Terrestrial Wildlife Habitat And Species

INTRODUCTION

Terrestrial wildlife species viability is dependant upon maintaining a mix of vegetation quantity, quality, and distribution (habitat). Wildlife use different vegetative and structural stages (condition of one kind of vegetation as it changes through time) for feeding, reproduction, and cover (Thomas et al. 1979). Vegetation change, both natural and human-caused, and human use of the land are the major influences on terrestrial wildlife. Spatial characteristics of landscapes—such as fragmentation, patch size distribution, and connectivity—are largely determined by management actions and their interactions with natural disturbances such as fire, insects, and disease. The landscapes of the Ecogroup represent diverse, highly complex systems that have been affected by many factors, including the interaction of soils, aspect, elevation, climate, and disturbance. All of these influences have shaped vegetative composition and patterns that, in turn, have influenced the distribution of biodiversity across the landscape (Mehl et al. 1998).

Historically, fire, insects, storms, disease, animals, and plant succession were the agents that modified habitat and caused disruption of species use of habitat (Graham et al. 1997, Morgan and Parsons 2001). Fire has been a dominant influence historically in the northern Rocky Mountains (Agee 1999, Gruell 1983). Over time, ecosystems fluctuate within some range of variability related to the disturbances that occur within them. The term "historical range of variability" (HRV) has been used to describe these fluctuations in ecosystems, using conditions prior to Euro-American settlement as a reference point (Morgan et al. 1994). Historically, low-elevation forests in the western Rockies often burned frequently (every few years), with low-intensity ground fires, leaving most of the large trees alive. By contrast, high-elevation forests usually burned with stand-replacing fires that killed most trees, but at infrequent intervals, as much as hundreds of years apart.

Today, fire regimes in some forest vegetation types have substantially changed, due mostly to increases in vegetation densities and fuel loadings that are outside the historic range of variability (see *Fire Management* and *Vegetation Hazard* sections). This, in turn, has led to increases in stand-replacing fires in areas where they historically did not typically occur, resulting in dramatic changes in wildlife habitat. The increases in vegetation densities and fuels have been largely caused by human suppression and exclusion of fire in ecosystems that historically had relatively frequent fire return intervals. Humans have caused other major changes in vegetative patterns through such activities as timber management, livestock grazing, road and facility construction, mining, and recreation. Habitats adjacent to the Forests have changed or been converted to agricultural use, urban development, dams, or water diversions which have influenced species that use Forest-administered lands. In addition, increases in human use and access have increased disturbance to wildlife species, and disruption and fragmentation of their habitats (Forman et al. 1997).

Similar changes in fire regimes have occurred in shrub and grassland environments. Fire exclusion, livestock grazing, roads, and non-native plants have altered shrubland and grassland structure and composition in many areas. In some areas, shrub density has increased while the grass/forb communities have decreased. These factors have influenced vegetation development, patterns, and distribution of habitats for species that use these cover types (Wisdom et al. 2000).

This analysis looks at how the management alternatives for Forest Plan revision either contribute to or mitigate changing patterns of habitat alteration and fragmentation, and disturbance to wildlife. Particular attention is paid to those species whose viability may be affected by the alternatives and their associated activities. Federal regulation 36 CFR 219.19 requires that viable populations of all native and desirable non-native vertebrate species be maintained at the planning area level. Species with a viability concern include those listed or proposed for listing under the Endangered Species Act, those on the Regional Forester's sensitive species list, species at risk, and Forest Management Indicator Species for which populations and habitat conditions may be a concern. Currently, there is no approved or standardized viability analysis approach used by the Forest Service, and the discussion is continuing at the national level. Two commonly used but different approaches (Andelman et al. 2001, Holthausen et al. 1999) indicate the need to analyze viability for different types of species, and this EIS analysis has borrowed from both of these approaches. Additional species and habitats of concern for the planning area have been identified through Idaho Partners In Flight (2000) and Wisdom et al. (2000).

Issues and Indicators

Issue Statement 1 – Forest Plan management strategies may affect habitat for terrestrial wildlife species, including species that are listed or proposed for listing under the Endangered Species Act, Region 4 sensitive species, species at risk, and Forest Management Indicator Species.

Background to Issue 1 – The *Preliminary AMS for the Southwest Idaho Ecogroup* (USDA Forest Service 1997) identified a Need For Change to develop integrated and consistent direction to provide for connectivity of habitat while providing sufficient habitat quantity, quality, and distribution for species viability. Also, there is a need to contribute to the protection, recovery, and de-listing of threatened and endangered species.

Management alternatives and their associated activities may have many effects on terrestrial wildlife habitat and species. Alternatives that would increase activities such as road construction, timber harvest, livestock grazing, recreation, and mining could also increase habitat alteration and fragmentation, as well as disturbance to species. These impacts, in turn, could negatively affect species viability. Viability is a concern for all terrestrial species, but particularly for threatened, endangered, proposed, or sensitive species for which habitat and/or populations are currently in decline or suspected. Effects are analyzed for these species, and for Forest Management Indicator Species that have been chosen to represent local habitats or populations of concern.

Indicators for Issue 1 – Effects to most species in this analysis are measured by changes to habitat and habitat trends. For selected species, effects are displayed through anticipated changes to potential vegetation groups or cover types and the following vegetation components:

- Vertical structure,
- Size class,
- Density,
- Species composition,
- Snags and coarse woody debris.

The indicators are designed to show the relative amount of impact by alternative from those management activities that have the greatest potential for impacts. Differences between alternatives are displayed by the use of SPECTRUM modeling outputs, which show relative changes in the number of acres of PVGs and structural stages as they relate to habitat for different species. However, in order to better reflect the reality of program or project implementation, these indicators need to be assessed with respect to the resource protection methods that would be implemented to mitigate effects.

Issue Statement 2 - Forest Plan management strategies may affect disruption, vulnerability, and disease risk to terrestrial wildlife species.

Background to Issue 2: Some species of wildlife are sensitive to human activities in close proximity during the breeding, nesting and wintering portions of their life cycles. Human activities, whether intentional or unintentional, can increase stress to some species and may reduce their reproductive success.

For example, bighorn sheep populations have declined in the Ecogroup area during the last 100-150 years. Although these species have no status under ESA, the U.S. Fish and Wildlife Service is concerned about their population status and viability (Quigley and Arbelbide 1997c, Wisdom et al. 2000). One threat may be the potential risk of disease transmission from domestic sheep. The current Forest Plans lack management direction for this situation.

The *Preliminary AMS for the Southwest Idaho Ecogroup* (USDA Forest Service 1997) identified a Need For Change to give direction to decrease the adverse affects of access that may cause disruption to species during critical life stages.

Indicators for Issue 2: Effects to species in this analysis are measured by changes in disruption, vulnerability, or the risk of disease. Species considered in this analysis include wide-ranging carnivores such as gray wolf and wolverine, habitat generalists such as elk, and species that spend considerable time nesting or roosting, like bald eagles and bats. Bighorn sheep are also considered due to their susceptibility to fatal diseases that are known to occur in domestic sheep and goats. Indicators used to show changes in disruption, vulnerability, or the risk of disease are taken from Wisdom et al. (2000):

- Risk of human-related disruption to wide-ranging carnivores and other species.
- Road densities related to road construction and decommissioning, and roadless areas.
- Acres of suitable domestic sheep range within bighorn sheep habitat.

Affected Area

The affected area for direct and indirect effects on terrestrial species is National Forest administered lands within the Ecogroup area. The vegetative communities within Forest boundaries could be influenced by implementation of any of the revised Forest Plan alternatives. The affected area for cumulative effects includes all land ownerships within and adjacent to the boundaries of the Ecogroup Forests. Species using habitats do not recognize administrative boundaries, and implications from vegetation management often extend beyond Forest boundaries.

CURRENT CONDITIONS

Fragmentation and Disturbance/Disruption

The ability of terrestrial habitat to support viable populations of terrestrial species is dependant on vegetation quantity, quality, and distribution through both space and time. Habitat can be fragmented by natural events such as fire and insect and disease outbreaks, and human activities such as timber management, roads, dams, diversions and facility construction. Fragmentation of habitat is the isolating or splitting of similar habitat into smaller and more separated pieces. As pieces of habitat become smaller and farther apart, it becomes more difficult for species to make use of them and persist into the future (ICBEMP 1996b).

Human activity other than habitat modification or fragmentation can influence some species through disturbances or disruption. Wildlife behavior in response to human activities generally takes the form of avoidance, attraction, habituation, or indifference, as in no response (Knight and Temple 1995).

Several variables influence disturbance, and therefore the response of an animal to disturbance. These variables may include the type, predictability, frequency, magnitude, timing, and nearness of disturbance. Some individuals respond differently then others to the same disturbance, often due to group size, age, or sex. These responses may vary during different life stages of a given species (Knight and Temple 1995, Wisdom et al. 2000). For example, an individual may be disturbed by human proximity during nesting or denning when young are present, causing disruption to its reproductive cycle, but that same individual may be indifferent to human proximity during other seasons of the year.

Vegetation and Habitat Changes

The Forest Service is primarily responsible for wildlife habitat management on lands it administers. Idaho and Utah state fish and wildlife agencies have authority to carry out statutory policy to preserve, protect, perpetuate, and manage all fish and wildlife species. Close cooperation between the different state and federal agencies is necessary to ensure proper management of the fish and wildlife resources for the public.

The Forest Plan Revision Team has classified and identified 11 forest potential vegetation groups (PVGs), and 10 shrubland/grassland cover types. These vegetation groupings and their successional stages, interacting with physical components of the landscape, make up the basic components of habitat for terrestrial wildlife. The eleven forest PVGs are groups of habitat types that reflect moisture and elevations gradients that exist across the landscape (Mehl et al. 1998, Sallabanks 1996). Current conditions in plant communities indicate that some of these communities have substantially changed from what they were historically (see Vegetation Diversity section, Geier-Hayes 1995, Graham et al. 1997, Quigley and Arbelbide 1997a, Morgan and Parsons 2001, Sloan 1998).

In general, vegetation species composition has shifted from early seral to climax in a number of PVGs and cover types compared to the HRV. Some of these changes are particularly evident in PVGs that historically maintained a large portion of the area in early seral species due primarily to fire. For example, in PVGs 1 and 2 the predominate cover type was ponderosa pine, which is adapted to the frequent, nonlethal fires that were common historically. Many factors have produced a shift from ponderosa pine toward climax Douglas-fir in portions of these PVGs. In these areas, the amount of ponderosa pine has declined below the estimated historical levels and Douglas-fir has increased. Early seral species that were not a dominant feature on the landscape have also declined below historical estimates. Both western larch and whitebark pine, early seral species in the grand fir and subalpine fir PVGs, have in most cases declined. Whitebark pine, in particular, is experiencing high mortality rates due to a host of factors, but especially blister rust (Smith and Hoffman 2000). While some of these agents caused mortality in historical times, regeneration has declined with the advent of fire exclusion. In addition, mortality of smaller-diameter trees has been greater than in larger-diameter trees (Smith and Hoffman 2000), further reducing opportunities to retain whitebark pine on the landscape over the long term.

It is estimated that Idaho and Utah provide habitat for 364 species of breeding vertebrates (13 amphibians, 22 reptiles, 230 birds and 99 mammals) that occur in forested and non-forested habitats (Groves et al. 1997, Spahr et al. 1991). About 300 of these vertebrate species are known to occur within the Ecogroup area (Groves et al. 1997).

Vegetation management practices, fire and fire suppression, insects, non-native plants, disease, livestock grazing, climate, and plant succession are currently the agents that modify non-forested habitats the most. It is important to recognize that natural disturbances do not necessarily create the same conditions as mechanical treatments or livestock grazing (Quigley and Arbelbide 1997a). In forested areas that have been harvested, stand densities and species composition have been generally altered, resulting in a reduction of large-sized trees. Harvest areas and areas that have been protected from fire have regenerated with tree species that are more tolerant of

shady conditions. New roads were constructed to access most of the harvest areas, and many of these roads are still present, contributing to habitat fragmentation and potential human disturbance to species. Conversely, areas that have not been harvested, but that have had fire excluded, have developed uncharacteristically high levels of tree densities and fuel loading, and are now dominated by climax plant species, which has increased the risk of insect activity and stand-replacing fire. Similar changes have occurred in non-forest vegetation. Fire exclusion and livestock grazing have altered shrubland and grassland structure and composition in many areas, which has also affected wildlife habitat. In these areas, shrub density has increased while grass/forb communities have decreased.

These and other factors have influenced vegetation development and patterns, and distribution of habitats. The potential to diminish biological diversity can be high if current conditions are outside of, and remain outside of, the historical range of variability. However, this does not mean we must return our forests completely to the range of historical conditions to sustain biological diversity (Morgan and Parsons 2001). Historically, environmental conditions were variable and modified habitats over both the short and long term.

Recent information suggests that past management practices have had impacts on vegetation within and adjacent to National Forests (Geier-Hayes 1995, Quigley and Arbelbide 1997c). Also, habitats adjacent to the Forests have changed or been converted to agricultural use or urban development, which has influenced species that use Forest administered lands. Some species that use habitat on the Forests may spend some of their life off the Forest and be influenced by activities in these locations. Additionally, non-native wildlife species have been introduced that use habitats differently than native wildlife species, and may compete with native species.

The Ecogroup area is not one uniform block of habitat within Forest Service administration. The northern portion is a large contiguous tract of land of over six million acres that varies from 1,600 to 11,800 feet in elevation. Within this regional area are countless types and variations of habitat that merge into one another gradually or are separated by abrupt natural and human-caused breaks. Also, within the Forest administrative boundaries are lands of other ownership (private, State, BLM) that are often managed under different goals and objectives.

The Snake River Plain separates the southern portion of the Ecogroup from the northern portion. The southern portion is comprised of five relatively small, higher-elevation isolated parcels that are mostly surrounded by agricultural development on lower-elevation private lands. Within these areas, other land ownership (private, State, BLM) also occurs. Some of these ownerships are actively managed, and some are not.

Some landscape formations that are important as habitat are not related to vegetation, but at times can be modified by management activities. Some of these formations are caves, talus slopes, large rock outcrops, and rim rock canyons. These types of habitats are used by species such as bats, amphibians, and reptiles, to mention a few.

It must be acknowledged that species populations may fluctuate (up and down) with no change in habitat. These fluctuations may be due to climate changes, disease, predation, excessive harvest, competition or displacement from exotic species, and other factors not related to habitat

changes. A change in habitat (loss, reduction in density, fragmentation, or habitat made inaccessible) could also cause additional change in populations. For migratory species, a change in population may not represent changes in local Forest habitat conditions. Many species migrate off Forest at different times of year and are influenced by activities or conditions that occur off Forest. However, the Forest Service still has an obligation under the Migratory Bird Treaty Act (MBTA) and Executive Order 13186 relative to migratory birds while they are on National Forest System lands. The U.S. Fish and Wildlife Service has developed a list of species (Birds of Conservation Concern) relative to the MBTA, but a Memorandum of Understanding has not been finalized between the agency and the Forest Service on how these species will be addressed (USDI FWS 2002).

Threatened and Endangered Species

Special management emphasis is given to species for which there is a documented viability concern. Species listed under the ESA fall into four categories based on viability concerns: Threatened, Endangered, Proposed, and Candidate. The Forest Service has a legal requirement to maintain or improve habitat conditions for threatened, endangered, and proposed species under the ESA. Administrative direction also exists to maintain or improve conditions for species on the Regional Forester's sensitive species list, and for Management Indicator Species, which are addressed in Forest Service Manual 2670, and Handbook 2609.

The U.S. Fish and Wildlife Service (USFWS) has not identified any critical habitat within the Ecogroup area for terrestrial species currently listed as threatened or endangered under the ESA. Recovery plans and Biological Opinions are developed for threatened and endangered species by the USFWS. Recovery plans and Biological Opinions provide goals and actions needed to recover species. Threatened, endangered, proposed, or candidate species that may occur within the Ecogroup area, their locations, and important consideration for management are described in Table W-1.

Table W-1. Locations and Management Considerations for Threatened, Endangered, Proposed, or Candidate Species in the Ecogroup Area

Type	Common Name	Forest*	Global Rank	PVGs or Cover Types+	PVGs or Cover Types^	Management Considerations
Mammal	gray wolf	All 3	G4	All	All	Vulnerability during denning
	northern Idaho ground squirrel	Payette	G2	1, 2, 4, 5	2	Vulnerability, specific habitat needs
	Canada lynx	All 3	G5	3, 6, 7, 9, 10, 11	3, 6, 7, 9, 10, 11	Vulnerability, prey abundance during the winter
Bird	bald eagle	All 3	G4	All	2, 3, 4, 5, 6, 7, 8, 9	Nest stand, prey availability
	Yellow-billed cuckoo	All 3	G5	Cottonwood riparian forest	Cottonwood riparian forest	Nesting and foraging

* Forest or Forests in the Ecogroup where this species occurs.
+ Potential Vegetation Groups or cover types that species use.
^ Potential Vegetation Groups or cover types that provide primary habitat needs of this species.
Global Rank is a system of ranking the range-wide status of species maintained by State Conservation Data Centers and Natural Heritage Programs throughout North America and several other countries. Numerical rankings range from G1 to G5, where G1 species are considered critically imperiled at the global scale, and G5 species are considered globally widespread, abundant, and secure, although there may be concerns for the viability of local populations. Many researchers believe that species ranked G1-G3 need special consideration or mitigation for management activities that may negatively affect their habitat because their long-term viability is currently a concern (Andelman et al. 2001)

Gray Wolf (*Canis lupus*)

Wolves are native to Idaho and Utah. They are habitat generalists, and historically they were fairly common in most parts of the state with big game herds. The basic social unit in wolf populations is the pack. A pack can consists of 2 to 20 wolves (average of 10). Pack members have a strong social bond to each other, and they establish and defend territories. Territories range in size from 80 square miles in Minnesota to over 600 square miles in Alberta. Home ranges for Central Idaho packs range from 360 square miles to 2000 square miles over the last several years.

From about 1860 to the mid-1930s, a series of events resulted in the eradication of wolves from the western United States and southern Canada. The Idaho legislature passed a law in 1907 authorizing the Idaho Department of Fish and Game to devise and put into operation such methods and means as would best secure and obtain the extermination of wolves, coyotes, wild cats, and cougars. Ultimately, the introduction of processed strychnine in 1920 spelled the doom of the gray wolf throughout the West. Despite efforts to exterminate them, wolf reports persisted in Idaho from the late 1920s through the 1970s. These were believed to be dispersing animals from Canada.

Although the gray wolf is considered an endangered species throughout much of its range, including northern Utah, the populations south of Interstate 90 in the State of Idaho and Montana are considered Experimental/non-essential. In 1994, the USFWS approved the Final EIS for the

Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho (USDI FWS 1994). In November of that year, final rules were issued for the establishment of Experimental/ non-essential populations of gray wolves in Yellowstone and central Idaho. One of the rules states that all wolves found in the wild within the boundaries of the management areas after the first wolf releases are considered experimental/non-essential animals (USDI FWS 1994). Except for the Raft River unit on the Sawtooth National Forest (which is in Utah) the entire Ecogroup area is within the experimental/non-essential population management area for central Idaho.

The U.S. Fish and Wildlife Service, as the agency initiating the Reintroduction Plan, analyzed and documented the potential effects of various land management activities through their Final EIS. The June 15, 1994 Notice of Record of Decision and Statement of Findings on the EIS for the Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho, by the USFWS states,

> "No conflicts are envisioned with any current or anticipated management actions of the U.S.D.A. Forest Service or other Federal agencies in the experimental areas. Forest Service properties are a benefit to the project since they form a buffer to private properties in many areas, and management activities on National Forests are typically conducive to production of numerous prey animals."

The Reintroduction Plan did provide for temporary use of land use restrictions by land and resource managers to control intrusive human disturbance near active den sites between April 1 and June 30, when there were five or fewer breeding pairs of wolves in the experimental/non-essential population.

In the Central Idaho Experimental/Non-essential Population Management Area, 15 Canadian wolves were released in 1995; and 20 Canadian wolves were released in 1996. By 1999, there were wolves breeding on each of the three Forests, and packs on the Boise (2), Payette (2), and Sawtooth (2) had formed. Recovery is occurring at a faster rate than expected. The recovery goal for wolves in central Idaho is 10 breeding pairs for three consecutive years (USDI FWS 1994). Based on the December 2002 Idaho wolf population estimate, there are an estimated 280 wolves with 19 packs and 10 breeding pairs in the central Idaho recovery area. There have been no documented wolves in the Raft River unit in northern Utah.

The primary threat to wolves is mortality from shooting and vehicle collisions (Quigley and Arbelbide 1997c, Wisdom et al. 2000). Primary management concerns for the Forest Service are (1) disturbance to denning wolves when pack numbers are low within individual recovery areas, and (2) providing adequate habitat for populations of prey species such as elk.

Bald Eagle (*Haliaeetus leucocephalus*)

Nesting habitat on the Forests is associated with large rivers—such as the Salmon, North Fork Payette, South Fork Boise, and Snake—or large lakes and reservoirs, such as Cascade Reservoir, Anderson Ranch Reservoir, Arrowrock Reservoir, Warm Lake, and Lost Valley Reservoir. Nests are commonly found in large trees, mainly conifers and cottonwoods, and usually near water. Because eagles build large nests, nesting habitat is often found in multi-story, old forest stands with open canopies (Quigley and Arbelbide 1997c). Nests can also occur in single, isolated trees if the trees are strong enough to support them.

During the breeding season, bald eagles eat mainly fish. They also eat waterfowl, shorebirds, upland birds, and small mammals. Eagles are opportunistic foragers, especially during the winter, when they will eat whatever is available, including live fish, waterfowl, small mammals, and carrion. Wintering bald eagles tend to congregate near bodies of unfrozen water and roost communally. Major rivers and large reservoirs constitute the majority of winter habitats used, although the temporary presence of high-quality foods may entice eagles to areas far removed from aquatic zones. Roost sites are usually located in stands/clumps of mature or old conifers or cottonwoods.

Eagles are currently nesting on the Boise (10 nests) and Payette (1 nest) Forests, and winter roosting on all three Forests. There are approximately 21,000 acres of existing nesting habitat, an additional 8,000 acres of potential nesting habitat, and 170,000 acres of wintering area within the Ecogroup area. The number of occupied bald eagle territories within Idaho continues to increase. USFWS Recovery Plan goals for management zones for this portion of the population have been exceeded during the last ten years. The USFWS has proposed to de-list the bald eagle because of positive population trends within this and other recovery areas.

Canada Lynx (*Felis canadensis*)

There has been considerable interest in habitat potential and viability for lynx during the last several years. The proposed rule to list population segments as threatened was published in the Federal Register on July 8, 1998 (63FR 36994). The lynx was listed as threatened under ESA by the USFWS in March of 2000.

Major risk factors for lynx include direct human threat (shooting, trapping, vehicle collisions), as well as changes in forage and denning habitat. Lynx have evolved a competitive advantage in deep snow environments due to their large paws that allow them to hunt prey where other predators cannot because of snow conditions. However, snow trails compacted by human activity may allow other predators to access prey in deep snow conditions where historically they were excluded. Advances in snowmobile capabilities have raised concerns about intrusion into previously isolated areas (Wisdom et al. 2000). Human access into lynx habitat during winter can also increase threats, because lynx can be detected or disturbed by snowmobiles traversing vast forest areas in short periods of time. This increased access can also increase lynx vulnerability to harvest, collision, or harassment.

Lynx are usually more active at night than during the day. The eyes of lynx are well adapted for night hunting. Preferred winter food consists primarily of snowshoe hares, along with rodents such as red squirrels, and birds. Suitable habitat for hares generally consists of young conifer stands with relatively dense and interconnected canopies that provide both cover and food. Fire suppression has reduced the quality and quantity of hare habitat by reducing the amount of conifer regeneration. Little is known about habitat for snowshoe hares in terms of patch size and spatial arrangement in this portion of Idaho. Denning habitat for lynx occurs in mature and late structural boreal forests with locally abundant large woody debris present.

Roads and trails have resulted in increased human access and activity in lynx habitat, particularly during critical winter months. Many of the existing routes are closed to motorized travel during certain times of the year but are open to over-the-snow travel and provide popular snowmobile

opportunities. Packed snow trails made by snowmobiles can allow other predators, such as coyotes that would normally be excluded because of snow conditions, to compete with lynx for prey. Lynx use roads and packed trails for travel, which may make them more vulnerable to human-caused mortality. Fire suppression and logging have altered the mosaic of habitats needed for prey species and denning sites (Wisdom et al. 2000, USDI FWS 2000). Abundant quality and quantity of snowshoe hare habitat appears to be limited within the Ecogroup area.

Lynx may be present in the Ecogroup area, but no population numbers are available (Wisdom et al. 2000). Lynx occurrences have been documented within the Ecogroup area, some as recent as the 1960s and 70s. There have been several recent creditable observations of lynx within the area. It would appear, however, that the species was never common in this area, as it is further north in Canada. During 1999, 2000, and 2001, lynx hair sampling surveys were conducted on all three Forests. Lynx hair samples were only detected on the Boise National Forest during 1999. (The hair surveys were not intended to be population or presence/absence surveys). A more complete description of lynx historical occurrence for local areas in Idaho is found in Lewis and Wenger (1998).

During 2002, an effort was started that would amend existing Forest Plans that are not in the process of Forest Plan revision. The Southwestern Idaho Ecogroup Forests are within the Northern Rockies Lynx Amendment area but are not included in the amendment process because they are in the process of plan revision. The intent of this amendment is to make existing plans not currently in revision consistent with the Lynx Conservation Assessment and Strategy (LCAS) (USDI FWS 2000). The Boise, Payette, and Sawtooth Forests are in the process of plan revision and have incorporated direction that is consistent with the LCAS because they are not be included in the Northern Rockies amendment process.

Northern Idaho Ground Squirrel (*Spermophilus brunneus brunneus*)

The northern Idaho ground squirrel is the most imperiled terrestrial species in Idaho. This squirrel is the only mammal in Idaho that occurs in Idaho alone, and population numbers have been declining. This ground squirrel occurs in meadows adjacent to forest clearings surrounded by ponderosa pine and Douglas-fir. The meadows usually have shallow soil, with intrusions of deeper soils. The areas of deep soil are necessary for nest burrows. The squirrel is known to occur in only two counties and in fewer then 25 locations. All current occupied sites are on the west side of the Payette National Forest or adjacent private lands, except for a single site in Valley County. It is known that the squirrel has been extirpated from a number of locations where it historically occurred, including locations on the Boise National Forest. The total population is currently estimated at 250-500 individuals. About half of the known populations occur on the Payette National Forest (Yensen 1991).

Because of the current very low population numbers, any losses from any cause are of great concern. With such low population levels, major threats include vulnerability to shooting, poisoning, trapping, road kill, and predation. Disturbance from recreation activities and livestock grazing is also a concern. A variety of fine-scale habitat issues—such as exotic vegetation, reduced native grasses and forbs, tree and shrub encroachment, and fire suppression—are important management considerations.

Given the low population levels and disjunct habitat that presently occurs, viability is a concern for this species (Moroz et al. 1995, Wisdom et al. 2000). In 1996, a Conservation Agreement between the Payette Forest and the USFWS was approved to address this viability concern. Prior to and since this agreement, the Payette Forest has been implementing habitat improvement projects to decrease tree encroachment on current occupied sites, and to connect isolated populations. In March of 1998, the USFWS proposed that the northern Idaho ground squirrel be listed under the ESA as a threatened species. It was listed as threatened under the ESA by the USWFS in April of 2000. The USFWS released a ground squirrel Draft Recovery Plan for public comment in July 2002.

Candidate Species

Yellow-billed Cuckoo *(Cocyzus americanus)*

The yellow-billed cuckoo inhabits extensive deciduous cottonwood forests with dense shrub understories. This species is known to occur in Idaho and is considered a peripheral species in Idaho by the Idaho Partners in Flight (IPIF 2000). Populations are rare in Idaho but are known to occur in eastern Idaho on the South Fork of the Snake River below Palisades Reservoir, an area with extensive cottonwood forests (Groves et al. 1997). This species is declining in parts of its range due to deterioration and loss of riparian forest habitat. Principal causes of riparian cottonwood forest habitat loss are conversion to agricultural and other uses, dams and river flow management, stream channelization and stabilization, livestock grazing, and competition from exotic plants. Overuse by livestock has been a major factor in the degradation and modification of riparian habitats in the western United States. The breeding population of yellow-billed cuckoos in Idaho is likely limited to a few breeding pairs, at most. Population numbers have declined substantially across much of the western United States over the past 50 years (Federal Register Vol. 66, No 143, 2001). The yellow-billed cuckoo is currently a Candidate species in this area for listing under the ESA.

Western yellow-billed cuckoos breed in large blocks of riparian habitat with a dense understory of foliage. This understory appears to be important for breeding success. The large blocks of riparian habitat for nesting are usually greater than 25 acres (Federal Register Vol. 66, No 143, 2001; Saab, 1992).

There are areas that contain cottonwood riparian forest within the Ecogroup. Few if any of the areas could be considered extensive. Most of the cottonwood forest within Forest Service administered lands occurs on high-gradients streams (steep), which results in narrow, linear pieces of habitat. Some private in-holdings adjacent to Forest Service administered lands contain cottonwood forest that could be considered extensive. No records of yellow-billed cuckoos have been documented within the Ecogroup on Forest Service administered lands.

Recently De-listed Species, as of 1999, and Currently a Sensitive Species

Peregrine Falcon (*Falco peregrinus*)

Peregrine falcons associated with the Ecogroup area are part of the Rocky Mountain population (USDI FWS 1984). The objectives from the recovery plan were 17 breeding pairs in Idaho, and 21 breeding pairs in Utah. Since 1982, 288 captive-reared young have been released in Idaho.

The first re-established pair was discovered in 1985. The current reproductive level has been sufficient to support considerable population growth. The USFWS American Peregrine Falcon Recovery Plan population objectives have been exceeded. Recently, the USFWS published a final rule to remove the peregrine falcon from its list of endangered and threatened wildlife (USDI FWS 1999). The de-listing was based on the increasing population trend during the last five years.

Peregrine falcons occupy a wide range of habitats, and are typically found in open country near water. They capture prey by striking from above with their talons after a high-speed dive. Foraging habitat includes wetlands and riparian habitats, meadows and parklands, croplands such as hay fields and orchards, gorges and mountain valleys, and lakes that support good populations of small- to medium-sized terrestrial birds, shorebirds, and waterfowl.

Cliffs are preferred nesting sites (known as eyries), although re-introduced birds now regularly nest on man-made structures such as towers and high-rise buildings. Peregrines may travel more then 18 miles from the nest site to hunt for food; however, a ten-mile radius around the nest is an average hunting area, with 80 percent of foraging occurring within a mile of the nest. They migrate south for the winter to the Gulf of Mexico and into Mexico and Central America, or to large rivers and wildlife refuges in the southern United States (USDA Forest Service 1991).

Peregrines declined precipitously in North America following World War II. Research implicated pesticides—particularly DDT, DDE, and dieldrin applied in the United States and Canada during this same period—as causing the decline linked to weakened egg shells (USDI FWS 1984). Use of these chemicals peaked in the 1950s and early 1960s, and continued through the early 1970s (Federal Register Vol. 64, No. 164, 1999).

The most significant event in the recovery of the peregrine falcon was the restriction placed on the use of pesticides. Use of DDT was restricted in Canada in 1970 and in the United States in 1972. Restrictions that controlled the use of aldrin and dieldrin were imposed in the United States in 1974. Since implementation of these restrictions, pesticide residues have significantly decreased in many regions where they were formerly used. Consequently, reproductive rates in most surviving peregrine falcon populations in North America improved, and numbers began to increase (USDI FWS 1984, Quigley and Arbelbide 1997c). In Idaho, the peregrine population has been increasing during the last 10 years.

Other known negative factors—such as illegal shooting and collisions with wires, fences, cars, and buildings—are much less significant to population levels of the peregrine falcon in the West. On an individual nest-site basis, human-caused disturbance or habitat alterations close to an active peregrine falcon nest can be a problem. For example, in some areas, rock-climbing is a growing sport and has resulted in nest failure due to abandonment (Quigley and Arbelbide 1997c). Closure of rock-climbing cliffs in proximity to nesting peregrine falcons has recently prevented adverse effects. Power lines, especially distribution lines, can cause peregrine falcon mortality; but many peregrine falcons nest successfully each year near power lines, especially in urban areas. Land-use practices adjacent to peregrine falcon eyrie that do not result in extensive habitat changes or excessive disturbance appear to have little adverse effect on nesting success.

The recent apparent increase in the number of pairs of peregrine falcons in the West suggests that significant adverse factors affecting the western subspecies at the population level are being alleviated or have been reduced (USDI FWS 1999). Ten years ago there were no known nesting occurring within the Ecogroup. Currently peregrine falcons are known to be breeding on the Sawtooth Forest. There is no known nesting currently on the Boise and Payette Forests, but tall cliff habitat is present for more nesting to occur within the Ecogroup.

Sensitive Species

At present, 16 terrestrial vertebrate species (1 amphibian, 11 birds, and 4 mammals) within the Ecogroup are on the U.S. Forest Service, Intermountain Region sensitive species list (see Table W-2). The list is evaluated annually to see if species need to be added or removed. A revised list is anticipated sometime during 2003, and this list is expected to increase the number of sensitive species. The 1999 sensitive species list was used because it has strongly influenced past and recent management actions conducted under the current Forest Plans. This list has not changed and is still current as of early 2003.

Species are designated "sensitive" by the Regional Forester because their population or habitats are trending downward, or because little information is available on their population or habitat trends. The primary purpose of the sensitive species program is to conserve or restore habitat conditions for these species to prevent them from becoming federally listed under ESA. Regional and Forest Plan direction is designed to restore, protect, and enhance sensitive species habitat and population viability. When species are de-listed as threatened or endangered by the USFWS, they usually are added to the Forest Service sensitive species list if they occur in the area. This was the case with the peregrine falcon when it was recently de-listed. The sensitive species, their locations, and important consideration for management are described in Table W-2.

Table W-2. Sensitive Terrestrial Species of the Ecogroup

Type	Common Name	Forest*	Global Rank	PVGs or Cover Types+	PVGs or Cover Types^	Management Considerations
Mammal	Wolverine	All 3	G4T4	All	All	Vulnerability during denning
	fisher	All 3	G5	3, 4, 5, 6, 7, 8, 9, 10	3, 4, 5, 6, 7, 8, 9	Habitat fragmentation, snags and logs
	Townsend's big-eared bat	All 3	G4	NA	NA	Vulnerability to disruption
	spotted bat	All 3	G4	NA	NA	Vulnerability to disruption
Bird	northern goshawk	All 3	G5	All	2, 3, 4, 5, 6, 7, 8, 9	Nest stand, prey availability
	white-headed woodpecker	All 3	G4	1, 2, 3, 5	1, 2, 3, 5	Large Snags, low crown density
	flammulated owl	All 3	G4	1, 2, 3, 5, 7	1, 2, 3, 5, 7	Large snags and trees
	harlequin duck	Payette	G4	Large streams in forest setting	Large streams in forest setting	Forest Riparian

Type	Common Name	Forest*	Global Rank	PVGs or Cover Types+	PVGs or Cover Types^	Management Considerations
	mountain quail	Payette, Boise	G5	1	1	Shrubby Riparian
	boreal owl	All 3	G5	3, 6, 7, 8, 9, 11	3, 6, 7, 8, 9, 11	Large snags
	northern three-toed woodpecker	All 3	G5	3, 7, 8, 9, 10, 11	3, 7, 8, 9, 10, 11	Abundant snags
	great gray owl	All 3	G5	9, 10	9, 10	Forested areas with meadows
	Columbian sharp-tailed grouse	Sawtooth	G5T3	Native shrub/ grass lands	Native shrub/ grass lands	Shrubby wintering areas
	common loon	Sawtooth	G5	Natural lakes	Natural lakes	Vulnerability during nesting, abundant small fish for prey
	peregrine falcon	All 3	G4T3	High cliffs	High cliffs	Vulnerability during nesting, prey abundance
Amphibian	spotted frog	All 3	G4Q	Riparian areas	Riparian areas	Still or ponded water

* Forest or Forests in the Ecogroup where this species occurs.
\+ Potential Vegetation Groups or cover types that species use.
^ Potential Vegetation Groups or cover types that provide primary habitat needs of this species.
Global Rank = Globally imperiled ranking, from Idaho Conservation Data Center (2002)
NA = Not Applicable

Wolverine (*Gulo gulo*)

The wolverine is a species suited to extensive, usually high-elevation areas. Threats to wolverine include motorized and non-motorized travel during winter and spring denning, especially in forested and alpine ecosystems where human use is presently low and habitats have not been greatly modified. A study of wolverine in central Idaho occurred from 1992-1996, and portions of the Ecogroup were included in the study area (Copeland and Harris 1994). Wolverines are primarily scavengers that forage on carcasses of large ungulates such as elk, moose, deer, mountain goats, and bighorn sheep. They also hunt hares, marmots, ground squirrels, and grouse, but will eat fruits and insects when other items are unavailable.

Wolverine home range sizes are influenced by prey remains and other food sources. Individual animals have large territories and can cover large distances in short time periods. In central Idaho, home ranges have been documented as large as 2,079 square kilometers (802 square miles) for males, although female ranges tend to be smaller. Wolverines do not show strong territorial behavior and have overlapping ranges. They use several habitats and have been located in forested drainage bottoms to high-elevation, sparsely timbered cirque basins. Two natal dens were located in subalpine cirque areas on north-facing slopes, suggesting that this type of habitat is important in central Idaho (Copeland and Harris 1994).

Due to their large home range size and habitat needs, this species is rare and uncommon, and most likely always has been. Habitats within the areas wolverine are known to inhabit are the least modified by human activities, due to their remote, steep, and harsh environments

(Sallabanks 1996). Wilderness and roadless lands account for much of the areas wolverines are known to use (Copeland and Harris 1994). There have been some very large fires in the type of habitat wolverines inhabit on the Payette Forest. These fires were generally characteristic (large in area, infrequent in occurrence, and stand-replacing) for the plant communities and elevations in which they burned.

Human intrusion within denning habitat during the winter is probably the primary threat to this species (Wisdom et al. 2000). Human activities during denning may cause wolverines to relocate to less preferred habitat, which may reduce reproductive success. Moving wolverine young can also expose them to predators and harsh weather when they are vulnerable. Recent technological advances in snowmobile capabilities have raised concerns about intrusion in previously isolated areas (Wisdom et al. 2000) where natal denning may be occurring.

There are no known population trends for the wolverine within the Ecogroup area. Wisdom et al. (2000) estimate an increase of 32 percent of source habitat from historic to current for this species within the Central Idaho Mountains ERU, which includes a majority of the Ecogroup.

Fisher (*Martes pennatia*)

Fishers are a rare predator found in mature to old forests with high canopy closure and large tree (both live and dead) structure. They avoid large openings. They are associated with mesic forest conditions and forested riparian areas. Natal dens have been located in pileated woodpecker cavities and other forest structures. They eat small mammals, birds, fish, amphibians, insects, carrion, fruit, and nuts (Idaho State Conservation Effort 1995). Fishers hunt for prey on the forest floor and in trees and snags (Spahr et al. 1991). Vegetation management and fire suppression have influenced habitat of this species and its prey by altering composition and structure. There are no known population trends for fishers within the Ecogroup area. Wisdom et al. (2000) estimate an increase of 35 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU, which includes an estimated 87 percent of the Ecogroup area.

Boreal Owl (*Aegolius funereus*)

Boreal owls nest in old woodpecker cavities in live and dead trees. Boreal owls are found in high-elevation spruce-fir, mixed conifer, and aspen forests year-round and do not migrate. They are known to prey extensively on redbacked voles. Thirty acres encompass the largest nest sites recorded for boreal owls. Winter home ranges encompass about 3,600 acres. Summer home ranges are slightly smaller (USDA Forest Service 1991). Forest management can change the composition and structure of vegetation used by this species. Management activities that affect large snags and down logs are important habitat considerations for this species. There are no known population trends for boreal owls within the Ecogroup area. Wisdom et al. (2000) estimated an increase of one (1) percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

Great Gray Owl (*Strix nebulosa*)

The habitat components considered most important for this species are: (a) mature or older forest to provide suitable nesting sites; and (b) suitable foraging areas that include non-stocked and seedling forests, meadows, and open riparian habitats that are adjacent to meadows. Great

grays hunt from perches and capture their prey on the ground, usually small rodents (Groves et al. 1997). They do not build their own nest, but use existing nests built by other species and debris platforms, or broken-topped trees and snags (Groves et al. 1997, Bull et al. 1997). Great gray owl nest sites average 150 yards from the nearest opening. The largest home range recorded for a great gray owl is 6.5 square kilometers, which is 1,622 acres (USDA Forest Service 1991).

The great gray owl is a year-round resident on portions of the three Forests, but has not been documented on every Forest District. In relation to other owls in the Ecogroup area, this owl is considered rare in terms of abundance because the habitat (mid- to high-elevation old forests near meadows) it prefers is somewhat uncommon. Intensive timber harvest, snag removal, and removing trees with broken tops in forested areas with meadows are important concerns for this species. There are no known population trends for great gray owls within the Ecogroup area. Wisdom et al. (2000) estimated an increase of 32 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

Flammulated Owl (*Otus flammeolus*)

Flammulated owls are present on the Ecogroup Forests only during the breeding season and migrate off the Forests to winter. The habitat components considered most important for flammulated owls are: a) mature and old forests of Douglas-fir, ponderosa pine, mixed conifer, including lodgepole pine and aspen; b) a moderate density of large trees, and c) snags used for nesting habitat created by larger woodpeckers and sapsuckers (Spahr et al. 1991, Groves et al. 1997). Thirty acres encompass the entire home range of a flammulated owl pair during the breeding and nesting period. They feed almost entirely on flying insects.

Occupied flammulated owl habitat has changed during the last hundred years due to human activities (Morgan and Parsons 2001, Sloan 1998). Major changes in habitat have occurred within the Ecogroup from: selective harvesting of large-diameter ponderosa pine, snag removal in harvest areas, extensive areas (14 percent) of ponderosa pine mortality from wildfires during the last 15 years, and a change in composition and density of remaining stands because of long-term fire exclusion (Geier-Hayes 1995, Quigley and Arbelbide 1997b, Morgan and Parsons 2001, Sloan 1998, Wisdom et al. 2000). These and other changes have reduced habitat in terms of quality, quantity, and distribution.

This owl has been documented on all ranger districts in the Ecogroup area. Important management considerations for this species include retaining or restoring older mid- to lower-elevation forests dominated by ponderosa pine and Douglas fir, and retaining or restoring snags and down logs (Wisdom et al. 2000). There are no population trends for flammulated owls within the Ecogroup area. Wisdom et al. (2000) estimate a reduction of 52 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU, which includes a majority of the Ecogroup area.

White-headed Woodpecker (*Picoides albolarvatus*)

White-headed woodpeckers are found mainly in open and mature ponderosa pine and mixed ponderosa pine/Douglas-fir forests in Idaho (Frederick and Moore 1991, Groves et al. 1997). They feed on conifer seeds during the fall and winter. Cone crops are different from year to year, and large trees usually produce more cones then small trees. During other times of the

year, flying insects are important. Nests are usually excavated in large-diameter snags that have a moderate degree of decay (Bull et al. 1986, Bull et al. 1997). Nesting snags need to be greater than 20 inches in diameter (Wisdom et al. 2000). Nesting stands of ponderosa pine used by white-headed woodpeckers have a low canopy cover, generally less than 30 percent (Frederick and Moore 1991). Based on studies done in Idaho, little migration occurs, and they are considered year-round residents.

The habitat that white-headed woodpeckers occupy has changed during the last hundred years due to human activities (Morgan and Parsons 2001, Sloan 1998). Major changes in habitat have occurred within the Ecogroup area from selective harvesting of large-diameter ponderosa pine, snag removal in harvest areas, extensive areas (14 percent) of ponderosa pine mortality from wildfires during the last 15 years, and a change in composition and density of remaining stands because of long-term fire exclusion (Geier-Hayes 1995, Quigley and Arbelbide 1997b, Morgan and Parsons 2001, Sloan 1998, Wisdom et al. 2000). These and other changes have reduced habitat of white-headed woodpeckers in terms of quality, quantity, and distribution. Because of reductions in late structural ponderosa pine forest and changes in their remaining habitat, this species is being considered as a Management Indicator Species (see MIS, below).

White-headed woodpeckers have been observed on all three Forests, but are restricted to areas that have a significant composition of ponderosa pine, which are more common on the west side of the Boise and Payette Forests than the Sawtooth. Management of large, low-density ponderosa pine, including snags, is an important consideration in mid- to low-elevation forest habitat for this species (Wisdom et al. 2000). There are no known population trends for the white-headed woodpeckers within the Ecogroup. Wisdom et al. (2000) estimate a reduction of 62 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU, which includes a majority of the Ecogroup. It is assumed that the extent of large-tree and snag reduction on the landscape has had a negative effect on species such as the white-headed woodpecker.

Northern Three-toed Woodpecker (*Picoides tridactylus*)

Northern three-toed woodpeckers are primarily associated with mature forests with outbreaks of bark beetles and stand-replacing fires. They have been found within the Ecogroup mostly in lodgepole pine stands with mountain pine beetles, and in burned-over areas (Groves et al. 1997). They forage mainly in dead trees, and a large percentage of their diet are wood-boring insect larvae. They excavate nesting cavities in snags or occasionally in live trees (Groves et al. 1997). This species is considered non-migratory. Management for abundant snag densities that normally occurs in higher elevation forests is an important habitat consideration. The processes (fire, insects and disease) that generate these high densities of snags are essential. There are no known population trends for northern three-toed woodpeckers within the Ecogroup. Wisdom et al. (2000) estimate an increase of 77 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

The large fires that burned during 2000 on the Boise and Payette National Forest improved the habitat for this species. These fires burned several hundred thousand acres, of which the majority was forested vegetation. The burned forested acres will be used by this species because of the additional foraging habitat created.

Northern Goshawk (*Accipter gentilis*)

The goshawk is a forest habitat generalist that uses a variety of forest types, ages, structural conditions, and seral stages (Graham and Jain 1998). It preys on small- to medium-sized birds and mammals (robins and chipmunks to grouse and hares), which it captures on the ground, in trees, or in the air. Goshawks and their prey require a variety of forest structures dispersed over large areas (Graham and Jain 1998).

Northern goshawks have been documented nesting in all three Forests on all Districts in all forested PVGs. For this species, a change in population may not represent changes in habitat conditions on the Forests. Population may be influenced by activities off Forest, particularly in wintering areas, which are largely unidentified.

The major changes in habitat that have occurred within the Ecogroup area are: selective harvesting of large-diameter trees, snag removal in harvest areas, extensive (14 percent) ponderosa pine area mortality from wildfires during the last 15 years, and a change in composition and density of remaining stands because of long-term fire exclusion (Forest-wide Monitoring Reports, Sloan 1998, Wisdom et al. 2000).

Nest Areas - Nest areas usually include one or more forest stands, several nests, and several landform characteristics. Nest areas are occupied by breeding goshawks from early March until late September. The size (generally 20-25 acres) and shape of nest areas depend on topography and the availability of patches of dense, large trees.

Goshawks have a high fidelity to nest areas, which are often used more than one year, and sometimes used intermittently for decades (Reynolds et al. 1992, Wisdom et al. 2000). Many pairs of goshawks have two to four alternate nest areas within their home range. All previously occupied nest areas may be important for maintaining nesting populations because they contain the habitat elements that originally attracted the goshawks. Replacement nest areas are advantageous because goshawk nest stands are subject to loss from catastrophic events and natural tree mortality.

Goshawk nest areas typically have high tree canopy cover and a higher proportion of larger trees then surrounding areas. Studies suggest that dense vegetation provides relatively mild and stable microenvironments, as well as protection from predators. Nest areas are usually classified as mature and late structural forest stands (Reynolds et al. 1992, Graham and Jain 1998). Human activity during the nesting period may cause the nest to be abandoned and subsequent nest failure (Reynolds et al. 1992, Braun et al. 1996).

Post-Fledging Family Area (PFA) - PFAs are used by the adults and young from the time the young leave the nest until they are no longer dependent on the adults for food. The PFA surrounds the nest area and, although it generally includes a variety of forest conditions, the vegetation structure resembles that found within nest stands. PFAs vary in size from 300 to 600 acres. PFAs provide the young hawks with cover from predators, and sufficient prey to develop hunting skills, so they may learn to feed themselves before dispersing during mid-summer to fall. Therefore, PFAs should contain habitat attributes for producing prey species.

Managing for current and future nest areas conditions and large adjacent areas that provide prey are important habitat considerations. There are no known population trends for goshawks within the Ecogroup area, but some annual nest monitoring has been occurring in selected locations within the area. Wisdom et al. (2000) estimate a reduction of 7 percent in source habitat from historical to current times for this species within the Central Idaho Mountain ERU. Goshawks also occur on the southern portion of the Sawtooth National Forest, which is not in the Central Idaho Mountains ERU. Source habitat reduction is believed to have occurred in the southern portion of the Forest as well due to past timber harvest (Wisdom et al. 2000).

Columbian Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*)

Sharp-tailed grouse occur on the Sawtooth Forest, but only on one ranger district. Small, isolated populations of these birds use adjacent BLM and private lands. These birds are also known to occur in the Weiser River drainage (Mann Creek), but have not been detected on the Payette Forest.

Sharp-tailed grouse need low-elevation native shrub-grassland year-round. Abundant grass composition appears to be important within shrub/grassland communities during all life stages. During the summer, the shrubs are used for cover, and the grass and forbs are used as food, including insects that are available in these habitats. During the winter, shrubs (serviceberry, chokecherry, bitter brush, bitter cherry, hawthorn, and aspen) increase in importance for food supply because they are above snow cover. In an Idaho study, winter food and cover were regarded as the most limiting habitat factors for long-term maintenance of grouse (Apa 1998, Groves et al. 1997, Spahr et al. 1991).

Sharp-tailed populations statewide have been increasing over the past ten years, but most populations are still small and isolated. Most of this increase has been attributed to the Conservation Reserve Program (CRP) on private lands (Apa 1998, Wisdom et al. 2000). Birds are making extensive seasonal use of the CRP seedings that are maintained in grass/shrub cover year round, year after year. In some locations, these CRP fields are adjacent to the Forest. Livestock grazing management of native shrub/grassland and shrub-dominated riparian areas is also an important management consideration for this species. In the past many areas of shrub/grassland were burned, sprayed/plowed, and planted to non-native grasses to improve conditions for livestock grazing and reduce erosion. These practices would be detrimental to grouse if they take place on wintering areas where shrubs that are used as food and cover protrude above the snow level. Additional threats to sharp-tailed habitat include habitat fragmentation and invasion of exotic plants (Wisdom et al. 2000).

Sharp-tailed grouse currently occupy less than 10 percent of their former range in the Northwest United States, and there has been an estimated 24-56 percent decrease in source habitat in the Ecogroup area (Wisdom et al. 2000). Populations occur in three subbasins within the Ecogroup, Curlew Valley, Raft River and Salmon Falls Creek. Populations are small and isolated, and it is assumed that these birds use adjacent BLM and private lands. This species was likely common in historical times within the Ecogroup area. Forest Service administered lands are believed to be important fall and wintering habitat for this species. Fall and winter habitats need to be dominated by tall shrubs other than sagebrush to meet wintering requirements. These habitats are referred to as mountain shrub communities and shrub-dominated riparian areas, and include

the moderate and high canopy cover in Table W-3. An approximate even mix of the three canopy cover classes would be desirable within each occupied area through time. It is not known if these birds nest on National Forest System lands, but it is assumed that some likely do.

Table W-3 shows disturbed lands within one Management Area that likely do not meet wintering requirements of sharp-tailed grouse. These lands have low shrub canopy cover that would likely not protrude above the snow during winter. Historically the disturbed areas might not have been all wintering habitat with mountain shrub communities. In the five Management Areas that have grouse, National Forest System lands are a major contributor to wintering habitat. Disturbed areas include agricultural fields, areas dominated by annual vegetation, and urban areas.

Table W-3. Mountain Shrub Type Within Management Areas With Differing Canopy Cover Of Shrubs for Potential Wintering Habitat for Sharp-tailed Grouse
(McClure et al. In Press)

Management Areas	Acres of Potential Winter Habitat	Acres and % in Low Canopy Cover, < 10%	Acres and % in Moderate Canopy Cover, 11-20%	Acres and % in High Canopy Cover, >21%
11 - Rock Creek	24,080	1,680 acres 7%	7,180 acres 30%	15,220 acres 63%
13 - Trapper Creek/ Goose Creek	32,980	12,270 acres 37%	5,240 acres 16%	15,480 acres 47%
14 - Shoshone Creek	14,315	5,226 acres 36%	1,745 acres 13%	7,344 acres 51%
19 - Black Pine	14,410	10,089 acres 70%	4,321 acres 29%	140 acres 1%
20 - Sublett	11,870	120 acres 1%	2,470 acres 20%	9,390 acres 79%

Mountain Quail (*Oreoryx pictus*)

Mountain quail are found in dense shrub areas of coniferous forest and shrubby areas adjacent to meadows and riparian areas. They occur on the Boise and Payette National Forests on brushy, low-elevation mountain slopes. Mountain quail have steadily declined in central and southwestern Idaho over the last 30 years (Spahr et al. 1991). The cause of this rapid decline is unknown. Predation by feral cats is known to be a problem in areas near human habitation. Management of shrub cover adjacent to riparian areas needs to be considered as an important habitat feature of this species. There are no known population trends for mountain quail within the Ecogroup. Wisdom et al. (2000) estimate a reduction of 12 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU. There are no estimates of Mountain quail populations or habitats within the Ecogroup area, but they could be characterized as limited and rare.

Harlequin Duck (*Histrionicus histrionicus*)

The harlequin ducks observed on the Payette Forest are part of the Idaho-Wyoming population. The estimated breeding population in the Pacific Northwest is as follows: Washington-274, Oregon-50, Idaho-50, Montana-110, and Wyoming-40, for a total of 514. Harlequin's are present in these states during the nesting and brood-rearing seasons; they migrate to the coasts of

Oregon and Washington to winter. For nesting and brood rearing, these ducks require undisturbed, low gradient, meandering mountain streams with dense, shrubby riparian areas, and woody debris. They also need log jams and overhanging vegetation for cover and loafing areas.

Harlequin ducks have been observed along the East Fork of the South Fork of the Salmon River within the Payette National Forest. No nesting has been documented. Harlequin ducks have not been documented on the Boise and Sawtooth National Forests. Monitoring in Idaho and Wyoming indicate that populations are stable. Harlequins feed primarily on crustaceans, mollusks, insects, and small fish (Groves et al. 1997). For these migratory species, a change in population may not represent changes in habitat conditions on the Forests. Population may be influenced by activities off Forest, particularly in wintering areas. Logging in riparian areas may make these areas unsuited for this species. There are no known population trends for harlequin ducks on the Payette Forest, as they are believed to just pass through the area during migration to nesting areas in eastern Idaho or Wyoming.

Spotted Bat (*Euderma maculatum*)

Spotted bats forage nocturnally and feed mainly on moths in open ponderosa pine stands and meadows. They roost in cracks in steep rocky outcrops and cliff faces (personal comm. with L. Lewis 2000). This type of habitat does occur in some of the steep basalt canyons within the Ecogroup area. There has been no documented occurrence of spotted bats within the Ecogroup, but surveys have been limited. Spotted bats are known to occur in the southwestern portion of Idaho, south of the Snake River (Groves et al. 1997). This species is sensitive to human disruption during roosting and will abandon roost sites, which may increase mortality. There are no known population trends for spotted bats within the Ecogroup area. Wisdom et al. (2000) estimated a reduction of 18 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

Townsend's Big-eared Bat (*Corynorhinus townsendii*)

Big-eared bats are nocturnal and feed primary on moths along forest edges. They roost in caves, old mines, and buildings. Maternity and hibernation colonies occur almost exclusively in caves and mine tunnels (Groves et al. 1997). Unlike other species of bats that seek refuge in crevices, big-eared bats group in clusters on open surfaces, making them more vulnerable to disturbance (Idaho State Conservation Effort 1995). Most of the big-eared bat records have been in lower elevations outside of large expanses of forest cover (Groves et al. 1997). This species is sensitive to human disruption during roosting and will abandon roost sites, which may increase mortality. There are no known population trends for the big-eared bats within the Ecogroup, but this species has been identified at several locations within the Ecogroup. Wisdom et al. (2000) estimated an increase of 20 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU.

Common Loon (*Gavia immer*)

The common loon is a large diving bird weighing 7-9 pounds. Like many other diving birds loons must run across the water surface to achieve enough speed to get airborne. Nests are made of mud and vegetation and are usually close to the shoreline in shallow-watered natural lakes without rapidly fluctuating water levels. Nests can be located on small islands that are mostly composed of emergent vegetation. Nesting usually occurs in early May just after ice breakup. Loons have a high fidelity to nest sites year after year. Loons avoid lakes with high levels of

human activity, fluctuating water levels, turbid water, and no protective coves for nesting. These birds feed mostly on small fish such as yellow perch and various minnow species. Other aquatic organisms may also be consumed. Feeding occurs mainly under water (Spahr et al. 1991). Loons are not a high or moderate priority breeding bird species for Idaho Partners in Flight (IPIF 2000) in Idaho. Loons have been observed on some of the moraine lakes in Sawtooth Valley, but no nesting has been documented.

Spotted Frog (*Rana pretiosa*)

Spotted frogs are most often found near permanent water such as the marshy edges of ponds or lakes, in algae-grown overflow pools of streams, or in wet areas with emergent vegetation. They may move considerable distances from permanent water during rainy periods after breeding, often frequenting mixed conifer and subalpine forests, grasslands, and shrublands if puddles, seeps, or other waters are available. Spotted frogs are thought to hibernate in holes near springs or other areas where water remains unfrozen and is constantly renewed. The frog prefers a muddy or soft substrate in streams or ponds for hibernation (Spahr et al. 1991). They feed on invertebrates, generally close to ponds or standing water in riparian areas.

Spotted frogs have been documented on all three Forests in habitats that have standing or slow-moving water through the summer. Predation by bullfrogs, a non-native species, is thought to be a major reason for spotted frog declines. It is believed that populations of spotted frogs have also become fragmented and reduced in abundance because of introduced fish in systems that historically had no fish. These fish prey on both young and adult frogs. Alteration of riparian and wetland habitats is also an important management consideration for this species. There are no known population trends for spotted frogs within the Ecogroup, but they are commonly observed in areas of shallow standing water during the summer. Wisdom et al. (2000) did not evaluate source habitat changes for the spotted frog.

Management Indicator Species

Current Management Indicator Species

Management Indictor Species (MIS) can be selected for several reasons, one of which is, "…because their populations are believed to indicate the effects of management activities" (36 CFR 219.19(a)(1). By monitoring and assessing habitat conditions of MIS, managers can estimate effects on other species within similar habitats. However, monitoring of current MIS has indicated that some may not be good indicators for Forest habitat conditions and management activities. Some MIS were selected because they were thought to be good biological indicators, but monitoring has shown this not to be the case (see Preliminary AMS and Forest Five-year Monitoring Reports). Also, some of the MIS migrate off Forest to wintering areas and may be influenced by activities off Forest. For migratory species, a change in population may not represent changes in local Forest habitat conditions where they summer. Additional analysis and rationale for changing MIS is contained in the MIS process paper in Appendix F to the FEIS. Table W-4 has the current list of MIS for the three Forests.

Table W-4. Current Management Indicator Species of the Ecogroup

Type	Common Name	Forests with MIS
Mammal	Rocky Mountain elk	All 3
	mule deer	Boise, Sawtooth
	red-backed vole	Boise
	meadow vole	Boise
	mountain goat	Sawtooth
Bird	pileated woodpecker	All 3
	yellow warbler	Boise
	mountain chickadee	Boise
	Williamson's sapsucker	Payette
	vesper sparrow	Payette
	Lewis' woodpecker	Sawtooth
	Brewer's sparrow	Sawtooth
	sage grouse	Sawtooth
	Columbian sharp-tailed grouse	Sawtooth

Proposed Management Indicator Species

The proposed Management Indicator Species for Forest Plan revision are described below, along with reasons for their proposal.

Sage Grouse (*Centrocercus urphasianus*) - Within the Ecogroup area, sage grouse occur only on the Sawtooth National Forest, the southern end of the Boise National Forest, and adjacent BLM and private lands that contain habitat. The sage grouse is totally dependent on sagebrush/grassland vegetation to meet its habitat requirements. Some populations migrate long distances, some do not. Despite some wide-ranging annual movements, sage grouse have high fidelity to seasonal ranges for both nesting and wintering, and birds need extensive areas of native sagebrush/grassland year-round. Abundant native grass/forbs composition appears to be important within sagebrush-grassland communities during all life stages in the snow-free season. In summer, shrubs are used for cover, and grass and forbs are used as food, along with insects. During winter, sagebrush increases in importance because it protrudes above snow in wintering areas, and sagebrush leaves are used exclusively as food during the winter and early spring (Apa 1998, Braun 1998, Groves et al. 1997, IDFG 1997, Connelly et al. 2000).

Sage grouse statewide have declined 40 percent during the last 40 years. Populations in other western states and within the Ecogroup have shown similar declines (IDFG 1997). State Fish and Game, in cooperation with other agencies, monitor sage grouse population trends, usually annually. Sage grouse are hunted where they occur within the Ecogroup. Some organizations have petitioned this species for listing as a threatened or endangered species as recently as 2002, but the USFWS dismissed the petition as unwarranted. Because of habitat loss and population declines, the remaining habitat on Forest Service lands and adjacent ownerships is increasingly important to this and other sagebrush-dependent species. Population trends are improving in some locations, but are still reduced from the recent past. Because of its recent population declines, recent large fires that have modified habitat, its historical local habitat loss on other ownerships, and its status as a sagebrush obligate, the sage grouse is selected as a MIS for the Sawtooth National Forest.

Sagebrush/grassland in Idaho has changed greatly over the past 150 years. Much of the lower-elevation private areas supporting sagebrush have been converted to agriculture. Some of this conversion has made former habitats totally unusable by sage grouse and other sagebrush-dependent species. The extent of this conversion varies by location within and adjacent to the Ecogroup area. Some of this conversion has caused the remaining habitats to become fragmented, resulting in barriers to movement between populations (Apa 1998, Braun 1998, ICBEMP 1997c, Quigley and Arbelbide 1997b, Wisdom et al. 2000, Connelly et al. 2000). The overall quality of existing sage grouse habitat will likely become increasingly important as the quantity of these habitats continues to decrease due to modifications and development on non-federal lands.

The sagebrush communities that have not been converted to agriculture have also changed due to several factors, including livestock grazing, changes in fire regimes, road building, noxious weeds, and introduced livestock forage grasses (Apa 1998, Wisdom et al. 2000). Sagebrush has been treated on grazing lands by burning, plowing, chaining, disking, spraying, and seeding to increase livestock forage. These changes have occurred on public and private lands. These actions have changed the native sagebrush/grassland vegetation and are generally not beneficial to sage grouse habitat. Remnant sage grouse populations have become more dependent on native habitat remaining on and adjacent to the Forest Service and BLM administered lands (IDFG 1997, Quigley and Arbelbide 1997b, Wisdom et al. 2000).

Fires started by lightning historically modified the growth stages of sagebrush communities to the greatest extent. These fires cause sage grouse and other species to move into areas that did not burn, until sagebrush re-establishes itself in 10-15 years or more, depending on climate conditions. Livestock grazing increases successional rates, which results in dense shrub-dominated communities and a subsequent reduction in herbaceous understory. Fire exclusion has some of the same effects on sagebrush, increasing shrub densities and reducing herbaceous understory production. Another concern is the invasion of non-native plants that are not always used by native wildlife species. It is estimated that 16 species of non-native plants are a concern to sagebrush/grassland vegetation in the Ecogroup area, as well as to the wildlife species that are adapted to these plant communities.

Based on LANDSAT imagery, Table W-5 shows examples of differences in canopy coverage of sagebrush that likely have implications for sagebrush obligate species, including sage grouse. Shown are the 16 Management Areas that are known to have supported sage grouse populations in the recent past. It is believed that most of the sage grouse habitat within the administrative boundary of the Forest is used for nesting, brood rearing, and summering. Most of the wintering areas are on adjacent BLM, state, and private lands, but depending on climatic conditions, some wintering occurs within Forest Service administered lands.

Table W-5. Sage Grouse Habitat Within Management Areas With Differing Canopy Cover of Sagebrush (McClure et al. In Press)

Management Areas	Acres of Sage Grouse Habitat	Acres and % in Low Canopy Cover, <10%	Acres and % in Moderate Canopy Cover, 11-20%	Acres and % in High Canopy Cover, >21%
Lower South Fork Boise River (BNF)	7,897	1,750 acres 22%	2,161 acres 27%	3,985 acres 51%
Big Wood River	1,328	308 acres 23%	938 acres 71%	81 acres 6%
Little Wood River	2,073	490 acres 24%	1,500 acres 72%	84 acres 4%
Little Smokey Creek	2,443	20 acres 1%	1,388 acres 56%	1,036 acres 43%
Lime Creek	2,114	0 acres 0%	1,182 acres 56%	932 acres 44%
Soldier Creek/ Willow Creek	2,296	169 acres 7%	1,211 acres 53%	916 acres 40%
Rock Creek	40,343	5,795 acres 14%	20,060 acres 50%	14,488 acres 36%
Cottonwood Creek	10,079	1,851 acres 18%	4,187 acres 42%	4,042 acres 40%
Trapper Creek/ Goose Creek	46,193	21,850 acres 47%	13,677 acres 30%	10,665 acres 23%
Shoshone Creek	22,425	7,193 acres 32%	9,373 acres 42%	5,859 acres 26%
Albion Mountains	1,832	490 acres 26%	935 acres 51%	405 acres 23%
Howell Creek	377	81 acres 21%	178 acres 47%	118 acres 32%
Independence Lakes	537	284 acres 53%	194 acres 36%	59 acres 11%
Raft River*	5,279	4,035 acres 76%	569 acres 10%	675 acres 14%
Black Pine	6,134	3,568 acres 59%	1,310 acres 21%	1,226 acres 20%
Sublett	4509	326 acres 7%	2,604 acres 58%	1,579 acres 35%

*The acreage figures for the Raft River management area are not accurate because of lightning fires that burned approximately 2100 acres during the summer of 2002. These fires likely resulted in an increase of the 0-10 percent canopy coverage from the numbers displayed in Table W-5, with corresponding decreases in canopy cover percentages.

Canopy coverage of sagebrush is important to sage grouse in different ways. Most of the documented nesting of sage grouse occurs in sagebrush with canopy coverage of 15 to 25 percent (Apa 1998, Braun 1998, IDFG 1997). Sagebrush canopy coverage changes due to succession. Natural-occurring lightning fires have influenced succession rates and the extent of canopy coverage changes through time (see the Non-forested Vegetation section in Chapter 3 of the FEIS for a more complete explanation). Losses or changes of sage grouse breeding habitat or reduction in canopy coverage that exceed 40 percent of a large-scale area are detrimental to sage

grouse (Connelly et al. 2000). These areas would equate to those within the less then 10 percent canopy cover in Table W-5. Based on this type of analysis, four management areas exceed the recommended threshold of greater than 40 percent in the 0-10 percent canopy cover within sage grouse habitat.

Guidelines to manage sage grouse populations and their habitats have recently been updated (Connelly et al. 2000). Based on these updated guidelines, no other management-controlled reduction should take place in the near term in these areas (Connelly et al. 2000). Wisdom et al. (2000) suggest that a loss or change in habitat of greater than 20 percent is significant and should be considered during proposed management activities. Additionally, there are areas within these management areas that contain sagebrush that are not habitat for sage grouse, but used by other species. Most populations use other ownerships adjacent to the Forest such as BLM, state and private lands. The condition and canopy cover of these other sagebrush habitat ownerships is unknown.

White-headed Woodpecker (*Picoides albolarvatus*) - A description of this species and its habitat needs and trends can be found in the Sensitive Species section, above. This species is being considered as an MIS for the Boise and Payette National Forests because of extensive habitat reduction, and the potential for additional habitat modification in the future. Because it is associated with relatively open ponderosa pine forests, the white-headed woodpecker is being considered as an MIS in selected management areas where that habitat occurs (1-16 on the Boise NF, and 1, 2, 3, 5, and 10 on the Payette NF).

Pileated Woodpecker (*Dryocopus pileated*) - Pileated woodpeckers occur on all ranger districts within the Ecogroup area, except the southern portion of the Sawtooth Forest. Habitat is mixed conifer forests, including spruce-fir and lodgepole pine, that are capable of growing large-diameter (>20 inches) trees with multi-storied stands. Pileateds nest in standing large-diameter snags, and are the largest woodpecker occurring within the Ecogroup area. Because pileateds are so large, they need snags of sufficient diameter to accommodate their body size when excavating nest cavities. Studies in Montana and Idaho have shown that old and mature larch, ponderosa pine, grand fir, and Douglas-fir are used for nesting. Dead and dying trees over time become snags, logs, and stumps that are important foraging sites containing carpenter ants. Pileateds also dig directly into anthills (Groves et al. 1997). Carpenter ants are the major food source used by pileated woodpeckers, and the ants must have dead trees, snags, and logs as habitat.

Fourteen other species of birds within the Ecogroup area are dependent on cavities that pileated woodpeckers excavate for nesting, because they are not able to excavate their own cavities. In addition to birds, mammals such as fisher, bats, and flying squirrels use the pileated cavities for nesting, denning and roosting sites (Bull et al. 1997, Quigley and Arbelbide 1997, Thomas et al. 1979, Wisdom et al. 2000). Because of their reliance on large-diameter trees and their importance to other wildlife species, the pileated woodpecker is proposed as an MIS for all three Forests.

There are limited surveys of population trends for pileated woodpeckers within the Ecogroup area. Wisdom et al. (2000) estimates an increase of 21 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU. The increase is believed to be the result of long-term fire suppression that has allowed the development of additional multi-storied stands and abundant dead trees, snags, and down logs for foraging sites.

The proposed management indicator species, their locations, and important considerations for management are described in Table W-6.

Table W-6. Locations and Management Considerations for Proposed Management Indicator Species of the Ecogroup

Type	Common Name	Forest*	Global Rank	PVG Occurrence+	Management Considerations
Bird	White-headed woodpecker	Boise and Payette	NA	1, 2, 3, 5	Snags, large trees with low crown density
	Sage grouse	Sawtooth	NA	Sagebrush - grass lands	Habitat reduction and alteration
	Pileated Woodpecker	All Three	NA	3, 4, 6, 7, 8	Snags, large trees with multiple canopies, and down logs

* Forest or Forests in the Ecogroup where this species occurs.
\+ Potential Vegetation Groups or cover types that this species uses.
Global Rank = Globally imperiled ranking, from Idaho Conservation Data Center (2002)
NA = None available

Species of Special Interest

Rocky Mountain Elk (*Cervus elephus*)

Elk are not good biological indicators because of their generalized habitat needs. They were previously selected as MIS because they have a high social and economic value to the public, tribes, and state agencies in Idaho and Utah. For example, 1996 Idaho elk tag sales totaled $5.3 million dollars. This dollar amount does not include money elk hunters spent while hunting, which also contributes to the economic importance of this species to state and local communities.

Current populations of elk on the three Forests are estimated by Idaho Fish and Game and Utah Division of Wildlife Resources, even though the numbers of elk can change during the year. Elk populations are lowest during the winter after they migrate to lower-elevation winter ranges following the hunting season in the fall. Forest Service management actions—such as road construction, road obliteration, or vegetation management—can influence mortality rates during the hunting season. Additional mortality usually occurs on winter ranges, depending on the severity of the winter. The last several mild winters have contributed to current high elk numbers. Several predators take animals all seasons of the year, including wolf and cougar. Some winter ranges occur off Forest Service administered lands. Elk populations on the Forest are highest during the spring and summer, as elk migrate back from winter range areas and calves are born (Unsworth et al. 1993, Christensen et al. 1995, IDFG 1999).

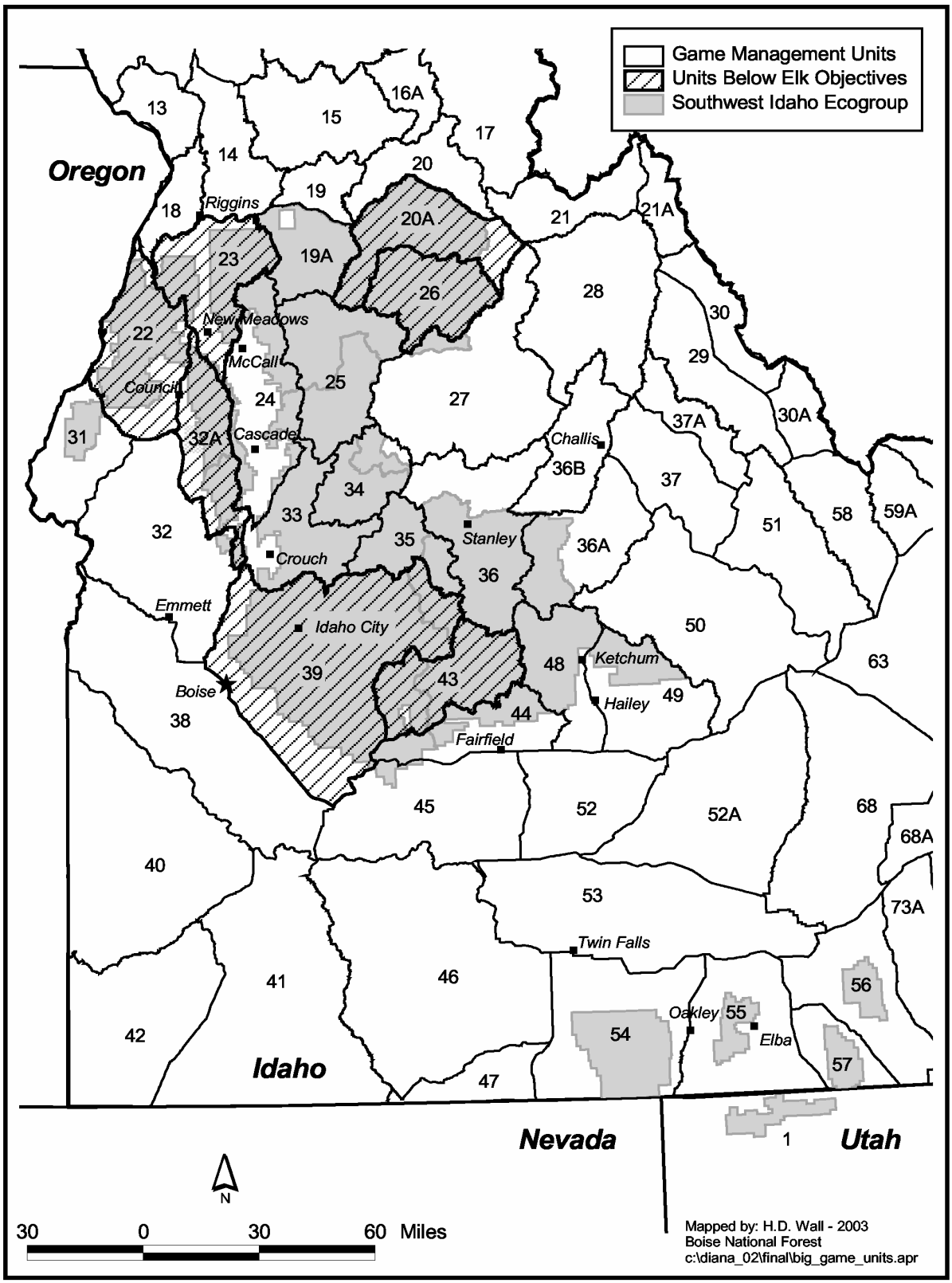
Elk and other big game within the Ecogroup are managed by the states of Idaho and Utah. Population and harvest goals are established within Big Game Management Units by the states with public participation. There are 27 big game management units within the Ecogroup, 26 in Idaho and one in Utah (see Figure W-1 and Table W-7).

Table W-7. Current Bull Elk Populations and Objectives for Idaho and Utah Big Game Hunting Units Within the Ecogroup Area

No.	Idaho and Utah Hunting Units	Current Bull Population Estimates	State Adult Bull Population Objectives	Meeting (M) Not Meeting (N) Exceeding (E) Objectives	Percent of FS Administered Land within Hunting Units
1	19A - Idaho	131	100-150	M	94
2	20A	130	150-250	N	99
3	22	91	125-200	N	55
4	23	119	125-175	N	62
5	24	0	0	N/A	42
6	25	154	75-125	E	98
7	26	100	150-200	N	98
8	27	389	300-450	M	99
9	31	72	50-100	M	18
10	32	128	40-60	E	1
11	32A	19	75-125	N	58
12	33	354	300-450	M	83
13	34	0	0	N/A	98
14	35	37	25-75	M	99
15	36	34	30-50	M	95
16	36A	353	200-300	E	51
17	39	119	375-575	N	59
18	43	223	275-400	N	94
19	44	129	30-50	E	36
20	45	150	35-50	E	1
21	48	176	75-125	E	69
22	49	531	300-400	E	27
23	54	5	1-5	M	34
24	55	5	1-5	M	12
25	56	50	20-30	E	17
26	57	5	1-5	M	32
27	1a - Utah	N/A	275	N/A	33

NA = Not Available

Figure W-1. Idaho and Utah Game Management Units and the Ecogroup Area



All of these management units contain elk, but some of the populations are limited to the extent that no hunting season occurs. Some of these Fish and Game units are totally within the Ecogroup Forests, and some only have small portions that are within the Forest administered lands.

Based on research conducted in Idaho and other western states, the major factor contributing to elk mortality is hunter harvest during hunting season (Unsworth et al. 1993). Elk vulnerability is defined as a measure of elk susceptibility to being killed during the hunting season (Christensen et al. 1995). Elk vulnerability is an important component of the State Fish and Game Department's management goals and objectives.

Elk Vulnerability models (Unsworth et al. 1993) have been proposed as a predictive tool managers can use to predict mortality rates and monitor elk vulnerability. Research conducted by the Idaho Department of Fish and Game and the University of Idaho provides the basis for this elk vulnerability analysis (Unsworth et al. 1993, Christensen et al. 1995). For the Forest Plan Revision, two parameters were suggested to be useful for elk vulnerability analysis:

- Hunter-day densities (measured in total hunter-days per square mile on a watershed basis).
- Motorized road and trail densities and cross-country motorized access (measured in miles per square mile on a watershed basis).

The number of hunter-day densities is influenced by the number of permits issued by the state agencies and the ease of access. State wildlife agencies have control over the number of permits issued and the length of the hunting seasons.

Forested vegetation is also an important consideration for management of elk populations during the hunting season (Christensen et al. 1993, Hillis et al. 1991, Lyon 1983, Lyon and Canfield 1991). Forested vegetation is modified during management activities for many reasons; elk security area needs should be one consideration if state elk population goals are to be achieved (Christensen et al. 1993).

Elk vulnerability analysis could be used to predict percent mortality of bull elk during the general antlered elk rifle hunting season, which usually occurs in the months of October and November (Christensen et al. 1995). Access management in selected locations to restrict motorized travel during the hunting season is occurring on all three Forests currently. Most State Fish and Game Units contain roads that traverse multiple ownerships of federal, state, and private lands, so that access management must consider these other ownerships. State Fish and Game agencies monitor elk populations annually. Overall, elk populations statewide are currently near all-time highs, indicating that no major habitat limitation is currently present, which seems to be the situation within the Ecogroup as well. Hunter harvest statewide during the 1999/2000 hunting seasons was near a record level. Within the Ecogroup area, state agency elk population objectives are shown in Table W-7.

Forest Service administered lands contribute significantly to the elk population and hunter opportunities within the Ecogroup area. With the current high population levels, present habitat conditions do not appear to be limiting the populations within the Ecogroup area, though mature bull vulnerability may be a concern in some areas. Seven of the 27 Big Game Management Units are currently below state objectives for estimated bull populations, while eight are above.

Bighorn Sheep (*Ovis canadensis spp.*)

Bighorn sheep populations have greatly declined in the Ecogroup. Based on historical records, bighorn sheep were common on all three Forest 100-150 years ago. Since then, habitat and populations have become small and fragmented (Wisdom et al. 2000). Bighorns currently occur as small, isolated populations on the Sawtooth and Payette National Forests. Some of these populations are recent transplants by State Fish and Game agencies. Numbers are estimated at several hundred animals on the two Forests, though habitat is available for larger populations.

Although these species have no status under the ESA, the USFWS is concerned about their population status and threats to their local viability (Quigley and Arbelbide 1997c). One threat is the risk for disease transmission from domestic sheep (Quigley and Arbelbide 1997c, Wisdom et al. 2000). Prevention of disease transmission between domestic and wild sheep is an important management concern [36 CFR 219.20(b)].

Bighorn populations currently occur in five general geographic locations: the Cassia and Albion areas and White Cloud Mountains on the Sawtooth; and Hells Canyon and the Salmon River Canyon on the northern portion of the Payette Forest. Only the Cassia Division and Hells Canyon areas have a significant threat of disease transmission from domestic sheep. These two areas account for an estimated 200,000 acres (see Figure F-5, Appendix F for general locations).

Bighorn sheep populations that are small and isolated, such as the recently transplanted individuals, can suffer significantly from predation as well as disease transmission concerns. This situation has occurred on the southern portion of the Sawtooth National Forest during the last ten years, where predation losses have been known to be high within these small populations. Areas referred to as “bighorn sheep emphasis areas” were identified by state wildlife agencies as high priority habitat for wild sheep.

In the Hells Canyon area, disease transmission between domestic and wild sheep is a greater concern. Domestic sheep grazing in Oregon within the Hells Canyon NRA have been greatly reduced during the last 20 years, and this has allowed for the expansion of bighorn sheep herds in Oregon. Currently bighorn sheep in Oregon are crossing the Snake River into bighorn sheep habitat in Idaho, which was not anticipated. Once in Idaho, these sheep may come in contact with domestic sheep because domestic sheep allotments occur on the Payette National Forest in the Hells Canyon area of Idaho. The concern is that these bighorn sheep can return to Oregon and potentially infect a large and extensive bighorn sheep population that occurs on the Oregon side of Hells Canyon. In situations where domestic sheep and bighorn sheep come in direct contact, bighorn sheep almost always die from infections, whereas domestic sheep are unaffected.

To deal with this concern in the Hells Canyon area, Idaho, Oregon, and Washington state wildlife agencies and other interested organizations have assumed the responsibility for bighorn sheep losses and further disease transmission in their respective states. These three state wildlife agencies and others formed the Hells Canyon Bighorn Sheep Restoration Committee in 1997 to address the disease transmission issue in Hells Canyon area. Currently they have a process to deal with bighorn sheep crossing the river between Oregon and Idaho that have come in contact with domestic sheep.

Snowshoe Hare (*Lepus americanus*)

Forest plant communities that provide snowshoe habitat are subalpine fir, Engelmann spruce, Douglas fir and lodgepole pine. Within these types, tree density and understory vegetation are the important components. Snowshoe hare have a strong preference for microhabitats of young, dense tree seedlings and saplings that provide protective understories composed of edible shrubs and tree limbs. The dense small-diameter trees and shrubs help protect the hares from predators and harsh winter weather. During the winter, food for snowshoe hares is limited to twigs and stems that are within reach above the snow surface. The large feet of snowshoe hare enable the animal to traverse deep snow easily. It is not known what constitutes habitat for snowshoe hares in terms of patch size and spatial arrangement of patches (Ferron et al. 1989).

Snowshoe hare habitat is influenced by forest management practices such as timber harvest, thinning, brush control, fire use, fire suppression, and snow compaction (Wisdom et al. 2000). Snowshoe hares are the primary winter food source for lynx, an ESA listed species. It is assumed that habitat quality and quantity have decreased due to past management activities such as thinning and fire exclusion that have reduced the extent of early seral forest plant communities over a extensive area of the Ecogroup that coincides with lynx habitat (USDI FWS 2000).

Habitats/Species of Birds At Risk

Several groups, organizations, and agencies monitor wildlife species and their habitats and make recommendations concerning their conservation to land management agencies and interested publics. One such organization is Idaho Partners In Flight (IPIF), which is concerned about the viability of bird species because of habitat alteration and loss, or direct impacts to the species. They have identified four priority bird habitats in Idaho for restoration and conservation: (1) riparian; (2) marshes, lakes, ponds; (3) sagebrush; and (4) ponderosa pine. These four habitats were selected because they are the most altered by past and present human activity in Idaho (IPIF 2000).

The four priority habitats support 35 at risk bird species that breed in Idaho (see Appendix F). Within the Ecogroup area, an estimated 27 of these 35 species are breeding in these priority habitats (IPIF 2000). Some of these species are year-round residents, and others are migratory. The birds that are migratory may be having problems (habitat loss, pesticides poisoning, harvest) on their wintering areas outside of Idaho. A change in abundance for these species in Idaho may not relate directly with habitat conditions in Idaho. Habitats in Idaho that have significantly changed, reduced, or altered may affect species dependent on these habitats.

Riparian Habitats - In Idaho, 113 species are known to use riparian areas for nesting. Within the Ecogroup, riparian habitats are believed to support 14 priority bird species at risk. Riparian habitats account for a very small portion of land area (about 2 percent), but support additional species besides birds. The willow flycatcher will be used to analyze potential effects on non-forested riparian habitats. Effects on forested riparian habitats will be analyzed for the fisher, a Region 4 sensitive species.

Marsh, Lake, and Pond Habitats – In Idaho, 77 bird species are known to use these types of habitats for nesting. These habitats feature standing water, and within the Ecogroup they are believed to support five at risk bird species. These habitats occupy an even smaller portion of the Ecogroup than riparian areas, most likely under one percent. Water bodies such as reservoirs usually do not meet the needs of many of these species because the draw down of water for irrigation or power production reduces the quality of shoreline habitats. Marsh, lakes and ponds that have not had their hydrologic regime modified (increased, decreased, modified) provide the best habitat. Because these habitats are such a small portion of the Ecogroup area, and because they are strongly protected by both Forest Plan management direction and legislation (Executive Order 11990), no significant effects are anticipated from any management alternative.

Sagebrush/Grassland Habitats - In Idaho, about 100 species are known to use sagebrush habitats. Within the Ecogroup, these habitats support as many as eight priority bird species. Many of these species are totally dependent on sagebrush habitats. The sage grouse, a proposed management indicator species for the Ecogroup, will be analyzed to show potential effects on these habitats.

Ponderosa Pine Habitats - In Idaho, 31 species breed in this type of habitat. Within the Ecogroup, these habitats support two priority bird species at risk, the white-headed woodpecker and pygmy nuthatch. The white-headed woodpecker, a Region 4 sensitive species and the pileated woodpecker, a proposed MIS for the Ecogroup, will be analyzed to show potential effects on these habitats.

Habitats in Idaho that have significantly changed, reduced, or altered may affect species dependent on these habitats. Wisdom et al. (2000) believe a loss in habitat of 20 percent is significant, and habitats that have experienced such loss need special consideration. Selected species from those identified at risk identified by Wisdom et al. (2000) that occur within the Ecogroup area have also been evaluated (see Terrestrial Technical Report 2003).

The USFWS has developed a list of species (Birds of Conservation Concern) relative to the MBTA, but an MOU between agencies has not been finalized on how to address these species (USDI FWS 2002). A Birds of Conservation Concern list of species that may occur in the Ecogroup area is displayed in the Terrestrial Technical Report 2003.

Snags and Down Logs

Snags and coarse wood are important habitat consideration for many species. Within the Ecogroup area, sixteen species of birds and nine species of mammals are dependent on snags to meet some part of their life stage (Wisdom et al. 2000). See the *Vegetation Diversity* section for

a discussion of the effects to snags and coarse wood components. Effects of the alternatives on the snag and log components of terrestrial habitat will be analyzed for those representative species of concern that are dependent on snags or down logs for nesting, denning, or foraging habitat. These species include lynx, fisher, white-headed woodpecker, northern three-toed woodpecker, boreal owl, flammulated owl, great gray owl, and northern goshawk.

ENVIRONMENTAL CONSEQUENCES

Effects Common to All Alternatives

Resource Protection Methods

Laws, Regulations, and Policies - Congress has passed legislation to protect and manage wildlife resources, which influences the Forest Service's authority and compliance for management of wildlife resources on their administered lands. Some of the major laws are: Bald and Golden Eagle Protection Act, Sustained Yield Forest Management Act, Sikes Act, Multiple Use-Sustained Yield Act, National Environmental Policy Act, Endangered Species Act, Migratory Bird Treaty Act (MBTA), Federal Land Policy and Management Act, National Forest Management Act, Executive Order 11990 – Protection of Wetlands, Forest and Rangeland Renewable Resources Research Act, Public Rangelands Improvement Act, Fish and Wildlife Conservation Act, Federal Cave Resources Protection Act, and North American Wetlands Conservation Act.

These laws are interpreted into National and Regional regulations and policies to help federal agencies follow the intent of the laws. Regulations and policies developed from the laws that most influence the management of Forest wildlife resources are 36 CFR 219.19 Planning regulations, 1500 NEPA regulations, and the 2500 and 2600 sections of Forest Service Handbook and Manual direction. Agency direction, in turn, influences finer-scale analysis, biological assessments, inventories, and monitoring. The intent of these fine-scale implementation activities is to make better management decisions based on local information to maintain or improve habitats for species with identified concerns.

Forest Plan Direction – Forest Plan direction for all action alternatives is designed to maintain or improve conditions for habitats/species with identified concerns. Direction occurs at both the Forest-wide and Management Area levels. Goals and objectives have been designed to move toward or achieve desired conditions to maintain or restore habitats and processes needed over the long term by species. Standards and guidelines give additional direction to protect or restore conditions for habitat/species that could be negatively affected by other land management activities. Other resource programs also implement additional direction and guidance for resource protection in an integrated manner to maintain or restore desired conditions.

The Forest Plan revision effort developed alternatives (except 5 and 1B) that have desired conditions for vegetation that strive to be within the bounds of the Historic Range of Variability (HRV). If management activities can produce conditions that are within HRV, then it is assumed that the species that adapted to these conditions will have sufficient habitat to meet their needs. The potential to diminish biological diversity is high if current and anticipated conditions are

outside of, and remain outside of, the HRV (Morgan and Parsons 2001). Desired conditions (Appendix A to the Plans) also describe structural stage condition of forested communities that should provide the ecological representation needed to maintain their associated species.

Wildlife considerations were one of the main drivers for determining desired conditions during the modeling of forested vegetation. To meet the needs of many terrestrial species, emphasis was on maintaining or restoring the amount of large trees on the landscape. A 20-percent large-tree desired condition became the management constraint to meet species viability in forested communities during modeling in all alternatives except 1B, where 10 percent was used to reflect current plans. Several studies (see technical report) have found that a 20 percent large tree condition will meet the habitat needs for goshawk and other species such as the white-headed woodpecker, pileated woodpecker, and fisher. It was assumed if goshawk habitat was maintained and developed, the varied prey that goshawks require would also be maintained. Goshawks are known to occur on all Districts in the Ecogroup, are a top predator that use all PVGs, and have a large home range of 3,000-6,000 acres. The 20 percent large tree component described above was further validated through analysis of nest sites on the Minidoka Ranger District on the Sawtooth National Forest. The analysis found that old forest within 500 acres of 15 active goshawk nests averaged 20 percent.

The original Forest Plans tied a desired amount of "old growth" to the needs of a single species. The amount of "old growth" required varied between 5 and 10 percent in the three (Sawtooth – 1987, Payette – 1988, Boise – 1990) Forest Plans. Ten percent old growth was suggested by Thomas et al. (1979) to maintain several species over the landscape that are adapted to large trees. Revised Forest Plan direction recommends a 20 percent large tree component to maintain biological diversity for a host of species (Fahrig 1997, Graham et al. 1997, Graham et al. 1999, Graham and Jain 1998, Reynolds et al. 1992). The large tree component was used instead of old growth because wildlife habitat is mainly a product of the vegetative structure of a community and not the age of the vegetation. Large trees are not always old, and old trees are not always large (Thomas et al. 1979).

The main reason for the differences between large tree percents and old growth percents is that vegetation structural conditions in central Idaho develop in conjunction with disturbance processes (fire, insect, disease, wind, etc.) and climate variations. Conversely, late successional old growth characteristics develop in the absence of frequent disturbances (Hamilton 1993). In central Idaho, disturbance is a common occurrence. In historical times, forested stands in lower-elevation vegetation groups likely developed large trees and relatively open canopies during mid-successional stages, and these conditions were maintained over time by frequent low-intensity fire disturbance. Dense stands and decadence typically associated with late successional stage conditions (old growth) rarely occurred. Thus, historical stands dominated by large and old seral trees like ponderosa pine could be considered old forest, but not as "old growth" under any definition that incorporates a full set of late successional conditions.

As Mehl et al. (1998) point out:

> "Specific measures of old growth characteristics have not been developed for the understory fire maintained systems. The large tree vegetation growth stage within the understory fire regime is a fire maintained system that is usually dominated by seral species in a late growth stage. However, if species composition and tree densities meet the requirement of the understory fire/large tree vegetation growth stage, it is likely to closely represent "old growth" conditions, as we currently understand them. The overall point being that old growth forest and climax forest can be different entities".

The RELM model was also used to help achieve the "well distributed in the planning area" requirement for wildlife habitat. Using RELM, a five-decade analysis was created for each alternative that spatially displays the distribution of the large tree desired conditions. The RELM model uses SPECTRUM solutions for the first five decades to pro-rate solutions to subwatersheds using Geographic Information System (GIS) technology.

Forest Plan Implementation - Project implementation under the umbrella of Forest Plan direction includes analysis based on current and more site-specific information about existing conditions where actions are proposed. Proposed projects collect more accurate resource information for the local area. Historical conditions, current conditions, and desired conditions are analyzed at a finer scale of resolution to better predict project outcomes. Biological evaluations and assessments, providing a more detailed analysis of potential effects, are required for listed or species of concern. A determination of effects for any listed or proposed species would also have to be made for any future project under the direction of the revised plans.

General Effects

The following is a description of general effects to wildlife habitat or species from other resource management activities. Although the amount or distribution of these activities may differ by alternative, the general types of effects from the activities would be the same for all alternatives.

Timber Harvest – Timber harvest activities alter vegetation components that comprise habitat for almost all terrestrial species. Harvesting can change vegetation composition, density, size, amounts and distribution, and move successional trend toward or away from HRV. These changes in vegetation can have positive or negative effects on different species. For example, past selective harvesting of large seral species is detrimental to species such as the white-headed woodpecker that depend on large trees and snags, but may be beneficial for other species like vesper sparrow that prefer open, brushy habitats. Post-fire salvage logging can reduce the amount of large trees or snags used by cavity-nesting species that have evolved with fires where trees were not removed.

The mechanical processes involved in timber harvest produce disturbance to wildlife because of equipment use or human presence. In areas where roads are built and maintained for long-term use, vehicle access can increase threats to some wildlife species. Snags are usually removed adjacent to roads for safety reasons, and roads provide ready access by people wanting firewood. This reduces the habitat for species that require snags/logs. The timing of activities can also have different effects. For instance, localized harvest activities may disturb elk calving during a relatively short period in the spring, but not at other times of the year.

Potential effects to wildlife habitat and species from timber harvest and associated management activities will vary by alternative theme and management prescription (MPC) assignments.

Fire Management – Fire management activities change vegetation. Fire use or exclusion of fire can change vegetation composition, density, size, amount, and distribution of both live and dead material, as well as successional trends. Wildland fire can also have these effects.

Long-term fire exclusion causes an increase in vegetation quantity above levels that were historically present. In white-headed woodpecker habitat, this has caused a reduction in habitat quality because of increasing tree density and higher composition of shade-tolerant trees. Long-term fire exclusion in the same type of habitat has benefited species such as the pileated woodpecker, which prefers multi-storied tree stands and abundant snags and logs for feeding sites. The timing of fire can also have different effects. Historically, fire created disturbance that altered vegetation at fairly regular intervals and intensities that varied by PVG. Vegetation and animals evolved with fire being a common occurrence in the environment. The changes in vegetation resulting from fire can have positive or negative effects on different species depending on the fire intensity, frequency, and timing.

Alternatives vary in the trade-offs of fire risk to vegetation change. Potential effects to wildlife habitat and species from fire management will vary by alternative theme and MPC assignments.

Livestock Grazing – Grazing livestock compete with wildlife for the use of available forage. Grazing results in plant defoliation, mechanical changes to soil and plant material, and nutrient redistribution. These and other factors also influence successional trends. Succession is affected by the grazing frequency (times grazed), intensity (amount of plant removal), and opportunity (time the plant needs to meet its physiological growth needs). Timing (spring, summer, fall) of grazing can also have different effects on vegetation, such as a reduction of flowering parts, or physical damage to plants if conditions are to wet in the spring. Grazing can alter the density and composition of herbaceous and shrub vegetation. Vegetation is sometimes altered to increase forage for livestock. Even the very presence of livestock can affect some wildlife species. For example, cattle attract cowbirds in open forest settings. Cowbirds lay their eggs in the nest of other birds. Cowbird chicks out-compete the young of other species, and force them out of the nest, usually resulting in death. The presence of livestock may be giving cowbirds an ecological advantage over other bird species in the area.

Grazing by domestic sheep can increase the risk of disease transmission to bighorn sheep. Bighorn sheep are highly susceptible to some strains of *Pasteurella* that are carried by domestic sheep. The disease, which does not affect domestic sheep, is usually fatal to bighorn sheep. Transmission of the disease can occur when bighorn sheep and domestic sheep occupy the same area and come in physical contact with each other.

Road and Trail Construction and Use –The majority of roads constructed on national forest lands over the last 50 years have been developed primarily for timber management activities. Historically, trails were developed for livestock management activities, mining, and fire lookout access. More recently however, trails have also been constructed for recreational activities.

Roads and trails remove vegetation from the travel surface. This removal directly reduces the amount of vegetation that can be used as habitat, and indirectly affects adjacent habitat. The relative effects of roads on wildlife depend on the interactions of topography, vegetation type and condition, and frequency of human use. One of the primary direct effects is increased human access in to areas. Increased access increases mortality risk, fragmentation of habitat, and displacement/avoidance responses. Access can increase the risk of non-native plants becoming established, and many of these plants are not used as habitat or forage by native species. Access on roads and trails can be restricted during certain times of the year to reduce or eliminate the effects of access.

The increasing human population trend for this region is likely to continue, and this growth will likely increase human use of public lands during all seasons of the year.

Minerals Management – Mining exploration and development can influence wildlife in a number of ways, including road construction to mineralized areas, increased human interaction, and loss of vegetation that was used as habitat. Mining in the past has not influenced extensive areas, but can result in considerable changes to landscapes where it does occur. Some of the first roads constructed were to gain access to mineral deposits. Mining operations have different needs for the extent of support facilities and access. In areas where mineral reserves justify the construction of a mill, impacts may include buildings, equipment, utilities, tailings, and human presence. Generally, mining operations that use tunnels influence less surface area then open pit technology.

The scale of mineral development has differing effects on habitat and displacement/avoidance associated with the extent, timing, and duration of activities. Exploration activities are usually short term, while mineral production can displace wildlife for many years in some cases. Some mining activities use or produce toxic material. If improperly handled, this material can cause mortality to wildlife.

The effects to habitat and species will not vary between alternatives. The ability to access minerals would not change by different alternatives. Mineral development is a function of worldwide market values that are unaffected by different alternatives or MPCs. Areas can be withdrawn from mineral exploration or development by Congress or administratively. There are no proposals to directly withdraw any areas through plan revision, although land allocation decisions (recommended wilderness, eligible Wild and Scenic Rivers) made during revision could indirectly influence mineral withdrawals in the future, depending on Congressional action.

Recreation – Recreation is a function of social demands related to experiences desired, available and provided on Forest Service administered lands. Developed and dispersed camping can decrease the habitat capability for some species. Wildlife species that require snags are usually negatively affected by hazard tree removal for safety reasons and the desire for firewood. Long-term use of dispersed sites can modify the vegetation that wildlife species depend on. Wildlife disturbance or disruption from recreation during breeding/nesting periods can also occur.

Winter recreation, such as cross-country skiing and snowmobiling, can stress wintering animals during deep snow periods. Over-the-snow trails allow access for some animals to areas they usually cannot use during the winter because of deep snow conditions.

Alternatives with different recreational emphasis would likely change the distribution and amount of recreational activities. The increasing human population trend for this region is likely to continue. Likewise, the desire by the public to meet their expectations for differing recreational activities will continue to increase. This increase in recreation use has resulted in increased conflicts with wintering wildlife, particularly big game. Most big-game winter ranges have access restrictions to reduce stress during periods of deep snow; additional restrictions for big game winter ranges are not anticipated.

Non-native Plants – Over time many non-native plants have been introduced into the Ecogroup area. Some plants were intentionally introduced; others were not. Non-native plants change the value of wildlife habitat by displacing native plant species. Some non-native species are not usable by native wildlife species as habitat or forage, and their presence decreases the habitat carrying capacity. Some non-native plants influence the fire regime and create conditions that may cause areas to burn more frequently. The increasing frequency of fire can cause a reduction in woody species that are valuable as habitat. Additionally, non-native plants compete with native vegetation for moisture, nutrients, and space, all of which can reduce habitat quality and quantity. Some non-native plants are considered "noxious weeds" by the state. Programs are in place to reduce the spread of noxious weeds, but these programs have had mixed success. All alternatives would treat noxious weeds, but some may be more successful than others due to variable factors such as access, detection, and vectors of establishment and spread (see *Non-native Plants* section in this chapter).

General Effects by MPCs

Vegetation Management with Emphasis on Restoration (MPCs 3.2, 5.1, and 6.1) - Wildlife habitats are anticipated to improve over the long term because of the emphasis on restoration of habitats with these prescriptions. Habitat would benefit because of an emphasis on road obliteration, mechanical vegetation treatments, and fire use to manage vegetation toward HRV conditions. Other resource activities are allowed as long as plant species composition and structure achieve sustainable resource conditions and ecosystem health. The need for resource mitigation activities for wildlife habitat would be minimal where management activities occur.

Vegetation Management with Emphasis on Commodity Production (MPCs 5.2, 6.2) – Wildlife habitats are anticipated to improve because of required protection measures and restoration activities associated with commodity production projects, but impacts may occur in the short term before improvements occur. The use of fire in forest vegetation would be the most limited, and this would make it harder to achieve habitat conditions needed for some species. Large tree, snag, and down log management requirements would be at threshold levels where intensive management occurs. Road construction and use would be at highest levels, which would have adverse impacts to species that are sensitive to disturbance. Mitigation activities are major elements of most project activities with these MPCs.

Natural Processes Dominate (MPCs 1.1, 1.2, 2.2, 3.1, 4.1) - Wildlife habitats are anticipated to improve by natural process, with succession and disturbance being emphasized. Restoration of habitat will occur, but may take the longest time frame to achieve, because of an emphasis on unpredictable natural processes. Species that are most negatively affected by mechanical disturbance and other human activities would benefit from these prescriptions.

Viability Analysis

This analysis looks at how the management alternatives for Forest Plan revision either contribute to or mitigate changing patterns of habitat alteration and fragmentation, and disturbance to wildlife. Particular attention is paid to those species whose viability may be of concern and affected by the alternatives and their associated activities. Federal planning regulation 36 CFR 219.19 requires that viable populations of all native and desirable non-native vertebrate species be maintained at the planning area level. Species with a viability concern include those listed or proposed for listing under the Endangered Species Act, those on the Regional Forester's sensitive species list, Forest selected Management Indicator Species for which populations and habitat conditions may be a concern and other species identified that may be at risk at a more local level.

There is no approved or standardized approach for viability analysis, and the debate continues at the national level. Several different recent approaches (Andelman et al. 2001, Holthausen et al. 1999) have been considered in this analysis. A caveat that should be noted is that each species has a unique response to environmental conditions and changes in those conditions (Landres et al. 1999). The very presence of a species is indicative of its persistence in an environment, but species are generally tolerant of a range of environmental conditions, resulting in increasingly complicated predictions when using a model (Haufler et al. 1996). All viability analysis approaches have limitations and risks involved because of incomplete species and habitat information, lack of data precision, environmental uncertainty, potential natural catastrophic events, and the uncertainty associated with future projections (Holthausen et al. 1999).

Direct and Indirect Effects by Alternative

Endangered and Threatened Wildlife Species

Special consideration for management proposals at the project level is given to species listed under the Endangered Species Act (ESA). Biological assessments are completed that identify possible effects to these species. The assessments determine how well management alternatives maintain or improve habitat conditions for these species of concern. Potential effects at the Ecogroup and Forest scales are described below for species currently listed under the ESA.

Gray Wolf (*Issue 2)* - Because wolves are habitat generalists that hunt and den over a wide variety of vegetation types, the alternatives would not have significant effects on the amount and distribution of habitats used by wolves or their prey species. Gray wolf populations are primarily limited by non-habitat factors such as denning disturbance and direct interaction with humans that cause mortality. Most of the known wolf mortality that has occurred in the Ecogroup has been in response to livestock depredations. Wolves that have a history of livestock depredations are lethally controlled by agents of USDA, APHIS Wildlife Services. Most of the depredation problems have been on or near the Sawtooth National Forest within the Central Idaho Recovery Area.

Wolves are most vulnerable to disturbance while denning and rearing pups. Forest-wide management direction has been designed to allow wolf pairs to establish dens and packs on the Forest if they choose to do so, under the protection of the Experimental/Non-essential population rule in Idaho (USDI FWS 1994). Activities that disrupt wolves during denning and pup rearing are prohibited near wolf dens during the spring denning and rearing period under all alternatives until six (6) breeding pairs are obtained. Additional management direction will contribute to viability and persistence of this species within the Ecogroup area, including northern Utah.

Wolf interaction with humans is perhaps most influenced by human accessibility to remote habitats. Under all alternatives, the amount of roads across the Ecogroup is expected to decrease over the short term (10-15 years), although small amounts of new road construction would also occur. Based on proposed vegetation management opportunities, Alternative 3 would reduce roads the most, followed in order by Alternatives 2, 7, 4, 5, 1B, and 6 (Table W-8).

Table W-8. Ecogroup Average Road Miles Related to Vegetation Management Opportunities by Alternative, Average of First Two Decades

Road Miles	Alt. 1B	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt.7
Decommissioning	54.2	82.1	109.6	44.3	63.7	24.3	63.6
New Construction	25.7	28.9	21.4	5.4	30.9	2.7	22.2
Net Differential*	- 28.5	-53.2	-88.2	-38.9	-32.8	-21.6	-41.4

*Calculated by subtracting new road construction from road obliteration

Additional roads would likely be obliterated or closed depending on protection and restoration needs and funding available from other resources such as soil, water, fish, and wildlife. The reduction in roads would have the indirect effect of reducing the likelihood of adverse human interaction with wolves in the form of shooting, harassment, vehicle collisions, and other forms of threats. Road reduction would likely continue over the long term in gradually diminishing amounts until the Forests have transportation systems that achieve a more desirable balance between access needs, resource impacts, and effective road maintenance capability.

Another way to assess inaccessibility is to calculate the amount of acres that would be generally regarded as roadless under each alternative. Areas without roads are typically represented by management prescriptions for Designated Wilderness (1.1), Recommended Wilderness (1.2), Research Natural Areas (2.2), and Semi-primitive Recreation (4.1a). These areas would also have either no motorized recreation or relatively low levels. Acres for these areas are presented by alternative in Table W-9, below.

Table W-9 indicates that Alternative 6 would have the most areas without roads, followed in order by Alternatives 4, 7, 1B, 2, 3, and 5. For all alternatives, areas without roads would represent a substantial percentage of the overall Ecogroup area; however, Alternative 6 would have almost three times as much area in a roadless condition as Alternative 5. Forest-wide direction will implement access restrictions if breeding pairs drop below the objective of six (6) breeding pairs as directed by the special rule.

Within the Central Idaho recovery area, wolves are increasing and exceeding the recovery goals numbers and time frames under current conditions. Increases are occurring despite mortality due to lethal control actions on individual wolves that have a history of livestock depredation. Current estimates within the Central Idaho Recovery area of wolf numbers for 2002 are 19 packs, 10 breading pairs, and 282 individuals. Before this species can be de-listed, the States of Idaho, Wyoming, and Montana must have an approved wolf management plan in place that is approved by the USFWS. No alternative is anticipated to reduce the prey abundance for wolves. Currently elk are at all time high populations levels state-wide and believed to be a primary prey of wolves in this part of the Central Idaho Recovery Area.

Table W-9. Acres of MPCs Representing Areas Without Roads by Alternative

MPC	Alt. 1B	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
1.1	985,400	985,400	985,400	985,400	985,400	985,400	985,400
1.2	660,900	661,300	661,600	2,537,500	0	661,600	661,600
2.2	25,600	25,600	25,600	25,500	25,600	25,600	25,600
4.1a	800	3,900	21,600	65,500	219,800	2,569,600	84,000
Total Acres	1,672,700	1,676,200	1,694,200	3,451,400	1,099,400	4,242,200	1,756,600
Percent of Ecogroup Area	25%	25%	25%	52%	16%	64%	26%

Bald Eagle *(Issue 1)* - Bald eagles rely primarily on fish for food during the spring, summer, and fall. Their nesting, perching, roosting, and wintering sites tend to be near riparian areas near large bodies of water. Riparian area protection would be provided by management direction under all alternatives. This direction would include a general reduction in vegetation-disturbance activities from past levels, along with goals to maintain or restore large trees where possible for other resource needs, such as shade, bank stabilization, and pool habitat recruitment. These large trees would also provide nesting, perching, and roosting habitat for bald eagles over the short and long term, in both existing and potential eagle territories. Improved riparian and aquatic resource management direction under all alternatives should also help maintain or restore fish populations for bald eagles over the short and long term.

(Issue 2) Human presence and activities have occurred and will continue to occur within and adjacent to bald eagle territories on the Forests. As long as humans are present, there may be short-term displacement, which could result in nest failure. However, Forest-wide direction has been developed to protect bald eagle nesting and wintering areas from disturbance on National Forest System lands under all action alternatives. Specifically, Forest-wide direction in each Forest Plan states:

- Maintain or restore forest structural conditions for nesting and roosting areas near water bodies used by bald eagles.

- Seek funding and initiate preparation of a site-specific Bald Eagle Nest Site Management Plan within 5 years after a nesting territory is determined to be occupied.

- Mitigate, through avoidance or minimization, management actions within known nest or denning sites of TEPC species if those actions would disrupt reproductive success during the nesting or denning period. During project planning, determine sites, periods, and appropriate mitigation measures to avoid or minimize effects.

- Mitigate, through avoidance or minimization, management actions within known winter roosting sites of TEPC species if those actions would adversely affect the survival of wintering or roosting populations. During project planning, determine sites, periods, and appropriate mitigation measures to avoid or minimize effects.

This direction would help reduce disturbance to bald eagles during critical periods and therefore have beneficial effects to Bald eagle over the short and long term. Currently eleven nesting territories are present within the Ecogroup area, which reflects a steady increase in nesting territories over the last 15 years. Within the Central Idaho Bald Eagle management zones, eagles are increasing and exceeding the recovery goals numbers and time frames under current conditions. Bald eagle estimates for 2002 are 11 active nesting territories, four higher than the Fish and Wildlife Service recovery plan objectives for this part of the recovery area. Additional nesting habitat is available for new territory establishment. In habitat without territories, management direction would maintain or restore habitat conditions for perching, foraging, and potential nest sites. This management direction will contribute to viability and persistence of this species within the Ecogroup area.

Northern Idaho Ground Squirrel *(Issue 1)* - All alternatives would follow the 1996 Conservation Strategy and Agreement developed to help recover this species. A Recovery Plan is in the process of being developed, but is not approved at this time. All alternatives would provide management direction to protect and restore this species habitat. Therefore, implementation of all alternatives should have beneficial effects on northern Idaho ground squirrel habitat on Forest Service administered lands. The squirrel is Idaho's only endemic animal, with an estimated 250-500 individuals. The populations are small, disjunct, and isolated, a situation that challenges future management on the two Ranger Districts where they occur.

Because the northern Idaho ground squirrel has such a limited distribution and extremely low population numbers, potential effects to this species are best addressed at a finer scale, as outlined in the Conservation Strategy and Agreement. More specific direction is contained at the Management Area level, in the three Management Areas the species is known to occur in, and in two other Management Areas where they historically occurred. Forest-wide direction states:

- Maintain or restore vegetative conditions that contribute to the recovery of Northern Idaho ground squirrel habitat. See additional management area direction for Northern Idaho ground squirrels in Management Areas 2, 3, and 5 *(on the Payette National Forest)*.

- Maintain or restore vegetative conditions that contribute to the recovery of Northern Idaho ground squirrel habitat *(on the Boise National Forest)*.

Much of the squirrel's preferred meadow and natural opening habitat on the Payette National Forest has been managed in the past, but not in a way that has particularly benefited this species. Many areas adjacent to the meadows historically had large, widely spaced ponderosa pine and Douglas-fir that have been replaced by dense stands of younger trees with dense understories, which may inhibit movement of squirrels between colonies. Many of these meadows and opening have been invaded by trees because of past fire exclusion and grazing. MPC 5.2 offers the most options (tools) for habitat management but not necessarily the most compatible objectives for restoring or maintaining habitat. MPCs 5.1 or 3.2 management prescription would emphasize the restoration of large, widely spaced seral species with an open understory, more similar to habitat that occurred historically. Vegetative conditions best suited for ground squirrel dispersal at individual sites needs to determined including: tree density, tree size, species composition and understory conditions. The same type of vegetative information is needed for meadow areas. MPC 4.1 emphasizes semi-primitive recreation, with limited vegetation management, and is expected to allow successional trends to continue in areas where fires continue to be suppressed with resulting undesirable habitat condition. Habitat conditions in meadows and adjacent forests where squirrels currently occur vary from site to site. It is these fine-scale differences that need to be taken into account in project proposals that intend to improve habitat. Any vegetation treatments should be designed to implement the intent of the North Idaho Ground Squirrel Conservation Strategy, until a Recovery Plan is approved. Management direction will contribute to habitat conditions for viability and persistence of this species.

Ground Squirrels have been decreasing in numbers under current conditions (Alternative 1B). All action alternatives have Forest-wide and management area direction to restore ground squirrel habitat over the short and long term. Alternative 1B would require a Forest Plan amendment to incorporate the direction and intent of the conservation strategy or recovery plan. Based on MPC allocations, the alternatives that would have the most effective prescriptions to help restore and maintain ground squirrel habitat are, in descending order, 3, 4, 7, 5, 6, 2, and 1B. The extent and timing of management actions would likely vary somewhat by alternative, but restoration treatments under any alternative would help meet the intent of the North Idaho Ground Squirrel Conservation Strategy.

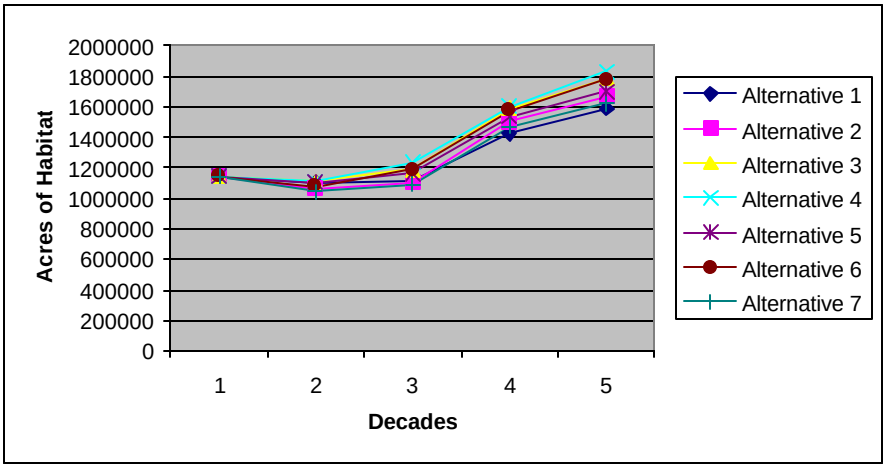
Canada Lynx *(Issue 1)* - All action alternatives would meet the intent of the standards specified in the 2000 Lynx Conservation Assessment and Strategy (LCAS) developed to help recover this species. Similarly, all action alternatives would provide management direction to protect this species and its habitat, including retention of mature forest conditions and coarse woody debris for denning and rearing habitat. Alternative 1B would require a Forest Plan amendment to incorporate the direction and intent of the LCAS. A reduction in roads under all alternatives would also reduce disturbance and vulnerability to hunting, trapping, and vehicle collisions. Therefore, implementation of all alternatives should have beneficial effects on lynx habitat on Forest Service administered lands. However, the extent and timing of management actions would vary somewhat by alternative.

Much of the estimated lynx's habitat in the Ecogroup area has not been actively managed in the past, other than to suppress wildfires that would have otherwise altered age class, stand structure, and species composition. Most lynx habitat occurs in the higher elevation areas and roadless

areas that have had little active management. Thus, many areas that historically had patches of trees in mixed ages, sizes, and species have been replaced by larger stands of even-aged but older trees, in or approaching climax conditions. Long-term fire suppression has generally reduced lynx foraging habitat, but likely benefited denning habitat. Large-scale management activities are not anticipated in lynx habitat; succession and fire will cause most of the vegetation changes long term. Figure W-2 indicates that succession is the major cause for change in lynx habitat, which results in all the alternatives being closely grouped together through time. Although a large amount of lynx habitat has burned within the last 10-15 years, it is estimated that 15-25 years may be needed for succession to advance before some of these recently burned areas turn into lynx foraging habitat. Recently burned areas are not considered suitable lynx habitat until they become re-established with sufficient vegetation to support cover for the lynx and its prey.

As shown in Figure W-2, Alternative 4 would have the best mix of management prescriptions to maintain lynx habitat over the long term, followed in order by Alternatives 6, 3, 7, 2, 5, and 1B.

Figure W-2. Estimated Acres of Lynx Habitat by Alternative



Under 3.2 or 5.1 management prescriptions, stands would be actively managed to move stand age class, density, structure, and species composition toward the HRV for appropriate PVGs. This management would create a better balance of foraging and denning habitat than current conditions in many areas. Foraging and denning habitat would be managed to meet conditions described in the Conservation Assessment and Strategy. Under a 5.2 management prescription, these stands would be regenerated to seral species tree and shrub species over time, which would increase foraging habitat for lynx and its primary winter prey species, snowshoe hare, over current conditions. Retention of patches of large trees for lynx denning would need to be retained in riparian zones and unmanaged areas to meet the area minimum management requirements. Human access and activities would be anticipated to be greatest in this prescription and may adversely affect lynx.

Management prescriptions 4.1, 3.1, 1.2 and 1.1 would passively allow natural processes to influence vegetation structure, composition, and patterns. These prescriptions may or may not achieve more desirable lynx and snowshoe hare habitat conditions over time, depending on variables such as climate, fire ignitions, fire size and intensity, and fire suppression strategies. Although conditions would change over the long term, it is difficult to predict how, where, or when they would change. Conservation Strategy habitat requirements may or may not be met. Human disturbance, however, would be relatively low due to little or no road construction or road use by full-sized vehicles.

Overall, MPCs 3.2 and 5.1 would likely provide the best mix of emphasis and tools for actively restoring or maintaining lynx and snowshoe hare foraging habitat over the short term. Overall, Alternative 3 would provide these MPCs across the largest extent of the Ecogroup area, followed in descending order by Alternatives 2, 7, 5, 4, 1B, and 6.

Within the Ecogroup, 94 Lynx Analysis Units (LAUs) have been identified and mapped based on criteria from the LCAS (USDI FSW 2000): 20 occur on the Boise National Forest, 38 on the Payette National Forest, and 36 on the Sawtooth National Forest. A broad-scale analysis of the each LAU showed that on the Boise National Forest three of the LAUs are out of compliance, with greater than 30 percent of lynx habitat being in a unsuited condition, based on the LCAS programmatic direction. Twenty LAUs on the Payette National Forest and one on the Sawtooth National Forest are also not in compliance. It is believed that the majority of the non-compliance is the result of the recent large fires that have occurred on the Boise and Payette National Forests.

The Ecogroup Forests have the potential for management activities that convert existing lynx habitat and exceed the 30 percent threshold of suitable habitat required by the LCAS. In reality, however, because so few LAUs are close to the threshold, there would not be much potential for habitat conversion from management actions. For one thing, it would likely be beyond the Forests' capacity to implement that much vegetation management during any planning period. For another, management direction under the action alternative would generally not allow this conversion to occur. However, the potential for wildfire in these LAUs is an unknown risk that could cause habitat conversion exceeding the threshold. Management direction will contribute to habitat conditions for viability and persistence of this species.

The LAU is the area in which programmatic management direction is to be evaluated and applied (USDI FWS 2000). A broad-scale analysis, such as the approach used for Forest Plan revision, is not believed to be sensitive to changes at the watershed or project-level scale. Forest-wide direction is in place to implement specific programmatic direction from the LCAS and Amendment. Following the LCAS direction within LAUs should improve conditions for the lynx under all action alternatives.

Candidate Species

Yellow-billed Cuckoo *(Issue 1)* - The key component for yellow-billed cuckoo habitat is extensive riparian cottonwood forest areas. Cottonwood riparian communities are essential for habitat of this species. One of the best examples of this type of habitat is found downstream of

Palisades Reservoir on the South Fork of the Snake River in South Eastern Idaho. There are currently no estimated acres of habitat for this species within the Ecogroup area, but from personal knowledge, habitat is considered limited in extent and isolated.

All action alternatives are anticipated to improve the trend in habitat for this species based on revised Forest-wide direction. Riparian area protection within RCAs/RHCAs would be provided by management direction under all alternatives. This direction would likely result in a general reduction in vegetation-disturbance activities from past levels, and include goals and objectives to maintain or restore cottonwood riparian systems where possible for resource needs, such as shade, bank stabilization, and pool habitat. Management direction will contribute to habitat conditions for viability and persistence of this species. Cuckoos are occasionally observed in southwest Idaho in cottonwood riparian forests; however, information regarding populations within Idaho indicates this species is extremely rare, and the breeding population is likely limited to a few breeding pairs at most. No CDC records are present for this species within the Ecogroup area.

Recently De-listed Species, as of 1999

Peregrine Falcon *(Issues 1 and 2)* - Most potential management activities would do little if anything to affect nesting habitat, which consists typically of cliffs in natural environments. All alternatives could indirectly affect this species as a result of changes in habitat for small birds that peregrines hunt, and these changes would vary somewhat by alternative, depending on how dense forests become over time due to management activities or natural processes. If anything, more open stands created through fire or vegetation management would likely increase foraging areas for peregrines, a positive effect for this species. Management direction is also in place to protect nesting birds from disturbance while nesting and raising their young. Management direction will contribute to habitat conditions for viability and persistence of this species. Alternatives 5, 1B, 2, 7, and 3 would potentially create more openings over the short term than Alternatives 6 and 4. At the present stage of recovery, however, effects on the peregrine from habitat changes for prey species within the Ecogroup area would likely be insignificant. Because this species status is sensitive after de-listing, further habitat analysis would occur for any project proposal that may affect its habitat.

Regional Forester Sensitive Species

Potential effects at the Ecogroup and Forest scales are described below for sensitive species currently listed by the Regional Forester. Assessments estimating habitat acres by alternative were completed for selected forest-dwelling species based on forested PVG and structural stage combinations. This is an approach similar to that used by Wisdom et al. (2000). This type of assessment generally overestimates the amount of habitat because it selects all acres of a particular PVG/structural stage combination that a species was assigned. Some of the combinations are too small in extent to meet species home range requirements. Also, some fine-scale attributes, such as snags and logs, may be lacking, which make the habitat unusable. However, this coarse-scale analysis is still useful because it displays relative differences between alternatives and trends in habitat amount through time for macro-habitat elements. It also identifies species where factors other than habitat may be keeping populations lower than a habitat assessment would suggest. For example, direct mortality may be limiting a population, but not the amount of habitat.

This type of approach also has the advantage of tracking coarse-filter habitat components (such as large trees) for all species that use an area, rather than for individual species, as in the species-by-species approach that has been done in the past. Based on MPC assignments, some of the alternatives would increase the extent of habitat components (PVGs/structural stages) at different rates and amounts, and this would affect different species habitat in somewhat different ways. These differences are described for each species if known.

Forest-wide direction is present for all sensitive species for the action alternatives. Species may come and go off the sensitive list, but the general direction will apply (see revised Forest Plans, Chapter III, Wildlife Resources section, Sensitive Species). The original Forest plans have little or no management direction dealing with Regional Forest Sensitive species. The Regional Forester's sensitive species "list" was first developed in the early 1990s and some base level direction was developed in the Forest Service Manual 2670 and Handbooks 2609. This direction as amended gives individual Forests basic direction for the management of Regional Foresters Sensitive Species. Manual and Handbook direction applies to all Forest Plans, and any projects implemented are obligated to follow the direction as amended, including Alterative 1B. For the effects analysis, Alterative 1B represented the current plans with direction in the Manual and Handbooks. The action alternatives follow the Manual and Handbook direction, plus additional direction for species and their habitat where specific issues have been identified.

Wolverine *(Issue 2)* - Wolverines are considered habitat generalists, and their home ranges are so large that they are usually measured in hundreds of square miles rather than thousands of acres. Thus, specific habitat needs are not as important as reducing human disturbance, particularly in natal den sites (subalpine talus cirques) during the denning period.

Because this species prefers high-elevation, remote areas in which to den and forage, wolverine habitat is found mostly on Forest Service lands and has generally been little affected by past management activities in terms of road construction, timber harvest, and altered fire regimes. It has been suggested that large unroaded areas are needed to maintain or improve conditions for wolverine in order to minimize disturbance and vulnerability from trappers, hunters, predators, and collision with vehicles. Direction proposed under all action alternatives would mitigate management actions within known denning sites of sensitive species if those actions would disrupt the reproductive success of those sites during the nesting or denning period. Management direction will contribute to habitat conditions for viability and persistence of this species. This direction would need to be added to the Forest Plans under the No Action Alternative for 1B to provide the same level of protection.

As seen in the analysis for gray wolf above, Table W-9 indicates that Alternative 6 would have the most areas without roads, followed in order by Alternatives 4, 7, 1B, 2, 3, and 5. For all alternatives, areas without roads would represent a substantial percentage of the overall Ecogroup area; however, Alternative 6 would have four times as much area in a roadless condition as Alternative 5. As this species is sensitive, further analysis would occur for any project proposal that may affect its habitat.

Forest Tree-Adapted Species - The next seven sensitive species are dependent on forest vegetation. Their habitats were evaluated with the aid of the vegetation SPECTRUM quantitative model outputs (see Appendix B for more information on this model). These species were selected because it is believed that their habitats have decreased or changed greatly from historic conditions, with possible implications for viability concerns (Raphael et al. 2000, Wisdom et al. 2000). These species were assigned PVG/structural stage combinations that they use as habitat. Habitat acres were generated by PVG/structural stage combinations from the SPECTRUM model outputs and then used to estimate habitat change for forest vegetation for each alternative (Vegetation Diversity Chapter 3, Wildlife Technical Report 2003). Changes in habitat acres were also tracked through five decades to show trends in habitat through time. The habitat acres displayed are not absolute, but should be regarded as only depicting relative trends over time from the different alternatives. In addition, the acreage predictions are a coarse-scale estimate and usually an over-estimation. Other finer-scale habitat attributes are assumed to be present to meet a particular species needs; for instance, snags in the case of woodpeckers. Snags and understory vegetation cannot be accurately modeled at the Ecogroup-wide scale and have to be evaluated at the project level. For this coarse-scale analysis the trend lines are more important then the acreage amounts. The trends displayed in the figures below for the different alternatives are the result of model outputs based on desired vegetation conditions, which vary by alternative. Management direction has been added that should further complement and improve the habitat trends and help resolve other issues not covered by modeled habitat estimations for these species.

Historical acreage estimates (Wisdom et al. 2000) were developed using a different model, and the vegetation was classified differently than in the SPECTRUM model (Morgan and Parsons 2001). Thus, a direct comparison between historic habitat acreage and predicted habitat acreage by alternative should not be made, although trends are important. Also, historic conditions were variable within a Historic Range of Variability (HRV) rather than a set point. The acre changes over time are meaningful only for a comparison of trends in habitat for different alternatives.

The forested vegetation structure outcomes from the SPECTRUM model were used in the wildlife habitat modeling process. A fundamental assumption of the analysis is that if the alternative depicts an increase in macro-habitat features from current conditions, the viability of the species is improving due to anticipated management actions, allowing for species persistence. It is also assumed that if the alternatives desired conditions are approaching or fall within the HRV for vegetation and habitat conditions, the viability for wildlife species will be improving and/or maintained. However, this does not mean our forests must return completely to the range of historical conditions to sustain biological diversity (Morgan and Parsons 2001). Historically, environmental conditions were variable, and changing conditions modified habitats over both the short and long term.

Often there appears to be a dip in large tree structure in the first or second decade as part of the outcomes from the modeling effort. This is likely occurring as an artifact of how the growth matrix was input into the model. Each growth stage has an inherent age range (such as 100 to 140 for medium tree high density) that may differ by PVG. The model uses the mid-point of the range (120) as the starting point for moving the vegetation through the modeling process.

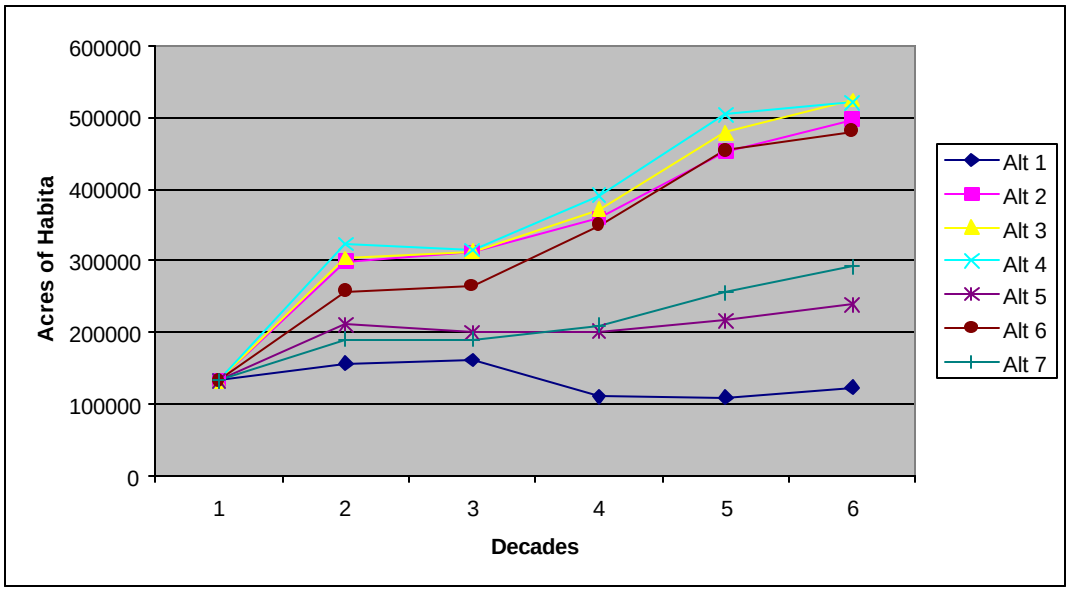
Therefore, in the model it may take two decades before medium trees move into the large tree structure, while management actions or background fire are taking large tree structure to grass/forbs/shrub/seedling structure. Thus, a reduction in large trees is being reflected in the model that may not actually be occurring on the landscape.

For several species, the patterns and trends of habitat are similar. One reason for this is that only a minor percentage of vegetation within any PVG would be treated by any alternative during a given decade. Another reason is the large tree minimum management requirement built into the model and management direction. For all action alternatives, the model is trying to increase the amount of large trees present on the landscape, thus benefiting the species adapted to them, except in Alternative 1B where a different large tree management requirement is used based on current plan direction. The majority of the vegetation in all PVGs continues along the successional pathway toward larger tree sizes, upon which these species depend. This pathway is occasionally interrupted by natural disturbance such as fire, but again, the majority of the vegetation in all PVGs continues to grow toward the larger tree classes. This pattern is not always repeated in nature, where large stochastic disturbance events can change vegetation components over large landscapes in a short period of time; however, these large events are unpredictable and difficult to model.

White-headed Woodpecker *(Issue 1)* - White-headed woodpeckers occur in forest types (PVGs 1, 2, 3, and 5) with a high proportion of large ponderosa pine at low tree densities. There are currently an estimated 130,000 acres of habitat for this species within the Ecogroup area. It is estimated that historically there was a much greater amount. Many unmanaged areas do not presently benefit the white-headed woodpecker because they have higher tree densities due to fire exclusion and little or no improvement treatments. Conversely, many areas of historical habitat have been converted by the removal of large trees, primarily through timber harvest.

All action alternatives show an increasing trend in the amount of white-headed woodpecker habitat through time compared to the current condition. This increasing habitat trend should increase the likelihood of continued persistence and improve viability for this species. However, 1B, the No Action Alternative, results in a continued decrease in habitat for the first five decades (Figure W-3).

Figure W-3. Estimated Acres of White-Headed Woodpecker Habitat by Alternative Over Five Decades

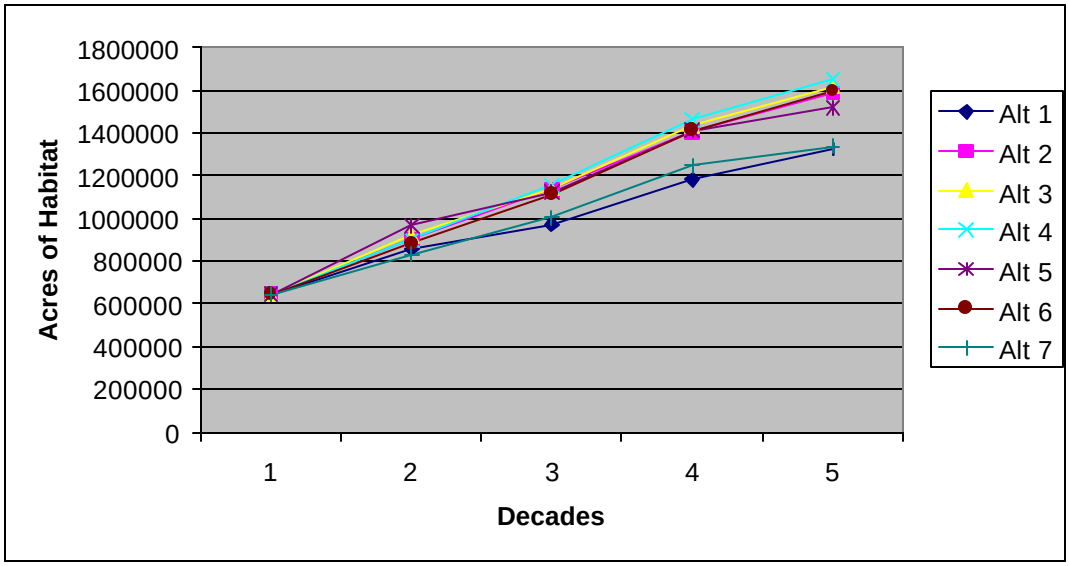


Over the next five decades, the most white-headed woodpecker habitat would occur under Alternative 3, followed in descending order by Alternatives 4, 2, 6, 7, 5, and 1B. This species habitat will benefit from increasing the extent of large ponderosa pine and reducing tree densities. Alternatives that have a restoration and fire use emphasis, such as Alternative 3, benefit this species, because non-lethal fire use reduces tree densities. Direction for the recruitment and retention of snags would also benefit this species. Management direction for the appropriate numbers and sizes of snag and down log incorporated the needs of species dependent on these habitat attributes. Road decommissioning would also benefit this species by increasing snag retention through restricted access. Because this species is sensitive and proposed as an MIS, all alternatives would have to maintain or improve its habitat conditions. Alternative 1B has a lower management requirement for the extent of desired large tree structure than the other alternatives and better access for snag removal, which would likely result in less desirable outcomes for this species' habitat and a continued viability concern.

Fisher *(Issue 1)* - Key components for fisher habitat are forested riparian areas, mature to old forests (PVGs 3, 4, 6, 7, 8, 9, 10, and 11) with moderate moisture conditions, and snags and coarse woody debris. Riparian forest communities are very important habitat for this species, and they are used disproportionately where available. There are currently an estimated 610,000 acres of habitat for this species within the Ecogroup area.

All alternatives show an improving trend in habitat for this species. Over the next five decades, the most fisher habitat would occur under Alternative 4, followed in descending order by Alternatives 6 and 3, 2, 5, 7, and 1B (Figure W-4).

Figure W-4. Estimated Acres of Fisher Habitat by Alternative Over Five Decades



This species habitat will benefit from the increase in the extent of large trees on the landscape. This is occurring because much of the habitat (PVGs) where this species occurs has limited amounts of mechanical management activities, and succession is producing additional mult-storied stands with large trees. This increasing habitat trend should increase the likelihood of continued persistence and improve viability for this species. Alternative 1B has a lower management requirement for the extent of large tree structure desired then the other alternatives, thus this alternative produces the least amount of habitat. Direction for the management of snags will also benefit this species, which uses snags and down logs for denning and hunting prey. Management direction for the appropriate numbers and sizes of snag and down log incorporated the needs of species dependent on these habitat attributes for denning and prey habitat. Road decommissioning will also benefit this species by increasing snag retention through restricted access.

In addition, riparian area protection within RCAs/RHCAs would be provided by management direction under all alternatives. This direction would likely result in a general reduction in vegetation-disturbance activities from past levels, and include goals to maintain or restore large trees where possible for other resource needs, such as shade, bank stabilization, and pool habitat recruitment. These trees would also provide foraging habitat and movement corridors for fisher over the short and long term, in both existing and potential habitat. However, information regarding populations within Idaho indicates that species viability is a concern because of population isolation, small size, and direct mortality in spite of improving trends in habitat. As this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

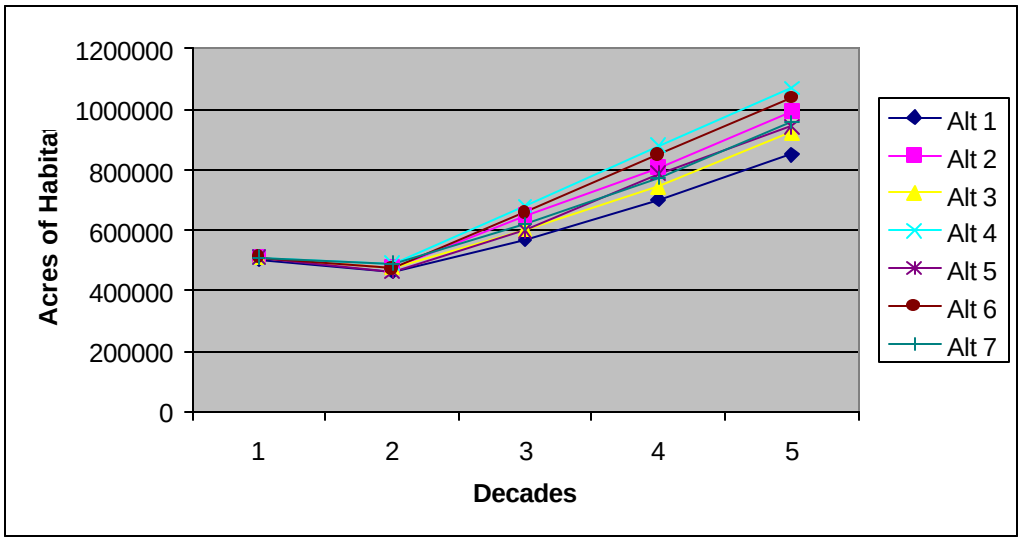
Boreal Owl *(Issue 1)* - Boreal owls inhabit mid- to higher-elevation forests that are capable of growing large-diameter trees. Snags and down logs are also necessary habitat attributes. It is estimated there are currently 500,000 acres of habitat for this species within the Ecogroup.

All alternatives show an improving trend in habitat for this species after the first decade (Figure W-5). Over the next five decades, the most boreal owl habitat would occur under Alternative 4, followed in descending order by Alternatives 6, 2, 7, 5, 3 and 1B.

The minor reduction in habitat for the first decade is likely the result of a modeling constraint (see discussion under Tree Dependent Species, above, and Appendix B). Large-scale management activities are not anticipated in extensive areas of boreal owl habitat, so succession and fire will cause most of the vegetation changes.

This species habitat will benefit from the increase in the extent of large trees on the landscape. This increase is occurring because much of the habitat (PVGs) where this species occurs at higher elevations, which would have limited amounts of management activities, and succession is producing additional multi-storied stands with large trees. Direction for the management of snags will also benefit this species. Management direction for the appropriate numbers and sizes of snag and down log incorporated the needs of species dependent on these habitat attributes. The results for all the alternatives are similar. This increasing habitat trend should increase the likelihood of continued persistence and improve viability for this species. Alternative 1B has a lower management requirement for the extent of desired large tree structure than the other alternatives; thus this alternative produces the least amount of habitat, but still shows an improving trend, likely because of advancing succession in high-elevation forest. As this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Figure W-5. Estimated Acres of Boreal Owl Habitat by Alternative Over Five Decades

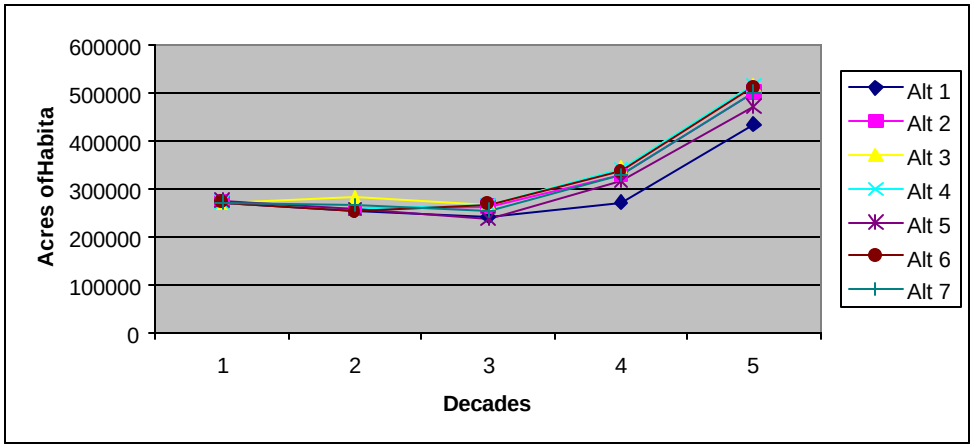


Great Gray Owl *(Issue 1)* - The habitat components considered most important for this species are: a) mature or older open forest habitat to provide suitable nesting sites; and b) suitable foraging habitat that includes non-stocked and seedling forests, meadows, and open riparian habitats adjacent to forested vegetation in PVGs 9, 10, and 11. This owl appears not to use steep slopes and is usually found in gentle rolling terrain, with open areas to hunt for prey. An estimated 280,000 acres of habitat for this species occur within the Ecogroup area. The analysis is believed to over-estimate the extent of this owl's habitat, because the model cannot restrict its coverage to the PVGs that are just adjacent to meadows and riparian areas. The great gray owl is not a species of concern within the Columbia River Basin (Wisdom et al. 2000).

All alternatives show an improving trend in habitat for this species after the first decade (Figure W-6). Over the next five decades, the most great gray owl habitat would occur under Alternative 4, followed in descending order by Alternatives 6, 7, 2, 3, 5, and 1B.

The minor reduction in habitat for the first decade is likely the result of a modeling constraint (see discussion under Tree Dependent Species, above, and Appendix B). Much of the estimated Great Gray owl habitat on the Ecogroup has not been actively managed in the past, other than to suppress wildfires that would have otherwise altered age class, structural, and species composition. Large-scale management activities are not anticipated in this habitat, so succession and fire use will cause most of the vegetation changes. All the alternatives have similar outcomes (improving trends), and there is little difference between alternatives. The trends are occurring because much of the habitat (PVGs) where this species occurs at higher elevations, which would have limited amounts of management activities; thus succession is producing additional multi-storied stands with large trees.

Figure W-6. Estimated Acres of Great Gray Owl Habitat by Alternative Over Five Decades



Management direction for the appropriate numbers and sizes of snag and down log incorporated the needs of species dependent on these habitat attributes. This increasing habitat trend should decrease the risk of continued persistence and improve viability for this species. Alternative 1B

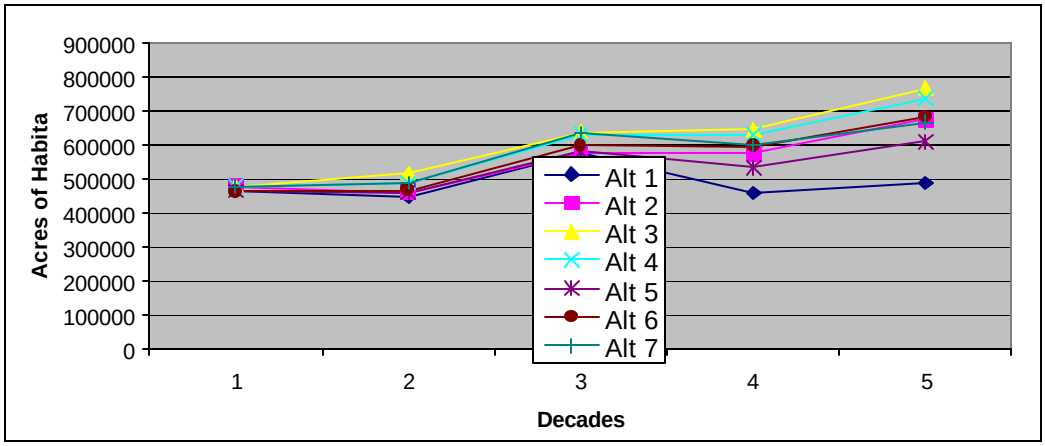
has a lower management requirement for the extent of desired large tree structure than the other alternatives, thus this alternative produces the least amount of habitat, but still shows an improving trend. Because this species is sensitive, further habitat analysis would occur for any project proposal that may affect its habitat.

Flammulated Owl *(Issue 1)* - Flammulated owls use lower-elevation forested areas that contain large ponderosa pine, Douglas-fir, and aspen trees of moderate densities, along with large snags for nesting. An estimated 480,000 acres of habitat currently exist for this species within the Ecogroup area.

All alternatives show a decrease in the first decade, followed by an increase until the fourth decade (Figure W-7). The reduction in habitat for the first decade is, at least in part, a result of a vegetation modeling constraint (see discussion under Tree Dependent Species, above, and Appendix B). The decrease after the fourth decade could be a concern for this species for some of the alternatives in the long term if it continues. Over the next five decades, the most flammulated owl habitat would occur under Alternative 3, and Alternatives 2, 4, 6, and 7 would have similar but somewhat lesser amounts than 3. Alternatives 1B and 5 display the slowest rate of improvement, with 1B showing a decrease in habitat after the third decade.

This species habitat will benefit from increasing the extent of large ponderosa pine, Douglas fir, and aspen and reducing tree densities. Alternatives that have a restoration and fire use emphasis, such as Alternative 3, benefit this species, because thinning and non-lethal fire use will reduce tree densities. Direction for the management of snags will also benefit this species. Management direction for the appropriate numbers and sizes of snag incorporated the needs of species dependent on these habitat attributes. Road decommissioning will also benefit this species by increasing snag retention through restricted access. This increasing habitat trend should increase the likelihood of continued persistence and improve viability for this species.

Figure W-7. Estimated Acres of Flammulated Owl Habitat by Alternative Over Five Decades



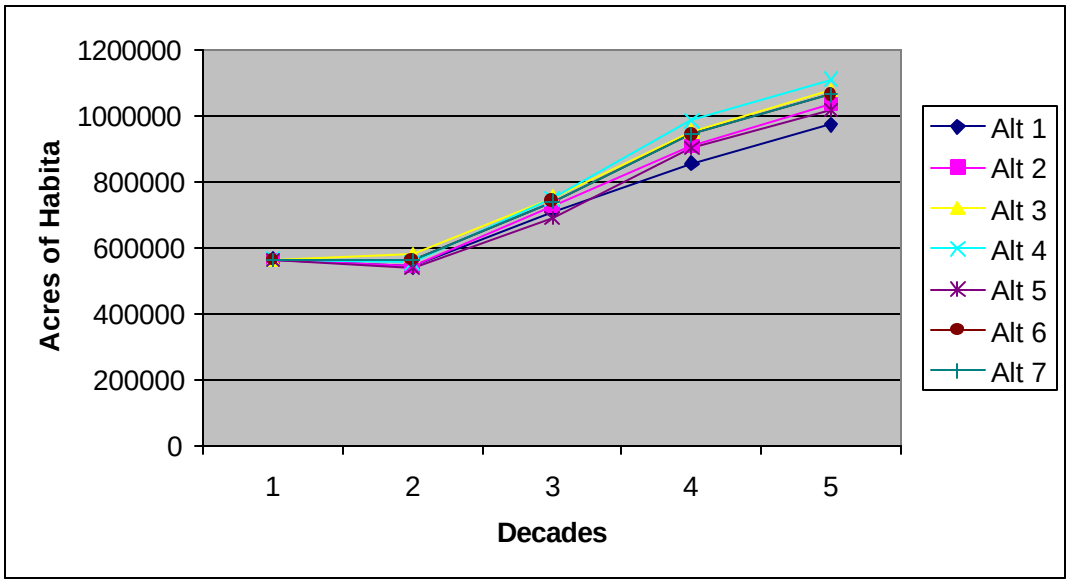
Alternative 1B has a lower management requirement for the extent of desired large tree structure than the other alternatives and the most road access, thus this alternative produces the least amount of habitat, thus a concern for the continued persistence of this species. As this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Northern Three-toed Woodpecker *(Issue 1)* - These woodpeckers take advantage of areas with extensive tree mortality and can be thought of as opportunists when these conditions occur. They reside in most of the higher-elevation forests within PVGs 7, 8, 9, 10, and 11. They have evolved with forest systems where insects, disease, and fire create conditions that produce abundant snags insects and insects for nesting and feeding. This species cycles in response to these disturbances and should have benefited greatly from the hundreds of thousands of acres that burned during the last ten years. Recent increasing insect activity in many of the lodgepole pine communities should also benefit this species in the near future. An estimated 580,000 acres of habitat for this species occurs within the Ecogroup area. This large amount is likely a result of long-term fire exclusion, which has resulted in increasing insect, disease, and wildfire mortality.

All alternatives show an improving trend in habitat for this species after the first decade (Figure W-8). Over the next five decades, the most northern three-toed woodpecker habitat would occur under Alternative 4, followed in descending order by Alternatives 6 and 3, 7, 2, and 5 and 1B.

Habitat increases are likely a result of the anticipated increase in tree mortality under all alternatives at higher elevations as these forests become older and more susceptible to insect, disease, and fire events. Management direction for the appropriate numbers and sizes of snag and down log incorporated the needs of species dependent on these habitat attributes. The minor reduction in habitat for the first decade is likely the result of a modeling constraint (see discussion under Tree Dependent Species, above, and Appendix B). The overall increasing habitat trend should increase the likelihood of continued persistence and improve viability for this species.

Figure W-8. Estimated Acres of Northern Three-toed Woodpecker Habitat by Alternative Over Five Decades



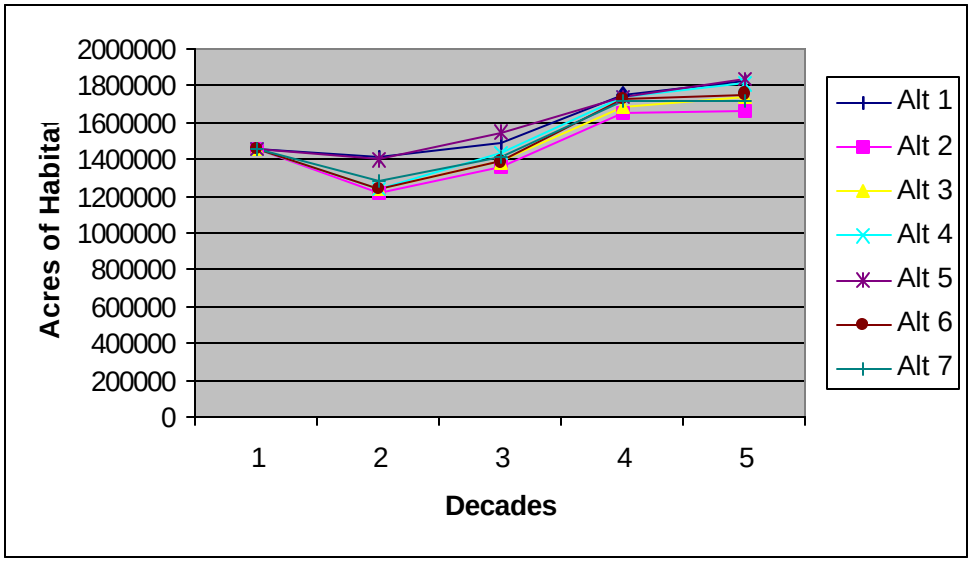
Alternative 1B has a lower management requirement for the extent of desired large tree structure than the other alternatives; thus this alternative produces the least amount of habitat, but still shows an improving trend. Because few mechanical treatments will occur in this specie's habitat, succession is the major controller of vegetation (habitat), which results in all the alternatives having similar outcomes. As this species is sensitive, further habitat analysis will occur any project proposal that may affect its habitat.

Northern Goshawk *(Issues 1 and 2)* - Goshawks use all forest types within the Ecogroup area, and they select nesting sites that usually have larger trees available compared to surrounding areas, and an abundant prey base. An estimated 1,410,000 acres of habitat for this species currently occurs within the Ecogroup area.

All alternatives show an improving long-term trend in habitat for this species as a result of increasing the amount of large tree structure on the landscape (Figure W-9).

All alternatives are producing a larger extent of area with large trees. This is occurring in areas with planned management activities that will actively increase the extent of large trees. This is also occurring in areas with little or no planed management because of plant succession. Direction for the management for the appropriate numbers and sizes snags will also benefit this species because many of its prey use snags as habitat. The minor reduction in habitat for the first decade is likely the result of a modeling constraint (see discussion under Tree Dependent Species, above, and Appendix B). Differences in the amounts of habitat over the next five decades for all alternatives are very minor, with a slowly improving trend. This increasing habitat trend should decrease the risk of continued persistence and improve viability for this species.

Figure W-9. Estimated Acres of Northern Goshawk Habitat by Alternative Over Fire Decades



Management direction proposed under all alternatives would mitigate activities within nesting stands and fledging areas that may disrupt nesting and fledging. Because this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Other Sensitive Species

Columbian Sharp-tailed Grouse *(Issue 1)* - In the past some mountain shrub communities were converted and seeded to non-native grasses to increase forage for livestock. Due to the importance of these habitats to sharp-tailed grouse and other species, these types of actions would no longer occur under the action alternatives. The continued emphasis in the No Action Alternative (1B) on production of livestock forage could result in additional areas being converted to non-native grasses, and the maintenance of non-native seedings in areas already converted. Another concern has been the recent extensive modification of some of these communities due to wildfire in the five Management Areas where sharp-tailed grouse are known to occur. It is believed that wildfire historically was the disturbance that played the largest role in modification of these communities. Once these areas have burned, it will take an estimated 20-30 years before sharp-tailed grouse can use them as wintering habitat. Fire is not undesirable in these communities, but the extent and timing can be a concern in localized areas and some management areas. As this species is sensitive, further habitat analysis will occur any project proposal that may affect its habitat.

Mountain Quail *(Issue 1)* - These birds are known to occur on the Boise and Payette National Forests, but not the Sawtooth. They use low-elevation dense shrub areas of coniferous forest and shrubby riparian area at the forest/non-forest interface. These types of habitats are not depicted by the 30-meter LANDSAT imagery used to map Ecogroup vegetation. Wisdom et al. (2000) estimate a reduction of 12 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU. No estimate of the amount of their habitat is available within the Ecogroup area. Population numbers can be reduced by habitat degradation caused by human activities such as urbanization and livestock overgrazing. It is estimated that very little if any development or proposed management activities would occur in mountain quail habitat under any alternative. Riparian areas would be protected from overgrazing and other management-related disturbances under all alternatives through Forest Plan RCA/RHCA direction. Therefore, all alternatives would have little or no adverse impacts on mountain quail habitat, and would likely improve habitat conditions over the short and long term. As this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Harlequin Duck *(Issue 1)* - Harlequin ducks nest along high-gradient mountain streams in north central Idaho. No nesting has been documented during surveys for this species in the Ecogroup area. The birds that have been observed are believed to be passing through to nesting areas outside the area. No alternative would influence the birds' ability to pass through the area to their nesting territories elsewhere. The locations where these birds have been observed are within forested riparian areas. Riparian area protection for RCAs/RHCAs provided by Forest Plan direction would maintain or restore riparian habitat conditions under all alternatives.

Direction for habitat protection should increase the likelihood of continued persistence and improve viability for this species. Therefore, all alternatives would have a beneficial effect on this species, and provide for continued migration to and from nesting areas. Because this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Spotted Bat *(Issues 1 and 2)* - Spotted bats roost in crevices of high cliffs and forage in sagebrush shrub and low-elevation forest. This species is very sensitive to human disturbance during roosting, but has not been detected within the Ecogroup area in limited surveys that have been completed. No management actions are proposed that would modify high cliff roosting areas for this species. Forest-wide standards and guidelines have been added for surveying and protecting bat hibernacula under all action alternatives. If bats were detected, actions would be taken to protect these sites from disturbance. No actions are proposed to eliminate or convert native shrublands to non-native species. The No Action Alternative (1B) would likely continue to degrade spotted bat foraging habitat by removing shrub/brush vegetation to increase grass composition to maintain or increase livestock forage. However, all alternatives should have no significant effects on roosting habitat for this species, as there are no management activities proposed that would modify or destroy crevices of cliffs. Direction for habitat protection should increase the likelihood of continued persistence and improve viability for this species. Because this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Townsend's Big-eared Bat *(Issues 1 and 2)* - The Townsend's big-eared bat is known to occur in several locations within the Ecogroup area. Forest-wide standards and guidelines for surveying and protecting bat hibernacula have been added and would apply under all action alternatives. Management direction has also been developed to protect roosting sites and hibernacula from disturbance, when bats are detected. Management direction for the appropriate numbers and sizes of snag and incorporated the needs of species dependent on these habitat attributes for night roosting. Direction for habitat protection should increase the likelihood of continued persistence and improve viability for this species. The No Action Alternative (1B) does not address identification or protection of bat hibernacula and therefore could pose a greater risk to Townsend's big-eared and spotted bats. Because this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Spotted Frog *(Issue 1)* - All alternatives are expected to maintain the current distribution of spotted frogs within the Ecogroup area. Habitat conditions are expected to improve under all alternatives. The Forest Service will follow legal direction (Executive Order 11990) that mandates that wetlands will not be destroyed or negatively affected. RCA/RHCA management direction would provide additional protection to habitat for this species under all alternatives. In addition, the action alternatives provide management direction to reduce the impacts of fish stocking on native species, which should help maintain the spotted frog. The spotted frog has been eliminated in some high-elevation lakes because of past fish stocking. Direction for habitat protection should increase the likelihood of continued persistence and improve viability for this species. Similar direction would need to be added to the No Action Alternative to address these concerns. Because this species is sensitive, further habitat analysis will occur for any proposal that may affect its habitat.

Common Loon *(Issues 1 and 2)* - Loons are known to nest in extreme eastern Idaho in natural lakes. No nesting has been documented for this species within the Ecogroup area. The birds that have been observed on some of the natural and man-made lakes are believed to be passing through to nesting areas outside the area. This species has also been observed in the general area on major rivers and reservoirs during their spring and fall migration. Wintering birds are mostly found on bays and coves along the coast of the Pacific Ocean. Loons are solitary nesters. Loons and humans (at moderate densities) can co-exist on lakes that provide some undisturbed suitable shoreline or islands for nesting. Islands are preferred sites. If nesting is documented in the Ecogroup area, appropriate direction is in place for sensitive species nesting habitat protection under the action alternatives. No alternative would influence the birds ability to pass through the area to their nesting and wintering areas elsewhere. Riparian area protection provided by Forest-wide direction would maintain or restore riparian habitat conditions under all alternatives. Therefore, all alternatives would have a beneficial effect on this species, and provide for continued migration opportunities. Direction for habitat protection should increase the likelihood of continued persistence and improve viability for this species. Because this species is sensitive, further habitat analysis will occur for any project proposal that may affect its habitat.

Species of Special Interest

Rocky Mountain Elk *(Issue 2)* - Access management in selected locations to restrict motorized travel during the hunting season is occurring on all three Forests to help meet state elk objectives. Access management is currently conducted through agreements with state agencies. These agreements are expected to continue, and Forest Plan direction encourages the coordination of access management with the appropriate state and federal agencies, and tribes. Because access restrictions can change seasonally and annually, mapping of these areas for revision analysis was not completed at the Ecogroup scale.

Elk populations within the majority of the Ecogroup are currently at record high levels. It is assumed that alternatives with the least road development or that maintain the current situation with regard to access would provide the security to allow elk to stay at current population levels within the game management units. As seen in Table W-8, all alternatives show an overall reduction in road miles over the short term. Based on proposed vegetation management opportunities, Alternative 3 would reduce roads the most, followed in order by Alternatives 2, 7, 4, 5, 1B, and 6. Table W-9 indicates that Alternative 6 would have the most areas without roads, followed in order by Alternatives 4, 7, 1B, 2, 3, and 5. Roadless areas would provide large security areas for elk, and make hunting elk in those areas more challenging. Also, as existing road numbers are reduced, additional security areas may be created.

In areas that are managed to reduce stand density to improve habitat for other species of concern, such as white-headed woodpecker, elk security would likely decrease because of the open stand conditions created. The anticipated increased use of non-lethal fire will likely also reduce the extent of areas that are used for security. If the same level of elk security were desired in these areas, additional access management restrictions would likely be needed to mitigate the change in vegetation conditions.

Bighorn Sheep *(Issue 2)* - Alternatives that reduce suitability for domestic sheep grazing in the disease risk areas would be most beneficial to bighorn sheep. Alternatives 3, 4, 6, and 7 reduce domestic sheep suitability in one area (see *Rangeland Resources* section, Acres Deducted Due to Bighorn Sheep Habitat). Implementation of all alternatives would result in bighorn sheep populations still being small and isolated in the southern portion of the Sawtooth National Forest. The Hells Canyon area has the greatest chance of an expanded population that could interact with other populations because of the large amount of bighorn sheep habitat present. Currently there is a multi-state agency agreement for the Hells Canyon area for dealing with disease risk between domestic sheep and bighorn sheep that cross the Snake River into Oregon from Idaho.

Snowshoe Hare *(Issue 1)* - Snowshoe hares inhabit boreal forest (high elevation) and dense riparian willow areas, and are important to management because they are the primary winter prey for Canada lynx. Within these types of vegetation, hares select for areas of small-diameter, dense young trees, and forest with dense shrub understories for both food and cover. These types of habitats are not captured by the 30-meter LANDSAT imagery used to map Ecogroup forest vegetation; therefore no estimate of the amount of habitat is available within the Ecogroup area. To be usable by hares, this type of habitat must be exposed above deep snow during the winter. This species cycles in response to these disturbances such as stand-replacing fire and should benefit greatly from the hundreds of thousands of acres that burned during the last ten years within the Ecogroup area. Areas recently burned should develop into quality hare habitat in 15 to 25 years after burning. Recent increasing insect activity in many of the lodgepole pine communities should also benefit this species in the near future, as these stands die, become more fire prone, and become re-established. Most of the habitat where snowshoe hares occur is not proposed for extensive vegetation management activities other than fire use. Succession and fire will play the major role in modifying habitat. Effects of all alternatives are assumed to be similar based on the role of succession, as well as direction for management activities in the LCAS.

Management Indicator Species

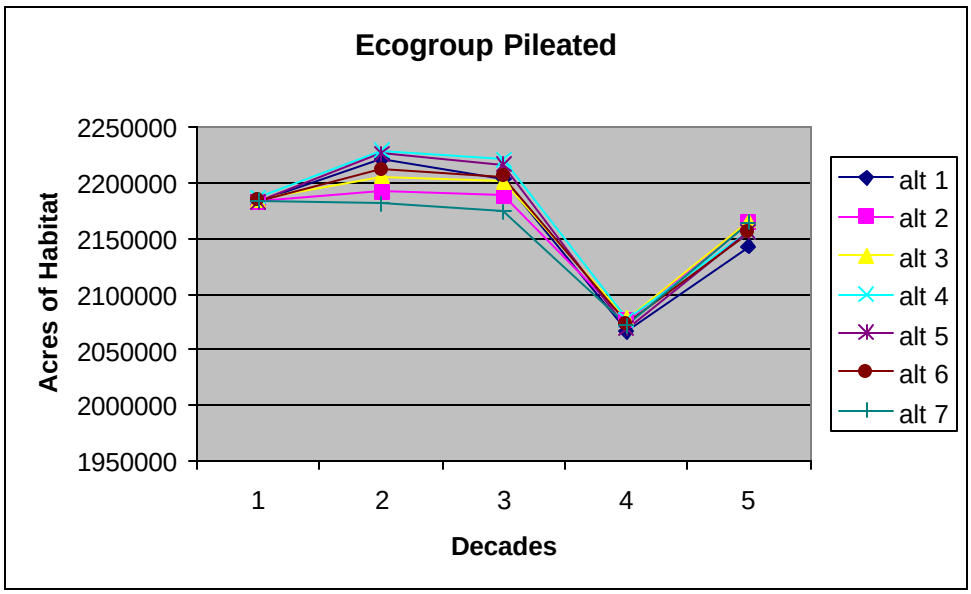
Sage Grouse *(Issue 1)* - None of the alternatives would change the extent of sagebrush communities within National Forest System lands. However, alternatives may change the structural stages of sagebrush to different degrees through the use of fire and other management activities. In the past, some of these communities were converted to seeded non-native grasses to increase forage for livestock. The primary concern has been the recent extensive modification of some sagebrush communities due to wildfire in the management areas where grouse are known to occur. Once these areas have burned it will take an estimated 10-20 years before grouse will use them. Due to the concern over the depressed population status of sage grouse, proposed projects will need to be carefully evaluated with local information in order to maintain or improve conditions for them. The desired conditions for sagebrush provided in the revised Forest Plans for the action alternatives should contribute to habitat maintenance or improvement. The revised plans also provide Management Area direction to address situations where wildfire has created a concern for this species. Because of the emphasis on livestock forage production, sagebrush communities may continue to decline under the No Action Alternative (1B). As this species is proposed as an MIS, potential effects will have to be evaluated during any project proposed within sage grouse habitat.

Pileated Woodpecker *(Issue 1)* - This species is native to North America, and they are known to occur across southern Canada. In the western U.S. they occur in Washington, Oregon, California, Nevada, Idaho and Montana in forest types that can grow large diameter trees. They are also found in the forested portions of all the eastern states with both pine and hardwood forests. This species uses mature forests with moderate to high tree densities and canopy closures, and well-developed understories with snags and down wood for nesting and feeding sites. These characteristics were provided by PVGs 3, 4, 6, 7, and 8. Stand characteristics are described as having moderate to high tree densities and large live trees and large snags and down material. The Wisdom et al. (2000) analysis estimated that pileated woodpecker source habitat has increased of 21 percent within ERU 13. This increase is due to fire suppression that has allowed for an increase in multi-storied stands and shade-tolerant trees. These conclusions are further supported by Breeding Bird Surveys in Idaho, which show a increasing presence of this species from the recent past in areas survey. However, past management within localized areas has resulted in a loss of pileated woodpecker habitat in some areas. Past logging and large wildfires have reduced the quality and quantity of habitat within portions of the Ecogroup area and possibly affected the distribution of territories, but not viability of the species. In addition, emphasis on retention and recruitment of large snags and down logs is an important management consideration for this species habitat.

Figure W-10 shows habitat trends for this species over the next five decades by alternative. After the third decade, habitat extent decreases with all alternatives, then increases after the fourth decade. Alternative 1B has a lower management requirement for the extent of desired large tree structure than the other alternatives; thus this alternative produces the least amount of habitat.

The reduction in habitat for the third decade is likely a result of the conversion of multi-storied stands to single-storied stands. Further reductions are anticipated over what is represented in Figure W-9 because of increased use of fire. Non-lethal management-ignited fire will reduce the amount of snags and logs in the drier PVGs used currently as foraging sites by the pileated for carpenter ants. Management direction for the appropriate numbers and sizes of snag and down log for each PVG incorporated the needs of species dependent on these habitat attributes. This reduction is not a concern for viability in this regional area because it is estimated that extent of source habitat for this species in ERU 13 has increased from historic times by 21 percent (Wisdom et al. 2000). The reduction in the fourth decade accounts for only 7 percent of the habitat within the Ecogroup area, which means the habitat extent would still be well above historical estimates.

Figure W-10. Estimated Acres of Pileated Woodpecker Habitat by Alternative Over Fire Decades



White-headed Woodpecker - See analysis under *Sensitive Species*, above.

Other Species of Concern

Five additional species at risk within the Columbia River Basin based on the Wisdom et al. (2000) analysis were evaluated with SPECTRUM model outputs: Vaux's swift, Williamson's sapsucker, brown creeper, Hammond's flycatcher, and the black-backed woodpecker. Results showed improving habitat trends for all these species because of increasing amounts of large tree structure based on habitat trending toward desired conditions that is within HRV and management direction in the revised plans that reduces known threats that are within Forest Service administrative control. A more complete analysis of these species and effects is contained in the Terrestrial Habitat and Species Technical Report (2003), in *Species at Risk Analysis within the Southwest Idaho Ecogroup, Boise NF, Payette NF, and Sawtooth NF*.

An estimated 27 species of birds are breeding in priority habitats (IPIF 2000) that occur within the Ecogroup area. Some of these species are year-round residents, and others are migratory. The birds that are migratory may be subject to threats (habitat loss, pesticides poisoning, harvest, etc.) on their wintering/summering areas outside of Idaho. Any species of bird that migrates outside of the United States is under the jurisdiction of the Migratory Bird Treaty Act (MBTA). The USFWS has developed a list of species (USDI FWS 2002) relative to the MBTA, but a MOU has not been finalized with the Forest Service and the Fish and Wildlife Service on how these species will be addressed during project analysis. Proposed management activities may have effects to these migratory species. For example, fire use in the spring may unintentionally destroy ground-nesting and snag-nesting sites. However, such actions may also provide long-

term habitat improvement for the same species in the years following the initial burning. Snag removal near building and power-lines because of human safety concerns may negatively affect cavity nesters in this group. Burning, and other vegetative management activities that have similar effects, only take place on a relatively limited extent of Forest Service administered lands on a yearly basis.

Cumulative Effects

Endangered and Threatened Species

Gray Wolf - The gray wolf has a circumpolar distribution in the northern latitudes. It occurs in Europe, Asia, and North America. In North America it is considered common in Alaska and most of Canada. Within all recovery areas in the U.S., the populations have been increasing, with the largest populations in Minnesota, Michigan, and Wisconsin.

Gray wolf populations have been increasing on all three Forests and within the Central Idaho Recovery Area since their re-introduction to central Idaho in 1995-96. This trend will likely continue over the short term due to high prey populations, decreasing roads densities across the Ecogroup, management direction to protect denning wolves (see Direct and Indirect Effects by Alternative), and the formation of new packs. However, as populations increase they will also disperse farther and farther from the Central Idaho Recovery Area in order to establish new territories and packs. This dispersal will bring them into increasing contact with human populations and activities. Over the long term, human social pressures will most likely restrict the distribution of wolves to areas of limited human occupation and away from concentrated domestic livestock production. Human tolerance and lack of persecution will be needed to achieve long-term successful recovery. Both regulatory and educational efforts will be important parts of wolf conservation and management efforts.

Bald Eagle - The bald eagle occurs in most regions of North America. It is considered common in Alaska and Florida. Populations have been increasing during the last 10-15 years in all areas where they occur in North America. In Idaho during 2001, eagles occupied 135 nesting territories, and 80 of these nests successfully fledged young. Nesting success in Idaho has been increasing during the last ten years, and that trend is expected to continue. The increasing population trends have been attributed to the banning of DDT in 1972 and management directed at protecting nesting habitat and birds. The USFWS has proposed to de-list the bald eagle in specific recovery areas because of the long-term positive population trends that are expected to continue.

Bald eagle nest and use areas occur on National Forest and other landownerships where large water bodies (lakes, reservoirs, and larger rivers) occur. Actions such as vegetation management, fish population regulation by state agencies, and reservoir level and river flow management (by the Bureau of Reclamation, Idaho Power, other agencies, and irrigators) can have positive or negative effects on bald eagle habitat and populations. Also, some eagles that nest in the Ecogroup area spend their winters elsewhere. These wintering areas may be on lands not administered by the Forest Service, and may not be managed for the benefit of wintering bald eagles. Populations continue to increase in most of the five recovery areas in the United States.

Northern Idaho Ground Squirrel - Northern Idaho ground squirrels inhabit three Management Areas on the Payette National Forest that also include other land ownerships. This species is also believed to have occurred on portions of the Boise National Forest. Approximately half of the known populations occur on lands administered by the Payette National Forest. Agreements are in place with federal and some non-federal landowners to protect and restore ground squirrel habitat, but this area is limited in extent on non-federal ownerships. A number of habitat improvement projects have been implemented since the Conservation Strategy and Agreement was signed in 1996, involving both federal and non-federal partners. However, cumulative impacts from habitat modification, livestock grazing, private construction, natural predation, shooting and trapping remain a concern for this species' viability, particularly with regard to the extremely low and isolated populations that remain.

Canada Lynx - The lynx has a circumboreal distribution. In North America, the lynx ranges across nearly all of Canada and Alaska, and extends south into the northern, forested United States. In the western U.S., lynx are known to occur in Washington, Idaho, Montana, and Wyoming. Lynx are known to occur in the Ecogroup area in the recent past and are expected to still be present. Wisdom et al. (2000) estimate a 14 percent increase in source habitat for lynx habitat within the Columbia River Basin and 12 percent increase in the Central Idaho Mountains ERU over historical extent.

Lynx likely inhabit areas on National Forest and other adjacent ownerships including private, state, and other federal administration; however, much of their habitat is on higher-elevation lands administered by the Forest Service. Vegetation management on non-Forest Service lands may not consider the needs of the lynx or its primary prey species. Lynx in this part of their range may also be limited by non-habitat factors such as hunting, trapping, collision with vehicles, low population size, and competition with other predators. Limited local knowledge about lynx population size, density, and distribution suggest that lynx are rare within the southern portion of the species range. Forest Plan direction has been added to manage for and protect lynx and prey habitat, but even if such efforts are successful, they may not result in a noticeable increase in any local lynx populations that may currently exist. However, these management strategies could have a cumulative beneficial effect over this portion of the species range and the much larger area that is covered by the LCAS. The recent re-establishment of the gray wolf may also benefit the lynx by reducing other predators, like the coyote, that compete with the lynx for snowshoe hares.

Candidate Species

Yellow-billed Cuckoo - Yellow-billed cuckoo nest and use areas on National Forest and other land ownerships where extensive areas of cottonwood riparian forests occur. Most of this type of habitat in the western U.S. is in private ownership because of its desirability for agriculture production and livestock grazing. Extensive areas of this type of habitat were lost during reservoir construction, which was commonplace in the Western U.S in the early part of the last century. Additionally, actions such as vegetation management, livestock grazing, and reservoir level and river flow management (by the Bureau of Reclamation, Idaho Power, other agencies,

and irrigators) can have positive or negative effects on Yellow-billed Cuckoo habitat and populations. Also, Yellow-billow Cuckoos that may nest in the Ecogroup area spend their winters in Central and South America. These wintering areas are typically not on lands administered by federal agencies, and may not be managed for the benefit of cuckoos.

Recently De-listed Species

Peregrine Falcon - The peregrine falcon has an almost worldwide distribution. The American peregrine falcon occurs throughout much of North America, from the sub-arctic boreal forest of Alaska and Canada south to Mexico. Peregrine falcons are now found nesting in all states within their historical range, except a few eastern states.

This species will most likely be added to the Regional Forester's Sensitive Species List when it is updated in order to ensure that Forest management proposals do not negatively affect improving population trends. Peregrines will likely receive similar protection on BLM lands. The recent apparent increase in the number of pairs of the western subspecies at the population level are being alleviated or have been reduced (USDI FWS 1999).

Sensitive Species

Wolverine - The Wolverine has a circumboreal distribution. In North America, the wolverine extends across Canada and Alaska, and uses forested and non-forested environments. In the western U.S., they are known to occur in Washington, Idaho, Montana, and Wyoming. They are considered a Regional Forester sensitive species in Regions 1, 2, 4, and 6. Wisdom et al. (2000) estimate a 14 percent increase in source habitat within the Columbia River Basin and a 32 percent increase in the Central Idaho Mountains ERU over historical conditions.

Because most wolverine habitat occurs on high-elevation and remote Forest Service administered lands, few cumulative effects are expected from lands under private, state, or other federal administration. Although different combinations of MPCs in the alternatives would allow different levels of management activities within the Ecogroup area, it is doubtful that wolverine habitat would ever receive a very high level of commodity-oriented activities under any alternative, due to the remote and rugged terrain, the short growing season, and the relative low values of timber and forage resources. Even mineral values, which are relatively high in localized portions of wolverine habitat, are somewhat neutralized by the additional production costs in these remote and rugged areas.

Perhaps the biggest threat to wolverines is disturbance from recreation activities occurring in denning areas, as these types of activities (snowmobiling, heli-sking, cross-country skiing, and snow-shoeing) have expanded in recent years and may continue to expand in the future. Although management direction has been provided to specifically address this concern under the action alternatives, violations could still occur and have impacts on the rearing of wolverine young. This situation should be monitored and evaluated, so that any needed adjustments can be made to protect this species over the long term.

Fisher - Fishers are native to North America, with most of their distribution occurring in Canada. Habitat is found in extensive areas of coniferous forest. In the recent past in the United States, fishers have occurred in California, Oregon, Washington, Idaho, Montana, Wyoming,

Minnesota, Wisconsin, and the upper New England States. Wisdom et al. (2000) estimate a 20 percent decrease in source habitat within the Columbia River Basin, but a 35 percent increase within the Central Idaho Mountains ERU from historical to current times. Fishers inhabit areas under private, state, and other federal administration; however, much of their preferred habitat is on forested lands administered by the Forest Service. Vegetation management on non-Forest lands may not consider the needs of the fisher or its prey species. This would be of particular concern where management emphasis is on timber growth and yield prescriptions that do not emphasize maintenance of large trees, snags, and coarse woody debris needed for denning sites and prey.

Effects will also occur to fisher habitat from natural processes, both on and off lands administered by the Ecogroup Forests. Natural succession will tend to create additional habitat on unmanaged lands, while disturbance events such as fire, disease, and wind-throw will reduce green forests, but create new snags and coarse woody debris over time. Currently other factors besides habitat limitations are believed to be contributing to the low population levels of fishers. Mortality will likely continue to occur from hunting, trapping, and collision with vehicles.

Boreal Owl - Boreal owls have a circumpolar distribution. In North America, they occur from Alaska east to Newfoundland in boreal forests. Regionally they are found in Oregon, Washington, Idaho, Montana and Wyoming, occurring in high-elevation forests. Wisdom et al. (2000) estimate a 61 percent decrease in source habitat basin-wide, but a 1 percent increase within the Central Idaho Mountains ERU from historical times. Boreal owl habitat is expected to increase within the Ecogroup Forests over the long term under all alternatives, which would contribute to habitat within and near the Ecogroup area. Because much of their preferred habitat is on forested lands administered by the Forest Service, few cumulative effects are expected from lands under private, state, or other federal administration.

Great Gray Owl - The great gray owl has a circumpolar distribution. In North America, it is resident from Alaska south and east across Canada, and south into the Sierra Nevada and Rocky Mountains. Wisdom et al. (2000) estimate a 16 percent decrease in source habitat within the Columbia River Basin, but a 32 percent increase within the Central Idaho Mountains ERU from current to historical times. Therefore, minor short-term reductions in habitat predicted within the Ecogroup area would not likely have a significant cumulative impact on this species. Great gray owl habitat is expected to increase within the Ecogroup Forests over the long term under all alternatives, which would contribute to increasing habitat within and near the Ecogroup area. Great gray owls inhabit areas under private, state and other federal administration; however, much of their preferred habitat is on forested lands administered by the Forest Service. Therefore, few cumulative effects are expected from other land ownerships.

Flammulated Owl - Flammulated owls breed from British Columbia south through the western interior U.S. and into northern Mexico, and they winter primarily in Central America. Wisdom et al. (2000) estimate a 56 percent decrease in source habitat within the Columbia River Basin, and a 52 percent decrease within the Central Idaho Mountains ERU from historical to current times. Although all action alternatives would increase flammulated owl habitat to varying

degrees over the long term, predicted short-term reductions in habitat are a concern for this species that has already lost so much habitat compared to estimated historical conditions. Special consideration will therefore be needed for projects that could potentially reduce flammulated owl habitat on the Forests.

Flammulated owls inhabit ponderosa pine, Douglas-fir, and mixed conifer stands with aspen that occur on National Forest and other federal, private, and state land ownerships. Vegetation management on other ownerships has not featured the retention of large trees and snags in the past, and it may not in the future. It is therefore assumed that Forest Service administered lands will likely contribute the most to re-establishment and maintenance of these important habitat attributes. Also, this species is migratory, so a change in population may not represent changes in habitat conditions on the Forests. Populations may be influenced by activities off Forest, particularly in areas where they may be wintering in Central America.

White-headed Woodpecker - White-headed woodpeckers are resident in southern British Columbia, central Washington and Oregon, Montana, Idaho, and into southern California. Wisdom et al. (2000) estimate a reduction of 61 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU, and a 62 percent decrease within the Columbia River Basin. Under all alternatives but 1B, white-headed habitat is expected to increase within the Ecogroup Forests over the short and long term, which would contribute to restoration of deficient habitat within the Ecogroup area and ERU. White-headed woodpeckers inhabit ponderosa pine areas that occur on National Forest and other federal, private, and state land ownerships. Vegetation management on other ownerships has not featured the retention of large trees and snags in the past, and it may not in the future. It is therefore assumed that Forest Service administered lands will likely contribute the most to re-establishment and maintenance of these important habitat attributes.

Northern Three-toed Woodpecker - The Northern Three-toed Woodpecker occurs in North America from Alaska south through Canada along the western mountains into Arizona and New Mexico. This species usually occurs in higher-elevation forests that are dominated by smaller-diameter trees. They are considered opportunists that take advantage of fire, insect, and disease tree mortality within forests. Their numbers increase in areas of recent tree mortality due to insect or wildfire activity. Most of the higher-elevation forests this species uses are under Forest Service administration and to some extent the National Park Service. Wisdom et al. (2000) estimate a 24 percent increase in source habitat within the Columbia River Basin, and a 77 percent increase within the Central Idaho Mountains ERU from historical to current times. Therefore, minor short-term reductions in habitat predicted within the Ecogroup area would not likely have a significant cumulative impact on this species. Three-toed woodpecker habitat is expected to increase within the Ecogroup Forests over the long term under all alternatives, which would contribute to increasing habitat. This improvement of habitat is expected because of anticipated increasing levels of tree mortality and areas burned by wildfire with minimal salvage efforts in high-elevation forests. Many of the large fires in the western U.S over the past several years should benefit this species also. Because much of their preferred habitat is on forested lands administered by the Forest Service, few cumulative effects are expected from lands under private, state, or other federal administration.

Northern Goshawk - The northern goshawk ranges throughout the northern forests of North America, Europe, and Asia. In North America, goshawks breed in Canada, extending south through the mountains of western U.S. into northern Mexico. Wisdom et al. (2000) estimate a 43 percent decrease in source habitat basin-wide, and a 7 percent decrease within the Central Idaho Mountains ERU from historical to current times. Goshawks also occur on the southern portion of the Sawtooth National Forest, which is not in the Central Idaho Mountains ERU. Minor short-term reductions in habitat predicted within the Ecogroup would not likely have a significant cumulative impact on this species. Goshawk habitat is expected to increase within the Ecogroup Forests over the long term under all alternatives, which would contribute to the source habitat within the ERU that is slightly below estimated historical levels at present.

Goshawks inhabit ponderosa pine, Douglas-fir, mixed conifer stands and aspen that occur on National Forest and other federal, private, and state land ownerships. Vegetation management on other ownerships has not featured the retention of nesting and post-fledgling areas in the past, and it may not in the future. It is therefore assumed that Forest Service administered lands will likely contribute the most to restoration and maintenance of these important habitat attributes.

Columbian Sharp-tailed Grouse - The Columbian Sharp-tailed grouse occurs in southwestern Canada, Washington, Oregon, Idaho, Montana and Wyoming. Much of their low-elevation historical habitat has been converted to agriculture production. Forest Plan direction under the action alternatives would likely maintain or restore sharp-tailed grouse habitat on Forest administered lands, most of the habitat is considered wintering. However, most grouse summer habitat occurs at lower elevation on other federal, private, and state administered lands. Removal or conversion of shrubland communities used as wintering habitat would further reduce habitat for the sharp-tailed grouse. Wheat is a common crop grown on private land areas that were once sharp-tailed grouse habitat. This habitat conversion to intensive agricultural use can negatively affect this species, especially if it occurs on wintering areas.

Sharp-tailed populations statewide have been increasing over the past twelve years, but most populations are still small and isolated. Most of this increase has been attributed to the Conservation Reserve Program (CRP) on private lands (Apa 1998, Wisdom et al. 2000). These birds are making extensive use of these plantings that are maintained in permanent grass/shrub cover all year long, year after year. In some locations, these CRP fields are adjacent to the Sawtooth National Forest. Because these areas are in private ownership, once the CRP contracts expire these areas may be converted back to croplands that sharp-tailed grouse do not generally benefit from. Due to recent drought condition in the Western U.S., these CRP areas were allowed to be grazed or hayed, which is not desirable for this species. There is a risk to continued persistence and viability because most of the spring and summer habitat used by this species is not under the administration of the Forest Service. Also some of the populations are small and isolated, putting them at additional risk to long-term persistence.

Mountain Quail - Mountain quail reside from Vancouver Island, British Columbia south to northern Baja California, ranging into southeastern Washington, eastern Oregon, western Idaho, and central Nevada. Wisdom et al. (2000) estimate a reduction of 12 percent in source habitat from historical to current times for this species within the Central Idaho Mountains ERU. Cumulatively within the Columbia River Basin, there is a 16 percent increase (Wisdom et al.

2000). It is believed that populations can be reduced by habitat degradation caused by human activities such as development and livestock overgrazing in riparian areas. Development and overgrazing are expected to continue on other ownerships, which will further degrade mountain quail habitat; however, RCA direction should provide adequate on-Forest protection for this species. There is a risk to continued persistence and viability because most of the low-elevation habitat used by this species is not under the administration of the Forest Service. Also, some of the populations are small and isolated, putting them at additional risk to persistence.

Harlequin Duck - The Harlequin duck occurs from British Columbia south into Washington, Oregon, Idaho, Montana, and Wyoming. They winter on the west coast and move inland to breed and nest. Harlequin ducks are not known to breed or nest within the Ecogroup area. The birds may be present briefly in the spring, when they pass through to their breeding and nesting locations outside the Ecogroup area. The riparian areas they use during their migration would be protected by Forest Plan management direction for riparian areas. Management activities outside the Ecogroup have had, and will continue to have, a much stronger influence on harlequin ducks and their habitat.

Spotted Bat - This species in known from central Mexico north to southern British Columbia and east to Texas. Spotted bats are known from the southwestern portion of Idaho, south of the Snake River (Groves et al. 1997). They are also known from Twin Falls County north to the Middle Fork of the Salmon River (personal com. L. Lewis 2000). New methods of surveying and detecting this species have recently become available, which should better determine its distribution in the state. Little is known on wintering locations. Spotted bats are known to mostly use crevices of high cliffs for roosts. This type of habitat occurs within the Ecogroup area in steep basalt and limestone canyons, and also outside the Ecogroup area. This species is sensitive to human disruption to maternity roosting and will abandon roost sites, which may increase mortality to its young. Under all action alternatives, management direction has been added to the revised Forest Plans to protect these features on National Forest System lands. Off-Forest, some habitat that was usable by this species has been turned into reservoirs. Also, some areas adjacent to cliffs have been converted to agriculture, which does not meet the foraging requirements of this species.

Townsend's Big-eared Bat - This species ranges from southern British Columbia to southern Mexico and east to West Virginia in areas with deep canyons and high cliffs. This bat is considered common in the western U.S. In the eastern U.S., this species is listed as endangered. These bats are known to use buildings, caves, snags, and mine tunnels for roosting and hibernacula. Roosting and hibernacula sites are very important to the well being of this species. Under all action alternatives, management direction has been added to the Ecogroup Forest Plans to protect these features on National Forest System lands. However, buildings, caves, and mine tunnels occur on other ownerships where the presence of bats is not considered desirable. Human tolerance and lack of persecution will be needed to achieve long-term successful acceptance of this species because of its use of human habitations. Important habitats used by this species may not be protected on other ownerships, and this would negatively affect Townsend's big-eared bats.

Spotted Frog - The spotted frog is found in ponds and slow moving water from western Canada south through Idaho, eastern Washington and Oregon, and into northern Nevada and Utah. Spotted frogs use wet areas with standing water. Riparian areas, lakes, and wetlands are protected under all alternatives by management direction. Executive Order 11190 also limits the loss or conversion of this type of habitat. Off-Forest, much of this frog's habitat is in private ownership because of the presence of impounded or standing water. Many wetlands have been turned into irrigated fields and converted to agricultural uses, because of the availability of water. Also, one of the major threats to the species is thought to be competition from non-native amphibians and introduced non-native fish, more of which occur on lower-elevation private, BLM, and state lands. It is, therefore, assumed that Forest Service administered lands will likely contribute greatly to maintaining or improving important frog habitat.

Common Loon - The common loon has a circumboreal distribution and is known to breed in Finland, Northern Siberian, Alaska, Greenland, Iceland and Canada and most of the northern states in the U.S. that boarder Canada. There is an isolated population of loons in the Greater Yellowstone area of Idaho, Montana and Wyoming. The birds in this area winter on the west coast of the Pacific Ocean and move inland to breed and nest. Loons have been threatened by unregulated harvest, chemical contamination from mercury, oil spills on their wintering areas, and shoreline development in nesting habitat. Excessive human disturbance during nesting can also be detrimental to loons. Because relatively few occurrences of loons and no loon nest sites have been observed within the Ecogroup, it is assumed that management actions within the Ecogroup Forests would have little if any negative effect on current populations. If loons begin nesting on the Forests in the future, riparian area protection and direction for sensitive species provided by the revised Forest Plans should benefit this species.

Management Indicator Species

Sage Grouse - Sage grouse are native to western North America, historically occurring within the eleven western states that have extensive areas of sagebrush steppe habitat meeting habitat requirements. Sage grouse have been extirpated in Arizona, British Columbia, Kansas, Nebraska, New Mexico, and Oklahoma. In areas where they are still present, trend counts have been decreasing since the 1950s. Sage grouse are expected to continue to decrease over their current range because of habitat loss and degradation. Degradation is being caused by conversion of native habitat to intensive agricultural uses, the increasing spread of non-native plants, improper livestock grazing and urban development.

Wisdom et al. (2000) estimate a 27 percent decrease in source habitat basin-wide, an 11 percent increase within ERU 13, a 13 percent decrease in ERU 10, and a 53 percent decrease in ERU 11 from historical to current times. Sage grouse inhabit areas that occur on National Forest and other federal, private, and state land ownerships. Vegetation management on these other ownerships may not take into consideration the needs of sagebrush-dependent species. Mortality can occur from insecticide spraying and hunting, as well as collision with vehicles. Much of the habitat occupied by sage grouse is susceptible to the spread and invasion of non-native plants, which alters the understory communities of shrub/steppe habitat. Within Forest Service administered lands, habitat is still available for this species, but within the entire Snake River Valley there has been a significant reduction. Loss on this large scale will likely persist into the future. Therefore, Forest Service administered lands will play a major roll in maintaining habitat

for species dependent on sagebrush for some stage of their life history. Management areas that have the greatest extent of altered sagebrush need special management consideration when proposed activities would have the potential to change the structural stages of sagebrush on Forest Service administered lands.

White-headed Woodpecker - See analysis under *Sensitive Species*, above.

Pileated Woodpecker - The pileated woodpecker is native to North America. They are found in forested portions of all the eastern states. They are also known to occur across southern Canada. In the western states they occur in Washington, Oregon, California, Nevada, Montana and Idaho in forests that can grow large-diameter trees. Wisdom et al. (2000) estimated a 21 percent decrease in source habitat basin-wide and a 21 percent increase within the Central Idaho Mountains ERU form historical to current times. The species has a viability concern at the basin scale, though, because it has been estimated that a 21 percent decrease within the Columbia River Basin has occurred (Wisdom et al. 2000). Breeding Bird Surveys in Idaho, which show an increasing presence of this species from the recent past in areas surveyed, support the conclusions of Wisdom et al. (2000) that habitat has increased. Pileated woodpeckers inhabit areas under private, state and other federal administrations; however most of their habitat is on forest lands administered by the Forest Service. Therefore, limited cumulative effects are expected from other land ownerships.

Species of Special Interest

Rocky Mountain Elk - The Rocky Mountain elk is native to North America. It is common in all the western states and north into the Canadian Rockies. Elk numbers throughout the West are at high population levels based on records of state wildlife agencies during the last 50 years. In Idaho the trend is similar, with an all-time high record harvest of elk during the 1999 and 2000 hunting seasons. The high population levels are attributed to several factors, including recent mild winter weather, controlled harvest, and a better understanding of hunter access and how it relates to elk mortality during the hunting season. The recent re-establishment of the gray wolf will likely have some effect on local elk populations, but elk are expected to remain abundant due to their social and economic importance, management emphasis by state wildlife agencies, and the adaptability of the species.

Access to other non-federal ownerships during the hunting season can also influence elk populations. The percentages of these ownerships vary within the different game management units. State wildlife agencies can change the number of harvest permits allocated, season lengths, and sex to be harvested by game management units, which can also affect populations.

Within the Ecogroup area, state elk population objectives are shown in Table W-7. Of the 27 game management units, seven are not currently meeting population objectives. These seven need to be evaluated to better determine what factors are keeping them below desired population objectives. These units would be a starting point to analyze if additional access management would bring populations within objectives. Additionally, there are 10 units where elk population objectives are being exceeded. These units could be considered for modification of existing motorized access restrictions to help bring the population within desired objectives. Motorized access management must consider other land ownerships that roads traverse and allow legal

access. Most State Fish and Game Units contain multiple ownerships of National Forest System, other federal, state, and private land. Forest Plan management strategies would not have a significant cumulative impact on this species, because population numbers would still be above historical estimates. Elk inhabit areas under private, state and other federal administrations; however most of their habitat is on lands administered by the Forest Service. Therefore, limited cumulative effects are expected from other land ownerships except for potential urbanization or conversion to agricultural use of localized wintering areas.

Bighorn Sheep - Bighorn sheep are native to western North America, from British Columbia to Mexico. Within this area several sub-species occur. Populations have been greatly reduced throughout this range from once common abundance. It has been estimated that, within the Columbia River Basin, half of the bighorn sheep habitat currently contains no bighorn sheep. The majority of bighorn sheep habitat in Idaho is on lands administered by the federal government. Bighorn sheep populations are influenced by numerous factors other than habitat. The largest populations declines likely resulted from diseases transmitted from domestic sheep and over-harvest during settlement of the region 150 years ago. The current harvest of bighorn sheep is strictly controlled by state wildlife agencies. Re-introduced bighorn populations have become established and are expected to expand, but only in those habitats where domestic sheep are absent or confined because of potential disease concern.

Bighorn sheep populations within the Ecogroup area have declined dramatically over the last 150 years. The threat to bighorn sheep from domestic sheep disease still exists where private farm flocks of domestic sheep or goats occur within bighorn habitat or in close proximity. Population size and connectivity can also be limited by habitat modifications on private lands, expansion of urban areas, and construction of multi-laned highways and reservoirs. Current populations in the Hells Canyon NRA and Salmon River Canyon areas have the best potential for expansion due to the large amounts of continuous habitat and the relatively low amounts of domestic sheep within these two areas. The domestic sheep grazing in Idaho near the Hells Canyon NRA is still a disease transmission issue due to the mobility of bighorn sheep and potential for disease spread. In the other two areas, the White Clouds and Cassia Division, populations will likely remain small due to their habitat being isolated from other bighorn sheep habitat, their populations being relatively small and more susceptible to predation, and the relative close proximity of domestic sheep and goats on private lands.

Snowshoe Hare - Most of the boreal forest that comprises snowshoe hare habitat in the Ecogroup occurs within Forest Service administered lands. Hares have been negatively affected by long-term fire suppression activities in the boreal forest. Fire suppression has caused the forest to become older with reduced amounts of early successional stages, which the hares depend upon for both food and cover. Tree thinning in the boreal forest can reduce the quality of both food and cover. Thinning also reduces the time that these stand conditions meet hare needs. Trails open to snowmobile use have allowed additional predators (mountain lion, bobcat, and coyote) to access these areas and capture hares during the winter when these predators would not be expected to utilize boreal forest because of snow conditions. Under all action alternatives, Forest Plan direction has been added to address these concerns. These changes would likely have significant cumulative positive impacts on snowshoe hares or their habitat within the range of the lynx, because of implementing direction in the LCAS.

Other Species of Concern

An estimated 27 species of birds are breeding in priority habitats (IPIF 2000), these habitats also occur within the Ecogroup area. These same habitats also occur on other ownerships throughout the west. Some of these species that use these habitats are year-round residents, and others are migratory. The birds that are migratory may be subject to threats (habitat loss, pesticides poisoning, harvest, etc.) on their wintering/summering areas outside of Idaho. A change in abundance for these species may not relate directly with habitat conditions in just within the Ecogroup. Any species of bird that migrates outside of the United States is under the jurisdiction of the Migratory Bird Treaty Act. The USFWS in 2002 developed a list of species (Birds of Conservation Concern) relative to the MBTA, but the Forest Service and the USFWS have not finalized a MOU on how these species will be addressed at the project level (USDI FWS 2002). Management activities may have affects to these migratory species. For example, fire use in the spring may unintentionally destroy ground-nesting bird nests, yet may provide long-term habitat improvements for the same species in post-burn years. Snag removal near building and power-lines because of human safety concerns may negatively affect cavity nesters in this group. Burning and other vegetative management activities are commonplace on other ownerships and may have the same effects. Wildfires may also have the same type of effects, reducing the nesting habitat for some migratory species temporarily, while improving the habitat for these or other species over the long term.