HERRING PARK
BIOLOGICAL EVALUATION/ASSESSMENT

SALIDA RANGER DISTRICT
SAN ISABEL NATIONAL FOREST

PARK AND FREMONT COUNTIES, COLORADO

MAY 17, 2007

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE

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1.0 INTRODUCTION

1.1 Purpose of Biological Evaluation

This biological evaluation (BE) / biological assessment (BA) analyzes the potential effects of the proposed Herring Park Project within the Salida Ranger District (District) on the San Isabel National Forest (Forest) on federally listed threatened, endangered, and candidate species, and designated or proposed critical habitats pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (ESA). In addition, impacts from the proposed management action on Forest Service (FS) sensitive species identified by the Region 2 Regional Forester (Forest Service 2005) will also be assessed as required in the Forest Service Manual (FSM 2670.31-2670.32). Species meeting the following criteria are addressed in this assessment:

1. known to occur on the Forest based on confirmed sightings;
2. may occur on the Forest based on unconfirmed sightings;
3. potential habitat exists for the species on the Forest; or
4. potential effects may occur to these species

Federally listed species (i.e., threatened and endangered), critical habitat, and candidate species and their effect analysis are separated from FS sensitive species in each of the below sections to assist the U.S. Fish and Wildlife Service (FWS) in their review of federally listed species only.

1.2 Current Management Direction

Current management direction for federally proposed, threatened, endangered and FS sensitive species on the District of the Forest can be found in the following documents, filed at each district office:

- Forest Service Manual and Handbooks (FSM/FSH 2670)
- National Forest Management Act (NFMA)
- Endangered Species Act of 1973, as amended (ESA or Act)
- Migratory Bird Treaty Act (MBTA)
- National Environmental Policy Act (NEPA)
- Pike and San Isabel National Forests and Comanche and Cimarron National Grasslands (PSICC) Land Resource Management Plan (LRMP) (Forest Service 1984)
- Species-specific Recovery Plans which establish population goals for recovery
- Species management plans
- Species management guides or conservation strategies
- Regional Forester policy and management direction
- Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000)

The LRMP provides management guidelines, which incorporate regional direction for each species addressed in this assessment.

2.0 CONSULTATION HISTORY

Informal consultation for this Proposed Action with the FWS was initiated on August 15, 2006 between FS Wildlife Biologist Monica White and FWS Wildlife Biologist Leslie Ellwood. Several subsequent phone conversations with Ms. Ellwood continued thereafter to discuss this project and effects to Mexican spotted owl.

3.0 PROJECT AREA DESCRIPTION

Herring Park Project Area (Project Area) is comprised of several ownerships within Park and Fremont counties: Federal land administered by the Forest Service (7,174 acres), state land (324 acres) and private land (5,969 acres) with a total acreage of 13,467 acres within the analysis area. The Project Area is located 8 miles southeast of Buena Vista and 10 miles south of Trout Creek Pass and lies within the Sawmill Gulch, Herring Creek and Badger Creek Composite 6th level watersheds. Specifically, the Project Area is located within all or parts of Township 15S, Range 76W; Township 51N, Range 9E; and Township 51N, Range 10E. The Project Area boundary is bordered to the north by Cals Fork Gulch, the eastern border is San Isabel National Forest boundary, the southern boundary is a ridge between Antelope Gulch and Steer Creek, and the western boundary is the ridgeline east of Forest Service road (FDR) 186. The project area is comprised of Management Areas 4D and 6B, which is for aspen management and livestock grazing emphasis respectively. The majority of private lands and all federal lands within the Project Area are grazed by livestock. The area is managed for multiple use.

The Project Area has a diverse vegetation species composition as shown in Table 1 below. There is also diversity in structural stages, topography, and elevation ranges within the analysis area boundaries. Elevations range from approximately 9,100 feet (ft) to 9,800 ft. Topography varies from moderately steep forested ridges to gently rolling benches and mountain parks. Slopes range from near zero percent on some of the mountain park land to forested ridges reaching 40 percent slopes or greater.

Table 1. Vegetation cover types within the Herring Park project area

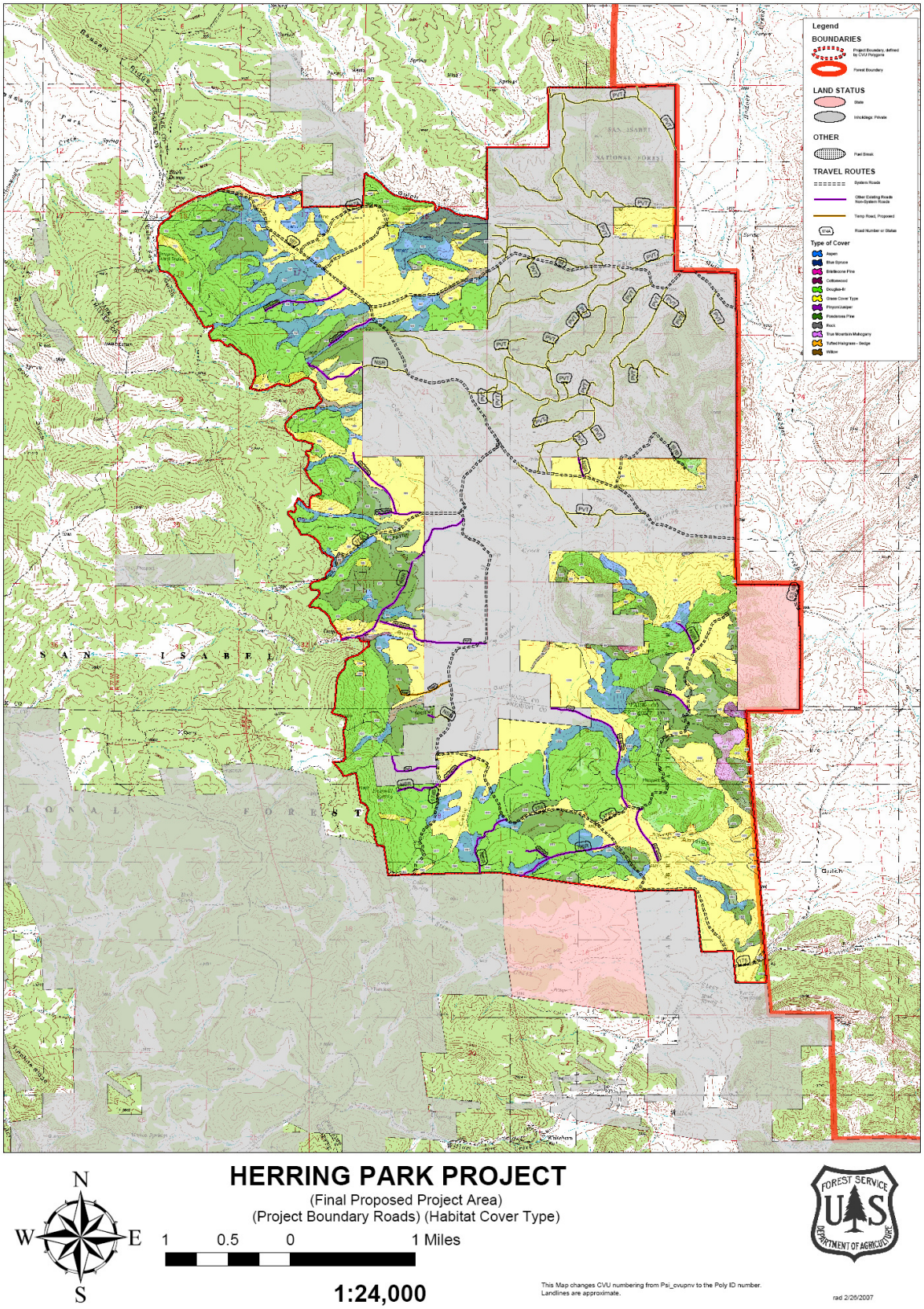
Vegetation	Approximate Acres
Aspen	731
Blue spruce	79
Bristlecone pine	5
Cottonwood	5
Douglas-fir	2442
Meadow	2859
Mount Mahogany	37
Pinon / Juniper	9
Ponderosa pine	964
Willow	38
Total	**7169**

The majority of the forested areas are comprised of Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) which have varying degrees of mortality due to insect infestation. Approximately 2000 acres of Douglas-fir stands which occur primarily on the western portion of the project area are 50 percent or greater dead standing trees. Approximately 600 acres of ponderosa pine stands are moderately to heavily infested (50 percent or greater) with mountain pine beetle. The majority of the live or lightly infested (approximately 360 acres) ponderosa pine stands are in the southern portion of the project area or in the form of plantations on the western edge of Herring Park. Tree mortality from insect infestation has resulted in a more open canopy which has created more diversity and higher vigor in the grass and forb communities which established naturally following the die-off in the conifers.

The ponderosa pine plantations occur primarily along the lower slopes of the western portion of Herring Park and are lacking a vigorous grass, forb and shrub component in the understory due to the high canopy closure resulting from high tree stocking rates. The plantations were apparently established as part of a watershed improvement effort sometime between the 1940' and 1950's however, the location of these plantations appear to have been open parkland in the past, since no stumps or coarse woody debris occur on the forest floor that would indicate a previously forested condition.

Approximately 730 acres of aspen occurs within the project area. Aspen (*Populus tremuloides*) occurs as remnant stands within the mixed conifer but, is most prevalent as stringers in the drainages and as patches of dry site stands in the mountain parks. Aspen is primarily in mid seral condition with pockets of older trees and good regeneration. Conifer encroachment is evident in some of the aspen drainages on the western portion of the project area. Aspen appears to be limited in part by the dense stands of conifer and by the lack of moist soils and water in the project area. Water is limited to a few seeps and springs, and intermittently in a few of the drainages within the project area. Calsfork Gulch, at the northern boundary of the project area, is the only location of perennial water.

Figure 1. Map of Herring Park Project Area Vegetation Cover Type.



Forest understory varies with amount of open canopy and moisture. In areas of high tree mortality, bunchgrasses and forbs have increased in quantity. Species include, but are not limited to, Arizona fescue (*Festuca arizonica*), mountain muhly (*Muhlenbergia montana*), fringed sage (*Artemisia frigida*), paintbrush (*Castilleja integra*), geranium (*Geranium* spp.) and, pussytoes (*Antennaria rosulata*). Shrubs include wild rose (*Rosa woodsii*), shrubbly cinquefoil (*Pentaphylloides floribunda*), gooseberry (*Ribes cereum*), and mountain mahoghany (*Cercocarpus montanus*). Wet areas contain willow (*Salix* spp.) and sedge (*Carex* spp.) as well as, other wetland associated species. Non-forested areas are primarily montane meadow.

For this analysis, the analysis area is defined as within 1/2 mile of the proposed management actions for all species; except for the Mexican Spotted Owl (*Strix occidentalis lucida*) which will be analyzed at the Forest scale.

4.0 PROPOSED MANAGEMENT ACTION

The proposed alternative (proposed action) would implement a combination of mechanical treatment, salvage activities, treatment of post-treatment debris (slash), and broadcast burning in order to achieve the desired conditions that are consistent with the standards and guidelines of the Forest Plan. Treatment objectives are to: 1) thin the over-story and mid-story to a density more representative of historical conditions that will reduce beetle spread and lower stand risk; 2) remove a majority of the understory ladder fuels; and 3) remove most of the MPB mortality to reduce future high levels of heavy down dead fuel loading. This in turn will reduce the risk of crown fires and make it easier to reintroduce fire to resemble historic fire regimes.

The total analysis area for this project consists of approximately 7,174 acres of San Isabel National Forest lands, 324 acres of state land, and 5,969 acres of private land with a total acreage of 13,467 acres within the analysis area. The proposed project would be implemented on USFS lands only.

The USFS proposes to mechanically treat vegetation on approximately 3,081 acres. Mechanical treatment would include salvaging insect-killed trees and reducing tree stocking levels. Prescribed fire would also be used to reduce fuel loadings throughout the project area; an additional 2,705 acres of montane grasslands will be burned with prescribed fire. The actual area burned would be about 5,786 acres; this includes portions of the 3,081 acres proposed for vegetative treatment.

The type of treatment proposed for specific areas was chosen by USFS technical specialists based upon the physical and natural characteristics of the area. These characteristics include the current level of beetle infestation, slope, soils, cover type, cover density, and proximity to developed areas and private land. Descriptions of treatments types follow:

Mechanical Treatment Areas

On 3,081 acres of the project area, the following treatment methods or stand types **Salvage, Thinning, Prescribed Fire (approximately 1067 acres), Light Salvage, Thinning, Broadcast Burning (approximately 1445 acres), Salvage Only, Prescribed Fire (approximately 268 acres), Aspen Treatment - Dry Site (approximately 55 acres), Aspen Treatment - Moist Site (approximately 42 acres), and Plantation Thinning (approximately 204 acres)** would include mechanical thinning of live trees, and/or salvaging of dead trees combined with a full range of slash treatments. Mechanical treatments may be carried out with the assistance of equipment,

such as harvesters, hydro-ax or bullhog heads, or by hand and power saws. A combination of USFS crews, stewardship, service contracts, and timber sales may be used to meet the objectives.

Salvage, Thinning, Prescribed Fire (approximately 1067 acres):

Ponderosa pine (approximately 335 acres): Dead stands of ponderosa pine and ponderosa pine trees infected with insect and disease may be harvested and removed from the area. In areas of heavy mountain pine beetle activity, infested trees will be removed and remaining trees may be thinned, if needed, to maintain the residual mature stand. Methods of removal include but are not limited to chainsaws, harvesters, skidders, dozers and log trucks.

Stands of healthy ponderosa pine (stands that have minimal or no insect or disease infestation) may be thinned to reduce overall stand density and improve the health and vigor of the remaining ponderosa pine.

After harvesting is complete, the slash and hazardous fuels in the area may be reduced through fuelwood gathering and/or prescribed fire. Prescribed fire includes pile burning, broadcast burning or a combination of both. See the section on prescribed fire for more details. The desired result will be less than 40% canopy closure. The basal area will be an average of 50 square feet over the treatment area, incorporating areas with heavier thinning (less than 50 BA/acre) and areas that are greater than 180 square feet BA with interlocking canopy. Existing regeneration needed for desired stocking levels will be protected where practical.

Mixed conifer-Ponderosa pine & Douglas-fir mix (approximately 732 acres): Dead stands of ponderosa pine and Douglas-fir may be harvested and removed from the area. In areas of heavy mountain pine beetle activity, infested trees will be removed and remaining trees may be thinned, if needed, to try and maintain the residual mature stand. Remaining healthy stands may be thinned to reduce stand density and improve forest health. Methods of removal include but are not limited to chainsaws, harvesters, skidders, dozers and log trucks.

After harvesting is complete, the slash and hazardous fuels in the area may be reduced through fuelwood removal and/or prescribed fire. Prescribed fire includes pile burning, broadcast burning or a combination of both. See the section on prescribed fire for more details. The desired result will be less than 40% canopy closure. The BA will be an average of 60 square feet over the treatment area; incorporating areas with heavier thinning (less than 60 BA/acre) and areas that are greater than 180 square feet BA with interlocking canopy in areas with residual aspen stands the objective of the treatment will be to stimulate the regeneration of aspen. Large diameter trees, minor species and five-needled pines will be favored for retention. Existing regeneration needed for desired stocking levels will be protected where practical.

Fuel Break Treatments (approximately 176 acres): Fuel Break treatments are secondary and acres are included in the Salvage, Thinning and Prescribed Fire treatments. Objective of this treatment is to create a "filtered" fuel break along the adjacent private lands near the Badger Creek Subdivision. Forested stands would be thinned to approximately 30 square feet of basal area per acre for approximately 400 feet from the private land boundary. Natural openings, ridgelines and other fire control features will be utilized where possible in the design and layout of these fuel breaks.

Light Salvage, Thinning, Broadcast Burning (approximately 1445 acres):

Ponderosa pine (approximately 331 acres) & Mixed conifer-Ponderosa pine & Douglas-fir mix (approximately 1114 acres): These treatments are the same as the above "Salvage, Thinning, Prescribed Fire" treatments except salvage of standing dead and down-dead material is secondary to the thinning of the existing "green, live trees". This is because the current mountain pine beetle infestation/mortality is lower in these stands and treatment emphasis is on maintaining the "live, un-infected forested" stands. If MPB populations drastically increase, more emphasis would then be put on salvage operations. Post-treatment of broadcast burning is anticipated following these treatments. Post-treatments may also include release and weeding, and thinning of existing regeneration.

Aspen Treatment - Dry Site (approximately 55 acres): Objective of this treatment is to maintain the "dry site" aspen clone by removing non-commercial conifer tree species (less than 8 inches diameter breast high (DBH)). Prescribed fire would be allowed within these sites where appropriate and/or feasible.

Aspen Treatment - Moist Site (approximately 42 acres): Objective of this treatment is to maintain the larger diameter aspen trees. Where appropriate, treatments around the aspen clone would be designed to enhance/increase the size of the aspen clone. Use of mechanical equipment would be allowed with site specific restrictions. Prescribed fire would be allowed within these sites where appropriate and/or feasible.

Plantation Thinning (approximately 204 acres): Pre-commercial thinning of the existing ponderosa pine "plantations" to desired and prescribed stocking levels per silvicultural prescriptions. Prescribed fire would be allowed within these sites where appropriate and/or feasible following the thinning treatments.

Salvage Only followed by Prescribed Fire (approximately 268 acres): Salvage of standing dead and down-dead material would be allowed. Mountain pine beetle infested "green" trees would be removed. Prescribed fire would be allowed within these sites where appropriate and/or feasible.

Prescribed Burning:

In addition to the 3,081 acres of broadcast burning that would occur in conjunction with mechanical treatments, prescribed burning would be the only method of treatment on 2,705 acres of **montane grasslands (2,206 acres), aspen sites (472 acres), and low maintenance Ponderosa Pine / Douglas-fir stands (27 acres).**

Prescribed fire would be used to reduce hazardous fuel accumulation, promote regeneration (grass, forbs, shrubs, and trees) and reintroduce fire into fire-dependent ecosystems. To ensure fire safety, prescribed fire units will be delineated using natural fuel breaks, roads, handline, and wetline; mechanical thinning may be completed prior to ignition to improve holding features. Aerial ignition (ping-pong ball, helitorch), hand ignition (drip torches, fusees) and/or all terrain vehicle (ATV) ignitions may be used. Fire managers will work with resource specialist to determine if handlines need to be rehabilitated.

Prescribed burning of individual units will likely be completed in 2 to 3 days, with residual smoke lasting 3 to 5 days.

Pile burning will take place in areas where broadcast burning is not desired or where fuels must be reduced prior to broadcast burning (ie. fuel breaks). The average size of hand piles is 6 feet x 6 feet x 6 feet. The average size of mechanical piles is 6 feet x 6 feet x 10 feet. The burning of the piles usually takes place in the winter months.

Meadows & shrublands (approximately 2206 acres): Prescribed fire will be used to improve the health of the montane grasslands and improve the forage. The desired result will be a mosaic pattern in the meadows and shrubland of approximately 50 to 75% of the vegetation burned. Preparation work may be needed to ensure the prescribed burn is maintained within the prescription set forth in the prescribed fire plan. Examples of preparation work include the construction of handlines, to mineral soil, and the removal of brush. Where available, natural and existing fuel breaks will be used.

Aspen (approximately 472 acres): Prescribed fire treatments would be allowed through these stands with the objective to reduce fuel loading and also to stimulate regeneration of the aspen clones.

Ponderosa pine & Douglas-fir (approximately 27 acres): Prescribed fire will be used to maintain healthy stands of ponderosa pine and Douglas-fir in their current condition, reduce hazardous fuel accumulations, and return fire to the ecosystem. The desired result will be a mosaic of approximately 50 to 80% of the understory (duff, needles, grass, and small trees) vegetation burned.

Light mechanical preparation work may be needed to ensure the prescribed fire is maintained within the prescription set forth in the prescribed fire plan. Examples of preparation work include: 1) limbing trees to a height of approximately 6 to 10 feet (primarily along firelines and at critical holding points), 2) construction of handline and/or ATV dragline, to mineral soil, as a boundary between burn units, 3) bucking and removing large concentrations of dead and down material from beneath larger live trees and snags (dead and down material would be moved to open areas within the unit), and 4) falling snags near holding lines to ensure control of the prescribed burn. Where available, natural and existing fuel breaks will be used.

Mechanical thinning may be needed to allow the prescribed fire to carry in a controlled fashion. Examples of thinning include: 1) limbing trees and 2) falling and limbing trees. Additional light mechanical preparation work may be needed to ensure the prescribed fire is maintained within the prescription set forth in the prescribed fire plan. Examples of preparation work include: 1) construction of hand line as a boundary between burn units, 2) bucking and removing large concentrations of dead and down material from beneath larger trees (dead and down material would be moved to open areas within the unit), and 3) falling snags near unit boundaries to maintain control of the prescribed burn. Where available, natural and existing fuel breaks will be used.

Road System

Existing county and USFS system roads would be used as much as possible to access the project area. These roads would be maintained as needed for safety and environmental considerations. No new system roads would be constructed in association with the proposed project. Within the project area, there are 13 miles of existing system roads. No system roads in the project area would be decommissioned after the project is complete.

Approximately 8 miles of existing non-forest system roads and closed road miles would be used to access treatment areas. Only one half mile (one quarter of which is located on private land) of new tempoprary road is proposed. This road would be constructed to the minimum standard needed for safe and efficient use by project equipment, which will likely include some level of vegetation clearing and minor earth movement. All non-system, re-opened closed roads, and temporary roads would be closed and obliterated once the project is complete.

The following Project Design Criteria are incorporated into the proposed action:

1. Protect current improvements including fences, and spring developments. Range improvements would be protected and replaced, if damaged by treatment.
2. If chipping is used as a means of disposal, chips would be distributed so that the chip layer is a maximum of 2 inches in depth; otherwise the chips would be hauled off site.
3. Wood chips may be used on identified cultural sites to retard erosion and increase effective moisture, encouraging the growth of grasses and small forbs that act as stabilizing agents. The depth of the chips would be determined by the Zone Archeologist. The Zone Archeologist would supervise and monitor these activities.
4. A cultural resource survey would be completed prior to ground disturbing activities.
5. All eligible archeological sites, including a minimum of 30 – 50 foot buffer (depending on slope and fuel loading), would be avoided and protected from damage by equipment traveling in the area and pile burning activities. The Zone Archeologist would determine the buffer and mark the area.
6. The Zone Archeologist would identify areas where prescribed fire is not allowed, to avoid impacts to eligible sites. In areas with eligible sites, the Zone Archeologist would assist in identifying staging areas to avoid impacts to sites.
7. If heavy fuel loads exist on any of the archeological sites for which avoidance is stipulated, then those fuels may be removed with an archeologist present.
8. If artifacts, features, or other indications of previously unrecorded heritage resources are identified in the course of ground-disturbing activities, all work in the vicinity of those materials would cease and the Zone Archaeologist would be notified immediately.
9. Deferment of grazing in burned areas would occur for at least one growing season. Timing of prescribed fire treatments would be coordinated with the Rangeland Management Specialist to avoid conflicts with permittees and stress on vegetation.
10. Seasonal restrictions would be implemented for the southern portion of the Project Area below Bull Gulch from December 1 through April 15 for big game winter and transitional range protection. Low frequency activities, such as prescribed burning and removing decks from open roadways would be coordinated with the Wildlife Biologist on an as-needed basis prior to implementation. Please refer to map below.
11. Hauling restrictions would be implemented for the southern portion of the Project Area below Bull Gulch from December 1 through April 15 for big game winter and transitional range protection. County Road 187 would be used for hauling out of the project area during these months. Please refer to map below.

12. Second year protocol surveys would be conducted for goshawks in 2007 prior to implementation of any treatment activities. Timber sale prep (painting and flagging) is permissible on the salvage units prior to survey work.

13. Nesting/Denning sites would be reported to the Wildlife Biologist and appropriate protection measures would be implemented.

14. If new site information regarding threatened, endangered, and sensitive species is located during the course of ground disturbing activities all work in the vicinity of those species would cease and the appropriate specialist would be notified.

15. An activity exclusion area would be marked by the Wildlife Biologist and avoided around known active raptor nests from March 1 through September 30.

16. If treatments are proposed within any raptor territory, the Wildlife Biologist would work with managers to determine treatment specifications for protection of that site.

17. A minimum 100-foot buffer would define the Water Influence Zone (WIZ). The WIZ includes the geomorphic floodplain, riparian ecosystem, and inner gorge. The WIZ would be maintained on either side of perennial and intermittent streams and ephemeral areas as specified in the Watershed Conservation Practices Handbook (FSH 2509.25, Chapter 10).

18. Mechanical thinning treatments would not occur inside the WIZ as delineated by a Fisheries Biologist or Hydrologist. If the area has not been delineated, then treatments would occur outside a 100-foot buffer from all perennial and intermittent streams. The 100-foot WIZ also applies to all lakes, ponds, kettles and other forms of standing water. Some activities such as prescribed burning and hand treatments may be allowed in the WIZ, but only after consultation and concurrence with the project Hydrologist or Fishery Biologist.

19. Prescribed burning would be allowed to migrate into the WIZ from adjacent slopes, but would not be encouraged to do so; ignition of prescribed fire would not occur in the WIZ.

20. Heavy equipment and vehicles would be kept out of the WIZ, streams, swales, and lakes, except to cross at designated points, building crossings, conduct restoration work, or if protected by at least 1 foot of packed snow or 2 inches of frozen soil. Before heavy equipment or vehicles would be allowed to cross streams, the project Fishery Biologist or Hydrologist would be consulted and determine where crossings would occur or be constructed, and to specify any stipulations necessary to minimize negative impacts on aquatic resources.

21. Avoid soil disturbing activities during periods of wet soils. Apply travel restrictions to protect soil and water.

22. If a unit has previously been mechanically thinned / treated, no salvage treatment would take place after prescribed fire treatments occur.

23. Protect or provide for one Abert's squirrel nest tree clump (0.1 acre of 9 to 22 inch dbh ponderosa pine with a basal area of 180 to 220, if available, and interlocking canopy) per six acres on ponderosa pine (Forest Plan, pg. III – 29). In addition, all ponderosa pine trees showing sign of Abert's squirrel feeding activity would be retained as wildlife trees. This direction would be written into timber prescriptions and the prescribed fire plan. For the prescribed fire, protection measures include avoiding to the extent possible torching of ponderosa pine clumps and Abert's squirrel feed trees.

24. A Wildlife Biologist would work with managers to determine treatment specifications for protection of cone monitoring trees within the established Abert's squirrel monitoring plot in the southern portion of the project area.

25. Within mixed conifer, allow no harvest of trees >22.4 cm (9 inches dbh) on any slopes >40% or bottoms of steep canyons where timber harvest has not occurred in the past 20 years (Mexican Spotted Owl Recovery Plan).

26. Implementation and effectiveness monitoring would be conducted by an interdisciplinary team. Snag, down woody material, and other stand conditions would be monitored pre and post treatment to ensure desired conditions are achieved. The following snags/down wood guidelines would be followed.

Snags and CWD

- In forested areas, maintain greater than or equal to 40 snags/recruitment trees per 5 acre average; retain the largest sizes and numbers available (all stages of development). These should consist of at least 30 snags and/or down logs per 5 acres and 10 recruitment snags (green trees) per 5 acres. Guidelines for snags include:

- Retain all soft snags (class 3, 4, and 5) except for safety hazards (Forest Plan, pg. III – 12) to the greatest extent reasonable and practical.

- Retain hard snags (when they are present) greater than or equal to 12 inches diameter at breast height (dbh) or as large as available.

- If above existing snag levels are not available, provide for green recruitment snag trees sufficient to bring snag/recruitment snag levels up to the above mentioned levels in a well distributed manner of both clumps and individual trees, favoring largest available trees. Trees with defects (e.g. "wolfy" appearance, dead tops, forked tops, cankers, heartrot, knarls, diseases, broken tops and large limbs) would be selected when possible as follows:

    - Provide for the above number of recruitment snags (live trees)

    - Create new snags by burn plan design or other means, as necessary.

    - Protect reserved snags/down logs from fuelwood cutting, mechanical treatment and prescribed fire treatment to the greatest extent reasonable and practical.

- In treatment units designated as fuel break, the above snag requirements would not be implemented. Adjacent units or portions of units untreated for fuel break prescriptions would retain an increased number of snags/cwd/green recruitment trees to make up for the acres designated as fuelbreak. These areas would be monitored by the wildlife biologist and fuels specialist to assure that the dead and down component is within acceptable levels for hazardous fuels reduction.

26. Gates and/or barricades would be installed on temporary roads to restrict use by the public during operations and/or until final road closures occur.

27. In forested areas, a 200-foot buffer would be maintained along 75% or more of each side of County Roads 187 and 186 and FDR 174, 174A, 174B, and 174C to discourage and minimize off-road vehicles (OHV) use and to maintain visual screening for wildlife. Mechanical treatment would not take place in the buffer, but prescribed fire may be allowed; hazard trees may be mechanically removed (Forest Plan, pg. III – 32).

28. Access routes would be designated within public firewood areas.

29. Only administrative and permitted access would be allowed on new temporary roads and previously closed roads.

30. Temporary roads used during the project activities would be closed by ripping and seeding with native species, then signed to inform the public that vegetative restoration is in progress. Road closures would occur within six months after completion of the treatment(s) in that unit.

31. To reduce risk of spreading noxious weeds, coordinate with the Noxious Weed program manager prior to implementation. Heavy equipment would be cleaned and inspected prior to entering the project area. Treatment areas would be monitored pre and post treatment for noxious weeds. If present, avoid or remove sources of weed seed and propagules to prevent establishment of new weed infestations and spread of existing weeds. Weed locations would be sent to the Noxious Weeds Coordinator and scheduled for treatment.

Figure 2. Map of Herring Park Project Area and Proposed Treatments

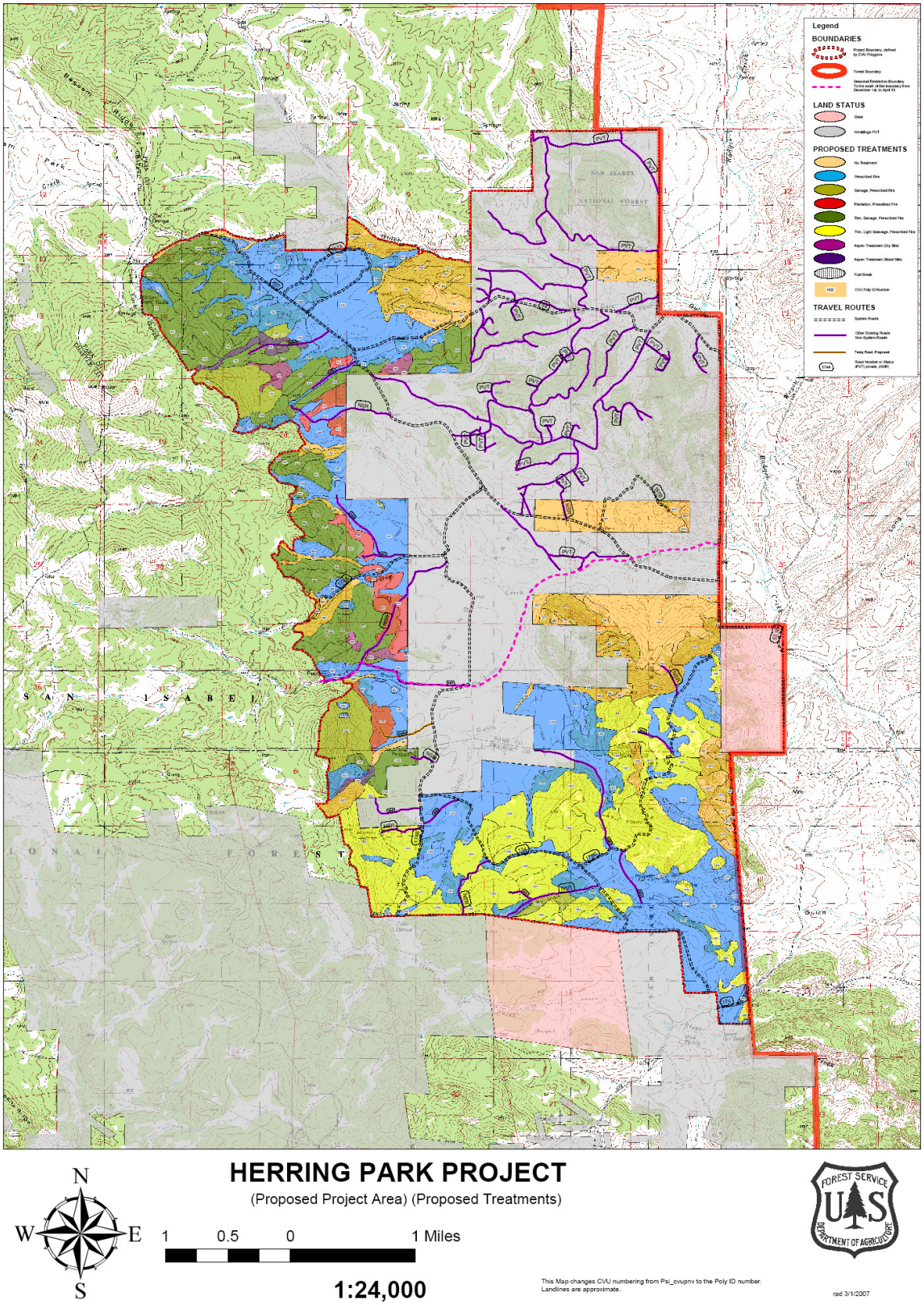


Table 2. Proposed treatment acres by vegetation cover type

Vegetation Type	Proposed Treatment	Approximate Acres
Aspen	ASPEN (Dry)	56
	ASPEN (Moist)	42
	RX	472
	Total	570
Douglas-fir	THIN/SAN/RX	1115
	THIN/SAL/RX	718
	SAL/RX	256
	RX	27
	Total	2116
Meadow	RX	2207
	Total	2207
Ponderosa pine	THIN/SAN/RX	331
	THIN/SAL/RX	334
	SAL/RX	11
	PLANTATION RX	204
	Total	880
Total		**5773**

5.0 SPECIES CONSIDERED AND EVALUATED

Pre-field Review

5.1 Colorado Natural Heritage Program Element Occurrence Records

The Colorado Natural Heritage Program database (CNHP 2005) was reviewed to identify element occurrence records within the action area. No element occurrences are located within the analysis area. In addition, files from the Salida District and Forest were reviewed for known species locations. One historic goshawk nest is known to occur 1 mile outside of the project area to the west. No element occurrences are located within the analysis area.

5.2 Federally Listed and Candidate Species and FS Sensitive Species

A species list from the FWS (dated December 2006) with all federally listed and candidate species within Park, Fremont and Chaffee counties in Colorado was reviewed for this analysis. In addition, the Region 2 Sensitive Species list (Forest Service 2005) was also reviewed for FS sensitive species. Using these lists, we determined which of those species had a potential to occur within our administrative boundaries (shown in Table 3. below). Species not known or with no potential of occurring on the District was documented with rationale in the following document: *Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest* (Wrigley et al. 2006). A list of species known or with a potential to occur or be affected by the proposed action is shown in the table below, and those marked with no potential

to occur, will not be discussed further in this document. Excluded species have been dropped from further analysis by meeting one or more of the following conditions:

1. occurs in species' habitats that are not present in the project area;
2. occurs in habitats that would not be impacted by the proposed activities;
3. is outside of the geographical or elevational range of the species;
4. species do not occur nor is expected in the project area during the time period activities would occur.

In addition, Table 3. below, gives a very brief summary of federally listed/candidate species, critical habitat, and Forest Service sensitive species' habitat requirements and known occurrence information of species which are known to or may occur on the District and/or Forest. For a more detailed species account, including natural history, habitat requirements, status, and background information for each species please refer to Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest (Wrigley et al. 2006) which can be found on file at the District office.

Critical Habitat

There is no proposed or designated critical habitat for any federally listed or proposed species within the analysis area; therefore, there will be no direct, indirect, or cumulative effects to any critical habitat will occur and critical habitat will not be addressed further in this assessment.

Table 3. Threatened, endangered, candidate/proposed, and FS sensitive species with the potential to occur within the analysis area on the San Isabel National Forest (Forest). For more species information, please refer to Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest (Wrigley et al. 2006).

[1]**Status Codes**: **E**=federally listed endangered; **T**=federally listed threatened; **C**= federally proposed/candidate for listing; and **S**=Forest Service sensitive
[2]**Exclusion Rationale Codes**: **ODR**=outside known distributional range of the species; **HAB**= no habitat present in analysis area; **ELE**= outside of elevational range of species; **INV**= presence of non-native salmonids.

Species Common and Scientific Name	Status[1]	Potential to Occur	Rationale for Exclusion[2]	Habitat Description and Range in Colorado
INVERTEBRATES				
Caddisfly *Ochrotrichia susanae*	S		HAB	springs and seeps found in Chaffee and Park Counties
Hudsonian emerald *Somatochlora hudsonica*	S		ODR, HAB	boggy wetlands, streams, ponds, & reservoirs are breeding sites, documented in Lake County; however, distribution in CO is unknown, populations appear to be disjunct.
Rocky mountain capshell snail *Acroloxus coloradensis*	S		HAB	littoral zone of oligotrophic and mesotrophic mountain lakes with neutral to slightly alkaline water and high dissolved oxygen content; 8,800-9,800 ft.
Uncompahgre fritillary butterfly *Boloria acrocnema*	E		ODR, HAB, ELE	known to only occur above timberline on Mt. Uncomaghre, laying eggs on snow willow (*Salix nivalis*); potentially occurring in Custer and Saguache counties.

Species Common and Scientific Name	Status[1]	Potential to Occur	Rationale for Exclusion[2]	Habitat Description and Range in Colorado
FISH				
Greenback trout *Oncorhynchus clarki stomias*	T		HAB	well-oxygenated headwaters of mountain streams, restricted to 7 drainages on Pike-San Isabel NF; found in Custer, Douglas, El Paso, Huerfano, Lake, Park, and Pueblo counties.
AMPHIBIANS AND REPTILES				
Boreal toad *Bufo boreas boreas*	S		HAB	breeds in ponds & over winter in refugia within lodgepole pine, spruce-fir forests, & alpine meadows; 7,500-12,000 ft.
Northern leopard frog *Rana pipiens*	S		HAB	banks & shallow portions of marshes, ponds, lakes, reservoirs, beaver ponds & streams, especially those with rooted aquatic vegetation up to 11,000 ft.
Plains leopard frog *Rana blairi*	S		ODR, HAB	margins of streams, natural and artificial ponds, reservoirs, creek pools, irrigation ditches and other water bodies in plains grassland, sandhills, stream valleys, or canyon bottoms. Elevations below 6,000 ft.
BIRDS				
American peregrine falcon *Falco peregrinus anatum*	S		HAB	wide variety of habitats, selects cliff ledges or rock outcroppings for nesting, preferring high, open cliff faces that dominate the surrounding area.
American three-toed woodpecker *Picoides dorsalis*	S	√		mature or old-growth spruce-fir forest, but also occurs in ponderosa pine, Douglas-fir, & lodgepole pine forests with abundant snags and insect populations are present due to outbreaks from disease or fire.
Bald eagle *Haliaeetus leucocephalus*	T		HAB	near open water including rivers, streams & lakes, nesting & roosting in large ponderosa pine, Douglas-fir, or cottonwood trees in proximity to open water and rivers.
Black swift *Cypseloides niger*	S		HAB	nests on cliffs near or behind high waterfalls.
Boreal owl *Aegolius funereus*	S		HAB	high elevation, subalpine mature & old-growth coniferous woodlands, including mature Engelmann spruce, subalpine fir or spruce/fir-lodgepole pine forests, interspersed with meadows, nesting in cavities in trees larger than 15 in dbh.
Brewer's sparrow *Spizella breweri*	S		HAB	Sagebrush, mountain meadows, and mountain shrub habitat in CO.
Flammulated owl *Otus flammeolus*	S	√		old-growth or mature ponderosa pine, ponderosa pine, & Douglas-fir forests, often mixed with mature aspen, nesting in cavities, feeding on insects.
Gunnison sage grouse *Centrocercus minimus*	S		HAB	tall dense stands of sagebrush near wet meadows with tall grasses for hiding; occurring primarily in SW & W CO, but also including Saguache & S Chaffee County.
Lewis' woodpecker *Melanerpes lewis*	S		HAB	lowland & foothill riparian forests, agricultural areas, urban areas with tall deciduous trees, & foothills including Wet Mountains & grasslands

Species Common and Scientific Name	Status[1]	Potential to Occur	Rationale for Exclusion[2]	Habitat Description and Range in Colorado
Loggerhead shrike *Lanius ludovicianus*	S	√		open riparian areas, montane meadows, agricultural areas, grasslands, shrublands, & piñon/juniper woodlands in western valleys in E CO
Mexican spotted owl *Strix occidentalis lucida*	T	√		steep-sided canyons with old-growth mixed conifer forests, nesting on cliff ledges or caves along canyon walls in shady/cool canyons of the piñon/juniper zone; SW CO
Northern goshawk *Accipiter gentilis*	S	√		primarily forest habitat, especially in mountains, nesting in lower portions of mature Douglas-fir, ponderosa pine, lodgepole pine, or aspen canopies; prefers mature or old-growth forest structure.
Northern harrier *Circus cyaneus*	S	√		spring & fall migrant in western valleys mountain parks, and eastern plains in CO inhabiting grasslands, agricultural areas, marshes & tundra in fall; 3,500-13,000 ft.
Olive-sided flycatcher *Contopus cooperi*	S		HAB, ELE	mature spruce-fir & Douglas-fir forests, especially on steep slopes or near cliffs, near bogs & meadows during the summer, 10,000-11,000 ft.
Purple martin *Progne subis*	S		HAB	old-growth & aspen forests near parks, generally near water; 6,500-10,000 ft in the summer, nesting in colonies in tree cavities or man made structures
White-tailed ptarmigan *Lagopus leucurus*	S		HAB, ELE	Inhabit alpine tundra with moist, low-growing alpine vegetation, particularly willows (Salix ssp.), with boulders, in proximity of water.
Yellow-billed cuckoo *Coccyzus americanus*	S		ODR, HAB	Eastern subspecies: riparian forests along the Arkansas River & urban areas with tall trees; rare to uncommon spring/fall migrant & summer resident of E CO & SW KS
MAMMALS				
American marten *Martes americana*	S		HAB	spruce-fir & lodgepole pine mature to old-growth forests with moderate to high density canopy closures & abundant snags & logs; 8,000- 13,000 ft.
Canada lynx *Felix lynx canadensis*	T		HAB	dense spruce-fir, Douglas-fir, early seral lodgepole pine, mature lodgepole pine with developing understory of spruce-fir & aspen in subalpine zone & timberline, using caves, rock crevices, banks, logs for denning, closely associated with snowshoe hare.
Common hog-nosed skunk *Conepatus leuconotus*	S		ODR, HAB	grasslands & foothills, prefers partly wooded, brushy, rocky area; SE & south-central CO.
Fringed myotis *Myotis thysanodes*	S	√		rocky outcroppings in mid-elevation ponderosa pine, piñon/juniper, oak, & mixed conifer woodlands, grasslands, deserts, & shrublands; Baca, El Paso, Huerfano, Las Animas, Otero, & Pueblo counties.
Gunnison's prairie dog *Cynomys gunnisoni*	S		HAB	shrub-grassland habitats in SW CO in mesic plateaus and intermountain valleys, benches, and arid lowlands.

SPECIES COMMON AND SCIENTIFIC NAME	STATUS[1]	POTENTIAL TO OCCUR	RATIONALE FOR EXCLUSION[2]	HABITAT DESCRIPTION AND RANGE IN COLORADO
Pygmy shrew *Sorex hoyi*	S		ODR, HAB	occupies a wide variety of habitats in the mountains of CO at elevations above 9,600 ft., such as subalpine forests, edges of meadows, bogs, willow thickets, aspen-fir forests, and parklands.
Rocky mountain bighorn sheep *Ovis canadensis canadensis*	S	√		prefers semi-open, precipitous terrain characterized by a mixture of steep and gentle slopes, broken cliffs, rocky outcrops, and canyons
Townsend's big-eared bat *Plecotus townsendii*	S	√		typically associated with caves & abandoned mines for day roosts & hibernacula, will also use abandoned buildings in western shrubland, piñon/juniper woodlands, & open montane forests in elevations up to 9,500 ft.
Wolverine *Gulo gulo*	S		HAB	alpine & subalpine mature/intermediate timbered areas around natural openings, including cliffs, slides, basins, & meadows, dependant on ungulates, historically in CO, extending the length of the Rocky Mts.

Only those federally threatened, endangered. Proposed and FS sensitive species with the potential to occur on the Forest that could potentially be affected by this project (evaluated species) as shown in the above table are addressed hereafter in this assessment.

6.0 EVALUATED SPECIES INFORMATION

6.1 Field Reconnaissance

Surveys were conducted according to protocol for Northern goshawks in suitable habitat throughout the entire project area and up to ¼ mile outside of the project area in July and August of 2006 by Dennis Austin (FS Wildlife Technician) and, Janelle Grabowski (FS Biologist). No goshawks were observed or detected. One active red tailed hawk nest was located in the southern portion of the project area. Abert squirrel activity was detected in the southern portion of the project area as well. Second year protocol surveys would be conducted for goshawks in 2007 and subsequent years prior to vegetation treatment implementation.

The project area has been analyzed to determine physical and biological characteristics including dominant vegetation types, topography, administrative boundaries, and watershed boundaries. These characteristics and others were validated through field visits occurring on numerous occasions by Monica White (FS Wildlife Biologist) between 2001 and 2006; and by Janelle Grabowski (FS Biologist) and Dennis Austin in the summer of 2006.

7.0 ENVIRONMENTAL BASELINE

As defined under the ESA, the environmental baseline includes past and present impacts of all federal, state, and private actions in the action area; the anticipated impacts of all proposed federal actions in the action area that have undergone formal or early section 7 consultation; and the impact of state and private actions which are contemporaneous with the section 7 consultation process. Future actions and their potential effects are not included in the environmental baseline. This section in combination with the previous section and separate document *Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest* (Wrigley et al. 2006) defines the current status of these species and their habitat and provides a platform to assess the effects of the proposed action under consultation with the FWS. The LRMP identifies past and planned FS activities on the PSICC, which includes the San Isabel National Forest. In addition to the activities identified below, please refer to the LRMP for additional information regarding federal actions on the Forest. Many of these are ongoing activities can be also considered as cumulative effects and are applicable to the cumulative effects analysis in the *Effects to Species* (*Section 8.0*) below.

7.1 Past Consultations with the FWS

Table 4. Past consultations with the FWS for projects within the Analysis Area.

Project Name	Implementation Time Period	Type of Project	Species Affected	Effect Determination/Effects
Aspen Ridge and Bassam Livestock Grazing Allotments	ongoing	Livestock Grazing	Lynx	NLAA/ minor vegetation modification in isolated marginal lynx habitat

Although lynx were consulted on for the livestock grazing allotments that are within the project area, no part of the proposed action area is within an LAU boundary.

7.2 Past and Current Activities within the Analysis Area

Please refer to a separate document (*Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest [Wrigley et al. 2006])* for more discussion on activities that have occurred or are currently taking place within the analysis area. These past and ongoing actions are being considered in the environmental baseline and the effects of these activities have had on the species addressed in this assessment. The following is a summary of these activities:

- *Mining*—Historic mining activities have had great impacts on many species addressed in this assessment and area responsible for shaping the landscape and vegetation today. Much of the mixed conifer within the project area was harvested for mining timbers, fuelwood, and charcoal. Old snags and CWD that provide important habitats were also harvested for fuel and are lacking in the project area today. Many of the large diameter trees were removed. The ponderosa pine and mixed conifer developed into greatly dense even-aged stands as a result of the widespread timber harvest in the project area historically. Some of these stands are now heavily infested with both insects and disease, which has resulted in opening of the forest canopy, increase of grass and forb growth and higher numbers of snags.

- *Recreation*—A major use of the Forest within the analysis area is recreation. Use is primarily during the spring through fall months. Specific recreational activities occurring within the analysis area include the following: hunting, four-wheel driving, ATV and motorcycle riding, and horseback riding. Each of the above activities have incrementally impacted many fish and wildlife addressed in this assessment directly, indirectly, and cumulatively through fragmentation, habitat loss, and loss of effectiveness through human disturbance.

- *Roads and Special Use Permits*—Motorized and non-motorized recreational use (including OHV use, camping, horseback riding, mountain biking, hiking, hunting, and fishing) has led to the development of non-system roads and trails, development of dispersed campsites, erosion, disturbance to wildlife species, and the vectoring of invasive and noxious weeds in previously pristine areas. The spread of noxious weeds has led to changes in species composition of the Forest, especially on roadsides, drainages and dispersed camping areas.

- *Wild fires and prescribed fires*—Fires have been small and few within the project area in recent history. Fire exclusion and suppression has led to increased fuel loading and canopy closure. Fire suppression has prevented natural thinning of the ponderosa pine and mixed conifer stands and limited tree growth. These, dense ponderosa and mixed conifer stands are now relatively homogenous and are more susceptible to high levels of insect and disease populations and tree mortality. Few snags were created as a result of fire suppression and existing snags were harvested for fuel in past history. These historic activities combined to produce a forest that has smaller trees, less structure (snags and CWD), less species diversity, and a low stand age diversity (more older stands, 4B structural stage). Heavy insect infestation has resulted in high tree mortality in the

ponderosa pine and mixed conifer stands within the project area. Aspen stands within the project area have also been encroached by conifer as a result of fire suppression.

- *Timber harvest*—Historic timber harvest has resulted in changes in forest composition, structure and fire frequency. See mining discussion above. Recent and ongoing timber and fuels treatments have occurred on a limited scale on private land within the analysis area. No recent (past 40 years) fuels or timber treatment have occurred on National Forest lands within the project area however, tree planting occurred extensively along the eastern slope of the western ridge within the project area. Ponderosa pine plantations are currently very dense even-aged stands between 35 and 40 years old.

- *Livestock grazing*—Historic and current grazing has contributed to changes in species composition, compaction of soils, changes in fuel loading and the fire regime, downcutting of riparian areas with subsequent drying of adjacent meadows, and noxious weed invasion. Allotments that occur within the analysis area are the Aspen Ridge, Bassam and Cameron cattle and horse allotments. Cattle are typically grazed at various times on federal land within the project area between the months of June and October. Private land which is surrounded by the National Forest land within the project area is also grazed season long between May and October annually.

- *Human development*—Subdivision and development of private lands within the analysis area adjacent to federal lands is expected to continue to increase. This will continue to impact and fragment species habitat, fragment/isolating populations, increase the risk of weed invasion, and the incidence of wildfire. Human population growth has increased an average of 2.5% over the past decade, and this population growth is predicted to continue at the same rate within Park and Fremont Counties and surrounding counties. As more and more private lands adjacent to the Forest are developed, this will adversely affect many plant and wildlife species by increasing fragmentation, increased frequency and intensity of human noise disturbance, increased recreational use from nearby residents, and other associated activities. In addition, housing units and human developments within wildland/urban interface areas immediately adjacent to the Forest increase the risk of potential wildfires on the Forest that also will impact habitat for these species. The Badger subdivision, containing approximately 257 landowners, is located within the analysis area. The project area surrounds a large expanse of privately owned land that is currently owned by a two entities and is currently used for livestock grazing.

- *Climate change*—The analysis area has been subjected to extensive drought conditions over the past 6-10 years. Changes in water availability, vegetation growth and tree mortality are evident in the analysis area.

Each of the above activities have incrementally impacted various fish, wildlife, and plant species addressed in this assessment directly, indirectly, through fragmentation, habitat loss, and loss of effectiveness through human disturbance.

8.0 EFFECTS OF THE PROPOSED MANAGEMENT ACTION ON EVALUATED SPECIES AND DETERMINATIONS

General Direct and Indirect Effects Applicable to Wildlife

Alternative 1 (No Action):
Under the no action alternative, no change would occur in the vegetation patterns and stand structures through mechanical treatment or prescribed fire. Insects would be expected to continue to infest remaining stands of dense ponderosa pine and Douglas fir at the current rate, which would result in continued opening of tree canopy cover, increasing number of snags and accumulation of CWD on the forest floor within the project area. Grasses and forbs would likely increase in production in areas of opening canopy in the short term. An increase in herbaceous vegetation would likely lead to increased small mammal populations providing an increased prey base for numerous mammal and bird species. A shift in vegetation patterns and stand structure would occur as natural processes continue (decay, insect infestation, regeneration). Fire suppression activities would continue as currently implemented and stand densities would likely continue to increase as regeneration occurs in the absence of fire disturbance. Risk of larger scale stand replacement fire may increase in the short term (approximately two years) when trees are dead and dry needles remain on the trees. The risk of these stand replacing fires may then actually drop for a period of decades as dead trees create openings or gaps in the canopy and reduce canopy continuity (Romme et al. 2006). As accumulation of CWD and regeneration in the understory increases, it creates ladder fuels that may increase risk of high intensity fire 20-50 years following the insect outbreak if conditions are right. Risk of high intensity fire is driven not only by fuels, but also by climatic conditions such as drought and extreme fire weather (high temperatures, low moisture and wind) (Romme et al. 2006). Aspen is likely to grow more vigorously and to expand in stand size as openings are created from the dead conifer. Many insect feeders and snag dependent species are likely to flourish in the area for several decades as trees die and decay.

Alternative 2 (Proposed Action):

Habitat Modification
Effects from habitat modification include reducing the density of live and dead trees by removing the understory and smaller diameter trees until targets for the area are achieved. Reducing the number of trees in the area can have both positive and negative effects depending on species needs. The reduced number of snags would limit opportunities for perches, nests, roosts, and foraging for snag dependant associates and cavity nesters in the treatment areas. Design criteria calls for retention of an average of 40 snags or recruitment snags per 5 ac. Retaining this number of snags in the treatment areas should provide adequate habitat for snag associate wildlife species in the future, however removal of large areas of dead trees may have negative effects, in the short term, on insect eaters such as the three-toed woodpecker that are attracted to areas of vast insect infestation. Most of the larger snags currently present are from the recent MPB outbreak, and spruce bud worm activity 12 to 15 years ago. MPB snags often lack some desirable characteristics; species variety, long lifespan as a standing snag (they typically do not remain standing longer than 5-7 years), and defects that allow easy excavation for primary cavity nesters, which may be selected for in

current green tree recruitment snags. As a result of the recent MPB infestation, there are a greater number of snags than would be expected in the ponderosa pine. Snags created by the spruce bud worm in the Douglas fir are more likely to persist for a longer period of time. Removing some snags from treatment areas would impact individuals, but should not adversely affect snag associate populations. Reducing the amount of canopy closure would allow more sunlight to reach the forest floor. The amount of grasses, forbs and overall understory vegetation would be expected to increase in both the no action and proposed action alternatives. An increase in herbaceous vegetation would likely lead to increased small mammal populations which provide a prey base for numerous mammal and bird species. Reducing tree density through thinning and salvage activities would make it easier for some species like flammulated owls to maneuver within stands and may become more attractive foraging habitat. Likewise, if openings are created then species utilizing more edge habitats may be benefited. This comes at the expense of reduced visual obstruction for species that are more sensitive to human disturbance, which is discussed below. Proposed treatments would reduce current levels of down wood, which would have varying effects for many small mammal species (Converse, Block and White 2006). Small mammals use down logs extensively as travelways, especially when the logs are situated perpendicular to the slope. Down wood also creates subnivean travelways during the winter. Reducing the amount of down wood would make it more difficult and require greater energy expenditures for small mammals to travel, especially during the periods with snow. Finally, individuals could experience direct mortality from mechanical equipment (run over, or hit) or prescribed fire treatments. These instances are expected to be rare and isolated and would not likely have any affect on vertebrate populations.

Human Disturbance

Displacement is an animal's immediate response to disturbance. This can have negative effects, especially to species with low tolerances to humans, or species with limited distribution or mobility. However, little study has been done for the species addressed in this assessment. For example the flight distances and return intervals for a given species following disturbance is unknown for most species. It is known that repeated or intensive disturbance can lead to long-term affects on distribution, abundance, demographics, species composition, and interactions by altering behavior, vigor, and productivity (Knight and Gutzwiller 1995). Although the direct effect may be displacement, there may be additional indirect effects. Energy is expended in fleeing, or energy intake is lost when an animal is displaced from foraging areas. Additional stress may occur during periods when animals are already stressed, for example, during periods of low food supplies such as winter periods with increased competition or limited foraging habitat. Disturbance during the breeding season can cause reproductive failure from interruption of breeding behavior, nest abandonment, or inability of adults to feed juveniles when kept away from the nest or den (Knight and Gutzwiller 1995). Denning carnivores may move young to a new den location following disturbance, resulting in increased exposure to predators and increased stress to females and their young. When an animal is displaced, it moves into adjacent suitable habitat. However, little study has been done on how animals redistribute themselves if adjacent habitat is occupied. Territorial species may need to move long distances to find suitable unoccupied habitat if their existing territory becomes unusable. Displaced animals, especially juveniles, may be more susceptible to predation while fleeing or in unfamiliar areas.

Tolerance to humans varies both intra and inter specifically. Some species or individuals of a species may be very tolerant of human activity while others are highly sensitive to these disturbances. For example, hiking, skiing, snowshoeing, and camping can displace animals from an area for a short period of time, or longer if the activity is sustained. The flight or flushing distance varies for different species. Human behaviors, the predictability of the disturbance, the frequency, magnitude, timing and location of the activity all have an influence on how animals react (Knight and Gutzwiller 1995). Noise can affect animals by disturbing them to the point that detectable change in behavior may occur. Such behavioral changes can affect their activity and energy consumption (Bowles 1995). Dangerous or unfamiliar noises are more likely to arouse wildlife than harmless and familiar noises. Habituation is the crucial determinant of success in the presence of noisy disturbances. Exposures of some experienced birds to frequent or expected activities may produce no or minimal losses of some species (Black et al. 1984). The habituation process can occur slowly, so it may not be detected in the short-term. In the long-term, Knight et al. (1987) found responses to noise disturbances and habituation in nesting birds become more tenacious and less responsive in the presence of human disturbance if they were not deliberately harassed. Raptors in frequent contact with human activities tend to be less sensitive to additional noise disturbances than raptors nesting in remote areas. However, exposure to direct human harassment may make raptors more sensitive to noise disturbances (Newton 1979). Where prey is abundant, raptors may even occupy areas of high human activity, such as cities and airports (Newton 1979). The timing, frequency, and predictability of the noise disturbance may also be factors. Raptors become less sensitive to human disturbance as their nesting cycle progresses (Newton 1979). Studies have suggested that human activities within breeding and nesting territories could affect raptors by changing home range movements (Anderson et al. 1990) and causing nest abandonment (Postovit and Postovit 1987).

The proposed Herring Park Project would result in increased frequency and duration of human disturbance during the winter months as timber removal practices are implemented. Winter is a time period when human activities in the project area are generally low. There would also be an increase in the amount or type of human activity or disturbance during the breeding season for wildlife addressed in this assessment.

Cumulative Effects

ESA: Under ESA, future federal actions are <u>not</u> part of the cumulative effects analysis, rather only future state, tribal, or private activities that are reasonably certain to occur within the action area are considered. Future federal actions that are unrelated to this proposed action are not included in the cumulative effects analysis because they will undergo section 7 consultation at the time they are brought forward for consultation. All past and present impacts of federal, state, and private actions in the action area have already been considered in the Environmental Baseline (Section 7.0) above and will not again be considered here for consultation purposes under ESA. Therefore, only future private, state, or tribal activities that are reasonably likely to occur within the action area will be considered below for cumulative effects for those species addressed under Section 7 consultation with the FWS. See also *Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest* (Wrigley et al. 2006) which can be found on file at the District office. The following are activities that are reasonably likely to occur within the action area:

- *Livestock grazing*—Historic and current grazing has contributed to changes in species composition, compaction of soils, changes in fuel loading and the fire regime, downcutting of riparian areas with subsequent drying of adjacent meadows, and noxious weed invasion. Private land which is surrounded by the National Forest land within the project area is also grazed season long between May and October annually. This activity and the associated effects are expected to continue on private lands within the project area.

- *Timber Harvest*--Recent and ongoing timber and fuels treatments have occurred on a limited scale on private land within the analysis area. It is expected that these efforts will likely continue as a tool to improve livestock grazing opportunity and reduce risk of wildfire on private lands in the future.

- *Human development*—Subdivision and development of private lands within the analysis area adjacent to federal lands is expected to continue to increase. This will continue to impact and fragment species habitat, fragment/isolating populations, increase the risk of weed invasion, and the incidence of wildfire. Human population growth has increased an average of 2.5% over the past decade, and this population growth is predicted to continue at the same rate within Park and Fremont Counties and surrounding counties. As more and more private lands adjacent to the Forest are developed, this will adversely affect many plant and wildlife species by increasing fragmentation, increased frequency and intensity of human noise disturbance, increased recreational use from nearby residents, and other associated activities. In addition, housing units and human developments within wildland/urban interface areas immediately adjacent to the Forest increase the risk of potential wildfires on the Forest that also will impact habitat for these species. The Badger subdivision containing approximately 257 landowners is located within the analysis area. The project area surrounds a large expanse of privately owned land that is currently owned by a two entities and is currently used for livestock grazing. Parcels of private land have been for sale in the past several years. It is expected that sale and development of these private lands would continue in the future.

- *Climate change*—The analysis area has been subjected to extensive drought conditions over the past 6-10 years. Changes in water availability, vegetation growth and tree mortality are evident in the analysis area. As these lands continue to be dewatered through human development and livestock grazing activities, changes in climatic conditions and reoccurring drought may have increasingly negative effects. Precipitation deficits, evaporation losses, hot temperatures and higher than average municipal and irrigation demand all effect severity of drought. Climatic change combined with these other conditions and activities has made lands in Colorado more vulnerable to short-term drought than in the past (Pielke et al. 2005).

Under NEPA, the cumulative effects are defined somewhat differently as under ESA. The following is a discussion of the cumulative effects for the NEPA analysis which includes the total effect, including both direct and indirect effects of the proposed action combined with the effects of past, present, and reasonably foreseeable future actions (including future federal actions) that are not specifically related to the proposed action.

All past and current activities and their effects to the species addressed in this assessment have already been discussed above (*Environmental Baseline Section 7.0* and *Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest* (Wrigley et al. 2006). Future reasonably foreseeable future federal actions, added to future state, private, and tribal actions analyzed for ESA above apply and are incorporated herein as well. Below is a summary of past, current, and additional reasonably foreseeable future actions, which combined with direct and indirect effects may cumulatively affect plant, wildlife, and fish species addressed in this assessment:

- Historic mining activities
- Recreation(both motorized and non-motorized, hunting, camping, hiking, and horseback riding) and Special Use Permits
- Continued use of, or construction of new roads and trails
- Wildfire and prescribed fire
- Timber harvest
- Livestock grazing
- Human development
- Climate change

In addition to the activities outlined above, the proposed North Trout Creek fuels reduction project, (approximately 4000 acres) located 8 miles north of the project area, is currently in the planning phase by the Salida District; and the adjacent South Park District is in the implementation phase of the Black Trout Insect Management project (approximately 4000 acres). The RORA fuels reduction project (approximately 1300 acres), located approximately 7 miles north of the project area, is also in the implementation phase. Currently and in the future, additional areas within the Wildland Urban Interface will be given a priority for treatment. Each of these projects would be implementing the same activities (timber harvest, thinning and prescribed fire) as those proposed in the Herring Park project.

The Salida Ranger District is in the planning phase for the Range Allotment Management Plans (SLS RAMPS project). This analysis will determine how lands within and adjacent to the project area would be managed with livestock grazing in the future.

Past and present forest management activities have caused changes in plant community structure and composition across the forests. These management activities have altered the present landscape to varying degrees and have had direct, indirect, and possibly cumulative effects on TEPS species. These effects can be reduced by following Forest Service standards and guidelines and by implementing integrated design criteria to monitor or offset impacts. With these protective measures in place, cumulative effects are less likely to be adverse.

Each of the above activities have incrementally impacted wildlife and plant species addressed in this assessment directly, indirectly, and cumulatively through fragmentation, habitat loss, and loss of effectiveness through human disturbance. This proposed action would add to the overall cumulative effects to the species addressed in this assessment from the salvaging, thinning, and fuels reduction treatments; and associated increased level of human activity during treatments. Treatments within the project area may reduce short-term habitat effectiveness during implementation, but should return to pre-treatment human activity levels upon completion. Habitat changes could be positive or negative depending on species requirements. Changes that would occur from the Herring Park project would be in addition to the vegetation changes occurring both in the past; and from current and reasonable foreseeable future activities. The RORA, North Trout Creek and Black Trout projects, SLS RAMPS and future MPB and spruce bud worm activity in the vicinity all add to the cumulative effects.

8.1 Federally Listed Species

Specific Direct and Indirect Effects and Determinations Applicable to Wildlife

Mexican Spotted Owl (Strix occidentalis lucida)
A comprehensive discussion of Mexican spotted owl distribution, natural history and threats can be found in the *Recovery Plan for the Mexican Spotted Owl* (FWS 1995). The project area does not occur within designated critical habitat. The nearest known owl location (PAC) is the Rock Creek PAC 50, near Colorado Springs approximately 40 miles from the project area. The project area is lacking many of the primary habitat components needed by the owl (e.g. large diameter trees, high canopy cover, steep canyons and rock). Although surveys for Mexican spotted owls have been conducted in suitable habitat on the Salida Ranger District in the past, no owls have been documented. A vocalization from a Mexican spotted owl heard near Turret, in May of 2005, was reported to Leslie Ellwood, USFWS (Ellwood 2006). Turret is located just north of Salida in the Arkansas foothills, approximately 5 air miles from the project area. Follow up surveys were conducted by Forest Service biologists in 2006, however no owls were detected.

A recent analysis of mature mixed-conifer stands on the Pike and San Isabel National Forest Smith 2005) indicates that possibly 35-40% of the stands may meet the standards for canopy cover (> 50% closure) for restricted habitat (future potential nesting and roosting habitat); possibly 20% of the mature mixed conifer (Douglas fir in R2RIS) stands on the Pike forest met standards for basal area and; possibly 5% of the mature mixed conifer stands on the Pike Forest meet standards for density of large diameter trees (more than 12 trees per acre that are larger than 18 inches dbh) in the *draft revision of the MSO Recovery Plan*. Fewer stands are likely to meet the more stringent threshold conditions in the current *MSO Recovery Plan* (FWS 1995). Basal area and tree density measurements were not available for the San Isabel side of the Forest as part of the above analysis.

The project area was reviewed to determine if the above threshold conditions for mixed conifer were present. Current existing mixed conifer stand conditions have a maximum basal area of 140-150 in areas that have not been infested with insects; and average tree diameters are between 8 to 12 inch diameters at breast height (dbh), with less than 10 percent of the trees larger than 12 inches (Freeman 2006). Mean annual precipitation in the project area is between 13 to 15 inches.

Climatic conditions, as well as topographic, and site potential conditions within the project area are not likely capable of sustaining mixed conifer stands at the threshold conditions as described in Table III.B.1. in both the current and draft *Recovery Plans for MSO*. Stands are currently being identified that would be managed for moving toward threshold conditions. All of the stands that would be managed to maintain 25% of mixed conifer in target/threshold conditions are located outside of the project area boundaries.

Direct and Indirect Effects
Alternative 1 (no action):
In addition to the general effects discussed above (section 8.0), climatic and topographic factors influence the capability of the project area to achieve the target/threshold standards for mixed conifer stands within the project area. Natural processes would be expected to continue within the project area under the influence of fire suppression. Risk of larger scale stand replacement fires may increase in the short term (approximately two years) when trees are dead and dry needles remain on the trees. The risk of these stand replacing fires may then actually drop for a period of decades as dead trees create openings or gaps in the canopy and reduce canopy continuity (Romme et al. 2006). The project area is lacking many of the primary habitat components needed by the owl (e.g. large diameter trees, high canopy cover, steep canyons and rock) for nesting and roosting, however natural processes would result in increased down woody debris and increased grass and forb production which would favor habitat for small mammal prey species of the MSO. As owls increase in numbers and distribution increases, the project area may potentially provide foraging habitat for MSO that may disperse to potential nesting habitat located 5-10 miles (Arkansas foothills) southwest of the project area.

Alternative 2 (proposed action):
In addition to the general effects discussed above (section 8.0), the biggest impacts to this species would be the removal of snags and CWD, reduced tree understory, density, and canopy cover. Approximately 2100 acres of Douglas fir and 880 acres are planned for a combination of salvage, thinning, and prescribed fire. Where steep slopes exist, Recovery Plan Guidelines for steep slopes (outside of PACS) would be implemented. Within mixed conifer, no harvest of trees >22.4 cm (9 inch dbh) on any slopes > 40% where timber harvest has not occurred in the past 20 years would be implemented. Climatic and topographic factors influence the capability of the site to achieve the target/threshold standards for mixed conifer stands within the project area. The project area is lacking many of the primary habitat components needed by the owl for nesting (e.g. large diameter trees, high canopy cover, steep canyons and rock). Salvage, thinning and prescribed fire treatments would favor retention of large diameter trees in the mixed conifer, though, overall density of trees would be reduced in an effort to reduce risk of live stands to insect infestation. Opening of the canopy would increase grass and forb production which would favor habitat for small mammal prey species of the MSO. Dead tree removal would lessen the availability of downed logs for hiding and nesting habitat of small mammals however, design criteria are in place retain both snags and downed logs at 30 trees per 5 acres and recruitment snags (green trees) at 10 trees per 5 acres to retain small mammal and bird habitat. As owls increase in numbers and distribution increases, the project area may provide foraging habitat for MSO that may disperse to potentially suitable nesting habitat located approximately 5-10 miles (Arkansas foothills) southwest of the project area. The use of this area being by MSO would

likely be incidental and effects from the proposed actions insignificant due to the low quality of the habitat within the project area and distance to known breeding sites.

Effects from Interrelated and Interdependent Actions
Interrelated activities are part of the proposed action that depends on the action for their justification, and interdependent activities have no independent utility apart from the action. There are no interrelated or interdependent actions associated with this project.

Cumulative Effects
See above cumulative effects discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to this species. The *Recovery Plan* (USFWS 1995) states that the Southern Rocky Mountains – Colorado Recovery Unit contains only 1.8% of the known owl sites. The *Recovery Plan* indicates that the greatest risk to the owl is from catastrophic fire and the continued use of even-aged timber management. Hazardous fuels reduction treatments have been completed and are being planned on State, private and public lands within the ponderosa pine/Douglas fir zone throughout Colorado to reduce the risk of catastrophic crown fires. Insects and disease are also likely to continue to infest densely stocked stands. All Federal actions have and will consider the needs of the Mexican spotted owl. It is unlikely that activities proposed in the Herring park project would contribute to adverse cumulative effects on the owl.

Determinations
Alternative 1 (no action):
A determination of ***may affect, but not likely to adversely affect*** for MSO is based on the following rationale:

- The Mexican spotted owl is not known to occur in the project area. The nearest known occupied sites are 40 miles distant on BLM land.
- The project area is lacking many of the primary habitat components needed by the owl (e.g. large diameter trees, high canopy cover, steep canyons and rock), therefore it is unlikely that Mexican spotted owl would occupy the project area for nesting or roosting purposes.
- As owl populations increase and disperse into unoccupied suitable nesting habitat (Arkansas foothills), it is possible that the project area could provide potential future foraging habitat. Natural processes progress, they are likely to improve habitat conditions for MSO prey species within the project area by creating a mosaic of forest stand conditions and increasing dead and down woody components. Continued fire suppression activities, however, would influence the rate and distribution of these processes.
- Effects of natural processes are insignificant.

Alternative 2 (proposed action):
A determination of ***may affect, but not likely to adversely affect*** for MSO is based on the following rationale:

- The Mexican spotted owl is not known to occur in the project area. The nearest known occupied sites are 40 miles distant on BLM land.
- The project area is lacking many of the primary habitat components needed by the owl (e.g. large diameter trees, high canopy cover, steep canyons and rock), therefore it is

unlikely that Mexican spotted owl would occupy the project area for nesting or roosting purposes.

- MSO Recovery Plan standards and guidelines would be implemented.
- As owl populations increase and disperse into unoccupied suitable nesting habitat (Arkansas foothills), it is possible that the project area could provide potential future foraging habitat. Activities associated with timber harvest, thinning, and fuels reduction may affect availability of MSO prey species and the ability of MSO to use the project area in the short term while activities are being implemented.
- Effects of the proposed action are insignificant.

8.2 Forest Service Sensitive Species

Specific Direct and Indirect Effects and Determinations Applicable to Wildlife

American three-toed woodpecker (*Picoides tridactylus*)

Direct and Indirect Effects
Alternative 1 (no action):
This woodpecker inhabits primarily spruce-fir forest, but where insect populations are high as a result of fires or large die-offs due to insect infestation or disease, it may also occur in ponderosa pine, Douglas-fir, and lodgepole pine forests. In addition to the general effects discussed above (section 8.0), the history of fire suppression has lead to fewer large-scale burned over areas, but has also lead to highly favorable conditions for infestations of the wood-boring insects that this species primarily feeds upon. There is no habitat in the project area classified as spruce-fir in the project area, however, the abundant mountain pine beetle population in the project area and surrounding areas would likely be attractive to three-toed woodpeckers. Natural processes are likely to favor habitat conditions for this species in the short term (1-10) years and the long term (10 plus) years as MPB continues to expand within the project area. Risk of larger scale stand replacement fires may increase in the short term (approximately two years) when trees are dead and dry needles remain on the trees (Romme et al. 2006). The risk of these stand replacing fires may then actually drop for a period of decades as dead trees create openings or gaps in the canopy and reduce canopy continuity (Romme et al. 2006). As accumulation of CWD and regeneration in the understory increases, it creates ladder fuels that may increase risk of high intensity fire 20-50 years following the insect outbreak if conditions are right (Romme et al. 2006). All of these processes would be beneficial to perpetuating habitat for the three toed woodpecker.

Alternative 2 (proposed action):
In addition to the general effects discussed above (section 8.0), the biggest impact to these species would be the removal of snags. This woodpecker is associated with snag abundance and insect outbreaks from disease or fire. While maintaining an average of 40 snags/downed logs (CWD) and snag recruitment trees per 5 acres may still provide some habitat for these species, future habitat quality would be lowered by reducing the overall high concentration of snags and insects. Because ponderosa pine and Douglas fir stands are not this species primary habitat, it would be unlikely that the project area would be as attractive to the woodpecker as snag abundance and insect outbreaks are diminished.

Cumulative Effects
See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to this species. Specifically, of the activities/effect listed above in that section, ongoing and anticipated future timber harvest and fire suppression within areas of suitable habitat have the greatest cumulative effect that will directly and indirectly affect these species. In particular, habitat modification from the removal of snags, CWD, and large trees may adversely affect this species and add to the cumulative effects. Each of these activities and actions would increase habitat fragmentation and alter suitable habitat to some degree as discussed above.

Determinations
Alternative 1 (no action):
A determination of ***beneficial impact*** for the three-toed woodpecker is based on the following rationale:

- Though, ponderosa pine and Douglas fir are not this species primary habitat, insect and disease infestations have created favorable habitat conditions for the woodpecker and are currently widespread throughout the project area. In the absence of largescale fire, these secondary habitats are more important to providing forage opportunity for the woodpeckers. It is expected that these conditions would perpetuate within the project area as natural processes continue.

Alternative 2 (proposed action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for the three-toed woodpecker is based on the following rationale:

- Though, ponderosa pine and Douglas fir are not this species primary habitat, insect and disease infestations have created favorable habitat conditions for the woodpecker and are currently widespread throughout the project area.
- Treatments could occur in nesting or foraging habitat; and treatments are designed to remove high concentrations of dead trees and discourage future insect infestations and stand replacing fire risk within the project area.

Flammulated owl (*Otus flammeolus*)

Direct and Indirect Effects
Alternative 1 (no action):
In addition to the general effects discussed above (section 8.0), this species shows a close association with older ponderosa forests therefore, declines in the extent of mature and older ponderosa pine have a negative impact to this species. Under this alternative, there would be no mechanical thinning, fuels reduction or prescribed fire. Insect infestation, in conjunction with extended drought in the area, have resulted in extensive mortality of ponderosa pine in the project area and surrounding areas. As a result, flammulated owls, which are closely associated with mature ponderosa pine are expected to decline in the area because of these natural factors until suitable habitat reestablishes. Current Douglas-fir stands make up approximately 2400 acres of the project area. Insect killed trees are widespread throughout most of the Douglas fir stands which has reduced the density of trees and canopy cover in this habitat. Current

ponderosa pine stands make up approximately 900 acres. Approximately 380 acres of ponderosa pine in the project area are currently uninfested with MPB. The currently uninfested stands of ponderosa may be more susceptible to attack by MPB because of high density, drought stress and competition. MPB are in the vicinity of the uninfested stands, and it is likely that the beetles will spread to these stands within the next couple of years based on the rate of spread observed within and around the project area. If this were to occur, flammulated owl foraging habitat would be further reduced in the short term, however nesting opportunity would increase. As stands of ponderosa pine, Douglas fir and aspen regenerate, flammulated owl foraging and nesting habitat would increase.

Alternative 2 (proposed action):
In addition to the general effects discussed above (section 8.0), the biggest impacts to these species would be the removal of snags and CWD, reduced tree understory density, and canopy cover. Flammulated owls use snags for nesting. While maintaining an average of 40 snags/downed logs per 5 acre would still provide habitat for these species, current and future habitat quality may be lowered by reducing the amount of snags and down wood (CWD) in the short term (1-10 years) and long term (10 plus years). Mountain pine beetle are expected to continue to move throughout the project area as remaining live ponderosa pine stands are more susceptible to infestation because of high tree densities, drought stress and competion. The proposed treatments would reduce the density of live ponderosa pine stands in an effort to lessen the susceptiblity to mountain pine beetle infestation in remaining live ponderosa pine stands, though success these efforts in the past has been variable. A more open stand structure could be beneficial for flammulated owl foraging as long as remaining habitat requirements are still met.

Cumulative Effects
See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to these species. Specifically, of the activities/effect listed above in that section, ongoing and anticipated future timber harvest and fire suppression within areas of suitable habitat have the greatest cumulative effect that will directly and indirectly affect these species. In particular, habitat modification from the removal of snags, CWD, and large trees may adversely affect these species and add to the cumulative effects. Each of these actions would increase habitat fragmentation and remove suitable habitat as discussed above.

Determinations
Alternative 1 (no action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for flammulated owl is based on the following rationale:

- Natural processes have resulted in a decrease in the amount of live large ponderosa pine within and adjacent to the project area, which has reduced the amount of available foraging habitat for flammulated owls, but has increased the number of snags which may provide future nesting habitat.
- Remaining live ponderosa pine trees are more susceptible to insect infestation due to drought stress, density, and competition. It is likely that insects will infest the remaining stands of live ponderosa pine, further reducing available foraging habitat in the short term.

- As stands regenerate through natural processes (ponderosa pine, Douglas fir and aspen) and snags and CWD are retained, foraging and nesting habitat is likely to increase.

Alternative 2 (proposed action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for flammulated owl is based on the following rationale:

- A minimum of 40 snags/downed logs (CWD) and recruitment snags per 5 acres would be retained in treatment areas. Additional snags and down wood would be removed.
- Treatments could occur in nesting, roosting and foraging habitat however, treatments are designed to retain large live ponderosa pine trees and encourage aspen regeneration.

Loggerhead shrike (*Lanius ludovicianus*)

Direct and Indirect Effects
Alternative 1 (no action):
Though breeding birds are rarely found above 8,900 feet in elevation, potential habitat does exist within the project area, primarily on private land. Insect infestation would continue to increase openings and create greater potential for foraging birds on Forest lands surrounding the private land habitat. But, given the rare occurrence of loggerhead shrikes (Andrews and Righter 1992) in the area, natural processes are unlikely to greatly influence their distribution or use of the project area.

Alternative 2 (proposed action):
Conducting prescribed burns in meadow habitats could displace individuals if they are using the area during burning. Prescribed burns in the project area would be relatively small and similar unburned meadow habitats would remain in the vicinity. Given the rare occurrence of loggerhead shrikes (Andrews and Righter 1992) in the area, small temporal and spatial impacts to potential habitats and availability of untreated habitats in the vicinity it is unlikely that the activities proposed in this alternative would have any measurable effect on shrikes.

Cumulative Effects
See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to this species. Specifically, of the activities/effect listed above in that section, grazing and fire suppression has had, and likely continues to have, the greatest cumulative direct and indirect cumulative effect on this species. The current MPB outbreak and subsequent logging across the area will alter habitat composition, ultimately creating a more open forest structure. Each of these activities and actions would increase meadow habitat and possibly shrub habitat to some degree as discussed above.

Determinations (both alternatives)
A determination of ***no impact*** for loggerhead shrike is based on the following rationale:

- Given the rare occurrence of loggerhead shrikes (Andrews and Righter 1992) in the area, small temporal and spatial impacts to potential habitats and availability of untreated habitats in the vicinity, no impacts to individuals are expected with any of the alternatives.

Northern goshawk (*Accipiter gentilis*)
Most goshawk nests on the Salida Ranger District are located within aspen dominated stands. Approximately 1300 acres of potential nesting habitat was surveyed for presence of goshawks. Goshawks were not detected nor any goshawk nests located within the project area during surveys conducted in 2006 however; a historic nest is known to occur approximately 1 mile west of the project area. Many of the larger aspen stands within the project area are small dry site stands bordering open meadow. Smaller stands that contain some of the larger diameter aspen trees occur as narrow stringers within some of the drainages and are surrounded by stands of conifer that contain high levels of insect infestation and dead tree component. Some of these aspen stands have also been encroached by conifer. Stands that contained the highest canopy cover of live ponderosa pine and aspen were located in the southern portion of the project area and contained the best potential goshawk habitat within the project area. Small MPB infestations are in the vicinity of the uninfested stands, and it is likely that the beetles will spread to these stands within the next couple of years based on the rate of spread observed within and around the project area.

Direct and Indirect Effects
Alternative 1 (no action):
In addition to the general effects discussed above (section 8.0), natural processes are increasing openings in the canopy of conifer stands which would increase the opportunity for regeneration of aspen. Natural processes would result in increased CWD and increased grass and forb production which would favor habitat for small mammal prey species of the goshawk. Aspen stands currently being encroached by conifer are likely to expand as adjacent conifer stands continue to be infested by insects and trees die back. Diversity of bird and other prey species in the area are likely to change spatially within the project area as this transition occurs. Natural processes are creating a mosaic of open patches and variable stand densities which could increase foraging success and improve the area as quality goshawk habitat. Stands that are more open would also improve habitat conditions for prey species (primarily passerines) which will ultimately benefit goshawks. As MPB continues to spread to the southern portion of the project area, potential nesting habitat would be further reduced in the project area, however foraging opportunity is likely to increase. Goshawks nesting in areas adjacent to the project area could benefit from this increased foraging opportunity currently; and as stands regenerate, nesting habitat is likely to improve within the project area to provide dispersal habitat in the future.

Alternative 2 (proposed action):
In addition to the general effects discussed above (section 8.0), treatments may reduce conifer encroachment in aspen stands. Diversity of bird and other prey species in the area are likely to change spatially within the project area as this transition occurs. Birds are a key prey item for goshawks and removal of conifers within aspen stands could reduce foraging opportunities to some degree. Removal of conifer in addition to the reintroduction of fire to the ecosystem will encourage aspen expansion and regeneration. If some snags and/or CWD are removed, the loss of these habitat components could also affect goshawk prey species as well to some degree. However, goshawks need a relatively open stand structure to capture prey. Reducing stand density as is proposed could increase foraging success and improve the area as suitable goshawk habitat. Stands that are more open could also improve habitat conditions for prey species (primarily passerines) which will ultimately benefit goshawks. Disturbance and habitat

protective measures listed in the design criteria above should maintain or improve species diversity and habitat conditions for goshawks. Increased human activity during the implementation of the proposed activities could displace nesting goshawks from the project area. Additional surveys will be conducted in 2007 prior to any implementation of vegetation treatments in suitable habitat. Treatments may reduce the quality of habitat in some areas over the short-term (1-10 years); however, the quality of goshawk habitat is expected to increase in the long term (10 plus years). Implementation guidelines are in place to adjust season of treatment and create protective buffer areas if goshawks are detected in the project area in the future.

Cumulative Effects

See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to this species. Specifically, of the activities/effects listed above in that section, timber harvest and fire suppression has had, and likely continues to have the greatest cumulative direct and indirect cumulative effect on this species. The current MPB outbreak and subsequent logging across the area would alter habitat composition, ultimately creating a more open forest structure. Each of these activities and actions would increase habitat fragmentation and alter suitable habitat to some degree as discussed above.

Determinations

Alternative 1 (no action):

A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for northern goshawk is based on the following rationale:

- Insect infestations may continue to reduce potential nesting habitat within the project area as MPB continues to expand in the short term (1-10 years), however, foraging habitat would improve and provide increased prey opportunity for goshawks that may be nesting adjacent to the project area. Nesting opportunity is likely to improve as aspen stands expand and regenerate in the future (20-50 years). Natural processes would continue to impact goshawks through spatial displacement as stand conditions change through time.

Alternative 2 (proposed action):

A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for northern goshawk is based on the following rationale:

- A minimum of 40 snags/downed logs (CWD) and recruitment snags per 5 acres would be retained in treatment areas. Additional snags and down wood would be removed.
- Treatments could occur in nesting or foraging habitat however, treatments are designed to retain large live conifer trees and encourage aspen regeneration which would improve both nesting and foraging habitat in the future.
- Design criteria is in place to conduct additional surveys for goshawks prior to project implementation and to establish protective habitat and seasonal disturbance buffers if a nest is detected.

Northern harrier (*Circus cyaneus*)

Direct and Indirect Effects
Alternative 1 (no action):
Though potential habitat exists within the project area, primarily on private land, no breeding records are known to occur within the project area (Kingery 1998). Harriers require dense and abundant cover in grasslands and marshes for nesting and hunting. These conditions are limited in the area due to livestock grazing on both and forest lands and adjacent private lands. They are also limited by site potential due to limited water and riparian habitats in the area. Natural processes are unlikely to greatly influence their distribution or use of the project area.

Alternative 2 (proposed action):
Conducting prescribed burns in meadow habitats could displace individuals if they are using the area during burning. Prescribed burns in the project area would be relatively small and similar unburned meadow habitats would remain in the vicinity. Given the small temporal and spatial impacts to potential habitats it is unlikely that the activities proposed in this alternative would have any measurable effect on harriers.

Cumulative Effects
See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to this species. Specifically, of the activities/effect listed above in that section, grazing and fire suppression has had, and likely continues to have, the greatest cumulative direct and indirect cumulative effect on this species. The current MPB outbreak and subsequent logging across the area will alter habitat composition, ultimately creating a more open forest structure. Each of these activities and actions would increase meadow habitat and possibly shrub habitat to some degree as discussed above.

Determinations (both alternatives)
A determination of ***no impact*** for northern harrier is based on the following rationale:

- Given low quality of habitat in the area, small temporal and spatial impacts to potential habitats, no impacts to individuals are expected with any of the alternatives.

Fringed myotis (*Myotis thysanodes*)

Direct and Indirect Effects
Alternative 1 (no action):
In addition to the general effects discussed above (section 8.0), roost loss and habitat alteration may be the most important factors affected by declines in the extent of mature and older ponderosa pine. Though there are no documented occurrences of this bat species within the project area; survey efforts conducted by the CDOW have been limited to mines outside of the project area. A maternity roost is known to occur in an abandoned mine near the town of Buena Vista approximately 11 miles from the project area (Navo et al. 1998). Under this alternative, there would be no mechanical thinning, fuels reduction or prescribed fire. Insect infestation, in conjunction with extended drought in the area, have resulted in extensive mortality of ponderosa pine and Douglas fir in the project area and surrounding areas. As a result, potential roosting habitat has increased in the area as more snags are created. Natural processes are expected to maintain these conditions in the short term (up to 20 years) however, in the absence of natural

fire, due to continued fire suppression activities, it is unlikely that these conditions would persist in the long term (over 20 years). A possible limiting factor to the use of the project area by the myotis is the proximity to open water for drinking.

Alternative 2 (proposed action):
In addition to the general effects discussed above (section 8.0), the biggest impact to these species would be the removal of snags. Snags provide roost habitat for the myotis. Cavity trees that could be used for individual roost sites are within the treatment areas however, implementation guidelines are in place to retain these trees across the landscape. While maintaining an average of 40 snags/downed logs (CWD) and snag recruitment trees per 5 acres may still provide some habitat for these species, it is thought that suitable snag densities are likely over 8 large snags per acre, and regular pockets with several times that density may be required (Keinath 2004). Though there are no documented occurrences of this bat species within the project area; survey efforts conducted by the CDOW have been limited to mines outside of the project area. A maternity roost is known to occur in an abandoned mine near the town of Buena Vista approximately 11 miles from the project area (Navo et al. 1998). A possible limiting factor to the use of the project area by the myotis is the proximity to open water for drinking.

Cumulative Effects
See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to these species. Specifically, of the activities/effects listed above in that section, ongoing and anticipated future timber harvest and fire suppression within areas of suitable habitat have the greatest cumulative effect that will directly and indirectly affect these species. In particular, habitat modification from the removal of snags, and large trees may adversely affect this species and add to the cumulative effects. Each of these activities and actions would increase habitat fragmentation and alter suitable habitat to some degree as discussed above.

Determinations
Alternative 1 (no action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend toward federally listing*** for the fringed myotis is based on the following rationale:

- Potential roosting habitat has increased in the area as more snags are created. Natural processes are expected to maintain these conditions in the short term (up to 20 years) however, in the absence of natural fire due to continued fire suppression activities, it is unlikely that these conditions would persist in the long term (over 20 years).

Alternative 2 (proposed action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for the fringed myotis is based on the following rationale:

- While maintaining an average of 40 snags/downed logs (CWD) and snag recruitment trees per 5 acres may still provide some habitat for these species, it is thought that

suitable snag densities are likely over 8 large snags per acre, and regular pockets with several times that density may be required (Keinath 2004).

- There is no known occurrence of this species within the project area however, surveys have not been conducted.

Rocky mountain bighorn sheep (*Ovis canadensis canadensis*)

Direct and Indirect Effects
Alternative 1 (no action):
Bighorn sheep are primarily animals of open habitats, such as alpine meadows, open grasslands, shrub-steppe, talus slopes, rock outcrops, and cliffs. In addition to the general effects discussed above (section 8.0), insect activity is increasing the openness of the densely stocked stands of ponderosa pine and mixed conifer which surround the open park within the project area creating more visibility for sheep that may use these stands. Visibility is an important habitat variable for bighorn sheep, so much so that the structure and height of vegetation are probably more important than composition of plant species because high visibility facilitates the detection of predators (Beecham et al. 2007). Slope steepness also appears to be a significant feature of bighorn sheep habitat. They use slopes of 36 to 80% in Montana and Colorado, while avoiding slopes less than 20% (Beecham et al. 2007). While bighorns feed in open areas, they are rarely found more than 400 meters from escape cover, where they have an advantage over most predators (Beecham et al. 2007). Talus slopes, rock outcrops, and cliffs provide habitat for resting, lambing, and escape cover (Beecham et al. 2007). Bighorn sheep are known to occur both north and south of the project area, however use within the project area is likely incidental. Opening of the forest may expand the habitat available to bighorn sheep adjacent to the project area, however slopes are relatively gentle (approximately 155 acres over 40% slope) and escape cover is limited which may limit the use of the project area by bighorn sheep regardless of natural processes effects to forest stand conditions.

Alternative 2 (proposed action):
In addition to the general effects discussed above (section 8.0), proposed activities would increase the openness of the densely stocked stands of ponderosa pine and mixed conifer which surround the open park within the project area. Bighorn sheep may use areas of deciduous and conifer forests, especially where openings have been created by clear-cuts or fire (Beecham et al. 2007). Bighorn sheep are known to occur both north and south of the project area however use within the project area is likely incidental. Opening of the forest may expand the habitat available to bighorn sheep adjacent to the project area, however slopes are relatively gentle (approximately 155 acres over 40% slope) and escape cover is limited within the project area which may limit the use of the project area by bighorn sheep regardless of the resulting forest openings created by proposed activities. Important bighorn sheep winter and lambing range has been identified by CDOW biologist, Jack Vayinger (2006) to occur south of the project area. Bighorn sheep are more sensitive to disturbance on their winter range when forage resources are scarce and higher demands on their metabolism are brought on by exposure to winter conditions. Increased activity by logging and hauling vehicles through winter range may negatively impact sheep through disturbance to security areas and increased stress in areas where vehicle traffic is normally lower in the winter months. Design criteria are in place to reduce disturbance to winter range by restricting logging and hauling to the northern portion of the project area during the

period of December 1 through April 15. Vehicle traffic on these routes is much greater during the spring, summer and fall months due to increased forest visitor use. Logging activities which may occur during these seasons may have effects on individuals lambing by increasing disturbance caused by vehicular traffic, but the increases would be negligible.

Cumulative Effects
See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to this species. Specifically, of the activities/effect listed above in that section, ongoing and anticipated future timber harvest and fire suppression within areas of suitable habitat have the greatest cumulative effect that will directly and indirectly affect this species.

Determinations
Alternative 1 (no action):
A determination of ***no impact*** for the bighorn sheep is based on the following rationale:

- Natural processes may expand the habitat available to bighorn sheep adjacent to the project area as the density of trees is reduced however, use of the project area may be limited by lack of adequate escape cover and steep terrain. Use of the project area would likely be incidental.

Alternative 2 (proposed action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for bighorn sheep is based on the following rationale:

- Logging and hauling activities may increase disturbance to security areas during the winter and lambing season when sheep are more susceptible to disturbance.
- Design criteria are in place to reduce disturbance to winter range by restricting logging and hauling to the northern portion of the project area during the period of December 1 through April 15. Some negligible disturbance may occur with increased traffic through security areas during the lambing season.

Townsend's big-eared bat (*Plecotus townsendii*)

Direct and Indirect Effects
Alternative 1 (no action):
In addition to the general effects discussed above (section 8.0), habitat alteration may be the most important factor affected by declines in the extent of mature and older forests. Though there are no documented occurrences of this species within the project area; survey efforts conducted by the CDOW have been limited to mines outside of the project area. A hibernacula is known to occur in an abandoned mine near the town of Buena Vista approximately 11 miles from the project area (Navo et al. 1998).Under this alternative, there would be no mechanical thinning, fuels reduction or prescribed fire. Insect infestation, in conjunction with extended drought in the area, have resulted in extensive mortality of ponderosa pine and Douglas fir in the project area and surrounding areas. As a result, potential foraging habitat has been affected in the area as canopy cover has been reduced and regeneration is occurring. Natural processes may reduce the quality of potential foraging habitat as canopy cover is reduced in the short term (up

to 20 years) but, may provide more quality foraging habitat in the future. A possible limiting factor to the use of the project area by the Townsend's big-eared bat is the proximity to open water and roost sites.

Alternative 2 (proposed action):
In addition to the general effects discussed above (section 8.0), the biggest impact to this species would be the opening of the canopy. This species typically does not use large clearcuts or regenerating stands in the early stages (Gruver and Keinath 2006). Salvage, thinning and prescribed burning treatments would reduce canopy cover and encourage regeneration in forested stands, thus reducing potential foraging habiat quality until these stands again reach mature and older stages. Though there are no documented occurrences of this species within the project area; survey efforts conducted by the CDOW have been limited to mines outside of the project area. A hibernacula is known to occur in an abaondoned mine near the town of Buena Vista approximately 11 miles from the project area (Navo et al. 1998). A possible limiting factor to the use of the project area by the Townsend's big-eared bat is the proximity to open water for drinking; and roost locations. No known caves, abandoned mine tunnels or abandoned buildings that could be used for communal or maternity roost sites would be affected by the proposed treatments.

Cumulative Effects
See above cumulative effect discussion (section 8.0) for specific activities and further detail on potential adverse cumulative effects to these species. Specifically, of the activities/effects listed above in that section, ongoing and anticipated future timber harvest within areas of suitable habitat have the greatest cumulative effect that will directly and indirectly affect these species. In particular, habitat modification from the removal of snags and large trees may adversely affect these species and add to the cumulative effects. Each of these activities and actions would increase habitat fragmentation and alter suitable habitat to some degree as discussed above.

Determinations
Alternative 1 (no action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for the Townsend's big-eared bat is based on the following rationale:

- Natural processes are expected to reduce the quality of potential foraging habitat as the canopy opens and regeneration occurs but, may provide more quality foraging habitat in the future.

Alternative 2 (proposed action):
A determination of ***may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federally listing*** for the Townsend's big-eared bat is based on the following rationale:

- Salvage, thinning and prescribed burning treatments would reduce canopy cover even further than natural proceses and encourage regeneration in forested stands, thus reducing potential foraging habitat quality until these stands again reach mature and older stages.
- No known caves, abandoned mine tunnels or abandoned buildings that could be used for communal or maternity roost sites would be affected by the proposed treatments.

9.0 EFFECT DETERMINATIONS SUMMARY

For the species addressed in this assessment, the direct and indirect effects, effects from interdependent and interrelated activities, and cumulative effects of this proposed action have been added to the environmental baseline to each species as stated above. The following table summarizes the effect determinations for each species presented above. The rationale for the determinations is discussed in the *Effects Section (8.0)* above for each species. No proposed or designated critical habitat is present nor will it be affected.

Table 5. Effect determinations for each species addressed in this assessment.

[1] **STATUS CODES: E**=federally listed endangered; **T**=federally listed threatened; **C**=federally proposed/candidate for listing; and **S**=FS sensitive
[2] **MAII**= may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend toward federally listing; **NE**=no effect; **NI**=no impact; **NLAA**=may affect, but not likely to adversely affect, **BI**=beneficial impact

SPECIES COMMON NAME	SCIENTIFIC NAME	STATUS CODE[1]	DETERMINATIONS OF EFFECT [2]	
			ALT. 1 (NO ACTION)	*ALT. 2 (PROPOSED ACTION)*
BIRDS				
Flammulated owl	*Otus flammeolus*	S	MAII	MAII
Loggerhead shrike	*Lanius ludovicianus*	S	NI	NI
Mexican spotted owl	*Strix occidentalis lucida*	T	NLAA	NLAA
Northern goshawk	*Accipiter gentilis*	S	MAII	MAII
Northern harrier	*Circus cyaneus*	S	NI	NI
Three-toed woodpecker	*Picoides dorsalis*	S	BI	MAII
MAMMALS				
Fringed myotis	*Myotis thysanodes*	S	MAII	MAII
Rocky mountain bighorn sheep	*Ovis canadensis canadensis*	S	NI	MAII
Townsend's big-eared bat	*Plecotus townsendii*	S	MAII	MAII

10.0 MITIGATION

Mitigation measures are not necessary for the species addressed in this assessment. Measures needed to minimize effects to these species and their habitats have been incorporated into the project proposal through project design criteria.

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