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Forest Service

Salmon-Challis National Forest

Salmon Cobalt Ranger District
311 McPherson Street
Salmon, ID 83467

File Code: 2672.4
Route To: 1950

Date: 7/1/2006

Subject: Proposed Salmon Moose Timber Sale

To: District Ranger, Salmon Cobalt Ranger District

The U.S. Fish & Wildlife Service (FWS) lists three vertebrate species which occur, potentially occur, or habitat for which occurs on the Salmon Cobalt Ranger District as Threatened or Endangered under the Endangered Species Act of 1973: Gray Wolf, Canada Lynx and Bald Eagle and one candidate species, the yellow cuckoo (USFWS Species List # 2006-SL-0547, updated June 1, 2006). The U.S. Forest Service, Region 4 has designated fourteen vertebrate species and seven plant species that occur, potentially occur, or habitat for which occurs on the Salmon Cobalt Ranger District as Sensitive species. The purpose of this document is to analyze the effects of the proposed project, described below, on each of these species and the habitats that they require for self-sustaining populations.

Bald eagle (*Haliaetus leucoephalus*)—Threatened
Gray wolf (*Canis lupus*)---Endangered (experimental/non-essential population)
Canada lynx (*Lynx canadensis*)---Threatened
Yellow cuckoo (Coccyzus americanus)---Candidate
Wolverine (*Gulo gulo*)---Sensitive
Fisher (*Martes pennanti*)---Sensitive
Western big-eared bat (*Corynorhinus townsendii*)---Sensitive
Spotted bat (*Euderma maculata*)---Sensitive
Harlequin duck (*Histrionicus histrionicus*)---Sensitive
Peregrine falcon (*Falco peregrinus anatum*)---Sensitive
Northern goshawk (*Accipiter gentilis*)---Sensitive
Great gray owl (*Strix nebulosa*)---Sensitive
Boreal owl (*Aegolius funereus*)---Sensitive
Flammulated owl (*Otus flammeolus*)---Sensitive
Three-toed woodpecker (*Picoides tridactylus*)---Sensitive
Greater sage-grouse (*Centrocercus urophasianus*)---Sensitive
Pygmy rabbit (*Brachylagus idahoensis*)---Sensitive
Spotted frog (*Rana pretiosa*)---Sensitive
Pink agoseris (*Agoseris lackschewitzii*)---Sensitive
Lemhi penstemon (*Penstemon lemhiensis*)---Sensitive
Flexible collomia (*Collomia debilis* var. *camporum*)---Sensitive
Salmon twin bladderpod (*Physaria didymocarpa* var. *lyrata*)---Sensitive
Marsh's bluegrass (*Poa abbreviata marshii*)---Sensitive
Douglas' biscuitroot (*Cymopterus douglasii*)---Sensitive
Idaho range lichen (*Xanthoparmelia idahoensis*)---Sensitive

SUMMARY OF ACTIVITY

Project Area Description - The project area consists of numerous small perennial or intermittent streams that feed directly and indirectly into the main Salmon River (see Map 1). Terrain in the project area is variable, from extremely steep slopes to flat meadows or floodplains. Elevation ranges from the valley floor along the Salmon River at 3,800 feet to Wallace Peak at 8,275 feet.

The vegetation within the project area consists of forest, shrub, and herbaceous cover types. The forest cover types occupy the mid and upper elevations and include the following tree species: Douglas-fir, lodgepole pine, ponderosa pine, subalpine fir, Engelmann spruce and whitebark pine. Shrub and herbaceous cover types occupy the drier, lower elevations of the project area between the Salmon River and the timbered slopes. These plant communities include a variety of sagebrush species mixed with several species of bunchgrass. Grasslands where shrubs are relatively sparse and bunchgrasses dominate are common vegetative features within the project area. The project area also contains scattered wet meadow communities, including several larger meadow complexes (up to 100 to 200 acres).

The vegetation within the project area has changed during the past century due to plant community succession and forest management activities that include fire suppression, cattle grazing and timber harvest. Changes in species composition, structure and density have resulted. For example, formerly park-like Douglas-fir stands with an understory of grasses, forbs and shrubs have changed to densely stocked conifer forests with thickets of smaller diameter trees and fewer grasses, forbs, and shrubs in the understory. There has also been an increase in the continuity of closed forest canopy lodgepole pine and subalpine fir successional stages. Drought and insect or disease outbreaks stress these overcrowded forest stands and mortality ensues.

Past and on-going human uses within the project area include motorized and non-motorized recreation, recreational and commercial mining, livestock grazing and timber harvest. Livestock grazing within the area is authorized through grazing permits issued by the Bureau of Land Management and Forest Service. Intensive commercial timber harvest has occurred in the area, and harvest of forest products for personal use, such as firewood, is common.

Wildlife habitat within the project area includes a variety of forest, grassland, and riparian community types. The amount and distribution of wildlife habitat in the project area has changed due to fire suppression and other forest activities mentioned above. The changes in habitat have had both positive and negative effects for wildlife species that utilize the area.

Activity – The proposed action would use commercial mechanical timber harvest to thin understory and mid-canopy trees or remove continuous crown fuels from 64 proposed units on approximately 1,553 acres to meet silvicultural and fuels management objectives (see Map 1).

The proposed action also specifies treatment of designated old growth to retain large tree character and to achieve desired vegetative conditions.

Lodgepole Pine Treatments

- Mechanically harvest lodgepole pine from 50 units on 968 acres. Eighty percent of the lodgepole pine overstory would be removed from each unit. No Douglas- fir or pondersoa pine would be harvested. Merchantable timber products would be offered commercially through multiple sales of varying sizes.

Aspen Treatments

- Mechanically remove conifers from or adjacent to aspen clones from 14 units on approximately 518 acres. Merchantable timber products would be offered commercially through multiple sales of varying sizes.
- Treatment of aspen within aspen clones would be non-commercial.

Management Requirements for All Vegetative Treatments

- Log during dry or frozen conditions. Logging would be permitted on frozen, snow-covered ground, as long as haul routes entering or crossing lynx analysis units could be traveled without snow plowing. Haul routes accessing units outside the lynx analysis areas could be snow plowed to allow winter harvest.
- All primary and constructed skid trails would be designated within cutting units.
- All constructed skid trails would be reclaimed, put back on the contour, seeded if necessary, and covered with scattered slash to mitigate soil disturbance, weed introduction and spread and minimize motorized vehicle access after the sale is complete.
- All landings that are detrimentally compacted or have detrimental soil displacement, according to the definitions set forth in the Regional Soil Quality Standards, would be rehabilitated by scarifying or ripping the soil to restore proper water infiltration, redistributing displaced topsoil, seeding with native species, and mulching.
- Implement the following measures to reduce the probability of weeds introduction and spread: (1) treat existing weed infestations in and around treatment units and haul routes prior to project implementation, (2) encourage logging operators to maintain weed-free equipment yards and staging areas, (3) use standard timber sale contract provisions to ensure that harvest equipment is cleaned and inspected prior to mobilization onto national forest system lands, (4) designate landings and skid trails, using existing sites wherever possible, (5) minimize areas of soil disturbance to no more than that needed to meet project objectives, (6) minimize soil disturbance and off-site transfer of soil and road surfacing material when maintaining or re-opening roads and (7) inspect areas of ground disturbance in the project area for at least three years after project completion and eradicate any new weed infestations found (USDA Forest Service, 2001).
- Twenty to fifty percent of duff and organic matter would remain following treatments.
- Activity fuels would be handpiled and burned or jackpot burned in all treatment units. In lodgepole pine units, activity fuels in excess of 15 tons per acre would be jackpot burned, except in riparian areas. Activity fuels would be hand piled and burned within RHCA's. To reduce detrimental soil disturbance and protect existing aspen regeneration, mature trees, and root systems from adverse impacts of machine piling, activity fuels exceeding 4-15 tons per acre would be hand piled and burned within aspen clones in units 52-M, 53-S, 54-S, 60-S and 700-S. Slash remaining within aspen clones in these units would be scattered and/or piled as needed to discourage livestock access to the clones. Slash exceeding 4-15 tons per acre would be jackpot burned outside aspen clones in units 52-M, 53-S, 54-S, 60-S and 700-S and

the remainder of the aspen units. Slash piles would be burned in the late fall or early winter.

- Two slash piles per acre would be retained to provide habitat for small mammals and as a source of prey for raptors.
- Ground-disturbing activities (tractor skidding, etc.) on wet soils (when soil moisture is near field capacity) would be avoided to minimize detrimental soil compaction and puddling.
- All ponderosa pine, regardless of size, within treatment units would be retained.
- Hauling would be restricted to drier or frozen conditions so that rutting would not be a common or frequent occurrence on the haul routes.
- Standard contract clauses would be used to ensure all equipment undercarriages are power-washed prior to initial entry to logging areas to prevent introduction and spread of noxious and invasive weeds.
- All applicable forest plan standards, best management practices, PACFISH measures and lynx habitat standards would be implemented to comply with the FLRMP, state water quality standards, PACFISH, and the Lynx Conservation Assessment and Strategy.
- Draft suction hoses used for dust abatement or road maintenance would be equipped with a screen of 3/32 mesh or less and would have an intake flow of less than one foot per second to prevent entrainment of fish or amphibians.
- Water would be drafted at a rate that would not decrease the wetted width of the channel.

Road Treatments

- Approximately three miles of road currently closed to motorized vehicle travel would be opened to motorized vehicle travel year-round.
- Approximately 3.5 miles of road currently closed to motorized vehicle travel would be changed to a seasonally open to motorized vehicle travel status.
- Approximately 4.4 miles of road currently open to motorized vehicle travel year-round would be changed to a seasonally open to motorized vehicle travel status.
- Approximately 4.7 miles of road currently open to motorized vehicle travel would be closed to motorized vehicle travel.
- Approximately 13 miles of road would be decommissioned through project implementation.
- Approximately 24 miles of open roads would be maintained and/or added to the forest road system and would remain open. Of these miles, 8.6 miles would be used to access treatment units during implementation.
- Approximately 11.7 miles of roads currently closed to motorized vehicle access would be added to the forest road system and would remain closed. Of these miles, about 3.2 miles would be temporarily opened to access treatment units during project implementation and then reclosed.
- Approximately 16 miles of open or closed non-system roads would be added to the forest road system.
- At "Racetrack Meadow" (T23N, R21E, NW¼/NW¼ Sec.31), the following actions would be implemented to reduce the impacts of motorized vehicle travel to the wet meadow:
    - Restore the original alignment of about 600 feet of an existing two-track from the middle of the meadow to the northwest edge of the meadow (above the water table). (Note: The route realignment would be as indicated on the USGS Ulysses Mountain SE quadrangle, 1974.) The realigned route would be a low standard travel route (i.e., two-track/pickup truck clearance).

- Install two culverts (one at a spring location and the other in a small (3 – 8 inch channel). The only anticipated site disturbance would be for culvert installation. No excavation or surface blading would be necessary to establish the route's travel surface, and only one to two mature-size trees would need to be cut.
- Construct an approximately 700-foot jack/rail fence between the meadow and the re-located route to direct vehicle traffic toward the higher elevation route.
- At "Dump Creek Meadow" (T23N, R20E, NE¼/SE¼ Sec.13 & T23N, R21E, NE¼/SW¼ Sec.18), the following actions would be implemented to reduce motorized vehicle travel:
    - Close the two-track road that crosses the mouth of Diamond Gulch in Section 13 beyond the private land parcel.
    - Close the two-track entering the meadow at the turnoff to private land in Section 18.

Road Treatment Specifications

- When opening a closed or grown-in road for temporary use during proposed vegetation treatments, maintain the existing vegetative cover along the road to the extent possible. Limit blading to rock removal or necessary slough removal. Conifers or brush on the road surface would be removed by hand felling or pruning.
- Roads proposed for decommissioning and temporarily re-opened roads would be scarified with a harrow and seeded with a native or non-invasive seed mix.
- Where culverts are removed, the fill material would be pulled away from the stream to an angle of repose, mulched, and seeded to reduce sediment movement.
- The effectiveness of current road closures (gates, earthen berms, etc.) would be maintained following vegetation treatments.
- To minimize the potential effect of actions related to road maintenance, use, reopening, and closure during the project, the following mitigation measures must be followed. All ground disturbing activities such as vegetation removal, scarification, grading, and berming will be carried out entirely within the existing road footprint. Where vegetation removal in the roadbed is required to allow access, ground disturbance will be minimized by hand felling conifer regeneration and shrubs, and allowing only high blading. Earthen material for road closure berms must be taken from the existing roadbed or a pre-designated area and have no effect on known historic properties. Heavy maintenance equipment will travel the road prism, with exceptions for parking, passing, and turnarounds.

Location – T22N, R20E, Sections 1 and 12. T22N, R21E, all sections but 25,30-32 and 36. T23N, R20E, Sections 1, 2, 11-13, 24 and 36. T23N R21E, all sections but 13, 24 and 36. T24N, R21E, Sections 31 and 32.

Duration - Five years

Time Period - 2006 through 2011

Habitat and Species Presence/Use Information for the Project

Terrestrial Vertebrate Species/Status	Habitat Use		
	Reproduction	Foraging	Migration
Gray wolf (XN)	X	X	X
Canada Lynx (T)	P	P	P
Bald eagle (T)	NA	P	NA
Yellow Cuckoo (C)	NA	NA	NA
Wolverine (S)	P	P	P
Fisher (S)	NA	NA	NA
Western big-eared bat (S)	X	X	NA
Spotted bat (S)	NA	NA	NA
Harlequin duck (S)	NA	NA	NA
Peregrine falcon (S)	NA	NA	NA
Northern goshawk (S)	X	X	NA
Great gray owl (S)	X	X	NA
Boreal owl (S)	P	P	NA
Flammulated owl (S)	P	P	NA
Three-toed woodpecker (S)	P	P	NA
Spotted frog (S)	X	X	X
Greater sage-grouse (S)	NA	NA	NA
Pygmy rabbit (S)	NA	NA	NA

X = known to be present
P = potentially present, based on known habitat preferences

Plant Species	Suitable Habitat	Potential Habitat	Present
Pink agoseris (S)	-	X	P
Flexible collomia (S)	NA	NA	NA
Douglass' biscuitroot (S)	NA	NA	NA
Lemhi penstemon (S)	X	-	X
Salmon twin bladderpod (S)	NA	NA	NA
Marsh's bluegrass (S)	NA	NA	NA
Idaho range lichen (S)	NA	NA	NA

X = known to be present
P = potentially present, based on known habitat preferences

DISCUSSION OF EFFECTS

Federally Listed Species

The Forest Service is required to manage habitat and activities to promote recovery for listed species that occur on National Forest System lands (Forest Service Manual 2670.21 1995). The Forest Service is also required to avoid adverse effects to listed species and their habitats from Forest Service land management actions, unless such effects can be compensated or when a waiver is granted for exemption or incidental take (Forest Service Manual 2670.31 1995).

The U. S. Fish and Wildlife Service species list for the Salmon-Challis National Forest also displays one candidate species – the yellow-billed cuckoo (USFWS Species List #2006 SL 0547). Candidate species have no protection under the Endangered Species Act although the U. S. Fish and Wildlife Service recommends that potential effects be evaluated on a project-level basis when the candidate species occurs or may occur in the project area.

The bald eagle and yellow-billed cuckoo will not be analyzed for this project because the project area does not contain suitable habitat for these species. Refer to Appendix B for more information on habitat, population status and trend, viability threats, distribution and rationale for exclusion from analysis.

GRAY WOLF

Species Biology:

Range and Habitat - Historically, the gray wolf occurred in suitable habitat throughout the northern Rocky Mountains, including the state of Idaho (USFWS 1987). The gray wolf was largely extirpated from Idaho by the 1930s. Gray wolves were re-introduced to central Idaho in 1995 and 1996 by the U.S. Fish and Wildlife Service.

Wolves use a variety of habitats, but use primarily coincides with wild ungulate ranges, including winter range, summer range and calving/fawning areas (USFWS 1987). Important wolf habitat components for reproduction are denning sites and rendezvous sites.

Seasonal Distribution - Members of the Jureano wolf pack are present in the project area at least occasionally, based on monitoring flights conducted by the Idaho Department of Fish and Game and the U.S. Fish and Wildlife Service.

Population Size and Trend - Historically, the gray wolf occurred in suitable habitat throughout the northern Rocky Mountains, including the state of Idaho (USFWS 1987). The gray wolf was largely extirpated from Idaho by the 1930s. Gray wolves were re-introduced to Idaho in 1995 and 1996 by the USFWS. The USFWS, in cooperation with the IDFG is responsible for monitoring wolf population numbers and trend (USFWS et al. 2005). Since 1995, wolf numbers have risen rapidly and steadily. By the end of 2004, the USFWS estimated that the Northern Rocky Mountain wolf population (Idaho, Montana, and Wyoming) contained an estimated 835 wolves and 110 packs. Of these 110 packs, 66 packs met the definition for breeding pairs (USFWS et al. 2005).

The Northern Rocky Mountain wolf population contains three recovery areas, including the Central Idaho recovery area. At the end of calendar year 2004, the Central Idaho recovery area wolf population was estimated at 452 wolves and up to 44 packs. Last year (2004) marks the fifth consecutive year in which biological recovery goals for the Northern Rocky Mountain wolf population were met (USFWS et al. 2005).

Threats to the Species – The primary risk factor determining the population size and distribution is human-caused mortality (Wisdom et al. 2000). The major conflicts involve wolf predation on domestic livestock and the effects wolves have on wild ungulate populations (Mack and Laudon 1998). Wolves seem most likely to thrive long-term in more remote areas where they do not come into continual contact and conflict with humans (Wisdom et al. 2000).

Action Area:
The area of analysis for wolves is confined to the project area, located in the Central Idaho recovery area. Radio telemetry monitoring of wolves in central Idaho shows that wolves can roam very widely (Mack and Laudon 1998). However, the project area contains a core portion of the Jureano wolf pack's territory.

The quality of wolf habitat may be predicted in part by the quality of habitat for primary prey species. In central Idaho, the primary prey species for wolves are elk and mule deer. Population levels of these species are dependent on the amount and quality of winter ranges, an array of cover types and successional stages (both forested and non-forested) for cover and foraging throughout the year and escapement areas during hunting season (Ralphs et al. 1981).

The project area consists of more than 37,000 acres, of which about 31,000 acres are forested plant communities and almost 6,000 acres are rangeland or wetland plant communities (Table 1 below). These plant communities are represented by a variety of cover types and structural stages. Another 470 acres consists of rocks (boulder fields, talus, scree, etc.), which are not considered wolf habitat.

Table 1. Wolf Habitat by Plant Community

Non-Forested/Rangeland Communities					*Forested Communities***			
Bunch Grass	***Graminoid / Forb***	***Sage / Grass***	***Evergreen Shrub***	***Wetlands****	***Deciduous Shrub****	***Deciduous Tree****	***Young Conifer Forest***	***Mature Conifer Forest***
1,243 ac.	715 ac.	3,847 ac.	13 ac.	56 ac.	56 ac.	1,153 ac.	13,080 ac.	17,040
Total Non-Forested/Rangeland Communities – 5,874 acres					***Total Forest Communities – 31,329 acres***			

* The acreage of wetlands and deciduous communities is underestimated due to conifer encroachment.
**Includes burned, harvested and unharvested conifer stands

This array of plant communities provides for the various seasonal needs of wild ungulates throughout the year, but is especially valuable during the spring and summer months. Mule deer are present in or near the project area year-round. Elk typically are present seasonally, from spring through fall. Winter range within the project area is presently little used by elk, which tend to move north and west of the project area during the winter months.

Approximately 1,645 acres in the eastern portion of the project area between Wallace Creek and

Diamond Creek burned in 2000. Plant communities in the burned areas have been set back to an earlier successional stage due to the fire. There will be increased grass, forb and shrub (both deciduous and sprouting species) production in the burned areas for up to several decades. This increase will then gradually taper off as conifers or non-sprouting sagebrush species regenerate in the burned areas (Brown and Smith 2000).

Exposure to Project Activities:
Wolves may occur anywhere within the project area. However, no harvest units are located in or near (within 2 to 5 air miles) a known wolf den or rendezvous site. Sustained direct effects to wolves from the proposed action would be improbable since wolves typically travel miles in a day. If there were any contact, it would likely be only short, chance encounters between harvest personnel and wolves. Since the majority of the road system in the project area is open to year-round motor vehicle travel and is heavily used, the likelihood of timber harvest personnel encountering wolves seems no greater than other forest users.

Project Effects Analysis:
Direct Effects
Human-caused mortality is recognized as the major factor determining the success of wolf recovery efforts (Wisdom et al. 2000). Road density is recognized as a factor that limits wolf recovery and yields underutilization of suitable habitat (Wisdom et al. 2000). The degree of human presence and motor vehicle traffic rises as road densities rise, resulting in an even higher likelihood of negative encounters. Road densities in the project area are high to very high, as shown in Table 2 below.

Table 2. Analysis Area Roads and Road Density Summary

Sub-Watershed	*Total Road Miles*	*Open Road Miles*	*Open Road Density*	*Closed Road Miles*	*Closed Road Density*	*Total Road Density*
Dump	40.0 mi.	22.55 mi.	1.74 mi./mi.^{2}	17.45 mi.	1.47 mi./mi.^{2}	3.2 mi./mi.^{2}
Fenster	64.92 mi.	52.23 mi.	2.41 mi./mi.^{2}	12.69 mi.	0.59 mi./mi.^{2}	3.0 mi./mi.^{2}
Moose	102.49 mi.	81.95 mi.	2.07 mi./mi.^{2}	20.54 mi.	0.52 mi./mi.^{2}	2.6 mi./mi.^{2}
Wagonhammer	20.11 mi.	8.65 mi.	0.53 mi./mi.^{2}	11.46 mi.	0.69 mi./mi.^{2}	1.2 mi./mi.^{2}
Wallace	82.16 mi.	52.49 mi.	2.26 mi./mi.^{2}	29.67 mi.	1.28 mi./mi.^{2}	3.6 mi./mi.^{2}
Analysis Area	***309.68 mi.***	***217.87 mi.***	***1.8 mi./mi.^{2}***	***91.81 mi.***	***0.91 mi./mi.^{2}***	***2.7 mi./mi.^{2}***

The overall road density in each of the sub-watersheds within the analysis area is quite high, with the exception of the Wagonhammer sub-watershed. That portion of the Wagonhammer sub-watershed within the analysis area has low road densities due to a lack of commercially valuable timber. Throughout the remainder of the analysis area, however, overall open road densities are more than two miles per square mile: a high road density as rated by the Interior Columbia Basin project (USFS 1996).

In addition, these ratings can be misleading since the road densities are calculated based on total acreage of the sub-watershed. However, the road densities within the Moose sub-watershed depicted in Table 2 above are diluted by the roadless areas contained within the sub-watershed. Actual road densities within several drainages within the Moose sub-watershed are much higher road than those depicted in Table 2. For example, actual road densities are particularly high in

the Daly Creek drainage, at 5.0 miles per square mile. This ranks as an extremely high road density, based on road density classes as rated by the Interior Columbia Basin project (USFS 1996).

The density of year-round open roads in the analysis area, by sub-watershed and as a whole, is also high. Seventy percent of the roads in the analysis area are open to motor vehicle travel year-round. In most sub-watersheds, the density of open roads far exceeds that of closed roads.

Under Alternative 4, the effective amount of road miles proposed for closure that would benefit wolves is 9.5 miles. This would yield very little improvement in overall road densities or closed road densities over the current condition, given the high amount of road miles and road densities in the project area. The travel management changes proposed under Alternative 4 would contribute little to reducing the risk of human-caused mortality to wolves.

Beneficial indirect effects to wolves would primarily be related to indirect effects to elk and deer. The proposed timber harvest would create new transitory forage for elk and deer, offsetting a loss of current forage as older cutting units from previous timber harvest regenerate. The almost 1,000 acres in the proposed lodgepole pine units would provide improved foraging habitat for elk and deer soon after treatment. Graminoid production would improve in some units to benefit elk while deciduous shrubs would release and regenerate in other units to benefit deer. Quaking aspen is recognized as prime habitat for elk and deer (DeByle and Winokur 1985). Aspen bark, stems, green leaves and fallen leaves are all highly palatable and nutritious, providing wild ungulates with quality year-round foraging opportunities. Understory forage production in healthy aspen clones is generally quite high compared to adjacent uplands. The proposed harvest could boost forage production over more than 500 acres. Since the proposed harvest would benefit elk and deer by improving foraging habitat, it would also indirectly benefit wolves.

Travel through the Racetrack Meadows would be closed to motor vehicle traffic whenever the meadows were wet enough for motor vehicle traffic to create ruts deeper than four inches on unclassified road #U232636 (e.g. spring and early summer, early to mid fall and whenever there was a wetting rain). This will be impossible to enforce and is the equivalent of no protection to these meadows whatsoever. Deleterious impacts to soil, vegetation and watershed resources will not diminish if motor vehicle operators do not honor this closure. The two-track roads (#60051 and U232118E) leading into and across Dump Creek Meadows would be closed to motor vehicle travel seasonally from September 30 to June 15 annually. Eliminating motor vehicle travel, in conjunction with improve cattle management, would contribute toward recovery of this meadow system. The proposed changes to motor vehicle travel through Racetrack and Dump Creek Meadows, if successful, would be beneficial.

Detrimental indirect effects to gray wolves would be connected to: (1) the risk of introducing and spreading noxious weeds and (2) road densities and travel management. Noxious weeds threaten prey species' habitat while high road densities and poor travel management affect wolves and ungulates through disturbance and an increased risk of mortality.

As discussed above, the proposed timber harvest would increase transitory forage resources for wild ungulates. However, the heavy equipment and support vehicles used in timber harvest

operations, as well as the increase in soil disturbance in harvest units and along roads, amplify the risk of weed establishment and spread. The transmission of noxious weeds into currently un-infested areas or establishment of new weed species in the project area could quickly offset these gains in forage.

Current noxious weed management in the project area is aimed at preventing new invaders and numerous new infestations as well as controlling large existing infestations of spotted knapweed. Although elk and deer use a wide variety of cover types and structural stages, the amount and condition of winter ranges can often be a limiting factor for wild ungulate herds (Ralphs et al. 1981). Plant communities comprising wild ungulate winter range in the project area are those most threatened by noxious weeds.

Nonetheless, riparian areas, harvest units and aspen and conifer stands are increasingly at risk as new invaders appear in the county. The likelihood of new invaders establishing, such as hound's-tongue, hawkweed or blue weed, increases this threat to wild ungulate populations. The increased spread of noxious weeds in the project area would be deleterious to elk and deer (Sheley and Petroff 1999) and therefore detrimental to gray wolves as well.

The degree of risk associated with this alternative would depend on the district's ability to rapidly detect and eradicate new infestations resulting from implementation. In turn, this ability is dependent on the success of prevention measures, such as equipment washing, and on adequate funding for weed detection and control. However, funding for weed management on the forest is projected to decline, greatly decreasing the chances for sustained weed management in and around the project area. Prevention measures to reduce the potential for introducing and spreading noxious weeds are, therefore, vital. These include mandatory harvest equipment washing and inspection and minimizing the amount of soil disturbance when re-opening or maintaining roads to be used during timber harvest. While these measures reduce the risk of transmitting noxious weeds, they cannot eliminate it.

Road density control and effective motor vehicle travel administration are crucial components to the management of wild ungulates and gray wolves. Benefits of effective roads and travel management include not only a reduced risk of human-caused mortality to wolves, but also better utilization of the habitat by wild ungulates and a reduced rate of weed transmission. Alternative 4 proposes minor improvements in road densities and travel management.

Approximately 8.5 miles of currently closed roads would be re-opened for timber harvest. Five miles would be reclosed to motor vehicle travel or decommissioned. The other 3.8 miles would remain open to all motor vehicle travel year-round. Almost 13 miles of road would be decommissioned under Alternative 4 as compared to more than 30 miles under Alternative 2. Of these 13 miles, 3.6 miles are already closed to motor vehicle use and 9.2 miles are currently open to motor vehicle use. In addition, another five miles of road currently open to motor vehicle use would be closed year-round, for a total of 18 miles. Approximately 1.6 miles of road currently open to year-round vehicle travel would be shifted to seasonal use. Once timber harvest activities were complete, travel on road #60329 would be permitted from December 15 through April 1, annually. Effectively, however, this equates to 14 fewer miles of open road in the project area since 3.6 miles are already closed to motor vehicle travel.

Under Alternative 4, current motorized travel restrictions on several road systems would be relaxed. The original road closures were intended to provide some measure of habitat security during the general rifle elk and deer hunting seasons. Road #60170 (a little over two miles) currently closed year-round to motorized vehicle traffic would be opened to motor vehicles seasonally from May 15 to September 30 annually. The six-mile #60183 loop road is currently managed under a seasonal closure, with motor vehicles prohibited from September 25 to December 15 annually to provide big game security. The eastern gate on this loop would be relocated to permit year-round motor vehicle traffic on an additional mile of road. Travel on road # 60051 (1.4 miles) would also be permitted from May 15 to September 15 annually, however, the fall closure will be very difficult to enforce. Together, these changes would total 4.5 miles. This would offset the 14 miles of proposed decommissioning and road closures, decreasing effective miles closed under this project to 9.5 miles.

The travel management changes proposed under Alternative 4 would contribute little to improve habitat capability over the existing condition in gray wolf and wolf prey species' habitat in the project area. Neither would the rate of spread of noxious weeds from motor vehicle traffic, which is a major vector of noxious weed seeds and other reproductive propagules, be appreciably reduced.

Determination of Effects and Rationale:
The effect of project activities to gray wolves in the action area would be inconsequential. This rationale is based on: (1) the well-established gray wolf population in central Idaho, (2) the potential for direct effects such as disturbance to active wolf dens or rendezvous sites or human-caused wolf mortality in association with project activities and (3) impacts to wolf and wild ungulate habitats.

The likelihood of direct adverse encounters with timber harvest personnel is no greater than encounters with any other humans in the project area. The nearest known den site for wolves is located outside the project area and is about five air miles from project area activities. Although project activities would be spread out over a five-year period, there would be no activities occurring during the denning and early rearing period. Annual operations would not begin until after July 31 yearly, eliminating the possibility of project activities disturbing an active den site. There are no harvest units within 2 air miles of any known rendezvous sites. Although project activities are distributed throughout the project area, the magnitude of disturbance overall is small since only a portion of proposed activities would occur annually. Although the travel management measures proposed under Alternative 4 would provide little benefit to wolves, the proposed timber harvest would be advantageous for wolves by creating new transitory forage areas for wild ungulates. This would be beneficial to elk and deer and, therefore, to wolves, provided weed management measures are applied effectively. Accordingly, implementation of activities proposed under Alternative 4 would have ***no effect*** to the central Idaho non-essential, experimental gray wolf population.

CANADA LYNX
Species Biology:
Range and Habitat – The Salmon-Challis National Forest is located in the Northern Rocky

Mountains Lynx Geographic Area, consisting of Idaho, western Montana, eastern Oregon, eastern Washington and western Wyoming. Idaho lays within the historical range of Canada lynx (Ruediger et al. 2000). Lynx were historically known to occur in the northern and central portions of the state, with occasional records of transient lynx in southern Idaho counties. There have been only two recent verified occurrences of lynx in Idaho since 1991, one from the Boise National Forest and another from the Clearwater National Forest (Dick Wenger, National Lynx Biology Team, personal communication 1/21/2004).

In Idaho, the primary types of vegetation suitable as lynx habitat are lodgepole pine, subalpine fir, Engelmann spruce and moist Douglas-fir communities at mid to higher elevations (Ruediger et al. 2000). Dense multi-storied stands of mature conifers and young regenerating conifer stands with a high density of trees provide excellent foraging habitat. Aspen clones, willow and other deciduous scrublands, high elevation shrub steppe communities interspersed with conifer forest and riparian areas also provide quality foraging habitat.

In addition to specific vegetation types, lynx also seem to prefer areas with gentle topography at mid-elevations (Ruediger et al. 2000). Lynx occur more often in gentle terrain; favoring rolling ridges, swales, benches, toe-slopes and u-shaped valley bottoms. Most lynx sightings in the western United States occur from about 5,000 to 7,000 feet in elevation (Ruediger et al. 2000).

Snowshoe hares are the primary prey for lynx while red squirrels are the most important alternate prey species (Ruggiero and McKelvey 1999). Forest grouse, other hare species, tree squirrels and a variety of rodents are also used as prey.

An important component of lynx habitat is the availability of suitable denning sites in close proximity to foraging areas (Ruediger et al. 2000). Stand structure is the most essential feature of a den site, with large downed logs a vital component (Ruediger et al. 2000). Substantial amounts of large woody debris are necessary to provide a high degree of overhead cover that protects kittens from predators and weather.

Seasonal Distribution – There are no current data to determine if there is a breeding population of lynx on the Salmon-Challis National Forest. There are occasional recorded observations of lynx on the Salmon-Cobalt Ranger District (NRIS Fauna database 5/2006). The project area contains mapped suitable lynx habitat (Ruediger et al. 2000) and lynx are thought to be present at least occasionally based on unverified lynx observations (a verified lynx observation is supported by DNA evidence; all other sightings are considered unverified) in adjacent watersheds.

Population Size and Trend – There are no reliable population estimates for lynx in the contiguous United States (Ruggiero and McKelvey 1999). The size of the lynx population in the Northern Rocky Mountains Geographic Area is unknown. However, lynx populations are believed to be small and often isolated (Ruggiero et al. 1994, Ruggiero and McKelvey 1999). The trend of lynx populations throughout the contiguous United States and in the Northern Rocky Mountains Geographic Area is likewise unknown.

The distribution of lynx coincides with the distribution of snowshoe hare (Ruggiero et al. 1994, Ruggiero and McKelvey 1999). In the northern part of lynx range, when snowshoe hare

numbers are low, more lynx die of starvation, fewer kittens are born and fewer survive to adulthood. Presently, it is not known whether snowshoe hare and lynx populations in the southern part of their range are as cyclic as they are in northern areas (Ruggiero and McKelvey 1999). If snowshoe hares do have measurable periodic cycles in the southern portions of lynx range, then lynx numbers may be expected to fluctuate as well in response to snowshoe hare numbers (Ruggiero and McKelvey 1999).

Moreover, it is possible that lynx populations at southern latitudes are population sinks that require constant replenishment from lynx migrating from northerly populations to maintain lynx numbers (Dick Wenger, National Lynx Biology Team, personal communication 12/15/2003). Habitat for lynx at southern latitudes is often naturally fragmented. The naturally fragmented and isolated nature of southern lynx habitat may not possess the energetics needed to sustain southern populations without continual input from northern lynx migrating southward.

Threats to the Species – Other risk factors are related to human uses and influences on lynx habitat (Ruediger et al. 2000, Wisdom et al. 2000). Lynx are vulnerable to human-caused mortality from trapping or shooting. Timber management, fire exclusion, road construction, livestock grazing and other human uses can indirectly influence lynx populations by altering habitat or increasing mortality. Habitat fragmentation and invasion of noxious weed species into lynx habitat are likewise recognized as threats.

Action Area:

Overview - The two lynx analysis units in which the project area is located comprise the area of analysis for Canada lynx. Lynx analysis units were delineated to represent, as a minimum, areas containing sufficient habitat to support resident lynx year-round (Ruediger et al. 2000). While they are not intended to depict actual lynx territories, lynx analysis units are to be used as the smallest scale for the evaluation of effects of management actions on lynx (Ruediger et al. 2000).

The project area is located within portions of the Moose Creek and Salmon City lynx analysis units. The Moose Creek lynx analysis unit includes the Moose Creek and Dump Creek drainages. The Salmon City lynx analysis unit covers the west Salmon River face from Henry Creek north to Bird Creek. Table 3 displays the acres of habitat by cover type for each LAU.

Table 3. Lynx Analysis Unit (LAU) Acreage Summary

	Moose Creek LAU	***Salmon City LAU***
Total Acres in LAU	47,977 acres	44,762 acres
Non-Lynx Habitat	11,257 acres	16,005 acres
Lynx Habitat:	***Acres by Cover Type***	
Aspen	Unknown	308 acres
Engelmann Spruce/Subalpine fir	7,182 acres	2,014 acres
Grass/Forb	1,141 acres	1,945 acres
Lodgepole Pine	19,841 acres	13,823 acres
Mesic Douglas-fir	8,303 acres	6,686 acres
Moist Upland/Riparian Shrub	64 acres	138 acres
Other Miscellaneous Cover Types	117 acres	2,042 acres
Upland Grass/Shrub	NA	1,470 acres
Whitebark Pine	72 acres	331 acres
Acres of Suitable Lynx Habitat	36,720 acres	28,757 acres

Denning Habitat - The Canada Lynx Conservation Assessment and Strategy requires that adequate denning habitat be present and well-distributed within each lynx analysis area. Denning habitat for lynx is defined as unharvested stands of mature conifers, conifer/deciduous types, or unthinned regenerating stands older than twenty years (Ruediger et al. 2000). Patches of denning habitat should be larger than five acres and must be within daily travel distance of quality foraging habitat. The total acres of denning habitat within a lynx analysis unit must comprise at least 10% of the lynx habitat with the lynx analysis unit.

Table 4 below displays acres of denning habitat within the Moose and Salmon City lynx analysis units and the percentage of lynx habitat within each lynx analysis unit that the denning habitat comprises. For this analysis, only unharvested and unburned stands of mature conifers were considered as denning habitat. The rationale for this decision is as follows: (1) Deciduous cover types are represented primarily by aspen, which constitutes a miniscule portion of the lynx analysis units. The majority of aspen clones in the lynx analysis units are currently in a degraded condition and do not contain features associated with quality lynx denning habitat. (2) Harvested stands of regenerating conifers older than twenty years were not considered to provide denning habitat. The harvested stands in these two lynx analysis areas typically do not have much woody debris remaining after harvest due to slash disposal treatments. (3) Neither were burned areas considered to provide denning habitat. While burned areas can provide denning habitat, there are very few acres of regenerating conifers in stands more than twenty years old resulting from fire in these two lynx analysis units.

Table 4. Denning Habitat Available per Lynx Analysis Unit

Acres per Cover Type in Old Forest, Multi-strata Structural Stage		
	Moose LAU	*Salmon City LAU*
Subalpine fir/Engelmann Spruce	4,974 acres	1,244 acres
Lodgepole Pine	2,155 acres	1,167 acres
Mesic Douglas-fir	4,659 acres	2,497 acres
Total Acres Denning Habitat	11,788 acres	4,908 acres
Total Acres Lynx Habitat	36,720 acres	28,757 acres
Percent of LAU in Denning Habitat	***32.1 percent***	***17.1 percent***

Foraging Habitat - There are over 5,000 acres of multi-storied lodgepole pine, subalpine fir, mesic Douglas-fir and mixed conifer stands in the project area. Research in progress indicates that mature, multi-storied subalpine fir, mesic Douglas-fir and mixed conifer stands may be more important to snowshoe hares and, thus to lynx, than previously thought and may even be more important than early seral stands (Dick Wenger, National Lynx Biology Team, personal communication 12/2003). The research suggests that hares retreat into multi-storied stands that serve as refugia under marginal conditions or at the low end of the snowshoe hare population cycle. Multi-storied stands can be used by snowshoe hares year-round while early seral stands may only be occupied on a seasonal basis. There is no harvest proposed in these 5,000 acres of multi-storied stands.

Current Status of Vegetatively Unsuitable Lynx Habitat - The Canada Lynx Conservation Assessment and Strategy limits the amount of vegetative disturbance to lynx habitat that can take

place in a lynx analysis unit to ensure that vegetation types necessary to lynx survival and reproduction are present (Ruediger et al. 2000). Table 5 below displays the acres and percent of lynx habitat in each lynx analysis unit that are currently in an unsuitable condition and the amount that has been converted to an unsuitable condition within the last ten years. "Unsuitable" is defined as vegetation in an early successional stage due to timber harvest or wildfire, in which the vegetation has not sufficiently re-established to support snowshoe hares year-round (Ruediger et al. 2000).

Table 5. Lynx Habitat in Unsuitable Condition per Lynx Analysis Unit

*Acres and Percent of Lynx habitat in Unsuitable Condition**		
	Moose LAU	***Salmon City LAU***
Timber harvest within last ten years	93 acres	222 acres
Timber Harvest between ten and twenty years	1,444 acres	590 acres
Harvest units thinned within last ten years	441 acres	132 acres
Wildfire within last ten years	< 1 acre	15 acres
Total Acres Lynx Habitat	36,720 acres	28,757 acres
Total acres of currently unsuitable lynx habitat	1,978 acres	959 acres
Total acres of lynx habitat converted to unsuitable in last ten years	534 acres	369 acres
Percent of lynx habitat currently in an unsuitable condition	5.4 percent	3.3 percent
Percent of lynx habitat converted to unsuitable in the last ten years	1.5 percent	1.3 percent

*Does not include aspen acreage

Exposure to Project Activities:

Lynx have been sighted by reliable observers in areas adjacent to the Moose and Salmon City lynx analysis units. Lynx hair snare surveys have not been conducted within either of these lynx analysis units. Ruggiero et al. (2000) define verified lynx observations as "...;a museum specimen or written account in which a lynx was either in someone's possession or observed closely, i.e., where a lynx was killed, photographed, trapped and released, or treed by dogs."

Nonetheless, lack of verified proof that lynx are present does not constitute absence and the presence of lynx within the Moose and Salmon City lynx analysis units cannot be precluded. The unverified sightings were made by individuals with familiarity with lynx in Alaska. The Moose and Salmon City lynx analysis units contain suitable year-round habitat for lynx. Potential lynx denning and foraging habitat will be affected by the project activities proposed under Alternative 4. Therefore, as a conservative approach, it is assumed that lynx may be present year-round in the Moose and Salmon City lynx analysis units based on the unverified sightings. With the assumption that this is a reasonable premise, lynx might be encountered in the Moose and Salmon City lynx analysis units.

Project Effects Analysis

Thirteen proposed treatment units (1S, 5S, 11S, 18S, 20S, 22S, 29S, 56S, 58S, 59S, 61S, 63S and 700S) are not located in lynx habitat and therefore would not affect lynx. The effects of harvest in these units will not be analyzed for lynx.

A total of 512 acres of lynx habitat is proposed for harvest in the Moose lynx analysis unit under Alternative 4. This includes all of twenty-four proposed lodgepole pine units and portions of four others (21M, 25S, 27S, 30S) and one aspen unit (53M).

A total of 412 acres is proposed for harvest in the Salmon City lynx analysis unit under Alternative 4. This includes all of 12 proposed units (ten lodgepole pine units and two aspen units) and portions of 13 other units (nine lodgepole pine units and four aspen units.)

The proposed lodgepole pine treatments would eliminate habitat for pine squirrels, a secondary prey species for lynx, for thirty to fifty years. However, the timber harvest in lodgepole pine would set these stands back to an early seral stage, which would favor snowshoe hare, the primary prey species for lynx.

The proposed lodgepole pine treatments would temporarily eliminate cover for snowshoe hare and for lynx. However, the units would, in time, provide excellent foraging opportunities for snowshoe hares and therefore, for lynx. Within two to three decades, the vegetation in these units will provide optimal habitat for snowshoe hares. These new units would then replace existing units in which the conifer regeneration will soon grow to the point where its value to snowshoe hares has lessened, providing a continuum of foraging habitat over time. This is consistent with direction in the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000).

The proposed aspen treatment units are not located in stands of subalpine fir, mesic Douglas-fir or mixed conifers, with the exception of units 52M, 53S and 54S. Commercial timber harvest of conifers in the other aspen treatment units would consist mostly of lodgepole pine and smaller Douglas-fir. These treatments would not affect mature, multi-storied stands of subalpine fir, mesic Douglas-fir or mixed conifers.

The proposed aspen treatments are intended to establish self-sustaining regenerating stands of aspen. This is consistent with direction in the Canada Lynx Conservation Assessment and Strategy, which recognizes the value of regenerating aspen stands to snowshoes hare and other lynx prey species (Ruediger et al. 2000). Forb and graminoid production could substantially increase within a few years of treatment if cattle are successfully managed after implementation. These treatments would benefit lynx prey species and contribute to stable prey bases for lynx.

Implementation of this alternative will not substantially decrease the amount of denning habitat currently available in either lynx analysis unit. Table 6 depicts changes that would occur to lynx denning habitat in each lynx analysis unit from implementation of Alternative 4.

Table 6. Changes to Lynx Denning Habitat

	Moose LAU	*Salmon City LAU*
Acres Affected	115 acres	135 acres
Percent Change in Denning Habitat	- 0.3 percent	- 0.5 percent
Percent Denning Habitat	31.8 percent	16.6 percent
Meets standard to maintain at least 10% of lynx habitat as denning habitat?	Yes	Yes

Implementation of Alternative 4 would alter these percentages slightly. Table 7 depicts the conversion of suitable lynx habitat to an unsuitable condition if this alternative were implemented. This table does not include aspen clones proposed for treatment, almost all of which are already in unsuitable condition due to grazing impacts and forest succession (see Aspen above). Nonetheless, adding estimated aspen acreage to unsuitable habitat would change the figures given below less than one percent.

Table 7. Lynx Habitat changed to an Unsuitable Condition by Project Implementation

Acres and Percent of Lynx habitat Converted to Unsuitable Condition*		
	Moose LAU	**Salmon City LAU**
Total Acres Lynx Habitat	36,720 acres	28,757 acres
Total acres of currently unsuitable lynx habitat (not including aspen)	1,978 acres	959 acres
Total acres of lynx habitat converted to unsuitable in last ten years	534 acres	369 acres
Total acres of lynx habitat converted to unsuitable by Alternative 4	512 acres	412 acres
Percent of lynx habitat in an unsuitable condition after implementation	6.8 percent	4.8 percent
Percent change from existing condition to post-implementation	+ 1.4 percent	+ 1.5 percent
Meets standard of ≤30% of habitat in a currently unsuitable condition?	Yes	Yes
Percent of lynx habitat converted to unsuitable within ten years	2.8 percent	2.7 percent
Percent change from existing condition to post-implementation	+ 1.3 percent	+ 1.4 percent
Meets standard of ≤15% of habitat converted to unsuitable in ten years?	Yes	Yes

*Does not include aspen acreage

Lynx appear to be able to survive with some degree of human presence. However, the threshold at which human presence and activities negatively affect lynx are unknown (Ruediger et al. 2000). Some human activities are detrimental to lynx. Trapping is recognized as a significant source of mortality for lynx (Ruediger et al. 2000). Even incidental take of lynx during coyote and bobcat seasons can result in mortality levels that affect low-density lynx populations (Wisdom et al. 2000). Den site disturbance could impact lynx production, a concern in small, isolated low-density populations (Ruediger et al. 2000). Road density is one factor determining lynx vulnerability to trapping and other forms of human disturbance, including mortality from vehicle collisions (Ruediger et al. 2000). The degree of human presence and motor vehicle traffic rises as road densities rise, resulting in an even higher likelihood of negative encounters.

Road densities in the project area are presently high to very high (refer to Tables 3 and 4 above for road densities and miles of open and closed roads). Current research suggests that lynx may do best in areas with low levels of human presence and activity (Ruediger et al. 2000, Wisdom et al. 2000). Alternative 4 would provide very little improvement over current conditions in terms of road densities and travel management within lynx habitat. This lack of improvement would be most significant in the Daly Creek drainage, which contains quality lynx habitat, but a very high road density.

Winter recreation is suspected to negatively affect lynx populations through disturbance and by providing access along packed snowmobile trails to bobcats and coyotes into areas where they typically could not go due to deep snow (Ruediger et al. 2000, Wisdom et al. 2000). These species are believed to be potential competitors with lynx for winter prey.

The project area is heavily used for snowmobile recreation. Any roads open to motorized

vehicles may be traveled by snowmobiles during the winter. There are a number of regularly groomed snowmobile trails in the Moose and Salmon City lynx analysis units as well. There are about 30 miles of groomed snowmobile trails in or along the boundaries of the Moose lynx analysis unit and up to 55 miles of groomed snowmobile trails in or along the boundaries of the Salmon City lynx analysis unit.

The effects of road densities and traffic density on lynx are largely unknown (Ruediger et al. 2000). Therefore, the calculation of suitable and unsuitable lynx habitat during timber sale planning does not consider road densities. Nevertheless, the Lynx Conservation Assessment and Strategy considers road densities greater than two miles/mile^2 to be high. The strategy recommends that roads in lynx habitat with high road densities be prioritized for seasonal closures or reclamation (Ruediger et al. 2000). However, this is a guideline rather than a conservation standard requiring compliance.

Total and open road densities in lynx habitat in the Moose and Salmon City lynx analysis units would remain essentially the same. Within Moose lynx analysis unit, there would be no decrease in open road densities and a 0.2 percent decrease in total road densities. Within the Salmon City lynx analysis unit, there would be no decrease in open road densities or total road densities. This is not consistent with road density guidelines in the Lynx Conservation Assessment and Strategy (Ruediger et al. 2000).

Two minor travel management changes, if successful, have the potential to benefit lynx indirectly through enhancements to habitat used by secondary prey species. Travel through Racetrack Meadow would hypothetically be closed to motor vehicle traffic whenever the meadows were wet enough for motor vehicle traffic to create ruts deeper than four inches (e.g. spring and early summer, early to mid fall and whenever there was a wetting rain). This will be impossible to enforce and is the equivalent of no protection to these meadows if motor vehicle operators do not honor this closure. Deleterious impacts to soil, vegetation and watershed resources would not diminish otherwise. The two-track roads (#60051 and U232118E) leading into and across Dump Creek Meadows would be closed to motor vehicle travel seasonally from September 30 to June 15 annually. Eliminating motor vehicle travel during the wet season, in conjunction with improve cattle management, would contribute toward recovery of this meadow system. The proposed changes to motor vehicle travel through Racetrack and Dump Creek Meadows, if successful, would be beneficial to lynx.

The Lynx Conservation Assessment and Strategy recognizes noxious weeds as one of the risk factors affecting conservation of lynx populations (Ruediger et al. 2000). The viability of lynx populations is threatened indirectly through the changes in plant community composition that occur when noxious weeds invade and establish in the various habitats necessary to snowshoe hare and secondary prey species.

Aspen, conifer, meadow, riparian and wetland plant communities within lynx habitat are at risk from noxious weed invasion resulting from project implementation. The heavy equipment and support vehicles used in timber harvest operations, as well as the increase in soil disturbance in harvest units and along roads, amplify the risk of weed invasion and spread. The transmission of

noxious weeds into lynx habitat would offset the potential benefits of the proposed action to lynx.

The degree of risk associated with this alternative would depend on the district's ability to rapidly detect and eradicate new infestations resulting from implementation. In turn, this ability is dependent on the success of prevention measures, such as equipment washing, and on adequate funding for weed detection and control. However, funding for weed management on the forest is in decline. This decline is projected to continue, greatly decreasing the chances for sustained weed management in and around the project area. Prevention measures to reduce the potential for introducing and spreading noxious weeds are, therefore, vital. These include mandatory harvest equipment washing and inspection and minimizing the amount of soil disturbance when re-opening or maintaining roads to be used during timber harvest. While these measures reduce the risk of transmitting noxious weeds, they cannot eliminate it.

Determination of Effects and Rationale:
While there are several potential adverse effects to lynx resulting from project implementation, the overall consequences of project activities to Canada lynx would be inconsequential. This rationale is based on: (1) the low potential for direct effects to lynx, such as disturbance to active lynx dens or human-caused lynx mortality in association with project activities, (2) project design features that mitigate potential adverse effects to lynx habitat and prey species' habitats and (3) adherence to applicable standards and guidelines contained in the Canada Lynx Conservation Assessment and Strategy (Ruediger et al., 2000).

The probability that lynx would be directly impacted by harvest activities is low. If lynx were present in the Moose or Salmon City lynx analysis units, they would occur at very low population densities. It is highly unlikely that more than one or two lynx would be present (Ruediger et al. 2000). Adult lynx would be able to move beyond the range of project activities, if disturbed. Since a majority of roads in the project area is open to year-round motor vehicle traffic and most units are located along open roads, there is no greater potential for timber harvest personnel to encounter lynx than other forest users. Project activities would be deferred until after July 31 annually, which would greatly reduce any potential for disturbance at a den site. By mid-July, kittens would be able to travel with their mother and would not be confined to the den (Ruediger et al. 2000).

Project activities would occur within or in close proximity to lynx habitat in the Moose and Salmon City lynx analysis units. All or portions of 29 harvest units would be distributed within the Moose lynx analysis unit and all or portions of 25 harvest units would be distributed within the Salmon City lynx analysis unit. This would yield a combined total of 912 acres modified by timber harvest within currently suitable lynx habitat in the two lynx analysis units. While project activities would be widely distributed in these two lynx analysis units, the magnitude of disturbance overall would be small since only a portion of proposed activities would occur annually over a five-year period.

Although implementation of Alternative 4 would have short-term adverse effects to snowshoe hares and secondary prey species, habitat for these species would eventually be enhanced through implementation. There would be increased forage production in the aspen units and in

lodgepole pine units with a deciduous shrub understory within a few years of treatment. Over a longer time frame, new winter habitat for snowshoe hares would be created. Reduction or elimination of motor vehicle travel through wet meadows could improve wetland structure and function, as would improved cattle management. These improvements would benefit lynx secondary prey species. Mandatory measures to manage transmission of noxious weeds would acceptably reduce the risk posed to lynx habitat resulting from weed invasion.

There would be no snow removal on roads to access harvest units and therefore, no winter activity once snow accumulations close the roads. This mitigation eliminates potential direct and indirect adverse effects to lynx in the winter that could result from project activities. Note, however, that this mitigation does not apply to approved groomed snowmobile routes that traverse lynx habitat in the Moose and Salmon City lynx analysis units.

All lynx management standards contained in the lynx conservation assessment and strategy (Ruediger et al. 2000) pertinent to the proposed project would be met, with the possible exception of the aspen regeneration standard. This standard requires that harvest prescriptions favor regeneration of aspen and that grazing in aspen clones be managed to ensure successful sprouting sufficient to perpetuate the clones. While the harvest prescription is specifically designed to regenerate aspen, it will be difficult to fully meet the requirements of this standard under the current management of the Diamond-Moose cattle allotment.

Based on the rationale described above, implementation of activities proposed under Alternative 4 would have ***no effect*** to Canada lynx.

Forest Service Region 4 Sensitive Species

Plant and animal species designated as "sensitive" are identified by regional foresters as species for which population viability is a concern as evidenced by current or predicted downward trends in population numbers, density or habitat (Forest Service Manual 2670.5 1995). The Forest Service must implement management practices that ensure that sensitive species do not become threatened or endangered and must implement management objectives for populations or habitat of Sensitive species (Forest Service Manual 2670.22 1995).

A number of sensitive species will not be analyzed for this project. There is either no habitat in the project area for the species or the project area lies outside the existing distribution of the species. These include three animal species (spotted bat, fisher and pygmy rabbit), three bird species (peregrine falcon, harlequin duck and greater sage-grouse) and five plant species (Idaho range lichen, Marsh's bluegrass, Salmon twin bladderpod, Douglas' biscuitroot and flexible collomia). Refer to Appendix C for more information on habitat, population status and trend, viability threats, distribution and rationale for exclusion from analysis.

WOLVERINE

Species Biology:

Range and Habitat – Wolverines occur naturally at very low densities and tend to occupy very large home ranges that are based on the abundance and distribution of available food sources (Federal Register 12/2003). In the northern Rocky Mountains, wolverines typically are found in

mid to higher elevation montane forests, usually in remote locations (Ruggiero et al. 1994, Copeland 1996). Important habitat features include large snags and down logs, secure den sites, abundant primary and secondary prey species and escape cover (Ruggiero et al. 1994, Wisdom et al. 2000).

Reproductive dens are most often found in talus slopes in cirque basins, but wolverine may also den in down logs, hollow trees or cavities in live trees (Copeland 1996, Wisdom et al. 2000). Research indicates that female wolverines are sensitive to human disturbance at den sites (Copeland 1996, Wisdom et al. 2000).

Wolverines are opportunistic omnivores and scavengers (Ruggiero et al. 1994, Copeland 1996). Scavenging is particularly important during the winter. Wild ungulate carcasses are a mainstay of a wolverine's diet, including carcasses of animals that died of natural causes, of predation by other carnivores, animals wounded by hunters that later died and gut piles from animals harvested during big game hunting seasons. Small mammals and birds such as snowshoe hares, red squirrels, forest grouse and a variety of rodents are also eaten. They also eat fruits, berries and insects when available.

Seasonal Distribution – Wolverines are known to occur in central Idaho, including the Salmon-Challis National Forest (Copeland 1996). There are occasional records of wolverine observations on the Salmon-Cobalt Ranger District, including two observations within twelve to fifteen air miles of the project area (NRIS FAUNA database 5/2006).

Wolverine distribution coincides with the distribution of wild ungulates, particularly elk and mule deer. Wolverines exhibit an elevational shift in habitat use from summer to winter. During the summer, wolverines typically are found at higher elevations in the subalpine and alpine zones. During the winter, wolverines often move downward into montane forest communities.

Population Size and Trend – The wolverine is considered one of the most rare and least understood mammals in North America due to its low densities, low reproductive rate, large spatial requirements and solitary lifestyle (Ruggiero et al. 1994, Copeland 1996). The wolverine is assigned a global conservation status rank of G4, meaning that the species is not considered rare and is apparently secure across its range, but there are causes for long-term concern (NatureServe 2003).

The U.S. Fish and Wildlife Service recently announced a 90-day finding for a petition to list the wolverine in the contiguous United States. The service found that there is insufficient information regarding all aspects of wolverine ecology, current distribution and historical range. However, the service also found that wolverines are distributed in the states of Idaho, Montana, Washington and Wyoming in apparently stable populations. The service concluded that there is no substantive evidence to show listing the wolverine in the contiguous United States is warranted (Federal Register 12/2003).

The population of wolverine in the northern Rocky Mountains is unknown, but it is believed that numbers are low and that there has been a decline from historical levels across the wolverine's range in the northern Rocky Mountains (Ruggiero et al. 1994, NatureServe 2003). Wolverine

numbers may now be stable and increasing in the northern Rocky Mountains (Hash 1987, Wisdom et al. 2000, Federal Register 12/2003), although more monitoring is needed to verify this trend.

In Idaho, the wolverine has a state conservation priority rank of S2, which means that the species may be imperiled in the state because of rarity or other factors that make it vulnerable to extirpation from the state (NatureServe 2003). The population in Idaho may number about 100 animals, but this is largely speculation since snow track surveys conducted by the Idaho Department of Fish and Game and the Forest Service are capable only of documenting presence, not determining population size or trend (Chuck Harris, personal communication, 11/14/2003).

Threats to the Species – There are number of threats to wolverines throughout their range. These include increasing levels of backcountry summer and winter recreation, loss of large refugia to harbor thriving sub-populations, fragmentation and loss of dispersal corridors, trapping and illegal shooting mortality, high road densities and extensive timber harvest. The U.S. Fish and Wildlife Service has concluded that too little is presently known about wolverine population numbers, distribution and dispersion to determine the effects of these threats to wolverine population viability (Federal Register 12/2003).

Action Area:
The area of analysis for wolverines is confined to the project area. Wolverines travel very widely; even females with young kits may occupy home ranges of almost 30,000 acres (Ruggiero et al. 1994). The project area is large enough to demonstrate effects to a female wolverine with young kits. Enlarging the analysis area further, to imitate the average home range size of an adult male wolverine or a female without kits, would dilute project level effects.

Habitat quality for wolverines is partially predicated on the sufficiency of the area they inhabit to provide for the needs of their prey species, particularly wild ungulates (Ruggiero et al. 1994). Within the project area, the primary prey species for wolverines are elk and mule deer (although rodents are important on a seasonal basis). Mule deer are present in or near the project area year-round while elk typically are present seasonally, from spring through fall. Winter range within the project area is presently little used by elk, which tend to move north and west of the project area during the winter months.

Elk and mule deer are dependent on the amount and quality of winter ranges, an array of cover types and successional stages (both forested and non-forested) for cover and foraging throughout the year and escapement areas during hunting season (Ralphs et al. 1981). The project area consists of approximately 37,000 acres, of which about 31,000 acres are forested plant communities and 6,000 acres are rangeland or wetland plant communities. These plant communities (see Table 8) are represented by a variety of cover types and structural stages. This array provides for the various seasonal needs of wild ungulates throughout the year, but is especially valuable during the spring and summer months.

Table 8. Wolverine Habitat by Plant Community

Non-Forested/Rangeland Communities					*Forested Communities***			
Bunch Grass	*Graminoid / Forb*	*Sage / Grass*	*Evergreen Shrub*	*Wetlands**	*Deciduous Shrub**	*Deciduous Tree**	*Young Conifer Forest*	*Mature Conifer Forest*
1,243 ac.	715 ac.	3,847 ac.	13 ac.	56 ac.	56 ac.	1,153 ac.	13,080 ac.	17,040
Total Non-Forested/Rangeland Communities – 5,874 acres					*Total Forest Communities – 31,329 acres*			

* The acreage of wetlands and deciduous communities is underestimated due to conifer encroachment.
**Includes burned, harvested and unharvested conifer stands

The entire project area is put to a variety of human uses. Cattle occupy the Diamond-Moose allotment from spring through fall in the project area. The project area has been intensively managed for timber production and, correspondingly, has high road densities throughout. Timber harvest benefits wild ungulates and, therefore, wolverines, by furnishing new foraging areas. Conversely, road construction associated with timber harvest is detrimental to elk and deer as well as wolverines when the roads remain open to all motorized vehicle traffic year-round since habitat security and escapement are greatly compromised (Ralphs et al. 1981, Ruggiero et al. 1994).

Exposure to Project Activities:
Direct effects to wolverines from implementation of Alternative 4 would be improbable since wolverines typically travel many miles in a day. If there were any contact, it would likely be only short, chance encounters between harvest personnel and wolverines. Since the majority of the road system in the project area is open to year-round motor vehicle travel and is heavily used, the likelihood of timber harvest personnel encountering a wolverine seem no greater than other forest users.

Project Effects Analysis:
The balance of indirect effects of timber harvest to wolverines is uncertain (Ruggiero et al. 1994). Wolverines are habitat generalists in terms of foraging and seem to benefit from a diversity of cover types and structural stages (Wisdom et al. 2000). It is not certain though that all forest openings can be considered comparable. Research in Montana found that clearcuts and recent burns were avoided by wolverines while traveling (Hornocker and Hash 1981) while Copeland (1996) found that wolverines in his central Idaho study area routinely crossed natural openings. Based on this lack of knowledge it is not possible to determine the effects of the proposed vegetative changes to individual wolverines that may occupy habitat in the project area or to wolverine distribution and productivity. Since elk and deer are the primary prey species for wolverine, timber harvest practices that promote elk and deer productivity would seem to potentially benefit wolverine as well (Ruggiero et al. 1994).

However, if all habitat features necessary for wolverine reproduction and survival are not present, then promoting prey species' productivity is useless. There are thought to be several threats to wolverines resulting from vegetation alteration. Loss of mature montane and subalpine forest is believed to be detrimental since these forest types are important to successful wolverine reproduction (Wisdom et al. 2000). Likewise, the loss of snags is indicated as detrimental to successful wolverine production. There has been extensive harvest of the subalpine fir habitat

type in the project area, but most of this has been in the lodgepole pine cover type. Within the project area, high elevation conifer stands are unharvested, as is the majority of the Douglas-fir cover type. Riparian habitat conservation area buffers are applied to all intermittent and perennial streams as well as to wetlands. These buffers provide linkage among habitats in different cover types and structural stages.

Wolverines appear to be dependent on escape cover, secure den sites, mature forest stands and protection from human-caused mortality to maintain population numbers (Ruggiero et al. 1994, Wisdom et al. 2000). Therefore, in order for timber harvest to provide benefits to wolverine, provisions to retain these features would be necessary. The proposed action would provide for these needs overall. More than one hundred acres of talus and boulder fields within the project area suitable for denning would remain undisturbed. Snags and downed woody debris would be retained in harvest units as required by the forest plan. Patches of dense mature forest would be retained between harvest units and within riparian habitat conservation areas. Additionally, old growth retention stands in the analysis area would provide mature forest stands.

Nonetheless, under Alternative 4, the ongoing unsustainable loss of snags and the interruption of the wood decay cycle in the Douglas-fir/ponderosa pine cover type would essentially remain the same as the existing condition due to negligible changes in road densities and travel management. Likewise, these minimal improvements would do little to moderate the establishment and spread of noxious weeds associated both with the proposed harvest and with general motor vehicle traffic. As budgets to manage invasive species decline, prevention becomes correspondingly important. These shortcomings of Alternative 4 offset the potential benefits to be gained from the timber harvest, aspen restoration and enhancement of Douglas-fir old growth.

Human disturbance at den sites, trapping and hunting mortality are likewise identified as affecting wolverine populations (Ruggiero et al. 1994). Roads and road densities increase the probability of negative human-wolverine encounters (Wisdom et al. 2000). Road densities in the project area are high to very high (in excess of two to three miles/mile^2 in most sub-watersheds). Other than that offered by topography, there is virtually no security throughout much of the project area. Under Alternative 4, habitat security for wolverine and for their prey species would show little to no improvement over existing conditions.

Determination of Effects and Rationale:
Wolverines could plausibly be encountered anywhere within the project area and could be impacted by project activities. Proposed harvest units are distributed throughout the project area. Many units contain habitat attributes sought by wolverine or are in proximity to stands with the necessary habitat features. Almost 1,500 acres of timber harvest would occur over a five-year time span. However, only small areas would be impacted at any one time. Additionally, harvest operations would not be permitted until after July 31 annually. This late date for beginning operations would considerably reduce the potential for disturbance of an active wolverine den since denning and early rearing would have commenced in late winter/early spring.

The proposed timber harvest is likely to benefit elk and deer and indirectly wolverine as well from a foraging standpoint. Crucial features for denning, such as snags, large downed trees,

talus and boulder fields would not appreciably decline. The acreage of mature high elevation spruce/fir, mixed conifer and Douglas-fir stands would not be reduced. Conversely, Alternative 4 would not yield improvements over the existing condition for road densities and travel management. The high road densities and poorly regulated motor vehicle travel would continue to impact denning and habitat security.

Overall, due to a lack of substantive and effective road density and travel management improvements and loss of active weed management, habitat capability for wolverine and their prey species within the project area would decline with implementation of Alternative 4. However, there would be no loss of species' viability or habitat capability that could contribute to a trend toward federal listing. Project implementation ***may affect, but is not likely to affect*** wolverine across the forest.

WESTERN BIG-EARED BAT

Species Biology:

Range and Habitat – The western big-eared bat is categorized as a cave-dwelling species (Idaho State Conservation Effort 1995). This species is also known to frequent abandoned mine workings that contain suitable habitat attributes. The western big-eared bat occurs in a variety of habitats ranging from sagebrush communities to conifer forests, but its distribution within these habitats is limited by the availability of caves or old mine shafts and tunnels (Idaho State Conservation Effort 1995).

The western big-eared bat is a sedentary species that roosts colonially, using the same sites year after year (Idaho State Conservation Effort 1995). Appropriate roosting habitat for several purposes is crucial to western big-eared bats' use and persistence in any locale (Idaho State Conservation Effort 1995). Secure sites with the proper characteristics are necessary for maternity roosts, hibernacula (winter roosts), summer day roosts for males and non-reproducing females and for night roosts. In addition, maternity roost sites and summer day roosts need to be located close to quality foraging habitat. Maternity roosts and hibernacula are the roosts most crucial to the survival of western big-eared bat populations.

The important attributes of maternity roosts include temperature, dimension, light quality and airflow (Idaho State Conservation Effort 1995). Of these, temperature is the most critical; pregnant and lactating female and infant bats require specific temperature ranges for survival and growth of the young. Bats in maternity roosts are sensitive to disturbance, which can result in injury, abandonment or death of the infants.

Hibernacula selected by western big-eared bats usually have cold stable temperatures with moderate airflow (Idaho State Conservation Effort 1995). Western big-eared bats are known to rouse and change positions in the hibernacula throughout the winter in response to changes in temperature, airflow and humidity. They also emerge from hibernation when disturbed by humans. Bats disturbed by humans may not resume hibernation and often starve before spring.

Summer day roosts and night roosts often include a variety of sites ranging from caves and mines to culverts and bridges (Idaho State Conservation Effort 1995). These roosts are usually used by individual bats or small groups. Individual tend to return to the same summer day roosts, but

shift often between night roosts.

Western big-eared bats consume noctuid moths almost exclusively. They may also sporadically consume small amounts of other insects (Idaho State Conservation Effort 1995).

Seasonal Distribution – There are known locations of the western big-eared bat along the Salmon River corridor near Salmon (NRIS Fauna database 5/2006). Western big-eared bat are known to occur in the project area based on summer inventories. Hibernacula within the project area are unknown.

Population Size and Trend – The population numbers and trend of western big-eared bats throughout its range in western North America are generally unknown. The stability of populations appears to vary by location (Idaho State Conservation Effort 1995, Wisdom et al 2000). This species is considered most abundant in the western United States and in Mexico, but more rare in the east (NatureServe 2003). Substantial declines have been noted in some western states, such as California and Oregon (Idaho State Conservation Effort 1995).

Threats to the Species – Western big-eared bat numbers appear to have declined considerably from historical levels throughout the interior Columbia River basin due to anthropogenic threats (Wisdom et al. 2000). The same may be true for the population of big-eared bats in Idaho, due largely to roost disturbance in caves, lava tubes and mines (Idaho State Conservation Effort 1995). The species is considered very vulnerable to local extirpations that may contribute to a range-wide downward trend due to its restricted roosting requirements and sensitivity to human disturbance (Wisdom et al. 2000).

The western big-eared bat is assigned a global conservation status rank of G4, meaning that the species is not considered rare and is apparently secure across its range, but there are causes for long-term concern (NatureServe 2003). In Idaho, the western big-eared bat has a state conservation priority rank of S2? (? denotes uncertainties in the rank), which means that the species may be imperiled in the state because of rarity or other factors that make it vulnerable to extirpation from the state (NatureServe 2003).

The greatest threat to the western big-eared bat is loss of suitable roosting sites (Idaho State Conservation Effort 1995). The western big-eared bat is also very susceptible to human disturbance, especially at maternity roosts and hibernacula (Wisdom et al. 2000). Human disturbance, including destruction of roosting habitat, disturbance to maternity roosts and hibernacula from recreation and the deliberate killing of bats, poses a serious threat to this species' viability.

Action Area:
The area of analysis for western big-eared bats is confined to the project area. Effects to western big-eared bats would be limited to the stands proposed for treatment and would not extend beyond the project area.

There are a number of old abandoned mines within the project area, many of which are occupied by various bat species. Based on bat presence/absence surveys or reviews of mine characteristics

(complexity, temperature ranges, air flow, etc.), these sites are known to provide seasonal or year-round bat habitat. The forest has an active abandoned mines reclamation program. An important component of this program is maintenance of ingress/egress for bats while cleaning up and securing sites for human protection. Several mine sites in or near the project area have been reclaimed with design adaptations that meet the roosting needs of bats.

The western big-eared bat is a habitat generalist from a foraging perspective. This species uses a variety of cover types and structural stages, including edge habitat such as riparian areas or forest edges, open areas such as meadows and conifer forests (Idaho State Conservation Effort 1995). The project area contains a range of forested and non-forested cover types in a variety of structural stages. Western big-eared bats may use any cover type and structural stage that provides suitable conditions for noctuid moths.

The majority of foraging habitats for western big-eared bats within the project area are functional plant communities. However, the functionality of high value plant communities, particularly aspen, moist upland and riparian shrub, grass/forb meadow and wetlands, has been compromised in the last one hundred and twenty years. Fire suppression, forest succession, weed invasion and heavy grazing are each factors contributing to reduced habitat capability of these communities

Exposure to Project Activities:
There are no harvest units near sites occupied by western big-eared bats so there would be no direct disturbance to day roosts, hibernacula or maternity roosts. Harvest operations would not be active at night when bats emerge from roosts to drink and forage. Effects, whether beneficial or detrimental, to western big-eared bats would therefore be indirect or cumulative.

Project Effects Analysis:
Dense lodgepole pine stands, where many of the proposed lodgepole pine units are located, are unlikely to be used by big-eared bats currently due to high stem densities and the lack of an deciduous/herbaceous understory. Removing the majority of the overstory in these stands would increase production of deciduous shrubs and forbs, which could benefit western big-eared bats. Regeneration treatments in the proposed aspen units, if successful, would provide definite foraging benefits for western big-eared bats.

On the other hand, the proposed timber harvest could increase the rate of spread of existing noxious weed species within the project area or introduce new weed species. Unchecked noxious weed invasion would eventually create major changes in plant community structure and composition (Sheley and Petroff 1999). This could result in changes in the density and population composition of the noctuid moth species that are the primary prey species for western big-eared bats. Reductions of the prey base, in turn, would reduce habitat capability for western big-eared bats.

Determination of Effects and Rationale:
Western big-eared bats are present within the project area, but would not be directly affected by project activities, as no roosts would be impacted. Effects would be correlated to changes in the suitability of foraging habitats. Proposed harvest and aspen regeneration units are distributed throughout the project area, in reasonable proximity to roost sites to allow use by big-eared bats.

In conjunction with improved cattle management, the aspen regeneration treatments would improve almost 600 acres of potential foraging habitat western big-eared bats.

Conversely, there would be no reduction in road densities and no reduction in the rate of noxious weed transmission. Increased weed establishment, particularly in riparian areas and wetlands would offset the benefits to western big-eared bats. It is possible, therefore, that implementation of Alternative 4 would not enhance habitat capability for western big-eared bats in the project area. Nonetheless, project implementation would not contribute to a loss of species' viability or habitat capability across the forest that could establish a trend toward federal listing. Project implementation ***may affect, but is not likely to affect*** western big-eared bats across the forest.

NORTHERN GOSHAWK

Species Biology:

Range and Habitat – In the western United States, the northern goshawk occurs in montane coniferous forests (The Nature Conservancy, 1999). Ponderosa pine, Douglas-fir, spruce-fir and lodgepole pine cover types are usually selected by northern goshawks in the intermountain west. Occasionally aspen clones are also used. Important habitat components include mature to old forest stands, large trees, large snags, large downed logs and a variety of abundant prey (Hayward et al. 1990).

Northern goshawks typically nest in stands of mature or old conifers with a moderate to high degree of canopy closure and dense patches of large trees capable of holding their bulky stick nests (Hayward et al. 1990). Northern goshawks may also nest in a mosaic of younger forest stands, provided necessary structural components are present as small patches of mature forest with large trees (Federal Register 6/29/1998). Most nest stands are located on gentle terrain near water, often with a northerly exposure (Hayward and Escano 1989). On the Salmon-Challis National Forest, a number of northern goshawk nest sites have been located in lodgepole pine stands with a high degree of advanced dwarf mistletoe infestation.

Goshawks prey on a variety of small mammals and birds, including rodents, tree squirrels and ground squirrels, forest grouse and songbirds (Hayward et al. 1990). Northern goshawks readily forage in a range of forested habitats, including closed canopy forest with an open understory, open canopy forest, forest edges and meadows. Dense conifer stands with a high percentage of small understory trees do not provide suitable foraging habitat since northern goshawks hunt in the understory. Stands with these characteristics restrict goshawk flight and reduce growth of forbs that support goshawk prey species (Wisdom et al. 2000).

A northern goshawk pair's home range consists of three components; (1) the nest area, (2) a buffer area around the nest site, known as the post fledging-family area, where young goshawks learn to forage while still under the care of their parents and (3) a larger foraging area used by the adults (Graham et al. 1995). The nest area is usually quite small, often no more than 20 to 30 acres in size. A northern goshawk pair typically maintains several alternate nest sites within its territory (Reynolds et al. 1992). The post fledging-family area that surrounds the nest area is usually between 300 and 600 acres. Adult goshawks actively defend the nest area and post fledging-family area. The foraging area is typically quite large, ranging from about 5,000 acres to 10,000 acres in size (Reynolds et al. 1992). The foraging area is not actively defended from

other northern goshawk pairs. Northern goshawk pairs are faithful to their territory and return to them annually (Wisdom et al. 2000).

Seasonal Distribution – The northern goshawk is considered a rare resident in the upper Salmon River drainage (Roberts 1992). On the Salmon-Challis National Forest, northern goshawks occur primarily in mature to old stands of lodgepole pine or mixed conifers with a high degree of canopy closure and numerous large trees (Craig 1992, NRIS Fauna database 5/2006).

The most recent surveys for northern goshawks in the project area were conducted in June 2005. Goshawks were detected in the project area during this survey. Northern goshawks are also known to occur in the project area based on incidental observations (NRIS Fauna database 5/2006).

Northern goshawks are present on their nesting territories during the summer breeding season. Birds then typically migrate to lower latitudes during the winter, returning to their nesting territories each spring.

Population Size and Trend – North American Breeding Bird Survey data indicate an overall stable trend from 1966 through 2002 in the Western Breeding Bird Survey Region, which includes Idaho (Sauer et al. 2005). However, these data may be deficient in one or more ways and may not accurately reflect the real trend. For example, northern goshawks are typically detected at low levels by the Breeding Bird Survey, resulting in low sample sizes. Sample size is one factor that affects the accuracy of the data. In addition, the northern goshawk appears to be declining in one or more physiographic regions that comprise the Western Breeding Bird Survey Region (Sauer et al. 2005).

The northern goshawk is assigned a global conservation status rank of G5, meaning that the species is considered widespread, abundant and secure across its range (The Nature Conservancy 1999). In Idaho, the northern goshawk has a state conservation priority rank of S4, which means that the species is considered apparently secure and usually widespread. While an S4 species may be uncommon, it is not considered rare.

In 1997, a status review was initiated by the U.S. Fish and Wildlife Service in response to a petition for listing the northern goshawk in the United States west of the 100th meridian (Federal Register 6/29/1998). This status review found that the northern goshawk is still widely distributed throughout its historical range and that there is no evidence of a declining trend (Federal Register 6/29/1998). Based on this status review, the United States Fish and Wildlife Service found that listing the northern goshawk in the United States west of the 100th meridian was not warranted (Federal Register 6/29/1998). The 9th U.S. Circuit Court of Appeals recently upheld a 2001 decision made in U.S. District Court that ruled that the Fish and Wildlife Service was not arbitrary and capricious in coming to this decision (Center for Biological Diversity versus Badgley 2003).

Threats to the Species – While the northern goshawk is secure across its range, there have been widespread alterations to habitats historically occupied by this species (Federal Register 6/29/1998). Timber management practices that remove large trees and greatly reduce or

eliminate canopy closure have been identified as potential risks to northern goshawk populations (Federal Register 6/28/1998, The Nature Conservancy 1999). Past harvest techniques such as extensive clear cutting have altered the distribution, amount and structural features of goshawk habitat. However, the U.S. Fish and Wildlife status review concluded that changes in forest management have largely halted this decline and that habitat conditions for northern goshawks are improving in many areas (Federal Register 6/29/1998).

Action Area:
The area of analysis for northern goshawks is confined to the project area. At almost 31,000 acres, the forested portion of the project area is large enough to support several pairs of northern goshawks, which typically forage over 5,000 to 10,000 acres (NatureServe 2003). The project area would reasonably depict project level effects to these pairs.

The two primary cover types that support northern goshawk in the project area are the Douglas-fir/ponderosa pine and lodgepole pine cover types.

Table 9 displays the current condition of the Douglas-fir cover type within the project area.

Table 9. Current Condition of Douglas-fir by Structural Stage and Management Status

DF/PP Cover Type	Wildfire 1931 - 2000	Harvest < 40% canopy removal	Harvest > 40% canopy removal	Unharvested
Structural Stage				
Stand Initiation	1,684 acres	214 acres	1,612 acres	635 acres
Young Forest	1,276 acres	500 acres	928 acres	3,215 acres
Old Multi-Strata Forest	0	165 acres	802 acres	5,995 acres
Old Single Stratum Forest	0	16 acres	96 acres	925 acres
Total Acres	2,960 acres	895 acres	3,438 acres	10,770 acres
Percent of DF Cover Type	16 percent	5 percent	19 percent	60 percent

Table 10 displays the current condition of the lodgepole pine cover type within the project area.

Table 10. Current Condition of Lodgepole Pine by Structural Stage and Management Status

Lodgepole Pine (LPP) Cover Type	Harvest < 40% canopy removal	Harvest > 40% canopy removal	Unharvested
Structural Stage			
Stand Initiation	34 acres	994 acres	59 acres
Young Forest	38 acres	609 acres	978 acres
Understory Re-initiation	69 acres	219 acres	5,769 acres
Old Multi-Strata Forest	0	0	853 acres
Old Single Stratum Forest	0	0	0
Total Acres	141 acres	1,822 acres	7,659 acres
Percent of LPP Cover Type	percent	percent	·percent

Exposure to Project Activities:
Based on several inventories and incidental observations, northern goshawks are known to occupy the project area on a year-round basis. Douglas-fir, lodgepole pine and mixed conifer stands in the understory reinitiation, multi-strata young forest and old forest structural stages provide goshawk habitat in the project area. This includes about 9,000 acres of Douglas-fir, ponderosa pine, spruce/fir and lodgepole pine old forest structural stages that remain unharvested.

Over 12,000 acres of lodgepole pine and mixed conifer stands occur in the project area. Of this acreage, there are currently 7,600 acres of unharvested lodgepole pine (The last harvest of lodgepole pine in the project area occurred in 1997.) and a little more than 2,000 acres of unharvested mixed conifers in structural stages suitable for use by northern goshawks. Approximately 2,500 acres of lodgepole pine and a little more than 200 acres of mixed conifer stands have been harvested within the project area to date. All or most of the overstory was removed from these stands through timber harvest. These stands at the time of harvest would have provided suitable habitat for northern goshawks. Now, however, most lodgepole pine units are less than 30 years old and do not currently provide foraging or nesting habitat for northern goshawks. Few of the mixed conifer stands retain adequate overstory to provide nesting habitat, although there may be some opportunity for foraging. Therefore, at present, seventy-eight percent of lodgepole pine and mixed conifer habitat within the project area remains for use by northern goshawks while 22 percent has been rendered unsuitable by timber harvest.

The amount of time these stands will remain unsuitable for northern goshawks depends on time since timber harvest and productivity of the site. Most lodgepole pine stands on the forest typically require about eighty to one hundred years for trees to become large enough to provide nesting habitat for northern goshawks (BK Thin Program, 1993, 9/1/2005 model run). Since most lodgepole pine units were harvested between the 1960's and the 1980's, these stands will not provide even the minimal habitat requirements of northern goshawks for at least another thirty to fifty years.

Approximately 4,500 acres of Douglas-fir have been harvested in the project area to date. A majority of these acres was heavily harvested (50% to 90% of the overstory trees were removed). Most of these stands were harvested in the late 1970's to mid 1980's and are only 20 to 25 years old (the last harvest of Douglas-fir occurred in 1993). Few of these stands currently provide northern goshawk nesting habitat and most do not offer foraging habitat either. About 900 acres of harvested Douglas-fir and ponderosa pine were lightly harvested (forty percent or less of the overstory was removed). These stands continue to offer foraging habitat; a number also continue to provide nesting habitat.

Of the unharvested Douglas-fir in the project area, 8,500 acres occur in these three structural stages and are suitable for use by northern goshawks. Of the 900 acres of lightly harvested Douglas-fir in the project area, approximately 650 acres provide suitable northern goshawk habitat. This has yielded a reduction of three percent in suitable Douglas-fir habitat while 97 percent of the Douglas-fir habitat suitable for northern goshawks remains available for use.

About 970 acres of lodgepole pine in fifty proposed units would be harvested. Many of these units provide the habitat features selected by northern goshawks for nesting (refer to Habitat above). It is not known whether northern goshawks occupy territories in lodgepole pine stands proposed for harvest since surveys to date have not been successful in locating and defining northern goshawks territories in the project area. As top-level predators, northern goshawks typically occur at low densities (Braun et al. 1996) and it is possible that no northern goshawk nest territories would be harvested. However, since northern goshawks establish large territories, it is likely that at least some of the proposed harvest would occur in or near northern goshawk post fledging-family areas or foraging territories.

Project Effects Analysis:
No harvest would occur in the Douglas-fir cover type outside of aspen restoration units. Douglas-fir habitat suitable for use by northern goshawks would not otherwise be affected by the currently proposed timber harvest.

Northern goshawks are known to nest and forage in aspen stands set in a matrix of coniferous forest (NatureServe 2003). The current condition of many mature aspen clones in the project area appears to provide suitable nest sites for northern goshawks. Due to degraded understory conditions, far fewer appear to provide high quality foraging habitat. Nonetheless, most aspen clones in the project area are probably used at least occasionally by northern goshawks.

The proposed treatment in unit # 700S would have no effect to northern goshawks. The stand is located near the bottom edge of conifer distribution in the project area and is largely surrounded by sagebrush/grassland communities. While northern goshawks have been observed foraging occasionally along sagebrush ecotones, they nest in montane forest habitats (NatureServe 2003).

The proposed treatments are intended to set back forest succession and promote aspen regeneration (refer to section on Aspen above). The current condition of the clones proposed for treatment would be drastically altered (refer to Pileated Woodpecker above). Treated aspen clones could provide quality foraging opportunities for northern goshawks as the clones regenerated. However, even with the proposed mitigation measures, the aspen clones would provide only minimal conditions for nesting northern goshawks post-treatment. The treated clones would not provide northern goshawk nesting habitat for many decades since they require mature forest conditions with abundant large trees. In the future, the proposed aspen restoration, in conjunction with other restoration or rehabilitation projects, would contribute to enhanced habitat conditions in the future.

Northern goshawks depend on numerous snags and downed logs within closed canopy stands to provide a variety of abundant prey. Eighty percent of the overstory would be removed in the lodgepole pine units while twenty percent of the overstory would be retained in patches. While this would meet forest guidelines for snag retention and snag replacements, it would not meet the minimum needs of northern goshawks. Since the northern goshawk is an interior forest species that does not nest or forage in open areas, these units would no longer provide habitat for northern goshawks. Implementation of the lodgepole pine harvest would reduce habitat for northern goshawks in the project area by 970 acres for eighty to one hundred years.

The effects of harvest would be variable should northern goshawk territories coincide with proposed harvest, depending on several factors such as location, season and the amount of disturbance. If harvest were to occur in nest stands, the stands would be completely or partially destroyed by the harvest. This would require northern goshawk pairs to locate another nesting territory. The degree of the effect would depend on the pair finding another suitable stand that was not already occupied by another pair.

If the harvest occurred late in the summer or in the fall or winter, direct effects would be mitigated by timing. Northern goshawk young will have fledged by late summer and would be able to move out of the way of harvest operations. Winter operations would not directly affect northern goshawks as they migrate out of their territories for the winter.

Harvest occurring during the nesting season prior to fledging could result in the loss of eggs or dependent young. To prevent this loss, the forest plan requires that all active northern goshawk nests encountered before or during timber harvest operations be protected from disturbance by a buffer with a one-half mile radius until the young have fledged (FLRMP IV-20, 2h).

The larger units would detract from post fledging-family areas and from foraging territories since northern goshawks typically avoid larger openings (Hayward et al. 1990). If several units, particularly larger units, were located in post fledging-family areas or foraging territories, northern goshawk pairs might have to enlarge their territories to accommodate the loss of habitat. This could force northern goshawks into less suitable habitat, especially because so much of the lodgepole pine cover type in the project area has already been harvested (refer to Cumulative Effects below). Small units would likely have little effect to post fledging-family areas and foraging territories since northern goshawks will hunt along the margins of small openings (Hayward et al. 1990).

Snags and large, down logs are important to northern goshawk prey species and indirectly to goshawks as well. A major human use of sound snags is for firewood. The constant removal of sound snags ultimately yields an overall reduction in dead wood from an area because the progression of decay from sound snags to soft snags to down logs is interrupted.

Firewood cutting is linked mostly to roads. High road densities affect northern goshawks largely by opening up areas to firewood cutting. Road densities in the project area are high (see Roads/Travel Management above). The project area is located very close to the town of Salmon, Idaho, and receives a high degree of use by firewood cutters. Snags alongside roads or within easy reach of roads in the analysis area have usually been removed by firewood cutters. For now this effect may be offset by the current insect outbreak in the analysis area, but duration and extent of the outbreak are unknown.

The proposed travel management changes contained in Alternative 4 would not improve the current condition of northern goshawk habitat in the project area or offset the loss of habitat caused by the timber harvest.

Determination of Effects and Rationale:
The timber harvest proposed in Alternative 4 would decrease currently suitable habitat for

northern goshawks by approximately 1,500 acres. This would amount to a reduction of eight percent of the currently suitable northern goshawk habitat in the project area. After project implementation, twenty-one percent of all northern goshawk habitat in the project area would be in an unsuitable condition. Overall, habitat capability for northern goshawks in the project area would diminish another eight percent for approximately one hundred years as a result of implementation.

Cumulatively, implementation of Alternative 4 would be deleterious to northern goshawks because there would be almost no travel management improvements to offset the proposed harvest and contribute to increased retention of dead wood resources. As compared to Alternative 2, implementation of Alternative 4 would contribute less to stable or improved habitat capability for northern goshawks in the project area.

The lodgepole pine harvest would be detrimental to northern goshawks residing in the project area while the aspen restoration, although detrimental for a period of some years, has the potential to improve foraging habitat for northern goshawks over time. Implementation of Alternative 4 may impact and is likely to adversely impact individual northern goshawks or family groups. However, implementation would not contribute to a permanent reduction of habitat for northern goshawks, a downward trend of northern goshawks across the forest or to a trend toward federal listing.

GREAT GRAY OWL
Species Biology:
Range and Habitat – Great gray owls usually occupy forest communities in close proximity to meadow complexes (Bull and Duncan 1993, Hayward and Verner 1994). More than 90 percent of sightings of great gray owls in a study in southern Idaho were in lodgepole pine, Douglas-fir and aspen cover types (Franklin 1988). During the breeding season, great gray owls are mostly found in cool forested communities since their dense plumage makes them susceptible to high temperatures (Bull and Duncan 1993). During the winter months, they move to lower elevations where snow cover is thinner to facilitate hunting (Clark et al. 1989, Bull and Henjum 1990). On the Salmon-Challis National Forest, great gray owls are typically found in lodgepole pine stands adjacent to meadows and often in aspen clones interspersed within lodgepole pine communities (Roberts 1992, NRIS Fauna database 5/2006).

Great gray owls do not build their own nests; they use a variety of existing platforms including broken trees, mistletoe brooms, old hawk and raven nests, snags in an advanced state of decay and even artificial platforms (Franklin 1988, Bull and Henjum 1990). Pairs of great gray owls tend to return to the same nest site year after year (Franklin 1988, Bull and Henjum 1990). Young owls leave the nest before fledging and climb perches to avoid predators until they learn to fly (Clark et al. 1989, Bull and Henjum 1990).

Great gray owls forage in meadows, open riparian areas, upland willow communities, forests with open understories and along forest edges (Bull and Duncan 1993, Bull and Henjum 1990). Great gray owls can also forage in harvested areas, including clearcuts, as long as the necessary perches from which to hunt are available (Hayward and Verner 1994) since great gray owls are primarily perch hunters. Birds fly from perch to perch, watching and listening for prey at each

one (Bull and Henjum 1990). Deep soils, high vegetative cover and large downed logs are common features of foraging sites (Bull and Henjum 1990). These characteristics are indicative of areas that potentially support high rodent densities.

Voles in the genus *Microtus* are a major food item for great gray owls in North America (Hayward and Verner 1994). They also use a wide variety of other prey depending on availability, including other vole species, shrews, deer mice, tree squirrels, chipmunks, songbirds and amphibians. They also occasionally take larger prey such as other raptors, snowshoe hares and forest grouse (Bull and Duncan 1993).

Seasonal Distribution – The great gray owl is thought to be a very rare resident in east central Idaho (Roberts 1992). On the district, great gray owls have most often been observed in the Napias Creek and Moose Creek drainages. This species is probably observed more frequently in these drainages because they contain large tracts of lodgepole pine interspersed with numerous small wetlands and meadows. A portion of the project area is located in the Moose Creek drainage. Although there are no recorded observations of great gray owls in the project area, they can reasonably be expected to occupy suitable habitat in the project area.

Population Size and Trend – Great gray owls have a large circumboreal range and the species seems to be stable throughout most of its range (Bull and Duncan 1993). In most areas, however, few data are available to verify this assumption (Hayward and Verner 1994). Populations in the western United States appear to be more stable than populations to the north.

The great gray owl has a global conservation status rank of G5 (NatureServe 2003). This indicates that the species is considered demonstrably widespread, abundant and secure across its range. In Idaho, the great gray owl has a state conservation priority rank of S3, which means that the species is considered vulnerable in the state for one or more of several reasons. These include rarity, a restricted range or other factors that could contribute to extirpation in the state.

Threats to the Species – Timber harvest poses the greatest threat to great gray owl populations (Clark et al. 1989, Bull and Duncan 1993). A number of timber management practices affect great gray owls. Removing large diameter trees and snags, removing diseased trees, eliminating dense canopy closure in nest stands necessary to protect fledglings and clearcutting without providing hunting perches are detrimental to great gray owls (Hayward and Verner 1994). Firewood cutting is also a risk factor that affects great gray owl populations (Clark et al. 1989). Livestock grazing practices that reduce prey populations may affect great gray owls (Bull and Duncan 1993). Permanent habitat loss due to ongoing development of the urban/forest interface for primary homes or vacation homes has been identified as a threat as well (Bryan and Forsman 1987).

Action Area:
The area of analysis for great gray owls is confined to the project area. The project area is large enough to display effects to multiple pairs of great gray owls. Effects from project implementation would be limited to the treatment units.

Suitable habitat for great gray owls in the project area is located at mid to higher elevations and

is comprised of mesic meadows, aspen communities, mature unharvested conifer stands and harvested stands in structural stages that contain the necessary attributes for use by great gray owls.

Currently, within the project area there are a total of approximately 20,000 acres of habitat above 6,000 feet elevation in structural stages suitable for use by great gray owls. This includes 8,511 acres of Douglas-fir, 7,584 acres of lodgepole pine, a little over 2,037 acres of mixed conifers, approximately 1,000 acres of aspen and an estimated 500 acres of meadow habitat.

About 9,000 acres of mature conifer forest remains unharvested within the project area. This includes stands of Douglas-fir, ponderosa pine, spruce/fir and lodgepole pine. These stands and the surrounding areas provide quality nesting and foraging habitat for great gray owls. Table 11 below displays these stands by cover type and structural stage.

Table 11. Unharvested Conifer Stands in Structural Stages Suitable for Great Gray Owls

Species by Structural Stage	Lodgepole Pine	Mixed Conifer	Douglas-fir	Totals
Old Multi-Strata Forest	853 acres	1,366 acres	5,649 acres	7,868 acres
Understory Reinitiation	5,769 acres	136 acres	1,348 acres	7,253 acres
Young Multi-Strata Forest	962 acres	535 acres	1,514 acres	3,011 acres
Totals	7,584 acres	2,037 acres	8,511 acres	18,132 acres

Almost 2,500 acres of lodgepole pine have been harvested in the project area to date, most as clearcuts. The last harvest of lodgepole pine in the project area occurred in 1997. Most lodgepole pine units are less than 30 years old and do not currently provide nesting habitat for great gray owls. However, the more recent clearcuts (those 20 years old or less) provide foraging habitat.

Approximately 4,500 acres of Douglas-fir have been harvested in the project area to date. The last harvest of Douglas-fir occurred in 1993. Most Douglas-fir stands were heavily harvested (50% to 90% of the overstory trees were removed). Most of these stands were harvested in the late 1970's to mid 1980's and are only 20 to 25 years old. Few of these stands provide nesting habitat, but offer foraging opportunities for great gray owls. Table 12 below displays the current condition of Douglas-fir in the project area.

Table 12. Current Condition of Douglas-fir by Structural Stage and Management Status

DF/PP Cover Type	Wildfire 1931 - 2000	Harvest < 40% canopy removal	Harvest > 40% canopy removal	Unharvested
Structural Stage				
Stand Initiation	1,684 acres	214 acres	1,612 acres	635 acres
Young Forest	1,276 acres	500 acres	928 acres	3,215 acres
Old Multi-Strata Forest	0	165 acres	802 acres	5,995 acres
Old Single Stratum Forest	0	16 acres	96 acres	925 acres
Total Acres	2,960 acres	895 acres	3,438 acres	10,770 acres
Percent of DF Cover Type	16 percent	5 percent	19 percent	60 percent

Approximately 900 acres of Douglas-fir were lightly harvested (forty percent or less of the overstory was removed). Since lightly harvested stands can support great gray owls provided necessary habitat attributes are available (Bull and Henjum 1990, Hayward and Verner 1994), it is assumed these stands continue to offer foraging and nesting habitat.

Exposure to Project Activities:
Within the cover types where great gray owls occur, all structural stages except those with high stem densities and most of the basal area in small trees (e.g. stem exclusion structural stages), may potentially be used for either nesting or foraging. This includes harvested stands. Timber harvest is compatible with management for great gray owls. Management for great gray owls focuses on providing and protecting sufficient high quality nesting habitat and promoting productive foraging habitat (Clark et al. 1989, Bull and Henjum 1990, Hayward and Verner 1994).

Most timber harvest in great gray owl habitat occurred 20 to 30 years ago. Typically, a majority of the overstory was removed from most harvest units. For lodgepole pine stands, the percent removal was commonly 80 to 100 percent and for Douglas-fir stands, more than 60 percent.

Harvest within the aspen cover type was incidental, being related to conifer management and not intended to benefit aspen as an objective of the harvest. However, conifer removal and domestic livestock exclusion resulted in regeneration of these clones (D. Basford, personal communication, 2/2/2004). Great gray owls are known to nest and forage in aspen clones (Hayward and Verner 1994), where the graminoid and forb production often provides a large biomass of rodent prey. Great gray owls could reasonably be expected to use these areas.

Project Effects Analysis:
The proposed action would affect about 1,500 acres of habitat used or potentially used by great gray owls. Fifty units would be harvested from approximately 970 acres in the lodgepole pine cover type. Another fourteen units containing aspen would also be harvested from more than 500 acres to regenerate aspen.

Timber harvest that removes most of the overstory trees can provide excellent foraging opportunities for great gray owls (Hayward and Verner 1994). To permit use of these harvest units for foraging, hunting perches must be provided (Bull and Henjum 1990). Perches can be as short as ten feet tall, but need to be dispersed throughout a unit at 65-foot minimum intervals. This requirement would be fulfilled in the proposed lodgepole pine units in several ways. All Douglas-fir trees would be retained. All existing snags in each unit would be left to the extent possible during harvest operations. Twenty percent of the lodgepole pine in the units would be retained. These leave clumps would be grouped around existing snags as much as possible. Scattered stubs and broken-topped trees would also remain in harvest units after treatment.

Burning harvest units to clear logging slash is detrimental to rodent populations. Large woody debris needs to be left on site for a harvest unit to function as foraging habitat (Bull and Henjum 1990). At least four and up to fifteen tons of woody debris per acre would remain on the ground after all treatments were complete. One ton per acre consisting of logs ten to twelve inches in

diameter would meet the minimum forest plan standard for wildlife structural diversity. This standard would be easily met since all proposed lodgepole pine and aspen units contain numerous trees in this diameter range.

The survival rate of juvenile great gray owls is quite low (Clark et al. 1989, Bull and Henjum 1990). It is necessary to maintain snags, leaning trees and dense cover in nesting habitat to provide protection to juveniles and improve the chances of survival (Franklin 1988, Bull and Henjum 1990). Nesting habitat would be provided near the new lodgepole pine units within the riparian habitat conservation areas along perennial and intermittent streams, in designated old growth retention stands, in untreated aspen clones and along the edges of forest meadows. Snag density, structural diversity and canopy closure would be unaffected in these areas.

Aspen provides high quality habitat for many wildlife species including great gray owls (DeByle and Winokur 1985). Most sightings of great gray owls in Idaho have been in the lodgepole pine/Douglas-fir/aspen zone (Hayward and Verner 1994). However, the majority of aspen clones in the analysis area are in poor condition and as they continue to deteriorate without replacement, aspen habitat will gradually disappear.

Fourteen units containing substantial amounts of aspen would be treated to promote aspen regeneration. Most of the aspen clones proposed for treatment are situated in naturally moist areas, the canopy is closed by increasing numbers of conifers and large Douglas-fir trees, large mature aspen trees and woody debris are all present.

The proposed treatments are intended to set back forest succession and promote aspen regeneration (refer to section on Aspen above). The regeneration of these clones would not benefit great gray owls directly for many decades since they require large platforms for their nests and mature forest conditions for reproducing (Hayward and Verner 1994). However, aspen restoration, in conjunction with other restoration or rehabilitation projects, would contribute to enhanced habitat conditions in the future. In the meantime, the proposed treatments are designed to maintain the clones as foraging habitat at least.

Loss of large snags and down logs is recognized as a threat to great gray owls (Hayward and Verner 1994). A major human use of sound snags is for firewood. The constant removal of sound snags ultimately yields an overall reduction in dead wood from an area because the progression of decay from sound snags to soft snags to down logs is interrupted.

Firewood cutting is linked to open roads. High road densities contribute to reduced snag densities and recruitment of large downed logs by opening up areas to firewood cutting. Road densities in the project area are high (refer to Roads/Travel Management above for more information). The analysis area is very close to the town of Salmon, Idaho, and receives a high degree of use by firewood cutters. Snags alongside roads or within easy reach of roads in the analysis area are often removed by firewood cutters. For now this effect may be offset by the current insect outbreak in the analysis area, but duration and extent of the outbreak are unknown. Under Alternative 4, loss of snags and interruption of the decay cycle would essentially remain the same as the existing condition due to minimal changes in road densities and travel management.

The proposed action would provide few benefits to great gray owls in terms of enhanced habitat conditions resulting from improvements in travel management. However, if travel management changes contributed to improvements in wet meadow habitat, benefits to foraging habitat would accrue. Nonetheless, these benefit are uncertain since motorized vehicles would easily be able to circumvent the road realignment and closures.

Determination of Effects and Rationale:
The probability of project activities affecting great gray owls is high. Great gray owls are present and have been observed in or near proposed lodgepole pine harvest units and aspen treatment units. Approximately 1,000 acres of lodgepole pine would be harvested from 50 units, removing 80 percent of the overstory. Many of these stands provide nesting and foraging habitat for great gray owls. A little more than 500 acres of aspen distributed within 14 aspen treatment units would be treated for regeneration. Aspen clones in the project area currently provide nesting and foraging habitat for great gray owls.

Several design features have been incorporated into the project to reduce overall impacts. Not all units would be harvested simultaneously, but would be spread out over a five-year period. Project activities could begin only after July 31 annually to prevent impacts to nesting birds. Activities would then be permitted from mid summer through late fall or early winter.

Approximately seven percent of all currently suitable great gray owl habitat in the project area would be affected by implementation of Alternative 4. Habitat capability would be diminished over about 500 acres for several decades due to regeneration treatments in the fourteen aspen units. Almost 1,000 acres of the lodgepole pine cover type would be shifted back to a stand initiation structural stage. These effects would be mitigated by leaving adequate hunting perches, slash piles and woody debris. While the lodgepole pine and aspen units would no longer be available as nesting habitat, they would continue to provide foraging habitat. Overall, benefits from project implementation to great gray owls in the project area would not accrue for several decades.

Implementation of Alternative 4 would not contribute to increased retention of large dead wood resources needed by great gray owls due to negligible improvements in road densities and travel management. There would be no improvements in snag and dead wood retention to offset the temporary loss of habitat capability in aspen clones.

The population trend of this species in the western United States appears stable, although there are concerns about the long-term stability of great gray owl populations in Idaho. The great gray owl is considered rare on the forest (Roberts 1992), in that the species occurs at low densities. Although the great gray owl occurs at low densities, as would be expected of a large raptor and a species that is elevation-limited, it has even and widespread distribution across the forest (Roberts 1992). Timber products are not offered across the forest on an annual basis at a scale to produce spatial or temporal cumulative effects to great gray owls. There would be no loss of species' viability or habitat capability that could contribute to a trend toward federal listing, although individuals or family groups may be impacted. Implementation of Alternative 4 ***may affect, but is not likely to adversely affect*** the great gray owl population across the forest.

BOREAL OWL

Species Biology:

Range and Habitat – Boreal owls use high elevation mature and old forest habitat with a high degree of canopy closure and abundant large snags (Hayward and Verner 1994). This species occurs primarily in subalpine fir or mixed conifer forest, but may also use Engelmann spruce and high elevation, mesic Douglas-fir stands (Reynolds et al. 1989). Necessary habitat components include large snags, mature forest, hunting perches and day roost sites.

The boreal owl is a secondary cavity nester that uses cavities excavated by the larger woodpecker species, mainly pileated woodpeckers and northern flickers (Hayward and Verner 1994). Most documented boreal owl nest sites in central Idaho have been in old pileated woodpecker cavities (Hayward and Verner 1994). A sufficient number of snags containing woodpecker cavities for boreal owls to use as nest sites are obligatory to provide suitable habitat.

Boreal owls use mature forest stands with abundant prey for hunting, typically selecting microsites with the highest densities of rodents (Hayward and Verner 1994). Boreal owls hunt at night from perches. Voles are the primary prey species. Boreal owls also prey on mice, shrews, gophers, squirrels, chipmunks, small birds and insects.

During the day, boreal owls roost in trees that provide protection from weather and predators. Roost sites are usually located in dense conifer patches with moderate to high canopy closure (Hayward and Verner 1994).

Seasonal Distribution – The boreal owl is considered a rare resident in the upper Salmon River drainage (Roberts 1992). Calling surveys have located this species in the Williams Creek drainage south of the project area (NRIS Fauna database 5/2006). Due to a lack of presence/absence inventories and no records of any incidental sightings, it is not known if boreal owls occur in the analysis area. However, apparently suitable habitat is present above 6,000 feet in elevation and the species is assumed present year-round.

Population Size and Trend – Population numbers in North America are unavailable for this species (Hayward and Verner 1994). The trend in the United States and in Canada is also unknown (Hayward and Verner 1994). The boreal owl is assigned a global conservation status rank of G5 (NatureServe 10/2003). This means that the species is considered widespread, abundant and secure across its range.

In North America, an increasing alteration of forest structure in boreal owl habitat would suggest a downward trend (Hayward and Hayward 1993, Hayward and Verner 1994). The boreal owl has a state conservation priority rank of S2 in Idaho, which means that the species is considered imperiled due to rarity or factors that make it highly vulnerable to extirpation from the state (NatureServe 10/2003). The boreal owl is widely distributed in suitable habitat in Idaho, based on presence/absence surveys (Reynolds et al. 1989), but the population status is uncertain.

Threats to the Species – The primary threat to the viability of boreal owl populations is timber harvest (Hayward and Hayward 1993, NatureServe 10/2003). Even-age timber harvest practices

that eliminate mature forest structure adversely affect boreal owls. The most serious effects of these structural changes are reductions in prey densities and the availability of suitable nest sites (Hayward and Verner 1994). Management practices that diminish or eliminate habitat components required by large woodpeckers are highly detrimental to the boreal owl since it is a obligate secondary cavity nester.

Action Area:
The area of analysis for boreal owls is the same as the analysis area for designated old growth. Apparently suitable habitat for boreal owls in the analysis area is isolated from other suitable habitat to the north, east and south by large expanses of xeric conifer and sagebrush/grass plant communities. The analysis area for designated old growth includes apparently suitable habitat for boreal owls west of and contiguous to the analysis area. Enlarging the analysis area further would dilute project level effects.

There are almost 7,000 acres of subalpine fir and Engelmann spruce in the analysis area, much of which is available for foraging and roosting by boreal owls. Subalpine fir is confined mostly to high elevation drainage bottoms and frost pockets. Engelmann spruce stands are scattered throughout the analysis area along high elevation stream reaches and wetlands. In addition to providing prime habitat for boreal owls, these cover types also provide linkage among the other boreal owl habitats in the analysis area.

There are approximately 15,000 acres of Douglas-fir cover type above 6,000 feet in the analysis area, of which 6,400 acres are single stratum and multi-strata old forest. Douglas-fir habitat for boreal owls in the analysis area is in flux with the recent bark beetle outbreak. Tree mortality is beneficial up to a point. However, if the overstory experiences complete mortality and the stand is exposed to increased sunlight and drying, then fewer large woodpeckers roost and nest in the stand. When habitat capability for woodpeckers declines, habitat capability for secondary cavity nesters, such as the boreal owl, declines as well.

DF/PP Cover Type	Wildfire 1931 - 2000	Harvest < 40% canopy removal	Harvest > 40% canopy removal	Unharvested
Structural Stage				
Stand Initiation	1,684 acres	214 acres	1,612 acres	635 acres
Young Forest	1,276 acres	500 acres	928 acres	3,215 acres
Old Multi-Strata Forest	0	165 acres	802 acres	5,995 acres
Old Single Stratum Forest	0	16 acres	96 acres	925 acres
Total Acres	2,960 acres	895 acres	3,438 acres	10,770 acres
Percent of DF Cover Type	16 percent	5 percent	19 percent	60 percent

Minor amounts of mixed conifer and aspen stands are also available to boreal owls, but constitute a small component of the available habitat. Approximately 1,500 acres of mixed conifer stands occur in the analysis area. There are approximately 1,000 acres of quaking aspen within the analysis area. Based on field reconnaissance and stand exam data, most aspen clones

in the analysis area contain attributes that make them suitable for use by various species of woodpeckers and therefore potentially by boreal owls. However, the aspen cover type is essentially a subset of the Douglas-fir or lodgepole pine cover types. Since it is so difficult to differentiate aspen from conifers, this analysis does not consider aspen acres in addition to Douglas-fir or lodgepole pine acres in calculating the amount of boreal owl habitat for this analysis.

Exposure to Project Activities:
Boreal owls are strongly linked to mature forest, therefore, only mature stands of Douglas-fir, spruce/fir and mixed conifers containing a large tree component were considered for the purposes of this analysis. Combined, these stands constitute almost 14,000 acres of habitat available to boreal owls within the past 50-100 years. This acreage assumption is based on timber harvest records from the project area kept since 1960 and the forest vegetation database.

Of the 10,500 acres of single stratum and multi-strata Douglas-fir available in the analysis area over the past 50 years, approximately 4,500 acres have been harvested to date. The last harvest of Douglas-fir occurred in 1993. These stands at the time of harvest would have provided suitable habitat for boreal owls. Most of these Douglas-fir stands were heavily harvested (50% to 90% of the overstory trees were removed) in the late 1970's to mid 1980's and the regeneration is only 20 to 25 years old. Few of these stands currently provide nesting or foraging habitat for boreal owls. Boreal owls in the analysis area would therefore be confined to the unharvested habitat. At present, 41 percent of mature Douglas-fir habitat within the analysis area remains for use by boreal owls while 59 percent has been rendered unsuitable by timber harvest.

There are also approximately 1,350 of unharvested Douglas-fir stands in the understory reinitiation structural stage. The overstory of these stands is typically quite old and beginning to fall apart as trees die. These stands often provide good habitat for woodpeckers and therefore, for secondary cavity nesters as well. However, this habitat is in a transitional state moving toward an unsuitable condition.

There are a little more than 2,000 acres of unharvested mixed conifers in mature structural stages that are suitable for use by boreal owls in the analysis area. Approximately 200 acres of mixed conifer stands have been harvested within the analysis area to date. All or most of the overstory was removed from these stands through timber harvest, thus yielding a ten percent reduction in this habitat.

Quaking aspen is a shade-intolerant, seral species largely dependent on periodic natural or planned disturbances, such as wildfire, insect or disease episodes, prescribed fire or timber harvest, for successful regeneration and retention on the landscape (DeByle and Winokur 1985). However, aspen communities have been declining throughout the interior of the western United States for decades (Schier 1975, Bartos and Campbell 1998). The two primary risk factors contributing to the decline of aspen are fire suppression that has led to conifer establishment in aspen clones and long-term overuse by domestic livestock and wild ungulates (USDA Forest Service 1991, Bartos and Campbell 1998).

Trampling from over use by domestic livestock contributes to the decline of aspen as well

(DeByle and Winokur 1985). Trampling can affect aspen communities even when over browsing does not occur (DeByle and Winokur 1985). Trampling compacts mineral soil, especially on moist sites with friable soils. This contributes to soil erosion and overland water flow, yielding further site deterioration. Soil compaction from trampling reduces the ability of air and water to move through the soil profile, which, in turn, affects plant root development (Karen Gallogly, personal communication, 11/2003).

With more than 50 years of active fire suppression, most aspen clones in the project area have shrunk in acreage as succession moves toward closed conifer canopies. Lodgepole pine and Douglas-fir ingrowth is common in most quaking aspen clones across the forest, including the project area. In addition, many aspen clones associated with upland meadows and mid to lower elevation riparian areas have been impacted by cattle. The majority of aspen clones in the analysis area are in poor condition and as they continue to deteriorate without replacement, aspen habitat will gradually disappear.

Cumulatively, thirty-four percent of the boreal owl habitat within the analysis area is currently in an unsuitable condition while 66 percent of the habitat remains available. The one-third reduction in suitable habitat within the analysis area has probably adversely affected boreal owls. Since the reduction occurred in some of the highest quality-nesting habitat, the greatest impact was in all probability a reduction in nesting sites. Although there is no population data for the boreal owl in the analysis area, there may have been a decrease in production concurrent with the reduction in habitat. Owls may also have been forced to disperse from the analysis area or crowded into smaller areas, further magnifying loss of productivity.

Based on (1) the assumption that boreal owls occupy the analysis area, (2) the fact that suitable habitat within the analysis area has been reduced by one-third and (3) that timber harvest is proposed in currently suitable boreal owl habitat, boreal owls are likely to be exposed to project activities.

Project Effects Analysis:
The proposed harvest of lodgepole pine in the analysis area would be unlikely to directly or indirectly affect boreal owls. In the Rocky Mountains, boreal owls usually nest in mature stands of mixed conifers, typically containing large subalpine fir, Engelmann spruce or mesic Douglas-fir (Hayward and Verner 1994). A few of the lodgepole pine stands contain clumps of mature subalpine fir, Engelmann spruce and Douglas-fir, but most do not. There would be no harvest in riparian habitat conservation areas where most of the Engelmann spruce are located. All Douglas-fir, regardless of size, would be retained in the lodgepole pine harvest units.

Fourteen units containing substantial amounts of aspen would be treated to promote aspen regeneration. Boreal owls are known to regularly nest in aspen clones with suitable characteristics (Hayward and Verner 1994) and retaining large diameter trees in aspen clones is a recommended conservation measure for boreal owls (NatureServe 2003). The proposed treatments are intended to set back forest succession and promote aspen regeneration (refer to section on Aspen above). The regeneration of these clones would not benefit large woodpeckers and boreal owls directly for some decades since they require large trees and mature forest conditions for reproducing and foraging.

In the interim, however, the proposed aspen regeneration treatments would be somewhat detrimental to boreal owls using the clones. The current condition of many of the aspen clones in the analysis area is conducive to nesting by boreal owls. Most aspen clones are situated in naturally moist areas that are quite productive. The canopy is becoming increasingly closed as conifers mature. Large mature aspen trees and large downed logs are present. These conditions would be altered with the proposed treatments.

However, the silvicultural prescription has been designed to maintain current wildlife habitat within and around these clones as much as possible while removing enough overstory and conifer ingrowth to promote aspen sprouting. Habitat capability would be reduced in the aspen regeneration units, for a temporary loss of five percent of currently suitable habitat, but would quickly begin to regain habitat capability, provided aspen regeneration is effectively protected. These treatment units would continue to contribute to the needs of woodpeckers and thus boreal owls, albeit at a reduced level.

The proposed treatment in unit #700S would have no effect to boreal owls. The stand is located near the bottom edge of conifer distribution in the project area and is largely surrounded by sagebrush/grassland communities. This stand does not constitute habitat for boreal owls. Direct effects due to disturbance in the other aspen units would be mitigated by permitting harvest operations in the units to occur only after July 31 annually to protect active raptor and pileated woodpecker nests.

Loss of large snags and down logs is recognized as a threat to boreal owls (Hayward and Verner 1994). A major human use of sound snags is for firewood. The constant removal of sound snags ultimately yields an overall reduction in dead wood from an area because the progression of decay from sound snags to soft snags to down logs is interrupted.

Firewood cutting is linked to open roads. High road densities contribute to reduced snag densities and recruitment of large downed logs by opening up areas to firewood cutting. Road densities in the project area are high (refer to Roads/Travel Management above for more information). The analysis area is very close to the town of Salmon, Idaho, and receives a high degree of use by firewood cutters. Snags alongside roads or within easy reach of roads in the analysis area are typically removed by firewood cutters. For now this effect may be offset by the current insect outbreak in the analysis area, but duration and extent of the outbreak are unknown.

Under the proposed action, the ongoing unsustainable loss of snags and the interruption of the wood decay cycle would essentially remain the same as the existing condition due to minimal changes in road densities and travel management.

Determination of Effects and Rationale:
Boreal owls are assumed to occupy suitable habitat within the analysis area year-round and could reasonably be encountered in units 52S, 54S and 53M at a minimum. Project implementation would affect a little more than 500 acres of Douglas-fir and aspen habitat. If aspen sprouts were successfully protected until they have grown beyond browse height, 500 acres of aspen habitat would be regenerated, with a temporary decrease in aspen habitat suitability. Under Alternative

4, loss of snags and interruption of the decay cycle would essentially remain the same as the existing condition due to minimal changes in road densities and travel management. Implementation of Alternative 4 would yield a static or downward trend in habitat capability for boreal owls in the analysis area.

Harvest activities would not be permitted prior to July 31 annually to avoid impacts to nesting birds, reducing the risk of affecting family groups of boreal owls, since young owls would capable of moving out of disturbed areas. Individual birds, however, may potentially be impacted by project activities.

Given the Idaho state conservation ranking, the threat that timber harvest poses to this species and the amount of habitat rendered unsuitable by timber harvest in the past 45 years, any future timber harvest in the analysis area that further reduces the quantity or quality of habitat for boreal owls would be detrimental. Implementation of Alternative 4 may impact, but is not likely to adversely impact boreal owls.

FLAMMULATED OWL

Species Biology:

Range and Habitat – The flammulated owl is typically found in xeric ponderosa pine, Douglas-fir or a mix of ponderosa pine and Douglas-fir (Hayward and Verner 1994). Stands occupied by flammulated owls have several consistent characteristics. The stands are mature to old with a moderate degree of canopy closure, an abundance of large live trees and large snags and occasional dense thickets of conifer regeneration or clumps of tightly grown trees (Hayward and Verner 1994). These structural characteristics comprise necessary habitat attributes for nesting, foraging and roosting.

The flammulated owl is a secondary cavity nester. Sufficient large snags with old woodpecker cavities are obligatory for a site to support flammulated owls. Flammulated owls usually occupy pileated woodpeckers cavities in the northern part of their range (Hayward and Verner 1994).

Flammulated owls are insectivores that hunt at night from perches (Reynolds and Linkhart 1992). A major component of their diet is noctuid moths, but they also eat a variety of insects, including beetle, butterfly, cricket, grasshopper and spider species (Reynolds and Linkhart 1992). Flammulated owls forage in large conifers with open crowns, gleaning insects from foliage and branches or on the ground beneath open conifer stands and along forest edges (Hayward and Verner 1994). The ponderosa pine and Douglas-fir stands selected by flammulated owls provide high densities of insects used by flammulated owls compared to other conifer communities (Reynolds and Linkhart 1992).

Flammulated owls roost during the day in dense clumps of conifer regeneration or patches of closely grown trees (Hayward and Verner 1994). These clumps provide protection to owls during the day.

Seasonal Distribution - Flammulated owls occur in suitable habitat throughout Idaho and are locally abundant in some areas (Groves et al. 1997). Surveys of the northern portion of the forest indicate that flammulated owls are present and successfully reproducing in suitable habitat

(Atkinson and Atkinson 1990). Flammulated owls are present on breeding territories during the spring and summer months, then migrate to wintering areas in the southern United States and Mexico (Hayward and Verner 1994).

Presence/absence surveys for flammulated owls were conducted in 1990 along the major ridge system running north and south through the middle of the project area. This survey detected only a single singing male (Atkinson and Atkinson 1990). This survey indicates that flammulated owls are present in the project area, but perhaps at low to very low densities. If flammulated owls are present at low to very low densities, then the habitat in the project area may be marginal, possibly because of isolation, past human uses in the project area or other unknown factors.

Flammulated owls most often select pileated woodpecker cavities as nest sites, although flicker and sapsucker cavities are also used where pileated woodpeckers are absent (Hayward and Verner 1994). Pileated woodpeckers appear to be distributed throughout the Douglas-fir cover type in the project area, suggesting that pileated woodpeckers cavities would be the main source of nest sites for flammulated owls. This could also indicate that flammulated owls might be distributed throughout the Douglas-fir cover type in the project area.

Population Size and Trend – Population numbers in the United States are unavailable for this species. The available data are insufficient to determine trend. The flammulated owl has a global conservation status rank of G4, indicating that the species is apparently secure on a range-wide basis (NatureServe 2003). Species with a G4 rating are considered uncommon, but not rare. However, there may be causes for concern regarding long-term viability. The flammulated owl has a state conservation priority rank of S3B for the breeding population in Idaho, which means that the species is considered vulnerable with regard to population viability for one or more reasons (NatureServe 2003). These include rarity, a restricted range or other factors that could contribute to extirpation in the state.

Current records indicate that the flammulated owl is still well distributed throughout its known historical range and may be locally common in some areas (Hayward and Verner 1994, NatureServe 2003). Numbers may be declining in the northern Rocky Mountains, but the data are inadequate and too little is known about the status of this species in the Rocky Mountains to confirm this trend (Hayward and Verner 1994).

Threats to the Species – Several risk factors may affect flammulated owl populations. The primary threat is habitat loss or alteration resulting from timber harvest that removes large trees and snags (The Nature Conservancy 1999). Timber harvest practices and firewood cutting that severely reduce or eliminate large snags result in a loss of nesting habitat. Timber management that reduces pileated woodpecker populations will be detrimental to flammulated owls as well (Hayward and Verner 1994, NatureServe 2003). The use of insecticides to control outbreaks of forest pest insects can also reduce populations of non-target insects important to flammulated owls (Reynolds et al. 1989, NatureServe 2003).

Action Area:

The area of analysis for flammulated owls is confined to the project area. Suitable habitat in the

project area is isolated to some extent from other occupied habitat to the north, south and west of the project area. Enlarging the area of analysis to include other occupied habitat would create a very large area where project level effects would be diluted by the scale.

Suitable habitat for flammulated owls in the project area is contained within the Douglas-fir cover type. A small ponderosa pine component, found occasionally in xeric Douglas-fir stands, is included here in the Douglas-fir cover type. There are 18,000 acres of Douglas-fir cover type in the project area, of which 11,300 acres may have been occupied by flammulated owls within the past 100 years. Of this acreage, a little over 7,800 acres of Douglas-fir and Douglas-fir/ponderosa pine could currently be utilized by flammulated owls.

There are approximately 1,000 acres of quaking aspen within the project area. Based on field reconnaissance and stand exam data, most aspen clones in the project area contain attributes that make them suitable for use by various species of woodpeckers and therefore potentially by flammulated owls. However, the aspen cover type is essentially a subset of the Douglas-fir or lodgepole pine cover types. Since it is so difficult to differentiate aspen from Douglas-fir, this analysis does not consider aspen acres in addition to Douglas-fir acres in calculating the amount of flammulated owl habitat for this analysis.

Exposure to Project Activities:
Douglas-fir Habitat - Of the 18,000 acres of Douglas-fir in the project area, a little more than 10,500 acres are unharvested. Of this acreage, the forest vegetation database estimates that there are approximately 7,000 acres of mature unharvested Douglas-fir and/or ponderosa pine in the old single stratum and multi-strata forest structural stages. These stands are suitable for use by flammulated owls.

The multi-strata old forest stands comprise the majority (87 percent) of the unharvested Douglas-fir habitat. These are characterized by a broken overstory with large old trees, several lower canopy strata represented by two or more age classes and vertical and horizontal diversity in the understory. The remaining acreage (13 percent) is in single stratum old forest. The single stratum old forest stands have a broken or continuous overstory of dominated by large, old trees. The understories are often typified by grasses and forbs. Conifers may be present in the understory or are represented by seedling and saplings only. Most stands in both of these structural stages are in the mature or early old growth phases.

The earliest timber harvest records in the project area date from 1960-1969 when 837 acres of mature Douglas-fir were harvested. The last harvests of Douglas-fir in the project area occurred between 1989 and 1993 when approximately 365 acres were harvested in three sales in the Diamond Creek and Dump Creek drainages. There has been no commercial harvest of mature Douglas-fir or ponderosa pine in the project area since.

According to the forest timber harvest history, approximately 4,436 acres of mature Douglas-fir stands have been harvested in the project area to date. This amounts to 39 percent of the more than 11,000 acres of mature Douglas-fir and/or ponderosa pine present in the project area within the past 50 to 100 years. Of the 4,436 acres harvested, a little more than 3,400 acres was heavily harvested (i.e. the majority of the overstory was removed). These Douglas-fir stands are no

longer available to flammulated owls. This represents a loss of 31 percent of Douglas-fir habitat in the project area for a century or more.

Almost 900 acres were harvested lightly to moderately (i.e. canopy removal of ≤ forty percent). Of this, about 200 acres retain an old forest structural appearance while the majority (about 700 acres) of these stands are open with a widely spaced overstory and a regenerating conifer understory (i.e. understory reinitiation structural stage). Flammulated owls are known to used harvested areas provide the structural attributes needed for nesting and foraging remain (Hayward and Verner 1994). While the dead wood decay cycle has been interrupted to some degree and the amount of large snags and large down logs is less than optimal, particularly in stands located on drier sites, these stands retain enough large trees to be considered suitable at least for foraging by flammulated owls. Therefore, it is assumed that these 900 acres continue to provide habitat for flammulated owls.

Table 15 below depicts the acreage of stands in the Douglas-fir cover type in mature structural stages present in the project area from 1960 (when records of commercial timber harvest in the project area begin) up to the present time. These 11,300 acres are considered to constitute the flammulated owl habitat in the project area, including stands in suitable condition and in unsuitable condition due to timber harvest. This assumption is based on the 45-year record of stands known to be in mature structural stages within the past fifty to one hundred years.

Table 15. Douglas-fir/Ponderosa Pine Cover Type by Structural Stage and Management Status

DF/PP Cover Type	Harvest > 40% canopy removal	Harvest < 40% canopy removal	Unharvested	Total Acres by Structural Stage
Structural Stage	**Management Status**			
Old Multi-Strata Forest	3,129 acres	802 acres	5,995 acres	9,926 acres
Old Single Stratum Forest	309 acres	96 acres	925 acres	1,330acres
Total Acres	3,438 acres	898 acres	6,920 acres	11,256 acres
Percent of Flammulated Owl Habitat	31 percent	8 percent	61 percent	100 percent

These figures suggest that 69 percent of the harvested and unharvested mature Douglas-fir habitat in the project area contains attributes suitable for flammulated owls, whether for foraging, nesting or both. Thirty-one percent of the flammulated owl habitat in the project area is currently in an unsuitable condition. This reduction has occurred in the past thirty years.

The metapopulation dynamics of this species have not been studied and are uncertain (Hayward and Verner, 1994). Flammulated owls often appear to be clustered in groups with large "empty" spaces between clusters. This may be a facet of the species' social structure or perhaps habitat that appears suitable may, in fact, not contain all attributes sought by flammulated owls or do not occur in sufficient quality or quantity.

Many of the harvested stands in the Douglas-fir cover type contained substantial amounts of mature lodgepole pine, especially those at higher elevations. The GIS coverage for the project

area timber harvest history shows that 1,868 acres (42 percent) of the 4,436 acres of harvested Douglas-fir contained substantial amounts of lodgepole pine. Many unharvested stands of Douglas-fir display this same characteristic. These stands may be marginal habitat most likely to be occupied only by young unmated males unable to secure better territories. Since this marginality appears indicative of a considerable amount of the habitat in the project area, flammulated owls may be distributed very thinly over large territories or alternatively may have been forced into smaller areas of suitable habitat. In either case, even slight reductions in Douglas-fir habitat could have adversely affected flammulated owls.

Quaking Aspen Habitat - Any aspen clone that contains large (i.e. ≤12"–14" dbh) live or dead stems is occupied by nesting woodpeckers, typically hairy woodpeckers, northern flickers or pileated woodpeckers. There was evidence of woodpecker use in all the proposed aspen treatment units. Therefore, each of the 14 proposed aspen units could also furnish nesting habitat for flammulated owls.

Quaking aspen is a shade-intolerant, seral species largely dependent on periodic natural or planned disturbances, such as wildfire, insect or disease episodes, prescribed fire or timber harvest, for successful regeneration and retention on the landscape (DeByle and Winokur 1985). However, aspen communities have been declining throughout the interior of the western United States for decades (Schier 1975, Bartos and Campbell 1998).

The two primary risk factors contributing to the decline of aspen are fire suppression that has led to conifer establishment in aspen clones and long-term overuse by domestic livestock and wild ungulates (USDA Forest Service 1991, Bartos and Campbell 1998). Trampling from over use by domestic livestock contributes to the decline of aspen as well (DeByle and Winokur 1985). Trampling can affect aspen plant communities, even when over browsing does not occur, especially on moist sites with friable soils (DeByle and Winokur 1985). Trampling crushes vegetation and soil surface litter and compacts mineral soil. These effects contribute to soil erosion and overland runoff of water, yielding further site deterioration. Soil compaction from trampling reduces the ability of air and water to move through the soil profile, which, in turn, affects plant root development (Karen Gallogly, personal communication, 11/2003).

With more than 50 years of active fire suppression, most aspen clones in the project area have shrunk in acreage as succession moves toward closed conifer canopies. Lodgepole pine and Douglas-fir ingrowth is common in most quaking aspen clones across the forest, including the project area. In addition, many aspen clones associated with upland meadows and mid to lower elevation riparian areas have been impacted by cattle. The majority of aspen clones in the analysis area are in poor condition and as they continue to deteriorate without replacement, aspen habitat will gradually disappear.

Lodgepole Pine - Flammulated owls do not use habitats in the lodgepole pine cover type since large woodpeckers tend not to use it. There is a small component of Douglas-fir containing large, relict trees in a number of the proposed clearcut units. These small patches appear to be used little, if at all, by pileated woodpeckers. An exception to this is unit 52M, which is adjacent to an old growth Douglas-fir stand. This unit is located in a drainage bottom and contains large aspen, Engelmann spruce, Douglas-fir and lodgepole pine.

Conclusion - Available data may indicate that flammulated owls, although present within the project area, are thinly distributed throughout the Douglas-fir/ponderosa pine and aspen cover types. Timber harvest is proposed within currently suitable habitat for flammulated owls. Flammulated owls are likely to be directly and indirectly exposed to project activities in these areas, especially in the aspen treatment units.

Project Effects Analysis:
There is only one lodgepole pine unit (52M) that might be used by flammulated owls. Large Douglas-fir trees in this unit would not be harvested. The large Engelmann spruce would likewise be retained. Otherwise, the lodgepole pine units do not provide habitat for flammulated owls. Therefore, the proposed lodgepole pine harvest would not affect flammulated owls directly or indirectly.

Direct effects due to disturbance would be mitigated by permitting harvest operations to occur only after July 31 annually to protect active raptor and pileated woodpecker nests. Flammulated owls nest later in the spring compared to many other migratory bird species so nesting owls could be disturbed by the initiation of harvest activities despite this mitigation. Flammulated owls are generally considered tolerant of human presence and activities. However, it is unknown whether a nesting pair would tolerate timber harvest during the breeding season or abandon the nest (Hayward and Verner 1994). Should an active flammulated owl nest site be located in or within 1/8th mile of harvest activities, the forest plan standard that requires a "no disturbance" 1/8th mile-radius buffer around the nest site would be applied (FLRMP IV-70, 2-h). This buffer would remain in place until the site was no longer in use. This standard should prevent abandonment of an active nest located prior to harvest, but would not necessarily preclude harvest of a nest tree if the nest were not discovered before cutting the tree.

The only Douglas-fir habitat suitable for flammulated owl use that would be targeted for harvest occurs within or adjacent to the proposed aspen treatment units. The largest Douglas-fir trees would be retained while smaller trees would be thinned from below to promote growth. Healthy Douglas-fir regeneration would be retained to provide a continuum of Douglas-fir habitat. This would indirectly benefit the pileated woodpecker and, in turn, the flammulated owl.

Aspen is a highly valuable species for most cavity excavators, including pileated woodpeckers, and secondary cavity nesters. Flammulated owls are known to use cavities in the aspen cover type for nesting (DeByle and Winokur 1985). Fourteen units containing substantial amounts of aspen would be treated to promote aspen regeneration. The proposed treatments are intended to set back forest succession and promote aspen regeneration. The regeneration of these clones would not benefit large woodpeckers, such as the pileated woodpecker, for decades since they require large trees and mature forest conditions for reproducing and foraging.

However, the silvicultural prescription has been designed to maintain current wildlife habitat within and around these clones as much as possible while removing enough overstory and conifer ingrowth to promote aspen sprouting. Habitat capability would be reduced in the aspen regeneration units, for a temporary loss of 58 percent of aspen habitat and about seven percent of total habitat. These units would begin to regain habitat capability within several decades,

provided aspen regeneration is effectively protected. These treatment units would therefore continue to contribute to the needs of woodpeckers and thus flammulated owls, albeit at a reduced level. Aspen restoration, especially in conjunction with other restoration or rehabilitation projects, would contribute to enhanced habitat conditions in the future. Actions that benefit the pileated woodpecker and other large woodpeckers would therefore benefit the flammulated owls as well.

Implementation of Alternative 4 would reduce currently suitable habitat for flammulated owls by seven percent. The cumulative total reduction including past timber harvest and the proposed harvest would be about 38 percent.

Under Alternative 4, the ongoing unsustainable loss of snags and the interruption of the wood decay cycle in the Douglas-fir/ponderosa pine cover type would essentially remain the same as the existing condition due to minimal changes in road densities and travel management. Managing additional Douglas-fir habitat as old growth would, in part, also help to offset this loss as well. (Note that changing the management designation for these 1,200 acres would not affect flammulated owls directly or indirectly since very few acres would be treated in these stands.)

Determination of Effects and Rationale:
Flammulated owls are known to occur within the project area and could be exposed to project activities. These activities will occur on almost 700 acres of habitat suitable for and probably occupied by flammulated owls based on site characteristics and use by pileated woodpeckers and northern flickers. While the regeneration treatments in the aspen units will ultimately benefit flammulated owls, these may not accrue in full for up to 50 to 100 years. Although less than 500 acres would be affected, project activities to which flammulated owls may be exposed would be scattered throughout much of the suitable habitat. These activities would occur over a five-year period and would occur annually. Activities would last four to five months, beginning after July 31 each year. Flammulated owls nest later in the spring than most other birds and will still be tending dependent young when annual harvest begins. Based on these factors, project implementation may adversely affect flammulated owls in the project area directly as well as indirectly for at least several decades.

Given: (1) the state conservation ranking for the breeding population of flammulated owls in Idaho, (2) the cumulative loss of optimal habitat across the northern portion of the forest, (3) the lack of concrete knowledge of metapopulation dynamics and structure and (4) uncertainty of the population number and status of flammulated owls across the forest; further harvest of mature Douglas-fir trees in the analysis area is not recommended. Failure to maintain adequate amounts of old growth within the project area could contribute to the cumulative pattern of declining habitat capability for this species across the forest. Project implementation ***may affect, but is not likely to adversely affect*** the flammulated owl population across the forest.

THREE-TOED WOODPECKER

Species Biology:
Range and Habitat – In the northwestern United States, three-toed woodpeckers are typically found in lodgepole pine or in higher elevation mixed conifer stands, especially those containing spruce (Wisdom et al. 2000, Clark et al. 1989). They may also be found in aspen clones located

in or near suitable conifer habitat (Spahr et al. 1991). Three-toed woodpeckers appear to be constrained by heat intolerance to higher elevation areas with cooler summer temperatures (Goggans et al. 1987). Key habitat components include mature and old lodgepole pine and mixed conifer stands, high snag densities, and trees containing wood-boring insects and heart rot (Wisdom et al. 2000).

Three-toed woodpeckers usually occupy mature to old stands with a high degree of insect and disease activity and numerous snags (Wisdom et al. 2000, Clark et al. 1989). Three-toed woodpeckers are strongly attracted to tracts of timber infested by wood-boring beetles or recently burned areas. Large stand-replacing fires may result in local increases in three-toed woodpeckers beginning three to five years after the fire (Spahr et al. 1991).

Three-toed woodpeckers are most often found in lodgepole pine or spruce stands because these species have flaky bark (Clark et al. 1989). Three-toed woodpeckers forage by scaling the bark flakes from the tree trunk to locate insect prey. Primary prey species are the larvae and pupae of wood-boring insects (Goggans et al. 1987).

Three-toed woodpeckers are one of the few woodpeckers that nest in lodgepole pine (Bull 1980). They are able to do so because they are a small bird that excavates small cavities, so they can utilize lodgepole pine, a tree species that seldom grows to diameters large enough for the bigger woodpecker species. Lodgepole pine suitable as nesting habitat for three-toed woodpeckers needs to be at least eight to ten inches in diameter, although trees and snags up to twenty inches dbh are selected as nest sites (Goggans et al. 1987, Bull 1980). Nest cavities are excavated in trees with heart rot and are close to good foraging habitat (Goggans et al. 1987, Bull 1980).

Seasonal Distribution – The three-toed woodpecker is considered a rare resident in east central Idaho (Roberts 1992). Roberts (1992) has found three-toed woodpeckers evenly distributed throughout the upper Salmon River drainage above 6,000 feet in elevation wherever the lodgepole pine cover type occurs. They are occasionally observed in high elevation mesic Douglas-fir stands as well.

Population Size and Trend –Three-toed woodpeckers have an extensive circumboreal distribution, but are not common anywhere within their range (Clark et al. 1989). The three-toed woodpecker has a global conservation status rank of G5 (NatureServe 2003). This indicates that the species is considered demonstrably widespread, abundant and secure across its range. In Idaho, the three-toed woodpecker has a state conservation priority rank of S3, which means that the species is considered vulnerable in the state for one or more of several reasons. These include rarity, a restricted range or other factors that could contribute to extirpation in the state.

Existing data are inadequate to determine the size and trend of three-toed woodpecker populations. Limited data from the Breeding Bird Survey suggest an upward trend in the western United States, including the northern Rocky Mountains (Sauer et al. 2005). However, these data may be deficient in one or more ways and may not accurately reflect the real trend. For example, few three-toed woodpeckers are detected by the Breeding Bird Survey, resulting in a very low sample size that affects the accuracy of the trend estimate.

In an assessment of habitat requirements and trends in the Columbia River basin, it was noted that the current geographic distribution of habitat for the three-toed woodpecker appears to coincide with the historical distribution of habitat (Wisdom et al. 2000). Wisdom et al. also documented an increasing trend in suitable habitat in the central Idaho mountains for three-toed woodpeckers. A sufficient amount of well-distributed habitat is available to support three-toed woodpeckers in central Idaho, although there is potential for a decline in key habitat components.

Threats to the Species – Risk factors that may affect three-toed woodpecker populations include timber management practices that reduce or eliminate snags, that permanently convert mature lodgepole pine habitat to younger age classes or clearcutting large tracts of lodgepole pine due to mountain pine beetle epidemics (NatureServe 2003, Wisdom et al. 2000, Goggans et al. 1987).

Action Area:
The area of analysis for three-toed woodpeckers is confined to the project area. The project area is large enough to contain multiple pairs of three-toed woodpeckers and to depict project level effects. Effects from project implementation would be confined to the proposed units.

Conifer habitats within the project area that may be occupied or occasionally used by three-toed woodpeckers is displayed by species and structural stage in Table 16 below. Three-toed woodpeckers are sporadically observed in multi-strata Douglas-fir stands on the forest, usually in stands containing a component of other species, such as lodgepole pine. Therefore, Douglas-fir is depicted in Table 16. However, Douglas-fir is not recognized as core habitat for this species. For the purposes of this analysis, use of Douglas-fir by three-toed woodpeckers is considered incidental and is not included in calculations for effects determinations.

Table 16. Unharvested Conifer Stands in Structural Stages Suitable for Three-toed Woodpeckers

Species by Structural Stage	Lodgepole Pine	Mixed Conifer	Douglas-fir	Totals
Old Multi-Strata Forest	853 acres	1,366 acres	5,649 acres	7,868 acres
Understory Reinitiation	5,769 acres	136 acres	1,348 acres	7,253 acres
Young Multi-Strata Forest	962 acres	535 acres	1,514 acres	3,011 acres
Totals	7,584 acres	2,037 acres	8,511 acres	18,132 acres

Over 12,000 acres of unharvested lodgepole pine and mixed conifer stands occur in the project area currently. Of this acreage, there are approximately 2,200 acres of unharvested mature lodgepole pine and mixed conifer stands remaining in the project area in addition to another 7,300 acres of lodgepole pine and mixed conifers in understory re-initiation and young, multi-strata forest structural stages. There are an estimated 1,000 acres of aspen habitat in the project area that are probably used by three-toed woodpeckers as well. This amounts to approximately 10,600 acres of habitat in structural stages currently suitable for three-toed woodpeckers.

Exposure to Project Activities:
This species may reasonably be expected to occur in the project area year-round although there are no known observations of three-toed woodpeckers in the project area. This assumption is based on observations of three-toed woodpeckers in similar habitats elsewhere in the northern portion of the forest (NRIS Fauna database, 5/2006).

More than 2,500 acres of conifer stands in structural stages formerly suitable for three-toed

woodpeckers have been harvested in the project area to date (The last harvest of lodgepole pine in the project area occurred in 1997). All or most of the overstory was removed from these stands through timber harvest. These stands at the time of harvest would have provided suitable habitat for three-toed woodpeckers. However, most of these harvest units are less than 30 years old and do not currently provide foraging or nesting habitat for three-toed woodpeckers. Therefore, at present, seventy-eight percent of lodgepole pine and mixed conifer habitat within the project area remains for use by three-toed woodpeckers while 22 percent has been rendered unsuitable by timber harvest.

The amount of time these stands will remain unsuitable for three-toed woodpeckers depends on time since timber harvest and the presence of bark beetles and other insect prey. Most lodgepole pine stands on the forest typically require about fifty years for trees to become large enough to provide nesting habitat for three-toed woodpeckers and as much as eighty to one hundred years to provide good foraging habitat (BK Thin Program, 1993, 9/1/2005 model run). Since most lodgepole pine units were harvested between the 1960's and the 1980's, these stands will not provide even the minimal habitat requirements of three-toed woodpeckers for at least another ten to thirty years.

Three-toed woodpeckers in the project area would therefore be present in aspen clones and unharvested lodgepole pine or mixed conifer stands in structural stages that meet their needs. The fifty lodgepole pine units in the project area proposed for harvest are located from 6,000 feet in elevation to over 7,000 feet in elevation as are most of the aspen treatment units. This is within the elevational range of three-toed woodpeckers on the forest. The lodgepole pine units are primarily in understory reinitiation or mature structural stages, which provide for the year-round needs of three-toed woodpeckers. The aspen clones proposed for treatment are shifting from aspen to lodgepole pine-dominated sites. Thus, three-toed woodpeckers in the project area are likely to be directly exposed to project activities.

Project Effects Analysis:
Most of the proposed lodgepole pine units currently provide nesting and foraging habitat for three-toed woodpeckers, especially in areas where mountain pine beetles are active. Eighty percent of the overstory would be removed in the 50 proposed lodgepole pine units, while twenty percent would be retained in patches to meet forest snag and snag replacement guidelines. Three-toed woodpeckers might continue to use these patches to some extent, but overall, implementation would reduce currently suitable lodgepole pine habitat for three-toed woodpeckers in the project area by almost 1,000 acres for as much as eighty to one hundred years. This amounts to a reduction of nine percent in the currently suitable lodgepole pine habitat for three-toed woodpeckers in the project area and a 13 percent reduction of habitat overall.

Three-toed woodpeckers are known to nest in aspen clones (NatureServe 2003). Most of the estimated 1,000 acres of aspen in the project area are suitable for use by three-toed woodpeckers. Of this acreage, 518 acres containing substantial amounts of aspen within 14 delineated treatment units would be treated to promote aspen regeneration.

The proposed treatments are intended to set back forest succession and promote aspen

regeneration. The regeneration of these clones would not benefit three-toed woodpeckers directly for several decades since they require mature forest conditions for reproducing and foraging. However, the silvicultural prescription has been designed to maintain current wildlife habitat within and around these clones as much as possible while removing enough overstory and conifer ingrowth to promote aspen sprouting. Habitat capability would be reduced in the aspen regeneration units, for a temporary loss of 58 percent of aspen habitat and a five percent reduction in currently suitable habitat overall. These units would quickly begin to regain habitat capability, provided aspen regeneration is effectively protected. These treatment units would continue to contribute to the needs of three-toed woodpeckers, albeit at a reduced level for several decades. The proposed aspen restoration, in conjunction with other restoration or rehabilitation projects, would contribute to enhanced habitat conditions in the future.

The proposed travel management changes would not improve the current condition of three-toed woodpecker habitat in the project area or to offset the loss of habitat caused by the timber harvest. Overall habitat capability for three-toed woodpeckers in the project area would be diminished. In the lodgepole pine units, this reduction would last for almost a century and in the aspen units for at least three decades.

Determination of Effects and Rationale:
Three-toed woodpeckers are likely to occur in any or all of the proposed lodgepole pine and aspen treatment units. The probability of impacting three-toed woodpeckers directly and indirectly through project implementation is high. The project is designed to reduce direct impacts to nesting birds and dependent young by prohibiting harvest activity prior to July 31 annually.

The proposed lodgepole pine units would reduce currently suitable lodgepole habitat for three-toed woodpeckers by another 13 percent, yielding a total of 35 percent in an unsuitable condition. Almost 58 percent of the aspen habitat in the project area would become unsuitable. Combined this yields a total fifteen percent reduction in currently suitable habitat because of project implementation. With project implementation, the cumulative amount of three-toed woodpecker habitat in the project area converted to an unsuitable condition due to past and present timber harvest would be 31 percent. Implementation of Alternative 4 may adversely affect individual, paired or family groups of three-toed woodpeckers within the project area. Adverse project effects would persist for thirty years up to one hundred years.

The population trend of this species in the western United States is uncertain. Data regarding habitat capability is conflicting, perhaps a reflection of varying conditions between different regions. There are concerns about the long-term stability of the three-toed woodpecker within the state and the species is considered rare on the forest (Roberts 1992). In this case, rarity means that the species occurs in limited habitats and at low densities. Although the three-toed woodpecker occurs in apparently low densities, it has even and widespread distribution across the forest (Roberts 1992). Moreover, timber products are not offered across the forest on an annual basis at a scale to produce spatial or temporal cumulative effects. There would be no loss of species' viability or habitat capability that could contribute to a trend toward federal listing. Project implementation ***may affect, but is not likely to affect*** populations of three-toed woodpeckers across the forest.

SPOTTED FROG

Species Biology:

Range and Habitat – The Columbia spotted frog occurs in a variety of forest and non-forest communities as long as suitable aquatic habitat is available. This highly aquatic species occupies slow-moving cool water streams, beaver ponds, ephemeral pools and the marshy edges of lakes (Gomez 1994). It uses adjacent upland habitats for basking and foraging and migrates regularly between breeding sites and hibernacula (Gomez 1994, Maxell 2000).

Breeding takes place in permanent or ephemeral shallow ponds with warm water (Maxell 2000). Adult Columbia spotted frogs congregate at breeding sites in early spring, often before ice is completely melted from the ponds. After the breeding season, adults are often found some distance from ponds and lakes in various plant communities as long as surface water (seeps, springs, drying ephemeral pools, etc.) is available nearby (Gomez 1994).

Adult Columbia spotted frogs are carnivorous while larvae are herbivorous (Maxell 2000). The adults feed opportunistically on a variety of invertebrates, mollusks, crustaceans and arachnids as well as preying on younger age classes of amphibians. Larval Columbia spotted frogs consume algae, decomposed plant material and bacteria.

Important habitat attributes include permanent slow moving or still water, well-developed vegetation and sandy or muddy substrates (Gomez 1994, Maxell 2000). Hiding cover, such as algal mats, submerged aquatic vegetation, emerged vegetation and overhanging banks, provides protection against predators to adults and tadpoles. Adults hibernate in unfrozen muddy or soupy substrates in springs, streams, lakes or ponds where water is constantly renewed throughout the winter (Gomez 1994, Maxell 2000).

Seasonal Distribution – The Columbia spotted frog is widely distributed. The main population extends from southeast Alaska through the western edge of Alberta and northern British Columbia south to central Idaho, western Montana and western Wyoming (NatureServe 2003). Disjunct populations also occur in southwestern Idaho and other more southerly locales (NatureServe 2003).

Columbia spotted frogs are common to abundant in suitable habitat across the forest. Based on inventory and monitoring, this species can reasonably be expected to occur wherever there is suitable habitat (O'Siggins 1995). Columbia spotted frogs are known to occur in the Dump Creek drainage based on incidental observations (NRIS Fauna database 5/2006) and in the Moose Creek drainage based on sightings made during electrofishing monitoring (2000 Fish Survey Data). Columbia spotted frogs have not been detected to date during tailed frog inventories or fisheries inventories of other streams in the project area. Nonetheless, it is assumed that Columbia spotted frogs are present in suitable habitat throughout the project area.

Population Size and Trend – Total population estimates for the Columbia spotted frog are unknown (NatureServe 2003). It is numerous in some areas of its range with many known occurrences, including the Salmon-Challis National Forest. The main body of population is widespread, well distributed and numerous although declines has been consistently reported for

many of the disjunct populations (NatureServe 2003). Populations declines are often, but not always, related to human causes. Natural declines occur in response to weather events and patterns (NatureServe 2003).

The Columbia spotted frog is assigned a global conservation status rank of G4 (NatureServe 2003), meaning that the species is considered apparently secure across its range, but with cause for long-term concern. In Idaho, the Columbia spotted frog has a state conservation priority rank of S3S4 (NatureServe 2003). This means that the species is considered relatively common, although rare in some locales. Most populations appear secure, although with cause for long-term concern, while other populations are considered vulnerable to extirpation from the state.

Threats to the Species – There are a number of human-related risks to population stability. Habitat loss or alteration is a major threat. Columbia spotted frogs are sensitive to changes in habitat parameters such as riparian vegetation, water temperature and water quality (Gomez 1994, Maxell 2000). Land uses, such as timber harvest, road construction, water diversions and livestock grazing, that alter these parameters may lead to population declines (Gomez 1994). Loss of historical beaver populations, fish stocking and the introduction of non-native fish and amphibian species into Columbia spotted frog habitat also threatens populations (Maxell 2000).

In addition, since this species reproduces and develops in standing pools of water, individuals in polluted habitat may be exposed to high concentrations of environmental contaminants (NatureServe 2003). Range-wide, however, the Columbia spotted frog does not appear to be at risk from acidification or UV-B radiation (NatureServe 2003).

Action Area:
The area of analysis for Columbia spotted frogs is confined to the project area. Columbia spotted frogs are known to move overland between suitable habitats. The longest recorded overland migrations by Columbia spotted frogs on the Salmon-Challis National Forest were greater than 1,000 meters, or about 0.7 mile (Pilliod 2001). However, most Columbia spotted frogs remain within less than 0.5 mile of wetlands and streams (NatureServe 2003). The project area is spread over more than fifty square miles and is more than large enough to adequately depict project level effects to resident Columbia spotted frogs.

Columbia spotted frogs are common to abundant in suitable habitat across the forest. Based on inventory and monitoring, this species can reasonably be expected to occur wherever there is suitable habitat (O'Siggins 1995).

Lentic and lacustrine habitat for the Columbia spotted frog within the project area is spotty and irregularly distributed. Most of the habitat has been affected by historical grazing, mining and irrigation practices. The habitat is characterized by occasional ponds, wet meadows and numerous smaller wetlands connected by dendritic stream courses. Larger streams with a gentle gradient were dredged 100 to 150 years ago. Many of the ponds are associated with dredge mining in floodplains. Riparian and hydric vegetation around ponds and along streams is often limited due to past land uses.

Exposure to Project Activities:
Columbia spotted frogs are known to occur in the Dump Creek and the Bob Moore Creek drainages based on incidental observations (NRIS Fauna database 5/2006) and in the Moose Creek drainage based on sightings during fisheries and amphibian surveys (Salmon-Cobalt Ranger District 2000/2004/2005 amphibian and stream survey data). Columbia spotted frogs have also been observed in the East Boulder Creek, Jesse Creek and Napias Creek drainages, adjacent to the project area. Columbia spotted frogs have not been detected to date during other inventories in the project area. Nonetheless, it is assumed that Columbia spotted frogs are present in suitable habitat throughout the project area since they are elsewhere distributed in suitable habitat throughout the northern portion of the forest.

The sites where spotted frogs are known to be present have several attributes in common (Salmon-Cobalt Ranger District 2005 amphibian monitoring data). These sites contain one or more small ponds located in open areas with solar exposure. The water at these sites is fairly warm water (15-20 degrees C). The substrates are typically composed of mud and abundant organic matter at least several decimeters deep. The margins of the ponds are completely or partially surrounded by littoral vegetation, which provides hiding cover for adults and larvae.

There is no breeding or hibernating habitat in or directly adjacent to the lodgepole pine units. The proposed lodgepole pine units are one mile or more from potential breeding habitat with the exception of proposed units 13M and 19M. These units are located within 0.5 mile of dredge ponds near the mouth of Daly Creek. It is not known whether Columbia spotted frogs use these ponds, but it is reasonable to assume that they do. These proposed units are located on benches dominated by lodgepole pine and contain no wetlands or riparian corridors. Spotted frogs would be most likely to move along riparian corridors (NatureServe 2003) and probably would never be present in the proposed units since they do not contain surface water.

Columbia spotted frogs are known to be present near several of the aspen treatment units. They are present approximately 0.5 mile southwest of proposed unit 53M in the Dump Creek drainage. Migrating frogs may also occasionally be present in or near proposed units 52M, 53S and 54S since there are scattered small bogs in each of these units. These units do not otherwise contain suitable year-round habitat.

Since spotted frogs are unlikely to be present in the proposed treatment units, particularly during the season of operation, direct exposure, if any, to project activities would be inconsequential.

Project Effects Analysis:
Direct and indirect effects to Columbia spotted frogs from implementation of the proposed action would be unlikely. Few of the 64 proposed harvest units contain or lie adjacent to habitat suitable for Columbia spotted frogs. Moreover, the impacts of timber harvest to amphibians often appear to be related to the effects of roads rather than the harvest (Maxell 2000).

These units would be harvested during the dry season or under frozen ground conditions to protect soil and vegetation resources. All seeps and springs in the unit would be protected from direct disturbance during harvest activities. Harvest equipment would be limited to designated skid trails and would not be permitted to operate at sites with year-round surface water.

Columbia spotted frogs would not likely be present in the units during this season of harvest and would not be disturbed by harvest activities.

Road construction and road use has affected habitat for Columbia spotted frogs in a number of ways. Road densities in the project area are high to very high. Roads in the project area bisect numerous streams, meadows and wetlands. Roads are often located next to streams or in floodplains. Motorized vehicle travel across wet meadows on user-built roads is common. Direct effects may include mortality, displacement and changes in dispersal patterns (Gomez 1994). Indirectly, road construction and use cause habitat fragmentation, soil compaction, altered flow patterns, loss of wetlands, and the introduction of sediments and contaminants to water bodies (Gomez 1994, Maxell 2000).

The proposed roads and travel management improvements would attempt to reduce motor vehicle travel routes through wet meadows and alongside streams. If successful, this would improve the success of ongoing watershed restoration efforts and contribute to improved habitat conditions for Columbia spotted frogs.

Since Columbia spotted frogs use wet meadows with surface water during the summer (Pilliod 2001), frogs would benefit indirectly from the restoration activities proposed in unit 53M. Conifer removal, in conjunction with a period of livestock exclusion through fencing, would benefit soil, water and vegetation resources. Soil friability, soil water-holding capacity, wetland vegetation recovery and the amount of surface water present would all improve over time. Provided the chronic impacts of cattle were successfully alleviated in the proposed aspen treatment units where Columbia spotted frogs occur, these outcomes would improve habitat conditions.

Implementation of the proposed road reclamation and motorized vehicle travel management improvements, if successful in preventing motorized vehicle traffic, would benefit Columbia spotted frogs in two ways. First, there would be immediate benefits where current impacts to streams and wet meadows are halted. This would prevent further degradation of aquatic and riparian resources, allowing the healing process to begin. Second, an overall gradual improvement in watershed conditions would benefit all species that depend on aquatic and riparian habitats, including the Columbia spotted frog. Long-term benefits would include stabilization of stream banks, reduced erosion and channel downcutting, regeneration of riparian vegetation and improved water retention. However, these benefits could not be fully realized without concurrent improvements in livestock management (B. Rieffenberger, personal communication, 2/11/2004).

Determination of Effects and Rationale:
The probability of direct adverse effects to Columbia spotted frogs from project implementation is very low. Spotted frogs occur within or adjacent to very few of the proposed treatment units. The project has been designed to minimize impacts to wetlands and riparian areas. This includes timing of harvest, low impact implementation specifications and rerouting or eliminating motor vehicle travel through wet meadows or along several streams. Key components of the proposed action include habitat improvement activities that will benefit Columbia spotted frogs. Several hundred acres of habitat for spotted frogs would be improved under this project. For these

reasons, implementation of Alternative 4 will have no direct adverse affects to Columbia spotted frogs and will provide beneficial indirect effects though improvement of existing habitat.

Columbia spotted frogs are demonstrably secure across the forest, occurring in well-distributed sub-populations wherever suitable habitat occurs (Salmon-Challis National Forest, 2004). There would be no loss of species' viability or habitat capability that could contribute to a trend toward federal listing. Project implementation will have ***no effect*** to the Columbia spotted frog.

PINK AGOSERIS
Species Biology:
Range and Habitat – Pink agoseris is a species that was encountered and described only twenty years ago (Henderson et al. 1990). Relatively little is known about the species as of yet. It's full range, distribution within its range and habitat associations are still uncertain.

Pink agoseris occurs in mid-montane to subalpine meadows and wetlands that are open and saturated with water during the growing season (Elzinga 2003). It may also occur in open ecotones between wet meadows and conifer forest, including Engelmann spruce, subalpine fir, Douglas-fir and whitebark pine cover types (Janovsky-Jones 1999).

Distribution – The currently known range of pink agoseris extends from western Montana to central Idaho (Janovsky-Jones 1999). The known range of pink agoseris has expanded over the past few years with the discovery of a number of sites in southwestern Montana (Elzinga 2003). Lemhi County is on the western edge of the known distribution. Although few sites are known to occur in Lemhi County, the forest could contain many more unlocated pink agoseris sites.

Most known occurrences of pink agoseris on the forest are small and appear to be isolated (IDFG Conservation Data Center records). This is at least partially a function of the difficulty of inventorying for and locating pink agoseris. Inventory for pink agoseris is challenging because the species must be in bloom for positive identification. Since plants at different sites often bloom at varying times, potential sites must be visited repeatedly at close intervals each summer. Connectivity between occurrences will be better demonstrated as more sites are found.

The project area contains apparently suitable habitat for pink agoseris, although the species has not been observed in the project area. Although there have been no specific inventories for pink agoseris in the project area to date, the species has not been found in the project area during multiple site visits for other purposes. However, most apparently suitable habitat for pink agoseris in the project area is moderately to severely impacted by livestock grazing. These impacts may limit pink agoseris to more isolated, less impacted sites and will make finding the species more difficult.

Population Size and Trend – Pink agoseris appears to be stable across its range (Elzinga, 2003). The Idaho Native Plant Society ranks the species as "Sensitive". This designation is applied to taxa with small populations or localized distributions that are not in danger of extirpation, but whose populations and habitats may be jeopardized without active management or removal of threats.

Threats to the Species –Known threats to populations of pink agoseris are largely anthropogenic (Janovsky-Jones 1999). These include disturbance from road or trail construction and maintenance, grazing by sheep and cattle and trampling, erosion and other mechanical soil disturbance in wet meadows occupied by pink agoseris.

Action Area:
The area of analysis for pink agoseris is confined to the project area. The project area is spread over more than fifty square miles and is more than large enough to adequately depict project level effects to populations of pink agoseris.

There are at least one hundred acres of wet meadow complexes in the Moose Creek, Daly Creek and Dump Creek drainages in the Moose Creek sub-watershed that contain apparently suitable habitat for pink agoseris. Numerous smaller wetlands may potentially contain pink agoseris as well. The majority of apparently suitable habitat in the project area has been impacted by domestic livestock in the past, yielding soil compaction, reduced water holding capacity, lowered water tables and changes in plant community composition.

Exposure to Project Activities:
Based on habitat attributes of known pink agoseris sites, this species is most likely to occur in or near aspen unit 53M (in the Moose Creek sub-watershed), which contains apparently suitable habitat. Unit 53-M is located near an eastern extension of the Dump Creek meadow complex. This site has experienced annual heavy cattle use for decades and presently has reduced habitat capability. Due to soil compaction and conifer encroachment, the soils retain less water and the meadow dries earlier. If present, pink agoseris may exist only at very low levels or may even have been extirpated from suitable habitat due to grazing impacts.

Nonetheless, this area is about ten air miles from the nearest known site in the Napias Creek drainage and exhibits habitat features very similar to the known sites in Napias Creek. Pink agoseris could reasonably be expected to occur in the Dump Creek meadow complex.

Pink agoseris is less likely to occur in aspen units in the Salmon-Fenster and Salmon-Wallace sub-watersheds, as site conditions are different from those in the Moose Creek sub-watershed. Most of these units occur at lower elevations and tend to dry out by mid-summer, although unit 54-S contains small amounts of apparently suitable habitat.

The patches of apparently suitable habitat within unit 54S are very small and surrounded by wetland habitat that is not consistent with the characteristics of known pink agoseris sites. Wetlands in unit 54S are largely shaded by mature spruce and aspen. Most known sites of pink agoseris on the forest are in open wetlands with exposure to sunlight for part of the day.

With the exception of unit 52M, none of the lodgepole pine units contain habitat for pink agoseris. Unit 52M adjoins unit 53M to the east. It is located in one of the small intermittent tributaries to Dump Creek that drain into and form the Dump Creek meadow system. The habitat in this unit shifts gradually from an open meadow system to a series of small wetlands surrounded by aspen, Douglas-fir and Engelmann spruce confined in a narrow drainage. Habitat features in the lower reaches of this intermittent stream are similar to a known pink agoseris site

in lower Napias Creek.

As apparently suitable habitat for pink agoseris is present within or adjacent to several proposed treatment units, it is reasonable to assume that pink agoseris could be exposed to project activities.

Project Effects Analysis:
Timber harvest is not recognized as a threat to pink agoseris (Spahr et al. 1991). The proposed timber harvest activities would be unlikely to directly affect pink agoseris. Harvest would occur during the dry season on when the ground is frozen. There would no heavy equipment operation in areas of open wetland where pink agoseris would most likely be found. All skid trails would be designated. These measures would result in very low amounts of ground disturbance and little, if any, soil compaction, based on results from implementation of the Moccasin Aspen timber sale (Moccasin Aspen Timber Sale project record correspondence).

This project proposes to restore selected aspen stands through removal of conifers and more intensive livestock management in the treated stands. Implementation of these proposed restoration activities in units 52M, 53M and 54S would indirectly benefit pink agoseris, if present in suitable habitat near these treated aspen stands. These indirect benefits could include increased sunlight at ground level, improved soil water holding capacity, increased surface water for longer periods of time and improved soil friability (Karen Gallogly, personal communication, 11/2003).

Livestock grazing is acknowledged as the greatest potential threat to pink agoseris (Spahr et al. 1991). Better livestock management and monitoring of the effects of livestock use would improve potential pink agoseris habitat and ameliorate threats to this species' distribution and persistence in the project area. In turn, this could improve the species' distribution across the district and forest by strengthening metapopulation connectivity.

A number of motorized vehicle travel routes through wet meadows in the Moose sub-watershed contain apparently suitable habitat for pink agoseris. The impacts of vehicle travel across these sites compound the effects of overuse by cattle. Relocating a 600-foot section of road from Racetrack Meadow and eliminating motor vehicle use from the Dump Creek meadows during the wet season would contribute to improved conditions in apparently suitable habitat for pink agoseris in the project area. However, since the meadows are essentially flat and easily accessible, it will be virtually impossible to exclude motor vehicles without voluntary compliance from motorists.

Determination of Effects and Rationale:
The presence and distribution of pink agoseris in the project area is unknown. However, proposed units are located within or in close proximity to apparently suitable habitat for pink agoseris. Nonetheless, the probability of impacts to pink agoseris, if present in the project area, is low. Timber harvest is not typically known to be a threat to pink agoseris and the harvest has been designed to avoid impacts to wet meadows. The motor vehicle travel management improvements could benefit more than 100 acres containing habitat apparently suitable for pink agoseris. Implementation of Alternative 4 would have no direct impacts to pink agoseris. While

there would be no increase in habitat for pink agoseris, implementation could contribute to improved habitat conditions and would thus, indirectly would benefit pink agoseris.

Although the status of pink agoseris in the project area is unknown and the metapopulation dynamics and structure of this species is poorly understood, the project has been designed to avoid impacts to potential habitat as well as provide future benefits. There would be no loss of species' viability or habitat capability that could contribute to a trend toward federal listing. Project implementation will have ***no effect*** to pink agoseris.

LEMHI PENSTEMON

Species Biology:

Range and Habitat – Lemhi penstemon is endemic to Lemhi County and adjacent counties in Montana (Moseley et al. 1990). Although this species was described by botanists more than sixty years ago, very little was known about it and there were only a very few known populations up until the late 1980's (Moseley et al. 1990). Extensive surveys have been conducted since then to determine the range and habitat associations of Lemhi penstemon. There are now well more than a hundred known occurrences and additional sites are frequently found (Elzinga 1997).

Lemhi penstemon occurs in a variety of xeric non-forested cover types and xeric conifer forest cover types (Elzinga 1997). It is most commonly found in sage/grass cover types, often with an overstory of scattered conifers. Most occurrences on the forest occur in the mountain big sagebrush/bluebunch wheatgrass community, with or without a conifer overstory. The sites are usually characterized by a southerly aspect, shallow soils with a high percentage of surface rock fragments and often-frequent natural disturbances, such as surface soil movement due to unstable slopes, rain events or wildfire (Elzinga 1997).

Lemhi penstemon does not appear to be limited by elevation. Known occurrences span a range of almost 5,000 feet in elevation, from 3,200 feet to over 8,000 feet (Moseley et al. 1990).

Distribution –Lemhi penstemon occurs in the project area in sage/grass communities and in the conifer/sagebrush interface where there is an open conifer overstory above a sagebrush understory. It also occurs as roadside sites along the Stormy Peak and Diamond Creek roads (Moseley et al. 1990).

Population Size and Trend – The population of this species is stable across its range, although individual sub-populations often change over time (Elzinga 2003). Lemhi penstemon has been assigned a rank of G3 by the Idaho Native Plant Society (INPS 2003). This ranking indicates that while a species may be rare or uncommon, it is not imperiled. The Idaho Native Plant Society has assigned the following threat priority to Lemhi Penstemon: Threat Magnitude - low and Threat Immediacy - non-imminent.

The size of individual Lemhi penstemon populations is variable, ranging from only a few plants to many hundreds (Moseley et al. 1990). These are estimates based on the number of plants visible at the time of survey. Plants in the genus Penstemon are typically short-lived and Penstemon populations are often highly cyclic, so that the number of individuals in a population is never constant.

Population size probably depends on factors such as anthropogenic threats, time since the last landscape disturbance and climatic conditions as well as other unknown factors (Moseley et al. 1990, Elzinga 1997). Lemhi penstemon responds negatively to factors such as drought, herbivory and competition with noxious weeds (Elzinga 1997). It often responds very positively to disturbance such as wildfire. Large numbers of plants have been observed in several locations in Lemhi County a few years after wildfire (Pat Hurt, personal communication, 4/17/2001, Caryl Elzinga, personal communication, 10/9/2003).

Lemhi penstemon, as is typical of the Penstemon genus, is cyclic in nature. Unless there are anthropogenic threats that have not been managed, the dramatic fluctuations in individual populations are part of a normal pattern and do not indicate that the viability of the species is in question (Elzinga 1997, Caryl Elzinga, personal communication, 10/9/2003).

Threats to the Species – There are numerous anthropogenic threats to individual populations of Lemhi penstemon across its range, including road and trail construction and maintenance, timber harvest, livestock grazing, mining, noxious weed invasion, herbicide control of noxious weeds, lack of wildfire as well as wildfire suppression activities (Moseley et al. 1990, Elzinga 1997). Demographic threats are also a concern since many Lemhi penstemon occurrences exist as small isolated sub-populations (Elzinga 1997). Lack of successful pollination, herbivory or small-scale disturbances could lead to the extirpation of small, isolated occurrences of Lemhi penstemon.

Action Area:
The area of analysis for Lemhi penstemon is confined to the project area. The project area is spread over more than fifty square miles and is more than large enough to adequately depict project level effects to populations of Lemhi penstemon.

There are approximately 8,000 acres of potential Lemhi penstemon habitat within the project area. The table below depicts the breakdown of forested (harvested and unharvested) and non-forested cover types that provide apparently suitable habitat for Lemhi penstemon. Lemhi penstemon is a rare species that seldom occurs in large numbers except after wildfire (Pat Hurt, personal communication, 4/17/2001, Caryl Elzinga, personal communication, 10/9/2003) and then usually only locally. Although the total acreage represents potential occupation by Lemhi penstemon within the project area, the species is not present across all 8,000 acres. Total frequency in a plant community is typically very, very low.

Table 16. Potential Lemhi Penstemon Habitat by Cover Type

	Non-forested	Forested/ Harvested	Forested/Unharvested
Bunchgrass	1,243 acres	0	0
Grass/Forb	653 acres	0	0
Mountain Big Sage	3,146 acres	0	0
Wyoming Big Sage	701 acres	0	0
Conifer/Mtn Big Sage	0	315 acres	375 acres
Douglas-fir	0	170 acres	784 acres
Ponderosa Pine	0	0	668 acres
Totals	5,743 acres	485 acres	1,827 acres

Grand Total = 8,055 ac.

Exposure to Project Activities:
Lemhi penstemon exists as roadside occurrences along access routes and haul routes for the proposed treatment units on the Salmon River face of the project area.

Lemhi penstemon does not occur in the lodgepole pine harvest units, as lodgepole pine communities do not provide suitable habitat for Lemhi penstemon. Unit 52 M lies adjacent to a Douglas-fir stand known to contain Lemhi penstemon. This stand is designated old growth and consists of a mostly open canopy of overstory Douglas-fir with an understory of native bunchgrasses and elk sedge. Lemhi penstemon occurs in the western portion of this stand.

Of the aspen units, Lemhi penstemon is known to occur only within the boundaries of 53S. However, Lemhi penstemon is known to occur near a number of the proposed aspen treatment units. These units share several common attributes: (1) westerly or southerly exposures at elevations of 6,000 feet or less, (2) dry, rocky soils and moderate amounts of surface rock, (3) conifer overstory of Douglas-fir and or ponderosa pine, (4) native bunchgrass component to the understory and (5) located along or near a conifer/rangeland plant community ecotone.

Based on these known occurrences, it is highly likely that Lemhi penstemon would be directly exposed to project activities.

Project Effects Analysis:
Timber Harvest - Timber harvest has variable effects on Lemhi penstemon. Timber harvest can benefit Lemhi penstemon by reducing conifer cover on sites occupied by Lemhi penstemon (Elzinga 1997). Conversely, there are several detrimental effects to Lemhi penstemon from timber harvest (Elzinga 1997). Even minimal scarification from skidding can result in mortality to Lemhi penstemon. It is difficult to know exactly the nature of effects from logging to Lemhi penstemon populations in the project area due to this variability.

However, Lemhi penstemon within unit 53S is not located in areas targeted for aspen restoration. Harvest would be conducted during dry or frozen ground conditions when Lemhi penstemon is dormant. There would be no timber harvest activity beyond the northern boundary unit 52M, which lies adjacent to known occurrences of Lemhi penstemon. Therefore, any direct effects to Lemhi penstemon from timber harvest activities would be unlikely.

Indirect effects to Lemhi penstemon would most likely be connected to the risk of introducing and spreading noxious weeds. The heavy equipment and support vehicles used in timber harvest operations along with the increase in soil disturbance in harvest units and along roads amplify the risk of weed establishment and spread.

The potential effects of noxious weeds associated with timber harvest and associated road maintenance and improvement activities are myriad. Logging and road equipment can carry weed seeds from one area to another (Ferguson et al. 2003). This increases the potential for introduction of new noxious weed species into an area. Improved access resulting from timber harvest also increases the amount of other vehicle traffic along roads and contributes to noxious

weed spread along re-opened roads (Gelbard and Belnap 2003). Soil disturbance creates favorable conditions for establishment and rapid spread of noxious weeds by providing fresh seed beds, increased nutrient levels from microbial activity and reduced competition from native plants (Ferguson et al. 2003). It also contributes to an increase in the density of existing infestations of noxious weeds by providing optimal conditions for seedling germination and soil banking of seeds (Ferguson et al. 2003). Timber harvest decreases canopy closure and exposes the soil surface to more sunlight, further encouraging expansion of weed infestations, particularly on disturbed sites (Elzinga 1997, Ferguson et al. 2003). None of these effects can be ruled out completely, but can be mitigated to minimize the risk.

The Forest Service requires that heavy equipment (such as mechanized harvesters, skidders, bulldozers, etc.) be thoroughly washed and pass a post-wash inspection before it can be moved onto national forest system lands (WO-CT6.36 7/2000). The purpose of the washing and inspection is to remove noxious weed seeds and caked mud that could contain weed seeds from the equipment. Only heavy equipment that is intended to operate off-road must be washed and inspected. Pickups and other support vehicles are not subject to this requirement. Washing heavy equipment can reduce the likelihood of new weeds or new infestations occurring, but it does not eliminate the risk.

Additional spread or increased density of spotted knapweed in Lemhi penstemon habitat is the most likely consequence of project implementation. However, new invaders are found in Lemhi County each year and have become an increasing threat. Blueweed, leafy spurge, rush skeletonweed and sulfur cinquefoil can each thrive and spread very rapidly in Lemhi penstemon habitat. Several infestations of rush skeletonweed, leafy spurge and sulfur cinquefoil have been discovered by noxious weed inventory crews in the project area in the last three years.

Road Maintenance - Compared to timber harvest, the effects of road construction and maintenance are much more definite, impacting Lemhi penstemon populations through destruction of plants, fragmentation of habitat and introduction of noxious weeds into Lemhi penstemon habitat (Elzinga 1997). In addition, Lemhi penstemon occurrences alongside existing roads receive no protection during road maintenance or reconstruction activities.

Roadside occurrences of Lemhi penstemon are frequently threatened with eradication by road maintenance activities (Elzinga 1997). However, when plants at these sites are not eradicated by human action, they often continue to occupy the site for years, remaining vigorous and reproductive even when nearby sub-populations in native habitat have vanished (Elzinga 1997). These sites can be important in helping maintain the presence of Lemhi penstemon in a particular locale. Some roadside occurrences of Lemhi penstemon along the Stormy Peak road system in the Wallace 7th-field sub-watershed have persisted for more than twenty years.

Direct effects to Lemhi penstemon would be associated with road maintenance and improvement activities necessary to access the timber to be harvested. Only those occurrences of Lemhi penstemon alongside or on the road surface of roads to be maintained or improved would be directly affected.

Most roadside occurrences of Lemhi penstemon along the primary roads in the project area

would not be threatened by road maintenance or improvement activities related to this project. Small, scattered Lemhi penstemon sites or single plants located along currently closed roads in the Wallace Creek drainage (the Wallace, Scarecrow and Deriar 7th –field sub-watersheds) could be removed by these activities. Lemhi penstemon is not known to occur alongside primary roads to be used for project implementation in the Moose Creek portion of the project area (the Dump and Moose sub-watersheds) since there is no suitable habitat alongside these roads for Lemhi penstemon.

Determination of Effects and Rationale:
Overall, it does not seem very likely that the effects of timber harvest and road construction in the project area to date have threatened the distribution or viability of Lemhi penstemon sub-populations. The species is well distributed throughout the project area in sagebrush/grass plant communities. There would be no direct decrease in the amount of habitat (8,000 acres) for Lemhi penstemon resulting from the proposed timber harvest and road use.

The timber harvest in units near known occurrences of Lemhi penstemon would not benefit the species by opening up the understory since activities would be confined to aspen or lodgepole pine, which do not support Lemhi penstemon.

However, the continuing invasion of noxious weeds in the project area will impact the distribution and density of Lemhi penstemon based on interactions of spotted knapweed and Lemhi penstemon at other sites on the district (Elzinga 1997). Implementation of Alternative 4 would contribute to cumulative effects through the potential eradication of roadside Lemhi penstemon occurrences and an increased risk of spreading noxious weeds. The spread of noxious weeds is the greater threat. As a whole, Lemhi penstemon is secure across the forest, but its habitat is very vulnerable to the rapid spread of spotted knapweed. The probability of new invaders, such as blue weed, establishing successfully increases the threat.

The probability of project implementation contributing to the spread of noxious weeds is high. Lemhi penstemon sub-populations are located in or near proposed harvest units, along roads used to access the units and along haul routes. Project activities would be widely distributed across more than 40,000 acres and spread over more than five years. For these reasons, implementation of Alternative 4 may adversely affect Lemhi penstemon sub-populations within the project area through loss of roadside occurrences and spread of noxious weeds.

However, Lemhi penstemon population stability across the forest is secure at present. The metapopulation dynamics and structure of Lemhi penstemon are fairly well known (Elzinga 1997, Caryl Elzinga, personal communication, 10/9/2003). There would be no loss of species' viability or habitat capability that could contribute to a trend toward federal listing. Project implementation ***may affect, but will not adversely affect*** Lemhi penstemon.

Mandatory Conservation Requirements

- Project activities may not begin prior to July 31 annually to avoid disturbance to nesting birds during the breeding season.

- A mandatory "no disturbance" buffer zone will be applied around any and all active raptor nest sites found at any time during project implementation. For great gray owls and northern goshawks, this buffer zone consists of a 0.5 mile-radius in all directions from the nest site. For boreal owls and flammulated owls, this buffer zone consists of a 0.13 mile-radius in all directions from the nest site. These "no disturbance" buffers will be enforced until young birds are capable of sustained flight and are no longer dependent on the parents for care and feeding.

- Plowing roads for snow removal to facilitate project activities is not permitted. No winter activity may be permitted once snow accumulations close the roads. This measure is required to avoid potential adverse impacts to lynx that may winter in the project area.

- Any and all modifications to the projects described herein will require additional consultation with the district wildlife biologist for all applicable federally listed or Forest Service sensitive species and may require new or additional management requirements or mitigations, depending on the proposed modifications.

- Any and all proposed projects subsequent to this decision will require separate and specific analyses for all applicable federally listed or Forest Service sensitive species and will include completion of Biological Assessments and/or Biological Evaluations, as dictated by the proposed action(s).

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Date: 7/24/06

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