

APPENDIX A

Amended Biological Evaluation for Sensitive Species And Information on Management Indicator Species To the Main Boulder Fuels Reduction Project Environmental Impact Statement

File Code: 1950/5140

Date: April 15, 2005

Subject: Main Boulder Fuels Reduction Proposal Biological Evaluation for Sensitive Species and information on Management Indicator Species

To: District Ranger

A. INTRODUCTION

The Regional Forester of Region 1 Forest Service has designated several species as being "Sensitive". Forest Service direction is to maintain viable populations of "Sensitive" species and to ensure that those species do not become threatened or endangered because of Forest Service actions. The sensitive species list was last updated in 2004. The purpose of this analysis is to evaluate the effects of the proposed forest successional management, prescribed burning, and other treatments on sensitive wildlife and plant species. In addition, an analysis of effects to Gallatin National Forest Plan - Management Indicator Species (MIS) is included.

Proposed Action

Proposed fuels management treatments would occur on approximately 2,500 acres in fifty-one separate units. Overstory/understory density reduction would occur on approximately 2,100 acres (1,060 acres of slopes up to 35%, 1,040 acres of slopes greater than 35%) and would be uneven in spacing, leaving clumps while still breaking up fuel continuity. Prescriptions will vary between adjacent stands to break up possible fire patterns and create a disconnection between stands. Prescribed burning activities would occur on approximately 400 acres of meadow areas. Under story and pile burning are also being considered for the spring and winter seasons. The project area is situated along the Main Boulder Road and in the Boulder River corridor and has been designed to help protect the scenic quality of the area. Up to 7.4 miles of temporary road may be constructed to access the treatment areas. New permanent road construction is not being proposed. The project is projected to take 5-7 years to complete beginning in the winter of 2005.

The proposed treatments are based on current conditions, such as fuel continuity, fuel arrangement (vertical and horizontal), and vegetative types, corresponding to the criteria listed above in the project area description.

Detailed Stand Treatments

The primary objective for all treatment groups is to:

- 1) Provide for public and firefighter safety by minimizing the probability and effects of future human-caused fire starts and/or helping to reduce the intensity of a potential wildland fire leaving the wilderness and entering the wildland/urban interface of the Main Boulder River Corridor.
- 2) Extend the potential time available for evacuation in the event of a wildfire by reducing the fire hazard along the Main Boulder Road.
- 3) Reduce fuel loadings and break up the composition of vertical and horizontal fuels in the river corridor.

Treatment are designed to reduce ladder fuels (small to mid-story trees and shrubs), thin the overstory to increase the space between crowns, reduce accumulations of down woody material and create stand conditions less hospitable for insect attack.

The primary objective for prescription treatments is to reduce the risk to the public and increase fire fighter safety in the event of a human caused or wildland fire starts in the urban interface of the Main Boulder river corridor or the adjacent wilderness area.

Prescription treatments are designed to meet six secondary goals:

- 1) Improve wildlife habitat/forage by enhancing winter range and meadows.
- 2) Rejuvenate aspen stands.
- 3) Improve fire protection in the wildland/urban interface.
- 4) Increase vigor at the stand level, making trees less susceptible to future insect and disease predation.
- 5) Maintain and protect values for river segments that were identified as eligible for consideration and inclusion into the “Scenic and Recreational” classification of the National Wild and Scenic River System.
- 6) Through collaboration and public involvement in the NEPA process, increase the potential acres treated by providing property owners and local groups with the information needed to appreciate opportunities to implement similar hazardous fuel reduction plans on adjacent private land.

Stand Treatments have been roughly grouped and units have been associated with particular Stand Treatment Groups for descriptive purposes. See Table 2-1, Ch 2-21. The treatment group descriptions are fairly generic. Unit specific prescriptions will be developed to specify the actions needed to realize the vegetative condition envisioned for the associated treatment group.

Stand Treatment Group 1 – Multi-Storied type Mixed Conifer Stands

The current condition of these stands is a mixture of mature overstory Douglas fir, spruce, alpine fir, and lodgepole with variable dense midstories and/or understories consisting of each of these species. Some of the mature overstory and midstory lodgepole are mistletoe infected. Mountain pine beetle is present in the lodgepole pine stands in this group. Epidemic numbers of Douglas-fir beetle can be attributed to overstocking, age of trees, elevation, and species composition within affected stands.

The objective for this treatment group is to reduce the ladder fuels (small to midstory trees and shrubs), reduce the basal area (thinning) of the overstory, and reduce the excessive accumulations of ground fuel. Stand basal area ranges widely from 23 to over 320 square feet and would be reduced to an average of 60-80 square feet in each stand.

Harvest would emphasize removing small and intermediate sized Douglas fir, and lodgepole (between 3 inches and 9 inches in diameter). Varying amounts of overstory Douglas-fir, spruce, alpine fir and lodgepole would be removed. Harvest from the overstory would remove trees between 6.6 inches and 20 plus inches in diameter, while still fully meeting the snag and green tree retention requirements. The objective is to retain a multi-storied stand with between 2 and 22 trees/acre of large diameter trees (20" DBH plus) provided these trees are present in the stand before treatment. The overstory would consist of Douglas-fir, spruce, alpine fir and lodgepole.

Understory trees would be thinned to a variable spacing in order to retain a more natural appearing stand. For instance, 3-5 groups of trees may be left in a particular size class to achieve this objective. Harvest units would retain a mixture of species on any given acres (if they were present before treatment). Slash would be piled, burned or otherwise treated. Understory burning may be used to obtain desired downed woody fuel levels.

The breakdowns by species and size class below indicate the approximate percentage of the basal area that would be treated. These will vary depending on the composition of the unit to be treated:

- a) Reduce Douglas-fir basal area in trees greater than 8" diameter 60-80%
- b) Reduce Lodgepole pine basal area in trees greater than 8" diameter 70-90%
- c) Reduce Spruce and Alpine fir basal area in trees greater than 8" diameter 40-60%
- d) Reduce Douglas-fir trees per acre in trees less than 8" diameter 60-80%
- e) Reduce Lodgepole pine trees per acre in trees less than 8" diameter 70-90%
- f) Reduce Spruce and Alpine fir trees per acre in trees less than 8" diameter 70-90%

With only a light understory, low amounts of surface fuel present, and an increased crown base height, there would be a decrease in fire severity. Trees retained would be all aged.

Stand Treatment Group 2 - Lodgepole stands/ Douglas-fir stands

This treatment type includes densely stocked stands having varying amounts of patchy understory dominating along with some scattered 9" plus diameter trees. This treatment would be similar to an intermediate harvest, designed to remove the slower-growing trees from a stand to create additional space for the remaining trees and improve stand health. However, for these stands, a variable spacing tree marking guideline would be used with the objective of leaving approximately 300-500 trees per acre (including the 15-20 percent/stand areas left in leave clumps). Harvest within the stands would include trees between 3.0 inches and 20 plus inches, while fully complying with the snag and green tree retention requirements. Including the leave areas, the residual stand would be thinned to an average of 300-500 trees per acre of a mixture of sizes from seedling to mature trees.

Slash would be piled, burned, or otherwise treated. Understory burning may be utilized in order to obtain desired downed woody fuel levels.

With only a light understory, low amounts of surface fuel present, and an increased crown base height, there would be a decrease in fire severity. Trees retained would be all aged.

Stand Treatment Group 3 – Meadow community types

Grass and brush communities with instances of encroaching conifers characterize the stands within this treatment group. Many of these meadow types lie adjacent to transition, forested landscapes that are key habitat for big game. The objectives of the treatments within these communities are to reintroduce fire in the ecosystem, to rejuvenate the grass, forb, and brush communities for wildlife browse enhancement, to enhance aspen regeneration, to maintain open space, and to reduce present fuel volume. Merchantable/submerchantable conifers that are not essential to providing habitat for big game wildlife species would be slashed and burned within each unit. Merchantable trees that lie within the transition zone between meadow and forested types would be harvested. Fuel prescriptions would reduce the duff layer by 30-50% across the units. In places where aspen is present, aspen enhancement will be featured in these treatments.

Leaving 15%-20% of the total stand acres in leave clumps does not pertain to Treatment Group 3.

Stand Treatment Group 4 –Lodgepole Pine with mixed conifer

Proposed Unit 25 is dominated by a densely stocked midstory of intermediate sized, mixed species conifers (lodgepole, Douglas-fir, subalpine fir, and spruce) with a mature/overmature mixed species conifer (lodgepole, Douglas-fir, subalpine fir, and spruce) overstory. This treatment would remove the majority of the overstory trees from the areas where there is a manageable understory. There is scattered mistletoe in the overstory lodgepole, which has the potential to infect the understory trees. Much of the stand consists of overstocked, intermediate sized lodgepole. Treatments would thin the lodgepole pine (between 1 inches and 9 inches in diameter), and remove a majority of the mid-sized Douglas-fir, spruce, and alpine fir as well. A majority of the overstory trees would be removed, while meeting the snag and green tree retention requirements. After treatment the stand would be stocked, with the overstory consisting of a few scattered mature/overmature mixed species conifers and a majority of the stand comprised of intermediate sized mixed species conifers. Treatment activities would include thinning to an average spacing ranging from 10' x 10' to 17' x 17'.

It is important to note that spacing would be varied to retain a more natural appearing stand. For instance, 3-5 groups of trees may be left in a particular size classes to achieve this objective. Including the leave areas, the residual stand would be thinned to an average of 300-500 trees per acre. Slash would be piled, burned or otherwise treated.

Stand Treatment Group 5 – Sanitation Salvage of Multi-Storied Type Douglas-fir Stands

The purpose of this treatment is to remove dead, dying, or damaged trees and ladder fuels. The proposed Unit 14A would look very open with scattered reserve trees, due to the high incidence of standing dead trees, recently killed by the Douglas-fir beetle. Treating this stand to remove the existing surface fuels and dead trees would result in a short-term reduction in potential fire intensity. Due to the high amount of existing mortality, accumulations of additional fuel would be expected in the future without treatment. Removing the existing surface fuels would reduce the amount of fuel as well. A portion of the older dead (3-5 years) Douglas-fir would be left to meet snag requirements. Recent dead/new attacks would be removed as they contain Douglas-fir beetle brood and could further spread the epidemic. If available, 15 to 20 percent of the stand would be left in a natural condition (untreated clumps) including dead standing and down trees, to meet a variety of resource objectives. Slash would be piled, burned or ot

Stand Treatment Group 6 – Dry limber pine/blue bunch grass habitat types within Roadless Boundary

Stand Treatment Group 6 applies to the Main Boulder Station Unit. A portion of this unit lies within the inventoried roadless boundary. In this portion, treatment would consist of slashing and burning conifers and aspen less than 8” in diameter. All work in this area would be done by hand. Treating the area around the Main Boulder Station would maintain the area in a fire regime condition class one. Douglas fir stands are starting to encroach into the limber pine/blue bunch habitat and aspen stands. Around the Main Boulder Ranger Station, hazard trees would be removed and defensible space would be created following Firesmart/Firewise guidelines. Prescribed fire would be used to return or maintain the fire interval consistent with the habitat type. The area would be burned sufficiently hot in order to kill 70-90% of the remaining conifers and 50-60% of aspen over 6” in diameter. Prescribed fire objectives are to reduce the duff layer by 30-50%.

Other Treatments Being Considered

The following fuel treatments that may be considered in place of, or in conjunction with, thinning activities and prescribed fire include:

- Cutting or slashing of small diameter trees that provide "ladder" fuel to the more mature tree canopies;
- Chipping and/or removal of slashed or natural down woody material;
- Piling of natural and/or thinning-related fuels, followed by burning of hand-piles;
- Trampling or crushing natural down, woody fuels that are presently suspended above ground - by trampling these fuel conditions, the woody material would be in close contact with the ground, thus accelerating the decomposition process.

Table 1 Proposed Action- Individual Unit Descriptions

Unit ID	Stand Treatment Group	Forest Type	Acres	Mgmt Area	Slope Range %	Fuel Model	Remarks
MBS	3/6	DF/ Limber Pine	155	6,12,17	2-66	2/8	Cut only up to 8" dbh in roadless area w/hand treatment
1	1	DF/LP	19	3, 11	14-68	8	
2	1	DF/LP	19	11	13-68	8/10	Exclude any knapweed areas
3	2	DF/LP	49	5	13-34	8	Rehabilitate old ATV trails Park Electric powerline
3B	1	DF/LP	10	5	1-22	8	Park Electric powerline
3C	1	DF/LP	25	5	13-54	8	
4	1	DF	26	5	0-43	2/8	Weeds concern use old access road in center of unit Park Electric powerline
5	1	DF/LP	16	5	10-70	8	
5A	1	DF/LP	10	5	7-66	8	
5B	3	Non-Forest	46	5	3-47	8	
5C	3	Non-Forest	19	5	3-13	8	
6	1	DF/LP	17	5	7-21	8/10	
7	1	DF/LP Aspen	126	5	6-66	8/10	Park Electric powerline Use existing trails to minimize weeds
7A	3	Non-Forest	11	5	1-23	8/10	
7B	3	Non-Forest	31	5	6-27	8/10	Old burn bay on South end of unit
8	1	DF/LP	56	5	10-64	8	
8A	3	Non-Forest	35	5	0-28	8	
9	1	DF/LP	40	5	1-53	8/10	
10	1	DF/LP	24	5	13-33	10	
11	1	DF/LP	30	5	7-61	8/10	
12	1	DF/LP	71	5	10-43	8	
13	2	LP	59	5	0-28	8	Park Electric powerline
14	1	LP/DF	11	5	11-18	8	Park Electric powerline
14A	5	LP/DF	41	5	6-26	8	
15	3	Aspen	4	5	2-28	8	
16	1	DF	47	5	17-69	2/8	Park Electric

Unit ID	Stand Treatment Group	Forest Type	Acres	Mgmt Area	Slope Range %	Fuel Model	Remarks
							powerline
16A	3	Non-Forest	22	5	17-45	2/8	
17	1	DF	29	5	8-41	10	Park Electric powerline
17A	3	Non-Forest	27	5	8-45	10	Park Electric powerline
18	1	DF/LP	75	5	2-71	10/C	Park Electric powerline
18A	1	DF/LP	105	5	1-59	10/C	
19	1	DF/LP	37	5	11-58	10/C	
19A	3/1	DF/LP Aspen	15	5	1-29	10/C	
19B	3/1	Non-forest	10	5	0-29	10/C	
20	1	DF/LP Aspen	8	5	9-48	8	
20A	3	Non-Forest	3	5	13-27	8	
21	1	DF Aspen	54	5	0-38	8	
22	1	LP/S/DF	39	5	5-42	C	
22A	3/1	Non-Forest	17	5	0-42	C	
23	1	DF/LP Aspen	30	5	1-63	C	
24	1	S/LP/DF	218	5	0-86	10/C	
25	4	S/LP/DF	104	5	5-68	C	
25A	1	S/LP	51	5	0-28	C	
26	1	DF/LP	50	5	5-41	C	
26A	1	DF/LP	30	5	2-38	C	
27	1	DF/LP	146	5	3-83	C	
28	1	S/DF/LP	25	5	0-39	C	
29	1	DF/S/LP	36	5	4-40	C	
30	1	LP/S/DF Aspen	215	15	1-99	C	
31	1	LP/S/DF	79	5	1-47	C	
32	1	LP/S/DF	65	5	0-40	C	
Total			2487				

*Brush disposal and/or burning of slash will occur for all units. Underburning will occur in some units as needed to reach resource objectives.

*Park Electric powerline intersects a number of treatment units. Coordination with Park Electric Power Company prior to treatments will be necessary.

*Riparian MA7 are too fine to map within the Main Boulder corridor. Treatments in some of the units will continue into the riparian zone and will follow all riparian and MA7 guidelines.

Description of the Project Area

The Main Boulder corridor consists of an isolated strip of non-wilderness land that is about 24 miles long and approximately ½ mile wide that was first settled in the 1800's. This corridor consists of a "box canyon", cirque with steep sides and the Boulder River flowing roughly 3000-4000 feet below the high elevation plateaus, which are located on both the east and west sides of the canyon. The drainage is characterized by a combination of rocky timbered slopes, scree slopes, and occasional meadows. The Absaroka-Beartooth Wilderness, which encompasses approximately 1,700,000 acres surround the corridor on the west, south, and east. Due to the unique nature of the area, as well as the potential for mineral exploration, development has been continuous. Although there are approximately 115 mining claims in the drainage, recreation has become the predominant use with approximately 250 private residences, 26 recreational residences, 4 church camps, 6 Forest Service campgrounds and numerous wilderness trailheads. Much of the area is forested with vegetation forming a continuous canopy of both surface and ladder fuels. The project area is heavily utilized by tourists, camp participants, private landowners, and recreation users during the summer months with as many as 5,000 to 6,000 people occupying the area on a typical summer weekend.

Access to all locations in the Boulder River corridor is by way of a county road with ownership divided between Sweet Grass and Park Counties, with Sweetgrass County conducting the annual maintenance through a shared agreement. The road runs through the canyon bottom for approximately 24 miles ending at Monument Peak. It is a rough, unpaved, low speed, one-lane road with several one-lane bridges crossing the Boulder River. Some improvements of the road have been made beginning in 1998 at the urging of the Forest Service and County Fire Wardens. A policy of keeping transportation on site in the form of school buses was enacted for the four church camps during their operating season. These large buses traveling over the relatively narrow, winding road will potentially create a serious access problem during an urgent fire. The buses in conjunction with other fleeing visitors and residents, along with incoming fire equipment and personnel will produce traffic congestion, consuming time and putting people at risk.

The Boulder River corridor experiences frequent high wind events with wind speeds of up to 35-40 miles per hour, which sometimes persist for several hours. Dry thunderstorms, as well as Pacific Frontal Systems with their associated jet stream, occurring during the summer and fall often produce strong downdrafts in the narrow confines of the corridor. Given cured and dry vegetation these types of winds can result in extreme fire weather behavior.

Vegetative types vary within the corridor with spruce and remnant aspen occurring in the canyon bottoms and lower portions of the side drainages and increased amounts of Douglas-fir and lodgepole pine on the slopes above the canyon bottom. Conifers have encroached upon aspen stands leading to a decline in vigor and the loss of aspen in many areas. A continuous forest canopy covers much of the canyon. Forest floor fuels are moderate to heavy with heavy ladder fuels as well.

Aerial and ground surveys, as well as trapping actions within the analysis area since 2000 have shown continuing problems with a high infestation level of Douglas-fir beetle that have moved out of adjacent wilderness areas into Forest Service and adjacent private lands. In May 2003, a field visit by the Regional Entomologist Ken Gibson confirmed that populations are at epidemic levels and increasing. This field report can be found in the Project File. There are also isolated populations of mountain pine beetle within the analysis area and there are outbreak populations in adjacent areas (Yellowstone NP). Ground surveys indicate lodgepole pine dwarf mistletoe is also present. Dead and dying trees from insect and disease occurrences in the Main Boulder drainage are creating additional fuel loads on top of existing high natural fuel loadings. In the event there is a fire these high fuel loadings may hamper fire control actions and create additional public safety hazards

Mule deer and moose are present year round. Elk and white-tailed deer use the area during spring, summer, and fall, but typically winter on private lands at lower elevations. Carnivores such as Canada lynx, mountain lions, grizzly bears, black bears, wolverines, and pine marten may be present. There are healthy populations of small game such as mountain grouse, small mammals, and songbirds.

B. HABITAT USE BY SENSITIVE SPECIES OR MIS SPECIES

Table 2- Habitat Use by Sensitive Species (Animals)

SPECIES	SUSPECTED PRESENCE IN AREA	USE OF AREA	COMMENTS
Northern Leopard Frog	Unknown	Unknown	Suitable habitat may exist in the project area. Surveys have been conducted. Columbia spotted frogs are currently the only amphibians known to inhabit the District..
Boreal Toad	Unknown	Unknown	Suitable habitat may exist in the project area. Surveys have been conducted. Columbia spotted frogs are currently the only amphibians known to inhabit the District.
Yellowstone cutthroat trout	Yes	Yes	This species occurs in the Main Boulder river and its tributaries above the falls at Hillary bridge.
Wolverine	Yes	Unknown	This species occurs in the Absaroka and Beartooth Mountains. The project area may contain suitable habitat.
Western Big-eared Bat	Unknown	Unknown	The project area does not contain caves for critical roosting habitat and is not considered suitable for this species.
Peregrine Falcon	Unknown	Unknown	Peregrine falcons select cliffs for nest sites; cliff habitat would not be impacted.
Northern Goshawk (MIS)	Yes	Yes	Suitable potential habitat exists in the project area. Surveys have been conducted using playback tape calls. There have been no active nests located or expected in the project area. Active nests are the indicator of dependence and territory establishment.
Flammulated Owl	Unknown	Unknown	Suitable habitat may be present. Surveys have been conducted, but Flammulated owls were not detected. This species has not been detected on the Big Timber Ranger District, although surveys have been conducted.
Black-backed Woodpecker	Unknown	Unknown	Habitat for this species is primarily burned forests of lodgepole pine and Douglas-fir. No large-scale recent burns have occurred in the area.
Trumpeter Swan	No	No	Suitable habitat does not exist in the project area. This species requires large streams and lakes for nesting habitat.
Harlequin Duck	Yes	Yes	Suitable habitat does exist in the project area along the Main Boulder River. Mitigations for stream management zones (SMZ) and harvest limitations will ensure habitat protection.

Table 3- Habitat Use by Sensitive Species (Plants)

COMMON NAME	SCIENTIFIC NAME	FOREST OCCURRENCE	DISTRICT OCCURRENCE	PROJECT OCCURRENCE
Musk-root	Adoxi moschatellina	Suspected	Unknown	Unknown
Short-styled Columbine	Aquilegia brevistyla	Yes	Unknown	Unknown
Large-leaved Balsamroot	Balsamorhiza macrophylla	Yes	Unknown	Unknown
Small Yellow Lady's Slipper	Cypripedium parviflorum	Yes	Unknown	Unknown
English Sundew	Drosera anglica	Yes	Unknown	Unknown
Beaked Spikerush	Eleocharis rostellata	Yes	Yes	Unknown
Giant Helleborine	Epipactis gigantea	Suspected	Unknown	Unknown
Slender Cottongrass	Eriophorum gracile	Yes	Unknown	Unknown
Hiker's Gentian	Gentianopsis simplex	Suspected	Unknown	Unknown
Northern Rattlesnake Plantain	Goodyera repens	Suspected	Unknown	Unknown
Discoïd Goldenweed	Haplopappus macronema	Yes	Unknown	Unknown
Halls' Rush	Juncus hallii	Yes	Unknown	Unknown
Short-flowered Monkeyflower	Mimulus breviflorus	Suspected	Unknown	Unknown
Dwarf Purple Monkeyflower	Mimulus nanus	Yes	Unknown	Unknown
Austin's knotweed	Polybonum douglasii	Suspected	Unknown	Unknown
Jove's Buttercup	Ranunculus jovis	Yes	Unknown	Unknown
Barratt's Willow	Salix barrattiana	Yes	Unknown	Unknown
Shoshonea	Shoshonea pulvinata	Suspected	Unknown	Unknown
Alpine Meadowrue	Thalictrum alpinum	Suspected	Unknown	Unknown
California False-hellebore	Veratrum californicum	Suspected	Unknown	Unknown

Additional Comments:

Sensitive plant surveys have been conducted in the project area. At least four surveys have been made in the past, in conjunction with other resource projects (aspen enhancement and proposed timber sales) and with the Main Boulder Fuels Reduction Proposal. Sensitive plants have not been found in the Main Boulder River corridor.

Table 4- Habitat Use by Management Indicator Species

SPECIES	PRESENCE IN AREA	USE OF THE AREA	COMMENTS
Grizzly bear (threatened)	Yes	Yes	Suitable habitat is present. Grizzly bears are noted infrequently usually in early spring after they have emerged from dens and are searching for food. There is abundant habitat in the adjacent wilderness, but their presence is not being encouraged in the urban interface area along the lower Main Boulder river.
Bald eagle (threatened)	Yes	Yes	Marginal habitat is present. Bald eagles are irregularly seen on the Forest in the Main Boulder. They will forage for fish and carrion on forest, but typically winter further north along the river and out along the Yellowstone River.
Elk	Yes	Yes	The elk population is stable in the area, but recent evidence suggests that more of the elk population is migrating off the Forest to find winter forage opportunities.
Pine marten	Yes	Unknown	Suitable habitat is present. Marten are not regularly seen and likely forage away from the Main Boulder road because of road noise and human presence.
Northern goshawk (sensitive)	Yes	Yes	Suitable habitat is present. Northern goshawk surveys have been conducted in the area. No individuals or nest sites have been detected during the breeding season (April-July) within the proposed project area.
Wild trout	Yes	Yes	Yellowstone cutthroat trout, rainbow trout, brown trout, brook trout and hybrid trout are present and reproduce in the Main Boulder and its tributaries. Proposed mitigations will provide ample protections for these populations.

C. ANALYSIS OF EFFECTS

This effects analysis also includes cumulative effects that might occur from past, present, and reasonably foreseeable future activities. Livestock grazing (sheep and presently cattle) and recreation (recreational residences, hiking, horseback riding, snowmobiling, and 4-wheeling, hunting, outfitter guides, etc.) are common uses in the area. There are several church camps that operate seasonally in the Main Boulder river corridor. Small logging operations to remove hazardous and dead trees along the road right of way may also occur. Some small timber sales have occurred on private land adjacent to the forest in the drainage and others are likely to occur in association with this project. Previous prescription burns have occurred historically in the Main Boulder drainage. Cumulative effects to the habitat of Northern goshawk and wolverine are a result of the temporary disturbance of suitable potential habitat. Wolverine would not be cumulatively affected because they have not been observed, nor are they likely to occur near the Main Boulder Road, which is where the project area is located. Northern goshawk would not be cumulatively affected because they have rarely been observed and no active or former nest sites have been found in the project area. (See page DSEIS-6 and Additional Comments p. A-15).

Table 5- Effects to Sensitive Species (Animals)

SPECIES	HABITAT AFFECTED	SPECIES AFFECTED	CUMULATIVE EFFECTS
Northern Leopard Frog	No	No	No
Western Toad	No	No	No
Yellowstone Cutthroat Trout	No	No	No
Wolverine	Yes	No	No
Townsend’s Big-eared Bat	No	No	No
Peregrine Falcon	No	No	No
Northern Goshawk	Yes	No	No
Flammulated Owl	Yes	No	No
Black-backed woodpecker	Yes	No	No
Trumpeter Swan	No	No	No
Harlequin Duck	Yes	No	No

Table 6- Effects to Sensitive Species (Plants)

SPECIES	HABITAT AFFECTED	SPECIES AFFECTED	CUMULATIVE EFFECTS
Musk-root	No	No	No
Short-styled Columbine	No	No	No
Large-leaved Balsamroot	No	No	No
Small Yellow Lady's Slipper	No	No	No
English Sundew	No	No	No
Beaked Spikerush	No	No	No
Giant Helleborine	No	No	No
Slender Cottongrass	No	No	No
Hiker's Gentian	No	No	No
Northern Rattlesnake Plantain	No	No	No
Discoïd Goldenweed	No	No	No
Halls' Rush	No	No	No
Short-flowered Monkeyflower	No	No	No
Dwarf Purple Monkeyflower	No	No	No
Austin's knotweed	No	No	No
Jove's Buttercup	No	No	No
Barratt's Willow	No	No	No
Shoshonea	No	No	No
Alpine Meadowrue	No	No	No
California False-hellebore	No	No	No

Additional Comments

Sensitive species such as the wolverine and the northern goshawk may inhabit the area, but would not be negatively impacted by the project. Wolverines typically have a very large home-range and can cover many miles daily in search of carrion and other food sources. The presence of wolverines in the Main Boulder area is not likely to occur near the main road, where the project is focused, because they would be more vulnerable to accidental injury or harm than in more suitable adjacent wilderness habitat. Regardless, the wolverine most likely would occur as a rare transient during winter, and would not be affected by the scale of proposed actions. Wolverine breeding occurs in April in locations above tree line, which would be well outside of the boundaries of the proposed project. Northern goshawks may be present and are known to nest in areas adjacent to the project. No nest locations have been located within the proposed project area and typically these birds utilize narrow side drainages in the adjacent wilderness as core breeding and foraging areas. In addition, most project activities would occur outside the breeding season. Mitigation for nest tree locations is already incorporated into the project. Annual surveys of treatment units will be conducted to determine if goshawks are present and if any nest trees require protection. Stand-replacement fire prescriptions are not being proposed. Habitat conditions and remoteness of the adjacent wilderness area provide excellent habitat for these species. Direct effects would be negligible and consist of temporary displacement. Indirect effects would be beneficial to the wolverine because forest successional management and burning would enhance habitat for prey species. Sensitive plant surveys have been conducted; sensitive species were not detected.

Table 7- Effects to Management Indicator Species

SPECIES	HABITAT AFFECTED	SPECIES AFFECTED	CUMULATIVE EFFECTS
Grizzly bear (threatened)	No	No	No
Bald Eagle (threatened)	No	No	No
Elk	Yes	No	No
Pine marten	Yes	No	No
NorthernGoshawk (sensitive)	Yes	No	No
Wild Trout	No	No	No

Additional Comments

All of the Gallatin National Forest management indicator species (MIS) may be present in the proposed project area seasonally or intermittently. The effects to federally protected grizzly bear and bald eagle have been discussed in more detail in the Biological Assessment for the Main Boulder Fuel Reduction Project (located in the Project File). The U.S. Fish and Wildlife Service concurred with our determinations and mitigation measures for these species. An analysis of potential impacts to the other MIS revealed that no permanent adverse effects are likely to impact these populations. Furthermore, the scale of changes expected from forest successional management and prescription burning is likely to enhance the area and/or improve the diversity of habitats available to these species over time.

D. DETERMINATION

It is important to note that active fuel reduction operations will mostly be limited to the period between November and the end of March annually. During this period, most of the sensitive species present in the analysis and project area will either not be present or will be in a dormant state, and will be in a non-reproductive state. Because of this restriction, potential impacts to sensitive species could only result from indirect impacts. Furthermore, the mitigation measures described in detail below have been incorporated into the project design criteria to provide additional protections that would further limit any potential indirect impacts.

Table 8- Determination Calls for Sensitive (Animals and Plants)

SPECIES	DETERMINATION	BRIEF STATEMENT OF RATIONALE
Northern Leopard Frog	NI	Suitable habitat may occur in the drainage, but species presence is unknown. Wetlands would not be disturbed.
Western Toad	NI	Suitable habitat may occur in the drainage, but species presence is unknown. Wetlands would not be disturbed.
Yellowstone cutthroat trout	NI	Suitable river & stream habitat occurs in the drainage. No river or stream crossings are proposed
Wolverine	MIH	Suitable habitat may occur in the drainage, but species presence is unknown. Project occurs at low elevation and not during winter months.
Townsend's Big-eared Bat	NI	Suitable habitat may occur in the drainage, but species presence is unknown. Caves would not be disturbed.
Peregrine Falcon	NI	Suitable habitat may occur in the drainage, but species presence is unknown. Nesting habitat, such as cliffs, would not be disturbed.
Northern Goshawk	MIH	Suitable habitat occurs and species is known to inhabit the drainage. Nest sites may be located in the project area, however, the project would be accomplished prior to or after the nesting season, no known nest locations have been identified. Prior to management activities all units will be surveyed for goshawk using playback tape calls. If goshawks are present and a nest location is found in the project area mitigation measures as described will be followed.
Flammulated Owl	MIH	Suitable habitat may occur, but species presence is unknown.
Black-backed woodpecker	MIH	Suitable habitat does not occur and species presence is not known to occur due to a lack of large-scale burn areas.
Trumpeter Swan	NI	Suitable habitat does not occur..
Harlequin Duck	MIH	Suitable habitat will not be directly affected. Indirect effects are possible, but mitigation measures provide for protections.
Sensitive Plants	NI	Sensitive plant surveys have been completed.

Determination symbols: NI = no impact, BI = beneficial impact, MIH = may impact individuals or habitat, but not likely to cause a trend to federal listing or loss of viability, MIFV = likely to result in a trend to federal listing or loss of viability.

Table 9- Determination Calls for Management Indicator Species (MIS)

SPECIES	DETERMINATION	BRIEF STATEMENT OF RATIONALE
Grizzly bear (threatened)	May affect, not likely to adversely affect (p.3-70 FEIS)	Species occurs as transient in the project area and presence is not being encouraged outside of wilderness to avoid potential human conflicts.
Bald eagle (threatened)	No Effect (p. 3-75 FEIS)	Species is transient in winter and distribution restricted on river corridor where proposed treatments will not occur.
Elk	BI	Elk winter range will be expanded and improved as a result of proposed actions and hiding and security cover will be preserved through mitigations the abundance of adjacent habitat.
Pine marten	NI	Preferred moist-spruce habitat is not being targeted and prey species may increase due to successional forest management.
Northern goshawk (sensitive)	MIIH	Suitable habitat occurs and species is known to inhabit the drainage. Nest sites may be located in the project area, however, the project would be accomplished prior to or after the nesting season. Nest locations are not known to occur in the project area. Mitigation measures will protect against taking and successional forest management may improve foraging habitat.
Wild Trout	NI	All potential impacts to stream habitat have been mitigated.

Determination symbols: NI = no impact, BI = beneficial impact, MIIH = may impact individuals or habitat, but not likely to cause a trend to federal listing or loss of viability, MIFV = likely to result in a trend to federal listing or loss of viability.

Additional Comments

The existing condition of the area provides excellent habitat for wildlife; forest successional management and prescribed burning would enhance these conditions.

Amphibian surveys have been conducted in the area and no sensitive species of amphibians were detected. The project would not impact boreal toads and/or northern leopard frogs because the majority of management activities are planned outside the period when amphibians are actively present.

E. DESIGN CRITERIA AND MITIGATION MEASURES

Refer to Chapter 2 in the Main Boulder Fuels Reduction Project Final Environmental Impact Statement Pages 2-31 to 2-43 for detailed mitigations for all resource concerns.

Additional surveys would be conducted annually using play-back tape calls, visual observation, and other accepted methods for sensitive species and MIS potentially present in the treatment areas (Northern goshawk, flammulated owl, northern leopard frog etc.) in order to avoid any potential impacts and gather additional baseline information. The additional surveys are also being incorporated to satisfy the species viability requirements

of the National Forest Management Act (NFMA) and the subsequent Gallatin National Forest Viability Assessment for Species of Special Concern (Appendix D in the FEIS).

The Northern goshawk and other raptor species that may nest in the project area are susceptible to direct effects to nest trees and are generally intolerant of human presence and timber management activities in the vicinity of nest trees. In order to limit direct impacts to goshawks and other sensitive and management indicator species along with other nesting raptors, the following standards will be observed.

- a) No harvest of trees with goshawk or nests of other large raptors, whether they are occupied or inactive.
- b) For raptors other than goshawk. Leave a minimum 50-foot buffer around trees with nests.
- c) For confirmed goshawk nest sites, no activity would be permitted within one-quarter mile of any active nest between March 1 and June 31 annually and a 100-foot buffer would be retained in an untreated condition thereafter.

F. PROJECT MONITORING

The district wildlife biologist will conduct surveys within individual treatment units prior to beginning harvest activities. As described in the wildlife mitigation section, identification of any threatened, endangered or sensitive species, raptor nests, or other species of concern, may result in additional restrictions.

Treatment units will be monitored during fuels reduction activities and for two years following project completion to determine whether the wildlife mitigation and snag retention prescriptions were effective in maintaining sufficient habitat for threatened, endangered and sensitive species, big game cover, habitat use patterns, and snag-dependent wildlife species.

G. GOSHAWK SURVEY METHODOLOGY

Goshawks surveys were conducted using standard play-back tapes of goshawk alarm calls. Surveys are usually conducted beginning in May thru July when goshawks are present and actively breeding and/or nesting. A cassette tape of a goshawk alarm call was broadcast through a speaker megaphone at approximately 5 minute intervals along each route indicated on the survey maps below (Maps 1 thru 3). Between broadcasts of the call the surveyor listened for any response that would indicate the presence of a breeding goshawk or raptor in the area. If detection was made then an effort to locate the bird and track it to a known or expected nest location was made. If there was not nest site located after repeated effort, then it was determined that the bird was transient in the area or was in a non-breeding status.

H. LITERATURE CITED

Ruediger, Bill, Jim Claar, Steve Gniadek, Bryon Holt, Lyle Lewis, Steve Mighton, Bob Naney, Gary Patton, Tony Rinaldi, Joel Trick, Anne Vandehey, Fred Wahl, Nancy Warren, Dick Wenger, and Al Williamson. 2000. Canada Lynx Conservation Assessment and Strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication #R1-00-53, Missoula, MT. Pages 2-12, 13, 16, 17, and 18.

USDA. 2004. Updated Threatened, Endangered, and Sensitive Animal and Plant List for the Gallatin National Forest, Northern Region, Bozeman, MT. 4 pp.

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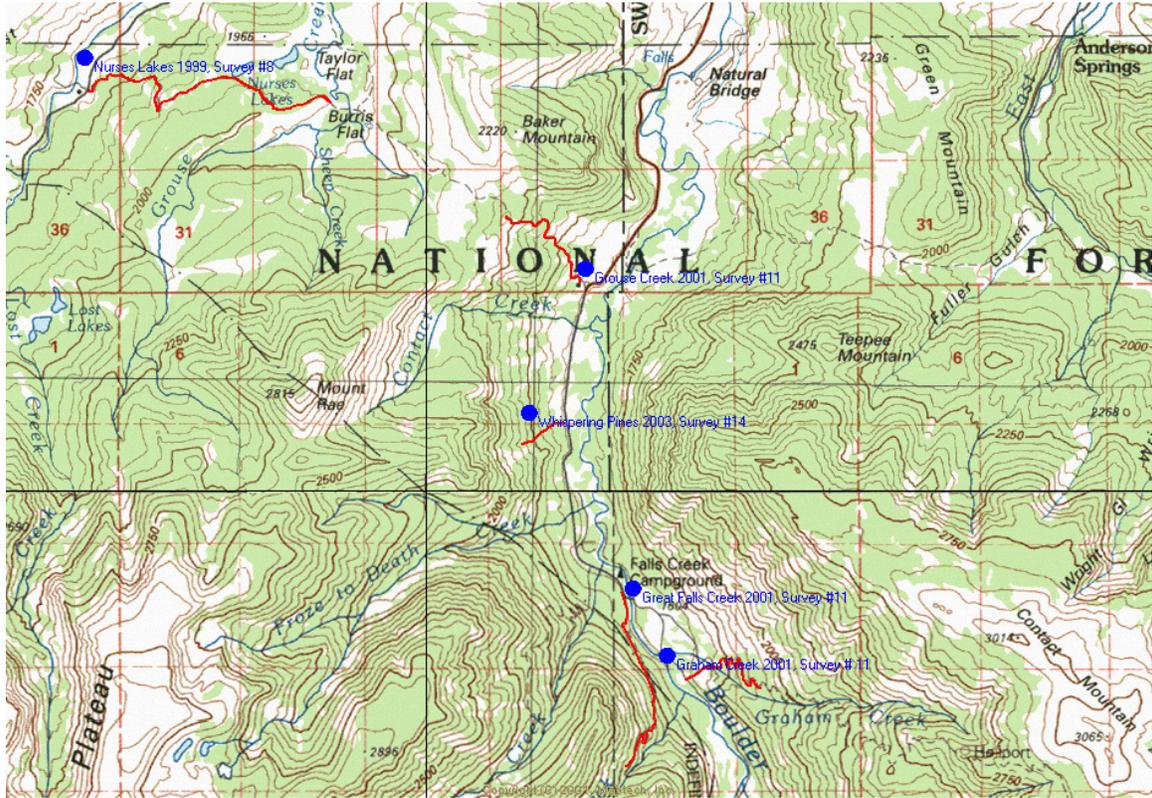
Table 10- Summary of northern goshawk play-back tape call surveys conducted on the Big Timber Ranger District, Gallatin National forest between 1992 and 2004.

Date	Survey No.	Observer	Position	Location	Result
5/3/92	1	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
5/12/93	2	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
6/2/94	3	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
5/24/95	4	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
6/10/96	5	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
6/ 3/97	6	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
5/28/98	7	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
7/01/99 7/19/99	8	C. Johnson S. Shropshire	Biol. Techs.	Nurses Lakes Fourmile/Box Cny	One unpaired goshawk detect**
5/10/00	9	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
6/5/01	10	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
7/09/01 7/16/01 7/17/01 7/23/01	11	C. Johnson	Biol. Tech.	Graham Creek Great Falls Ck. Grouse Creek Bridge Creek	No goshawks detected
5/24/02	12	J. Sparks	Wild. Biol.	Main Boulder	No goshawks detected*
7/04/02	13	C. Johnson	Biol. Tech.	Main Boulder	No goshawks detected
6/2/03	14	S. Schacht	Wild. Biol.	Whispering Pines	No goshawks detected
5/26/04 6/4/04	15	S. Schacht	Wild. Biol.	Placer Basin & Box Canyon E. Chippy Creek & Miller Creek	No goshawks detected

*There are no survey notes or route information associated with these surveys. The only records available are the date of the survey and the lack of detection information.

**A single goshawk was seen during the survey in the Box Canyon area but was not detected from the play-back tape call survey. No confirmed breeding or nest location were discovered.

Map 1. Main Boulder Goshawk Survey Locations Natural Bridge to Graham Creek, 1999 to 2004.



Survey Notes:

Survey No. 8 on 7/01/99 “Sabrina and Curran hiked up to Nurses Lakes to look for amphibians. On the way there, they played the Goshawk tape. They had no luck in finding any birds.”

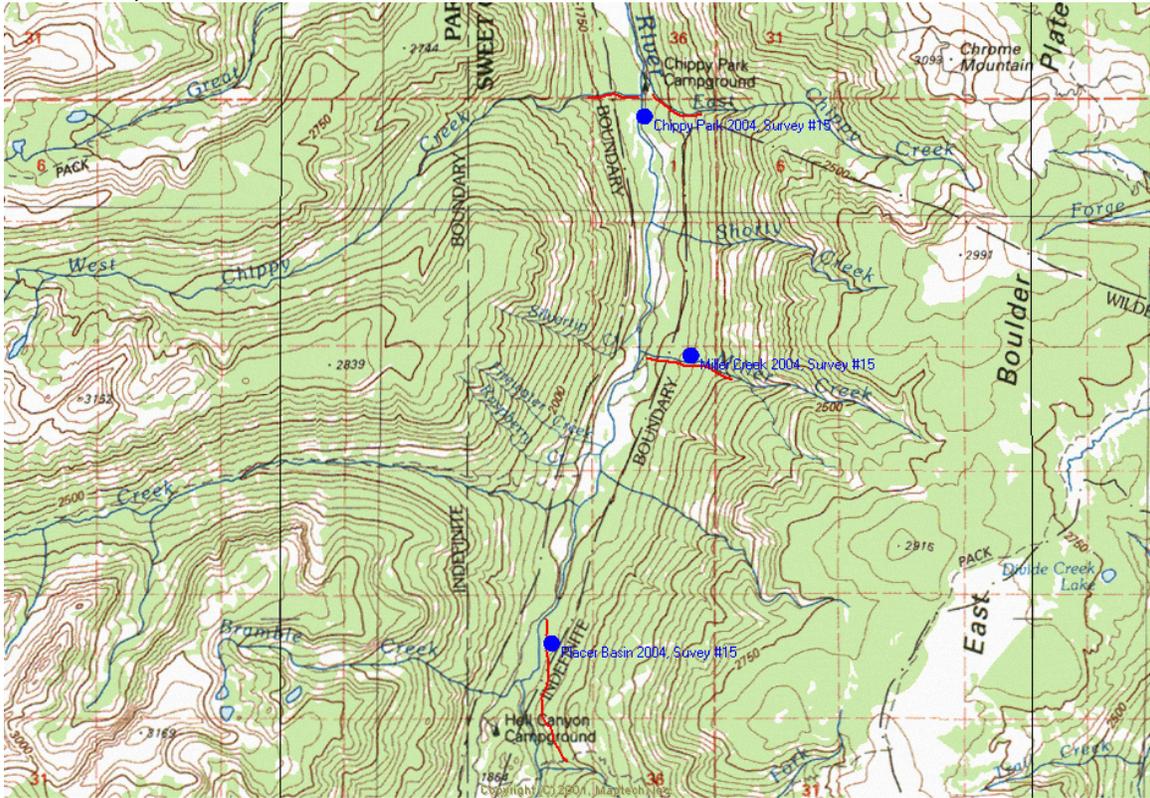
Survey No. 11 on 7/17/01 “This day I hiked up the Grouse Creek Trail from the Main Boulder side. I did have a bird respond to the call, but it was another Stellar’s Jay. One red-tailed hawk was also seen soaring above the Meadow, but no accipiters or owls were seen.”

Survey No. 11 on 7/16/01 “This survey was conducted up the Great Falls Creek trail. I hiked in about four miles and finally got a response to the Goshawk call. Two birds flew in and landed about twenty yards from me in the trees. Unfortunately I couldn’t get a positive i.d. on the species because they never sat long enough for me to get binoculars on them. However, they did have a call like the one I was playing through the tape player.”

Survey No. 11 on 7/09/01 “This day I hiked up the Graham Creek Trail about three miles. I did see some Hairy woodpeckers once I got into the basin on top, but I could not locate any goshawks or flammulated owls.”

Survey No. 14 on 6/03/03 “Surveyed with playback tape calls across from Whispering Pines subdivision in the Main Boulder drainage for goshawks and flammulated owls, no detections.”

Map 2. Main Boulder Goshawk Survey Locations Graham Creek to Placer Basin Trailhead, 1999-2004

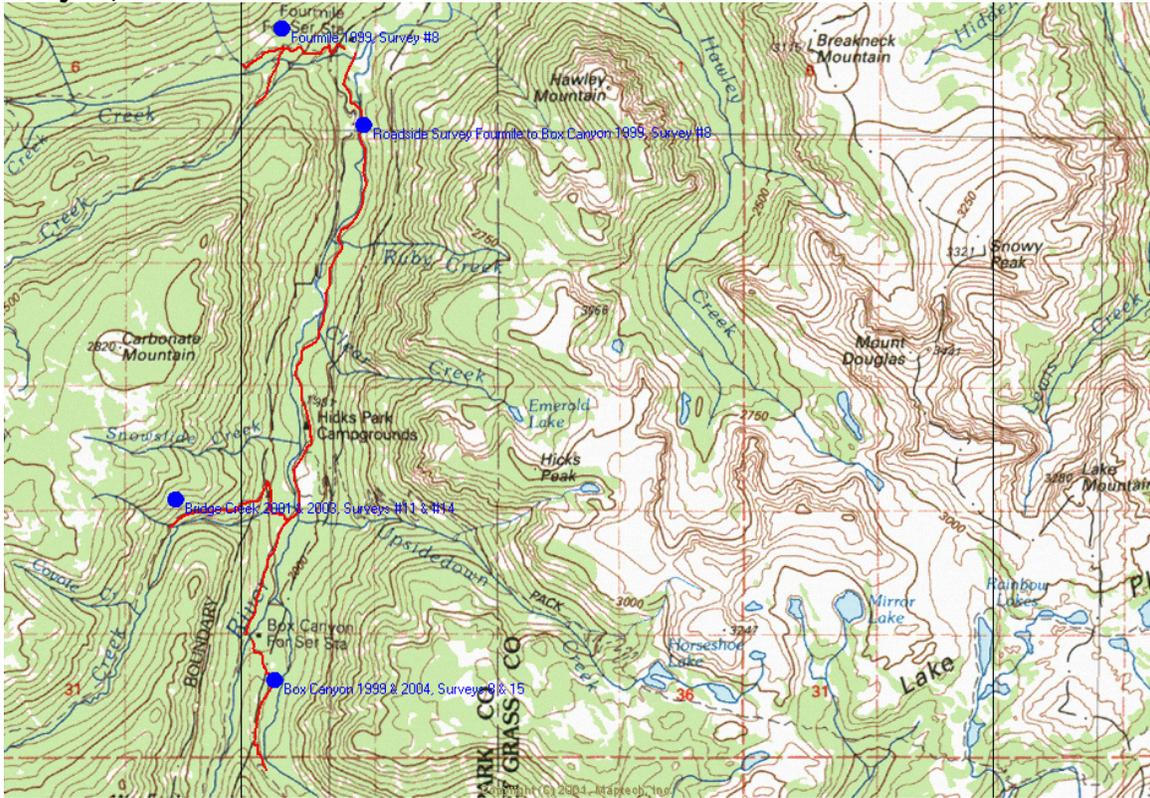


Survey Notes:

Survey No. 15 on 5/26/04 “Surveyed with playback tape calls in the Placer Basin area just south of Camp on the Boulder (Church Camp) in the Main Boulder drainage. Began playback calling at approx. 8:30 AM alternating goshawk and flammulated owl calls. No detections or response to calls were heard. Surveyed at Box Canyon area east of the Box Canyon Cabin beginning at 2:30 PM no response to calls detected.”

Survey No. 15 on 6/04/04 “Surveyed for goshawks east of Chippy Park Campground along East Chippy Creek with playback calls beginning at 8:00 AM. No response to calls were detected. Surveyed along Miller Creek east of Fleming bridge beginning at 3:00PM. No response to calling detected.”

Map 3. Main Boulder Goshawk Survey Locations from Four-mile to Box Canyon, 1999-2004.



Survey Notes:

Survey No. 8 on 7/19/99 “Sabrina drove up the Main Boulder and did a survey from Four-mile up to Box Canyon. At Box Canyon she had a Goshawk fly down from the tree she was under and land in another nearby tree. The bird flew out of sight before it called, but a positive visual identification was made.”

Survey No. 11 on 7/23/01 “This day I hiked up the Bridge Creek trail in the Main Boulder drainage. I could not locate any owls or goshawks with calls. I did happen to see a few pairs of woodpeckers in an old lodgepole stand about four miles up the trail.”

Survey No. 14 on 6/03/03 “Surveyed with taped calls for goshawks in the Bridge Creek area south of Christikon (Church Camp) beginning at 10:30, no detections.”

Survey No. 15 on 5/26/04 “Surveyed at Box Canyon area east of Box Canyon Cabin beginning at 2:30 PM no response to calls detected.”