1.0 WILDLIFE TECHNICAL REPORT AND BIOLOGICAL EVALUATION

1.1 INTRODUCTION

This biological evaluation and wildlife report was prepared for use by the U.S. Forest Service in conducting Section 7 compliance and NEPA analysis for the proposed White Pass MDP proposal. This report discusses potential occurrence of and impacts to species federally listed as threatened or endangered under the Endangered Species Act (ESA), U.S. Forest Service Survey and Manage species, U.S. Forest Service sensitive species, USFWS Species of Concern, USFS Management Indicator Species, and USFS Species of Local Concern for the Okanogan and Wenatchee National Forests and the Gifford Pinchot National Forest. Potential effects and the method used to determine whether or not effects would occur are discussed in this document.

This section describes the wildlife and wildlife habitat within the White Pass Study Area. The adjoining areas are described for the more regional setting, to place the White Pass Study Area in context with the surrounding conditions, and to adequately describe wide-ranging species such as elk, mountain goat, gray wolf, and grizzly bear. A regional map of the White Pass Study Area, including the Upper Clear Fork Cowlitz River and Upper Tieton River Modified 5th Field Watersheds, is provided in Figure 3-11. Information on wildlife was derived from background literature, color aerial photographs, field studies, and discussions with state and federal resource agencies including the U.S. Forest Service (USFS) and U.S. Fish and Wildlife Service (USFWS).

The White Pass Study Area lies within the Cascade Mountains of southern Washington. Both the Upper Clear Fork Cowlitz and Upper Tieton watersheds occur within the White Pass Study Area. The White Pass Study Area is defined as the area for which project specific GIS data has been developed and in which potential ground disturbance under all Action Alternatives would occur (i.e., the existing SUP area and the proposed expansion area). The White Pass Study Area is shown in Figure 2-2. For the purposes of differentiating locations where proposed activities would occur the White Pass Study Area has been further broken down into two components: the Proposed Expansion Area which includes Hogback Basin, and the Existing Ski Area which is comprised of the current White Pass Ski Area SUP boundary. Field surveys were conducted in all areas where activities may occur under any or each of the Action Alternatives.

Biologists performed field surveys to document the occurrence of special status wildlife species or their habitats, including species federally listed as threatened or endangered under the Endangered Species Act (ESA), species proposed for listing under the ESA, U.S. Forest Service Survey and Manage species, U.S. Forest Service (USFS) sensitive species, USFS Species of Concern, as well as other 2001 Record of Decision (ROD) species, and management indicator species for the OWNF and the GPNF. In addition to

field surveys, background literature was reviewed, color aerial photographs were analyzed and interpreted and state and federal resource agencies were contacted to accumulate information on wildlife resources.

This section focuses on wildlife habitat associations, the likelihood that specific wildlife species occur within the White Pass Study Area, and specific habitat types that are used by wildlife species. In addition, a discussion of habitat connectivity within the context of the White Pass area is also presented. Many of the wildlife species that may occur within the White Pass Study Area, and the habitat characteristics of those species were based on species identified in the *OWNF Forest Plan, as Amended* (USDA 1990b; USDA, USDI 1994, 2001, 2004a), and the *GP Forest Plan, as Amended*, and species listed under the Endangered Species Act (ESA). Additional sources of information include the OWNF and GPNF Geographic Information System (GIS) and watershed database *Clear Fork Watershed Analysis* (USDA 1998a) and *Upper Tieton Watershed Analysis* (USDA 1998b), and numerous technical studies.

The following management terms associated with wildlife species are used throughout this section:

- US Fish and Wildlife Service (USFWS) threatened and endangered and proposed species as designated under the ESA;
- USFS Survey and Manage Species per the 2001 Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (USDA, USDI 2001);[1]
- USFS sensitive species, which are species for which there are viability concerns as determined by the 2004 Regional Forester's Sensitive Animal List (USFS 2004b);
- USFWS Species of Concern. Species of concern is an informal term that refers to those species, which the USFWS believes, might be in need of concentrated conservation actions. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species; and
- USFS/OWNF/GPNF Management Indicator Species (MIS); the Forest Plans (USDA 1990a and 1990b) identifies standards and guidelines to manage these species as representatives of a wide range of vertebrate species.

[1] On January 9, 2006, the 2004 ROD to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (2004 ROD) was vacated and management direction for PETS and Survey and Manage species would be provided pursuant to the 2001 Record of Decision for management of these species. In this regard, the White Pass analysis area has been surveyed consistent with species identified in both the 2001 Record of Decision including any amendments or modifications to the 2001 ROD that were in effect as of March 21, 2004 (Table 1.1, December 2003), as well as, the 2004 ROD to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (2004 ROD).

Vegetation communities, described in detail in Section 3.5 – Vegetation, are the basis for the descriptions of wildlife habitat in this section. Additional information regarding the forest structure, (i.e., the, tree size, canopy layers, and canopy closure) is described in the Vegetation Technical Report and Biological Evaluation located in Appendix G.

1.2 AFFECTED ENVIRONMENT

The 1,570-acre White Pass Study Area is comprised of a mosaic of wildlife habitats.[2] Elevations within the White Pass Study Area range from approximately 4,900 feet to over 7,000 feet. Existing wildlife habitat conditions within the White Pass Study Area have been influenced by past natural and human-caused modifications including, timber harvest, wildfires, road construction, ski area development, other developed recreation, and existing human use of the facilities, including trails.

Wildlife resources are described for the White Pass Study Area and, where applicable, habitat is referenced and described outside of the White Pass Study Area to analyze for wide-ranging species, including elk, gray wolf, and wolverine, among others.

1.2.1 General Wildlife Habitat Associations

The *Clear Fork Watershed Analysis* reports approximately 271 species of wildlife potentially occurring within the watershed and the *Upper Tieton Watershed Analysis* reports approximately 256 known species within its boundaries (USFS 1998a; USFS 1998b). While some of these species may be restricted to either the lower elevations of these watersheds, or the drier eastern portions of the Upper Tieton watershed, the majority of the species have the potential to occur within the White Pass Study Area. Common species include deer, elk, and Neotropical migratory birds. Wildlife use throughout the area declines during the winter, with many birds and mammals migrating away from the area or retreating into hibernation.

The White Pass Study Area provides habitat for a variety of wildlife typically associated with late-seral mixed conifer and mountain hemlock forests, mountain hemlock parkland, as well as herbaceous communities. The White Pass Study Area contains habitat types primarily associated with forested cover and is dominated by approximately 654.4 acres of mountain hemlock parkland (42 percent of the White Pass Study Area) which makes up the majority of the proposed expansion area followed by approximately 528.5 acres of mixed conifer forest (34 percent of the White Pass Study Area) which comprises the majority of the existing White Pass Ski Area (refer to Table 3.5-1 in Section 3.5 – Vegetation). Other habitat types include mountain hemlock forest, modified herbaceous communities (i.e., ski trails), and rock/talus. In addition to forest community types, structural elements such as tree size, canopy closure,

[2] The current SUP indicates that the permit area is 710 acres. However, GIS analysis indicates that the actual SUP area is approximately 805 acres. As a result of the NEPA process, of which this FEIS is a part, the acreage will be re-calculated based on the best available data.

and canopy structure were used to determine habitat associations for wildlife species that may be present within the White Pass Study Area. Information for this analysis was derived from *Wildlife – Habitat Relationships in Oregon and Washington* (Johnson and O'Neil 2001). These habitat communities and vegetation types are described in greater detail in Section 3.5 – Vegetation and the *Vegetation Technical Report and Biological Evaluation* in Appendix G.

1.2.2 Key Wildlife Habitats and Associated Species

The respective Gifford Pinchot and Okanogan-Wenatchee Forest Plans, as Amended, have defined unique habitats as those features that are generally limited in their occurrence across the landscape such as wetland and riparian areas, cliffs, rock outcrops, talus, mature forest, snags, and downed logs. Unique habitat features typically provide critical breeding sites, feeding areas, and roosting sites for cavity-nesting birds, bats, and denning mammals. The level of dependence on unique habitat features varies from species to species. The unique habitat types present in the White Pass Study Area are described below.

Vegetation communities are described in detail in Section 3.5 – Vegetation, and provide the basis for the descriptions and analysis of wildlife habitat throughout this section. The amount of each vegetation type within the White Pass Study Area is presented in Table 3.5-1, and the distribution of these vegetation types throughout the White Pass Study Area is shown in Figures 3-31 and 3-34.

Wetlands and Riparian Habitats

Wetland and riparian habitats include wet meadows, forested wetlands (coniferous and hardwood), shrub wetlands, stream-associated (riverine) wetlands, and riparian areas. Wetlands and riparian areas are recognized by the USFS as important wildlife habitats for reproduction and foraging, and as movement corridors (USDA, USDI 1994). It is important to note that functional riparian zones differ in habitat value from Riparian Reserves. Riparian Reserves are designated within the Forest Plans, as Amended and may contain land cover types that do not serve as important riparian habitats. Functional riparian zones are more indicative of riparian areas that provide reproductive, foraging, and connectivity habitat for wildlife.

Riparian zones are an important habitat component for many species. They provide cover, foraging, calving, or nesting sites for species such as the northern spotted owl, pine marten, California wolverine, and elk. These riparian areas provide habitat and connectivity between habitats for many wildlife species, ensure bank stability and stable fish habitat, moderate water temperature, and represent a source of large woody debris for streams.

The condition of riparian habitat associated with streams and wetlands within the White Pass Study Area varies by elevation. Lower elevation riparian areas consist primarily of multi-story, closed canopy, late-seral forest and modified herbaceous open ski trails while higher elevations are comprised of small tree, single-story, moderate canopy mountain hemlock parkland.

In total, approximately 5.3 acres of wetlands and 632.3 acres of Riparian Reserves occur within the White Pass Study Area. These wetlands occur in both the proposed expansion area (Hogback Basin) and the existing ski area of the White Pass Study Area. Historic impacts to wetlands in the White Pass Study Area include the construction of lift terminals, ski trails, and roads within the existing SUP. The ecological processes of the wetlands found in Hogback Basin are functioning normally and there has been little alteration of these areas by human activity. Section 3.3 – Watershed Resources contains a complete description of wetlands within the White Pass Study Area.

Refer to Section 3.3 – Watershed Resources for a more thorough description of existing riparian conditions within the White Pass Study Area.

Late-seral Forest

Late-seral forest communities provide shelter, denning, and foraging habitat for many species potentially occurring within the White Pass Study Area. Late-seral forests are defined as stands greater than 80 years in age. There are approximately 1,235.8 acres of late-seral forest within the White Pass Study Area.

Past management activities within the White Pass Study Area have resulted in fragmentation of late-seral forests which presents challenges to wildlife species that require dense cover for foraging, denning, or travel such as pine marten, pileated woodpecker, and northern spotted owl. These species require dense forest for protection from predators. In addition the complex structure typically associated with late-seral forest stands, such as multi-story layers of vegetation and a closed canopy (greater than 70 percent canopy cover) provide unique foraging and denning habitats. This dense forest of multi-storied, closed canopy habitat can be found within the existing White Pass Ski Area. There are approximately 195.5 acres of small tree late-seral mixed conifer forest with multi-story vegetation and a closed canopy, and approximately 252.7 acres of medium tree late-seral mixed conifer forest with multi-story vegetation and a closed canopy; all within the existing ski area (refer to Table 3.5-2 and Figure 3-35). These forest stands are fragmented by numerous ski trails, particularly in the eastern portion. Several distinctions are important to note regarding late-seral forest and the White Pass Study Area. First, late-seral forests do not necessarily qualify as old growth. In order for a forest to be considered as old growth it must contain specific structural elements and characteristics. There is no old growth forest officially classified within the White Pass Study Area. However, certain portions of the forest within the existing ski area contain some old growth characteristics. Therefore, while the area hasn't been officially labeled as old growth this does not preclude the possibility that some old growth dependent species, such as northern spotted owl and great grey owl may utilize the area from time to time.

It is equally important to note that not all late-seral forest within the White Pass Study Area provides these structural and habitat characteristics. The proposed expansion area, which is comprised primarily of late-seral mountain hemlock parkland, has a moderate canopy structure (40-69 percent cover of small trees) and consists of a single-story of forested vegetation interspersed with a mosaic of treeless openings.

Snags and Downed Logs

Many wildlife species depend on snags and downed logs. Snags are used by at least 100 vertebrate species in forests in western Washington and Oregon (Brown 1985; Johnson and O'Neil 2001). Some species require snags in conjunction with early-seral habitat; others are generalist species that prefer mid- to late-seral habitats. Downed logs and woody debris are primary breeding areas for such species as the pine marten, and foraging habitat for the pileated woodpecker. In addition, these structures hold moisture during the dry summer months providing a cool, moist environment necessary for low-mobility species that depend on this unique microclimate habitat; and during the winter downed wood provides shelter from extreme temperatures. The Forest Plans, as amended, emphasize protection and management of large woody material (LWM) to ensure ecosystem functioning. Large woody material is defined as logs on the forest floor in pieces at least 24 inches in diameter at the large end (FEMAT 1993). Guidelines have been established for the maintenance of woody debris and snags for cavity-nesting species including pileated (and other) woodpeckers (USDA 1990a).

DecAID, the decayed wood advisor and management aid, is a planning tool intended to help advise and guide managers as they conserve and manage snags, partially dead trees and down wood for biodiversity (Mellen et al. 2003). The DecAID Advisor is an Internet-based summary, synthesis, and integration of published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience. The information presented on wildlife species use of snags and down wood is based entirely on scientific field research and does not rely on modeling wildlife populations. As such, it offers a new way of estimating or evaluating levels of dead wood habitat that provide for a wide array of species and ecological processes.

A critical consideration in the use and interpretation of the DecAID tool is that of scales of space and time. DecAID is best applied at scales of subwatersheds, watersheds, sub-basins, physiographic provinces, or large administrative units such as Ranger Districts or National Forests. DecAID is not intended to predict occurrence of wildlife at the scale of individual forest stands or specific locations. It is intended to be a broader planning aid not a species or stand specific prediction tool. As such, it was determined that it was unnecessary to use the DecAID tool here because the Proposed Action is on a scale much smaller than that for which DecAID was intended and the Proposed Action is not of the type that would modify forest vegetation over a large scale, such as a timber sale. In addition, there would be minimal impacts to snags as a result of the Proposed Action due to the open nature of the mountain hemlock parkland in which the majority of the development activity would occur. Mountain hemlock parkland, as described in the Vegetation section of the FEIS, is defined as a mosaic of treeless openings and small patches of trees (Johnson and O'Neil 2001). Impacts to this habitat are expected to be minimal as the proposed ski area design would utilize the natural openings in the parkland rather than cut new trails and only snags that present safety hazards along trails or lift lines would be felled. Therefore, the Forest Service determined that snags are not considered a significant issue for this project.

Snag and Coarse Woody Debris (CWD) generation within the White Pass Study Area was found to be primarily associated with vegetative communities below 5,500 feet elevation. This roughly correlates with the zone of mixed conifer in the existing ski area (refer to Figure 3-35). Snags created above this elevation are limited in size and number by the shorter growing season and location in the mountain hemlock parkland vegetation community, which makes up much of the proposed expansion area. Woody debris found within the expansion area is smaller, approximately 6-13 inches in diameter, and generally not large enough to be classified as LWM, as defined by the Forest Ecosystem Management Assessment Team (FEMAT). More to the point, woody debris of this size is not typically considered suitable denning and foraging habitat for cavity nesting birds, pine martens, and pileated woodpeckers; however, it does provide suitable habitat for smaller mammals and invertebrates. Based on field observations, the existing ski area portion of the White Pass Study Area contains sufficient amounts of CWD to support many different species (Forbes, personal communication 2004).

Numerous snags are present within the White Pass Study Area. Snags in the existing ski area are composed primarily of medium and small trees set in dense forest with multiple stories and closed canopies. Snags are abundant within the existing White Pass Ski Area. Snags in the proposed expansion area are more scattered, composed of small trees, and set amongst a moderate canopy, single-story parkland.

1.2.3 Threatened, Endangered, and Proposed Species

Threatened and endangered terrestrial wildlife species and/or their habitats known to occur or potentially occur within the White Pass Study Area are listed in Table 1. The northern spotted owl (*Strix occidentalis caurina*) is listed as threatened and is the only federally listed species that is likely to occur in the White Pass Study Area. The species status, habitat requirements, ecology, potential to occur within the White Pass Study Area, and nature of occurrence are described in the following table.

Table 1:
Federally Listed Threatened or Endangered Species
Potentially Occurring within the Project Area

Species	Habitat Association	Potential for Using Project Area
Northern spotted owl [a] (*Strix occidentalis caurina*)	Occurs in all coniferous forest types at low to mid elevations of the Cascade Mountains in Oregon and Washington. Most abundant in late-seral and mature forests. Nests in cavities or platforms in trees or snags (Forsman 2003).	The lower portions of the White Pass Study Area contain forest types that provide nesting, roosting, and foraging habitat. The upper portions of the White Pass Study Area could provide some dispersal habitat. May disperse through White Pass Study Area.
Designated Critical Habitat for the Northern Spotted Owl	Habitat that provides the functional elements of habitat for the Northern Spotted Owl. This includes nesting, foraging, roosting, and dispersal habitat.	There are approximately 14 acres of CHU, WA-18 in the project area.
Canada Lynx [a] (*Felis Lynx canadensis*)	Requires early-successional forest for primary prey (snowshoe hare) and late-successional forest for breeding (Ruediger et al. 2000). Primary habitat does not exist in the project area (USFS and USFWS 2006).	Early successional forest is lacking in area. Not expected to occur within the White Pass Study Area.
Grizzly Bear [a] (*Ursus arctos*)	Vast areas of remote, undisturbed habitat; a variety of habitats including meadows, wet areas, open slopes with huckleberries (USFWS 1993).	Developments, such as highways, trails, campgrounds, and ski area have reduced the area of undisturbed habitat. Not expected to occur within the White Pass Study Area.
Gray Wolf [a] (*Canis lupis*)	Vast areas of remote, undisturbed habitat; isolation from human disturbance for denning (Paradiso and Nowak 1982).	Developments, such as highways, trails, campgrounds, and ski area have reduced the area of undisturbed habitat. Not expected to occur within the White Pass Study Area.
Bald Eagle (*Haliaaetus leucocephalus*)	Almost always found near large bodies of water where primary prey items of fish and waterfowl can be found (USFWS 1986).	Potential foraging by bald eagle likely occurs at Leech Lake.
Marbled Murrelet (*Brachyrampus marmoratus*)	Mature and old-growth forest with trees having large-diameter branches for nesting (Hamer and Cummins 1991) within 50 miles of eastern Puget Sound, (Puget Sound Zone, USFWS 1997).	Project area is outside the Puget Sound Zone; therefore, habitat for this species is not present in the White Pass Study Area. This species will not be discussed further.

[a] Consultation with USFWS for these species is ongoing throughout this FEIS process and the final Biological Assessment is published in Appendix N of this FEIS.

1.2.3.1 Northern Spotted Owl (Strix occidentalis caurina)

The northern spotted owl was listed as a threatened species by the USFWS in 1990 (55 FR 26194) and critical habitat was designated in 1992 (57 FR 1796). Declines in spotted owl populations are a result of extensive habitat loss associated with timber harvesting (Csuti et al. 2001; Gutierrez et al. 1995).

Habitat Requirements and Ecology

There are two components of spotted owl habitat: habitat containing all the requirements for spotted owl nesting, roosting, and foraging (NRF) activities and dispersal habitat. Dispersal habitat includes both habitat required for juveniles to disperse following fledging, and connective habitat between spotted owl subpopulations (57 FR 1798).

The majority of known spotted owl nesting, foraging and roosting sites are in mature and large-tree old-growth forest. Nests typically occur in dense, multi-layered stands with large diameter branches and high canopy closure but are occasionally found in sites lacking some of these characteristics. Roosting habitat typically consists of stands containing large-diameter trees with high canopy closure and multiple canopy layers. Important components of foraging habitat include complex structure (multiple canopy layers, LWM, etc.) and high canopy closure (57 FR 1798). Nesting, Roosting, and Foraging (NRF) habitat in the Central Washington Cascade Range is generally below 5,000 feet elevation (Hamer and Cummins 1991; Forbes, personal communication 2004). It is hypothesized that the owls do not nest above this elevation due to the persistence of snow during the nesting season that may make prey less available. Spotted owl dispersal habitat is more variable, and at a minimum must provide trees of adequate size and canopy closure to provide protection from predators and offer some foraging opportunity (57 FR 1798). The preferred prey species of spotted owls in the Pacific Northwest are flying squirrels, deer mice, and juvenile snowshoe hares.

In the Washington Cascades, the spotted owl nesting season is generally considered to begin on or around March 1 and end on or around August 31, with a critical nesting season during which the species is believed to be more sensitive to disturbance around the nest site occurring between March 1 and July 15. Spotted owl pairs do not nest every year, an average of 62 percent (range 16-89 percent) nest each year (Forsman et al. 1984 *in* Forsman 2003).

In September 2004 a report was published by Sustainable Ecosystems Institute of Portland Oregon titled: *Scientific Evaluation of the Status of the Northern Spotted Owl* (Courtney et al. 2004). The report is a review and synthesis of information on the status of the northern spotted owl. The report was prepared to aid the US Fish and Wildlife Service in their 5-year status review process, as set out in the Endangered Species Act. The report did not make recommendations on listing status, or on management, but focused on identifying the best available science, and the most appropriate interpretations of that science. The focus is on new information developed since the time of listing in 1990. The report relied on demography

studies summarized in a report titled: *Status and Trends in Demography of Northern Spotted Owls, 1985–2003* (Anthony et al. 2004). The following excerpt is from the executive summary of the SEI report:

- Central to understanding the status of the subspecies is an evaluation of its taxonomic status. The panel is unanimous in finding that the Northern Spotted Owl is a distinct subspecies, well differentiated from other subspecies of Spotted Owls.

- The panel did not identify any genetic issues that were currently significant threats to Northern Spotted Owls, with the possible exception that the small Canadian population may be at such low levels that inbreeding, hybridization, and other effects could occur.

- The use of habitat and of prey varies through the range of the subspecies. These two factors interact with each other and also with other factors such as weather, harvest history, habitat heterogeneity etc, to affect local habitat associations. While the general conclusion still holds that Northern Spotted Owls typically need some late-successional habitat, other habitat components are also important (at least in some parts of the range).

- The available data on habitat distribution and trends are somewhat limited. Development of new habitat is predicted under some models. However our ability to evaluate habitat trends is hampered by the lack of an adequate baseline. Given these caveats, the best available data suggest that timber harvest has decreased greatly since the time of listing, and that a major cause of habitat loss on federal lands is fire. In the future, Sudden Oak Death may become a threat to habitat in parts of the subspecies' range.

- Barred Owls are an invasive species that may have competitive effects on Northern Spotted Owls (as was recognized at the time of listing). Opinion on the panel was divided on the effects of Barred Owls. While all panelists thought this was a major threat, some panelists felt that the scientific case for the effects of Barred Owls remained inconclusive; other panelists were more certain on this issue.

- The demography of the Northern Spotted Owl has been recently summarized in a meta-analysis (Anthony et al. 2004), which is the most appropriate source for information on trends. Although the overall population and some individual populations show signs of decline, we cannot determine whether these rates are lower than predicted under the Northwest Forest Plan (since there is no baseline prediction under that plan). However the decline of all four Washington state study populations was not predicted, and may indicate that conditions in that state are less suitable for Northern Spotted Owls. Several reasons for this pattern are plausible (including harvest history, Barred Owls, weather).

- There is currently little information on predation on Spotted Owls, and no empirical support for the hypothesis, advanced at the time of listing, that fragmentation of forest after harvest increases predation risk.

- West Nile Virus is a potential threat, but of uncertain magnitude and effect.

- In general, conservation strategies for the Northern Spotted Owl are based on sound scientific principles and findings, which have not substantially altered since the time of listing (1990), the Final Draft Recovery Plan (1992) and adoption of the Northwest Forest Plan (1994). Nevertheless we identify several aspects of conservation and forest management that may increase both short and medium term risks to the species. These are typically due to failures of implementation.

- A full evaluation of the uncertainties of the data, the conclusions that can be drawn from them, and of the perceived threats to the subspecies, are shown in the summary of individual panelist responses to a questionnaire.

Major threats to Northern Spotted Owls at this time include: the effects of past and current harvest; loss of habitat to fire; and Barred Owls. Other threats are also present. Of threats identified at the time of listing, only one (predation linked to fragmentation) does not now appear well supported.

Occurrence within the White Pass Study Area

The Gifford Pinchot and the Okanogan-Wenatchee National Forests GIS database indicate the presence of spotted owl NRF) habitat, and dispersal habitat in the White Pass Study Area. NRF within the White Pass Study Area is typically associated with Douglas-fir, Pacific silver fir, and western hemlock communities below 5,000 feet elevation and have canopy closures greater than 70 percent. Dispersal habitat, however, covers a variety of forests types which likely include those over 5,000-foot elevation where adequate canopy cover (generally considered to be 40 percent or greater) is present.

There are approximately 1,570 acres of northern spotted owl habitat within the White Pass Study Area, including approximately 216 acres of NRF habitat, 1,024 acres of dispersal habitat, and 330 acres of non-forested habitat (talus, open water, cleared ski trails) (refer to Figure 3-39). The proposed Hogback expansion area is primarily classified as dispersal habitat, whereas the existing ski area SUP is primarily NRF habitat. Portions of the existing ski area that are contiguous with this NRF habitat were also considered suitable for northern spotted owls because they contain sufficient canopy structure and cover. However, because of the high level of fragmentation and human activity within the existing ski area only the undeveloped fringes of the ski area were considered suitable NRF habitat. Prior to the Northwest Forest Plan, the Wenatchee and Gifford Pinchot National Forests designated a habitat network on both sides of White Pass to provide for species viability. The Forests coordinated the designation of these habitat units on both sides of White Pass to allow movement of the birds through potential owl habitat. Since the amendments of both the Wenatchee and Gifford Pinchot National Forest Plans by the Northwest

Forest Plan in 1994, this spotted owl management network has been re-allocated by the Northwest Forest Plan into Late-Successional Reserves (LSR) or Managed Late Successional Areas (MLSA). More than 5,560 acres or 60 percent of the Upper Clear Fork Cowlitz Watershed Study Area is in LSR or MLSA allocation to the north and west of the White Pass Study Area. The LSR located in the vicinity of the White Pass Analysis Area are RW-153 on the east side and RW-144 on the west side. The areas to the east and south of the White Pass Study Area are in Wilderness. In addition, the non-wilderness portions of the Upper Tieton watershed to the east of the Project Area are also largely composed of LSR and MLSA.

The Critical Habitat Units (CHU) located in the vicinity of the White Pass Study Area are WA-18 on the east side and WA-37 on the west side. A portion of CHU WA-18 (approximately 14 acres) extends into the White Pass Study Area. Critical Habitat for northern spotted owl was designated by the U.S. Fish and Wildlife Service in 1992 and is a completely separate entity from the Late Successional Reserves, which were designated under the Northwest Forest Plan (1994). There is some overlap between the two habitat designations and they are designed to serve a similar function, but they are separate in their legal definition.

There are two previously recorded spotted owl pair locations approximately 1.7 and 1.9 miles respectively from the proposed expansion area (Pearson 2002). Due to the proximity of suitable NRF habitat to the White Pass Study Area, surveys for northern spotted owls were conducted inside portions of the White Pass Study Area in 1987, 1997, 2000, 2001, 2002, and 2004 with no detections. In 2002, a survey route was added to accommodate the second planned ski lift (*Hogback Express*) in the White Pass Study Area. No detections were made during these surveys. The vegetation in the White Pass Study Area is mountain hemlock parkland type forest above 5,000 feet elevation with a north-northwest aspect. It was surmised that the lack of owl detections in the expansion area was largely due to its high elevation, north-facing aspect, and moist forest conditions (Pearson 2002). In addition, the open nature of mountain hemlock parkland does not provide suitable canopy layers and cover for proper NRF habitat; however, suitable cover exists for owl dispersal. Therefore, northern spotted owls are not expected to utilize the proposed expansion area for nesting, roosting, or foraging but may use the area for dispersal in the fall and early spring. In addition, due to the high human activity level and fragmented NRF habitat within the White Pass Study Area, northern spotted owls are not expected to occur on a regular basis.

1.2.3.2 Canada Lynx (Felis lynx canadensis)

The Canada lynx (*Lynx canadensis*) is listed as threatened under the ESA and by the USFWS and WDFW.

Habitat Requirements and Ecology

The total population of lynx in Washington State has been recently estimated at between 96 and 191 individuals (WDFW 1993a), but the status of lynx throughout their historic range in the Cascades is unknown (USFS 1998a). At least historically, lynx probably occurred in and adjacent to the GPNF and

the OWNF, although the evidence indicates that populations on the west side of the Cascades, in both Canada and Washington, were never very abundant (USFS, MBSNF 1992a).

Lynx occupy the boreal regions of North America and Eurasia, including Alaska, Canada, and the northern edge of the contiguous United States. Although the lynx remains widespread in many of its northern haunts, it has receded from much of its former range in the U.S. In Washington, the lynx is found in the North Cascade Range, particularly in high elevation lodgepole pine habitat.

Lynx home ranges and habitat characteristics were studied in the Okanogan National Forest from 1980-83 by the Washington Department of Wildlife (WDW) and from 1985-87 by the Wildlife Research Institute (Koehler 1990; Koehler and Brittell 1990). Koehler (1990) determined that radio-collared lynx utilized lodgepole pine and Engelmann spruce-subalpine fir forest cover types above the 4,500 foot elevation level in greater than expected proportions. Estimated density of resident adult lynx during the two studies was one animal per 10,750-11,800 acres (Koehler 1990).

Lynx depend on the snowshoe hare as their primary food source (Koehler 1990). Because of this close association of lynx with snowshoe hares, habitat that is good for hares is assumed to benefit lynx (Rodrick and Milner 1991). Snowshoe hares prefer early successional stages of forested habitats with dense stands of shrubs and saplings that provide hiding and thermal cover and winter food (Grange 1932; Pietz and Tester 1983; Litvaitis et al. 1985; Monthey 1986). Hares browse primarily on stems of hardwoods or conifers during winter (Pease et al. 1979), and shift to a diet of forbs, grasses, and leaves in the summer (de Vos 1964; Wolf 1978). Although studies in north central Washington found the stems and bark of lodgepole pine to be the principal winter foods of snowshoe hares (Koehler 1990), snowshoe hare populations in northern Idaho are concentrated in areas wherever hardwood shrubs protrude through snowpacks.

Lynx require a mosaic of forest conditions, including early successional habitat for hunting and mature forests for dens. Den sites are typified by forests older than 200 years with northerly aspects containing lodgepole pine, spruce, and subalpine fir and with a high density of downfall logs (Koehler 1989). These mature stands for dens were as small as 1-5 acres in size with stringers of connected travel corridors that provide security cover for adults and kittens. Intermediate stages may be used as travel corridors that provide connectivity between foraging, denning, and cover habitats (Koehler and Aubrey 1994; Aubrey et al. 1999).

Lynx use travel cover to move within their home ranges, for connectivity between denning and foraging areas, and for dispersal across the landscape. Travel cover generally consists of closed canopy coniferous/deciduous vegetation that is greater than 6 feet high and adjacent to foraging habitat. Forested areas with light stocking densities (170 to 260 trees per acre) and openings greater than 300 feet wide may be avoided by lynx (USFS 1998). Preferring continuous forest for travel, lynx often use ridges, saddles,

and riparian areas (Ruediger et al. 2000). Home range sizes in Washington range from 14 to 27 square miles, with daily travel distances of up to 3.2 miles per day and long distance dispersal or exploratory movements up to 600 miles (McKelvey et al. 1999c).

Occurrence within the White Pass Study Area

Nearly all of the White Pass Study Area is located above 4,400 feet elevation; however, the area does not provide a variety of early successional stage stands suitable as snowshoe hare habitat. Densities of snowshoe hare are low due to the lack of suitable habitat (Forbes, personal communication 2004). Given the average density of lynx (one per 11,000 acres) and the size and habitat types of the White Pass Study Area, less than one resident lynx (not including kittens) could be expected to utilize the White Pass Study Area as a portion of their territory. However, there is little to no forage habitat within the White Pass Study Area to meet the needs of breeding or raising young. In addition, due to the almost continuous ski area activity within the existing ski area, due to nighttime trail grooming, and intermittent avalanche control, and daytime operations, the existing White Pass ski area was not considered to contain suitable denning or foraging habitat for this project (USDA 2000d). According to guidelines established in the Lynx Habitat Mapping Direction memo, the White Pass Study Area does not contain suitable denning or foraging habitat for the Canada lynx due to the lack of subalpine fir parkland and early successional stage stands (USDA 2000d). Additionally, according to the Lynx Conservation Assessment Strategy (LCAS) and the Canada Lynx Conservation Agreement (USFS, USFWS 2005), which is an interim measure to promote the conservation of Canada lynx on Federal lands, the White Pass Study Area is located in peripheral lynx habitat. The habitat in the White Pass Study Area is considered unoccupied by the Occupied Mapped Lynx Habitat Amendment to the Canada Lynx Conservation Agreement (USFS, USFWS 2006). There have been no sightings or evidence of lynx use of the White Pass Study Area.

Since lynx prefer to travel through forest cover, and use riparian areas, saddles and ridges as travel habitat, the majority of the White Pass Study Area would be suitable for lynx travel habitat. Areas that would not be suitable include the developed portion of the base area, and the large open areas maintained as ski terrain surrounding the *Lower Cascade* chairlift and the lower portion of the *Great White Express* chairlift. Along the ridge tops in the proposed expansion area there are large natural openings in the mountain hemlock parkland vegetation type that may not be preferred lynx travel habitat; however, there are generally small tree islands within this vegetation type that could provide sufficient cover. Lynx could also travel through relatively continuous cover outside of the White Pass Study Area to both the north and south. A more detailed discussion of habitat connectivity is contained later in this section. Use of the White Pass Study Area by Canada lynx is expected to be limited to rare pass-through dispersal events.

1.2.3.3 Gray Wolf (Canis lupus)

The gray wolf (*Canis lupus*) is listed as threatened by the USFWS and endangered by WDFW in Washington.

Habitat Requirements and Ecology

Wolves potentially occurring in the Washington Cascades are part of the western distinct population segment. Critical habitat has not been designated for this distinct population segment and no recovery plan for it has been published.

Important elements of gray wolf habitat include large isolated areas with low exposure to humans, a sufficient year round food source and ample denning, rendezvous and dispersal habitat. Preferred habitat is dense conifer forest interspersed with large meadows. Wolf territories are associated with areas of low human use, including undeveloped areas (Wydeven et al. 2002; Mladenoff et al. 1995) and areas of low recreational activity (Peterson 1977). Wolf territories are also associated with areas having low open road densities (Mladenoff et al. 1995; Mladenoff et al. 1999; Mech 1989). Wolves are particularly sensitive to human activity around den sites (Chapman 1979) with wolf dens generally being located at least 1 mile from recreational trails and 1 to 2 miles from established backcountry sites (Carbyn 1974; Peterson 1977; Chapman 1979).

Wolf pack territories vary greatly in size, with wolf abundance within a landscape being dependent upon the amount of area available that is relatively free from human disturbance and associated mortality (Fritts and Carbyn 1995) and upon prey density within the landscape (Fuller 1989). Areas with a high density of ungulates are able to support a greater number of wolves in a smaller area (Fuller 1989; Fuller 1992; Lariviere et al. 2000; Wydeven et al. 1995; Haber 1977). In areas of low ungulate density, wolf density also decreases and territories become larger (Mech 1977; Messier 1987) and wolves may switch to alternate prey such as beaver or snowshoe hare (Voigt 1976). Reported sizes of wolf pack territories vary from 150 to 180 km^2 (37,000 to 45,000 acres) in the Lake Superior region (Fuller 1992; Wydeven et al. 1995) to 1,550 -2,590 km^2 (384,000 to 640,000 acres) in Alaska (Haber 1977). Although field studies have not been conducted locally, investigations in other regions suggest that wolf social groups occupy individual territories of up to several hundred square miles. Fritts and Mech (1981), for example, estimated territory sizes of eight wolf packs in northwestern Minnesota ranging from 75 to 214 square miles.

Gray wolves typically dig their own dens, often weeks in advance of birth of pups. Wolf dens are commonly located on southerly aspects of steep slopes (or rock caves/ abandoned beaver lodges), often within 400 yards of surface water and at an elevation overlooking the surrounding landscape. In addition, these sites tend to be at least 1 mile from recreational trails and 1 to 2 miles from backcountry trails (USFWS 1987).

Rendezvous sites are specific resting and gathering sites used by wolf packs during the summer and fall after natal dens have been abandoned. The sites are composed of meadows adjoining timber stands located near water. Wolves are particularly sensitive to disturbance at the first few rendezvous sites used after abandonment of the natal dens. Rendezvous sites are often located in bogs or abandoned and

revegetated beaver ponds. The sizes of rendezvous sites varies from 0.5 acre to sites along drainages 0.6 miles long, but are typically about 1 acre.

The most critical factors defining gray wolf habitats are the availability of large ungulate prey and isolation from human disturbance. Wolves follow migrating big-game herds to lower elevation winter range areas. Roaded access within gray wolf home ranges is a major factor in reducing security from human disturbance. The preferred road density is no roads but the target for gray wolf management is 1 mile or less per square mile of habitat (Theil 1985; Jensen et al. 1986).

Occurrence within the White Pass Study Area

The Forest Service has not conducted inventories for gray wolves in the vicinity of the White Pass Study Area. A review of the Naches Ranger District and Washington Department of Fish and Wildlife databases, however, reveals that there have been wolf sightings in the township, none of which have been confirmed by a biologist (a Class I sighting). The road density of the Upper Clear Fork Cowlitz River Watershed of which Hogback Basin is a portion is 1.5 miles per square mile. Road density within the Upper Tieton Watershed is 0.675 mile per square mile. Road densities for the Upper Clear Fork Cowlitz watershed exceed recommended targets for gray wolf management.

A large ungulate prey base exists within the White Pass Study Area during the summer season and extensive unroaded lands (Goat Rocks Wilderness and William O. Douglass Wilderness) connect to the White Pass Study Area. Big-game species are present within the White Pass Study Area during the summer but migrate to lower elevations during the winter in order to access more readily available sources of food. Thus, the presence of wolves is assumed during the summer and early fall. However, due to the high road density and recreational activity within the watersheds on a year-round basis, as well as absence of prey during the winter season, wolves are not expected to occur regularly within the White Pass Study Area.

1.2.3.4 Grizzly Bear (Ursus arctos horribilis)

The grizzly bear (*Ursus arctos horribilis*) is listed as threatened by the USFWS and as endangered by the WDFW.

Habitat Requirements and Ecology

The grizzly bear is a large, wide-ranging animal that requires vast amounts of remote, undisturbed habitat. It has a wide range of habitat tolerances and can exploit a wide variety of food resources. Grizzly bears use a wide variety of habitats from mature coniferous forest of varying story-layer and canopy closure to open meadows and riparian areas. They occupy home ranges that can be more than 1,000 square miles. Grizzly bears, males in particular, prefer low to mid-elevation riparian areas in the spring and late fall, but move up to higher elevation alpine and subalpine habitats during the summer season. Females with cubs generally stay at mid-to-upper elevations throughout the year, presumably to avoid contact with the

males. Rocky Mountain Region den sites are often at elevations above 6,500 feet, but in the Cascade Range denning may occur above 5,800 feet (Almack 1986). Physiographic conditions similar to high elevation denning sites could occur down to the 2,000-foot elevation in the Cascades. Food varies seasonally, and includes anything from forbs, grasses, and berries to rodents, large ungulates, and carrion. Grizzlies prefer secluded areas, generally indicated by open road densities of less than 1 mile per square mile.

For analysis purposes, the North Cascades Grizzly Bear Management Subcommittee (NCGBMS) has established the following seasons and associated habitat uses:

- Spring (den emergence to May 31) habitats include herbaceous, open canopy forest, shrub, and sparse vegetation in the western hemlock and Pacific silver fir zones;
- Summer (June 1-July 15) habitats include the same types as spring, with the addition of the mountain hemlock zone; and
- Fall (July 16-denning) focuses on shrub habitat and open forest types with no elevation restrictions.

Within the White Pass Study Area, the vegetation types most likely to be suitable for use by grizzly bears are late-seral open canopy; parkland; and managed herbaceous (ski trails).

Occurrence within the White Pass Study Area

Grizzly bear recovery plans focus on maintaining grizzly bear populations in defined areas classified as ecosystems. In western Washington, the North Cascades Ecosystem (NCES) has been established in the Cascade Mountains from the Canadian border south to Interstate 90. The recovery plan recognizes that grizzly bears will occur outside of the recovery zone, however only habitat within the recovery zones will be managed for grizzly bears (USFWS 1993). The southern boundary of the NCES is approximately 36 miles north of the White Pass Study Area. The Interagency Grizzly Bear Committee (IGBC) and associated interagency working groups concluded in 1991 that the North Cascades Ecosystem was capable of supporting a viable grizzly bear population and that a small number of grizzly bears currently inhabit the NCES (Almack et al. 1993). There are no estimates on the number of grizzly bears occurring in the Cascades south of the NCES.

There have been no Class I sightings (confirmed by a biologist) of grizzly bear or their sign within the White Pass Study Area or on the Naches or Cowlitz Valley Ranger Districts; although there have been confirmed sightings on the OWNF (USDA 1998a) to the north of the White Pass Study Area. A large ungulate prey base exists in the White Pass Study Area during the summer season and it is bordered by extensive unroaded lands (Goat Rocks Wilderness and William O. Douglass Wilderness). Grizzly bear use of the White Pass Study Area would be expected to be limited due to the high human activity level

and the proximity of US 12. Therefore, while potential summer and fall foraging habitat and winter denning habitat occur within the White Pass Study Area, habitat suitability for grizzly bears is greatly reduced by the existing level of human use in the White Pass Study Area. Given the low number of grizzly bears thought to occur in the Cascades and this reduced habitat suitability, regular use of the White Pass Study Area by grizzly bears is not expected to occur. Use of the area as part of a larger home range may occur, particularly during the summer when human activity is at a minimum. Since the White Pass Study Area is outside of the North Cascades Ecosystem (grizzly bear recovery area), and is an area managed for recreation and high human use, the area would not be managed as grizzly bear habitat (USFWS 1993).

1.2.3.5 Bald Eagle (Haliaeetus leucocephalus)

The bald eagle is listed as threatened by the USFWS and WDFW. The species has been proposed for removal from the Federal list of endangered and threatened wildlife (64 FR 36454-36464).

Habitat Requirements and Ecology

The species breeds across much of Canada, the Pacific Northwest, throughout the Great Lake states, and along the Eastern and Gulf coasts. Bald eagles are recovering as a breeding species in other areas of interior North America. Washington hosts one of the largest populations of wintering bald eagles in the lower 48 states as well as one of the largest populations of nesting pairs. The majority of nesting bald eagles in Washington occur west of the Cascade Mountains (Smith et al. 1997).

Bald eagles typically nest in stands of old-growth trees near large water bodies. Nests are often constructed in the largest tree in a stand with an open view of the surrounding environment. Nest trees are usually near water and have large horizontal limbs. Snags and dead-topped live trees may be important in providing perch and roost sites within territories. Because of their large size, eagles require ready access to an abundant supply of medium to large sized fish during breeding (Johnsgard 1990). Freedom from human disturbance is probably another important component of suitable nesting habitat (Rodrick and Milner 1991).

Bald eagles winter along rivers, lakes, and reservoirs that support adequate fish or waterfowl prey and have mature trees or large snags available for perch sites. Bald eagles often roost communally during the winter, typically in a stand of mature trees with an open branching structure and well developed canopies. Winter roost areas are usually isolated from human disturbance (Johnsgard 1990).

Early declines in bald eagle populations were attributed to human persecution and destruction of riparian, wetland, and conifer forest habitats. However, the widespread use of organochlorine pesticides that caused eggshell thinning and subsequent reproductive failure was the most important factor in the decline of the species (Detrich 1985).

Various legal and management measures, including restrictions placed on the use of organochlorine pesticides in 1972, development and implementation of the Pacific Bald Eagle Recovery Plan (USFWS 1986), and local bald eagle management plans, have contributed to the continuing recovery of bald eagle populations. Target numbers of nesting pairs in the region have been met and this species was proposed for delisting in 1999 (64 FR 36453-36464), however it has not been de-listed as of this time.

Occurrence within the White Pass Study Area

There is one documented occurrence of nesting bald eagle on Rimrock Lake, approximately 6 miles east of the White Pass Study Area. Bald eagles potentially forage around Leech Lake, which is located within the White Pass Study Area. Therefore, the occurrence of Bald Eagle within the White Pass Study Area is expected to be limited to pass through events.

1.2.3.6 Marbled Murrelet (Brachyrampus marmoratus)

The marbled murrelet is listed as threatened by both the USFWS and the WDFW.

Habitat Requirements and Ecology

The North American subspecies of marbled murrelet occurs from the Aleutian Islands south along the coasts of Alaska, Washington, Oregon, and California. Its distribution is closely correlated with the presence of late successional coastal forests (Carter and Erickson 1988; Nelson 1989; Paton and Ralph 1988; Sealy and Carter 1984). Marbled murrelets are mostly found within 1 mile of shore (Strachan et al. 1995; Strong et al. 1996) when in salt water. In Washington, the marbled murrelet is found in all near-shore marine environments, with the greatest concentrations found in the northern Puget Sound area (WDFW 1993b).

Murrelets live primarily in a marine environment but fly inland during the nesting season to nest in older forests. Murrelets typically nest in low-elevation old-growth and mature coniferous forests (Hamer 1995; Hamer and Cummins 1991). Once at sea, murrelets can be found as dispersed pairs or in flocks or aggregates (Strachan et al. 1995; Strong et al. 1996). Strong et al. (1996) found that most murrelets occurred within 1 mile of the shoreline, regardless of their age. However, hatch-year fledglings were closer to shore than the general population.

Marbled murrelets construct their nests high in older conifers with wide horizontal limbs. In Washington State, murrelets have been detected up to 50 miles inland from the coast, most typically adjacent to major drainages (Hamer and Cummins 1991). However, over 90 percent of all observations have been within 37 miles of the coast in the northern Washington Cascades (61 FR 26256-26320). According to the Recovery Plan for the Threatened Marbled Murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California, the Puget Sound Zone has been defined as extending 50 miles (80 km) from the eastern shore of Puget Sound (USFWS 1997).

Although marbled murrelets have been known to nest in stands as small as 7.5 acres, the average nest stand size in Washington is 515 acres (Hamer and Nelson 1995) and large contiguous stands of suitable habitat are considered important to marbled murrelet recovery (61 FR 26256-26320). Marbled murrelet nests in Washington are usually found at elevations below 3,500 feet, within 40 miles of the nearest body of salt water (Hamer 1995), and in stands with old-growth characteristics (Raphael et al. 1995).

Potential habitat for the marbled murrelet is defined in the survey protocol as mature, old-growth, or younger coniferous forests that have deformations or other structures suitable for nesting (Ralph et al. 1991). Although this definition is general, it encompasses some of the new information on murrelet nesting, including documented activity in younger forests (40 to 80 years) in the Oregon Coast Range (Grenier and Nelson 1995). Nonetheless, nearly all marbled murrelet nest trees have been located in old-growth and mature stands or stands with old-growth characteristics (Hamer and Nelson 1995). The percentage of old-growth tree crown cover appears to be an important factor associated with occupied sites (Miller and Ralph 1995; Hamer and Nelson 1995).

Because so few marbled murrelet nests have been found, an understanding of the microhabitat requirements of the bird is limited. The few nests that have been measured suggest that the number of potential nest sites on trees may be the best predictor of stand occupancy by this species (Hamer and Nelson 1995). Murrelets require a broad flat surface (referred to as a platform) on a large lateral limb or other lateral structure. Large lateral limbs are usually found on trees with larger diameters and/or on older-aged trees. Potential nest platforms include mistletoe brooms, deformed limbs, and areas where a tree has been damaged (Hamer and Nelson 1995). The essential element of a murrelet nest site, therefore, is the presence of a horizontal limb that is sufficiently large, wide, and flat enough to support a nest.

Occurrence within the White Pass Study Area

There have been no known occurrences of marbled murrelet within the White Pass White Pass Study Area. Marbled murrelet is not expected to occur within the White Pass Study Area as it is located greater than 50 miles from marine waters of Puget Sound.

1.2.4 US Forest Service Survey and Manage and Protection Buffer Species

Six species of wildlife on the USFS Survey and Manage Species list for the OWNF and GPNF may occur within the White Pass Study Area. Where surveys were required and protocols exist surveys were conducted for terrestrial mollusks and amphibians. The species status, habitat requirements, ecology, potential to occur in the White Pass Study Area, and nature of occurrence are listed in Table FEIS1 and described below.

Table FEIS1:
Wenatchee and Gifford Pinchot National Forest Survey and Manage Species Potentially Occurring within the White Pass Study Area

Species	Habitat Association	Potential for Using White Pass Study Area
Puget Oregonian (*Cryptomastix devia*)	Mature to late successional moist forest and riparian zones, under logs, in leaf litter, around seeps and springs, and often associated with hardwood debris and leaf litter and/or talus (BLM 1999).	Not expected to occur in White Pass Study Area. Potentially suitable habitat in White Pass Study Area surveyed to existing protocol (Furnish et al. 1997a), Species not found.
Warty jumping-slug (*Hemphillia glandulosa)*	Moist conifer forests. Associated with conifer logs and/ or heavy ground cover of low vegetation, litter, and debris (BLM 1999).	Not expected to occur in White Pass Study Area. Potentially suitable habitat in White Pass Study Area surveyed to existing protocol (Furnish et al. 1997a), Species not found.
Malone jumping slug (*Hemphillia malonei*)	Moist forests, associated with riparian habitat or wet areas (i.e., seeps), and large woody debris.	Not expected to occur in White Pass Study Area. Potentially suitable habitat in White Pass Study Area surveyed to existing protocol (Furnish et al. 1997a), Species not found.
Keeled jumping-slug (*Hemphillia burringtoni*)	Moist conifer forests. Associated with conifer logs and/ or heavy ground cover of low vegetation, litter, and debris (BLM 1999).	Not expected to occur in White Pass Study Area. Potentially suitable habitat in White Pass Study Area surveyed to existing protocol (Furnish et al. 1997a), Species not found.
Blue-gray taildropper (*Prophysaon coeruleum*)	Rare in Washington; occurs in deep forest floor litter and/or associated with logs and other late successional forest components (Burke 1999).	Not expected to occur in White Pass Study Area. Potentially suitable habitat in White Pass Study Area surveyed to existing protocol (Furnish et al. 1997a), Species not found.
Larch Mountain Salamander (*Plethodon larselli*)	Talus slopes within Douglas-fir forests. Talus may have covering of moss kept moist by forest overstory (Csuti et al. 2001).	Not detected in White Pass Study Area. Potentially suitable habitat in White Pass Study Area surveyed to existing protocol (Crisafulli 1999), Species not found.
Van Dyke's Salamander (*Plethodon vandykei*)	Usually among large, woody debris within the wetted edge of streams and seeps. Near the northernmost edge of known range (Leonard et al. 1993).	Potentially suitable habitat present near seeps and streams. No observations during 1998-2001 surveys.
Great Gray Owl (*Strix nebulosa*)	Mature forest stands with greater than 60 percent canopy cover within 1,000 feet of natural openings and meadows larger than 10 acres. (Regional Interagency Executive Committee 1995).	Potentially suitable habitat is present within the White Pass Study Area however there were no observations of this species during surveys.

Table FEIS1:
Wenatchee and Gifford Pinchot National Forest Survey and Manage Species Potentially Occurring within the White Pass Study Area

Species	Habitat Association	Potential for Using White Pass Study Area
Long-legged myotis (*Myotis volans*)	A variety of habitats including arid range lands, and humid coastal and montane forests. Summer day roosts are in buildings, rock crevices, fissures in the ground, and tree bark. Maternity colonies occur in attics, fissures in the ground, and under tree bark. Caves and mines are used for night roosts and hibernacula (Nagorsen and Brigham 1993).	May roost and forage in White Pass Study Area.
Long-eared myotis (*Myotis evotis*)	Forested habitat below the subalpine/parkland zone; roosts in trees, buildings, and caves and occurs in areas of low-density development (Johnson and Cassidy 1997).	May roost and forage in White Pass Study Area.
Silver-haired bat (*Lasionycteris noctivagans*)	Prefer older Douglas-fir/western hemlock forest to younger forests. Choose trees larger and taller than average, dead or damaged trees that contain refuge (Christy and West 1993). Forage primarily in clearcuts (Erickson and West 1996).	May roost and forage in White Pass Study Area.
Fringed myotis (*Myotis thysanodesa*)	Bunchgrass, interior Douglas-fir forest and ponderosa pine forest (Nagorsen and Brigham 1993).	No suitable habitat occurs within the White Pass Study Area.[a]
Pallid bat (*Antrozous pallidus*)	Low elevation, dry shrub-steppe and ponderosa pine forest.	No suitable habitat occurs within the White Pass Study Area.[a]

[a] As no suitable habitat for fringed myotis and pallid bat is present within the White Pass Study Area these species are not included in the following analysis.

1.2.4.1 Terrestrial Mollusks

Based upon pre-field discussions by Interdisciplinary Team (IDT) members and specialists, it was determined that the following Survey and Manage terrestrial mollusks (USDA, USDI 1994) may occur within the White Pass Study Area:

- Puget Oregonian,
- Keeled jumping-slug,
- Warty jumping-slug,

- Malone jumping slug, and
- Blue-gray taildropper.

These species are now listed on the Regional Forester's Sensitive Species List for the GPNF and the OWNF.

Habitat Requirements and Ecology

These mollusks occur in a variety of forest habitats. They are widely distributed in coniferous forest plant associations and dependent on specific habitat components such as rock outcrops, hardwoods or large logs. However, specific details on life span and reproduction for these species are largely unknown (BLM 1999).

The **Puget Oregonian** (*Cryptomastix devia*) is a medium to large sized snail (20 to 25 mm diameter) and is found in mature or late-successional forests in riparian zones, in association with leaf litter, and logs. It is often found close to seeps and springs and may be associated with hardwood leaf litter and debris, and/or talus. This species is often found in areas dominated by big-leaf maple and may be restricted to the low-to mid-elevational areas where these species occur (BLM 1999).

The **keeled jumping-slug** (*Hemphillia burringtoni*) and the warty jumping-slug (*Hemphillia glandulosa*) are both small slugs (13 to 26 mm long) that are found in moist coniferous forests in association with logs, a large amount of low ground cover, litter, and debris (BLM 1999).

The **Malone jumping slug** (*Hemphillia malonei*) has been found above 4,000 feet on the St. Helens Ranger District of the GPNF. This species is often found in moist forests, associated with riparian habitat or wet areas (i.e., seeps), and large woody debris. Potentially suitable habitat for this species is located within the riparian zone of the larger ponds within the proposed expansion area. Since these ponds would not be impacted by the Proposed Action, surveys were deemed unnecessary (Burke 1999).

The **blue-gray taildropper** (*Prophysaon coeruleum*) is found at higher elevations in Oregon, but is considered very rare in Washington (Burke 1999). However, currently known populations in Washington occur south of US 12, in the Cispus River Watershed south of Randle. While this species may be more likely to occur in the expansion area based on habitat observations across its total range, it is not expected to occur for the following reasons: 1) from observations of the blue-gray taildropper in captivity it appears to be sensitive to temperature extremes and 2) within its range in Washington, and in populations in central Oregon, they occur in relatively deep forest floor litter and/or are associated with logs and other late successional forest components. If this species occurs within the White Pass Study Area it would most likely be found in the riparian habitat or around some of the larger ponds. Surveys conducted in 1999 did not find any individuals or populations of the blue-gray taildropper (Leingang 1999).

Occurrence within the White Pass Study Area

Site visits and surveys in the proposed expansion area resulted in the determination that the area contains marginal habitat for USFS sensitive terrestrial mollusks (Burke 1999; Forbes, personal communication 2004). The blue-gray taildropper may potentially be found in riparian areas surrounding some of the larger ponds, which are characterized by a distinct increase in hydrophytic vegetation; however these ponds would not be impacted by the Proposed Action. None of the USFS sensitive terrestrial mollusk species were observed during any of the surveys conducted within the proposed expansion area in 1999 (Leingang 1999). Based on these surveys, the Puget Oregonian, Keeled Jumping-Slug, Warty Jumping-Slug, and the blue-gray taildropper are not expected to occur within the upper elevations of the White Pass Study Area (i.e., the proposed expansion area); however, suitable habitat may exist within the existing ski area. No surveys have been conducted for terrestrial mollusks within the existing ski area.

1.2.4.2 Larch Mountain Salamander (Plethodon larselli)

The Larch Mountain salamander is a Survey and Manage species under the Forest Plan, as amended. The Larch Mountain Salamander is also on the Regional Forester's Sensitive Species List for the GPNF and the OWNF.

Habitat Requirements and Ecology

Historically considered a talus obligate, Larch Mountain salamander has more recently been found to occupy a much broader range of habitats. Vegetation types within known sites vary from areas that are dominated by lichens and mosses to those dominated by late-seral forests. Larch Mountain salamanders have also been found in and near the entrances of caves and in and around seeps (Crisafulli 1999).

The distribution and abundance of this species is poorly known (Csuti et al. 2001). They are, however, thought to have small home ranges and limited capability to disperse (Crisafulli 1999).

The Larch Mountain salamander is entirely terrestrial and does not include a larval stage. Although habitat is variable, as described above, the common component of habitat used by this species are moist, cool conditions. The Larch Mountain salamander feeds on a variety of prey items, including mites and springtails. Larger individuals may also consume snails and earthworms (Csuti et al. 2001).

Occurrence within the White Pass Study Area

The known distribution of the Larch Mountain salamander is limited to areas within 22 km of the Columbia River in Multnomah and Hood River Counties and several locations in Washington. Within Washington, the highest known population of Larch Mountain salamander occurs at approximately 3,400 feet, well below that of the White Pass Study Area. One population has been documented on the Cowlitz Valley Ranger District of the GPNF (USDA 1999). Although habitat associations of Larch Mountain salamander are known to vary, as described above, upper elevation areas (above approximately 5,500 feet) do not provide suitable habitat because the area is comprised primarily of parkland habitat, which

consists of tree islands composed of mountain hemlock, interspersed with grass and herbaceous vegetation. In addition, the soils are generally low in organic matter and dry quickly after snowmelt. Talus material is limited and rarely exhibits the moist, mossy, shady conditions thought to be prime habitat for Larch Mountain salamanders. Habitat types identified as potentially suitable for these species includes late-seral closed canopy forest (448.2 acres), all types of late-seral open canopy forest except the subalpine fir forest of which there is a total of 133.4 acres available in the White Pass Study Area, and talus (52.5 acres). However, the majority of the talus slopes present within the White Pass Study Area are located along Hogback Ridge, well out of the known range of these species (refer to Figure 3-31).

1.2.4.3 Van Dyke's Salamander (Plethodon vandykei)

Habitat Requirements and Ecology

Van Dyke's salamander is a Survey and Manage species under the Forest Plan, as amended and is currently listed as a candidate species by WDFW. It is associated with riparian areas of streams and seeps containing mature forest habitat and large down wood (Leonard et al. 1993). This species may also be found far from water, usually on north-facing slopes with a thick cover of moss. They have also been located in seepages over talus and in rock faces (Leonard et al. 1993).

Occurrence within the White Pass Study Area

Surveys for Van Dyke's salamanders were conducted in the proposed expansion area due to the proximity of the White Pass Study Area to the Cascade Crest and the fact that little is known about the distribution of this species. No Van Dyke's salamanders were located during protocol surveys and therefore, the species has a status of "not detected" in the White Pass Study Area (Pearson 1997).

1.2.4.4 Great Gray Owl (Strix nebulosa)

Habitat Requirements and Ecology

The great gray owl is a Survey and Manage species now listed as Sensitive on the Regional Forester's Sensitive Species List. Mature, old-growth stands or remnants of older trees and snags are an essential element. They use abandoned nests, typically built by other raptors or corvids, or broken tree tops and snags large enough to suit this large species. Great grey owls typically choose nest stands near an opening (man-made or natural) and with 60 percent canopy closure with an open understory (Regional Interagency Executive Committee 1995). The great gray owl depends upon late-seral forest habitat for nesting, especially large tree, multi-story, closed canopy forest. There are 510.7 acres of this habitat type available within the White Pass Study Area, all of which are located in the existing ski area (refer to Table 3.5-2 and Figure 3-35). In the White Pass Study Area, this would include all of the moderate canopy late-seral vegetation types except mountain hemlock parkland, which does not provide suitable canopy cover and nesting trees. Great gray owls prefer to forage in open areas. Within the White Pass Study Area there are approximately 988.4 acres of potential foraging habitat (modified herbaceous areas, mountain hemlock parkland, and the small tree, multi-story, open canopy vegetation) (refer to Figure 3-35).

Occurrence within the White Pass Study Area

Great gray owl surveys were conducted during 1997 following the 1995 great gray owl survey protocol; no owls were recorded and no further surveys have been conducted. Surveys were conducted in the vicinity of proposed expansion elements involving the removal of trees representing potentially suitable nesting habitat. These survey areas were along the edges of the proposed expansion area where the trees are larger. The interior of the proposed expansion area was deemed inadequate for nesting but would provide suitable foraging opportunities. Because the White Pass Study Area is within the range of the great gray owl, owls may occasionally pass through the area as part of the overall movement and distribution of the species within its range. There have been no documented occurrences of great gray owl on the GPNF or the OWNF (Forbes, personal communication 2004; Kogut, personal communication 2004).

1.2.4.5 Long-eared Myotis (Myotis evotis) and Long-legged Myotis (Myotis volans)

Habitat Requirements and Ecology

In Washington, the long-eared myotis and the long-legged myotis are widespread throughout the state (Johnson and Cassidy 1997). These species of myotis use a range of roost types during the summer such as loose tree bark, snags, and rock crevices (Maser et al. 1981). Foraging habitat for these species is associated with cliffs, forest openings, and over water (Bat Conservation International website 2007). Maternity colonies for the long-legged myotis are located in attics, fissures in the ground and under the bark of trees. Maternity colonies for long-eared myotis are usually located in buildings (Nagorsen and Brigham 1995).

Occurrence within the White Pass Study Area

New information indicates these myotis species maybe be present in or adjacent to the White Pass Study Area using live trees or snags as roost during the summer (Forbes, personal communication 2006). There are, however, no mines, caves, abandoned buildings or bridges within the White Pass Study Area that might be used by these myotis species. It is considered unlikely that these species, if present, are year-round residents in the White Pass Study Area (Forbes, personal communication 2004). If present during the summer, they most likely hibernate elsewhere during the winter season. It is likely that these species may forage within the White Pass Study Area.

1.2.4.6 Silver-haired bat (Lasionycteris noctivagans)

The silver-haired bat is listed as a species identified with management recommendations in the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines 2001. These management recommendations are intended to provide additional feasible protection for roost sites for bats.

Habitat Requirements and Ecology

The silver-haired bat is generally regarded as a tree bat although specific information on its summer roosting habits is limited (Nagorsen and Brigham 1995). Individuals have been known to utilize crevices in tree trunks, fissures in tree bark, abandoned woodpecker holes and bird nests. Typically, the silver-haired bat roosts alone or in small groups. This species hunts throughout the night. Prey items include small insect species such as moths, midges, leafhoppers, caddisflies, flies, beetles, ants, and termites.

It is unclear whether silver-haired bats migrate during the winter or if they hibernate (Nagorsen and Brigham 1995; Bat Conservation International website 2004).

Because this species utilizes trees for day roosts, maternity colonies, and (potentially) hibernacula, it is a species that is highly dependent of on late-seral forest as well as the availability of snags.

Occurrence within the White Pass Study Area

Late-seral forest within the White Pass Study Area provides suitable habitat for the silver-haired bat. It may occur within the White Pass Study Area.

1.2.5 Forest Service Sensitive Species

Four species of wildlife on the Regional Forester's Sensitive Species List for the OWNF and GPNF may occur within the White Pass Study Area. Where surveys were required and protocols existed, surveys were conducted (e.g., great gray owl). Species that have no survey protocol, presence was assumed based upon the occurrence of suitable habitat. The species status, habitat requirements, ecology, potential to occur in the White Pass Study Area, and nature of occurrence are listed in Table 2 and described below.

Table 2:
Wenatchee and Gifford Pinchot National Forest Sensitive Species
Potentially Occurring within the White Pass Study Area

Species	Habitat Association	Potential for Using White Pass Study Area
American peregrine falcon (*Falco peregrinus anatum*)	Nest on cliffs near large concentrations of waterfowl or flocking birds (Johnsgard 1990). Known eyrie east of Dog Lake.	May forage in general White Pass Study Area and may occur as occasional migrant.
California wolverine (*Gulo gulo luteus*)	Requires vast areas of remote, undisturbed habitat (Banci 1994). Sensitive to human disturbance.	Human use is seasonally high along the Pacific Crest Trail (summer) and in the ski area (winter). May occur in White Pass Study Area.
Pacific western (Townsend's) big-eared bat (*Corynorhinus townsendii*)	Associated with caves, mines, rock crevices, and buildings which are used as both day and night roosts. Forested regions on both sides of the Cascades (Csuti et al. 2001).	Roost features limited in the White Pass Study Area. May use the White Pass Study Area for foraging.

1.2.5.1 American Peregrine Falcon (Falco peregrinus anatum)

The peregrine falcon was listed under the Endangered Species Conservation Act of 1969, and subsequently transferred to the ESA of 1973. It was federally delisted in 1999 (64 FR 46541-46558). It is currently on the USFS sensitive species list.

Habitat Requirements and Ecology

The peregrine falcon has adapted to a wide range of prey and nesting locations. The most critical habitat component for peregrine falcons is suitable nest sites, usually cliffs overlooking fairly open areas with an ample food supply.

Nesting habitat in the western United States most often includes tall rocky faces or cliffs overlooking an open expanse of lake, marsh or river bottomland. During winter migration, peregrine falcons may travel long distances and could potentially be present in many different habitats. Peregrine falcons most often winter in open non-forested areas near large bodies of open-water where concentrations of prey, particularly waterfowl, are available.

The peregrine falcon nesting season begins in March, with young usually fledged by late August. Peregrines defend a territory around the nest site, with the area defended varying between 100 yards to a mile from the nest. The home range territory in which they hunt varies in size from 25 to 100 square miles (Csuti et al. 2001).

Occurrence within the White Pass Study Area

There has been one reported sighting of a peregrine falcon in the Pigtail Peak area in August 1992. It was most likely an individual foraging. The nearest known eyrie is located east of Dog Lake, approximately 2.5 miles away. While infrequent foraging by peregrine falcons may occur, no nest sites are known to exist nor are there any suitable cliffs for nest sites within the White Pass Study Area. The Proposed Action is not expected to impact the ability of the peregrine falcon to forage in the area. Thus, there will be no further analysis of this species.

1.2.5.2 California Wolverine (Gulo gulo luteus)

Besides being a Region 6 sensitive species, the California wolverine is listed as a species of concern by the USFWS and is a candidate for listing by the WDFW. The current distribution of wolverines in Washington is unknown, although there are 28 records of documented sites from 1970 to 1990 that are primarily concentrated in north and central Cascades and in the northeastern corner of the state (Banci 1994; Johnson and Cassidy 1997).

Habitat Requirements and Ecology

Wolverines utilize a variety of habitats, ranging from tundra, taiga, and boreal forest in the northern portion of their range to high-elevation mixed conifer forest in the southern portion. In Washington,

wolverines have been documented primarily within conifer forest habitats. Distribution appears to be closely tied to the availability of food, usually large animals such as elk that are primarily taken as carrion (Banci 1994). Although they are generally considered a high-elevation species they may follow ungulates to lower elevations during winter, when other sources of prey (i.e., marmots, hares, and various rodents) are inactive and largely unavailable (Marshall et al. 1996).

The Washington Gap Analysis identified subalpine and alpine zones as potential habitat (Johnson and Cassidy 1997). Wolverines prefer mature timbered areas that contain natural openings such as cliffs, slides, timber blowdown, basins and meadows. Alpine cirques are also known to provide important wolverine habitat. In the summer, they inhabit higher elevations, especially alpine-fir forests (Reel et al. 1989). Wolverines are known to utilize remote unroaded areas and are found almost entirely in areas that have not been developed, extensively modified, or accessed by humans. Wolverines appear not to tolerate land use activities that permanently alter or fragment and provide human access to habitats (Banci 1994). They are primarily nocturnal and they do not hibernate but may be inactive during inclement weather (Strickland et al. 1982).

Information on habitats used for denning, resting, foraging, and dispersal in the southern portion of the wolverine's range is limited. In northern areas natal dens occur in snow tunnels, holes dug under fallen trees, hollow logs, CWD, cavities in trees, old bear dens, abandoned beaver lodges, caves, under tree roots, and in rocks and boulders. Boulder fields located in alpine cirques seem to be important locations for natal dens (Forbes, personal communication 2004). Breeding usually is in late spring or early summer and young are produced from February to May and remain with the female for two years (Verts and Carraway 1998; Maser 1998). These types of sites may also be used as resting areas (Banci 1994). A study conducted in Montana found that resting sites were often located in timber types that provided cover (Hornocker and Hash 1981).

Wolverines have large home ranges that span a variety of habitats, with results of various telemetry studies concluding that home ranges for males range from 91 square miles to 354 square miles, while those of females are smaller, particularly if they have a litter (Marshall et al. 1996). The wolverine is a snow-evolved mammal with a large home range that could easily cross watershed boundaries.

Occurrence within the White Pass Study Area

Potentially suitable foraging and dispersal habitat is present within the White Pass Study Area and areas of CWD, which occur primarily within the existing ski area, could provide suitable denning habitat. Wolverines are habitat generalists and are therefore capable of utilizing all of the habitat types within the White Pass Study Area.

During the winter the regular prey base (deer and elk) for wolverines is limited within the White Pass Study Area due to deep snow pack; therefore, wolverines are not expected to occur on a regular basis

during this time. Wolverines have been documented in the Tatoosh Wilderness of the Upper Clear Fork Cowlitz Watershed and several sightings have been recorded within the Upper Tieton River Watershed (USFS 1998a; USFS 1998b). The wolverine is not a common species in Washington, and occurs in low densities throughout its range; however it is known to occur in the Washington Cascades and may utilize the White Pass Study Area as part of a larger home territory. While the White Pass Study Area supports both vegetative and security habitat preferred by wolverine, no wolverine sightings have been reported.

1.2.5.3 Pacific Western (Townsend's) Big-Eared Bat (Corynorhinus townsendii)

The Pacific Western (Townsend's) big-eared bat is included on the Regional Forester's Sensitive Species List. Concern for the Pacific Western (Townsend's) big-eared bat stems from documented declines in populations that occur as scattered groups throughout the State; the limited amount of habitat available for this species, and it's intolerance for human disturbance at both nursery sites and hibernaculum (Marshall et al. 1996).

Habitat Requirements and Ecology

Pacific Western (Townsend's) big-eared bat is commonly considered a cave-dwelling species. As such, caves and abandoned mines are considered critical habitat for the species (Verts and Carraway 1998). Buildings and bridges are frequently used as night roosts (Csuti et al. 2001). They use caves or cave-like structures as roosts and although it has been documented that this species of bat will use snags as roots on occasions, it doesn't appear that snags are a primary roost type (Maser et al. 1981; Christy and West 1993). Females form nursery colonies that range in size from a dozen to several hundred individuals, usually within dimly lit areas of caves, mines, or buildings. Young are born from April-July depending on temperature, elevation, and latitude.

Foraging habitat for Townsend's big-eared bat includes forest edges, roads, or forest openings (Christy and West 1993). This bat tends to be late flying, emerging from the day roost approximately one hour after sunset (Nagorsen and Brigham 1995).

Townsend's big-eared bats are intolerant of human disturbance at both winter hibernacula and summer roosts (Csuti et al. 2001) and may abandon these sites in response to disturbance (Nagorsen and Brigham 1995). Marshall et al. (1996) reported research conducted in Oregon found that, between 1975 and 1985, populations had declined by approximately 58 percent west of the Cascades and 16.4 percent to the east of the Cascades. It was estimated that 2,800 individuals occupied the state at that time (Marshall et al. 1996).

Occurrence within the White Pass Study Area

There have been no surveys for Pacific Western (Townsend's) big-eared bats within the White Pass Study Area; however, based upon habitat requirements it is unlikely that the White Pass Study Area is likely to support a viable population of this species. The approximately 988.4 acres of foraging and dispersal

habitat (forest edges, small tree, single-story, open canopy forest) within the White Pass Study Area could be used as foraging habitat. The lack of suitable roosting habitat (mines, caves, abandoned building, bridges) in the White Pass Study Area further reduces the probability of a population of Pacific Western big-eared bats would exist.

Reproductive habitat in the form of mines, caves, abandoned buildings, or bridges for the Pacific Western (Townsend's) big-eared bat is absent from the White Pass Study Area. However, there are approximately 988.6 acres of foraging and dispersal habitat (forest edges, small tree, single-story, open canopy forest) present within the White Pass Study Area. The White Pass Study Area would not provide enough habitat for a viable population but it could be part of a larger territory. Pacific Western Big-eared Bats may be present in or adjacent to the White Pass Study Area using live trees or snags as roost and foraging along the forest edges created by existing ski trails during the summer season. There have been no surveys for this species within the White Pass Study Area however it is unlikely that there is a viable population of Pacific Western (Townsend's) Big-eared Bats within the White Pass Study Area. The lack of caves, mines, building, or bridges suitable for roosting, maternal colonies, and hibernacula limits the likelihood that roosting activities would occur within the White Pass Study Area.

1.2.6 U.S. Fish and Wildlife Service Species of Concern

Several species of wildlife have been identified by the USFWS as being of increased concern, although they are not listed under the ESA. Species in this category that are either suspected or documented within the White Pass Study Area are listed in Table 3.

Table 3:
USFWS Species of Concern
Potentially Occurring within the White Pass Study Area

Species	Habitat Association	Potential for Using Project Area
Cascades Frog (*Rana cascadae*)	Highly aquatic; closely associated with edges of seeps and other wetlands (Leonard et al. 1993).	Known to occur in White Pass Study Area.
Olive-sided flycatcher (*Contopus borealis*)	Northern and mountainous coniferous forests; perches on high dead branches (Stokes & Stokes 1995) or dead tops of trees (Ehrlich et al. 1988).	Known to occur in White Pass Study Area.

1.2.6.1 Cascade Frog (Rana cascadae)

Habitat Requirements and Ecology

The Cascade frog is distributed throughout the Cascade Range in the aquatic/riparian zones. It is closely associated with edges of seeps and other wetlands (Leonard et al. 1993). This species breeds from March to June and the adults use the same sites for breeding year after year. Breeding adults utilize wet

meadows, marshes, ponds, and lakes; following breeding season adults can be found along slow moving reaches of streams and rivers. Riparian areas surrounding aquatic habitat provide protection from predators and cover from extreme temperature elements.

Occurrence within the White Pass Study Area

The Cascade frog is known to occur within the White Pass Study Area based on numerous sightings during fieldwork (Forbes, personal communication 2004). Observation of tadpoles in ponds indicates that reproduction occurs among the aquatic/riparian areas that provide habitat for this species within the White Pass Study Area. Breeding is likely to occur during the later part of the breeding season due to the snowpack remaining for longer periods of time at the higher elevations of the project area. There are approximately 5.3 acres of wetlands and 632.3 acres of Riparian Reserves within the White Pass Study Area that could provide habitat for the Cascade frog. It is important to note, however, that not all of the acreage listed as Riparian Reserves would provide suitable breeding habitat. As this species is highly aquatic, it would only be found in Riparian Reserves in close proximity to seeps, wetlands, and ponds. Although typically found in association with water; outside of the breeding season, when traveling or dispersing, Cascade frogs can be found far from water sources.

1.2.6.2 Olive-sided Flycatcher (Contopus borealis)

Habitat Requirements and Ecology

Olive-sided Flycatchers use open mature stands of various conifers including subalpine fir. It needs both late-seral forests and an open to moderate canopy or openings in the forest for foraging. The species utilizes high hunting perches in the form of live tress or snags where it can get a view of openings as well as mature forest and broken canopy for foraging (Sharp 1992). The olive-sided flycatcher is an aerial insectivore that breeds in upland forest and woodlands throughout most of the western U.S., and they are common in most forested areas of Washington. The Olive-sided Flycatcher is a Neotropical migrant that typically winters in South America.

Occurrence within the White Pass Study Area

Vegetation types identified as potential habitat for the olive-sided flycatcher include those in the open and closed canopy late-seral forest types. No surveys have been conducted for this species; however it is known to occur within the White Pass Study Area (Forbes, personal communication 2004).

1.2.7 Management Indicator Species

Thirteen wildlife species are listed as OWNF and/or GPNF management indicator species that may occur within the White Pass Study Area. The GPNF and OWNF Land and Resource Management Plans (USDA 1990a; USDA 1990b) identify standards and guidelines to manage these species as representatives of a wide range of vertebrate species. The Northwest Forest Plan (USDA, USDI 1994) amended these individual Forest Plans and replaced the land allocations for pileated woodpecker and pine marten with

Northwest Forest Plan Land Allocations. Additionally, mountain goat management areas were replaced by Northwest Forest Plan land allocations except where the standards and guidelines for mountain goat were more restrictive under the original Forest Plans. Although Northwest Forest Plan standards and guidelines have replaced the majority of those for MIS, these species were kept on the list of species to be included in this analysis because they are still recognized as species for which management is a concern. Management Indicator Species have been selected to coordinate habitat management planning between projects, Ranger Districts and Forests. The species status, habitat requirements, ecology, potential to occur within the White Pass Study Area, and type of occurrence are listed and described in Table 4.

Table 4:
OWNF and GPNF Management Indicator Species
Potentially occurring within the White Pass Study Area

Species	Habitat Association	Potential for Using White Pass Study Area
Black-backed woodpecker (*Picoides arcticus*) Primary Cavity Excavator	Inhabit mixed conifer forests, primarily those in the mature or old-growth age class, and prefer areas of either fire or insect damage (Rodrick and Milner 1991). There are reports of black-backed woodpecker occurrence in most conifer forests including those dominated by true fir and mountain hemlock (Powell 2003), such as those found in the White Pass Study Area.	May occur in White Pass Study Area.
Black-tailed deer (*Odocoileus hemionus columbianus*) and Mule deer (*O. h. hemionus*)	Variety of habitats including ecotone between forest and meadow; late-seral forest, or small patches of shrub or trees (Maser 1998).	Known to occur in White Pass Study Area.
Downy woodpecker (*Picoides pubescens*) Primary Cavity Excavator	Sometimes found in conifer forests after the breeding season and especially in burned areas. However, downy woodpeckers generally prefer deciduous environments (Audubon Birdwatch 2004).	Suitable habitat present in White Pass Study Area. May occur in White Pass Study Area.
Hairy woodpecker (*Picoides villosus*) Primary Cavity Excavator	In Washington, the typical habitat of hairy woodpeckers is mature coniferous forest, although they are common in hardwood and mixed forests in other parts of their range. In Washington, they also frequent burned forests, mixed forests, wooded parks, and conifer-lined streams and shorelines. They require areas with heavier, more mature tree cover than downy woodpeckers and are more dependent on the presence of large trees (Audubon Birdwatch, 2004).	Suitable habitat present in White Pass Study Area. May occur in White Pass Study Area.

Table 4:
OWNF and GPNF Management Indicator Species
Potentially occurring within the White Pass Study Area

Species	Habitat Association	Potential for Using White Pass Study Area
Mountain goat (*Oreamnos americanus*)	Closely associated with steep, rocky cliffs, pinnacles, ledges, and talus slopes. Dense conifer stands, including mature and old-growth, may be important in providing winter forage and thermal cover (USDA 1990a and USDA 1990b; WDFW 1999).	Known to occur in White Pass Study Area.
Northern flicker (*Colaptes auratus*) Primary Cavity Excavator	Northern flickers can be found throughout most wooded regions of North America, and they are familiar birds in most suburban environments. They need some open area and do not nest in the middle of dense forests, but they breed in most other forest types. Outside of the breeding season, they also frequent other open areas, including suburban lawns and parks, grassland, sagebrush, and even sand dunes (Audubon Birdwatch 2004).	Suitable habitat present in White Pass Study Area. May occur in White Pass Study Area.
Pileated woodpecker (*Dryocopus pileatus*) Primary Cavity Excavator	Late-seral forest; may feed in early to mid-seral forests particularly those containing remnant patches of late-seral trees (Marshall et al. 1996).	Suitable habitat present in White Pass Study Area. May occur in White Pass Study Area.
Pine marten (*Martes americana*)	Dense coniferous forests, subalpine forests, areas above timberline (Maser 1998).	Known to occur in White Pass Study Area.
Rocky Mountain elk (*Cervus elephus nelsoni*) and Roosevelt Elk (*C. e. roosevelti*)	Combination of forest and open habitats. Seclusion from human disturbance important for calving (Thomas and Toweill 1982). Known to occur within White Pass Study Area; observed during field work for this analysis.	Known to occur in White Pass Study Area.
Three-toed woodpecker (*Picoides tridactylus*) Primary Cavity Excavator	Three-toed woodpeckers breed in mature or old-growth boreal conifer forests, especially spruce, larch, fir, and pine. In North America they breed farther north than any other woodpecker, and in Washington they can be found at elevations from about 4,000 feet up to the tree line. They will come down lower to burned and flooded areas with standing dead trees and to other areas undergoing heavy infestations of wood-boring	Suitable habitat present in White Pass Study Area. May occur in White Pass Study Area.

Table 4:
OWNF and GPNF Management Indicator Species
Potentially occurring within the White Pass Study Area

Species	Habitat Association	Potential for Using White Pass Study Area
	beetles. Their range and habitat overlap with those of Black-backed Woodpeckers, but they generally prefer denser forests (Audubon Birdwatch 2004).	
Williamson's sapsucker (*Sphyrapicus thyroideus*) Primary Cavity Excavator	Williamson's sapsuckers breed in dry, open, conifer forests in mountainous regions, especially along rivers and in areas with western larch. They appear to be most successful in conifer forests with many different species of trees. During their migration they use a wide variety of habitats, and in winter they often use broadleaved forests, especially along rivers and streams (Audubon Birdwatch 2004).	Suitable habitat present in White Pass Study Area. May occur in White Pass Study Area.

1.2.7.1 Black-backed woodpecker (Picoides arcticus)

The black-backed woodpecker is one of four species identified in the Forest Plan, as amended, as not being sufficiently protected by Riparian Reserve Standards and Guidelines and is in need of additional consideration (USDA, USDI 1994). As such, the Black-backed woodpecker is included as a protection buffer species. Protection buffers are additional standards and guidelines for specific rare and locally endemic species, and other specific species in the upland forest matrix (USDA, USDI 1994). Although provisions contained within the standards and guidelines for black-backed woodpeckers only pertain to matrix lands. There are no matrix lands within the White Pass Study Area; however they do exist in the lands adjoining the White Pass Study Area. This species is included in this analysis out of recognition that it is a species of special concern.

Habitat Requirements and Ecology

Black-backed woodpeckers inhabit mixed conifer forests, primarily those in the mature or late-seral age class, and prefer areas of either fire or insect damage (Rodrick and Milner 1991). There are reports of black-backed woodpecker occurrence in moist conifer forests including those dominated by true fir and mountain hemlock (Powell 2003), similar to those found in the White Pass Study Area.

Adults and larvae of wood-boring beetles (*Cerambycidae and Buprestidae*) comprise the bulk of the diet for this species, although it is also known to feed on bark beetles (family *Scolytidae*) (Powell 2003; Csuti et al. 2001; Marshall et al. 1996). Black-backed woodpeckers also consume ants, spiders, some fruit, acorns, and cambium, depending on the season and food availability (Csuti et al. 2001).

Black-backed woodpeckers begin nesting in May, and they excavate a nest cavity in a in a dead or diseased tree. Eggs are usually present in the nest until mid-June, and young are in the nest until mid July.

Occurrence within the White Pass Study Area

Suitable habitat for this species exists in the Project Area in forested areas, which contain a high number of dead and dying trees. Black-backed woodpeckers are only expected to occur intermittently within the White Pass Study Area due to their association with large densities of dead and dying trees.

1.2.7.2 Pileated Woodpecker (Dryocopus pileatus)

Habitat Requirements and Ecology

Pileated woodpeckers are associated with older, mature forest stands because of their dependence on both large-diameter trees with decay, and on snags for nesting, roosting, and foraging (Bull 2003). In addition, pileated woodpeckers have large home ranges.

The pileated woodpecker is most commonly found in mature to late-seral mixed conifer forests; although hardwood forests located in valley bottoms are also utilized. Necessary habitat components for this species include large diameter snags or living trees with some decay which are used for both nesting and roosting sites; both large diameter trees and logs which are used for foraging; and a dense canopy to provide cover which protects them from predators (Bull 2003). Pileated woodpeckers inhabit a wide variety of forest types throughout their range, including deciduous, coniferous, and mixed deciduous/coniferous forests, but they occur most commonly in mixed conifer and deciduous riparian habitats in the western United States (Winkler et al. 1995). In other parts of the species' range and in drier habitat conditions, pileated woodpeckers are associated with mature and old-growth forests (Bull 1987). In the southern Washington Cascades, most nests were found in old-growth stands (Lundquist and Mariana 1991).

The pileated woodpecker is a resident species that breeds throughout coniferous forests in western Oregon and Washington. Adults are not migratory and do not exhibit seasonal movements outside of the nesting territory. Juveniles disperse from their natal area in the fall.

Timber harvest has the most significant effect on habitat for this woodpecker. Forest fragmentation likely reduces population density and makes birds more vulnerable to predation as they fly between forest fragments (Bull 2003).

Pileated woodpeckers are primary cavity nesters. The species will excavate a new nest cavity each year. A diversity of other species use the cavities excavated by the pileated woodpecker. Therefore, the pileated woodpecker is considered an important species in forested areas. Nest trees are typically large-diameter dead trees with little bark, few limbs, and broken tops. Forest stands used for nesting contain many large-diameter live, dead and downed trees with at least two canopy layers (Mellen et al. 1992). Roost trees are

similar to nest trees but typically have less bark remaining on the tree, fewer limbs, more cavities, more broken tops, and more canopy layers, indicating that roost trees are typically dead longer than nest trees (Bull 1987).

Pileated woodpeckers forage on or near the ground, particularly on large-diameter downed trees and logs. They feed primarily on carpenter ants, wood boring beetle larvae, fruits, nuts, and other insects and arthropods (Bull 1987).

Forest habitats within the existing ski area are dominated by dense stands of small and medium late-seral forest with a closed canopy. The proposed expansion area is comprised almost entirely of small tree, single-story, moderate canopy mountain hemlock parkland that is of limited use to pileated woodpeckers for nesting or foraging. Large snags for nesting are limited in the expansion area but are generally available within the existing ski area. Vegetation types providing potential habitat for pileated woodpeckers within the White Pass Study Area include those in the moderate and closed canopy late-seral types, excluding the mountain hemlock parkland, for total of 522.5 acres.

Occurrence within the White Pass Study Area

There are approximately 1235.9 acres of suitable habitat (late-seral forest) located in the lower elevations of the White Pass Study Area. This forest, located primarily within the existing ski area, provides suitable cover for protection from predators as well as important habitat components such as snags for nesting and LWM for foraging. This species is expected to occur within and utilize the White Pass Study Area as nesting and/or foraging habitat.

1.2.7.3 Primary Cavity Excavators

Habitat Requirements and Ecology

The guild of primary cavity excavators is used as a Management Indicator Species for snag and down woody material components of the forest habitat. This guild includes all woodpecker species, many of which are discussed above, and other bird species known to excavate their own cavities. Species analyzed for this project include the following:

- northern three-toed woodpeckers (*Picoides tridactylus*),
- hairy woodpeckers (*Picoides villosus*),
- downy woodpeckers (*Picoides pubescens*),
- northern flickers (*Colaptes auratus*),
- Williamson's sapsucker (*Sphyrapicus thyroideus*),

- chickadees (*Poecile spp.*),
- nuthatches (*Sitta spp.*),
- pileated woodpeckers (*Dryocopus pileatus*), and
- black-backed woodpeckers (*Picoides arcticus*)

Secondary cavity nesters, such as owls, bats and flying squirrels, become additional beneficiaries of a viable primary excavator population. The availability of snags, future snags (green tree replacements), and downed logs for nest sites and as a food source for insect prey are generally the habitat limiting factors.

Forest Plan direction stipulates that sufficient 15-inch dbh and larger snags shall be retained to support 100 percent of potential primary cavity excavator populations. For the purpose of modeling the effects of alternatives on primary cavity excavators, the 1996 Forest-wide Standards and Guidelines for retaining 3.6 to 6.5 wildlife trees and three down logs per acre to be met in management units will be used. In riparian areas, a greater number would be retained in accordance with Forest Plan Standards and Guidelines.

Occurrence within the White Pass Study Area

No inventory of standing and down woody debris has been made for stands in the White Pass Study Area to determine snag numbers and distribution, but many of the stands are in an unmanaged condition, which leads to the natural development of snags and down wood as stands age. There are a large number of Pacific silver fir snags as well as replacement opportunities in the old growth stands in the existing SUP to support a viable primary cavity excavator population. Given that the timber stands in the proposed expansion area consist of small tree, moderate single story mountain hemlock parkland, the snag numbers and downed wood are less likely to provide suitable habitat for some these species requiring larger diameter trees.

Primary cavity excavators have been observed in the White Pass Study Area including Hogback Basin, but due to the elevation and juxtaposition of habitats within the area, this area is only capable of supporting a limited population, both in terms of numbers of individuals and in number of species.

1.2.7.4 Pine Marten (Martes americana)

Habitat Requirements and Ecology

Martens are associated with forested habitat and appear to prefer closed canopy mature forests. They have been observed using alpine areas and utilize forest openings if there is sufficient down wood to provide cover (Csuti et al. 2001).

In Oregon, the home range of a male Pine marten is approximately 1 square mile and the home range of a female is generally 0.25 square mile. Separation of home range territories within sexes and overlap between sexes is common (Maser 1998). Martens are generally considered to be forest dependent species and have been observed to avoid large forest openings, although non-forested habitats are used by martens, particularly during summer above tree line, and martens have been observed crossing openings (Ruggiero et al. 1994).

Important habitat components for marten include fallen trees, stumps, and rock piles that provide protective winter cover and access to prey under the snow. Large trees, snags, and logs are also used as resting and denning sites (Rodrick and Milner 1991). Late-seral conifer forests with canopy closures exceeding 30 percent supported the highest marten activity in Montana (Koehler and Hornocker 1977). Optimum marten habitat conditions for foraging have more than 20 logs per acre 6 inches or greater in diameter and for denning have more than 10 logs per acre 10 inches or greater in diameter (Allen 1982). Timber harvesting has been implicated as detrimental to marten populations due to reductions in preferred closed canopy forest and presumed reduction in prey availability (Yeager 1950; Koehler and Hornocker 1977).

Martens are primarily carnivorous and feed on small mammals including shrews, voles, woodrats, rabbits, squirrels, and mountain beaver, although marten's prey items also include birds, insects, and fruits (Csuti et al. 2001). Marten populations may fluctuate with small mammal densities and winter snow conditions that influence access to prey (Allen 1982). Like other mustelids, martens are extremely active year round.

Occurrence within the White Pass Study Area

Suitable closed-canopy conifer habitats with an optimal component of snags and downed woody material are available in most all of the White Pass Study Area with the exception of the cleared ski trails and those portions of the White Pass Study Area over the 5,400-foot elevation (notably the proposed expansion area). The timbered stringers above 5,200-foot elevation could be used by marten as corridors for movement through the area. Tracks have been regularly observed below the quad chairlift near the rock cliff and in the Hogback Basin (Kogut, personal communication 2004). They have also been observed in nearby forested areas and it is assumed that they occupy home ranges within the White Pass Study Area.

1.2.7.5 Mule Deer (Odocoileus hemionus hemionus) and Black-Tailed Deer (O. h. columbianus)

Habitat Requirements and Ecology

The black-tailed deer (*Odocoileus hemionus columbianus*) is a subspecies of mule deer (*O. h. hemionus*) that occurs in forested habitats of western Washington from the Pacific Coast to the crest of the Cascades. It is a MIS for the GPNF and a managed game species for the State of Washington. Along the Cascade

Crest the black-tailed deer intermingles and interbreeds with the mule deer of eastern Washington, a MIS species for both the GPNF and the OWNF and also a state game species.

Winter habitat is generally a controlling factor in deer populations, along with hunting pressure and cougar predation. Deer in western Washington have also been affected by a disease, hair loss syndrome, which appears to be causing additional mortality (WDFW 1999). Winter ranges usually consist of low elevation (below 2,700 feet) riparian areas and drainages that supply both forage habitat and cover.

Black-tailed deer populations on the west side of the Cascade Mountains currently appear to be stable. The long-term prediction is for a decline in deer habitat as National Forest Service lands that have been removed from timber production, such as LSR on National Forests, mature into forest types less suitable for deer (WDFW 2002). Black-tailed deer are reported to breed from September to November, with peak activity occurring up to a month earlier than other subspecies of mule deer (Wallmo 1978). Migration patterns vary considerably throughout the range of the subspecies. Populations inhabiting higher elevations in summer migrate downslope to lower elevations when accumulations of snow make forage unavailable, while other populations move short distances to preferred food patches or do not migrate at all (Wallmo 1978).

Deer utilize a broad range of forage, mostly feeding on woody plants but in some seasons eating large amounts of grasses and forbs. Forage habitat is defined as vegetated areas with less than 60 percent cover, trees or shrubs more than 7 feet tall, and with a shrub or herbaceous understory (Roderick and Milner 1991). Deer will also forage in more open areas if cover is nearby. Denser forest with large trees and 70 percent crown closure is used as cover. Cover includes both thermal cover for body temperature regulation and hiding cover (Maser 1998).

Mule deer are generally considered an ecotone, or edge, species, although they also inhabit highly forested areas (Maser 1998). Within the White Pass Study Area there is large amount of edge, both as a result of vegetation management for winter recreation and because of naturally occurring conditions. Historic fires and past logging in the White Pass Study Area may have increased the amount of deer habitat by providing areas of managed herbaceous forage habitat interspersed with mature forest for cover. Summer range for mule deer is optimal where there is a diversity of forest successional stages with hiding/escape cover in proximity to food sources. North aspect slopes are used for loafing, with cool riparian drainages being important during the warmest weather and during fawning season.

Occurrence within the White Pass Study Area

Within the White Pass Study Area, the late-seral closed canopy vegetation types constitute potential cover, while vegetation in the late and mid-seral open canopy types is potential foraging habitat. Additional foraging habitat occurs in the mountain hemlock parkland, and managed herbaceous areas. Islands of trees within the parkland type can also be considered cover. Based upon these definitions, the

White Pass Study Area currently contains 932.3 acres of primary foraging habitat and 315.2 acres of cover. Portions of the White Pass Study Area that are not included as deer foraging or cover habitat are cliff and talus, lakes and ponds, and developed areas. Lakes and ponds, however, are recognized as important components of deer habitat, providing a source of water.

Sufficient summer thermal/hiding cover and foraging habitat is available across the White Pass Study Area to support the existing population of these species. Mule deer and black-tailed deer are common within the White Pass Study Area from late spring to fall but spend the winter season at lower elevations in the Tieton River or Clear Fork Cowlitz River Basins, as there is no winter habitat within the White Pass Study Area due to deep snowpack.

1.2.7.6 Rocky Mountain Elk (Cervus elaphus nelsoni) and Roosevelt Elk (C. e. roosevelti) Habitat Requirements and Ecology

In Washington there are two different subspecies of elk, the Rocky Mountain elk and the Roosevelt elk, with the Rocky Mountain elk generally occurring east of the Cascade Crest and the Roosevelt elk generally occurring west of the Cascade Crest. Both subspecies are known to occur in the vicinity of the Cascade Crest and there is a region of integration along the Crest for these subspecies. Because habitat use is expected to be comparable for the two subspecies in the White Pass Study Area they will be discussed together.

The Rocky Mountain elk is an MIS for the OWNF. The Roosevelt elk is an MIS for the GPNF. Both are managed game species for the state of Washington. Along the Cascade Crest these species intermingle. Elk populations in the central Washington Cascade Range generally have geographically separate winter and summer ranges, each providing a different set of climate moderating features (Leege 1984). Elk are also known as ecotone species and migrate between summer and winter ranges. Elk require a juxtaposition of forest for cover and open habitats for forage. Dispersal corridors between summer and winter ranges must provide these requirements, along with relative freedom from human disturbance. Calving areas must also be relatively free from disturbance. Winter range is characterized by closed-canopy conifer forest, elevations below 3,000-foot, and mostly south facing slopes with snow accumulations of less than 18-24 inches. Forest canopy closure of 70 percent or greater with trees more than 40 feet tall provide optimal thermal cover, a dispersed snowpack, and litter/lichen foraging sources (Thomas et al. 1979). Elk use is concentrated under cover and along edge habitat with foraging generally 200 feet or less out into natural or managed openings. The optimal mix of thermal, hiding and foraging habitat is believed to be 20%:20%:60%, respectively (Thomas et al. 1979). Road densities of 1 mile per square mile or less open to motorized travel are preferred (Perry and Overly 1977). Human disturbance during winter can affect winter survival and subsequent breeding season fecundity.

Summer range for elk is characterized by more open-canopy forest (50 percent or greater), interspersed with grass/forb/shrub dominated foraging habitat (Irwin and Peek 1983), generally above 3,000-foot

elevation. Elk activity changes to north and east slopes, with mid-day use of cool, dense shade and thickets or old-growth habitats being used for thermo-regulation (Hershey and Leege 1982). Elk often move along established traditional routes, both seasonally and daily.

Elk within the Cascades typically begin migrating in June up-slope to summer range (Cooper 1987), following new plant growth as it becomes available. Calving areas are defined as the upper reaches of winter range which offer open brush and grassy areas near water and nearby forested areas for cover. The elevation of calving varies with the depth of the snow pack and the availability of forage and cover. Young are born in early June and within a week or two, cow-calf herds are formed (Cooper 1987).

Mature bulls are solitary or occur in small groups during the spring and summer, and often seek out high, windy points where breezes grant some relief from flies and other insect pests. In early September, the rut begins with mature bulls gathering and attempting to maintain harems of up to 30 cows. Individuals begin to migrate downslope to winter ranges after the first heavy snowfall (typically mid-October to mid-November), where they typically stay from December through June (Cooper 1987).

Occurrence within the White Pass Study Area

Within the White Pass Study Area, the late-seral closed canopy vegetation types constitute potential cover, while vegetation in the late and mid-seral open canopy types is potential foraging habitat. Additional foraging habitat occurs in the mountain hemlock parkland, and managed herbaceous areas. Islands of trees within the parkland type can also be considered cover. Based upon these definitions, the White Pass Study Area currently contains 932.3 acres of primary foraging habitat and 315.2 acres of cover. Portions of the White Pass Study Area that are not included as elk foraging or cover habitat are cliff and talus, lakes and ponds, and developed areas. Lakes and Ponds, however, are recognized as important components of elk habitat, providing a source of water.

Elk use the White Pass Study Area predominantly during the spring, summer, and fall period when forage is available. Elk use of the White Pass Study Area is extremely limited to non-existent during the winter period due to the deep snowpack and lack of adequate forage. It appears that most of the animals that use the area during the summer season winter in the lower Tieton River Basin. A small herd of cow elk all with calves was observed at the 4,400-foot elevation level in the White Pass Study Area during June 1997. Many trails developed by frequent elk travel occur throughout late-seral forest stands and along ridges and riparian corridors throughout the White Pass Study Area. Sufficient summer thermal/hiding cover and foraging habitat is available across the area. The road density within the Upper Clear Fork Cowlitz River watershed, of which Hogback Basin is a part, is 0.7 mile per square mile. Most of Hogback Basin, however, is greater than 0.3 mile from an open road and would be considered security habitat.

1.2.7.7 Mountain Goat (Oreamnos americanus)

Habitat Requirements and Ecology

Mountain goats can be found on steep mountainous terrain supporting herbaceous and woody vegetation in the Central and North Cascade Range (Wigal and Coggins 1982). Mountain goats (*Oreamnos americanus*) are closely associated with features such as steep, rocky cliffs, pinnacles, ledges, and talus slopes that provide escape cover from predators. The species occupies a wide variety of vegetation types associated with these features. Distance between winter and summer ranges was found to range from approximately 1 to 7 miles in Montana (Rideout 1978; Nowak and Paradiso 1983).

During the winter, mountain goats migrate to lower elevations and use dense conifer stands for thermal cover (USDA 1990a; WDFW 1999). There is a high degree of variation in mountain goat migration patterns and distances traveled; with some traveling several miles and others only short distances. Mountain goat winter range is characterized by steep rocky slopes in close proximity to dense conifer stands that provide cover on east and southwest facing slopes at low elevation, where there is relatively little snow accumulation (Rodrick and Milner 1991). In the north Cascades, the mountain goat is a prey/carrion species for some listed carnivore species that forage in high elevation wilderness areas, such as wolverine and grizzly bear.

Occurrence within the White Pass Study Area

The White Pass Study Area and most particularly the upper extent of the south, east and west sides of Hogback Ridge is mountain goat summer range. Goats are occasionally sighted in Hogback Basin during the summer season and evidence of foraging activity can be observed (Forbes, personal communication 2004). Known populations occur to the north, south and west of the White Pass Study Area in the Goat Rocks and William O. Douglass Wilderness Areas. Mountain Goats may pass through the area during their move to and from winter range in the Round Mountain area.

Winter range, besides being an important factor for determining goat populations, is often the limiting factor controlling them. Their use of the White Pass Study Area in winter is non-existent or extremely limited at best due to deep snow pack and lack of forage. During this period they are typically found much lower in elevation and away from White Pass. The White Pass Study Area, including Hogback Basin, has no windswept open ridges, typical of some steep mountain settings where wind and snow conditions keep grasses and forbs exposed most of the winter. The White Pass Study Area typically has wet snow and deep snow packs, which bury feed sources for mountain goat from late fall to late spring.

1.2.8 Species of Local Concern

1.2.8.1 Neotropical Migratory Birds

Neotropical migratory birds have been defined as those species that regularly breed in continental North America and winter south of the Tropic of Cancer, typically in Central and South America and the

Caribbean. Widespread declines in populations of many Neotropical migrants have intensified interest in avian conservation and resulted in policy direction to evaluate the impact of proposed activities on the nesting habitats of these species.

The North American Breeding Bird Survey Program found that 75 percent of forest dwelling migrants in eastern North America declined in population during the 1980s (Robbins et al. 1989). Potential causes of these declines are numerous and diverse, and may involve environmental changes and habitat deterioration in breeding areas, winter habitats, migration corridors and stopover sites, or a combination of these factors (Sherry and Holmes 1992). Related to these potential causes is the problem of nest parasitism by the brown-headed cowbird, populations of which have expanded significantly in the last few decades due primarily to human-induced changes in the landscape (Ehrlich et al. 1988). One hundred eighteen species of Neotropical migratory birds are known to breed in Washington, including common passerine songbirds, hawks, and owls (Andelman and Stock 1994).

Neotropical migrants occur in a wide variety of habitat types including early- and late-seral forests (Finch and Stangel 1992). However, in the relatively arid western United States, densities of Neotropical migrants are highest in riparian areas, with coniferous forests being the second-most used habitat by this assemblage of species (Saab and Rich 1997). A detailed table of neotropical migratory birds (modified from Andelman and Stock 1994) was developed for the *I-90 Land Exchange DEIS* (USFS 1998) and is included in Table 5 of this document. Based on geographic proximity and habitat similarity, this list is considered representative of the neotropical migratory birds with the potential to occur in the White Pass Study Area, although not all species or their habitats in Table 5 are present in the White Pass Study Area.

Table 5 contains a list of Neotropical migratory birds that may occur within the White Pass Study Area. Many of these species utilize a variety of habitats; however their primary associations are listed in Table 5. Of these species, two are also special status species that are discussed separately in this document (peregrine falcon and olive-sided flycatcher).

Table 5:
Neotropical Migratory Birds Potentially Occurring in the White Pass Area Having a Primary Association with Forested Habitat [a,b]

Species	Old-Growth	Clearcut	Young Forest	Broad leaf Forest	Riparian	Meadow	Marshes	Subalpine	Cliff
Late-Successional Forest Associates (eastside and westside)									
Sharp-skinned hawk[c]	X		X		X				
Cooper's hawk[c]	X		X	X	X				
Northern goshawk	X								
Red-tailed hawk[c]	X		X	X	X	X			X
Vaux's swift[c]	X				X				
Northern flicker	X	X	X		X				
Olive-sided flycatcher[c]	X	X	X		X				
Western wood-pewee[c]	X		X	X					
Hammond's flycatcher[c]	X		X	X	X				
Golden-crowned kinglet[d]	X		X						
Hermit thrush[c]	X		X						
American robin[c]	X	X	X	X	X	X			
Solitary vireo[c,d]	X		X	X	X				
Yellow-rumped warbler[c]	X		X						
Townsend's warbler[c]	X		X						
Western tanager[c]	X		X	X	X				
Chipping sparrow[c,d]	X		X						
Dark-eyed junco	X	X	X	X					
Rufous hummingbird[c,d]	X	X	X	X	X	X			X
Red-breasted sapsucker	X		X	X					
Pacific-slope flycatcherc	X	X		X	X	X			
Swainson's thrush	X	X	X	X	X				
Wilson's warbler[c,d]	X		X	X	X				
Merlin[e]	X	X	X		X				
Late-Successional Forest Associates (westside only)									
Band-tailed pigeon	X		X						

Table 5:
Neotropical Migratory Birds Potentially Occurring in the White Pass Area Having a Primary Association with Forested Habitat [a,b]

Species	Old-Growth	Clearcut	Young Forest	Broad leaf Forest	Riparian	Meadow	Marshes	Subalpine	Cliff
Hermit warbler	X	X	X						
Late-Successional Forest Associates (eastside only)									
Flammulated owl	X								
Red-naped sapsucker	X		X	X					
Williamson's sapsucker	X		X	X					
Dusky flycatcher	X		X	X				X	
Early to Mid-Successional Forest Associates									
Turkey vulture[c]		X							X
MacGillivray's warbler[c]		X			X				
Brown-headed cowbird[c]		X		X	X				
Willow flycatcher[c]		X			X				
Cedar waxwing[c]		X		X	X				
Warbling vireo[c]		X		X	X				
Fox sparrow		X			X				
Orange-crowned warbler[c,d]		X		X	X				
Black-throated gray warbler[c]			X	X	X	X			
Rufous-sided towhee		X		X	X				
White-crowned sparrow[c]		X			X				

a USFS, 1998
b Table modified from USFS, 1998 and Andelman and Stock, 1994.
c Included in Sharp (1992) list of species found in MBSNF.
d Population trends declining based on data for species where population trends are known (Andelman and Stock, 1994).
e Species habitat association in this table was modified from its original association for this analysis.

1.2.8.2 Blue Grouse (Dendragapus obscurus)

Habitat Requirements and Ecology

The blue grouse is a focal species identified in the East Slope Cascades Landbird Conservation Plan (Oregon/Washington State Partners in Flight 2000). The blue grouse is a species of the western mountains of North America occurring from southeast Alaska and Yukon south along the Pacific coast to California and inland through mountains to New Mexico and Arizona. Blue grouse are found at lower elevations in semi-open habitats during the summer months, but migrate to higher elevations in the winter. Maximum habitat suitability occurs when trees, used primarily by territorial males, are well interspersed with the more open habitats used by hens and broods (Landbird Conservation Plan website 2004). Preferred forested habitats consist of multi-storied vegetation, which provides shelter, foraging, and protection from predators (Landbird Conservation Plan website 2004). Food is comprised mainly of plants such as herb leaves and flowers, conifer needles, and shrub berries, but insects may supplement the diet, especially for young juveniles. Winter food primarily consists of conifer needles.

Blue grouse breed in shrub/steppe and grassland areas, in alpine or subalpine ecotones, or in forest in or bordering montane areas. Nest sites vary considerably but are always on the ground or on stumps. Many have some sort of covering. Nests are formed by shallow depressions in the ground, often with thin linings of only dead vegetation. The nest is abandoned approximately one day after young are born. From that point on, hatchlings feed themselves. (Audubon Watchlist website 2004).

Occurrence within the White Pass Study Area

Suitable habitat for blue grouse is present throughout the White Pass Study Area. They are known residents of the White Pass Study Area.

1.2.8.3 White-tailed ptarmigan (Lagopus leucurus)

Habitat Requirements and Ecology

The white-tailed ptarmigan is a locally important species in the OWNF. White-tailed Ptarmigan breed in alpine habitats at or above tree limit and having krummholz or willow dominated vegetation situated near snowfields and rocky areas. Nest sites are located in snow free areas in rocky areas or near willow or spruce krummholz. In summer males and broods are often found near receding snowfields and rocky areas at higher elevations. In winter this species occupies willow-dominated basins or riparian areas at or below treeline where snow is available for roosting. (Colorado Partners in Flight website 2004).

Occurrence within the White Pass Study Area

Alpine meadows and mountain hemlock parklands within the White Pass Study Area provide suitable habitat for the white-tailed ptarmigan. It is known to occur within the White Pass Study Area.

1.3 HABITAT CONNECTIVITY AND FRAGMENTATION

Habitat connectivity and fragmentation refer to the size, quality, and spatial arrangement of patches of a species' habitat across the landscape, particularly the amount and arrangement of these patches as they relate to the dispersal of organisms. Loss of habitat, isolation of small populations, and direct mortality from collisions with motor vehicles are major concerns in the conservation of large carnivores (Singleton et al. 2002). Fragmentation and connectivity of LSH (Late-Successional Habitat) is one of the focus points in the Northwest Forest Plan. As previously mentioned, there are no designated Late-Successional Reserves within the White Pass Study Area.

The habitats within the White Pass Study Area are somewhat fragmented and diverse. Woody vegetation is sparse at the higher elevations, becoming denser and more diverse at the lower elevations. The patchiness has resulted from a number of man-caused and natural perturbations identified in the Upper Tieton Watershed Assessment and the Clear Fork Watershed Analysis (USFS 1998b; USFS 1998a). These included fires, logging, development of the ski area, and natural events, such as, avalanches and debris flows. Hogback Basin has remained relatively undisturbed and reflects historic conditions.

Connectivity of forest habitats is critical to the movement and dispersal of some species. Wide-ranging species, such as gray wolf and wolverine, can be affected by fragmentation caused by human encroachment in the form of roads, trails, dispersed and concentrated recreation, and development. The habitat needs of wide-ranging species are associated primarily with large undisturbed tracts of land rather than the need for contiguous areas of LSH or other forest cover. The maximum road density for wide-ranging species is usually 1 mile per square mile. The road density in the Upper Clear Fork Cowlitz Watershed is 0.7 mile per square mile and the road density for the Upper Tieton Watershed is 0.6 mile per square mile. The existing White Pass Ski Area as well as the Pacific Crest Trail adds to the elevated human activity levels in the area. These activities further reduce the level of isolation for wide-ranging species within the White Pass Study Area.

Under the existing condition, the area within the White Pass Study Area that has the highest level of human-caused fragmentation is the base area. Tree islands in this area, when combined into forested stands and not considering age class or species composition, are generally smaller than tree islands in the remainder of the White Pass Study Area. Throughout the upper portions of the existing ski area the late-seral forest is crisscrossed by numerous ski trails that break up the forest into smaller patches. The exception to this is the area from the proposed expansion area (Hogback Basin) where trees naturally occur in linear clumps in the mountain hemlock parkland vegetation type. This can be seen on Figure 3-31. For wide ranging animals potentially moving through the White Pass Study Area, potential travel habitat exists in Hogback Basin where the mountain hemlock parkland provides patches of forest for security.

Existing openings, such as ski trails, are unlikely to be a complete barrier to wide ranging species potentially moving through the White Pass Study Area as they are habitat generalists and typically utilize a number of different habitat types. For species with low mobility, however, such openings are more likely to be complete or partial barriers. Historic clearing of riparian vegetation and culverting of streams in particular have decreased habitat connectivity in the SUP area for riparian dependent species. Culverting of streams refers to covering the stream channel by some method to allow for the movement of skiers over the channel, which can occur over long distance where the channel crosses or follows the trail. Outside of areas in a developed condition, vegetation is reestablishing along much of the cleared riparian areas, although within cleared ski trails it would be maintained in a modified condition.

The study entitled Landscape Permeability for Large Carnivores in Washington: A Geographic Information System Weighted-Distance and Least-Cost Corridor Assessment (Singleton et al. 2002) used a GIS weighted-distance and least-cost corridor analysis to determine the regional-scale landscape permeability for sensitive large carnivores in Washington and adjacent portions of British Columbia and Idaho. This analysis placed particular emphasis on identifying areas where the Washington state highway system intersects potential large carnivore habitat and linkages between blocks of habitat. US 12 around White Pass was included in the Southern Cascade Range analysis of this model. It is important to note that this study was conducted using regional-scale spatial data sets that are effective for evaluating broad-scale patterns. It is not intended to provide fine-scale information for specific projects. However, it can be used to identify areas where linkages between blocks of habitat are a concern.

This study, which was intended for identifying relative landscape permeability based on broad-scale landscape characteristics, was focused on four species: wolverine, lynx, grizzly bear, and gray wolf. The regional species distribution, habitat associations, dispersal characteristics, and previous habitat modeling efforts were used to develop a conceptual model of landscape permeability for each of these wide-ranging species.

Habitat concentration areas identified in the southern Cascade Range were centered primarily on Mt. Rainier National Park, and the Norse Peak, William O. Douglass, Goat Rocks, and Mt. Adams Wilderness Areas. Distribution of available habitat for the focal species was constrained by high road densities and discontinuous forest cover on all sides. A total of 187 km of Washington state highway was identified passing through consistently identified available large carnivore habitat in the southern Cascade Range. The highways on the east side of Mt. Rainier National Park (US 12 and highways 410 and 123) passed through habitat available to all four focal species. Highway 410 and US 12 also pass through ungulate winter range areas in the Tieton and Naches River drainages that could be important for large carnivores.

As indicated by the landscape permeability model, connectivity in the Southern Cascade Region is limited by US 12 and highways 410 and 123 which means that wide-ranging species could encounter difficulties trying to cross these roadways.

More locally, the White Pass Study Area at White Pass is adjacent to two large wilderness areas, Goat Rocks and William O. Douglass. These areas provide large tracts of undisturbed land for wide-ranging species as well as species with smaller home ranges.

1.4 ENVIRONMENTAL CONSEQUENCES

The physical actions associated with the White Pass Proposed Expansion would result in impacts to wildlife and/or wildlife habitat and are referred to as *impact mechanisms*. Impacts can be classified and discussed in many different ways. For the purposes of this FEIS, impacts to wildlife will be discussed in terms of direct versus indirect and short versus long-term as defined below. Finally, impacts associated with the Proposed Expansion will be evaluated at a larger scale (watershed), incorporating the incremental impacts of other past, present, and reasonably foreseeable projects through a cumulative effects analysis.

Activities leading to direct and indirect impacts to wildlife, wildlife habitat, and wildlife habitat connectivity include the following:

Direct

Implementation of the Action Alternatives would result in direct impacts, both long-term and short-term, to wildlife and wildlife habitat. These impacts include permanent and temporary habitat loss, conversion of habitat from one type to another, habitat fragmentation, and disturbance to wildlife. Direct impacts to wildlife or wildlife habitat would result from the following proposed actions:

- Road and parking lot construction.
- Building construction.
- Chairlift terminal construction and tower placement.
- Clearing with grading for lifts and ski trails.
- Clearing without grading for lifts and ski trails.
- Bridge construction, particularly placement of footings.
- Utility line installation.
- Routine annual maintenance.

Direct beneficial impacts include those restoration projects that reduce habitat fragmentation such as decommissioning and revegetating roads or planting trees along streams to improve riparian conditions. Revegetating ski trails with clusters of trees may also provide some benefit to smaller wildlife species such as birds and small mammals as resting or foraging habitat. There would be some time lag before these benefits would occur due to the time needed for trees and other vegetation to grow at the revegetation sites.

Indirect

Indirect impacts to wildlife and wildlife habitat potentially occurring as a result of Action Alternative implementation include a potential increase in wind-throw leading to a potential increase in coarse woody debris (CWD) (depending on how wind-throw is treated) and a potential decrease in large mature trees; a decrease in the number of snags and dead or broken-topped trees; and a change in the species composition of the native plant communities in the White Pass Study Area due to potential introduction of non-native plant species. Project components potentially causing these types of impacts include:

- Road and parking lot construction.
- Clearing with grading for lifts and ski trails.
- Clearing without grading for lifts and ski trails.
- Tree removal to create gladed ski trails.
- Utility line installation.
- Hazard tree removal along lifts and ski trails.

Short and long-term impacts to wildlife and wildlife habitat include the following:

Short-term

Short-term impacts include temporary habitat loss resulting from ground disturbing activities in areas, which would subsequently be allowed to revegetate. Short-term impacts would also include temporary noise disturbance from construction activities. All previously listed activities have the potential to cause temporary noise disturbance. Project components potentially resulting in short-term impacts to wildlife habitat include:

- Vegetation disturbance in buffer areas of road, parking lot, chairlift, and building construction.
- Clearing with grading for lifts and ski trails within areas containing modified herbaceous habitat.

- Clearing without grading for lifts and ski trails within areas containing modified herbaceous habitat.
- Utility line installation.

Long-term

Long-term impacts include 1) the permanent loss or conversion of wildlife habitat, 2) fragmentation of wildlife habitat resulting in decreased connectivity and a decrease in travel habitat effectiveness, and 3) increased human use on a year round basis making the habitat in the area less suitable for species that are sensitive to human presence. Long-term impacts on wildlife or wildlife habitat would result from the following proposed actions:

- Road and parking lot construction.
- Building construction.
- Chairlift terminal construction and tower placement.
- Clearing with grading for lifts and ski trails.
- Clearing without grading for lifts and ski trails.
- Bridge construction, particularly placement of footings.
- Utility line installation.
- Routine annual maintenance.

Each Action Alternative (Alternatives 2, 6, 9 and Modified Alternative 4) would have potential impacts to wildlife resources. Information on wildlife habitats in this section is based on the vegetation communities and stand information developed for the White Pass Study Area as described in Section 3.5– Vegetation, the *Vegetation Technical Report and Biological Evaluation* (Appendix G), and as shown in Figures 3-31 and 3-34 in the FEIS. Impacts to vegetation, as well as wildlife would vary, depending on the wildlife species and the impact mechanism and alternative. Impacts are discussed individually for each species analyzed. Impacts to vegetation communities and watershed resources are listed in Table 3.5-5 and displayed in Figures 3-32, 3-33, 3-34, 3-36, 3-37, and 3-38.

1.4.1 Key Wildlife Habitats

Wetlands and Riparian Reserves

Wetlands and riparian areas provide important habitat functions, as discussed in Section 3.6.2. Potential impacts to riparian areas are identified in Section 3.3 – Watershed Resources (refer to Table 3.3-14.) Impacts to wildlife would result largely from changes in vegetation composition. Removal of vegetation or conversion from forest to modified herbaceous would lead to changes in species composition and structural diversity of riparian vegetation, thereby altering wildlife habitat quantity and quality. Effects of these changes would likely vary by wildlife species. These changes could also fragment habitat for riparian-dependent animals of low mobility, such as small mammals and amphibians, and reduce the value of riparian areas as travel corridors for species such as pine marten and elk.

Table 6:
Potential Direct Impacts to Riparian Reserves within the White Pass Study Area

	Alt. 1	Alt. 2	Modified Alt. 4	Alt. 6	Alt. 9
	(acres)	(acres)	(acres)	(acres)	(acres)
Area of Riparian Reserves	632.3	632.3	632.3	632.3	632.3
Proposed Clearing in Riparian Reserves	0.0	13.5	14.7	8.6	15.7
Proposed Grading in Riparian Reserves	0.0	4.2	11.1	4.0	8.7
Landcover Types within Riparian Reserves					
Forested	522.7	19.7	43.1	15.1	35.3
Talus	4.8	0	0	0	0
Modified Herbaceous	67.5	0	1.3	0.2	3.6
Developed	10.5	0	0	0	0
Conversion to modified herbaceous	0.0	19.6	36.4	11.8	32.6
Conversion to developed	0.0	0.1	8.1	3.3	2.7

Impacts to wetland and stream habitat would result from clearing activities and grading associated with terminal/tower construction and utility installation. Refer to Section 3.3 – Watershed Resources for a detailed discussion of wetland impacts.

Table 6 identifies the area of Riparian Reserves that would be eliminated or converted under each of the Action Alternatives. Actual impacts to riparian habitat would be less than identified in Table 6. Elimination of vegetation would result from construction of lift terminals and towers. Conversion of habitat would result from clearing and/or grading for ski trails which would result in the conversion of forested vegetation communities to managed herbaceous/shrub communities.

Operational impacts, such as noise disturbances, would occur as a result of ski trail and the chairlift maintenance. Ground disturbance associated with utility installation and grading activities could alter species habitat by increasing sediment delivery to streams, reducing shading, and increasing access by

invasive plants. Construction impacts may include injuries and mortality to low-mobility species and nesting birds by construction equipment.

Alternative 2 represents the most impacts to Riparian Reserves in Hogback Basin, while Modified Alternative 4 has the highest acreage of impact to Riparian Reserves overall, as a result of clearing for ski trails, lifts and parking. Impacts under Modified Alternative 4 would be lower than Alternative 2 along the lifts and trails in Hogback Basin due to reduced clearing widths and routing trails around streams and wetlands, yet higher overall than Alternative 2 due to the inclusion of a parking lot and proposed trails within the existing SUP area. Alternative 6 would result in the lowest overall disturbance to Riparian Reserves in the White Pass Study Area (refer to Section 3.3 – Watershed Resources).

Late-Seral Forest

The White Pass Study Area contains approximately 1,236 acres of late-seral forest which can be broken down into two major zones within the White Pass Study Area: the mixed conifer forest in the existing ski area and the mountain hemlock parkland that comprises most of the proposed expansion area (refer to Figure 3-31). A smaller piece of late-seral mountain hemlock forest is located on the protruding northwest portion of the proposed expansion area. Late-seral forest has been identified as the primary habitat type that would be impacted by any of the Action Alternatives. Late-seral forests provide abundant shade, moisture, and security for a number of species, including the Pacific fisher, northern spotted owl, pileated woodpecker, and great gray owl. Table FEIS2 below displays impacts to late-seral forest resulting from each alternative.

Table FEIS2:
Potential Direct Impacts to Later-seral Forest within the White Pass Study Area

	Alt. 1	Alt. 2	Modified Alt. 4	Alt. 6	Alt. 9
	(acres)	(acres)	(acres)	(acres)	(acres)
Area of late-seral forest	1,236	1,236	1,236	1,236	1,236
Proposed Clearing and Grading	0.0	19.8	44.4	15.3	38.9

The greatest impacts to late-seral forest would occur under Modified Alternative 4 where approximately 43.2 acres would be impacted for the construction of lifts, trails and clearing for the parking lot near the base area (refer to Figure 3-33). The second greatest impacts to late-seral forest would occur under Alternative 9 (the infill alternative) where approximately 38.9 acres would be impacted for the construction of lifts and ski trails (refer to Figure 3-34). The fewest impacts to late-seral forest would occur under Alternative 6 with 15.1 acres removed or modified (refer to Figure 3-32). Alternative 2 would have approximately 19.7 acres of impacts to late-seral forest (refer to Figure 3-32).

Permanent impacts would include complete removal of late-seral forest for development of chairlifts and their associated ski trails under all the Action Alternatives. The ski trails would be maintained in a managed shrub/herbaceous condition.

Construction of the *Basin* and *Hogback Express* chairlifts (in Alternative 2 and Modified Alternative 4), the *Basin* chairlift (in Alternative 6), and *PCT* chairlift (in Alternative 9) and associated trails within late-seral forest has the potential to impact wildlife habitat connectivity by reducing the available connective habitat, increasing edge habitat, decreasing interior habitat, creating potential barrier effects, and increasing human activity, which in turn increases potential disturbance to animals moving through the area. Clearing for lifts and trails would result in similar linear openings that already exist in the mountain parkland habitat.

Full clearing would result in increased fragmentation of contiguous blocks of late-seral forest habitat within the White Pass Study Area as well as increased edge habitat. This would have the greatest potential effect on low mobility species and species dependent on interior forest conditions. For low mobility species, increased habitat fragmentation would increase the probability of population isolation. For organisms such as Cascade frogs, extensive fragmentation can represent a barrier to movement and individuals may become trapped in islands of remaining habitat, leading to a long-term effect of decreased genetic variability.

Habitat fragmentation and increased edge may also increase the risk of predation for animals moving through the area. Clearing of late-seral forest for ski trails and lift alignments would affect not only the area cleared but also a parallel band of remaining forest edge. For example, increased edge habitat may attract edge species, such as great horned owls, to the area that could result in an increased risk of predation for spotted owls potentially dispersing through the area, particularly when crossing openings in the forest. Clearing of late-seral forest would also result in increased edge habitat and may lead to indirect impacts of increased wind-throw.

Construction of the *Basin* and *Hogback Express* chairlifts (in Alternative 2 and Modified Alternative 4), the *Basin* chairlift (in Alternative 6), and *PCT* chairlift (in Alternative 9) would result in fragmentation of late-seral forest within the White Pass Study Area. The majority of trail clearing under Alternatives 2 and 6 would occur in the small tree, moderate canopy, single-story mountain hemlock parkland that comprises the majority of the proposed expansion area. Therefore, impacts to interior forest dependent species would not be as pronounced compared to Alternative 9 because this area already has a great deal of naturally occurring openings. Proposed ski trails have been designed to maximize these existing openings and minimize the amount of clearing necessary to meet standard trail requirements. Impacts to interior forest dependent species would be slightly greater under Modified Alternative 4 since there would be approximately 10 acres of clearing in the small tree, closed canopy, multi-story mixed conifer community. Chapter 2 contains a complete discussion of construction prescriptions.

Impacts to interior forest dependent species (such as northern spotted owl and pileated woodpecker) would be greater under Alternative 9 where fragmentation would occur within the medium tree, closed canopy, multi-story mixed conifer forest (refer to Appendix G – *Vegetation Technical Report and Biological Evaluation*). Fragmentation would indirectly impact forest dwelling wildlife species such as pine marten and pileated woodpecker by reducing overstory cover and LWM, considered key habitat components for late-seral dependent species. Some forest dependent species are hesitant and/or unwilling to cross large, open areas as they do not provide sufficient security cover. Since clearing of late-seral forests for ski trails and lifts would be maintained for the life of the ski area the impact of fragmentation would be permanent.

Periodic summertime maintenance of ski trails, utility lines, and lifts would result in direct and indirect impacts to late-seral forests. Indirect impacts as a result of these activities would include the increase in human activity and noise, which could result in avoidance of the area by some wildlife species. These occasions are expected to be brief and the impact of additional presence and noise is expected to cause only temporary and localized avoidance. Direct impacts resulting from off-season maintenance would occur during the denning, nesting, or breeding season of some species (e.g., marten, pileated woodpecker, etc.) in which case the additional presence and noise would potentially directly impact breeding individuals; causing den or nest abandonment and potential mortality of young.

Snags and Downed Logs

The White Pass Study Area contains approximately 1,236 acres of late-seral forest, most of which is capable of creating CWD and snags. Trail clearing of late-seral forest would result in a long-term reduction of snags within the White Pass Study Area as the cleared trails would be maintained for the life of the ski area. Generation of snags and CWD through forest maturation is already occurring but at a lower rate as a result of the low growth rates of forest vegetation at higher elevations. Reduction of existing snags would be greatest under Alternative 9 where trails and Chair 5 would be constructed in medium tree, closed canopy, multi-story forest (refer to *Appendix G – Vegetation Technical Report and Biological Evaluation*).

Direct impacts to snag-dependent wildlife species would occur if snags containing nesting and denning sites are cleared for trail/lift construction. These impacts would include potential mortality of individuals within the snag and potential nest/den abandonment. In addition, a short-term increase in human activity within the White Pass Study Area would lead to avoidance of the area in general and potential nest/den abandonment of snags located near construction activity. Since increased human activity in the White Pass Study Area would continue for the life of the ski area it is considered a long-term impact.

Clearing of mature forest for ski trails and lift corridors would not only impact the area being cleared but would also impact adjacent forest stands as hazard trees may be felled in the adjoining forest, indirectly impacting future snag recruitment. Other Management Provision OMP6 provides measures for retaining

snags whenever possible to reduce the permanent loss of wildlife habitat incurred from their removal (refer to Table 2.4-2). All trees that are cleared for any of the Action Alternatives would be left on-site to provide additional downed wood (refer to clearing prescriptions, Chapter 2). Felling hazard trees would create more downed wood on the forest floor, which would be a beneficial impact for many species that utilize downed wood for foraging, breeding, and denning.

1.4.2 Threatened and Endangered Species

Table 7 presents the impacts to Threatened and Endangered species potentially occurring within the White Pass Study Area.

Table 7:
Available Habitat for Federally Listed Threatened or Endangered Species Potentially Occurring within the White Pass Study Area by Alternative

Species	Alt. 1/ Existing	Alt. 2	Mod. Alt. 4	Alt. 6	Alt. 9	Determination of Effect; All Alternatives
	(acres)	(acres)	(acres)	(acres)	(acres)	
Northern spotted owl (*Strix occidentalis caurina*) Dispersal Habitat	1235.9	1216.2	1192.7	1220.8	1200.6	May Affect, Likely to Adversely Affect
Northern spotted owl (*Strix occidentalis caurina*) NRF Habitat	216	216	202.3	212.3	191.1	May Affect, Likely to Adversely Affect
Designated Critical Habitat for the Northern Spotted Owl, WA-18	14	14	14	14	14	No Effect
Canada Lynx (*Felis Lynx canadensis*) Dispersal Habitat	1,507.3	1,487.6	1,476.0	1,492	1,471.9	No Effect
Grizzly Bear (*Ursus arctos*)	1,507.3	1,487.6	1,476.0	1,492	1,471.9	No Effect
Gray Wolf (*Canis lupis*)	1,454.8	1,435.1	1,423.5	1,439.7	1,419.5	May Affect, Not Likely to Adversely Affect
Bald Eagle (*Haliaaetus leucocephalus*)	0	0	0	0	0	No Effect
Marbled Murrelet (*Brachyrampus marmoratus*)	0	0	0	0	0	No Effect

1.4.2.1 Alternative 1

Under Alternative 1, White Pass would continue to operate without any further development. Overcrowding on existing ski slopes would continue to be an issue. People would continue to ride the lift to the ski area boundary and hike out to Hogback Basin to ski, resulting in a low level of noise and human activity in the proposed expansion area. Under Alternative 1, suitable dispersal habitat could be removed through general maintenance of ski trails and hazard reduction. However, surveys for northern spotted

owls within the existing SUP have not detected any presence of the species. Under Alternative 1, direct and indirect effects to northern spotted owl dispersal habitat would continue to manifest as occasional summertime maintenance of lifts and trails. There would be no new potential impacts to grizzly bear, Canada lynx, gray wolf, bald eagle or marbled murrelet as these species are not expected to occur in the White Pass Study Area. Therefore, there would be No Effect to federally listed threatened and endangered species under Alternative 1.

1.4.2.2 Alternative 2

Northern Spotted Owl

Habitat for northern spotted owl within the White Pass Study Area includes dispersal habitat and NRF habitat, as discussed in Section 1.2.3.1. This determination was made based on the elevation of the White Pass Study Area and its lack of detections during surveys in 1987, 1997, and 2000-04 (Pearson 2002).

Clearing would result in permanent removal of suitable dispersal habitat, as vegetation within the ski trail boundaries would be maintained as a managed shrub/herbaceous condition for the life of the ski area. Alternative 2 would remove approximately 19.8 acres (1.9 percent) of the available dispersal habitat within the White Pass Study Area (refer to Table 7). No NRF habitat would be removed under Alternative 2. There would no impacts to NRF habitat under Alternative 2.

Northern spotted owls nesting sites and activity centers have been observed adjacent to the White Pass Study Area since 1992. Because of the proximity of their activity, and vegetation modification within the area proposed for expansion, Alternative 2 could potentially affect dispersal patterns for this species. As known nesting sites are more than 1 mile away from the proposed activities in Hogback Basin and the existing parking area near the base area, it has been determined that the effects on spotted owl nesting by project activities are highly unlikely. The White Pass Study Area is adjacent to two large wilderness areas and other LSR and MLSA's where suitable dispersal and nesting, roosting, and foraging habitat are widely available. It is unlikely that Alternative 2 would directly affect northern spotted owl dispersal habitat or the viability of the LSR. Data in the Clear Fork Cowlitz Watershed Analysis (USDA 1998a) also indicates that Hogback Basin is not within known nesting, roosting, foraging, or dispersal habitat for northern spotted owls.

Canopy closure and tree size would be negligibly affected by Alternative 2, as only individual scattered trees along ski trails and chairlift corridors would be removed rather than complete stands (refer to the *Vegetation Technical Report and Biological Evaluation* in Appendix G). Alternative 2 would occur in mountain hemlock parkland, high elevation forest with a naturally low canopy closure and comparatively small tree size (refer to Section 3.5 – Vegetation). As a result, Alternative 2 would have no effect on canopy cover within the expansion area. Effects to connectivity are discussed later in this section.

Under Alternative 2, clearing for ski trails and lift corridors would directly impact approximately 19.8 acres of potential dispersal habitat (refer to Table 7). Potential dispersal habitat remaining within the White Pass Study Area is not expected to be considerably fragmented following clearing as the new trails have been designed to minimize the amount of clearing necessary by utilizing the existing openings common throughout the mountain hemlock parkland forest cover. This clearing would reduce the overall amount of mature forest available, but not interior forest. However, long-term impacts would occur to potential dispersal habitat where islands of trees are removed for ski trails. The reduction of potential dispersal habitat and the creation of openings in the forest may increase the risk of predation for northern spotted owls if they were to disperse through the area.

Construction activities would require the use of a Type I helicopter (heavy lifting capacity) in order to transport materials to construction sites and to place lift towers. Helicopter operation could occur within suitable NRF and dispersal habitat, and within 2/3 mile of CHU WA-18. Therefore, a seasonal restriction during the critical breeding season of March 1 through July 31 would be implemented thus limiting disturbance to northern spotted owls within the White Pass Study Area or adjacent habitat. Outside of the critical breeding season adult owls would be more mobile and better able to move away from the disturbance; nevertheless some disturbance of individuals is possible. Large helicopters can have larger disturbance areas and can still impact spotted owls outside of the critical breeding season.

The information presented in the SEI report includes a review of the effects of forest fragmentation on the likelihood of occupancy by northern spotted owls (Courtney et al. 2004). The report concludes that:

> "Studies consistently showed that mature/old forest patch area was an important predictor of forest occupancy by northern spotted owls. While a fragmentation index was negatively associated with site occupancy in some studies, a trade-off between large patches of mature/old forest and juxtaposition of land cover types appeared to benefit northern spotted owls in other studies."

The report went on to recommend additional studies of long-term survival and reproductive data in order to determine more conclusively how significant the role of forest fragmentation is in the recovery of the species.

Alternative 2 would result in minimal fragmentation as it is designed to make use of the open nature of the mountain hemlock parkland that comprises the proposed expansion area.

Potential impacts to individuals resulting from construction and periodic maintenance would be temporary and would most likely result in avoidance of the area by this species. Juveniles typically disperse after fledging, in September and October, which would occur before ski area operations begin. However, some juveniles have been known to disperse again in late winter/early spring, which would coincide with late season nighttime trail grooming (Thomas et al. 1990). Grooming of ski trails, which

typically occurs at night, may also disturb individuals and lead to avoidance of the area, if they were to try to disperse within the White Pass Study Area. However, these impacts would be intermittent and short-term in nature. In addition, due to the absence of detections during surveys between 1987 and 2004 it is considered unlikely that owls regularly disperse through the area. ***Therefore, there would be No Effect to northern spotted owls under Alternative 2.***

There is approximately 14 acres of Designated Critical Habitat for the Northern Spotted Owl, Critical Habitat Unit (CHU), WA-18, in the White Pass Study Area. CHU, WA-18 would not be affected by actions proposed in this alternative. ***Therefore, there would be No Effect to Designated Critical Habitat under Alternative 2.***

Canada Lynx

Alternative 2 would not be expected to result in significant impacts to **Canada lynx** since it is not expected to occur in the White Pass Study Area except during rare pass-through occasions. Potential operational impacts include disturbance to lynx traveling through the area due to recreation and maintenance activities during both summer and winter. These activities would occur in existing developed areas and new areas proposed for development under Alternative 2, and could temporarily cause lynx to alter their route through the area. As explained in Section 1.2.3.2, the White Pass Study Area is not considered lynx habitat due to lack of suitable denning or foraging habitat which is due to the lack of plant associations identified as suitable lynx habitat as defined by the USFS and USFWS (2005). In addition, the area is considered unoccupied (USFS, USFWS 2006). As such, Canada lynx are unlikely to use the area as a permanent home range, and any lynx using the area are likely to be in transit to more suitable habitat. ***Therefore, there would be No Effect to Canada lynx under Alternative 2.***

Grizzly Bear

Alternative 2 would not be expected to result in significant impacts to **grizzly bears**. The White Pass Study Area is located approximately 35 miles south of the North Cascades Ecosystem, the nearest recovery zone for grizzly bear. Potential short-term construction impacts to grizzly bear and their habitat could include disturbance during construction of chairlifts and associated trails and short-term changes in vegetation within areas developed for ski trails. Increases in wintertime activity would not impact grizzly bears as they would be in hibernation, most likely outside of the White Pass Study Area since suitable habitat for hibernation is lacking within the White Pass Study Area. Impacts to grizzly bear during the summer would be minimal to non-existent since no summertime recreation activities are proposed. Occasional lift and trail maintenance, such as vegetation mowing or brushing, could potentially disturb bears that might pass through the area but this is expected to be rare. The addition of new ski trails within the White Pass Study Area would not be expected to alter grizzly bear travel habitat as this species is a habitat generalist and will utilize a variety of habitats during its travels. ***Therefore, there would be No Effect to grizzly bear under Alternative 2.***

Gray Wolf

As described in Section 1.2.3.3, **gray wolves** use a variety of habitat types and appear to select habitat based upon prey availability and security from human disturbance. Prey, including deer, elk, and small mammals, is seasonally abundant throughout the White Pass Study Area. The presence of gray wolves is expected to be rare and limited to occasional use of the White Pass Study Area as part of a larger home range territory, in part because the White Pass Study Area is lacking in suitable denning habitat for this species.

Construction activities associated with Alternative 2 would include increased human activity and noise and could result in the short-term avoidance of the area by wolves.

Wolves could occasionally hunt within the White Pass Study Area during the summer. Ungulates are the primary prey of gray wolves. Within the White Pass Study Area elk, black-tailed, and mule deer are most common and impacts to these species could have adverse affects on potential wolf populations. One factor affecting wolf abundance is the relationship of prey density and their densities have been observed to increase as ungulate populations increased (Fuller 1989; Lariviere et al. 2000). At low ungulate prey densities, wolves become nutritionally stressed, are more nomadic, less territorial, and more solitary (Mech 1977; Messier 1987). Both elk and deer are considered common in the White Pass Study Area in the summer but absent in the winter when the snowpack is too deep to support them.

For a complete discussion of potential impacts to elk and deer, primary prey species for gray wolves, see the discussion under each of these species in the following sections of this report. As described in the section for deer, the amount of foraging habitat and cover habitat would decrease under Alternative 2. Loss of cover would be a long-term effect while loss of foraging would be short-term until vegetation within graded areas has recovered. Greater impacts to deer and elk under Alternative 2 would be the short-term disturbance due to elevated noise and human activity in the White Pass Study Area, which would lead to avoidance of the area until construction activities subside. Any reduction in the number of potential prey animals occurring in the White Pass Study Area could make it more difficult for wolves to find prey in the area, further reducing the likelihood of wolves occurring in the area.

Impacts to wolves due to ski area operations are not expected as this species is not expected to occur in the White Pass Study Area during the winter due to lack of suitable prey and increased human activity. ***Therefore, there would be No Effect to gray wolves under Alternative 2.***

Bald Eagle

Alternative 2 is not expected to affect bald eagles as no known nests or wintering occurs within the White Pass Study Area. Potential foraging may occur at Leech Lake during the breeding season, however, due to the existing human use of the area, including the proximity of US 12, the existing ski area and

campgrounds, to which the eagles may be somewhat acclimated, no impacts to foraging eagles are expected. ***Therefore, there would be No Effect to bald eagle under Alternative 2.***

Marbled Murrelet

The White Pass Study Area is located outside the range of suitable marbled murrelet habitat and no documented occurrences have been recorded within the White Pass Study Area. Alternative 2 is not expected to have any effect on marbled murrelet. Therefore, there would be No Effect to marbled murrelet under Alternative 2.

1.4.2.3 Modified Alternative 4

Northern Spotted Owl

Due to the absence of detections during surveys between 1987 and 2004 conducted during the breeding season, it is considered unlikely that owls regularly use the area during the breeding season. Therefore, potential effects to northern spotted owl individuals resulting from construction and periodic maintenance would be temporary and would most likely result in avoidance of the area by this species. Juveniles typically disperse after fledging, in September and October, which would occur before winter ski area operations begin. However, some juveniles have been known to disperse again in late winter/early spring, which would coincide with late season nighttime trail grooming (Thomas et al. 1990). Grooming of ski trails, which typically occurs at night, may also disturb individuals, and lead to avoidance of the area, if they were to try to disperse within the White Pass Study Area. However, these impacts would be intermittent and short-term in nature. In addition, construction operations would increase the noise and activity levels within the White Pass Study Area and could result in avoidance of the area by dispersing individuals. These operations would be temporary and therefore, potential use of the area by dispersing and foraging owls would most likely resume once construction activities were complete. Construction of the ski runs and installation of the lifts, lodge and associated infrastructure would occur during the day in dispersal habitat and would not affect an active nest tree of spotted owls. There would be no effect from disturbance to northern spotted owls from the construction of the ski runs.

Construction activities would require the use of a Type I helicopter in order to transport materials to construction sites and to place lift towers. Helicopter operation could occur within suitable NRF and dispersal habitat, and within 2/3 mile of CHU WA-18. Therefore, a seasonal restriction during the critical breeding season of March 1 through July 31 will be implemented thus limiting disturbance to northern spotted owls within the White Pass Study Area or adjacent habitat. Outside of the critical breeding season adult owls would be more mobile and better able to move away from the disturbance; nevertheless some disturbance of individuals is possible. Large helicopters can have larger disturbance areas and can still impact spotted owls outside of the critical breeding season.

Suitable habitat (NRF and dispersal) for northern spotted owl within the White Pass Study Area would be impacted through clearing activities for ski trails, lifts, and facilities as summarized above in Table 7.

Clearing activities would result in permanent removal of approximately 13.7 acres of NRF habitat, as vegetation would be maintained as developed or a managed shrub/herbaceous condition for the life of the ski area (refer to Figure 3-41). The greatest impact to NRF would result from construction of the 7-acre parking lot and ticket booth at the base of the ski area. This would result in the complete removal of forested vegetation within NRF habitat. However, due to the presence of the existing ski area to the south and west, US 12 to the north, and the existing drainfields to the east, the condition of the NRF habitat is considered to be degraded.

Clearing for ski trails and lift corridors would directly impact approximately 43.2 acres of dispersal habitat within the White Pass Study Area (refer to Figure 3-41). Dispersal habitat remaining within the White Pass Study Area is not expected to be considerably fragmented following clearing as the new trails have been designed to minimize the amount of clearing necessary by utilizing the existing openings common throughout the mountain hemlock parkland forest cover. This clearing would reduce the overall amount of mature forest available, but not interior forest. However, long-term impacts would occur to dispersal habitat where islands of trees are removed for ski trails. The reduction of dispersal habitat and the creation of openings in the forest may increase the risk of predation for spotted owls if they were to disperse through the area.

Northern spotted owl nesting sites and activity centers have been observed adjacent to the White Pass Study Area since 1992. Modified Alternative 4 could potentially affect dispersal patterns for this species through the removal of vegetation. However, because of the proximity of known nests (approximately 1.7 and 1.9 miles away), the existing ski area operations, and the presence of US 12 adjacent to the White Pass Study Area, and the amount of habitat removed is relatively small and spread throughout the entire White Pass Study Area, dispersal patterns are not expected to change. As known nesting sites are more than 1 mile away from the proposed activities, it has been determined that the effects on spotted owl nesting by the Modified Alternative 4 are highly unlikely.

Canopy closure and tree size would be negligibly affected by Modified Alternative 4 in the mountain hemlock parkland community, a high elevation forest with a naturally low canopy closure and comparatively small tree size. Within this community, only individual scattered trees along ski runs and chairlift corridors would be removed rather than complete stands through the Tree Island Removal clearing prescription. Proposed activities occurring in lower elevation communities, where canopy closure is greater and tree size is larger, occur adjacent to existing ski trails. Construction of ski trails would fragment existing forest communities, but would not alter canopy closure and tree size in adjacent undisturbed areas.

Modified Alternative 4 would result in minimal fragmentation as it is designed to make use of the open nature of the mountain hemlock parkland that comprises the proposed expansion area. Fragmentation of

forested communities would be greatest within the existing ski area where previous trail construction has already fragmented habitat.

It is unlikely that Modified Alternative 4 would directly affect northern spotted owl dispersal habitat or the viability of the LSR. Modified Alternative 4 would not adversely affect the function of CHU and LSR or Managed Late-Successional Areas outside the White Pass Study Area utilized by northern spotted owls.

Modified Alternative 4 may affect, likely to adversely affect northern spotted owl through loss of suitable NRF habitat for construction.

No proposed activities would occur within CHU, WA-18. Modified Alternative 4 would not adversely affect the function of CHU, WA-18. ***Therefore, there would be No Effect to Designated Critical Habitat under Modified Alternative 4.***

Canada Lynx

Modified Alternative 4 is not expected to result in significant impacts to Canada lynx since it is not expected to occur in the White Pass Study Area, except during rare pass-through occasions. The White Pass Study Area is not located within a LAU and it is considered peripheral habitat according to the Canada Lynx Recovery Outline (USWFS 2005). Modified Alternative 4 is consistent with the Lynx Conservation Assessment and Strategy (LCAS; Ruediger et al. 2000) and the Lynx Conservation Agreement (USFS, USFWS 2005). An amendment to the Lynx Conservation Agreement (USFS, USFWS 2006) further identified the southern potion of the OWNF and GPNF as “unoccupied” by Canada lynx. Potential impacts to lynx traveling through the area include disturbance due to construction and maintenance activities during both summer and winter. These activities could temporarily cause lynx to alter their route through the area. As such, Canada lynx are unlikely to use the area as a permanent home range, and any lynx using the area are likely to be in transit to more suitable habitat. ***Modified Alternative 4 would have No Effect on Canada lynx.***

Grizzly Bear

Modified Alternative 4 is not expected to result in significant impacts to grizzly bears. No grizzly bears have been documented or are know to occur with the White Pass Study Area. The White Pass Study Area is located approximately 35 miles south of the North Cascades Ecosystem, the nearest recovery zone for grizzly bear. Potential short-term construction impacts to grizzly bear and their habitat could include disturbance during construction of chairlifts and associated trails and short-term changes in vegetation within areas developed for ski trails. Increases in wintertime activity would not impact grizzly bears as they would be in hibernation, most likely outside of the White Pass Study Area since suitable habitat for hibernation is lacking. Impacts to grizzly bear during the summer would be minimal to non-existent since no summertime recreation activities are proposed. Occasional lift and trail maintenance could potentially

disturb bears that might pass through the area but this is expected to be rare. The addition of new ski trails, the mid-mountain lodge, parking lot, and ticket booth would not be expected to alter grizzly bear travel habitat as this species is a habitat generalist and will utilize a variety of habitats during its travels. ***Modified Alternative 4 would have No Effect on grizzly bear.***

Gray Wolf

Modified Alternative 4 is not expected to impact individuals as gray wolf occurrence has not been documented within the White Pass Study Area. The presence of gray wolves is expected to be rare and limited to occasional use of the White Pass Study Area as part of a larger home range territory, in part because the area is lacking in suitable denning habitat for this species.

As previously described, gray wolves use a variety of habitat types and appear to select habitat based upon prey availability and security from human disturbance. Ungulates are the primary prey of gray wolves, and elk, black-tailed, and mule deer are seasonally abundant throughout the White Pass Study Area. Ungulates are present during the late spring, summer, and early fall months, but absent in the winter when the snowpack makes the forage unavailable and travel difficult. Therefore, wolves may occasionally hunt within the White Pass Study Area during the summer. Potential impacts to the prey base from Modified Alternative 4 could have adverse affects on potential wolf populations. Wolf abundance is related to prey density and their densities have been observed to increase as ungulate populations increased (Fuller 1989; Lariviere et al. 2000). At low ungulate prey densities, wolves become nutritionally stressed, are more nomadic, less territorial, and more solitary (Mech 1977; Messier 1987).

Potential impacts to ungulates within the White Pass Study Area would include loss or conversion of cover habitat, an increase in foraging habitat, and disturbance due to construction and increased human activity. These impacts could lead to a short-term avoidance of the White Pass Study Area during the summer when construction activities occur. A reduction in the number of potential prey animals occurring in the White Pass Study Area could make it more difficult for wolves to find prey, thereby affecting their ability to forage. However, cover habitat does not appear to be limiting in the White Pass Study Area and the changes should be negligible.

Construction activities during the summer months associated with Modified Alternative 4 would include increased noise and human activity within the White Pass Study Area that could result in short-term avoidance of the area by wolves. However, due to the proximity of US 12, the existing ski area operations, and human use of the PCT it is assumed that wolves currently avoid the area. Therefore, no impacts to wolf are expected during construction activities. Impacts to wolves due to winter ski area operations are not expected as this species is not expected to occur during the winter due to lack of suitable prey. ***Therefore, Modified Alternative 4 may affect, but is not likely to adversely affect gray wolf.***

Bald Eagle

Modified Alternative 4 is not expected to affect bald eagles, as no known nests or wintering occurs within the White Pass Study Area. Potential foraging may occur at Leech Lake during the breeding season, however, due to the existing human use of the area, including the proximity of US 12, the existing ski area and campgrounds, to which the eagles are likely somewhat acclimated, no impacts to foraging eagles are expected. ***Modified Alternative 4 would have No Effect on bald eagle.***

Marbled Murrelet

The White Pass Study Area is located outside the limit of suitable marbled murrelet habitat and no documented occurrences have been recorded within the White Pass Study Area. ***Modified Alternative 4 would have No Effect on marbled murrelet.***

1.4.2.4 Alternative 6

Northern Spotted Owl

Impacts to **northern spotted owl** under Alternative 6 would be similar to but fewer than the impacts described under Alternative 2. Approximately 15.1 acres of dispersal habitat would be impacted under this alternative; roughly half that of the amount impacted under Alternative 2. Additionally, there would be approximately 3.7 acres of clearing in NRF habitat within the existing ski area for development of a parking lot (refer to Figure 3-40). Therefore, there would be a total of approximately 18.8 acres of impacts (or 1.2 percent) to suitable habitat under Alternative 6.

A 0.25-mile road is proposed under Alternative 6. The road would run between the existing Quail trail to the base of the proposed *Basin* chairlift. Clearing and grading would be required for construction of this road, thus short-term indirect impacts to the northern spotted owl would occur from the additional noise and human activity. Additionally, this road would double as an egress trail during winter ski operations. Long-term impacts would be expected to be minimal as dispersal activity is typically limited to spring and late fall, during which time there would not be any activity from ski area operations within the *Basin* pod.

The mid-mountain lodge would be constructed adjacent to the Quail trail under Alternative 6. This would result in fewer potential long-term impacts to the northern spotted owl as the lodge would be located adjacent to a previously disturbed area. While short-term disturbance would occur during construction, long-term impacts would be expected to be minimal.

Under Alternative 6 the total SUP expansion area would be 282 acres thus limiting the proposed activities to a smaller portion of the Hogback Basin than in the other Action Alternatives. ***For these reasons, Alternative 6 may affect, likely to adversely affect northern spotted owl*** through loss of suitable NRF habitat for construction.

No proposed activities would occur within CHU, WA-18. Alternative 6 would not adversely affect the function of CHU, WA-18. ***Therefore, there would be No Effect to Designated Critical Habitat under Alternative 6.***

Canada Lynx, Grizzly Bear, and Gray Wolf

Under Alternative 6, the types of impacts to **Canada lynx, grizzly bear,** and **gray wolf** would be similar to Alternative 2, except with fewer acres (approximately 19.7 acres) of mountain hemlock parkland cleared for ski lifts and trails in the proposed expansion area. Additional impacts could result from clearing of forested areas for the road/egress trail. Construction activities could result in the short-term displacement of large ungulates, which are prey species for the gray wolf. Operational impacts under Alternative 6 would include increased noise and human activity within Hogback Basin; however, this activity would take place during the winter when these species are not expected to occur. The parking lot proposed under Alternative 6 would not be expected to have significant impacts to these species, as it would be constructed adjacent to the base area where a high level of human activity occurs year-round. ***Therefore, Alternative 6 would have No Effect on Canada lynx, grizzly bear, or gray wolf.***

Bald Eagle

Alternative 6 is not expected to affect bald eagles, as no known nests or wintering occurs within the White Pass Study Area. Potential foraging may occur at Leech Lake during the breeding season, however, due to the existing human use of the area, including the proximity of US 12, the existing ski area and campgrounds, to which the eagles are likely somewhat acclimated, no impacts to foraging eagles are expected. ***Alternative 6 would have No Effect on Bald Eagle.***

Marbled Murrelet

The White Pass Study Area is located outside the limit of suitable marbled murrelet habitat and no documented occurrences have been recorded within the White Pass Study Area. Alternative 6 is not expected to have any effect on marbled murrelet. ***Alternative 6 would have No Effect on marbled murrelet.***

1.4.2.5 Alternative 9

Northern Spotted Owl

Impacts to the **northern spotted owl** under Alternative 9 would be greater than under Alternative 2. All new lifts and trails would be constructed within the existing ski area (refer to Figures 3-34 and 3-38). Approximately 24.9 acres of NRF habitat would be cleared for construction of the ski lift and associated trails (refer to the *Vegetation Technical Report and Biological Evaluation* in Appendix G). In addition, 10.4 acres of dispersal habitat would be cleared in the western portion of the existing ski area for development of an egress trail for a total of approximately 35.3 acres (or 2.8 percent) of impacts to the suitable habitat for northern spotted owls.

Alternative 9, which proposes to build a new lift and associated trails within the existing ski area would result in fragmentation of late-seral forest. As a result it would be expected that the suitability of the existing ski area as potential habitat for the northern spotted owl would be diminished under the Alternative 9 scenario. Surveys for northern spotted owls within the White Pass Study Area have not resulted in any detections (Pearson 2002). According to the SEI report, forest fragmentation has the potential to affect dispersal patterns by forcing owls to detour around fragmented areas (Courtney et al. 2004). This would be an indirect impact under Alternative 9.

Construction of ski trails in this area would also reduce the amount of potentially suitable foraging habitat available and may reduce the effectiveness of foraging habitat by introducing increased amounts of human activity into the area.

Under Alternative 9 one new chairlift, the *PCT* chairlift, and seven new trails would be constructed in the eastern portion of the existing ski area. This portion of the ski area is comprised primarily of medium tree, multi-story, closed canopy, mixed hemlock forest. All of the impacts to vegetation would occur in late-seral forest. Construction of ski trails and the *PCT* chairlift would result in fragmentation of the forest within this portion of the existing ski area. Fragmentation would decrease the suitability of this forest for the interior forest dwelling northern spotted owl. Therefore, Alternative 9 would be expected to further decrease the available habitat within the existing ski area. However, surveys conducted over the past decade have not found any owls and the existing ski area is considered to be marginal NRF habitat at best due to its fragmented nature. Owls potentially utilizing the area for dispersal during the construction phase would be temporarily displaced by the increased noise and human activity. ***Alternative 9 may affect, likely to adversely affect northern spotted owl*** through loss of suitable habitat for construction.

No proposed activities would occur within CHU, WA-18. Alternative 9 would not adversely affect the function of CHU, WA-18. ***Therefore, there would be No Effect to Designated Critical Habitat under Alternative 9.***

Canada Lynx, Grizzly Bear, and Gray Wolf

Impacts to **Canada lynx, grizzly bear,** and **gray wolf** under Alternative 9 could occur in the more densely forested existing ski area portion of the White Pass Study Area. Impacts to these species from additional ski area operations are expected to be minimal as all proposed new trails and lifts would be developed adjacent to the existing high-use ski area. These species are not expected to occur within the White Pass Study Area during the winter due to the high level of human activity.

Construction impacts would potentially result in avoidance of the area during the summer and fall season; however, since these species are not expected to occur except on a transitory basis, these impacts would be short-term in nature. The parking lot proposed under Alternative 9 would not be expected to have significant impacts to these species, as it would be constructed adjacent to the base area, where a high

level of human activity occurs year-round. ***Alternative 9 would have No Effect on Canada lynx, grizzly bear, or gray wolf.***

Bald Eagle

Alternative 9 is not expected to affect bald eagles, as no known nests or wintering occurs within the White Pass Study Area. Potential foraging may occur at Leech Lake during the breeding season, however, due to the existing human use of the area, including the proximity of US 12, the existing ski area and campgrounds, to which the eagles are likely somewhat acclimated, no impacts to foraging eagles are expected. ***Alternative 9 would have No Effect on bald eagle.***

Marbled Murrelet

The White Pass Study Area is located outside the limit of suitable marbled murrelet habitat and no documented occurrences have been recorded within the White Pass Study Area. Alternative 9 is not expected to have any effect on marbled murrelet. ***Alternative 9 would have No Effect on marbled murrelet.***

1.4.3 US Forest Service Survey and Manage Species

Table FEIS3 presents impacts to US Forest Service Survey and Manage Species.

Table FEIS3:
Available Habitat for Okanogan and Wenatchee and Gifford Pinchot National Forest Survey and Manage Species Potentially Occurring within the White Pass Study Area by Alternative

Species	Alt. 1	Alt. 2	Mod. Alt. 4	Alt. 6	Alt. 9	Determination of Effects; All Alternatives
	(acres)	(acres)	(acres)	(acres)	(acres)	
Puget Oregonian (*Cryptomastix devia*)	522.5	522.5	500.8	518.7	487.2	May impact individuals but would not likely contribute to a trend toward federal listing
Warty jumping-slug (*Hemphillia glandulosa*)	522.5	522.5	500.8	518.7	487.2	May impact individuals but would not likely contribute to a trend toward federal listing
Keeled jumping-slug (*Hemphillia burringtoni*)	522.5	522.5	500.8	518.7	487.2	May impact individuals but would not likely contribute to a trend toward federal listing
Blue-gray taildropper (*Prophysaon coeruleum*)	569.7	550.2	548	565.9	534.4	May impact individuals but would not likely contribute to a trend toward federal listing

Table FEIS3:
Available Habitat for Okanogan and Wenatchee and Gifford Pinchot National Forest Survey and Manage Species Potentially Occurring within the White Pass Study Area by Alternative

Species	Alt. 1	Alt. 2	Mod. Alt. 4	Alt. 6	Alt. 9	Determination of Effects; All Alternatives
	(acres)	(acres)	(acres)	(acres)	(acres)	
Larch Mountain Salamander (*Plethodon larselli*)	575.0	555.3	553.3	571.2	539.3	May impact individuals but would not likely contribute to a trend toward federal listing
Van Dyke's Salamander (*Plethodon vandykei*)	216.8	216.8	192.0	214.8	195.3	May impact individuals but would not likely contribute to a trend toward federal listing
Great Gray Owl (*Strix nebulosa*) Nesting habitat	510.7	510.7	489	506.9	475.4	No impacts to this species are expected to occur.
Great Gray Owl Forgaing habitat	988.4	968.7	987.1	976.6	984.0	
Long-legged myotis (*Myotis volans*)	1,454.8	1,435.1	1,423.5	1,439.5	1,419.5	May impact individuals but would not likely contribute to a trend toward federal listing.
Long-eared myotis (*Myotis evotis*)	522.5	522.5	500.8	518.7	487.2	May impact individuals but would not likely contribute to a trend toward federal listing.
Silver-haired bat (*Lasioycteris noctivagans*)	327.0	327.0	317.4	323.3	301.8	May impact individuals but would not likely contribute to a trend toward federal listing
Fringed myotis (*Myotis thysanodes*)						
Pallid bat						

Alternative 1

Under Alternative 1, White Pass would continue to operate without any further development. Overcrowding on existing ski slopes would continue to be an issue. People would continue to ride the lift to the ski area boundary and hike out to Hogback Basin to ski, resulting in a low level of noise and human activity in the proposed expansion area. Under Alternative 1, suitable nest trees could be removed through general maintenance of ski trails and hazard reduction. ***No additional impacts would occur to Survey and Manage Species under Alternative 1.***

Alternative 2

As discussed in Section 1.2.4, surveys for **terrestrial mollusks** were conducted in 1999 with none found. Therefore, these species have a status of "not detected" and although absence cannot absolutely be determined, these species are unlikely to occur within the proposed expansion area. ***Therefore, impacts to terrestrial mollusks under Alternative 2 are not expected to occur.***

As discussed in Section 1.2.4, no suitable habitat for **Larch Mountain salamander** and **Van Dyke's salamander** exists at the higher elevations of the proposed expansion area. ***Therefore, impacts to these species are not expected to occur under Alternative 2.***

As explained in Section 1.2.5, the **great gray owl** depends upon mature forest habitat, especially closed canopy forest. This habitat is not found within the proposed expansion area in the Hogback Basin (refer to Figure 3-35). Mature open canopy forest with potential for large snags may also be used by great gray owls; however, large snags are generally unavailable within the proposed expansion area because it is composed of a small tree, single-story, moderate canopy mountain hemlock parkland forest (refer to Figure 3-35).

Construction of trails and lifts under Alternative 2 would not reduce any suitable nesting habitat as all potential nesting habitat is located within the existing SUP ski area. However, the proposed expansion area contains suitable foraging habitat for this species. Under Alternative 2 approximately 19.7 acres of potential foraging habitat would be directly impacted by construction activities such as increased noise and human activity in the area. These impacts would be considered short-term, however, because cleared ski trails represent suitable foraging habitat for this species.

Because no great gray owls were detected during surveys, conducted to current protocol in 1997, they are not expected to occur in the White Pass Study Area and no ski area operational impacts to great gray owls are anticipated within the White Pass Study Area. There is a possibility that an increase in disturbance to great gray owls potentially occurring in areas outside of the White Pass Study Area may occur as a result of increased recreation. These would be short-term and incidental impacts that are not quantifiable, since there are no known occurrences of great gray owls in the vicinity. ***Therefore, impacts to great gray owl under Alternative 2 are not expected to occur.***

Clearing of late-seral forest would impact habitat for the **long-legged myotis** and the **long-eared myotis**. These species are known to roost under loose tree bark, a characteristic of late-seral forest. These myotis species also utilize snags as roosting sites. Areas of full clearing within late-seral habitat would result in a reduction in the amount of roosting habitat available for these species. Snags would also be removed along edges of ski trails as a part of hazard tree management. Roosting habitat would therefore be reduced in these management areas and potential direct impacts could occur to individuals utilizing trees that are

removed. However, it is important to note that the proposed expansion area does not contain large trees or a dense canopy therefore, it does not provide high quality roosting habitat for these species.

Construction of chairlifts and ski trails would increase the amount of edge habitat within the White Pass Study Area thereby increasing the amount of potential foraging habitat for these species. Of the approximately 1,454.8 acres of foraging habitat available for the long-legged myotis, approximately 19.7 acres (1.4 percent) would be impacted under implementation of Alternative 2. Long-eared myotis, which tend to prefer more forested foraging habitat, have approximately 522.5 acres available habitat, none of which would be impacted under Alternative 2. ***Therefore, Alternative 2 may impact individuals but would not likely lead to a trend toward federal listing for the long-legged myotis and the long-eared myotis.***

Impacts to the **silver-haired bat** under Alternative 2 would occur from the reduction in late-seral forest. The silver-haired bat is known to roost under loose tree bark, a characteristic of late-seral forest. This species will also utilize snags as roosting sites. Areas of full clearing within late-seral forest habitat could result in a reduction in the amount of roosting habitat available for these species. Snags would also be removed from along the edges of ski trails as a part of hazard tree management. Roosting habitat could therefore be reduced in these management areas. However, Other Management Provision OMP6 would restrict the removal of snags and the management of hazard trees is only expected to require the removal of occasional, individual trees that present a danger to public safety, reducing the potential impacts to the silver-haired bat. Clearing for chairlifts and ski trails would increase the amount of edge habitat in the White Pass Study Area, thereby increasing the amount of potential foraging habitat for this species. ***Therefore, Alternative 2 may impact individuals but would not likely lead to a trend towards federal listing for the silver-haired bat.***

Modified Alternative 4

As discussed in Section 1.2.4, surveys for **terrestrial mollusks** were conducted in 1999 with none found. Therefore, these species have a status of "not detected" and although absence cannot absolutely be determined, these species are unlikely to occur within the proposed expansion area. Therefore, impacts to terrestrial mollusks in the higher elevation proposed expansion area are not expected to occur under Modified Alternative 4.

However, the proposed parking lot, which would be constructed adjacent to the base area may contain suitable habitat, although the likelihood of mollusk presence is low. There would be approximately 1 percent of impacts to available habitat for terrestrial mollusk species. Management Requirement MR9 would require surveys be performed for these species prior to any ground disturbing activities. Potential impacts to terrestrial mollusks from construction of the parking lot could include direct mortality of individuals and long-term loss of habitat. Trees cleared for construction of the parking lot would be scattered throughout the White Pass Study Area, thus providing additional habitat for these species.

Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend toward federal listing for terrestrial mollusks.

As discussed in Section 1.2.4, no suitable habitat for **Larch Mountain salamander** and **Van Dyke's salamander** exists at the higher elevations of the proposed expansion area. Therefore, impacts to these species in the higher elevation proposed expansion area are not expected to occur under Modified Alternative 4.

However, the proposed parking lot may contain potential habitat for these salamander species, although the likelihood of salamander presence is low. Management Requirement MR9 would require surveys be performed for these species prior to any ground disturbing activities. Potential impacts to Larch Mountain and Van Dyke's salamanders from construction of the parking lot could include direct mortality of individuals and long-term loss of habitat (approximately 5.9 percent of the suitable habitat available within the White Pass Study Area). Trees cleared for construction of the parking lot would be scattered throughout the White Pass Study Area, thus providing additional CWD habitat for these species. ***Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend toward federal listing for Larch Mountain salamander and Van Dyke's salamander.***

Impacts to **great gray owls** under Modified Alternative 4 would be similar to Alternative 2. The majority of the proposed trails and both of the proposed lifts would be installed in the mountain hemlock parkland in the proposed expansion area. This parkland does not provide the proper nesting habitat structure required by the great gray owl although it does provide suitable foraging habitat. Modified Alternative 4 would result in approximately 1.3 acres of impacts within suitable foraging habitat. In addition, approximately 21.7 acres of suitable nesting habitat would be directly impacted under Modified Alternative 4. The proposed egress trails, which would require the clearing of approximately 12.0 acres of small tree, multi-story, closed canopy mixed conifer forest, could potentially result in the disturbance of owls during construction. Long-term impacts to this species would be negligible because cleared ski trails represent suitable foraging habitat for the great gray owl. However, surveys have not found any evidence of owls in the area. ***Therefore, impacts to this species are not expected to occur.***

Impacts to the **long-legged myotis** and the **long-eared myotis** under Modified Alternative 4 would be similar to, but greater than, Alternative 2. Foraging habitat for the long-legged myotis would be reduced by approximately 31.3 acres (2.2 percent). Foraging habitat for the long-eared myotis would be reduced by approximately 21.7 acres (4.2 percent). ***Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend toward federal listing for the long-legged myotis and the long-eared myotis.***

Impacts to the **silver-haired bat** under Modified Alternative 4 would be similar to, but greater than, Alternative 2, because of the addition of the egress trail, ski trials, and the expanded parking lot

(approximately 9.6 acres, or 2.9 percent). Construction activities could lead to avoidance of the area as could ski area operations. Additional edge habitat created by ski trail clearing would result in a small increase in foraging habitat for this species. ***Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend towards federal listing for the silver-haired bat.***

Alternative 6

As discussed in Section 1.2.4, surveys for **terrestrial mollusks** were conducted in 1999 with none found. Therefore, these species have a status of "not detected" and although absence cannot absolutely be determined, these species are unlikely to occur within the proposed expansion area. Alternative 6 would impact approximately 0.7 percent of the habitat available for terrestrial mollusks within the White Pass Study Area. ***Therefore, Alternative 6 may impact individuals but would not likely lead to a trend toward federal listing for terrestrial mollusks.***

As discussed in Section 1.2.4, no suitable habitat for **Larch Mountain salamander** and **Van Dyke's salamander** exists at the higher elevations of the proposed expansion area. Therefore, impacts to these species in the higher elevation proposed expansion area are not expected to occur under Alternative 6. However, the proposed parking lot contains potential habitat for these salamander species. Management Requirement MR9 would require surveys be performed for these species prior to any ground disturbing activities. Potential impacts to Larch Mountain and Van Dyke's salamanders from construction of the parking lot could include direct mortality of individuals and long-term loss of habitat. Alternative 6 would impact approximately 0.7 percent of the habitat available within the White Pass Study Area for these species. Trees cleared for construction of the parking lot would be scattered throughout the White Pass Study Area, thus providing additional CWD habitat for these species. ***Therefore, Alternative 6 may impact individuals but would not likely lead to a trend toward federal listing for Larch Mountain salamander and Van Dyke's salamander.***

Impacts to **great gray owls** under Alternative 6 would be similar to Alternative 2. Approximately 3.8 acres of potential nesting habitat within the existing ski area and approximately 11.8 acres of potential foraging habitat within the proposed expansion area would be directly impacted due to construction activities. Increased noise and human activity resulting in potential avoidance of the area would be a short-term impact since cleared ski trails represent suitable foraging habitat for the great gray owl. As stated in Alternative 2, surveys conducted have not found any evidence that this species resides within the White Pass Study Area. ***Therefore, no impacts to great gray owl are expected to occur under Alternative 6.***

Impacts to the **long-legged myotis** and the **long-eared myotis** under Alternative 6 would be similar to, but greater than, Alternative 2. Foraging habitat for the long-legged myotis would be reduced by approximately 15.3 acres (1.1 percent), roughly 10 acres less than Alternative 2. Foraging habitat for the long-eared myotis would be reduced by approximately 3.8 acres (0.7 percent), more than Alternative 2,

which would not result in a reduction of habitat for this species. ***Therefore, Alternative 6 may impact individuals but would not likely lead to a trend toward federal listing for the long-legged myotis and the long-eared myotis.***

Impacts to the **silver-haired bat** under Alternative 6 would be greater than Alternative 2 because development would occur within the more heavily forested portions of the White Pass Study Area. Under Alternative 6 there is approximately 3.7 acres (1.1 percent) of the habitat available to this species within the White Pass Study Area. Construction activities could lead to avoidance of the area as could ski area operations. Additional edge habitat created by ski trail clearing would result in a small increase in foraging habitat for this species. Ski area operations could potentially lead to avoidance of the area due to increased noise and human activity. ***Therefore, Alternative 6 may impact individuals but would not likely lead to a trend towards federal listing for the silver-haired bat.***

Alternative 9

As discussed in Section 1.2.4, **terrestrial mollusks** are not expected to occur within the proposed expansion area due to habitat restrictions and lack of sightings during surveys conducted in 1999 (Leingang 1999). However, suitable habitat exists within the late-seral, multi-story closed canopy, mixed conifer forests of the existing ski area. Management Requirement MR9 would require additional surveys for these species be performed if Alternative 9 is selected. Alternative 9 would impact approximately 6.6 percent of the available terrestrial mollusk habitat within the White Pass Study Area.

Potential direct impacts to these species under Alternative 9 would include mortality of individuals from construction equipment and clearing. All trees cleared for development of ski trails and lifts would be retained on-site and used to enhance CWD habitat within the ski area which would create additional habitat for terrestrial mollusk species. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend toward federal listing for terrestrial mollusks.***

Impacts to **Larch Mountain salamander** and **Van Dyke's salamander** could occur under Alternative 9. As discussed in Section 1.2.4, potentially suitable habitat exists within the existing ski area and, should Alternative 9 be selected, Management Requirement MR9 would require surveys be performed for this species in all areas where disturbance may occur.

Direct amphibian mortality is possible where construction activity would be in or near forested or riparian areas. Construction equipment may crush any salamanders present in these areas, and disturbance to LWM could harm individual animals. The sedentary, subterranean lifestyle of this species may protect salamanders from direct impacts but leave them unable to find new habitat. Due to the limited mobility of this species, reduction in habitat area or change in edge microclimates could increase habitat fragmentation. Alternative 9 would impact approximately 7.2 percent of the available terrestrial

salamander habitat. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend toward federal listing for Larch Mountain salamander and Van Dyke's salamander.***

Impacts to the **great gray owl** under Alternative 9 would be greater than Alternative 2. The existing ski area contains elements of great gray owl nesting habitat such as a closed canopy and dense forests. Under Alternative 9 approximately 35.3 acres of potential nesting habitat and approximately 4.4 acres of foraging habitat within the White Pass Study Area would be cleared for development of ski trails and the *PCT* lift. This would be approximately 2.6 percent of the available habitat within the White Pass Study Area. These trails would be maintained for the life of the ski area thus resulting in long-term impacts to potential habitat to nesting habitat. However, cleared ski trails represent potential foraging habitat for great gray owls therefore, within the existing ski area, the suitable nesting habitat would be converted to suitable foraging habitat for this species.

In addition, ski trail maintenance requires the falling of hazard trees. Danger trees are typically snags and decaying trees that are too close to the ski trail and must be removed for public safety. Since these trees also provide excellent nesting habitat the removal of snags could potentially result in adult and/or infant mortality or nest abandonment. However, removal of danger trees is not expected to occur on a regular basis. OMP6 stipulates that removal would occur only when necessary to provide for public safety. In addition, downed snags would be left on site to provide additional forest habitat. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend towards federal listing for the great gray owl.***

Impacts to the **long-legged myotis** and the **long-eared myotis** under Alternative 9 would be greater than Alternative 2. Foraging habitat for the long-legged myotis would be reduced by approximately 35.3 acres (2.4 percent), roughly 15.6 acres less than Alternative 2. Foraging habitat for the long-eared myotis would be reduced by approximately 35.3 acres (6.8 percent), more than Alternative 2. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend toward federal listing for the long-legged myotis and the long-eared myotis.***

Impacts to the **silver-haired bat** under Alternative 9 would be greater than Alternative 2 because Alternative 9 would occur entirely within the heavily forested existing ski area as opposed to the mountain hemlock parkland of the proposed expansion area. Impacts could include the clearing of trees, thus the removal of potential roosting habitat and potential mortality of individuals. Approximately 35.3 acres of mixed conifer forest would be impacted under Alternative 9. In total, this would amount to 10.7 percent of the available habitat within the White Pass Study Area for this species. Development of ski trails would increase the amount of foraging habitat for these species. Ski area operations would potentially result in avoidance of the area however the new trails would be located within the existing ski area where a high level of human activity already occurs. Therefore, this species is not expected to occur

frequently. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend towards federal listing for the silver-haired bat.***

1.4.4 Forest Service Sensitive Species

Table 8 presents impacts to OWNF and GPNF Sensitive Species.

Table 8:
Available Habitat for Okanogan and Wenatchee and Gifford Pinchot National Forest Sensitive Species Potentially Occurring within the White Pass Study Area by Alternative

Species	Alt. 1 (acres)	Alt. 2 (acres)	Mod. Alt. 4 (acres)	Alt. 6 (acres)	Alt. 9 (acres)	Determination of Effects; All Alternatives
California wolverine (*Gulo gulo luteus*)	1,507.3	1,487.6	1,476.0	1,492	1,471.9	May impact individuals but would not likely contribute to a trend toward federal listing
Pacific western (Townsend's) big-eared bat (*Corynorhinus townsendii*) Foraging habitat	988.4	968.7	987.1	976.6	984.0	May impact individuals but would not likely contribute to a trend toward federal listing

Alternative 1

Under Alternative 1, White Pass would continue to operate without any further development. Overcrowding on existing ski slopes would continue to be an issue. People would continue to ride the lift to the ski area boundary and hike out to Hogback Basin to ski, resulting in a low level of noise and human activity in the proposed expansion area. Additionally, continued summertime use of the PCT would maintain human recreational presence in the area. Under Alternative 1, suitable nest trees could be removed through general maintenance of ski trails and hazard reduction. ***No additional impacts would occur to OWNF or GPNF Sensitive Species under Alternative 1.***

Alternative 2

Potentially suitable foraging and dispersal habitat for the **California wolverine** is present within the White Pass Study Area. The primary impact to wolverine could be the increase in human activity within the White Pass Study Area, as wolverines do not tolerate land use activities that permanently alter or fragment habitat and provide human access (Banci 1994). Short-term direct impacts include noise and activity associated with ski lift construction and ski trail clearing and grading. Noise and human presence associated with these activities may cause wolverine to avoid moving through the area.

Potential long-term direct impacts would result from increased winter recreational use of the area associated with the *Basin* and *Hogback Express* chairlifts and associated trails. In addition, ski trail grooming is often undertaken at night, resulting in almost continuous activity within the proposed expansion area during the winter ski season. Consequently, these activities may alter potential use of the area or lead to complete avoidance. Accordingly, Alternative 2 would further degrade the suitability of habitat available for wolverines within the White Pass Study Area by expanding wintertime recreation into habitat relatively undisturbed by human presence.

During the summer, ski lift and trail maintenance activities may have direct impacts on animals potentially moving through the area, as the associated noise and activity may alter use of the area. These activities would be expected to be of short duration with lift maintenance occurring on an annual basis and ski trail maintenance occurring less frequently. Alternative 2 would permanently remove approximately 19.7 acres of late-seral forested habitat (refer to the *Vegetation Technical Report and Biological Evaluation* in Appendix G). This would amount to approximately 1.3 percent of the available habitat within the White Pass Study Area for wolverine (refer to Table 8). Increased recreational use and maintenance activities could reduce the effectiveness of the White Pass Study Area for travel habitat. The continued presence of forested habitat to the south, east, and west of the White Pass Study Area would allow wolverines to move through the area, avoiding the White Pass Study Area; therefore, impacts would be expected to be limited to a modification in travel direction. ***Therefore, Alternative 2 may impact individuals but would not likely lead to a trend towards federal listing for the wolverine.***

Foraging habitat for **Pacific Western (Townsend's) big-eared bat** is present within the White Pass Study Area in the form of forest edges, roads, and forest openings. Forested dispersal habitat is also available. Alternative 2 would impact approximately 2.0 percent of the available habitat for this species within the White Pass Study Area (refer to Table 8). Construction associated with lift and trail development would increase noise and human activity within the area, which may disturb individuals that utilize the area. These construction-related impacts would be short-term disturbance.

Clearing would also result in the creation of additional edge to forest habitat, increasing the amount of foraging habitat available. Long-term impacts would include nighttime trail grooming within the White Pass Study Area, which could disturb foraging individuals, as this is a nocturnally foraging species.

Reproductive habitat for the Pacific Western (Townsend's) big-eared bat is absent within the White Pass Study Area, thus the disturbance caused by implementation of Alternative 2 would be limited to non-breeding individuals. ***Therefore, the Proposed Action may impact individuals but would not likely lead to a trend towards federal listing for the Pacific Western (Townsend's) big-eared bat.***

Modified Alternative 4

Under Modified Alternative 4, the potential impacts to **California wolverine** due to construction and ski area operations would be similar to, but slightly greater than, Alternative 2. Construction of ski trails and lift corridors would result in the elimination of approximately 21.5 acres of mountain hemlock parkland, roughly the same as Alternative 2 (refer to Figure 3-33). However, Modified Alternative 4 would also include the development of an egress trail through relatively undisturbed habitat. This trail would result in an additional 12.0 acres of clearing in small tree, multi-story, closed canopy mixed conifer forest just outside the existing ski area boundary (refer to the *Vegetation Technical Report and Biological Evaluation* in Appendix G). The parking lot proposed under Modified Alternative 4 would not be expected to have significant impacts to these species, as it would be constructed adjacent to the base area where a high level of human activity occurs year-round. Modified Alternative 4 would impact approximately 31.3 acres (2.1 percent) of habitat within the White Pass Study Area for wolverine. ***Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend towards federal listing for the California wolverine.***

Under Modified Alternative 4, impacts to **Pacific Western (Townsend's) big-eared bat** would be similar to, but less than Alternative 2. Impacts to habitat would amount to approximately 1.3 acres (0.1 percent) of that available within the White Pass Study Area. Additional edge (foraging) habitat would be created by the inclusion of the egress trail. ***Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend towards federal listing for the Pacific Western (Townsend's) big-eared bat.***

Alternative 6

Under Alternative 6, the potential impacts to **California wolverine** due to construction and ski area operations would be similar to, but fewer than, those described for Alternative 2. Alternative 6 would result in the clearing of approximately 11.3 acres forested habitat (refer to Figure 3-32). In addition, approximately 3.8 acres of forested habitat would be cleared for the development of a parking lot. Approximately 1 percent of the habitat available within the White Pass Study Area to wolverines would be impacted. As stated previously, however, this parking lot is not expected to result in significant impacts as it would be constructed adjacent to the base area which currently receives a high level of human activity. ***Therefore, Alternative 6 may impact individuals but would not likely lead to a trend toward federal listing for the California wolverine.***

Under Alternative 6, impacts to **Pacific Western (Townsend's) big-eared bat** would be similar to, but fewer than Alternative 2. Alternative 6 would impact approximately 1.2 percent of the available habitat within the White Pass Study Area. ***Therefore, Alternative 6 may impact individuals but would not likely lead to a trend towards federal listing for the Pacific Western (Townsend's) big-eared bat.***

Alternative 9

Under Alternative 9, the potential impacts to **California wolverine** due to construction and ski area operations would all occur within the existing ski area and not within the proposed expansion area. Alternative 9 would result in a loss of approximately 35.3 acres of forested habitat (refer to Figure 3-34). Alternative 9 would leave the proposed expansion area undeveloped resulting in increased habitat connectivity over the other Action Alternatives. Although Alternative 9 would impact approximately 2.3 percent of the available habitat within the White Pass Study Area for wolverines, by containing all of the proposed new trails and lift within the existing ski area Alternative 9 would concentrate the increased noise and human activity into an area that currently receives a high level of use. Although use of the Hogback Basin by backcountry skiers would continue to represent an intrusion on wolverine travel habitat, the localized containment of recreational activity would result in the fewest impacts to this species that is so highly sensitive to disturbance. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend toward federal listing for the California wolverine.***

Alternative 9 would result in the fewest impacts to **Pacific Western (Townsend's) big-eared bat** foraging habitat (approximately 0.4 percent). Alternative 9 would result in the fragmentation of late-seral forest within the existing ski area, thus increasing the amount of forest edge and increasing foraging habitat for Pacific Western big-eared bats. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend towards federal listing for the Pacific Western (Townsend's) big-eared bat.***

1.4.5 USFWS Species of Concern

Table 9 presents the impacts to USFWS Species of Concern.

Table 9:
Available Habitat for USFWS Species of Concern
Potentially Occurring within the White Pass Study Area by Alternative

Species	Alt. 1	Alt. 2	Mod. Alt. 4	Alt. 6	Alt. 9	Determination of Effects; All Alternatives
	(acres)	(acres)	(acres)	(acres)	(acres)	
Cascades Frog (*Rana cascadae*)	5.3	5.1	5.2	5.2	5.2	May impact individuals but would not likely contribute to a trend toward federal listing.
Olive-sided flycatcher (*Contopus borealis*)	1,235.9	1,216.2	1,192.7	1,220.8	1,200.6	May impact individuals but would not likely contribute to a trend toward federal listing.

Alternative 1

Under Alternative 1, White Pass would continue to operate without any further development. Overcrowding on existing ski slopes would continue to be an issue. People would continue to ride the lift to the ski area boundary and hike out to Hogback Basin to ski, resulting in a low level of noise and human activity in the proposed expansion area. Under Alternative 1, suitable nest trees could be removed through general maintenance of ski trails and hazard reduction. ***No additional impacts would occur to USFWS Species of Concern under Alternative 1.***

Alternative 2

As explained in Section 1.2.5, **Cascade frogs** are known to occur within the White Pass Study Area, having been observed on numerous occasions during fieldwork (Robinson, personal communication 2004; Forbes, personal communication 2004). Many of the ponds in which these frogs were observed are located within the existing ski area and they are assumed to be present within the wetlands of the proposed expansion area.

Total impacts to wetlands under Alternative 2 would be approximately 0.09 acre (approximately 1.7 percent of the available habitat for this species within the White Pass Study Area) which would consist of the trimming of shrub vegetation and removing any trees within the construction limits by cutting the tree flush to the ground (the stumps would not be removed), processing the tree by hand, and leaving all parts of the tree onsite (lop and scatter) (refer to Table 2.4-1). Potential impacts to these riverine wetlands from this clearing prescription would be minimized through implementation of Mitigation Measures MM8, and MM9 which would ensure that the surface of the wetland would not be graded, the natural ground cover would be maintained, and any tree removal would not cause incidental wetland impacts (refer to Table 2.4-2).

Under Alternative 2, there would be the potential for approximately 0.03 acre of grading impacts in wetlands within the White Pass Study Area, but there would likely be no long-term, direct impacts to wetlands due to grading. Implementation of MM1 requires that the project be designed to avoid the need for a Clean Water Act Section 404 permit (wetland fill) from the Army Corps of Engineers. The implementation of MM8 would also require the avoidance of grading impacts to wetlands during ski trail construction. The proposed clearing under Alternative 2 within riverine wetlands would have a long-term, direct impact on some of the functions of these wetlands, such as shading, nutrient and organic carbon cycling, and wildlife habitat. In addition, the potential for increased sediment delivery to wetlands would be increased during construction. Implementation of Management Requirements, Other Management Provisions, and Mitigation Measures would minimize the potential for these indirect impacts. ***Therefore, Alternative 2 may impact individuals but would not likely lead to a trend toward federal listing for the Cascade frog.***

Under Alternative 2, removal of late-seral forest habitat would also reduce the amount of nesting habitat available for **olive-sided flycatchers** within the White Pass Study Area. Under Alternative 2 approximately 19.7 acres (approximately 3.6 percent) of potential habitat for this species would be cleared for the development of ski trails, lifts, and the mid-mountain lodge. Potential direct impacts to olive-sided flycatchers include loss of nesting habitat and a localized reduction in the population. Loss of individual birds could occur during construction if vegetation was removed in suitable nesting habitat during the nesting season. Potential indirect impacts to olive-sided flycatchers may occur as a result of forest fragmentation, although this impact would not be as severe within the mountain hemlock parkland area. Increased fragmentation may contribute to increased nest predation by jays attracted to the edge habitat. These impacts to olive-sided flycatcher are expected to be short-term and occur during the year of construction. ***Therefore, Alternative 2 may impact individuals but would not likely lead to a trend toward federal listing for the olive-sided flycatcher.***

Modified Alternative 4

Impacts to **Cascade frogs** under Modified Alternative 4 would be similar to, but fewer than, Alternative 2. There would be approximately 0.12 acre of direct impacts to wetlands. However, with the implementation of Mitigation Measures MM9, MM1 and MM3 this 0.12 acre impact could be avoided, so that there would be no long-term, direct impacts to wetlands due to grading under Modified Alternative 4. ***Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend toward federal listing for the Cascade frog.***

Under Modified Alternative 4 impacts to **olive-sided flycatchers** would be similar to, but greater than, Alternative 2. Of the approximately 1,236 acres of habitat available to this species approximately 43.2 acres (3.5 percent) would be cleared for ski trails, lifts, the egress trail, and the parking lot (refer to Figure 2-4). ***Therefore, Modified Alternative 4 may impact individuals but would not likely lead to a trend toward federal listing for the olive-sided flycatcher.***

Alternative 6

Impacts to **Cascade frogs** under Alternative 6 would be similar to, but fewer than, Alternative 2. There would be approximately 0.11 acre of direct impacts to wetlands (2 percent). Under Alternative 6, there would be potential for 0.02 acre of grading impacts in wetlands within the White Pass Study Area. However, with the implementation of Mitigation Measures MM1, MM3, and MM9, this 0.02 acre impact could be avoided so that there would be no long-term, direct impacts to wetlands due to grading under Alternative 6. Therefore, Alternative 6 may impact individuals but would not likely lead to a trend toward federal listing for the Cascade frog.

Under Alternative 6 impacts to **olive-sided flycatchers** would be similar to, but less than, Alternative 2. Alternative 6 would include construction of one chairlift, rather than two, within the proposed expansion area. Of the approximately 1,236 acres of habitat available to this species approximately 15.1 acres would

be cleared for ski trails, lifts, the egress trail, and the parking lot (1.2 percent) (refer to Figure 2-6). Impacts to olive-sided flycatchers resulting from construction would include avoidance of the area. Ski area operations would not result in significant disturbance to this species. ***Therefore, Alternative 6 may impact individuals but would not likely lead to a trend toward federal listing for the olive-sided flycatcher.***

Alternative 9

Impacts to **Cascade frogs** under Alternative 9 would include approximately 0.07 acre of direct impacts to wetlands (1.3 percent of the available habitat for Cascade frogs within the White Pass Study Area), roughly 0.02 acre fewer than Alternative 2. Under Alternative 9, there would be potential for 0.05 acre of grading impacts in wetlands within the White Pass Study Area, with 0.04 acre of it occurring in the Upper Clear Fork Cowlitz Watershed and 0.01 acre of grading in the Upper Tieton Watershed. However, with the implementation of Mitigation Measures MM9, MM1 and MM3, these impacts could be avoided so that there would be no long-term, direct impacts to wetlands due to grading under Alternative 9. These Mitigation Measures would reduce impacts to wetlands through various limits on clearing and grading in the vicinity of wetlands and Riparian Reserves (refer to Table 2.4-2). Construction impacts to this species would include potential mortality of individuals due to the increase in human activity and the influx of large machinery. Long-term impacts to Cascade frogs are not expected to occur. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend toward federal listing for the Cascade frog.***

Under Alternative 9 impacts to **olive-sided flycatchers** would be greater than Alternative 2. Of the approximately 1,236 acres of habitat available to this species approximately 35.3 acres would be cleared for ski trails, lifts, the egress trail, and the parking lot; which is roughly 2.9 percent of the habitat available within the White Pass Study Area for this species (refer to Figure 2-8). Potential direct and indirect impacts would be as described under Alternative 2. ***Therefore, Alternative 9 may impact individuals but would not likely lead to a trend toward federal listing for the olive-sided flycatcher.***

1.4.6 USFS Management Indicator Species

Table 10 presents the impacts to USFS Management Indicator Species.

Table 10:
Available Habitat for Okanogan and Wenatchee and Gifford Pinchot National Forest Management Indicator Species Potentially Occurring within the White Pass Study Area by Alternative

Species	Alt. 1	Alt. 2	Mod. Alt. 4	Alt. 6	Alt. 9	Determination of Effects; All Alternatives
	(acres)	(acres)	(acres)	(acres)	(acres)	
Black-backed woodpecker (*Picoides arcticus*)	522.5	522.5	500.8	518.7	487.2	May impact individuals, but would not affect species viability in the project area
Black-tailed deer (*Odocoileus hemionus*), Mule deer (*O. h. hemionus*)	932.3 Foraging	912.6	909.4	924.1	932.2	May impact individuals, but would not affect species viability in the project area
	315.2 Cover	315.2	293.6	311.5	280.0	
Primary Cavity Excavators	522.5	522.5	500.8	518.7	487.2	May impact individuals, but would not affect species viability in the project area
Mountain goat (*Oreamnos americanus*)	522.5	522.5	500.8	518.7	487.2	May impact individuals, but would not affect species viability in the project area
Pileated woodpecker (*Dryocopus pileatus*)	522.5	522.5	500.8	518.7	487.2	May impact individuals, but would not affect species viability in the project area
Pine marten (*Martes americana*)	522.5	522.5	500.8	518.7	487.2	May impact individuals, but would not affect species viability in the project area
Rocky Mountain elk (*Cervus elephus nelsoni*); Roosevelt Elk (*C. e.*)	932.3 Foraging	912.6	909.4	924.1	932.2	May impact individuals, but would not affect species viability in the project area
	315.2 Cover	315.2	293.6	311.5	280.0	

Alternative 1

Under Alternative 1, White Pass would continue to operate without any further development. Overcrowding on existing ski slopes would continue to be an issue. People would continue to ride the lift

to the ski area boundary and hike out to Hogback Basin to ski, resulting in a low level of noise and human activity in the proposed expansion area. Under Alternative 1, suitable nest trees could be removed through general maintenance of ski trails and hazard reduction. ***No additional impacts would occur to USFS Management Indicator Species under Alternative 1.***

Alternative 2

Impacts to the **black-backed woodpecker** under Alternative 2 would be minimal. The proposed expansion area does not contain habitat typically associated with this species. Occasional individuals may occur from time to time in this area in which case they would most likely move elsewhere during construction activities. ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project area for black-backed woodpeckers.***

Impacts to **black-tailed deer** and **mule deer**, as well as **Roosevelt elk** and **Rocky Mountain elk** under Alternative 2 would be similar; therefore, they will be discussed together. Potential direct impacts to these species would include loss or conversion of cover habitat, a decrease in foraging habitat, and disturbance due to construction and increased human activity. Under Alternative 2, the amount of foraging habitat for these species would decrease by approximately 19.7 acres. This would occur as a result of converting late-seral habitat (cover) to a modified herbaceous condition (foraging) through ski trail construction, and clearing for chairlift construction. Alternative 2 would not result in the loss of any cover habitat for these species because the proposed lifts and trails would be constructed in the proposed expansion area where the landscape is comprised of small tree, single-story, moderate canopy mountain hemlock parkland. This landscape is naturally more open and provides less cover for deer and elk. These species are known to utilize the area and small islands of trees can serve as cover; however the development of ski trails in this area is not expected to have long-term impacts on cover habitat.

Direct short-term impacts to both elk and mule deer would include temporary displacement from specific areas during construction and the temporary loss of foraging habitat in areas disturbed by trenching for utility line installation. Direct long-term impacts to elk and deer may also occur as a result of disturbance from ski trail or lift maintenance. Deer and elk are not expected to calve within the White Pass Study Area due to late season snowpack; however adults and young will move into the area as summer progresses.

Indirect long-term impacts to elk and deer may occur if noxious weeds become established in areas disturbed by construction activities, leading to a long-term reduction of forage quality in the White Pass Study Area. This impact would be minimized through implementation of Management Requirement MR7, which provides various methods of noxious weed prevention measures (refer to Table 2.4-3 and Appendix O). ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project area for black-tailed deer, mule deer, Roosevelt elk, and Rocky Mountain elk.***

Impacts to **mountain goats** under Alternative 2 could occur through reduction in forested cover habitat since the White Pass Study Area does not contain any suitable cliff habitat for this species. However, the proposed expansion area does not contain dense canopy cover, which is an important source of thermal cover for mountain goats during the winter. This species is known to occur within the White Pass Study Area during the summer. Construction activities during the summer would result in increased noise and human activity, which would most likely lead to avoidance of the area during this time. ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project area for the mountain goat.***

The **pileated woodpecker** is expected to occur within the White Pass Study Area based on signs observed during field surveys. Their habitat is comprised of forests containing snags and downed logs. Suitable habitat for this species occurs within the late-seral forests of the existing ski area. The proposed expansion area is comprised of small tree, single-story, moderate canopy mountain hemlock parkland. It does not contain adequately sized CWD nor does it contain many suitable snags. However, pileated woodpeckers have been known to venture into this area from time to time. Alternative 2 is not expected to impact snag numbers due to the small number of acres that will receive some sort of activity (treatment) in terms of alteration from its current vegetative status. It is expected that natural processes would continue and that the 100 percent snag level would be the one expected to occur, except in the immediate vicinity of facilities, such as lift lines, lodges or other buildings. Impacts to this species under Alternative 2 would occur from the additional noise and human activity associated with construction activities. This would be a short-term impact since this species is not expected to be a regular visitor to the less suitable habitat available within the proposed expansion area. ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project area for the pileated woodpecker.***

Impacts to **primary cavity excavators** under Alternative 2 would be minimal, as Alternative 2 would take place outside of suitable nesting and foraging habitat. As described for pileated woodpeckers, primary cavity excavators potentially occurring within the White Pass Study Area are associated with dense canopy forests containing trees that are larger in size than those found within the proposed expansion area, which is made up of small tree, single-story, moderate canopy, mountain hemlock parkland. These species may occasionally venture into the proposed expansion area and may experience short-term impacts from the increased noise and human activity associated with construction and ski area operations; however, these impacts are expected to be limited to avoidance of an area that does not provide primary habitat. ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project area for primary cavity excavators.***

Construction activities such as noise and increased human presence could cause temporary disturbance and displacement of **pine marten** utilizing the White Pass Study Area. Martens are typically associated with dense canopy forest containing large amounts of downed wood to use for foraging and an abundant supply of snags used for denning. This type of habitat is available within the existing ski area but not

within the proposed expansion area, which contains the more scattered mountain hemlock parkland. This does not preclude the possibility that martens may utilize the proposed expansion area from time to time, potentially when dispersing. Therefore, impacts to pine martens from Alternative 2 are expected to be limited to disturbance of individuals that may use the proposed expansion area on occasion. Impacts would include avoidance of the area due to increased noise and human activity. Potential mortality of individuals could occur if snags are removed while individuals are utilizing them. Removal of snags could result in potential mortality of young or den abandonment. However, as stated previously, martens are not expected to regularly utilize the proposed expansion area. ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project area for pine marten.***

Modified Alternative 4

Impacts to the **black-backed woodpecker** under Modified Alternative 4 would be similar to those described under Alternative 2. However, Modified Alternative 4 would include the addition of an egress trail, ski trails within the existing ski area, and a 7-acre parking lot (refer to Figure 3-36). There would be approximately 21.7 acres of impact to black-backed woodpecker habitat under Modified Alternative 4. Impacts to this species would include the short-term impacts associated with construction activities, such as increased noise and human activity. Long-term impacts would occur as a direct loss of habitat from construction of the egress trail and disturbance of individuals from ski area activities. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability in the project area for the black-backed woodpecker.***

Impacts to **black-tailed deer**, **mule deer**, **Roosevelt elk**, and **Rocky Mountain elk** under Modified Alternative 4 would be similar to, but greater than, Alternative 2. Under Modified Alternative 4 the amount of foraging habitat for these species would decrease by approximately 22.9 acres, slightly higher than Alternative 2. This would occur as a result of converting late-seral habitat (cover) to a modified herbaceous condition (foraging) through ski trail construction, and clearing for chairlift construction. Modified Alternative 4 would also result in the loss of approximately 21.6 acres of forested cover habitat for these species due to clearing for lifts, trails, and development of the mid-mountain lodge (refer to Figure 3-37). However, as discussed under Alternative 2, the proposed lifts and trails would be constructed in the proposed expansion area where the landscape is comprised of small tree, single-story, moderate canopy mountain hemlock parkland. This landscape is naturally more open and provides less cover for deer and elk. These species are known to utilize the area and small islands of trees can serve as cover; however the development of ski trails in this area is not expected to have long-term impacts on cover habitat. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability in the project area for black-tailed deer, mule deer, Roosevelt elk, and Rocky Mountain elk.***

Impacts to **mountain goats** under Modified Alternative 4 would be as described under Alternative 2; however Modified Alternative 4 would result in additional impacts (approximately 21.7 acres (4.2 percent) of the habitat available within the White Pass Study Area) due to the addition of the egress trail,

ski trails within the existing ski area, and a 7-acre parking lot (refer to Figure 3-37). The egress trail would be constructed in suitable cover habitat for mountain goats. Therefore, construction activities could lead to short-term avoidance of the area. The White Pass Study Area does not provide suitable winter habitat for mountain goats. Therefore, there would be no impacts from ski area operations under Modified Alternative 4. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability in the project area for the mountain goat.***

Impacts to **pileated woodpecker** and **primary cavity excavators** under Modified Alternative 4 would be similar to, but greater than, Alternative 2 due to the addition of the egress trail, ski trails within the existing ski area, and a 7-acre parking lot. Clearing for these trails would require the removal of approximately 21.7 acres (4.2 percent) of the available habitat for this species within the existing ski area (refer to Figure 3-37). Impacts to this species would include the short-term impacts associated with construction activities such as increased noise and human activity. Long-term impacts would occur as a direct loss of habitat from construction of the egress trail and disturbance of individuals from ski area activities. In addition, maintenance of this trail would require the occasional removal of hazard trees. Since these trees provide suitable nesting habitat for pileated woodpeckers, this action could result in potential nest abandonment, injury or mortality of adults and nestlings. However, the Modified Alternative 4 is not expected to impact snag numbers due to the small number of acres that would receive some sort of activity (treatment) in terms of alteration from its current vegetative status. It is expected that natural processes would continue and that the 100 percent level of snags would be the one expected to occur, except in the immediate vicinity of facilities, such as lift lines, lodges or other buildings. As described in Section 1.2.6 the pileated woodpecker and other primary cavity excavators are not expected to occur regularly in the mountain hemlock parkland habitat that comprises the proposed expansion area. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability in the project area for pileated woodpeckers and primary cavity excavators.***

Impacts to the **pine marten** under Modified Alternative 4 would be similar to, but greater than, Alternative 2 due to the addition of the egress trail, ski trails within the existing ski area, and a 7-acre parking lot. Clearing for this trail would require the removal of approximately 21.7 acres (4.2 percent) of the available habitat for this species within the existing ski area (refer to Figure 3-37). Impacts to Pine marten would include the short-term impacts associated with construction activities such as increased noise and human activity. Long-term impacts would occur as a direct loss of habitat from construction of the egress trail and disturbance of individuals from ski area activities. In addition, maintenance of this trail would require the occasional removal of hazard trees. Since the trees in the vicinity of the egress trail provide suitable nesting habitat for pine marten, this action could result in potential nest abandonment, injury or mortality of adults and nestlings. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability for pine marten.***

Alternative 6

Impacts to the **black-backed woodpecker** under Alternative 6 would be similar to those described under Alternative 2. However, Alternative 6 would not include the addition of the *Hogback Express* lift in the Hogback Basin (refer to Figure 3-36). Clearing under Alternative 6 would result in the removal of approximately 11.3 acres of mountain hemlock parkland within the proposed expansion area (2.2 percent of the available habitat for this species within the White Pass Study Area). Impacts to this species would include the short-term impacts associated with construction activities such as increased noise and human activity. Long-term impacts resulting from operation use of the new trails would be minimal due to infrequent use of the area by this species. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for the black-backed woodpecker.***

Impacts to **black-tailed deer**, **mule deer**, **Roosevelt elk**, and **Rocky Mountain elk** under Alternative 6 would be similar to, but fewer than, Alternative 2. Under Alternative 6 the amount of foraging habitat for these species would decrease by approximately 8.2 acres, roughly 11.5 acres less than Alternative 2. This would occur as a result of converting late-seral habitat (cover) to a modified herbaceous condition (foraging) through ski trail construction, and clearing for chairlift construction. Alternative 6 would also result in the loss of approximately 3.7 acres of forested cover habitat for these species due to clearing for lifts, trails, and development of the mid-mountain lodge (refer to Figure 3-36). However, as discussed under Alternative 2, the proposed lifts and trails would be constructed in the proposed expansion area where the landscape is comprised of small tree, single-story, moderate canopy mountain hemlock parkland. This landscape is naturally more open and provides less cover for deer and elk. These species are known to utilize the area and small islands of trees can serve as cover; however, the development of ski trails in this area is not expected to have long-term impacts on cover habitat for these species. In addition, this species does not utilize the White Pass Study Area during the winter due to deep snow accumulation; therefore, impacts would be limited to the summer season. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for black-tailed deer, mule deer, Roosevelt elk, and Rocky Mountain elk.***

Impacts to **mountain goats** under Alternative 6 would be similar to, but greater than, Alternative 2 (approximately 3.8 acres, or 0.7 percent of the habitat available within the White Pass Study Area). Alternative 6 would reduce the number of lifts in the proposed expansion area from two to one. Short-term impacts to this species would occur during construction activities and summertime maintenance. These activities would occur during the summer months when mountain goats utilize a broader range of habitat. Impacts would include avoidance of the area due to increased noise and human activity. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for the mountain goat.***

Impacts to **pileated woodpecke**r and **primary cavity excavators** under Alternative 6 would be similar to, but fewer than, Alternative 2. Approximately 3.8 acres of forested habitat (0.7 percent of the available

habitat for this species) would be impacted under this Alternative. As discussed under Alternative 2, the proposed expansion area does not contain high quality nesting and foraging habitat for these species and therefore, impacts under Alternative 6 are expected to be minimal. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for pileated woodpeckers and primary cavity excavators.***

Impacts to the **pine marten** under Alternative 6 would be similar to, but fewer than, Alternative 2. Approximately 3.8 acres of forested habitat (0.7 percent of the available habitat for this species) would be impacted under this Alternative. Occasional use of the proposed expansion area by this species could lead to potential impacts associated with construction and maintenance activities. Impacts would include the short-term impacts associated with construction activities such as increased noise and human activity. Long-term impacts to this species under Alternative 6 are expected to be minimal, as this species is not expected to be a frequent visitor to the upper elevations of the proposed expansion area. Construction of ski trails would result in additional noise and human activity. However, clearing for trails is expected to be minimal, as the trails would be designed to utilize existing openings in the mountain hemlock parkland. Long-term impacts resulting from operation use would be minimal due to infrequent use of the area by this species. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for pine marten.***

Alternative 9

Impacts to **black-backed woodpecker** under Alternative 9 would be greater than Alternative 2. Under Alternative 9 approximately 35.3 acres (6.8 percent) of forested habitat within the existing ski area would be cleared for development of ski trails, the *PCT* lift, and parking lot. Direct impacts would occur to this species during construction activities due to increased noise and human activity in the area. In addition, operational impacts during the winter season would increase the noise and human activity in the area, which could potentially lead to avoidance of the area. However, as discussed in Section 3.6.2, the black-backed woodpecker is not expected to occur regularly within the White Pass Study Area. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for the black-backed woodpecker***.

Impacts to **black-tailed deer**, **mule deer, Roosevelt elk**, and **Rocky Mountain elk** under Alternative 9 would be greater than Alternative 2. Construction activities would temporarily affect deer and elk in the vicinity. Under Alternative 9, approximately 0.1 acre of foraging habitat would be impacted and approximately 35.2 acres of forested cover habitat would be impacted due to construction of trails, the *PCT* lift, and the parking lot. Disturbance would be likely to occur as a result of construction activities, such as the use of heavy equipment, increased human activity, and increased noise. Since these species are highly mobile, they are capable of moving away from localized disturbances. Continued disturbance over an extended period of time, however, can cause these species to alter their behavior, including displacing them from otherwise suitable foraging and cover habitat available in the White Pass Study

Area. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for black-tailed deer, mule deer, Roosevelt elk, and Rocky Mountain elk.***

Impacts to forested cover habitat for **mountain goats** would occur under Alternative 9. The existing ski area does not contain suitable cliff habitat for this species but it does contain dense canopy forest, which mountain goats utilize for cover and thermal protection. Under Alternative 9, approximately 35.3 acres of potential cover habitat (6.8 percent) would be cleared for development of trails, the *PCT* lift, and the parking lot. Impacts due to noise and increased human activity could occur during construction and during summertime maintenance activities. The increase in activity could result in avoidance of the area by mountain goats, which would seek out an undisturbed location. Long-term impacts due to ski area operations are not expected as this species does not occur in the White Pass Study Area during the winter. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for the mountain goat***.

Impacts to **pileated woodpecker** and **primary cavity excavators** under Alternative 9 would result from the clearing of approximately 35.3 acres (6.8 percent) of forested habitat within the existing ski area (refer to Figure 3-37). Long-term impacts to pileated woodpeckers and primary cavity excavators would include the permanent removal of late-seral forest, which would reduce the amount of habitat available for this species. This would result in long-term reduction both through the reduction in the amount of recruitment habitat for snags and from increasing the amount of area subject to hazard tree management. Habitat would be permanently lost within areas of full clearing with or without grading. Snags that are felled and left on the forest floor would lose value as nesting habitat but they would retain value as foraging habitat and contribute to CWD in the area. Nesting, depending on the location, could be directly impacted by construction if nest trees are removed or nearby construction causes enough noise and disturbance to result in nest abandonment. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for pileated woodpeckers and primary cavity excavators.***

Pine marten are known to use mature forest in the White Pass Study Area as described in Section 1.2.6. Approximately 35.3 acres of forested habitat (6.8 percent of the available habitat for this species) would be impacted under this Alternative. Clearing of mature forest would result in a decrease in the amount of denning, foraging, and travel habitat available for this species. Removal of snags in cleared areas and forested areas adjacent to new ski trails, and parking lots would also reduce the amount of denning habitat available to this species. Direct impacts from construction could include mortality of adults and/or young as well as den abandonment during the clearing of forested habitat. In addition, construction activities would result in short-term impacts such as increased noise and human activity, which would lead to avoidance of the area while such activities take place. Operational impacts could result in similar avoidance as martens seek areas less frequented by humans. Alternative 9 would result in increased fragmentation of medium tree, closed canopy, multi-story mixed conifer forest; more so than Alternative 2 which would primarily utilize the natural openings in the mountain hemlock parkland of the proposed

expansion area (refer to the *Vegetation Technical Report and Biological Evaluation* in Appendix G). Timber cleared from new ski trails would be left on site to provide CWD which would benefit marten, by providing additional denning, foraging, and security habitat. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for pine marten.***

1.4.7 Species of Local Concern

Table 11 presents the impacts to USFS Species of Local Concern.

Table 11:
Available Habitat for Species of Local Concern Potentially Occurring within the White Pass Study Area by Alternative

Species	Alt. 1	Alt. 2	Mod. Alt. 4	Alt. 6	Alt. 9	Determination of Effects; All Alternatives
	(acres)	(acres)	(acres)	(acres)	(acres)	
Neotropical Migratory Birds[a]	1,507.3	1,487.6	1,466.1	1,492.0	1,468	May impact individuals, but would not affect species viability in the project area
Blue Grouse (*Dendragapus obscurus*)	1,454.8	1,435.1	1,423.5	1,439.5	1,419.5	May impact individuals, but would not affect species viability in the project area
White-tailed ptarmigan (*Lagopus leucurus*)	654.4	634.7	632.9	643.1	654.4	May impact individuals, but would not affect species viability in the project area

[a] Neotropical Migratory Birds occupy a variety of habitats; therefore, the entire SUP, with the exception of developed areas, was considered to be habitat for this group as a whole.

Alternative 1

Under Alternative 1, White Pass would continue to operate without any further development. Overcrowding on existing ski slopes would continue to be an issue. People would continue to ride the lift to the ski area boundary and hike out to Hogback Basin to ski, resulting in a low level of noise and human activity in the proposed expansion area. Under Alternative 1, suitable nest trees could be removed through general maintenance of ski trails and hazard reduction. ***No additional impacts would occur to Other Species of Interest under Alternative 1.***

Alternative 2

Forty-one species of **Neotropical migratory birds** may occur in the mature forest habitat in the White Pass Study Area (refer to Table 5). Removal of forested habitat in the White Pass Study Area would result in a decrease in the amount of nesting habitat available for these species. Forest fragmentation may also result in an increase in nest predation since nest predators such as jays are attracted to edge habitat. Five of these species (golden-crowned kinglet, solitary vireo, chipping sparrow, rufous hummingbird, and Wilson's warbler) have been identified as having declining populations (Andelman and Stock, 1994) (refer to Table 5). Decreases in nesting habitat availability and increases in nest predation in the White Pass Study Area may incrementally contribute to these trends. Potential direct impacts to these species may occur as a result of clearing and construction activities during the nesting season, potentially resulting in nestling mortality. ***However, while Alternative 2 May impact individuals, but would not affect species viability in the project area for neotropical migratory birds.***

Impacts to **blue grouse** under Alternative 2 would include the clearing of approximately 19.7 acres of mountain hemlock parkland, roughly 1.4 percent of the available habitat for this species within the White Pass Study Area. Blue grouse tend to frequent lower elevations during the summer; however, they migrate to higher elevations during the winter and therefore, could be directly impacted by ski area operations. The open nature of the proposed expansion area may invite skiers to explore off-trail, leading to potential disturbance of foraging individuals and potential injury due to collision. Because they tend to prefer lower elevations during the summer, blue grouse are not expected to experience significant impacts from construction or summertime maintenance activities. ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project for the blue grouse.***

Impacts to the **white-tailed ptarmigan** under Alternative 2 would include the clearing of approximately 19.7 acres of mountain hemlock parkland, roughly 3.0 percent of the available habitat for this species within the White Pass Study Area. Construction and ski area maintenance activities during the summer could result in nest abandonment, as well as, adult and/or nestling mortality. Impacts from construction activities would be short-term in nature. During the winter, ski area operations would potentially lead to avoidance of the area due to increased noise and human activity. ***Therefore, Alternative 2 May impact individuals, but would not affect species viability in the project area for the white-tailed ptarmigan.***

Modified Alternative 4

Impacts to **Neotropical migratory birds** under Modified Alternative 4 would be similar to, but greater than, those described under Alternative 2. Modified Alternative 4 would result in greater impacts to Riparian Reserves (RR) than Alternative 2, which could mean greater potential impacts (i.e., disturbance, nest abandonment, individual mortality) to species utilizing RR for foraging or nesting. Impacts to Neotropical migratory birds from ski area operations could include avoidance of the area due to increased noise and human activity. Construction of the parking lot in the base area could potentially lead to nest

abandonment and mortality of adults and/or young. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability in the project area for neotropical migratory birds.***

Impacts to **blue grous**e under Modified Alternative 4 would be similar to, but greater than, those described under Alternative 2. Under Modified Alternative 4, clearing of approximately 31.3 acres of habitat would occur as a result of construction of the ski trails, facilities and parking lot (refer to Figure 3-37). Approximately 2.2 percent of the available habitat within the White Pass Study Area for this species would be impacted. Impacts to blue grouse within the proposed expansion area would be as described under Alternative 2. Additionally, construction of the parking lot in the late-seral forest near the base area could potentially result in disturbance and mortality of blue grouse during the summertime. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability in the project area for the blue grouse.***

Impacts to the **white-tailed ptarmigan** under Modified Alternative 4 would include construction and ski area maintenance activities during the summer, which could result in nest abandonment, as well as, adult and/or nestling mortality. Approximately 21.5 acres of (3.3 percent) of habitat would by impacted under Modified Alternative 4, slightly more than under Alternative 2. Impacts from construction activities would be short-term in nature. During the winter, ski area operations would potentially lead to avoidance of the area due to increased noise and human activity. ***Therefore, Modified Alternative 4 May impact individuals, but would not affect species viability in the project area for the white-tailed ptarmigan.***

Alternative 6

Impacts to **Neotropical migratory birds** under Alternative 6 would be similar to, but fewer than, those described under Alternative 2. Alternative 6 would include the construction one chairlift instead of two thus reducing the duration of construction activities within the proposed expansion area; therefore, there would be fewer disturbances to these species as a result of increased noise and human activity within the White Pass Study Area. Clearing for lift terminals and ski trails could potentially result in nest abandonment and nestling mortality. Impacts from ski area operations would most likely be limited to an avoidance of the area due to increased noise and human activity. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for Neotropical migratory birds.***

Impacts to **blue grouse** under Alternative 6 would be similar to, but fewer than, those described under Alternative 2. Under Alternative 6, clearing of approximately 15.3 acres (1.1 percent) of habitat would be impacted (refer to Figure 3-36). Impacts to blue grouse within the proposed expansion area would be as described under Alternative 2. Additionally, construction of the parking lot in the late-seral forest near the base area would potentially result in disturbance and mortality of blue grouse during the summertime. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for the blue grouse.***

Impacts to **white-tailed ptarmigan** under Alternative 6 would be similar to, but fewer than, those described under Alternative 2. Under Alternative 6, clearing of approximately 11.3 acres of habitat would be impacted (refer to Figure 3-36). In total, this would amount to 1.7 percent of the available habitat within the White Pass Study Area for this species. Impacts to white-tailed ptarmigan within the proposed expansion area would be as described under Alternative 2. ***Therefore, Alternative 6 May impact individuals, but would not affect species viability in the project area for the white-tailed ptarmigan.***

Alternative 9

Impacts to **Neotropical migratory birds** under Alternative 9 would be similar to those described under Alternative 2, however development would occur within the medium tree, closed canopy, multi-story mixed conifer forest within the existing ski area (refer to the *Vegetation Technical Report and Biological Evaluation* in Appendix G). Impacts to these species from construction activities would include potential nest abandonment and nestling mortality, loss of breeding habitat, and avoidance of the area due to increased noise and human activity. Increased forest fragmentation could result in an increase in predation for some species and an increase in foraging habitat for other species. Ski area operations would potentially lead to avoidance of the area. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for Neotropical migratory birds.***

Impacts to **blue grouse** under Alternative 9 would include the clearing of approximately 35.3 acres of forested habitat within the existing ski area, the most of any alternative (refer to Figure 3-38). In total, this would amount to 2.4 percent of the available habitat within the White Pass Study Area for this species. Impacts resulting from construction and summer maintenance activities as well as wintertime ski area operations would all potentially occur within this area. These impacts could include potential nest abandonment and mortality of individuals, as well as avoidance of the area. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for the blue grouse.***

Impacts to the **white-tailed ptarmigan** under Alternative 9 would be minimal. As described in Section 1.2.7 the white-tailed ptarmigan is not expected to occur frequently in heavily forested areas, as it prefers open tundra above timberline. ***Therefore, Alternative 9 May impact individuals, but would not affect species viability in the project area for the white-tailed ptarmigan.***

Habitat Connectivity

Habitat connectivity and fragmentation refer to the size, quality, and spatial arrangement of patches of a species' habitat across the landscape, particularly the number and arrangement of these patches as they relate to the dispersal of organisms. All of the projects listed in Tables 12 and 13 below would affect habitat connectivity to varying degrees. Ongoing and future projects occurring in and around previously developed areas that currently receive a high level of human activity would continue to limit the use of some portions of those areas by wildlife.

Late-seral forest habitat has been identified as an important area of habitat connectivity for wide-ranging species such as northern spotted owl, pine marten, and pileated woodpecker. Low mobility wildlife species, such as terrestrial mollusks, also depend on microhabitats provided by late-seral forest. Construction of a chairlift and ski trails within this type of forest has the potential to impact habitat connectivity by reducing the available connective habitat, increasing edge habitat, decreasing interior habitat, creating potential barrier affects, and increasing human activity, which in turn increases potential disturbance to animals moving through the area. Low mobility species would not be as able to move and avoid these impacts as high mobility species would be. Therefore, the impacts to connectivity would be greater for the low mobility species.

As mentioned in Section 1.4, the proposed expansion area represents previously undisturbed travel habitat (the mountain hemlock parkland community) that could provide connectivity for many wildlife species that occur in the OWNF and GPNF. While the vegetation community may be undisturbed, existing human recreational presence (e.g., PCT users and backcountry skiers) may deter the use of the area for some species sensitive to human presence such as gray wolf and wolverine. Construction of chairlifts and ski trails within this area has the potential to impact wildlife habitat connectivity by reducing the available connective habitat, creating potential barrier affects, and increasing human activity, which in turn increases potential disturbance to animals moving through the area.

Modified Alternative 4 would have the greatest potential impact to habitat connectivity of all the Action Alternatives because it would result in removal of the greatest amount of mountain hemlock parkland in the proposed expansion area as well as introduce development and increased recreational activity to a previously undisturbed area. However, because the nature of parkland habitat is to contain tree islands and treeless openings the primary impact to habitat connectivity would occur as a result of the intrusion of recreational activity into this previously undisturbed habitat and not necessarily as a result of forested parkland removal. In addition, the majority of increased activity within the proposed expansion area would occur during the winter when most species are not present or dispersing through the area.

Alternative 9 would result in the greatest amount of fragmentation of dense forest of all the Action Alternatives as it occurs entirely within the existing ski area. Late-seral forest would be removed in order to create new ski trails and lift lines. This fragmentation would potentially affect interior forest dwelling species that depend on forest cover for travel and safety. Species unwilling to cross open areas such as ski trails may find themselves limited to a small patch of forest within the ski area. Due to the current level of activity within the existing ski area it is expected that many species avoid passing through the area except on an occasional basis. However, human activity is generally limited to the winter months with summertime activity consisting primarily of ski area maintenance and existing sources of human recreational activity (e.g., PCT trail, campgrounds, etc.). Therefore, increased fragmentation within the existing ski area under Alternative 9 would most likely result in an alteration of travel direction as animals skirt around the area. Potential side affects of this alteration of travel direction could result in an

increase of animals that move north toward US 12 thereby increasing the potential for vehicle collisions and mortality.

The construction of chairlifts and ski trails would reduce the overall amount of undisturbed habitat in the proposed expansion area. Increases in human activity associated with chairlift and ski trail development may reduce the effectiveness of the area as travel habitat, particularly for species sensitive to human activity. Short-term direct impacts include noise and activity associated with ski lift construction and ski trail clearing and grading. Noise associated with these activities and human presence may cause animals to avoid moving through the area. Potential long-term direct impacts (e.g., area avoidance) would result from increased winter recreational use of the area associated with *Basin* and *Hogback Express* chairlifts and ski trails. In addition, ski trail grooming is often accomplished at night, and noise and light from this activity, particularly in the new proposed pods may alter use of the area by nocturnal species.

During the summer ski lift and trail maintenance activities may have direct impacts on animals potentially moving through the area, as the associated noise and activity may alter use of the area. These activities would be expected to be of short duration with lift maintenance occurring on an annual basis and ski trail maintenance occurring less frequently, as vegetation growth rates are slow.

1.4.8 Cumulative Effects

As described in Section 3.0 - Introduction, cumulative effects to wildlife are considered at the site scale (White Pass Study Area) and the Cumulative Effects Analysis Area (CEAA). The CEAA is comprised of two fifth field watersheds: the Upper Tieton watershed and the Upper Clear Fork Cowlitz watershed. A list of projects occurring within the Upper Clear Fork Cowlitz watersheds (refer to Table 3.6-13) and the Upper Tieton (refer to Table 3.6-14) and the impact to wildlife are presented below.

The alteration of vegetation communities described in Section 3.5 – Vegetation has the potential to impact wildlife habitat. For purposes of this analysis, cumulative impacts could result from both long-term and short-term losses of wildlife habitat. A long-term loss of wildlife habitat occurs when the native vegetation community is not easily replaced. For example, the removal of forested habitat is a long-term impact as the re-growth of the forest occurs on the order of decades. Similarly, the creation of new impervious surfaces in any community type results in the long-term loss of wildlife habitat. Short-term losses of habitat occur when herbaceous and shrub communities are disturbed, but are ultimately revegetated in a short (1-2 years) period of time. A second type of short-term cumulative impact occurs during construction phases of the various actions described in Tables 3.6-13 and 3.6-14. During this phase, noise generated by equipment and the increased human presence can impact wildlife in the vicinity of the action. This typically leads to avoidance behaviors by wildlife species and may disrupt normal behavioral patterns. This type of impact typically dissipates following the completion of construction activities as noise returns to background levels.

Table 3.6-13:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Clear Fork Cowlitz Watershed on Wildlife

Project Number	Project Name	Cumulative Effects
UCFC-3a	Palisades Scenic Viewpoint Project	Approximately 0.5 acre of trees, shrub, and herbaceous wildlife habitat associated with the project footprint was removed. Implementation of this project had no temporal overlap with the proposed White Pass expansion as the project site is assumed to be stabilized. As the project occurred within an existing area of high human activity and associated disturbance to wildlife, this project is not expected to have had any long-term impacts to wildlife.
UCFC-3b	Palisades Scenic Viewpoint Project Vegetation Mgmt	Wildlife habitat would be impacted on approximately 1 acre where trees were felled. Wildlife may be displaced in the short-term during project implementation. There would be an overlap in time with the construction of the White Pass expansion. There is no spatial overlap with the White Pass Study Area. The effects to wildlife from this project would not be measurable at the 5th field scale. Implementation of the Action Alternatives, combined with the additional vegetation removal from this and other projects identified in this table, would cumulatively impact wildlife from additional loss of habitat and human activity at the 5th field watershed scale.
UCFC-4	Mt Rainier/Goat Rocks Scenic Viewpoint	Approximately 0.75 acre of stand treatment would be conducted along US 12. There would be an overlap in time with the construction of the White Pass expansion. There is no spatial overlap with the White Pass Study Area. The effects to wildlife from this project would not be measurable at the 5th field watershed scale. Implementation of the Action Alternatives, combined with the additional vegetation removal from this and other projects identified in this table, would cumulatively impact wildlife from additional loss of habitat and human activity at the 5th field watershed scale.
UCFC-5	White Pass Wildfire	The wildfire burned approximately 204 acres within the Upper Clear Fork Cowlitz watershed resulting in direct impacts to vegetation and associated wildlife habitat. In the eight years following the fire, it is expected that some natural regeneration has occurred. This project did not overlap the in space with the White Pass Study Area. Partial natural regeneration of the vegetation has occurred since the fire. In the long-term, the effects of the fire, coupled with the effects of the White Pass expansion and other project effects listed in this table, will contribute to a cumulative reduction in forest habitat at the 5th field watershed scale. With continued revegetation, the potential for long-term effects of this fire will be reduced.
UCFC-6	Knuppenberg Lake Bridge Removal	Beneficial effects to 0.24 acre of riparian habitat resulted from the removal of the bridge, improving riparian conditions in the long-term. Short-term impacts including disturbance of wildlife from human activity and noise associated with demolition did not overlap with the White Pass expansion. Long-term beneficial impact to wildlife from recovery of riparian areas would overlap with the effects of the White Pass expansion. While the project does not overlap in space with the White Pass Study Area, the beneficial impact to wildlife habitat would occur at the 5th field watershed scale.

Table 3.6-13:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Clear Fork Cowlitz Watershed on Wildlife

Project Number	Project Name	Cumulative Effects
UCFC-7	Wilderness Trail Maintenance	Short-term disturbance to wildlife would result from clearing and brushing, ground disturbance and structure maintenance. Short-term, seasonal increases in disturbance of wildlife along the trail would also result from improved human access. Trail maintenance effects on wildlife would overlap in time with the effects of the White Pass expansion as maintenance activities would occur during the summer months. While the effects of system trail maintenance do not overlap with the White Pass Study Area, noise from increased human presence during maintenance activities would impact wildlife within the White Pass Study Area and at the 5th field watershed scale.
UCFC-8	Ongoing Road Maintenance	Permanent direct impacts of up to 46.3 acres of forest and shrub wildlife habitat along the margins of existing roads would result from this project. During maintenance activity, human and equipment disturbance to wildlife from clearing, grading, and maintenance of stream crossings would directly affect wildlife. Long-term impacts are not expected to occur. Road maintenance would overlap in time with the construction of the White Pass expansion as construction activities would occur during the summer months. While the project does not overlap with the White Pass Study Area, increased noise from maintenance activities would cumulatively affect wildlife at the 5th field watershed scale.
UCFC-9	Camp Site Maintenance	Additional noise and human activity during maintenance activities within dispersed areas would lead to short-term avoidance of the area by wildlife. Campsite maintenance would overlap in time with the effects of the construction of the White Pass expansion as maintenance activities would occur during the summer months. Maintenance activities, including increased human presence, and associated noise at dispersed sites would impact wildlife within the White Pass Study Area and at the 5th field watershed scale.
UCFC-11	Air Quality Monitoring Building	Construction of this building resulted in a long-term loss of 0.02 acres of wildlife habitat. Implementation of this project had no temporal overlap with the proposed White Pass expansion as the project site is assumed to be stabilized. Spatially, this project occurred within the White Pass Study Area and results in a loss of wildlife habitat at the 5th field watershed scale combined with implementation of the Action Alternatives and other projects listed in this table.
UCFC-12	Rockfall Mitigation (between mileposts 143 and 149)	No long-term impacts to wildlife are expected to have resulted from this project as construction activities occurred within the US 12 right-of-way. Implementation of this project did not overlap in time with the proposed White Pass expansion. Spatially, this project occurs outside the White Pass Study Area, and did not contribute to a loss of wildlife habitat at the 5th field watershed scale because it is located within the previously modified US 12 corridor.

Table 3.6-13:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Clear Fork Cowlitz Watershed on Wildlife

Project Number	Project Name	Cumulative Effects
UCFC-14	Unstable Slope Repair Projects (between mileposts 145.61 and 145.77)	No long-term impacts to wildlife are expected to result from this project as construction activities will occur within the US 12 right-of-way. Implementation of this project will overlap in time with the proposed White Pass expansion. Spatially, this project occurs outside the White Pass Study Area, and will not contribute to a loss of wildlife habitat at the 5th field watershed scale because it is located within the previously modified US 12 corridor.
UCFC-15	Unstable Slope Repair Projects (between mileposts 141.8 and 144.4)	No long-term impacts to wildlife are expected to result from this project as construction activities occur within the US 12 right-of-way. Implementation of this project will not overlap in time with the White Pass expansion. Spatially, this project occurs outside the White Pass Study Area, and will not contribute to a loss of wildlife habitat at the 5th field watershed scale because it is located within the previously modified US 12 corridor.
UCFC-16	Highway 12 Hazard Tree Removal	Hazard tree removal will reduce or modify wildlife habitat for species dependant on snags and LWD. The effects of a portion of the project would overlap spatially with the effects of the White Pass expansion (i.e. US 12 at White Pass). As hazard tree removal would overlap in time with construction of the White Pass expansion, it would cumulatively add to the loss of wildlife habitat for species dependant on LWD and snags.
UCFC-17	White Pass Ski Area Yurt Construction	Long-term, direct impact to wildlife habitat resulted from approximately 0.01 acre of new impervious surfaces from construction of the yurt. Spatially, the effects of the yurt overlap with the White Pass expansion. The effects of the project had no temporal overlap with the White Pass expansion as the project site is assumed to be stabilized. As the project occurred within the White Pass Study Area, an existing disturbance to wildlife from human activity, this project is not expected to have had any long-term impacts to wildlife.
UCFC-18	Special Forest Product Permits	Short-term temporary impacts to wildlife (avoidance) would result from increased human presence during collection of boughs and beargrass. Spatially, this project would result in short-term disturbances to wildlife at the 5th field watershed scale when combined with construction activities (noise) for the White Pass expansion and other projects identified in this table. Temporally, annual collection of beargrass and boughs would overlap with construction of the White Pass expansion.
UCFC-20	Benton Rural Electric Association (REA) Power Line Maintenance	No new long-term impacts to wildlife habitat are expected to result from maintenance activities as the vegetation is maintained in a non-natural condition. Temporary noise impacts would potentially disturb wildlife during construction. Ongoing maintenance would overlap in time with the White Pass expansion and would cumulatively add to short-term noise disturbance to wildlife in the White Pass Study Area and at the 5th field watershed scale.

Table 3.6-14:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Tieton Watershed on Wildlife

Project Number	Project	Wildlife
UT-2	White Pass Ski Area Sewer Line Replacement	Approximately 0.73 acre of grading will occur, associated with the excavation of the trench and resulting in the loss of ground cover vegetation (habitat for wildlife) in the short-term. Also in the short-term, during construction, noise impacts may cause some wildlife to avoid the area. Project implementation and effects are expected to overlap in time and space with the effects of the White Pass expansion. No long-term effects to wildlife are expected because the disturbed soil areas will be immediately stabilized/ revegetated after construction and construction equipment will not be present upon completion of the project. Combined with the White Pass expansion and other projects identified in this table, this project would add to a cumulative, short-term loss of wildlife habitat within and outside of the White Pass Study Area within the 5th field watershed.
UT-3	White Pass Ski Area Generator Shed and Propane Tank	Approximately 0.004 acre of shrub and herbaceous wildlife habitat associated with the project footprint was removed. Implementation of this project had no temporal overlap with the proposed White Pass expansion as the project site is assumed to be stabilized. As the project occurred within the White Pass Study Area, an existing disturbance to wildlife from human activity, this project is not expected to have had any long-term impacts to wildlife.
UT-4	White Pass Ski Area Relocation of Chair 3 and Platter Lift	Approximately 0.01 acre of shrub and herbaceous wildlife habitat associated with the project footprint was removed. Implementation of this project had no temporal overlap with the proposed White Pass expansion as the project site is assumed to be stabilized. As the project occurred within the White Pass Study Area, an existing disturbance to wildlife from human activity, this project is not expected to have had any long-term impacts to wildlife.
UT-5	US Cellular Tower	Approximately 0.004 acre of shrub and herbaceous wildlife habitat associated with the project footprint was removed. Implementation of this project had no temporal overlap with the proposed White Pass expansion as the project site is assumed to be stabilized. As the project occurred within the White Pass Study Area, an existing disturbance to wildlife from human activity, this project is not expected to have had any long-term impacts to wildlife.
UT-6	White Pass Ski Area Restaurant/Condo Conversion	Approximately 0.25 acre of existing building footprint was removed and converted to condominiums. Spatially, the effects of the project overlap with the White Pass expansion. The effects of the project had no temporal overlap with the White Pass expansion as the project site is assumed to be stabilized. As the project occurred within the White Pass Study Area, an existing disturbance to wildlife from human activity, this project is not expected to have had any long-term impacts to wildlife.
UT-7	White Pass Ski Area Cross Country Yurt	Approximately 0.25 acre of existing disturbed area was redeveloped. Spatially, the effects of the yurt overlap with the White Pass expansion. The effects of the project had no temporal overlap with the White Pass expansion as the project site is assumed to be stabilized. As the project occurred within the White Pass Study Area, an area of existing disturbance to wildlife from human activity, this project is not expected to have had any long-term impacts to wildlife.

Table 3.6-14:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Tieton Watershed on Wildlife

Project Number	Project	Wildlife
UT-8	White Pass Ski Area Manager's Cabin	Approximately 0.25 acre of trees, shrub and herbaceous wildlife habitat associated with the project footprint was removed. Effects to wildlife from this project had no temporal overlap with the White Pass expansion as the project site is assumed to be stabilized. As the project occurred within the White Pass Study Area, an area of existing disturbance to wildlife from human activity, this project is not expected to have had any long-term impacts to wildlife.
UT-10	Dog Lake Campground/Four Trailhead Reconstruction	This project would impact approximately 1.0 acre of wildlife habitat, including Riparian Reserves within the 5th field watershed scale. As this project is anticipated to overlap in time with the proposed White Pass expansion, short-term impacts (avoidance) to wildlife would likely result from construction noise. No long-term impacts are expected to occur.
UT-11	Clear Creek Overlook Reconstruction	This project would impact approximately 1.0 acre of wildlife habitat through the reconstruction of an overlook and the addition of the interpretive trail. As this area is already heavily used by humans, this project would not result in an increase in disturbance to wildlife from increased human presence. The project effects do not overlap with the White Pass Study Area, however, it is anticipated that the loss of habitat would be realized at the 5th field watershed scale. As the effects of this project would overlap in time with effects of the White Pass expansion, there would be a cumulative short-term increase in construction noise disturbance to wildlife at the 5th field watershed scale.
UT-16	Trail 1106 Water Crossing	If a ford is constructed (instead of bridge replacement), up to 0.1 acre of vegetation will be removed to reroute the trail, resulting in the short-term loss of 0.1 acre of riparian wildlife habitat. In addition, short-term impacts to wildlife from increased human presence and associated noise during reconstruction activities may cause some wildlife to avoid the area. This project does not overlap spatially with the White Pass Study Area. Project implementation and effects are expected to overlap in time with the effects of the White Pass expansion. No long-term effects to wildlife are expected because the abandoned trail segment will be closed and allowed to revegetate. Combined with the White Pass expansion and other projects identified in this table, this project would add to a cumulative, short-term loss of wildlife habitat within the 5th field watershed.
UT-17	North Fork Tieton System Ski Trail Grooming	Trail grooming likely creates short-term noise disturbances to wildlife during winter months. Construction noise associated with the White Pass expansion would occur during summer months and would therefore not overlap in time or space with grooming noise. Following completion of the expansion, grooming of new ski trails would overlap in time with the North Fork Trail grooming and would likely add to short-term noise disturbance to wildlife during winter months.

Table 3.6-14:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Tieton Watershed on Wildlife

Project Number	Project	Wildlife
UT-18	Benton Rural Electric Association (REA) Power line Maintenance	Power line maintenance will spatially overlap with the White Pass Study Area and the 5th field watershed. No new long-term impacts to wildlife habitat are expected to result from maintenance activities as the vegetation is maintained in a non-natural condition. Temporary noise impacts would potentially disturb wildlife during construction. Ongoing maintenance would overlap in time with the White Pass expansion and would cumulatively add to short-term noise disturbance to wildlife within the White Pass Study Area and at the 5th field watershed scale.
UT-19	Highway 12 Hazard Tree Removal	Hazard tree removal will reduce or modify wildlife habitat for species dependant on snags and LWD. The effects of a portion of this project would overlap spatially with the effects of the White Pass expansion (i.e. US 12 at White Pass). As hazard tree removal would overlap in time with construction of the White Pass expansion, it would cumulatively add to the loss of wildlife habitat for species dependant on LWD and snags.
UT-20	Clear Lake Recreation Projects	This project would be constructed within the existing camp and would not result in the additional loss of wildlife habitat. Spatially, the effects of the project would not overlap with the effects of the White Pass expansion. It is expected that construction will result in short-term impacts to wildlife from construction related noise. It is expected that the effects of this project would overlap in time with the effects of the White Pass expansion resulting in a cumulative noise impact to wildlife in the 5th field.
UT-23	System Trail Maintenance	Short-term disturbance to wildlife would result from clearing and brushing, ground disturbance and structure maintenance. Short-term, seasonal increases in disturbance of wildlife along the trail would also result from improved human access. Trail maintenance effects on wildlife would overlap in time with the effects of the White Pass expansion as maintenance activities would occur during the summer months. While the effects of system trail maintenance do not overlap with the White Pass Study Area, noise from increased human presence during maintenance activities would impact wildlife within the White Pass Study Area and at the 5th field watershed scale.
UT-24	Snoqueen Mine	Ongoing mining operations are not expected to result in further impacts to habitat under the existing permit, but continuing operations would create ongoing noise disturbances to wildlife. There would be no overlap in space with construction of the White Pass expansion as the mine is located outside the White Pass Study Area. However, construction of the White Pass expansion would overlap in time with ongoing noise and cumulatively add to the noise disturbance to wildlife at the 5th field watershed scale.
UT-25	*Zig Zag* Nordic and Snowshoe Trails	Trail grooming likely creates short-term noise disturbances to wildlife during winter months. Construction noise associated the White Pass expansion would occur during summer months and would therefore not overlap in time or space with grooming noise. Following completion of the expansion, grooming of new ski trails would not overlap in time with grooming because use will have been discontinued on these trails.

Table 3.6-14:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Tieton Watershed on Wildlife

Project Number	Project	Wildlife
UT-26	Highway 12 Rock Stabilization (at Mile Post 155)	No long-term impacts to wildlife are expected to result from this project as construction activities will occur within the previously modified US 12 right-of-way. Implementation of this project would likely overlap in time with the proposed White Pass expansion. Spatially, this project occurs outside the White Pass Study Area, but is not expected to contribute to a loss of wildlife habitat at the 5th field watershed scale because it is located along US 12.
UT-27	Highway 12 Rock Stabilization (at Mile Post 155)	No long-term impacts to wildlife are expected to have resulted from this project as construction activities occurred within the previously modified US 12 right-of-way. Implementation of this project did not overlap in time with the proposed White Pass expansion. Spatially, this project occurs outside the White Pass Study Area, and did not contribute to a loss of wildlife habitat at the 5th field watershed scale because it is located along US 12.
UT-28	Camp Prime Time Accessible Trail, Wagon Ride Route and Tree House	This project would be constructed within the existing camp and would not result in the additional loss of wildlife habitat. It is expected that construction will result in short-term impacts to wildlife from construction related noise. It is expected that this project would overlap in time with the proposed White Pass expansion resulting in a cumulative noise impact to wildlife.
UT-29	Clear Lake Boat Launch Heavy Maintenance	This project would be constructed within the existing recreation area and would not result in the additional loss of wildlife habitat. It is expected that construction will result in short-term impacts to wildlife from construction related noise. It is expected that this project would overlap in time with the White Pass expansion resulting in a cumulative noise impact to wildlife.
UT-30	US Cellular Backup power at White Pass Communications Site	This project was implemented within the existing disturbed area and did not result in the additional loss of wildlife habitat. It is expected that this project would overlap in time with the White Pass expansion resulting in a cumulative noise impact to wildlife from occasional generator use.
UT-31	Cellular Phone Carrier Improvements at White Pass Communication Site	This project would be constructed within the existing disturbed area and would not result in the additional loss of wildlife habitat. It is expected that construction will result in short-term impacts to wildlife from construction related noise. It is expected that this project would overlap in time with the proposed White Pass expansion resulting in a cumulative noise impact to wildlife.
UT-32	Camp Site Maintenance	Additional noise and human activity during maintenance activities would lead to short-term avoidance of the areas. Camp maintenance would overlap in time with the construction of the White Pass expansion as maintenance activities would occur during the summer months. Maintenance activities, including increased human presence and associated noise, would impact wildlife within the White Pass Study Area and at the 5th field watershed scale.

Table 3.6-14:
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Upper Tieton Watershed on Wildlife

Project Number	Project	Wildlife
UT-35	Unstable Slope Repair Projects (between Mile Posts 161.93 and 165.02)	No long-term impacts to wildlife are expected to result from this project as construction activities will occur within the previously modified US 12 right-of-way. The disturbance effects of this project do not overlap with the effects in the White Pass Study Area, but are expected to overlap in time with the effects of the White Pass expansion. The project will not contribute to a loss of wildlife habitat at the 5th field watershed scale because it is located along US 12.

As described in Tables 3.6-14 and 3.6-15, projects occurring within each 5th field watershed of the CEAA would cumulatively impact wildlife through short-term noise disruptions, increased human activity, and long-term losses of habitat. At the site scale, the projects described in the tables would cumulatively impact wildlife habitat over approximately 4.8 percent of the White Pass Study Area (refer to Table 3.6-15). Combined with the implementation of the White Pass Expansion, impacts to wildlife would occur over a maximum of 7.6 percent of the site scale. However, because the site scale includes an existing ski area development, major state highway, and human activity, no measurable cumulative impacts to wildlife are expected to occur.

Within the CEAA, cumulative impacts to wildlife habitat would occur over 0.37 percent of the area (refer to Table 3.6-15). As described previously, short-term impacts to wildlife would occur from short-term noise disruptions, increased human activity, and the loss of habitat. The maximum area of long-term, habitat-related cumulative impact from the White Pass expansion (Modified Alternative 4) and the projects described in Tables 3.6-13 and 3.6-14 would affect approximately 0.4 percent of the CEAA (refer to Table 3.6-15). The CEAA includes the existing ski area, US 12, and numerous other sources of human activity. As the cumulative impact from the White Pass expansion and other projects occurs over a small percentage of the CEAA and distributed throughout currently-developed areas within the CEAA, the cumulative effect to wildlife are not expected to be measurable.

Table 3.6-15
Cumulative Effects of Past, Present, and Reasonably Foreseeable Projects in the Cumulative Effects Analysis Area[a] on Wildlife

Impact Type	Alt. 1		Alt. 2		Mod. Alt. 4		Alt. 6		Alt. 9	
	Area (ac.)	Percent of Scale (%)	Area (ac.)	Percent of Scale (%)	Area (ac.)	Percent of Scale (%)	Area (ac.)	Percent of Scale (%)	Area (ac.)	Percent of Scale (%)
White Pass Study Area Scale										
White Pass Projects	0.00	0.00	19.70	1.25	44.51	2.84	15.10	0.96	35.30	2.25
Projects Not Associated with the White Pass Expansion	74.72	4.76	74.72	4.76	74.72	4.76	74.72	4.76	74.72	4.76
Cumulative Impacts	**74.72**	**4.76**	**94.42**	**6.01**	**119.24**	**7.59**	**89.82**	**5.72**	**110.02**	**7.01**
Fifth Field Scale										
White Pass Projects	0.00	0.00	19.70	0.01	44.51	0.02	15.10	0.01	35.30	0.02
Projects Not Associated with the White Pass Expansion	708.11	0.37	708.11	0.37	708.11	0.37	708.11	0.37	708.11	0.37
Cumulative Impacts	**708.11**	**0.37**	**727.81**	**0.39**	**752.63**	**0.40**	**723.21**	**0.38**	**743.41**	**0.39**

[a] The Cumulative Effects Analysis Area (CEAA) is the combined areas of the Upper Tieton and modified Upper Clear Fork Cowlitz watersheds.