearcuts represent is that newly regenerated forest would support, after a time, both prey and the concealment needed by lynx to hunt successfully. Lack of ground and overhead cover in clearcuts or other complete tree removal treatments would be an ephemeral (intermediate-term) impact. Within 10 to 20 years, grasses, forbs, shrubs and small trees would reoccupy openings where little vegetation remained following logging. At this stage of forest succession, the vegetative edge (a place where two vegetation cover types meet) defining the boundary between regenerated forest and adjacent mature trees may well provide improved opportunity for lynx to locate and catch prey. Known as edge effect, the transition area where two plant communities meet is typically more productive and has a greater array of plants and animals than either community would alone.

Beyond 20 years, the sapling and pole stands of lodgepole pine occupying formerly clearcut areas are expected to be suitable wintering habitat for snowshoe hares. Vegetation development at this age of succession would be completely sufficient for hares to fully re-colonize the former clearcuts. Thus, clearcuts represent a transient deficit in snowshoe hares and other prey but also ensure future replenishment of habitats highly suitable for hares. As explained by Koehler and Aubry (1994): "Lynx habitat in the western mountains consists of two structurally different forest types occurring at opposite ends of the stand age gradient. Lynx require early successional forests that contain high numbers of prey (especially snowshoe hares) for foraging and late-successional forests that contain cover for kittens (especially deadfalls) and for denning [p. 86]."

Lynx habitat for each LAU on the Routt Forest is summarized in Table 4 including results of the Hazard Tree project analyzed in this document.

The sum of all harvest units and road work will still retain natural connectivity across the landscape. The habitat changes identified in Table 4 show the percentage of lynx habitat within the LAU's that will change to currently unsuitable. Habitat changes will still allow lynx to move easily across LAU's.

Indirect Effects

Indirect effects to lynx as a result of the implementation of Alternative 2 (proposed action) may include the decreased risk of a large scale wildfire. Although this is a speculative scenario, part of the purpose of the project is to reduce the potential for wildfire. This action may help reduce the possibility of a wildfire impacting a greater portion of these LAU's. However, if wildfire were to occur, beetle killed trees combined with the likelihood of large, intense wildland fires could jeopardize watershed health, water flows, wildlife habitat , developed and dispersed campgrounds, road and trail systems, utility corridors and heritage sites.

Because of the current ongoing bark beetle epidemic we do not yet know the extent of lodgepole mortality and total indirect effects; however it has been stated (FS, R2 conference call January 2008) that within 3-5 years 100% of mature lodgepole pine will be dead as a result of the growing bark beetle epidemic. Studies from Oregon found that lodgepole pine killed by MPB began falling three years after death in thinned stands and five years after death in unthinned stands (Lewis, K.J. and I.D. Hartley. 2006, Mitchell and Preisler 1998). These and other changes could create an immediate substantial (1-10 years) loss of mature and older aged timber; however create an increase in coarse woody debris as lodgepole pine die and fall.

In the mid-term (10-25 years post harvest), the under stories of managed stands will recover and increase in height and density. This will result in improved snowshoe hare foraging habitat and thus lynx foraging would improve in the management units.

No substantive indirect effects are anticipated with the implementation of the actions associated with Alternative 2.

These activities will cause no substantial or permanent habitat changes that would affect lynx, lynx prey, other predators, or human presence.

V. DETERMINATION OF EFFECTS & RATIONALE FOR CANADA LYNX:

The project does occur within lynx habitat and if implemented would affect lynx habitat as described. The project does occur within the North Gate and Sierra Madre landscape linkage zone's as discussed previously in this document.

This project has been designed in association with the Canada Lynx Conservation Assessment and Strategy (Ruediger et al., 2000) and is consistent with the CLCAS guidance. However, impacts to lynx habitat would occur as a result of implementation. Implementation of this proposed project is "**Not Likely to Adversely Affect"** the Canada lynx.

This analysis will be submitted to the US Fish and Wildlife Service for consultation on this analysis and determination.

VI. CONSULTATION HISTORY

June 20, 2007 - General information exchange with Kurt Broderdorp, and mainly concerning Canada lynx issues and the thought that the in even-aged beetle-killed lodgepole pine stands, the natural process (bark beetles) had converted the stands from suitable to an unsuitable condition. (Nancy Warren, R2 TES Program Leader later reiterated this as fact in an 8/03/07 email).

June 26, 2007 - General information exchange with Kurt Broderdorp, concerning Canada lynx issues and the fact that the current Conservation Assessment Strategy addresses live trees, not dead.

January 10, 2008 - the Fish and Wildlife Service (FWS- Kurt Broderdorp) provided an email to the Routt National Forest listing those proposed, threatened, endangered (PET) and candidate species that might occur on, or be affected by actions implemented within, the Forest.

January 14, 2008 - the Fish and Wildlife Service (FWS- Kurt Broderdorp) provided an *updated* email to the Routt National Forest listing those proposed, threatened, endangered (PET) and candidate species that might occur on, or be affected by actions implemented within, the Forest. As previously mentioned, PET species will be addressed in the Biological Assessment for the Hazardous Tree and Fuels Reduction Project.

April ?, 2008 – Telephone conversation with Kurt concerning the BA; proposed action, connectivity, and definitions as written in the BA. Need to discuss further.

May 13, 2008 – In person communication with Kurt, my office concerning the "PET" species list, January 2008 is still the most current list.

May 14, 2008 – Informal consultation with Kurt at the Walden office with select members of the IDT. Concurrence received with "NLAA", FS will resubmit BA with recommended changes, and provide a map that shows *Hazard Tree Reduction Project* areas on a map.

The intent of the meeting was to clarify details of the proposed action, provide suggestions to more effectively address maintaining connectivity among LAUs, and discuss how to represent lodgepole stands in lynx habitat that are infected with pine beetles. Mr. Broderdorp recommended and the Forest agreed that all lodgepole pine stands within LAUs that have been or could possibly be infected by pine beetles will be considered as dead lodgepole stands for this analysis and future analyses. Almost all dead lodgepole stands will be considered currently unsuitable habitat, unless the remaining spruce, fir, or aspen overstory or the understory still provides some lynx habitat.

VII. RESPONSIBILITY FOR A REVISED BIOLOGICAL EVALUATION

This Biological Evaluation was prepared based on presently available information. If the action is modified in a manner that causes effects not considered, or if new information becomes available that reveals that the action may impact endangered, threatened, proposed, or sensitive species that in a manner or to an extent not previously considered, a new or revised Biological Evaluation will be required.

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