CASCADE RESOURCE AREA
EA WILDLIFE REPORT
Airstrip Project
T4S., R.5E., Section 7 and 18

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Incorporated by reference:

USDA, Forest Service; USDI. Bureau of Land Management. 1996. Lower Clackamas Watershed Analysis (LCWA 1996).

USDA, Forest Service. 1996. North Fork Clackamas River Watershed Analysis (NFCWA 1996).

USDA, Forest Service; USDI. Bureau of Land Management. August 2010. Biological Assessment of Likely to Adversely Affect (LAA) Projects with the Potential to Modify the Habitat of Northern Spotted Owls Willamette Planning Province - FY 2011-2012 (BA).

USDI, U.S. Fish and Wildlife Service. February 2011. Biological Opinion Regarding the Effects of Habitat Modification Activities on the Northern Spotted Owl and its Critical Habitat within the Willamette Province, FY2011-2012, Proposed by the Eugene District, Bureau of Land Management; Salem District, Bureau of Land Management; Mt. Hood National Forest; Willamette National Forest; Columbia River Gorge National Scenic; FWS Reference #13420-2010-F-0157.

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PART 1: NEPA ANALYSIS

Survey Results and Field Reconnaissance

The effects of the Airstrip Thinning Proposal on wildlife Special Status species documented or suspected to occur in the Airstrip area was analyzed. A list of Wildlife Special Status/species of concern in the Cascades Resource Area was compiled using BLM wildlife databases, BLM Special Status Species lists (BLM IM OR-2008-038), Oregon Natural Heritage Information Center lists (ONHIC 2007), various wildlife field guides, literature, and texts. The Project area was visited and habitats in and adjacent to proposed Airstrip units were examined during the 2009, and 2010 field seasons. From the Cascades Resource Area list, a list of Special Status/species of concern documented or suspected to occur in the Airstrip Project Area was compiled based the proposal's geographic location, elevation, and knowledge of habitats present gained through air photo interpretation, stand exam data, GIS information, and field

reconnaissance. For each species, habitat associations and the presence or absence of suitable habitat was determined. The resulting list of special status species which are known or suspected to occur in the Airstrip Project Area and their habitat preferences are included in Table 6.

New Bureau policy requires that BLM address federally listed and Bureau Sensitive species in Environmental Assessments (BLM IM OR-2008-038). The list of special status species documented or suspected to occur in the Airstrip area includes one terrestrial federally threatened (northern spotted owl), and three terrestrial Bureau Sensitive species (Oregon slender salamander, bald eagle and peregrine falcon), and the effects of the proposal to these species and their habitat are described in this report. A new category, Bureau Strategic, was identified in the July 25, 2007 Instruction Memorandum (BLM IM OR-2007-072). Strategic species are not Special Status for management purposes. The only requirement for this group of species is if species sites are located during any survey efforts, the site information must be entered into the BLM corporate database, Geographic Biotic Observations (GeoBOB). There are no terrestrial Bureau Strategic species known to occur in the Airstrip project area.

The Oregon slender salamander, a Bureau Sensitive species, was found in T.4S., R.5E., section 7, however habitat is present in all of the proposed units and they are highly likely to occur throughout the project area. Additional surveys for amphibians may be conducted in the future.

The Airstrip project area is within the provincial home range (1.2 miles) of two Predicted Sites for northern spotted owl determined by computer modeling by the US Fish and Wildlife Service (ITS 2008 pp. 8-9). The project area was surveyed in 2009 and 2010 by BLM contractors and there were no northern spotted owl responses. The closest known spotted owl site is located approximately 1.5 miles away. The Big Cliff known spotted owl site was last surveyed in 1999 by private industry. The last pair response was in 1994, and the last single response was in 1999. Additional surveys for northern spotted owls may be conducted to determine presence in the future.

Surveys for Survey and Manage species and protection for known sites are currently required in stands over 80 years of age. Surveys were conducted in the spring of 2010 and concluded in the fall of 2010 for terrestrial mollusk species following the Version 3.0. SURVEY PROTOCOL FOR SURVEY AND MANAGE TERRESTRIAL MOLLUSK SPECIES. Mollusk surveys were conducted during the spring and fall of 2010 in unit 7A. Target species for the surveys were Survey and Manage Species as of ROD 2001, including Oregon Megomphix (*Megomphix Hemphilli),* Malone's jumping-slug *(Hemphillia Malonei),* Puget Oregonian *(Cryptomatix devia),* and Crater Lake tightcoil *(Pristiloma arcticum crateris).* In addition, the axe-tailed or salamander slug (Gliabates oregonius), a Bureau Sensitive species, was searched for. Only one Survey and Manage mollusk species was found to be present, Oregon megomphix, (*Megomphix hemphilli).*

Red tree vole surveys were conducted following the SURVEY PROTOCOL FOR THE RED TREE VOLE Version 2.1. The surveys were conducted in the summer of 2010 in unit 7A. The

entire unit was surveyed from the ground and the trees that could not be inspected from the ground were climbed. 17 trees were climbed and inspected for any evidence of red tree voles. Although no red tree vole nests or evidence of the presence were found, five northern flying squirrel nests and a turkey vulture roost tree were found.

A list of migratory and resident birds was developed and addressed according to new interim guidance (BLM IM WO-2008-50). There are about 125 bird species which are documented or suspected to nest on BLM lands in the Cascades Resource Area, of which 82 have some probability of breeding in the Airstrip Project Area (Appendix A). Of these 82 species, 36 have been identified as priority species according to at least one of the sources listed in Appendix A and B of this report. Breeding birds observed in the Airstrip Area in recent years during the breeding season were noted. 16 species were identified, of which seven are priority species. Additional surveys for breeding birds may be conducted in the future.

Description of Project and Watershed Analysis

The proposed action is to commercially thin approximately 280 acres in Matrix and 10 acres in Riparian Reserve Land Use Allocations. Most of the units are mid seral stands in the 60 to 70 years age classes. Unit 7A it a two layer stand with a distinct overstory of remnants that are considerably taller and bigger in diameter (Schlottmann 2010). With 16 sample plots over 63 acres, the ages of the stand was estimated to be from 48 to 169, the average age of the stand is 68 years old.

The proposed action includes commercially thinning 10 acres of Riparian Reserve. Density management prescriptions should be applied in the ten acres of Riparian Reserves associated with units 18A and B (LCWA 1996, pp. 6-13). No Riparian Reserve thinning is proposed in T.4S., R.5E., section 7.

Currently there is one 6th field watershed analysis and one 5th field watershed analysis completed for the Airstrip project area, the North Fork Clackamas River Watershed Analysis and the Lower Clackamas River Watershed Analysis. The North Fork Clackamas River Watershed Analysis covers most of section 7 and the NE corner of Section 18. The Lower Clackamas River Watershed Analysis covers most of section 18 and the southern portion of section 7.

The Airstrip Thinning Proposes to treat 180 acres in North Fork Clackamas River Watershed. The North Fork Clackamas River Watershed is a 6^{th} field watershed that is 30,000 acres in size and is located in Clackamas County. The North Fork Clackamas River Watershed Analysis (NFCWA 1996) was completed in 1996. The Bureau of Land Management (BLM) manages about 2 percent of the North Fork Clackamas River Watershed, U. S. Forest Service (USFS) manages about 66 percent, and the rest is under private ownership.

The key findings of the North Fork Clackamas River Watershed Analyses were a lack of large diameter snags and course woody debris. There appears to currently be an adequate number of

small snags (NFCWA 1996, p. 5-1). Recommendations include thinning mid seral stands to promote tree growth for long-term future large snag recruitment. Over the short term, create smaller diameter snags only when they are determined to be lacking on a site specific basis (NFCWA 1996, p. 5-1). The watershed is currently lacking down woody debris of all sizes and decomposition classes. Recommendations include girdling standing trees to create down woody debris in areas throughout the watershed (NFCWA 1996, p. 5-1).

The Airstrip Thinning Proposes to treat 110 acres in Lower Clackamas River Watershed. The Lower Clackamas River 5th field watershed is 43,250 acres in size and is also located in Clackamas County. The Lower Clackamas River Watershed Analysis (LCWA 1996) was completed in 1996. The BLM manages about 2 percent, 5 percent is private ownership, and Forest Service manages 93 percent of the Lower Clackamas River Watershed.

There are two key findings in the Lower Clackamas River Watershed Analyses related to wildlife which are; 1) road densities exceed NW forest Plan standards, and 2) bald eagle nesting and roosting habitat is suitable in the Clackamas River corridor (LCWA 1996, p. 2-49). There was also a recommendation to maintain forest health by treating early and mid-seral stands (LCWA 1996, p. 6-7).

Wildlife Related Project Design Features

Residual Old Growth Trees, Snags and Coarse Woody Debris (CWD)

- Reserve and retain all old-growth trees and protect them from structural damage.
- Reserve and retain all remnant conifers larger than 36 inches diameter breast height (DBH). When any of these trees are felled to facilitate safe and efficient logging operations, leave them on site as CWD, as close to the cut site as possible.
- Reserve and retain minor hardwood species such as chinkapin, black cottonwood and Oregon ash; and all big-leaf maple that are larger than 18 inches diameter and protect them from structural damage where feasible with safe and efficient logging operations. When any of these trees are felled to facilitate safe and efficient logging operations, leave them on site as CWD, as close to the cut site as possible. Retain most hardwoods between 8 and 18 inches diameter and leave cut trees on site as CWD.
- Retain minor conifer species where feasible with safe and efficient logging operations.
- Reserve and retain created snags and topped trees in unit 7B. Mark these trees clearly as potential safety hazards and leave them standing as much as possible consistent with safe

logging operations. Where they must be felled for safe operations, retain them on site as CWD.

- Reserve and retain larger snags (above 15"diameter) of all decay classes, to the greatest extent possible under standard contractual logging procedures, Best Management Practices (BMP), and Occupational Safety and Health Administration (OSHA) requirements (RMP p. D-2). Any snags which are felled or otherwise knocked down would be retained on site as CWD, as close to the cut site as possible.

- Avoid skid roads and skyline corridors where snags, large remnants and old-growth remnants are located.

- CWD already on the ground that is larger than 20" diameter and 20' in length RMP p. 21would be reserved and protected from disturbance to the greatest extent possible during treatment (NWFP S&G p. C-40, RMP 21, p. D-2). If this CWD interferes with safe and efficient logging, cut and move a section of the log when feasible instead of moving the entire log.

Federally Listed Species: Northern spotted owl

- Operations may be shut down or restricted at any time if Special Status plant or animal populations are found (RMP p. 29; BLM-IM-OR-99-036).

- Maintain average canopy closures of 40+ percent over the project area after harvest.

- Place a seasonal restriction from March 1 through July 15 on all activities in 4 S 5E 7, (BO pp. 18, 100, 101).–Seasonal restrictions may be waived if protocol surveys indicate no presence of nesting spotted owls within disturbance distance (0.25 miles for most activities). The presence of nesting spotted owls in the Airstrip Area is highly unlikely.

Survey and Manage –Mollusk Species:

- Buffers around Oregon megomphix site are not recommended.

- Design features for other resources that have been incorporated into the proposed action to assure persistence of Oregon megomphix include:

    - Unthinned areas would include the best habitat in Riparian Reserves where most of the hardwood component is located. Large portions of like habitat in the parcels around Unit 7A would be left unthinned, and thus unimpacted.

    - Most of the hardwoods within the thinning unit boundaries would be retained and

left standing, including big leaf maple.

- Due to seasonal restrictions on bark slippage and soil moisture, operations should occur during the dry season when these mollusks are less active.
- No broadcast burning would occur, and only limited pile and burning would occur in the units.
- Large coarse woody debris would remain on site, and existing CWD would be left in place whenever feasible.
- Canopy closures would be maintained above 40 percent and in some cases over 60 percent.

- Close, block and/or decommission new road construction and renovation after project completion to reduce human disturbance of wildlife and promote vegetation recovery.

- Any new road construction uses the narrowest corridors possible for the operations.

AFFECTED ENVIRONMENT:

Table A: Wildlife Elements of the Environment.

Critical Elements Of The Environment		*Status: (I.E., Not Present , Not Affected, Or Affected)*	*Does this project contribute to cumulative effects? Yes/No*	*Remarks*
Threatened or Endangered (T/E) Species or Habitat (including designated Critical Habitat)	Wildlife	Affected	No	Addressed in text. This action may affect, and is likely to adversely affect spotted owls due to the modification of suitable habitat. No LSR or Critical Habitat would be affected.
Aquatic Conservation Strategy and Riparian Reserve Land Use Allocation		Affected	No	Addressed in text. Beneficial short term and long term effects to the distribution, diversity and complexity of features; connectivity; species and structural diversity of plant communities, and thus wildlife populations.
Late Succession and Old Growth Habitat		Affected	No	Addressed in text. 50 acres of thinning is proposed in structurally diverse forest. Unit 7A Has a large tree component and characteristics of mature.
Migratory Birds		Affected	No	Addressed in text. Habitat types and patch sizes would not change as a result of the action. Beneficial and adverse effects are expected depending on the species. Negative effects are short term and long term effects would be mostly beneficial (See Table 7).

Critical Elements Of The Environment		*Status: (I.E., Not Present , Not Affected, Or Affected)*	*Does this project contribute to cumulative effects? Yes/No*	*Remarks*
Other Special Status Species / Habitat	Wildlife	Affected	No	Addressed in text. Habitat types would not change as a result of the action. Beneficial and adverse effects are expected depending on the species.
Wildlife Structural or Habitat Components - Snags /CWD/ Special Habitats, road densities				Addressed in text. Snags, CWD and old-growth remnants would be retained on site. Some snags may need to be felled for safety, or would fall incidental to operations.

Unit 7A shows no records or ground evidence of past management. The lack of snags and old growth stumps indicate that fire was a recurrent event that prevented stands from becoming established. This is a distinct two layered stand. The dominant layer is in the understory and consists of predominately 60 year-old Douglas-fir with some minor amounts of big leaf maple and red alder. The overstory of 90+ year-old Douglas-fir is scattered and in clumps. The stand age range is from 48 to 169 year old trees, with diameters of the larger trees up to 72 inches. Some of the scattered large trees that weren't indicated on a stand exam plot could be old growth (over two hundred years old). The canopy cover is currently at 61%. Snags and down wood are lacking and don't met NWFP minimum requirements. The understory consists mostly of salal, vine maple and sword fern. The occasional tree regeneration is all Douglas-fir indicating this is a Douglas-fir plant association

Unit 7B is a uniform even-aged stand of 64 year old Douglas-fir. The stand age range is from 45 to 78. The canopy cover is currently at 65%. There are minor amounts of big leaf maple and red alder. Along the south boundary in section 18 there are some scattered residual old growth. There are very few snags and down logs present. The understory consists mostly of vine maple, sword fern and salal.

Units 18A and B are a uniform even-aged stand of 68 year old Douglas-fir. There are minor amounts of big leaf maple present. Some scattered residual large diameter trees are present, mostly along the east boundary. One brushy opening is present along the north boundary that has been created by phellinus root rot. There are few snags, but there is down wood throughout. The understory consists mostly of vine maple, salal and sword fern.

Young managed stands with simple structure and limited diversity such as those proposed for thinning in 7B, 18 A and B currently constitute a large portion of the Lower Clackamas River and the North Fork Clackamas River Watersheds. Forest management during the period when these stands were established was designed and intended to maximize timber production. Researchers have recognized that stands initiated and managed in such a way are not "equivalent" to similar-aged unmanaged stands, and the trajectory originally intended for many of these stands "would neither contribute to nor perpetuate old-forest

characteristics on these landscapes" (Hunter 1993).

Variation in forest stand conditions within stands and at the landscape level have been identified as a key factor in providing habitat for a diversity of forest organisms (Hayes et.al. 1997; Muir et.al., 2002). Certain structural and compositional aspects that have been found to be important contributors to habitat diversity and species richness include dead wood in the form of snags and down logs, remnant live trees, and vertical and horizontal variation in tree and understory canopies. Hardwood trees and shrubs have also been found to be important contributors to forest biodiversity, providing habitat substrate, food sources, foraging substrate, and nesting opportunities. These features make stands habitable by a broader range of forest-associated animal species. All of these features are generally lacking in the managed stands proposed for thinning in Unit 7B. Unit 7A and 18A & B currently have a large tree component, good understory development, and good quantities of coarse woody debris in advanced stages of decay, which contribute to habitat diversity.

Residual Old Growth Trees, Snags and Coarse Woody Debris (CWD)

Table 1 summarizes the presence of residual old growth trees, special habitats, and the amount of CWD present in the units prior to thinning. The presence of CWD, residual old growth trees and special habitats is based on stand exam data, aerial photos, and field review by specialists. CWD must be at least 20" in diameter at the large end, 20 feet in length, and in decay classes 1 and 2, to satisfy management direction as described in the Salem Resource Management Plan (RMP, p. 21). Material of this size that is in more advanced stages of decay is summarized as well, since this material is valuable habitat for such species as Oregon slender salamander, and will contribute to forest floor wildlife habitat conditions for some decades.

CWD in the project areas is predominantly soft, (decay class 3, 4 and 5). The small amount of hard (class 1 and 2) CWD is limited to smaller diameter material. This material is not considered adequate to meet RMP management direction due to being smaller than 20" in diameter. Soft CWD in more advanced stages of decay (classes 3-5) are usually remnants of old-growth "cull" trees that were not removed after harvest, and are often in larger diameter classes. These logs provide valuable habitat for a whole host of CWD associated wildlife species (O'Niell et.al. 2001), and they persist for many decades before passing through advanced decay classes to become unrecognizable as down logs. The less-decayed, hard logs in smaller size classes are mostly the result of recent self-thinning in crowded overstocked stands. These small logs are much less useful to forest floor-associated animal species for cover because they have less volume, and persist for shorter time spans (usually less than two decades) than the larger material, thus they are less useful for wildlife.

CWD is currently lacking in all of the units proposed for thinning that would meet RMP management direction (240+ linear feet per acre of material in decay classes 1 or 2, at least

20" in diameter at the large end, and 20 feet in length),(RMP, p. 21). Soft CWD in decay classes 3-5 is also lacking in Unit 7 B. Soft CWD is abundant (240+ linear feet/acre) in the rest of the units, and is large enough to last for at least several decades. Refer to table one unit specific information.

There are a few scattered old-growth trees in units 7B, 18A and B. There is a large remnant tree component present in unit 7A.

Table 1: Summary of special habitats, remnants, and coarse woody debris (CWD) present by project unit.

Name/Unit#	Location	Seral Stage	Remnant Old Growth	Special Habitats*	CWD***
Airstrip Project Area					
A	4S-5E-7	Late Mid/ Mature	No+	Yes#	0/240'+
B	4S-5E-7	Late Mid	Yes	No	0+/<200'
A&B	4S-5E-18	Late Mid	Yes	Yes#	50/240'+

Seral Stage Age Classes (years) based on Stand Exam data: Early Seral = 0-30; Early Mid Seral = 30-40;
Mid Seral = 40 – 60; Late Mid Seral = 60 -80; Early Mature Seral = 80 - 120; Mature = 120 - 200; Old Growth =200+
* Special habitats within the units include: wet and dry meadows, talus, cliffs & rock outcrops.
*** Linear ft/acre >19" diameter & >20' long, hard (decay classes 1-2)/soft (decay classes 3-5) logs.
\+ There may be some larger trees over 200 years of age.

Table 2 summarizes the number of snags necessary to meet management direction in the RMP (p. 21) for five cavity-excavating woodpecker species which are referred to in Neitro et al (1985). Table 3 summarizes the snags present prior to thinning. A diameter of 15+ inches was used because most wildlife species that utilize snags are associated with snags greater than 14.2 inches (Rose et.al., 2001). The presence of snags and standing dead material is based on stand exam data and field review by specialists. Stand exam data is based on a statistical sample from plots. Low numbers of snags may be present, but the sampling may not have picked up any on the plots. The use of 0+ in the table denotes when there are trace numbers of snags present that may not have shown up on the plots.

The hairy woodpecker, red-breasted sapsucker and pileated woodpecker are species associated with conifer stands in the western Cascade Mountains, and are present in the Airstrip project area. Northern flicker and downy woodpecker are not typically associated with closed-canopy conifer-dominated stands in the western Cascades, though both species are found in or around the project area.

Snag habitat does not meet the 40 percent of maximum population densities requirement for the five woodpecker species throughout the project areas (RMP, p.21). Most of the snags that are present are small (less than 20" diameter) and/or highly decayed. The watershed is currently lacking large snags (NFCWA, p. 1-5). There is an adequate supply of small snags

in many portions of the watershed (NFCWA, p. 1-5). Trees that could have developed into large snags and down logs were removed by past timber management treatments and fire. In general stands throughout the project areas are in a condition in which there is a near-term (less than three decades) snag deficit (RMP, p. 21).

Parts of Unit 7B had past management by top girdling and creating dead/deformed trees. This project was conducted in 1997, after a previous commercial thinning. The intent was to accelerate the development of complex crowns, lateral limbs and increase the number of dead and broken top trees in the stand. The green snag creation project treated 108 trees in 54 acres of Unit 7 B. The area was treated to create approximately 2 dead/deformed trees per acre. The trees were top girdled using hand saws.

Table 2: Minimum number of snags necessary to support species of cavity nesting birds at 40 percent of potential population levels (RMP p. 21, as per Neitro et al, 1985).

Diameter class (inches dbh)	***Snag Decay Stage*** ***Hard 2-3***	***Soft 4-5***	***Total by diameter class (per 100 acres)***
11+		Downy woodpecker (6)	6
15+	Red-breasted sapsucker (18)	Hairy woodpecker (77)	95
17+		Northern flicker (19)	19
25+	Pileated woodpecker (2)		2
Total – all diameter and decay classes			**122**

Table 3: Summary of snags currently available by project unit.

Snags at least 15' tall/ 100 acres					
Section (all units)	Hard snags - 15-25"	Hard snags 25+	Soft snags 15-25"	Soft snags 25+	Total snags
4S-5E-7A	0+	0	0+	0	0+
4S-5E-7B	110	0	0	0+	110
4S-5E-18 A&B	0+	0	0+	140	140

Special Habitats

There are special habitats present adjacent to units 7A, 18A and B . Adjacent to unit 7A there is a south facing talus slope, which provides habitat for mollusk, amphibian, and small mammals. There are also small cliff faces, less than 10 meters, and does not appear to be large enough nor adequate ledges to provide nesting habitat for birds of prey. Adjacent to units 18A and B there are three wetlands that are over 1 acre in size. The wetlands have

large deciduous trees, which include Oregon ash, black cottonwood, big leaf maple, red alder. The wetlands are high water table flat areas that have riparian vegetation and little to no open water. The large deciduous trees are important to insect gleaning Neotropical migratory birds for forage habitat, and nesting habitat. The wetlands are important habitat features for mollusk and amphibians.

Special Status Species

Table 6 lists BLM Special Status/Species of Concern which are documented or suspected to occur in the Airstrip Project Area based on field inventories of the habitats present and a review of the existing literature. Vegetation surveys (stand exam data) indicate that most of the stands proposed for thinning are lacking in habitat elements that support diverse populations of wildlife species, especially CWD, snags, deciduous understory and ground cover vegetation, or deep accumulation of leaf litter. Habitat, range data, and previous surveys conducted on the Cascades Resource Area indicate that it is suspected that 7 Bureau Sensitive species could be present in the proposed thinning units.

Federally Listed Species

Northern Spotted Owls

The proposed thinning units provide 245 acres of dispersal and 45 acres of Suitable habitat in the North Fork and Middle Clackamas Watersheds. There are two Predicted Owl Sites that are within 1.2 miles, the provincial home range of Northern spotted owls in Oregon Cascades. The project is just outside the provincial home range of the closest known owl site, which is 1.5 miles away from Unit 18A and B. The project area was surveyed for spotted owls in 2009, and in 2010. There were no spotted owl responses.

The Predicted Owl Sites are created by using computer models based on GIS data (ITS 2008 pp. 8-9) in an attempt to predict habitat that could sustain viable spotted owl sites and analyze the projected impacts of alternative land management strategies. Predicted Owl Site 642 is south of the Clackamas river about 1 mile from unit 7A. The proposed action would thin 5 acres of suitable and 50 acres of dispersal habitat within 1.2 miles of Predicted Owl Site 642. Predicted Owl Site 614 is approximately 450 meters to the east of Unit 7 A. The proposed action would thin 45 acres of suitable and 230 acres of dispersal habitat within 1.2 miles of Predicted Owl Site 614. Both predicted sites were analyzed and found to have less than 50% suitable habitat within the core area, and less than 40% suitable habitat within the provincial home range radius (1.2 miles), which are considered to be necessary to maintain spotted owl life history functions (ITS 2008 pp. 13-16; BO pp. 58-62, 64). Based on the lack of suitable habitat and survey results thus far, the presence of resident spotted owls in the vicinity of the Airstrip units is highly unlikely.

The Big Cliff known spotted owl site is located 1.5 miles south east of the Airstrip project area. This site was located during the early 1990s, and was established in 1994 with a pair of spotted owls. This site was last surveyed in 1999, when a sub-adult male was located.

No suitable habitat is proposed for thinning inside the provincial home range of any known spotted owl sites. Suitable habitat is proposed for thinning inside the provincial home range of two Predicted Owl Sites. None of the units are located in Critical Habitat and or unmapped Late Successional Reserves (LSRs) which are 100 acre core areas of known spotted owls as of January 1994.

Bureau Sensitive

Oregon Slender Salamander

Oregon slender salamander, a Bureau Sensitive Species, is expected to occur in portions of the project areas where CWD of adequate size (RMP requirements >20" diameter at the large end, >20' in length) occurs. Oregon slender salamander has been found throughout the Cascades Resource Area in stands across the full range of seral stages. Its distribution on BLM lands within the Cascades Resource Area appears to be limited by dry conditions at low elevations along the Willamette Valley floor, and by cold conditions at higher elevations (Dowlan, unpublished 2006).

Habitat is generally described as conifer stands dominated by Douglas-fir with large amounts of large rotten (decay class 3 to 5) Douglas-fir down logs. Old logs, stumps and large woody material piles around stumps, and exfoliated tree bark on the ground are used for cover, feeding and breeding. Larger material that can hold moisture through summer drought is generally considered to be most important in maintaining moderate subsurface microclimate conditions. Optimal habitat for these animals is generally described as late-successional forest conditions with cool, moist microclimates and large down wood.

The Oregon slender salamander, a Bureau Sensitive species, has been found in units 7A and B, and is highly likely and assumed to be present in all sections of the project area were appropriate habitat is found.

Bald Eagle

The bald eagle was removed from the endangered species list in June of 2007 by the US Fish and Wildlife Service. Currently, the bald eagle is a Bureau Sensitive Species. For nesting and perching they prefer large old-growth trees near major bodies of water and rivers. There are large diameter remnant trees in all units in Airstrip within 0.5 miles of the Clackamas River, making this area suitable habitat for bald eagles Oregon State University, with the collaboration of many state, federal, and non-profit groups have monitored bald eagle nest for the past 30 years in Oregon. OSU has identified an active bald eagle nest approximately 10 miles downstream of the project area on the Clackamas River, and another 12 air miles to the north on the Sandy River. Bald eagles have not been observed in the

project area, however there is available habitat and may be present in the future.

Peregrine Falcon
There are no suitable cliffs for nesting in the project area. There is a peregrine falcon nest site located 1.5 miles from the project area. Peregrine falcons likely forage occasionally in the vicinity of the proposed action along the Clackamas River corridor.

Bats
Four bat species of concern are suspected to occur in the Airstrip Area (silver-haired bat, long-eared myotis, long-legged myotis, and Yuma myotis). These species are associated with caves and mines, bridges, buildings, cliff habitat, or decadent live trees and large snags with sloughing bark. Decadent live trees and large snags, particularly ones with bark attached that extend above the tree canopy, are used variously as solitary roosts, maternity roosts, and hibernacula by these species, and other bat species associated with Douglas-fir forests (Christy and West 1993, Weller and Zabel 2001, Waldien et.al. 2000). Roost sites are poorly characterized in Pacific Northwest forests, existing information indicates that old-growth forests provide higher quality roost sites than younger forests and that many species prefer older forests (Thomas and West 1991, Perkins and Cross 1988). Old-growth and tall snags with sloughing bark are rare in the project areas (Tables 1 and 3), and these species are likely to be present in low numbers. In addition, the fringed bat, a Bureau Sensitive species, could occur in the Airstrip Area. This species is more closely associated caves, cliffs, rocky outcrops, buildings and abandoned mines; habitat features not present in the action area. Fringed bats have been known to use snags to a lesser extent, as described above.

Survey and Manage

Red Tree Vole
The red tree vole is an arboreal vole associated with conifer forests west of the Cascades summit, below about 3,500 to 4,500 feet in elevation. The project area is within the Northern Mesic Zone of the range identified for the species.

On December 17, 2009, the U.S. District Court for the Western District of Washington issued an order in *Conservation Northwest, et al. v. Rey, et al.*, No. 08-1067 (W.D. Wash.) (Coughenour, J.), granting Plaintiffs' motion for partial summary judgment and finding a variety of NEPA violations in the BLM and USFS 2007 Record of Decision eliminating the Survey and Manage mitigation measure. Previously in 2006, the District Court (Judge Pechman) had invalidated the agencies' 2004 RODs eliminating Survey and Manage due to NEPA violations. On October 11, 2006, following the District Court's 2006 ruling, parties to the litigation entered into a stipulation exempting certain activities from the Survey and Manage standard, including thinning projects in stands less than 80 years old. Most of the proposed units in Airstrip Project are under 80 years of age with the exception of T.4S.,

R.5E., section 7A (45acres). This unit meets the stand level criteria for red tree vole habitat, and is located inside of the range of the red tree vole (Huff, Biswell et.al., 2002).
This unit was surveyed for red tree voles in order to comply with the 2001 ROD without Annual Species Reviews (IM-OR-2010-017, *Interim NEPA Direction for Survey and Manage Species*).
The surveys were conducted in the summer of 2010 in unit 7A only. The entire unit was surveyed from the ground and the trees that could not be inspected from the ground were climbed. 17 trees were climbed and inspected for any evidence of red tree voles. No red tree voles nests were found.

Terrestrial Mollusk Species

There are two mollusk species which were removed from Survey and Manage through the Annual Species Review process from 2001 to 2003. The Oregon Megomphix is common in Conifer/hardwood forest in association with bigleaf maple, duff and litter at low to mid elevations, primarily along Willamette Valley floor/Cascades foothills. The Malone's jumping slug is another common species found in moist forested habitats over 50 years of age and 50%+ canopy cover below about 4000 feet. Both of these species are suspected to occur in unit 7A. Of the 17 combined spring and fall survey plots in Unit 7B, 4 plots had Oregon Megomphix, (*Megomphix hemphilli)* present. No Malone's jumping slug were found.

Oregon Megomphix was included as a Survey and Manage species under the Northwest Forest Plan (NWFP) based on a lack of knowledge about the species' range and an incomplete understanding of its ecology (APP. J2-314). In 1994, the Oregon megomphix was thought to be associated with late-successional and old-growth habitat and was thought to be restricted to the Olympic Peninsula and the Mount Baker-Snoqualmie National Forests. Since that time, agency surveys have expanded the knowledge of the species' range. It is now known to occur in western Oregon as well as Washington. In 2003, it was removed from Survey and Manage because it was no longer considered to be rare, and the reserve system and other Standards and Guidelines of the NWFP appear to provide for a reasonable assurance of species persistence (ASR 2003, FEIS 2007, App. 8 & 9).

By 2003, there were a total of 1,944 extant sites were known. In the Cascades Resource Area there are a total of 613 sites, and has been found to be common to abundant in moist conifer/hardwood forests with bigleaf maple at low to mid elevations, especially along Willamette Valley floor/Cascades foothills interface (Duncan et. al. 2003). It has been found in forest stands in a variety of seral stages, including young to mid age stands in the closed sapling pole stage. The Oregon megomphix has no BLM special status.

Migratory and Resident Bird Species

About 125 bird species are known or suspected to breed in the Cascades Resource Area

(Appendix A based on Altman and Hagar 2007, Altman 2008, Marshall et.al. 2003). Of these species, 82 have at least a low probability of breeding in the Airstrip Project Area. There are 54 bird species that nest in the Cascades Resource Area that are priority bird species of conservation concern identified by bird conservation partners (Appendix B). Of these species, 36 have at least a low probability of breeding in the Airstrip Project Area. For a full list of partners and conservation plans that were used to derive the priority bird species list for the Cascades Resource Area see the end of Appendix A. The proposed thinning is located in the Western Oregon Cascades Physiographic region. The Partners in Flight (PIF) conservation plan which addresses the Western Oregon Cascades is the *Conservation Strategy for Land birds in Coniferous Forest of Western Oregon and Washington* (Altman 2008). Focal species associated with various stand types and associated habitat attributes are shown in Appendix C.

Field Code C

Bird species richness at the stand level has been correlated in some recent studies with habitat patchiness, densities of snags, and density by size-class of conifers (Hagar, McComb, and Emmingham 1996, Hansen et al. 2003). Even-aged conifer stands provide habitat for a relatively high abundance of a few bird species, many of which feed on insects gleaned from conifer foliage. The most common species include chestnut-backed chickadee, Pacific-slope flycatcher, hermit warbler, golden-crowned kinglet, varied thrush, winter wren, red-breasted nuthatch, and Swainson's thrush, however, these species are also common or more abundant in mature conifer stands as well (Hansen et al 1995).

The proposed thinning areas are in mid seral, and early mature stands. The mid seral stand in Unit 7B, 18 A and B are in the stem exclusion stage. These forest conditions are structurally simple and characterized by an even-aged, single-layered, closed-canopy with poor understory development, and are low in land bird species richness. The light-limited understory of unthinned stands does not provide for a diverse community of shrub and ground cover plant species that are important in providing insect and plant food resources for bird species which rely on living deciduous trees, shrubs, and leaf litter (Hagar 2004). Abundance of arthropod prey species has been correlated with understory and midstory vegetation, particularly tall shrubs and hardwoods. These habitat elements are lacking or poorly-developed in the stand proposed for thinning in Unit 7B, 18 A and B, however are present in 7A.

Big Game

Big game species that are found in the project areas include Roosevelt elk (*Cervus elaphus roosevelti*) and black-tailed deer (*Odocoileus hemionus*). The project areas are in late mid and mature seral stands which provide hiding and some thermal cover. Early seral communities and mid seral stands are abundant on adjacent private lands surrounding the project areas. The Salem District Record of Decision and Resource Management Plan (RMP) approved May 1995, identifies no critical winter or summer range in the project areas (RMP p.26).

ENVIRONMENTAL EFFECTS

In the short term (less than 5 years) canopy cover reduction, disturbance, and reduction of understories and ground vegetation would occur due to thinning. The exception would be in Unit 7A were it will take longer for the canopy to close, 10+ years. The long term (more than 5 years) effects would be to increase structural complexity and improve habitat quality for wildlife.

Research that has occurred since the 1980s has determined that it is possible to develop desired structural and compositional diversity in young managed stands through specific actions (Bailey and Tappeiner 1997, Chan et.al.2006). Thinning forest stands produces what has been described as "cascading ecological effects" (Hayes, Weikel and Huso, 2003) that result from reduced competition between overstory trees and increased availability of solar radiation to the forest floor. Growth, size, branch diameter, and crown ratio of the remaining trees is increased, and development of understory and ground cover vegetation is stimulated. These changes effectively increase structural complexity and alter habitat quality. The increase in structural diversity would improve wildlife habitat by providing more opportunities for foraging; nesting/breeding activities; and resting, hiding and escape cover/habitat for a variety of species in the forest environment, including invertebrates, songbirds, and small mammal species. These changes are considered to be beneficial since there is an abundance of simplified structure habitats in the vicinity of the project area. The intensity of the fires in the watershed, coupled with salvage logging afterward, left very few remnant structures (trees, snags, down logs) especially in the western portion of the watershed (NFCWA, pp. 1-5).

Proposed road construction and renovation, skid trails and skyline corridors under the various alternatives would create narrow linear openings through the vegetation, disturbing, reducing or removing ground vegetation and creating breaks in the canopy, which allow more light to reach the forest floor. The effects on wildlife habitat would be a short term (less than 5 years) disturbance and reduction in ground vegetation and canopy closure that would increase access to the stand by certain wildlife species, specifically larger mammals such as big game, coyotes, and avian predators. In the long term (more than 5 years) ground vegetation would become re-established due to increased light to the forest floor and the breaks in the canopy would close.

Residual Old-growth, Snags and Coarse Woody Debris (CWD)

Within thinning units, most existing snags in all sizes over 15 inches diameter would be retained. It is anticipated that 90+ percent of these snags would remain standing after treatment. This would effectively reserve the best existing habitat features for primary excavators (woodpeckers), and secondary cavity users, such as songbirds, bats and small

mammals. The remaining 10 percent or less of these snags may need to be felled for safety, road construction, skid roads, and skyline corridors or would fall incidental to logging operations. More of the smaller diameter/taller snags (<12 inches diameter and >25 feet tall), would be felled for safety reasons, or fall incidental to thinning operations. These snags are less important for wildlife species than the larger material over 15 inches (Rose et. al., 2001). Any snag that falls for any reason as a result of thinning operations would remain on-site as CWD, providing important habitat for a different, but also, key group of dead-wood associated species, including the Oregon slender salamander, a Bureau Sensitive species. All dead wood that is on-site when timber marking takes place would remain on-site, either in the form or standing snags or as down logs, after thinning.

Management direction for the Matrix LUA is to provide a renewable supply of snags and down logs well-distributed across the landscape (RMP p. 21). Most units throughout the project areas are expected to remain in a snag deficit condition (RMP, p. 21) after thinning for three to six decades, until live trees become large enough (at least 20" diameter) to provide for recruitment of large snags and CWD which will meet RMP requirements. As a result of thinning, growth of residual live trees would be accelerated, so that larger trees would be available sooner than without thinning to contribute additional large snags and CWD in the future stand. There could be enough material of sufficient size to meet the RMP guidelines for snags (40 percent maximum population densities) and CWD (240+ linear feet per acre of material in decay classes 1 or 2, at least 20" in diameter at the large end, and 20 feet in length), in one to three decades. Large diameter CWD in more advanced decay conditions would persist and contribute to forest floor wildlife habitat conditions for many decades before passing through decay class five to become unrecognizable as down logs.

There may be a loss of large diameter remnant trees in Unit 7B, and 7A as a result of road construction, landing location, and cable yarding corridors. In Unit 7 B: a 60" dbh snag, 61" dbh snag could be cut, and two 51" large diameter remnant Douglas fir could be damaged due to road construction. By cutting these snags there could be a loss of snag habitat, however the CWD created will remain on the site. The 51" dbh trees provide decadence in the stand and could contribute to large snags in the future.

There could be a reduction in the number of small snags, (less than 15" DBH) as a result of the thinning. These smaller snags would be a product of suppression mortality in an untreated stand. The benefit to wildlife of smaller snags is limited. There would be very limited use in nesting and most of the benefit would be foraging habitat. In unmanaged forests the presence of cavity nesting birds has been linked to the presence of snags, particularly >50cm (19.26") (Carey et al. 1991, Huff and Raley 1991). Chestnut backed chickadees, red breasted nuthatches, brown creepers and hairy woodpeckers all show selectivity to foraging habitats based on deciduous trees, large diameter conifers, and large diameter heavy decayed snags and logs (Weikel, 1999). Large diameter trees cut in Unit 7A could reduce recruitment of snag habitat for these species in the project area. The long term

benefits of thinning a stand could outweigh the negative effects of losing the short term recruitment of large amounts of small dead wood to snag associated species for the purpose of foraging.

Large amounts of small dead wood will still be present and available in the no touch buffers along streams and in areas of unstable soils. The BLM parcels in T.4S., R.5E., section 7 and 18 are approximately 795 acres. The proposed action would thin 36 percent (290 acres) and leave 64 percent (505 acres) untreated. This will leave a mosaic pattern of forest left on these parcels. There should be sufficient untreated areas to provide any benefit that may be gleaned from suppression mortality to snag associated species, yet providing high growth rates in thinned areas to provide for future recruitment of large diameter snags.

It is anticipated that less than ten percent of existing CWD would be directly impacted by logging. Less than ten percent of the thinning area would be directly impacted by skidding, which is the operation with the highest potential impact to existing CWD. BLM oversight of skid trail locations would ensure that skid trails were located to avoid impact to high value CWD whenever feasible, reducing the anticipated impacts below the ten percent level that would be expected from locating skid trails without concern for CWD. The same principles generally apply to snag retention.

Special Habitats

The age classes proposed for thinning in Unit 7 B and Unit 18 A & B provide the greatest opportunities for acceleration of tree diameter growth and understory development through thinning and density management. It is anticipated that thinning would improve habitat conditions in the Riparian Reserves for wildlife by accelerating development of late seral forest stand characteristics. Desirable late seral forest stand characteristics include larger trees for a large green tree component and recruitment of large standing dead and down CWD in future stands, multi-layered stands with well-developed under stories, and multiple species that include hardwoods and other minor species (NFCWA 1996, p. 5-1).

At the landscape level, connectivity for species such as the spotted owl is expected to improve as late successional conditions develop in the Riparian Reserves. Other species which would benefit from the development of older forests in the Riparian Reserves include many species of mollusks, amphibians, bats, the red tree vole, blue grouse, red-breasted sapsucker, pileated woodpecker, Cooper's hawk, Pacific-slope flycatcher, Swainson's thrush, black-throated gray warbler, and black-headed grosbeak, olive-sided flycatcher, brown creeper, and hermit warbler.

There would be no effects to the rock out crops and talus slope below 7A as they would be posted out of the unit. There would be no effects to the wetlands adjacent to units 18A and B. They would be posted out of the units and buffered by a one site tree no treatment buffer.

Special Status Species

Federally Listed Species

Northern Spotted Owl

Refer to Table 4 for a summary of the Airstrip project and its effects on spotted owl habitat and definition of terms. In the short term, 245 acres of dispersal would be altered; and 45 acres of suitable habitat would be downgraded to dispersal as a result of thinning. Available scientific literature provides support for the finding that forest stands can be altered in a manner that is not necessarily expected to change the habitat function for spotted owls (Forsman et al. 1984, USFWS 2007c). Examples of silvicultural activities that may fall into this category are light to moderate thinning, down salvage, individual tree removal, and prescribed burning.

In the short-term, seasonal restrictions on habitat modification activities (felling, yarding, burning, and road building) in suitable habitat (unit 7A) would minimize the risk of disturbance to any unknown northern spotted owls during the critical nesting season and delay habitat modification activities later into the nesting season when spotted owls are less sensitive to disturbance. Disturbance associated with thinning (logging, road-building, etc,) may have temporary effects on the presence or movement of spotted owls. However, thinning would maintain dispersal habitat, therefore maintaining the ability of the habitat to accommodate movement of birds after thinning is completed. By reducing the canopy cover below 60 % in Unit 7 A the habitat functionality could change in the short term. The change would downgrade 45 acres of suitable habitat to dispersal habitat. These 45 acres could become suitable in ten to fifteen years, post project, when the limbs of the residual trees grow and fill the holes created form thinning.

In the long term, thinning in dispersal habitat (Units 7B, 18A and B) can have long-term benefits to spotted owls by encouraging late-successional characteristics to occur more rapidly (BA p. 13, BO p. 21). As thinned stands mature, habitat conditions are expected to improve. Canopy closures would increase and these stands could attain suitable habitat conditions within 10 to 30 years. These stands would develop foraging and nesting structure and residual trees will increase in size and be available for recruitment of snags, culls and CWD for prey species and nesting opportunities for spotted owls.

There are two Predicted Owl Sites within the provincial home range (1.2 miles) of the project area. The proposed action would downgrade 5 acres of suitable and alter 50 acres of dispersal habitat within 1.2 miles of Predicted Owl Site 642, and 35 acres of suitable and 230 acres of dispersal habitat within 1.2 miles of Predicted Owl Site 614. Both sites likely do not provide enough suitable nesting, foraging and roosting habitat necessary for maintaining spotted owl life history functions (BO pp. 58-62, 64; ITS 2008 pp. 13-16). The area has been surveyed two years with no responses. Based on the habitat analysis of these

two predicted sites which shows a lack of suitable habitat below viable levels necessary to maintain resident spotted owls (ITS 2008), and surveys conducted thus far, the presence of resident spotted owls in the vicinity of the Airstrip units is highly unlikely, and incidental take would not occur.

No suitable habitat would be altered or downgraded within the provincial home range radius of any known spotted owl sites. Overall habitat conditions with the provincial home range of the Big Cliff historic spotted owl site would not change as a result of thinning. None of the proposed units are located in LSR or Critical Habitat for the Northern spotted owl.

Current habitat conditions for the spotted owl would be maintained in all of the other proposed thinning units, other than 50 acres in Unit 7 A, after treatment. "Maintain" habitat means light to moderate thinning in which forest stand characteristics are altered but the components of spotted owl habitat are maintained such that spotted owl life history requirements are supported. As a result, the functionality of the habitat used by spotted owls remains intact post treatment. For spotted owl dispersal-only habitat a canopy cover of >40 percent along with other habitat elements (e.g. including snags, down wood, tree-height class-diversity, and older hardwoods) will be maintained post treatment to adequately provide for spotted owl dispersal. Such treatments can have long-term benefits to spotted owls by encouraging late-successional characteristics to occur more rapidly (BA p. 10). In addition trees larger than 36 inches dbh would be retained in unit 7A.

Table 4. Spotted Owl Habitat Modification by Treatment type1, Land Use Allocation2, Pre/Post Treatment Habitat Type3, Habitat Modification Type4, and Effect Determination5.

5th. Field Watershed	Project	Township-Range-Section#	Proposed Treatment 1	Acres	Land Use Allocation 2	Pre/Post Treatment Habitat Type 3	Habitat Modification 4	Effect 5
Middle Clackamas	Airstrip	4S-5E-7 A	Light to moderate thin	45ac	GFMA	Suitable/ Dispersal	Downgrade	LAA
Middle Clackamas	Airstrip	4S-5E-7 B; 18 A & B	Light to moderate thin	245 ac	GFMA/RR	Dispersal/ Dispersal	Maintain	NLAA
TOTAL				**290 ac**				

Notes for Table 4 ((BA, pp. 4-5; BO, pp. 14, 15-16)).

1 Treatment Type:

Light to moderate thinning in dispersal or suitable habitat can be for forest health or to improve the structural characteristics of a stand or to provide commodity. Such treatments may be described as commercial thinning, density management, selective cut, partial cut, or mortality (standing) salvage. Such thinning maintain a minimum of 40 percent average canopy cover. Light to moderate thinning can have long-term benefits to spotted owls by encouraging late-successional characteristics to occur more rapidly.

GFMA=General Forest Management Area Matrix; **RR**=Riparian Reserve.

3 Habitat Types:

Suitable habitat Consists of forested stands used by spotted owls for nesting, roosting and foraging. Generally these stands are conifer-dominated, 80 years old or older and multi-storied in structure, and have sufficient snags and downed wood to provide opportunities for owl nesting, roosting and foraging. The canopy cover generally exceeds 60 percent. This habitat is described as *nesting/roosting and foraging habitat* (NRF) in the northern spotted owl recovery plan (USFWS 2008a).

Dispersal habitat consists of conifer and mixed mature conifer-hardwood habitats with a canopy cover greater than or equal to 40 percent and conifer trees greater than or equal to 11 inches average diameter at breast height (DBH). Generally, spotted owls use dispersal habitat to move between blocks of suitable habitat, roost, forage and survive until they can establish a nest territory. Juvenile owls also use dispersal habitat to move from natal areas. Dispersal habitat lacks the optimal structural characteristics needed for nesting.

4 Habitat Modifications:

Maintain habitat means to alter forest stand characteristics but maintain the components of spotted owl habitat within the stand such that spotted owl life history requirements are supported (i.e. the functionality of the habitat used by spotted owls remains intact post treatment). For spotted owl dispersal-only habitat a canopy cover of >40 percent along with other habitat elements (e.g. including snags, down wood, tree-height class-diversity, and older hardwoods) will be maintained post treatment to adequately provide for spotted owl dispersal.

Downgrade suitable habitat means to change the functionality of spotted owl suitable habitat to dispersal habitat, but still retains the capability to again become suitable habitat in the future.

5 Effect: NE=No effect; **NLAA**=May affect, but not likely to adversely affect; **LAA**=May affect and likely to adversely affect.

Bureau Sensitive

Oregon Slender Salamander

It is not expected that thinning these stands would result in significant effects to Oregon slender salamanders or their habitat. Post-thinning treatment surveys in the Keel Mountain Density Management Study Area indicate that Oregon slender salamanders are not significantly affected by thinning (Rundio and Olson 2007). Oregon slender salamanders would be expected to persist at sites within stands where CWD of adequate size (RMP requirements >20" diameter at the large end, >20' in length) currently exists. The CWD currently on-site prior to thinning would continue to provide refuge for terrestrial salamanders many years after treatment (Table 1).

These results are consistent with survey results elsewhere in Cascades Resource Area from stands that had been subjected to timber harvest in the past (Dowlan, unpublished 2006). Stands in similar age classes had been subjected to regeneration harvest with no green tree retention, similar to the proposed thinning units. Logging practices of the time resulted in heavy concentrations of large logs, or "culls" which were cut, but not removed from the site. This large woody material lasts for many decades, and provides moderating microclimates in which Oregon slender salamanders can persist.

In the short term, direct effects (disruption or mortality) to Oregon slender salamanders may occur during logging operations. Ground based logging would result in the most impact due to higher ground disturbance, and skyline logging would have fewer impacts due to less ground disturbance.

Design features common to all projects would minimize disturbance to existing CWD. Ground disturbance from tractor skidding trails and other ground-based logging equipment

would be limited to ten percent of project unit areas, and therefore, no more than ten percent of potential Oregon slender salamander habitat within any unit.

Bald Eagle
The Airstrip Thinning is not expected to have adverse effects on any known bald eagle nesting sites. Thinning will provide a positive response by accelerating the tree growth for larger trees for nesting and perching.

The possible felling of some larger diameter remnant trees in Unit 7A for cable yarding corridors could reduce the number of tree suitable for perching and nesting. There are a sufficient number of large diameter residual trees in the vicinity of the units that the loss of less than 10 percent in unit 7A would not affect potential eagle nesting or perching habitat.

Peregrine Falcon
There would be no effects to cliffs suitable for nesting or to foraging habitat or behavior as a result of thinning. The peregrine falcon nest site located far enough away that no disturbance effects are anticipated.

Bats
Old-growth forests provide higher quality roost sites than younger forests and many species prefer older forests (Thomas and West 1991, Perkins and Cross 1988). Unit 7 A possesses some older forest characteristics that provide for bat habitat. Bat species which use snags would be affected due to a loss of 10 percent or less of the standing dead material within the thinning units. Most existing snags in all sizes over 15 inches diameter would be retained. It is anticipated that 90+ percent of these snags would remain standing after treatment. The remaining 10 percent or less of these snags may need to be felled for safety, road construction, skid roads, cable corridors or would fall incidental to logging operations. Bat activity appears to be higher in thinned versus unthinned stands. Structural changes in stands caused by thinning may benefit bats by creating habitat structure in young stands that bats are able to use more effectively (Humes, Hayes, Collopy 1999). Bat species which are more closely associated with buildings, bridges, mines, cliff crevices and caves than snag habitat would not be affected. None of these features are present in the Airstrip Project Area.

Survey and Manage

Red Tree Vole
In the short-term, undetected nests within marginal habitat (habitat less than 80 years of age), and suitable habitat over 80 years of age (Unit 7A) could be destroyed or disturbed during thinning. Habitat conditions for red tree voles throughout the project area after thinning would gradually become more suitable as the stands continue to mature and develop older forest characteristics. Large diameter remnant trees should start to display more epicormic branching, which is an important structure for red tree vole nests.

Mollusk Species

Suitable habitat conditions would be maintained in the short term in portions of the project areas, mainly the Riparian Reserve, providing refugia for low-mobility amphibians and invertebrates. In the proposed units, CWD as well as crown cover from residuals would provide shade and microclimates would assist mollusk species to persist. Implementation of the project would not eliminate connectivity between proposed units or adjacent untreated stands under BLM management.

Due to the abundance of site of Oregon megomphix over the geographic range, site should not be buffered. The scientific rationale provided in the 2001 and 2003 Annual Species Reviews is the currently the best science available. These documents state that this species is more common than previously thought, and the reserve system and other Standards and Guidelines of the NWFP appear to provide for a reasonable assurance of species persistence (ASR 2003, FEIS 2007, App. 8 & 9). In addition, the Oregon megomphix meets the criteria for locally common in all of the units surveyed (MEHE MR pp 17-18). The Management Recommendations for Oregon Megomphix allows a higher level of disturbance where this species is locally common, including thinning and other activities.

Migratory and Resident Birds

Unintentional take of nests, eggs, nestlings and nesting failure would be highly likely if harvest operations occur during active nesting periods. The impacts would be short term, involving loss of nests and unintentional take during one nesting season. This would not reduce the persistence of any bird species in the watershed or populations at the regional scale. In the western Oregon Cascades there is temporal variability of breeding bird species and individuals of the same species in forested habitats. For example some owls and woodpeckers begin breeding in February or March while some flycatchers do not finish breeding until August. The majority of birds in the Pacific Northwest complete their breeding cycle within the April 15 to July 31 time period (Altman, Hagar 2007).

Some individual birds may be displaced during harvest operations in the project area due to disturbance. Adjacent untreated areas and areas where active operations are not occurring would provide refuge and nesting habitat, which would help minimize short term disturbance.

The effects of thinning on priority bird species' habitat with at least a low probability of nesting in the Airstrip project area are shown in Table 7. Changes in habitat structure are expected to have immediate effects on bird communities in thinned stands. Thinning densely-stocked conifer stands would be expected to immediately enhance habitat suitability for species which prefer a less dense conifer canopy, and reduce habitat suitability for species that prefer continuous conifer canopies. Reducing the canopy closure and opening up stands is expected to have short term negative effects on the brown creeper, golden-

crowned kinglet, hermit warbler, Pacific-slope flycatcher and varied thrush however, these species are also common or more abundant in mature conifer stands as well (Hansen et.al., 1995). The thinning would have no effects or even positive long term effects on this same set of species as the understory develops and habitat quality improves.

Overall bird species richness (a combination of species diversity and abundance) would be expected to gradually increase for up to 20 years as hardwood components of stand structure develop, plant species composition becomes more complex, and hardwood shrub layers, epiphyte cover, and snag density become more prominent within the stands. The future development of hardwood/deciduous tree/bush components and canopy layers would favor species such as the band-tailed pigeon, ruffed grouse, red-breasted sapsucker, Wilson's warbler, Hutton's Vireo and black-throated gray warbler.

Big Game

Big game species would be temporarily disturbed during the implementation of the proposed action. Logging equipment noise and human presence may cause animals to avoid or disperse from the project areas temporarily. Thermal and hiding cover would be maintained after harvest. Thermal and hiding cover quality would decrease in the short-term as a result of thinning, opening new roads, renovating roads and road improvements (Cole, et al. 1997, Trombulak and Frissell 1999, USDA (PNW) 2006). Vegetative forage such as saplings, shrubs, grasses and forbs would increase as a result of thinning and road closures after thinning. As a result of increased light, forage quantity would increase and attract early successional species such as elk and deer to the thinned areas.

In the long term (5+ years), thermal and hiding cover quality would increase and vegetative forage such as saplings, shrubs, grasses and forbs would gradually decrease as a result of canopy closure decreasing the amount of light reaching the forest floor.

CUMMULATIVE EFFECTS

Residual Old Growth Trees, Snags and CWD

Regardless of the scale for assessing cumulative effects, design features would retain existing CWD, snags 15+ inches diameter, and most of the large tree component. It is expected that 90+ percent of the snags 15+ inches diameter would remain standing after treatment. Some snags, especially smaller diameter/taller snags (<12 inches diameter and >25 feet tall), would be felled for safety reasons, or fall incidental to thinning operations. Any snag that falls for any reason as a result of thinning operations would remain on-site to become CWD, providing important habitat for a different, but also, key group of dead-wood associated species (Aubry 2000, Bowman et.al. 2000, Butts and McComb 2000), including the Oregon slender salamander, a Bureau Sensitive species.

In Unit 7B, and 7A some large diameter remnant trees may need to be felled for road construction, landing location and/or to establish cable logging corridors. Falling two old-growth snags to facilitate road construction in unit 7B would reduce high value habitat for bats, primary excavators and cavity users in the watershed. The minimum number of snags necessary to support species of cavity nesting birds at 40 percent of potential population levels (RMP p. 21, 25 as per Neitro et al, 1985) is currently insufficent. Cutting these large snags will further reduce the snag deficit. The road building activities may damage roots and or cambium layer which may lead to disease or wind throw.

Beneficial cumulative effects to CWD, snag habitat and associated species may occur as a result of implementing the projects, since larger trees would be available sooner than without thinning to contribute additional large snags and CWD recruitment in future stands.

Special Status Species

Federally Listed Species

Northern Spotted Owl

The scale for cumulative effects for the northern spotted owl is the provincial home range of known spotted owl sites, 1.2 miles for the Cascades of Western Oregon (BA, p. 4; BO, p. 15), and the location of the project in relationship to adjacent known spotted owl sites and Late Successional Reserves (LSRs). The scale was chosen because the Northwest Forest Plan (NWFP) goal for conservation and recovery for spotted owls is to maintain suitable owl habitat within LSRs and the provincial home range of known owl sites; and maintain dispersal habitat between LSRs and known owl sites (BO pp.71-73).

Cumulative effects to spotted owls and their habitat were analyzed thoroughly at multiple scales in the BA, including the current Environmental Baseline (BA pp.17-28), and Cumulative Habitat Effects Summary (BA pp. 66). Unit Specific Data, including the environmental baseline and effects of proposed projects that are likely to adversely affect spotted owls, are summarized by Administrative Units in the Willamette Province (BA pp. 71-114), including the Cascades Resource Area where the Airstrip Project is located (BA pp. 79-86). The BO issued by the USFWS concurred with the analysis in the BA that the combined effects to spotted owl habitat and populations of all of the actions proposed in the Willamette Province (including the Airstrip Project) are not likely to jeopardize the continued existence of the spotted owl and are not likely to adversely modify spotted owl critical habitat (BO pp. 97-98), and would not likely diminish the effectiveness of the conservation program established under the NWFP to protect the spotted owl and its habitat (BO p. 98).

The proposed project would not contribute to cumulative effects to spotted owls because dispersal habitat within and between known owl sites would be maintained, and no suitable habitat would be removed or downgraded within known owl sites. Forty Five acres of suitable

habitat within one Predicted Site and 5 acres in another predicted site would be downgraded to dispersal habitat; however, these sites were analyzed and found to be below the thresholds for suitable habitat necessary to support spotted owls in the Airstrip vicinity. Consequently, the presence of resident spotted owls in the Airstrip area is highly unlikely. Silvicultural prescriptions that promote multi-aged and multi-storied stands may increase the quality of spotted owl habitat over time (BO p. 82).

Bureau Sensitive and Survey and Manage

The proposed action alternative would not contribute to cumulative effects to the Oregon slender salamander and other CWD associated species. Suitable habitat conditions would be maintained in the short term in the project areas, providing refugia for low-mobility amphibians and invertebrates. In the long term, larger trees would be available sooner than without thinning to contribute additional large CWD in future stands. Implementation of the project would not eliminate connectivity between proposed units or adjacent untreated stands under BLM management.

No adverse cumulative effect to red tree vole habitat is expected because:

- Red tree vole is considered to be a late successional associate. Units 7B, 18A and B are not late successional habitat over 80 years of age. Unit 7A has late successional characteristics and was surveyed for red tree voles.
- The thinned stands would attain older forest conditions sooner as a result of the density management thinning project, particularly in Riparian Reserves.
- Undisturbed habitat in the same or similar age class with connectivity to the thinning units exists within the project area, elsewhere within the affected sections.

Thinning in the project areas, either individually or collectively, would not be expected to contribute to the need to list any Bureau Sensitive species under the Endangered Species Act (BLM 6840) because habitat for the species that is known to occur in the project areas would be not be eliminated, habitat connectivity would not be changed, any habitat alteration would have only short-term negative effects, and long-term effects would be beneficial.

Migratory Birds

The proposed action would not reduce the persistence of any bird species in the watershed or populations at the regional scale. Habitat changes resulting from the proposed action would not eliminate any forest cover type, change any habitat or patch size, and therefore would not contribute to fragmentation of bird habitat. Thinning would not contribute to a fundamental change in the species composition of existing bird communities within the watershed. Therefore, no adverse cumulative effects would occur to migratory birds.

Big Game

No adverse cumulative effects to big game species populations are expected. The proposed action would not fundamentally change or eliminate any forest cover type or change any habitat patch size. Therefore, thermal and hiding cover present before treatment would be maintained after harvest.

Alternative 2

In Alternative 2 a section of approximately 1,500 feet of the former airstrip, could be re-opened for haul. Alternative 1 for road development in Unit 7 B would not use the 1,500 feet of reclaimed road but would create approximately 675 feet of new road. The reclaimed roadway has 20 year old trees and shrubs growing on it currently. The effects are the same as Alternative 1 except for the following differences.

Residual Old Growth, Snags and Coarse Woody Debris

In the former airstrip there is no legacy structure in this area due to relatively recent past disturbance. Alternative 2 should have the same effects on snags and course woody debris as Alternative 1.

Special Status Species

Federally Listed Species

Northern Spotted Owl

The airstrip which is proposed for re-opening has 20 year old trees which do not function as dispersal habitat for spotted owls. The habitat will not change from capable habitat. However the habitat will be set back by 20 years versus 60 years in alternative 1 from developing into suitable habitat. Alternative 2 should have the same effects on spotted owls as Alternative 1.

Bureau Sensitive and Survey and Manage

There shouldn't be an effect on BLM special status species by re-opening the reclaimed road. There may be a short term effect on some Survey and Manage mollusk species due to the loss of deciduous trees, particularly big leaf maple. Megomphix Hemophilli was removed in the Annual Species Review in 2003 due to abundance and not associated with late successional forest. This species uses habitat provided by big leaf maple leaf litter, and may have a short term negative effect.

Migratory and Resident Birds

There may be short term effect on migratory birds due to the loss of deciduous trees and fruiting shrubs from the reclaimed road. Both insect gleaners and avian frugivores will be effected by the loss of this area. Some insect gleaners like Pacific-Slope flycatchers, chestnut backed chickadees, winter wren and American robin have all shown a preponderance for vine maple canopy gaps (Saunders et. al. 2006).

Big Game

Currently the 1500 foot section of airstrip provides forage for big game species. The area has early seral vegetation which are important to forage. There will be a short term loss in forage be the implementation of Alternative 2.

NO ACTION ALTERNATIVE

Residual Old Growth, Snags and Coarse Woody Debris

Overcrowded stands with low vigor and small crowns in Units 7 B, 18 A and B would grow more slowly compared to thinned stands. Self-thinning would occur, but diameter growth would not accelerate as fast as in thinned stands. Snags and CWD created by self-thinning mortality would not be large enough to meet RMP standards until later in the life of the stand (approximately 20 to 40 years) when suppressed co-dominates achieve these diameters before dying. In the short term there would be an increase in the number of small snags, (less than 15" DBH). These smaller snags would be a product of suppression mortality in untreated stands. These snags are less important for wildlife species than the larger material over 15 inches (Rose et. al., 2001). There would be very limited use for nesting and most of the benefit would be foraging habitat. In unmanaged forests the presence of cavity nesting birds has been linked to the presence of snags, particularly >50cm (19.26") (Carey et al. 1991, Huff and Raley 1991). Chestnut backed chickadees, red breasted nuthatches, brown creepers and hairy woodpeckers all show selectivity to foraging habitats based on deciduous trees, large diameter conifers, and large diameter heavy decayed snags and logs (Weikel, 1999).

Understory and ground cover development would take longer than if these stands were thinned. Without management intervention, stands would take longer to develop late successional habitat conditions and remain less diverse for a longer period of time.

Unit 7 A is a mature stand that displays diversity in tree crowns, spacing, size and species. The unit has a complex structure associated with the two storied stand with a large tree component in the overstory. The structural elements that provide habitat to a suite of

wildlife species would not be downgraded due to thinning.

There would be no loss of large diameter remnant trees in Unit 7B, and 7A. These trees will provide many wildlife species with nesting, roosting and foraging habitat. The large trees will have a beneficial effect on snags and large snag associated species, in the near term when they die and contribute to more over all large snags in the watershed. The watershed is currently lacking large snags, and with the recruitment of these trees to snags this will help create snag habitat for those associated species and the species that use large course woody debris when they fall.

Special Status Species

Federally Listed Species

Northern Spotted Owl

There would be no immediate change in spotted owl habitat and no effect to spotted owls caused by management action. Habitat conditions would remain as described in the Affected Environment, and would continue to develop slowly over time for reasons stated above. In unthinned areas, it would take approximately 20 to 40 years to develop suitable habitat conditions if left untreated. The suitable habitat in Unit 7 A would be maintained. In sections of 7 A with the retention of large tree component, and the understory intact, nesting roosting and foraging habitat of the Northern spotted owl will not be downgraded.

Bureau Sensitive and Survey and Manage

In the short term, there would be no immediate change in current habitat conditions for Survey and Manage and BLM Special Status Species. In the long term (20 to 60 years):

- Trees will grow more slowly, and material available for CWD recruitment would average smaller in diameter than if thinning were to occur. Development of Oregon slender salamander habitat conditions would likely be delayed without the addition of new large woody material to replace existing well-decayed material that will eventually disappear.
- Since no new disturbance to the conifer canopy would occur, no undetected red tree vole nests would be affected. Optimal red tree vole habitat conditions, presumed to be older forest conditions, would develop more slowly without thinning.
- Current conditions would persist for mollusk species and there would be little change in CWD/hardwood components

Migratory and Resident Birds

Habitat conditions would remain as described in the Affected Environment, and would continue to develop slowly over time. Species richness of bird communities would reflect

the simple single storied mid seral stages for a longer period of time, and overall bird species richness would be less than if these stands were thinned. Bird species richness may not noticeably increase, and legacy features in the future stand would likely be smaller and less persistent, especially those that provide habitat for cavity-nesting species.

Big Game

In the short term (less than 5 years), there would be no disturbance effects due to the proposed action. Thermal and hiding cover quality would remain the same as current conditions. There would be no increase in vegetative forage due to increased light to the forest floor. In the long term (5+ years), thermal and hiding cover quality would gradually decrease as overstocked stands mature hindering mobility. Forage quantity would continue to decrease over time as less light reaches the forest floor.

ALTERNITIVES CONSIDERED BUT NOT ANYLIZED

As part of the commercial thin, canopy gaps were considered. The gaps proposed were to be one acre in size located on the flat ridge top in unit 7 B. There would be 12 trees left per acres of gap. The gaps were considered in the Matrix Land Use allocation. The alternative would be consistent with the Northwest forest plan because: 1) they provide habitat for a variety of organisms associated with late successional and younger forest, 2) provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees and, 3) provide early successional habitat (RMP p. 20).

Low density heavy thinning including small one acre canopy gaps which are recommended but not being proposed because they don't meet the silviculturist's objectives for Unit 7B. These openings would result in the development of more vertical understory layering and ground cover, adding more complexity to the stand. Species which are expected to benefit from canopy gaps and low density heavy thinning are ruffed grouse, black-throated gray warbler, orange-crowned warbler, McGillivray's warbler, Wilson's warbler, warbling vireo, spotted towhee, song sparrow and big game species. Leaving slash piles unburned is expected to provide habitat for winter wrens and small mammals. While burning some piles would promote early seral plant species, which are important forage for many wildlife species.

CONSULTATION:

ESA Section 7 Consultation - US Fish and Wildlife Service
For the FONSI:

The Airstrip Project was submitted for Formal Consultation with U.S. Fish and Wildlife Service (USFWS) as provided in Section 7 of the Endangered Species Act (ESA) of 1973 (16U.S.C. 1536 (a)(2) and (a)(4) as amended) during the FY2011/2012 consultation process. The *Biological Assessment of Likely to Adversely Affect (LAA) Projects with the Potential to Modify the Habitat of Northern Spotted Owls, Willamette Planning Province - FY 2011-2012* (BA)., was submitted in July 2010. Using effect determination guidelines, the BA concluded that the Airstrip Thinning may affect, and is likely to adversely affect the northern spotted owl due to the modification of suitable habitat (BA, pp. 30-31, 34-35, 58-59).

The *Biological Opinion (BO) Regarding the Effects of Habitat Modification Activities on the Northern Spotted Owl and its Critical Habitat within the Willamette Province, FY2011-2012* (BO) associated with the Airstrip Project was issued in February 2011 (FWS reference #13420-2010-F-0157). The BO concurred that the habitat modification activities described in the BA, including the Airstrip Thinning, are not likely to jeopardize the continued existence of the spotted owl and are not likely to adversely modify spotted owl critical habitat (BO, pp. 97-98). Furthermore, the proposed action is not likely to diminish the effectiveness of the conservation program established under the NWFP to protect the spotted owl and its habitat on federal lands within its range including designated spotted owl critical habitat (BO, p. 98).

The proposed thinning and connected actions described in this EA have incorporated the applicable General Standards that were described in the BA (p. 11) and BO (BO, pp. 17-18); and comply with all reasonable and prudent measures outlined in the BO (BO, p. 100). This includes delaying proposed activities to avoid disrupting owls at known or predicted owl sites until after the critical nesting season, and monitoring/reporting on the implementation of this project to the U.S. Fish and Wildlife Service.

TABLE 6: SPECIAL STATUS WILDLIFE SPECIES
For Airstrip, Cascades Resource Area
(Bureau Sensitive, USFWS SOC and Federally Listed)

OCCURRENCE	SPECIES & STATUS	HABITAT DESCRIPTION
	INVERTEBRATES	
D	CALLOPHRYS JOHNSONI **BS** Johnson's Hairstreak	Cool, moist, old-growth conifer forests of the Pacific Northwest, primarily west of the Cascade Mountains at higher elevations. Feeds on dwarf mistletoe associated with Western hemlock and true firs. Known to occur in old-growth hemlock near Larch Mountain , 20 air miles north of Airstrip project area. Suspected to occur in Airstrip.
N	COLLIGYRUS SP. **BS** Columbia Duskysnail	A Columbia Gorge endemic, found on both sides from east and south of Portland to Hood River, Oregon. Most sites are in Gorge tributaries; a few other sites occur in drainages originating from near Mount Hood, Oregon, to Mount St. Helens, Washington. Airstrip is outside this range.
N	CRYPTOMASTIX DEVIA **BS/ S&M** Puget Oregonian (snail)	Mature and old growth forests, typically under hardwood logs and leaf litter, rocks and talus, in litter under sword ferns growing under hardwood trees and shrubs, and under moss growing on big leaf maple trunks. None were found during purposive surveys conducted in the Cascades Resource area in 2006.
N	DEROCERUS HESPERIUM **BS/S&M** Evening fieldslug	Occurs in wet meadows in forested situations in a variety of low vegetation, litter, debris and rocks. Search area limited to within 30 meters of perennial wetlands, springs, seeps and riparian areas. This habitat is not present in the Airstrip project area.
N	GLIABATES OREGONIUS **BS** Salamander slug	Type locality is in leaf litter under bushes in mature conifer forest at elevation of 600' in east side of the Oregon Coast Range. Has been found at 11 sites in the Cascades Resource Area, ranging from unharvested or unthinned late-successional forest, to a 45 year old stand that originated after regeneration harvest. There are no salamander slug sites in the Airstrip area.
N	GONIDEA ANGULATA **BS** Western ridged mussel	Substrates of lakes, streams, and rivers that range in size from gravel to firm mud with the presence of at least some fine material (e.g. sand, silt or clay). Preferred sites generally have constant flow, rather shallow water (typically < 3 m in depth), and well-oxygenated substrates, especially when occurring in finer sediments.
S	HEMPHILLIA MALONEI **S&M** Malone's Jumping Slug	Common in moist forested habitats over 50 years of age and 50%+ canopy cover below 4000 feet with dense sword fern, conifer coarse woody debris, exfoliated bark and large decaying stumps. It has also been found in marshy open sites with skunk cabbage, fallen logs and low vegetative cover.
D	MEGOMPHIX HEMPHILLI **S&M** Oregon megomphix (snail)	Conifer/hardwood forest floor, in association with bigleaf maple, duff /litter at low/mid elevations. Common along Willamette Valley floor/Cascades foothills.

N	PRISTILOMA ARCITCUM CRATERIS **BS** Crater Lake tightcoil (snail)	Areas in moist conifer forests which generally remain under snow for long periods of winter. Found among mosses and other vegetation near wetlands, springs, seeps, and riparian areas. Specimens may be found on logs, among sedges, attached to decaying leaf surfaces, in litter, or inside other shells. Search area limited to within 10 m of open water.1
	HERPETOFAUNA	
N	ACTINEMYS MARMORATA MARMORATA **BS/SOC/ SC** Northern Pacific pond turtle	Marshes, ponds, lakes, slow rivers and streams, usually with an abundance of aquatic vegetation and emergent logs or boulders for basking. Associated with Willamette Valley. Airstrip is located in the Cascades Mountains and no suitable habitat is present.
S	ASCAPHUS TRUEI **SOC/SV** Tailed frog	Cold, fast-flowing permanent springs and streams in forested areas. Has a very narrow temperature tolerance. *Likely to occur in the Airstrip area.*
D	BATRACHOSEPS WRIGHTORUM **BS/SOC/SU** Oregon slender salamander	West slope of Cascades. Prefers down logs and woody material in more advanced stages of decay. Most common in mature and old-growth conifer forests. *Known to occur in Airstrip area. Addressed in text.*
N	CHRYSEMYS PICTA **BS/SC** Painted turtle	Marshes, ponds, lakes, slow rivers and streams, usually with an abundance of aquatic vegetation and emergent logs or boulders for basking. Associated with the Willamette River and its major tributaries in the Willamette Valley. Airstrip is located in the Cascades Mountains and no suitable habitat is present.
N	DICAMPTODON COPEI **BS/SU** Cope's giant salamander	Larvae in streams or occasionally (in Washington) in ponds and lakes, sea level to 4,400 feet. Very few sites in Oregon. Possible in Sandy River sub-basins. Airstrip is outside this range.
N	PLETHODON LARSELII BS/SV Larch Mountain salamander	Associated with rocky, talus areas on steep slopes and coarse woody debris in older forests close to the Columbia River Gorge. Airstrip is outside this range. There are no known sites on Salem BLM lands. None were found during purposive surveys conducted in the Cascades Resource area in 2006.
D	RANA AURORA **SOC/SU** Red-legged frog	Common in marshes, ponds, and streams with little or no flow, from the valley floor to about 2,500 feet in mountain forests. Can occur in seasonal waters if wet until late May or June. *Documented to occur in the Airstrip area.*
N	RANA BOYLEI **BS/SOC/SV** Foothill yellow-legged frog	Permanent rivers with rocky, gravelly and sandy substrates in the south half of the Resource Area. There is no suitable habitat in the Airstrip Area.
N	RANA CASCADAE **SOC/SV** Cascades frog	Found in higher elevation bogs, ponds and stream edges associated with moist meadows above 3500 feet. Airstrip is located at lower elevations and no suitable habitat is present.
	BIRDS	

1 No detections from the Cascades RA.

S	ACCIPITER GENTILIS **SOC/SC** Northern goshawk	Rare Summer resident in Cascades. Prefers mature or old-growth forests with dense canopy cover at higher elevations. Winters at lower elevations. Stands in Airstrip are young and located at lower elevations, however, habitat is present and goshawks are could occur in the Airstrip project area.
S	CONTOPUS COOPERI **SOC/SV** Olive-sided flycatcher	Remnant large trees/snags in forest openings/edges and open forests, high contrast old/young edges. Migratory, arrive late May, leave late August. *Suitable habitat is present in Airstrip. Addressed in Table 7.*
D	EMPIDONAX TRAILLII BRESTERI **SOC/SV** Little willow flycatcher	Dense shrub and early seral stages, prefers the wet sites/ riparian zones. Migratory, arriving in mid May 15, most leave early September. *Suitable habitat is present in Airstrip. Addressed in Table 7.*
S	FALCO PEREGRINUS ANATUM **BS/SE** American peregrine falcon	Rare during the nesting season. Usually occurs as a transient/migrant and winter visitor. Found in a variety of open habitats near cliffs or mountains. Prefers areas near larger bodies of water and rivers. There is a known nest cliff 1.5 miles southeast of section 18. There is suitable foraging habitat is present in the vicinity of the Airstrip project area.
S	HALIAEETUS LEUCOCEPHALUS **BS** Bald eagle	Rare summer resident in Cascades. Uncommon winter resident in Willamette Valley. For nesting and perching, prefers large old-growth trees near major bodies of water and rivers. There are large trees suitable for perching and within a 0.5 miles of the Clackamas River and the North Fork of the Clackamas River present in the Airstrip project area.
N	HISTRIONICUS HISTRIONICUS **BS/SOC/SU** Harlequin duck	An uncommon summer resident found in whitewater mountain rivers and streams during nesting season. Winters on rocky coasts. Possible suitable habitat is present in the Airstrip area along the North fork Clackamas River, project will have no effect on the river system.
N	ICTERIA VIRENS **SOC/SC** yellow-breasted chat (Willamette Valley)	Formerly common in dense riparian thickets along the Willamette Valley floor. Will use brushy young stands after regeneration harvest, blackberry thickets, and dense scotch broom stands. Possible in any young, brushy valley-edge elevation stand. Migratory. Airstrip is located in the Cascades Mountains and no suitable habitat is present.
N	MELANERPES FORMICIVORUS **SOC** Acorn Woodpecker	Nests in colonies in cavities in mature/old-growth oak groves in the Willamette Valley. Most common to the south in the Umpqua, Rogue Valleys and California. No suitable habitat is present in the Airstrip area.
N	MELANERPES LEWIS **BS/SOC/SC** Lewis' woodpecker	Formerly a common summer resident and uncommon winter visitor in Willamette Valley. Oak woodlands and hardwood forests. Transient on Salem District in fall along high divides. No suitable habitat is present in the Airstrip area.
D	PATAGIOENAS FASCIATA **SOC** Band-tailed pigeon	Nests in closed-canopy forest; forages in open-canopy forest. Keys in on mineral sites and berry producing plants. Migratory, most arrive in March, leave in October. *Suitable habitat is present in Airstrip. Addressed in Table 7.*

N	POOECETES GRAMINEUS AFFINIS **BS/SOC/SC** Oregon vesper sparrow	Rare and local summer resident in Willamette Valley. Very rare in winter. Dry, grassy areas. Western Oregon interior valley breeding population is of concern. Airstrip is located in the Cascades Mountains and no suitable habitat is present.
S	PROGNE SUBIS **BS/SOC/SC** Purple martin	Rare summer resident. Typically occurs along rivers and other water bodies. Nests colonially in cavities in old buildings, abandoned woodpecker holes, and nest boxes. North Fork Reservoir provides for some habitat and there is a low probability of occurrence in the Airstrip area. *Addressed in Table 7.*
S	STRIX OCCIDENTALIS CAURINA **LT/ST** Northern spotted owl	Permanent resident. Prefers mature and old-growth conifer forests with large down logs, standing snags in various stages of decay, high canopy closure and a high degree of vertical stand structure. *Portions of the Airstrip Project Area are located within the provincial home range of two Computer Induced Sites. Airstrip project is approximately 1.5 miles from Big Cliff known owl site. Addressed in text.*
	MAMMALS	
N	ANTROZUS PALLIDUS **BS/SOC/SV** Pallid bat	Occurs sporadically in w. Oregon. Associated with arid habitats, generally drier interior valleys of Southwestern Oregon. Found in caves, under bridges, cracks in rocks, hollow trees, old buildings, other secluded and protected places. No suitable habitat is present in the Airstrip area.
S	ARBORIMUS LONGICAUDUS **SOC, S&M** Oregon red tree vole	The red tree vole is an arboreal vole of conifer forests below about 3,500 to 4,500 feet in elevation. Optimum habitat is older forests, but it is found in younger stands. *Suspected to be present in the Airstrip area. Addressed in text.*
N	CORYNORHINUS TOWNSENDII **BS/SOC/SC** Townsend's big-eared bat	Feeds on flying insects in a variety of habitats in forested areas. Primary habitat is caves, bridges, buildings and mines. No suitable habitat is present in the Airstrip Area.
S	LASIONYCTERIS NOCTIVAGANS **SOC** silver-haired bat	Associated with buildings, snags, loose bark and cliff/cave habitat. Prefers older forests. Forages in a variety of forest habitats and riparian areas. *Addressed in text.*
S	MYOTIS EVOTIS **SOC/SU** Long-eared myotis	Associated with snags, loose bark, buildings and cliff/cave habitat. Prefers older forests. Forages over water and riparian areas. *Addressed in text.*
S	MYOTIS THYSANODES **BS/SOC/SV** Fringed myotis	Associated with buildings, bridges, mines, snags and cliff/cave habitat. Likely in the north half of the Resource Area, at lower elevations closer to the Willamette Valley. Prefers older forests. Forages over water and riparian areas.
S	MYOTIS VOLANS **SOC/SU** Long-legged myotis	Associated with snags, loose bark, buildings, bridges and cliff/cave habitat. Prefers older forests. Forages over water and riparian areas. *Addressed in text.*
S	MYOTIS YUMANENSIS **SOC**	Associated with buildings, bridges, snags and cliff/cave habitat. More closely associated with riparian areas than the

	Yuma myotis	other myotis. Prefers older forests. Forages over water and riparian areas. *Addressed in text.*

KEY

Occurrence:
N=Not Likely to Occur
S = Suspected (highly likely to occur)
D = Documented to occur

Status:
LE = Federal Endangered
LT = Federal Threatened
SOC = Species of Concern
BS = Bureau Sensitive
S&M=Survey and Manage
SE = State Endangered
ST = State Threatened
SC = State Critical
SV = State Vulnerable
SU = State Uncertain
SP = State Peripheral

Table 7. Effects of thinning on migratory bird species of conservation concern and/or focal species with a low, moderate or high likelihood of breeding in the Airstrip Project Area (Altman and Hagar, 2007, Altman 2008, Appendix A)

Species' Common Name	Short-term 0 – 5 Years Response[1]	Mid-Term to Long-term 6+ Years Response
Bald Eagle	*Negative due to loss of large trees in 7A.*	*Positive due to promoting large tree growth*
Band-tailed Pigeon	*Negative due to opening the canopy*	*Positive with increase in deciduous component and as canopy closes*
Black-throated Gray Warbler*	No affect due to lack of hardwood component	Positive due to increase in hardwood component especially in Riparian Reserves (RR)
Blue Grouse	Positive due to understory development	Positive due to understory development especially in RR
Brown Creeper	Negative due to opening the canopy	No affect as canopy closes, positive due to large tree development in RR
Cassin's Vireo	No affect due to lack of deciduous component	Positive due to increase in deciduous component
Chestnut-backed Chickadee*	*Similar abundance in thinned/unthinned, slight n*egative due to loss of <10% snags in smaller sizes	*Similar abundance in thinned/unthinned No affect*
Chipping Sparrow	No effect due to lack of habitat in these closed stands	Slight positive effect due to opening up stands
Common Nighthawk	Open habitats no affect	Open habitats no affect
Cooper's Hawk	No affect	Positive by encouraging late successional in RR
Golden-crowned Kinglet	*Negative due to opening the canopy*	*No affect as canopy closes*
Hammond's Flycatcher	Positive due to opening up stand	Positive due to opening up stand
Hermit Warbler	*Negative due to opening the canopy*	*No affect as canopy closes, positive affect in RR by encouraging late successional conditions*
Hutton's Vireo	No affect due to lack of hardwood component	Positive due to increase in hardwood component and understory development
MacGillivray's Warbler	Brushy open habitats No affect	Brushy open habitats No affect
Mountain Quail	Open habitats no affect	Open habitats no affect
Mourning Dove	Open habitats no affect	Open habitats no affect
Northern Flicker*	Open habitats no affect; slight negative due to <10% loss of snags	Open habitats no affect
Northern Goshawk	No affect	Positive by encouraging late successional in RR
Northern Pygmy-Owl*	Negative due to opening the canopy, and <10% loss of snags	No affect as canopy closes
Northern Saw-	Negative due to opening the canopy, and <10% loss of snags	No affect as canopy closes

Species' Common Name	Short-term 0 – 5 Years Response[1]	Mid-Term to Long-term 6+ Years Response
whet Owl		
Northern Spotted Owl	May Affect, likely to adversely affect due to modification of suitable habitat	No affect as canopy closes, *positive affect in RR by encouraging late successional conditions*
Olive-sided Flycatcher	No affect due to lack of two story habitat	Positive due to encouraging late successional conditions
Orange-crowned Warbler	Brushy open habitats No affect	Brushy open habitats No affect
Pacific-slope Flycatcher	Negative due to opening the canopy	No affect as canopy closes, positive with deciduous development in RR
Peregrine falcon	No affect to suitable cliffs or site 1.5 miles away, or open foraging habitat over the Clackamas River	No affect
Pileated Woodpecker*	No affect due to retention of old-growth remnants and large snags	Positive due to encouraging late successional conditions in RR
Purple Finch	Open to semi open mixed forest edges No affect	Open to semi open mixed forest edges No affect
Purple Martin	Open habitats No affect	Open habitats No affect
Red-breasted Sapsucker	slight negative due to 10% loss of snags in smaller sizes	Positive due to encouraging late successional conditions and hardwood component, especially in RR
Red Crossbill*	Negative due to opening the canopy	No affect as canopy closes
Ruffed Grouse	Positive due to understory development	Positive due to understory development, especially in RR
Rufous Hummingbird	Open habitats no affect	Open habitats no affect
Spotted Towhee	Edge and brushy openings No affect	Edge and brushy openings No effect
Steller's Jay*	*No affect*	*No affect*
Varied Thrush	*Negative due to opening canopy*	*No affect as canopy closes*
Vaux's Swift	No affect due to retention of old-growth remnants and large snags	Positive due to encouraging late successional conditions in RR
Western bluebird	Snags in/open habitats no affect	Snags in/open habitats no affect
Willow Flycatcher*	Brushy open habitats No affect	Brushy open habitats No affect
Wilson's Warbler	No affect due to lack of understory	Positive due to understory development especially in RR
Winter Wren*	Negative due to ground disturbance, opening canopy	No affect as canopy closes

*** Bird species which have been observed in the project area.**

REFERENCES AND LITERATURE CITED

Adamus, P., Larsen, K., Gilson, G., and Miller, C. 2001. Oregon Breeding Bird Atlas. Oregon Field Ornithologists, Eugene, OR.

Altman, Bob. 2008. Conservation Strategy for Landbirds in Coniferous Forests of Western Oregon and Washington, Version 2. American Bird Conservancy, Oregon-Washington Partners in Flight.

Applegarth, J. 1999. Management Recommendations for Terrestrial Mollusk Species, *Megomphix Hemphilli*, version 2.0. IM No. OR-2000-015 (MEHE MR 1999).

Aubry, K. 2000. Amphibians in Managed, Second-Growth Douglas-fir Forests. Journal of Wildlife Management, 64(4): 1041-1052.

Bailey, J., and Tappeiner, J. 1997. Effects of Thinning on Structural Development in 40 to 100 Year-old Douglas-fir Stands in Western Oregon. Forest Ecology and Management, 108 (1998) 99-113.

Bowman, J., Sleep, D., Forbes, G., and Edwards, M. 2000. The Association of Small Mammals with Coarse Woody Debris at Log and Stand Scales. Forest Ecology and Management, 129(1-3): 119-124.

Bunnell, F., Sutherland, G., and Wahbe, T. 2001, Vertebrates Associated with Riparian Habitats on British Columbia's Mainland coast, Riparian Decision Tool Technical Report #5: Centre for Applied Conservation Biology The University of British Columbia.

Burke, Thomas E. 1999. Management Recommendations for Four Species of the Genus *Hemphillia*, version 2.0. IM No. OR-2000-003 (HEMA MR 1999).

Butts, S., and McComb, W. 2000. Associations of Forest-Floor Vertebrates with Coarse Woody Debris in Managed Forests of Western Oregon. Journal of Wildlife Management, 64(1): 95-104.

Carey, A., Hardt, M., Horton S., Biswell, B. 1991. Wildlife and Vegetation of Unmanaged Douglas-Fir Forests. U.S. Dept. Agric. Gen. Tech. Rep. PNW-GTR-285 page 122-142.

Chan, S., Larson, D., Maas-Hebner, K., Emmingham, W., Johnston, S., and Mikowski, D. 2006. Overstory and Understory Development in Thinned and Underplanted Oregon Coast Range Douglas-fir Stands. Canadian Journal of Forest Research, 36:

2696-2711.

Christy, R.E., and S.D. West. 1993. Biology of bats in Douglas-fir forests. PNW-GTR-308. U.S.D.A. Forest Service, Pacific Northwest Research Station.

Corkran, C., and Thoms, C. 2006. Amphibians of Oregon, Washington and British Columbia. 2nd edition, Lone Pine, Canada.

Cole, E., Pope, M., and Anothony G. 1997. Effects of Road Management on Movement and Survival of Roosevelt Elk. Journal of Wildlife Management 61(4): 1115-1126

Demarais, S. and P.R. Krausman. 2000. Ecology and Management of Large Mammals in North America. Prentice-Hall Inc., New Jersey.

Dowlan, S. 2006. Conservation Assessment and Management Recommendations for Oregon slender salamander, *Batrachoseps wrightorum* (*wrighti*), Cascades Resource Area, Salem District, Bureau of Land Management. Unpublished.

Dowlan, S., and Price, R. 2007. Final Report (on 2006) Special Status Mollusk and Amphibian Species Purposive Surveys Salem BLM, Cascades Resource Area.

Duncan, N., Dowlan, S., Burke, T., and Hohenlohe, P. 2003. Survey Protocol for Survey and Manage Terrestrial Mollusk Species From the Northwest Forest Plan, Version 3.0

England, J., Brown, L., McCaull, A., Turner, S., LeComte, J., and DeFord, S. 1992-2008. *Northern Spotted Owl Monitoring Reports,* Cascades Resource Area, Salem District, Bureau of Land Management.

Forsman, E., Meslow, E., and Wight, H. 1984. Distribution and Biology of the Spotted Owl in Oregon. Wildlife Monographs 87:1-64.

Hagar, J., McComb, W., and Emmingham, W. 1996. Bird Communities in Commercially Thinned and Unthinned Douglas-fir stands of Western Oregon Wildlife Society Bulletin 24(2).

Hagar, J., 2004. Research Synthesis: Trophic Relations Among Birds, Arthropods, and Shrubs, in: CFER News, winter issue 2004. Cooperative Forest Ecosystem Research Program, Oregon State University, Corvallis, OR.

Hagar, J., Howlin, S., and Ganio, L. 2004. Short Term Response of Songbirds to Experimental Thinning of Young Douglas-fir Forests in the Oregon Cascades. Forest

Ecology and Management, v. 199, no. 2-3, p. 333-347.

Hansen, H., McComb, W., Vega, R., Raphael, M., and Hunter, M. 1995. Bird Habitat Relationships in Natural and Managed Forests in the West Cascades of Oregon. Ecological Applications 5:3. Ecological Society of America.

Hayes, Weikel, J., and Huso, M. 2003. Response of Birds to Thinning Young Douglas-Fir Forests. Department of Forest Science, Oregon State University, Corvallis, OR.

Hayes, J., Chan, S., Emmingham, W., Tappeiner, J., Kellog, L., and Bailey, J. 1997. Wildlife Response to Thinning Young Forests in the Pacific Northwest. Journal of Forestry, August 1997.

Hostetler, B.B., and Ross, D. 1996. Generation of Coarse Woody Debris and Guidelines for Reducing the Risk of Adverse Impacts by Douglas-fir Beetle. Unpublished paper, USDA Forest Service Westside Forest Insect and Disease Technical Center, Troutdale, OR.

Huff, R., Van Norman, K., Hughes, C., Mellen-McLean, K., Davis, R., and Forsman, E. 2008. Originally drafted by B. Biswell, M. Blow, R. Breskel, L. Finley and J. Lint. 2002. Survey Protocol For the Red Tree Vole, Arborimus Longicaudus (= Phenacomys Longicaudus In the Record Of Decision Of The Northwest Forest Plan), Version 2.1, October 2002.

Huff, M., Raley, C. 1991. Regional Patterns of Diurnal Breeding Bird Communities in Oregon in Washington. U.S. Dept. Agric. Gen. Tech. Rep. PNW-GTR-285 page 177-205.

Humes, M., Hayes, J., and Collopy, M. 1999. Bat Activity in Thinned, Unthinned, and Old-growth Forests in Western Oregon. Journal of Wildlife Management 63(2): 553-561.

Hunter, M. 1993. Young managed stands. Communique #1. Cascade Center for Ecosystem Management, Dept. of Forest Science, Oregon State University. Corvallis, OR.

Hunter, M. 2001. Young Managed Stands. Communique #3. Cascade Center for Ecosystem Management, Dept. of Forest Science, Oregon State University. Corvallis, OR.

Hunter, M. 1999. Maintaining Biodiversity in Forest Ecosystems. Cambridge University Press, New York.

Kie, J.G., Bowyer R., and Stewart, K. 2003. Ungulates in Western Coniferous Forests: Habitat Relationships, Population Dynamics, and Ecosystem Processes. http://www.isu.edu/bios/Professors_Staff/Bowyer/Kieetal.2003.pdf.

Marshall, D., Hunter, M., and Contreras, A. 2003. Birds of Oregon: A General reference. Oregon State University Press, Corvallis, OR.

Muir, P., Mattingly, R., Tappeiner II, J., Bailey, J., Elliot, W., Hagar, J., Miller, J., Peterson, E., and Starkey, E. 2002. Managing for Biodiversity in Young Douglas-fir Forests of Western Oregon: U.S. Geological Survey, Biological Resources Division, Biological Sciences Report USGS/BRD/BSR-2002-0006.

Neitro, W., Binkley, V., Cline, S., Mannan, R., Marcot, B., Taylor, D., and Wagner, F. 1985. Snags (Wildlife Trees), in: Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington, Part 1, Chapter Narratives. U.S.D.A. Forest Service, Pacific Northwest Region.

Olson, D. 2006 in review. Initial Effects of Headwater Riparian Reserves with Upslope Thinning on Stream Habitats and Amphibians. USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR.

O'Neil, T., Johnson, D., (Manag. Dirs.); and Barrett, C., Trevithick, M., Bettinger, K., Kiilsgaard, C., Vander Heyden, M., Greda, L., Stinson, D., Marcot, B., Doran, P., Tank, S., Wunder, L. 2001. Wildlife-Habitat Relationships in Oregon and Washington (and Matrices). Northwest Habitat Institute. 2001. Oregon State University Press, Corvallis, OR.

Oregon Natural Heritage Information Center. 2007. Rare, Threatened, and Endangered Species of Oregon. Oregon Natural Heritage Information Center, Oregon State University, Portland, OR (ONHIC 2007).

Perkins, M., and Cross, S. 1988. Differential Use of Some Coniferous Forest Habitats by Hoary and Silver-haired Bats in Oregon. Murrelet. 69: 21-24.

Rose, C., Marcot, B., Mellen, T., Ohmann, J., Waddell, K., Lindley, D., and B. Schreiber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management. Chapter 24 In Wildlife Habitat Relationships in Oregon and Washington, OSU Press, Corvallis, OR.

Rundio, D., and Olson, D. 2007. Influence of Headwater Site Conditions and Riparian Buffers on Terrestrial Salamander Response to Forest Thinning. Forest Science 53(2), USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR.

Saunders, S., Lertzman, K., Fuchs, M. 2006. Bird Assemblages Associated with Vine Maple Gaps in Coastal Western Hemlock Forests of British Columbia. Northwest Science. Vol. 80, No. 3.

Schlottman, D. 2010. Air Strip Thin Stand Exam Results and Analysis. Dept. of Interior B.L.M.

Thomas, D. 1988. The Distribution of Bats in Different Ages of Douglas-fir Forests. Journal of Wildlife Management. 52: 619-626

Thomas, D., and West, S. 1991. Forest Age Associations for Bats in the Washington Cascade and Oregon Coast Ranges. In: Ruggeiero, L., Carey, A., Aubry, K. (tech coords). Wildlife and Vegetation of Unmanaged Douglas-fir Forests. Gen. Tech. Rep. PNW-285, Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 295-303.

Trombilak, S., and Frissell, C. 1999. Review of Ecological Effects of Roads on Terrestrial and Aquatic Communities. Conservation Biology 14 (1): 18-30

USDA, Forest Service; USDI Bureau of Land Management. 1993. Final Supplemental Environmental Impact Statement Management of Habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, and Record of Decision, April 1994. Portland, Oregon.

USDA, Forest Service; USDI. Bureau of Land Management. 1996. Lower Clackamas Watershed Analysis (LCWA 1996).

USDA, Forest Service. 1996. North Fork Clackamas River Watershed Analysis (NFCRWA 1996).

USDA, Forest Service; USDI Bureau of Land Management. January 2004. Final Environmental Impact Statement to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl (SEIS 2004).

USDA, Forest Service; USDI Bureau of Land Management. December 2003. 2003 Annual Species Review and Implementation of the 2003 Survey and Manage Annual Species Review (ASR 2003).

USDA, Forest Service; USDI Bureau of Land Management. June 2002. 2001 Annual Species Review and Implementation of the 2001 Survey and Manage Annual Species

Review (ASR 2001).

USDA, Forest Service; USDI Bureau of Land Management. January 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage Mitigation Measures Standards and Guidelines, Forest Service National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl (ROD 2001).

USDA, Forest Service; USDI Bureau of Land Management. January 2004. Final Environmental Impact Statement to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl (SEIS 2004).

USDA, Forest Service; USDI Bureau of Land Management. July 2007. Record of Decision to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service National Forests and Bureau of Land Management Districts Within the Range of the Northern Spotted Owl (EIS 2007) and (July 2007 ROD).

USDA, Forest Service; USDI. Bureau of Land Management. March 2010. Biological Assessment of NLAA Projects with the Potential to Modify the Habitat of Northern Spotted Owls Willamette Planning Province - FY 2011-2012 (BA).

USDI, Bureau of Land Management. 2001. Special Status Species Management, BLM Manual Section 6840 (BLM 6840).

USDI, Bureau of Land Management. 1994. Salem District Proposed Resource Management Plan/Final Environmental Impact Statement. Salem, Oregon.

USDI, Bureau of Land Management. 1995. Salem District Record of Decision and Resource Management Plan. Salem, Oregon.

USDI, Bureau of Land Management. 1999. Revision of Timber Sale E-4 Special Provision for Protection of Threatened and Endangered Species, and Suspension, Modification, and Termination of Timber Sale Contracts. BLM Instruction Memorandum No. OR-1999-036. Oregon State Office, Portland, Oregon.

USDI, Bureau of Land Management. 2003. Oregon and Washington Bureau of Land Management Special Status Species Policy. BLM Instruction Memorandum No. OR-2003-054. Oregon State Office, Portland, Oregon.

USDI, Bureau of Land Management. July 25, 2007. Special Status Species (SSS).

Instruction Memorandum No. OR-2007-072 (BLM IM OR-2007-072).

USDI, Bureau of Land Management. December 18, 2007. Migratory Bird Treaty Act – Interim Management Guidance. Instruction Memorandum No. WO-2008-050, (BLM WO-2008-050).

USDI, Bureau of Land Management. February 6, 2008. Special Status Species (SSS). Instruction Memorandum No. OR-2008-038, (BLM IM OR-2008-038).

USDI, U.S. Fish and Wildlife Service. 1991. Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls. Revised March 1992.

USDI, U.S. Fish and Wildlife Service. 2007c. Draft: What are the Effects of Habitat Thinning on Northern Spotted Owls? Literature Summarized through 2005. Portland, OR.

USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDA Forest Service. September 2008. Methodology for estimating the number of northern spotted owls affected by proposed federal actions. Version 2.0. Oregon Fish and Wildlife Office, Fish and Wildlife Service, Portland, OR (ITS 2008).

USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDA Forest Service. May 2010. Biological Assessment of LAA Projects with the Potential to Modify the Habitat and/or Disrupt Northern Spotted Owls - Willamette Planning Province - FY 2011-2012 (Draft 7).

USDI, U.S. Fish and Wildlife Service. February 2011. Biological Opinion Regarding the Effects of Habitat Modification Activities on the Northern Spotted Owl and its Critical Habitat within the Willamette Province, FY2011-2012, Proposed by the Eugene District, Bureau of Land Management; Salem District, Bureau of Land Management; Mt. Hood National Forest; Willamette National Forest; Columbia River Gorge National Scenic; FWS Reference #13420-2010-F-0157.

USDI. U.S. Geological Survey. 2002. Managing for Biodiversity in Young Douglas-Fir Forests of Western Oregon. Biological Science Report USGS/BRD/BSR 2002-0006, October 2002. Corvallis, OR.

Verts, B., Carraway, L. 1998. Land Mammals of Oregon. University of California Press, Berkeley, Calif.

Waldien, D., Hayes, J., and Arnett, E. 2000. Day Roosts of Female Long-eared Myotis in Western Oregon. Journal of Wildlife Management 64(3):785-796.

Weikel, J. 1997. Habitat Use by Cavity Nesting Birds in Young Thinned and Unthinned Douglas-fir Forests of Western Oregon. Oregon State University, Corvallis, OR. MS Thesis.

Weikel, J.M., Hayes, J.P. 1999. The Foraging Ecology of Cavity-Nesting Birds in Young Forests of the Northern Coast Range of Oregon. The Condor, 101(1): 58-66

APPENDIX A

BREEDING BIRD OCCURRENCE
Airstrip Project
SALEM BLM-CASCADES Resource Area
October 2008

Explanation of Appendix A: A list of known or suspected birds that are likely to breed in the Project Area based on a literature search and the professional experience of BLM wildlife biologists. The Project Area is defined as the area where there will be direct impacts due to habitat modification. The species listed in red are priority bird species of conservation concern (Altman 2008). Refer to the end of Appendix A and B for a full list of partners and conservation plans used to derive the priority bird species list for the Cascades Resource Area. In column 2 is the primary nesting and foraging (N&F) habitat attributes that each species is associated with based on a literature search. Column 3 attributes a ranking of breeding likelihood in the project area, of high, moderate, low and X representing nesting habitat not present in the project area or species are not known to occur in the project area. A ranking in Column 3 with an asterisk * delineates a species that has been documented in the project area by a BLM survey.

Species Common Name	Primary Nesting (N) and Foraging (F) Habitat Attributes	Likelihood of Breeding in Project Area
Hutton's Vireo	N&F-dense conifer canopy with deciduous subcanopy	High
Band-tailed Pigeon	N-closed-canopy forest; F-berries from shrubs and trees	High
Black-throated Gray Warbler	N&F-deciduous canopy and sub-canopy trees, riparian habitats	High
Brown Creeper	N-large snags/trees with loose bark for cavity/ crevice nesting; F-bark gleaner	High
Common Raven	N-large conifer trees	High
Cooper's Hawk	N-mature trees for nesting; F-open and closed forests	High
Golden-crowned Kinglet	N&F-dense conifer canopy	High
Great-horned Owl	N-large snags/trees for cavity/ platform nest	High*
Hermit Warbler	N&F-dense conifer canopy	High
Northern Pygmy-Owl	N-snags; F-dense conifer canopy; diurnal	High
Northern Saw-whet Owl	N-snags; F-dense conifer canopy; nocturnal	High

Species Common Name	Primary Nesting (N) and Foraging (F) Habitat Attributes	Likelihood of Breeding in Project Area
Pacific-slope Flycatcher	N&F-deciduous canopy and subcanopy trees, especially alder	High
Pine Siskin	N&F-semi-open to closed conifer forest	High
Red-breasted Sapsucker	N-snags; F-mostly on soft snags in the riparian zone	High
Ruffed Grouse	N&F-deciduous shrubs/trees, esp. alder, in forest edges and openings	High
Rufous Hummingbird	N&F-dense shrub layer with nectar producers	High
Sharp-shinned Hawk	N&F-dense stands of young conifer trees	High
Song Sparrow	N&F-dense grass/forb/shrub openings, prefers the wettest areas	High
Swainson's Thrush	N&F-dense shrub layer, prefers wettest sites	High
Western Tanager	N&F-open conifer forests and mixed conifer/ deciduous forests	High
Wilson's Warbler	N&F-dense shrub habitat, prefers the wettest sites	High
Barred Owl	N-large snags/trees for cavity/ plat-form nest; F-openings/ edges	High*
American Robin	N-in tree/shrub; F-in openings/edges and semi-open forests	High*
Chestnut-backed Chickadee	N-snags; F-dense conifer foliage	High*
Dark-eyed Junco	N&F-patches of bare ground and low herbaceous vegetation in openings and open forests	High*
Hairy Woodpecker	N-snags; F-soft snags	High*
Northern Flicker	N-snags; F-forest edges/openings, moderate snag use	High*
Pileated Woodpecker	N-large snags in forest interior; F-primarily on snags	High*
Red-breasted Nuthatch	N-snags; F-high volume of conifer foliage	High*
Red-tailed Hawk	N-stand of large trees for nesting platforms; F- forest openings and edges	High*
Steller's Jay	N&F-multi-layered conifer canopies with high volume of conifer foliage	High*

Species Common Name	Primary Nesting (N) and Foraging (F) Habitat Attributes	Likelihood of Breeding in Project Area
Varied Thrush	N&F-structural complexity with mid-story and deciduous trees	High*
Winter Wren	N&F-complex understory structure; will nest in cavities/crevices	High*
American Crow	N&F-forest openings/edges at lowest elevations/ valley margins	Moderate
American Goldfinch	N&F-forest openings at lower elevations & valley margins; mid-late summer breeder	Moderate
Bald Eagle	N-large trees/snags for nest platforms close to large rivers, lakes/ reservoirs, and estuaries for foraging	Moderate
Black-headed Grosbeak	N&F-deciduous canopy and sub-canopy trees, prefers riparian zones	Moderate
Blue Grouse	N&F-mesic sites with deciduous cover in open and closed forests	Moderate
Cedar Waxwing	N-forest openings/edges; F-berries	Moderate
Common Yellowthroat	N&F-wetlands with tall herbaceous layer and dense shrubs	Moderate
Evening Grosbeak	N&F-forest edges/openings	Moderate
Gray Jay	N&F-dense conifer canopy	Moderate
Hammond's Flycatcher	N&F-open mid-story with dense conifer canopy cover	Moderate
MacGillivray's Warbler	N&F-openings with dense grass/forb/shrub vegetation on wettest sites	Moderate
Mountain Quail	N&F-openings with herbaceous and dense shrub patches	Moderate
Olive-sided Flycatcher	N&F-remnant large trees/snags in forest openings/edges and open forests	Moderate
Orange-crowned Warbler	N&F-dense shrub habitat in forest openings	Moderate
Osprey	N&F-forested areas with large snags or live trees with dead tops along rivers, large creeks and lakes	Moderate
Spotted Towhee	N&F-dense shrub habitat in forest openings/edges	Moderate
Townsend's Solitaire	N&F-sparsely vegetated ground in open forests, forest openings and edges; ground nester	Moderate

Species Common Name	Primary Nesting (N) and Foraging (F) Habitat Attributes	Likelihood of Breeding in Project Area
Vaux's Swift	N-large diameter, hollow live/dead trees for nesting and roosting	Moderate
Warbling Vireo	N&F-deciduous canopy/subcanopy trees, prefers the wettest sites, riparian zones	Moderate
Western Screech-Owl	N-snags; F-open forests, forest openings/edges and riparian woodlands	Moderate
Western Wood-Pewee	N&F-deciduous trees in canopy or subcanopy in forest openings/edges	Moderate
Red Crossbill	N&F-mature, dense conifer canopy with a high volume of cones	Moderate*
Willow Flycatcher	N&F-dense shrub habitat, prefers the wettest sites	Moderate*
American Kestrel	N-large snags; F-in forest openings/ edges at lower elevations/ valley margins; primarily insectivore	Low
American Peregrine Falcon	N&F- are on ledges of large cliffs	Low
Bewick's Wren	N-stumps/snags, cavity/crevice nester; F-open forests, forest openings and edges	Low
Black-capped Chickadee	N-snags; F-prefers riparian deciduous habitat	Low
Bushtit	N&F-dense shrubs and small trees, prefers deciduous vegetation; lowest elevations/valley margins	Low
California Quail	N-grass/forb habitat; F-open areas; dense shrub/ tree habitat for roosting and escape cover; lowest elevations/valley margins	Low
Cassin's Vireo	N-deciduous canopy/subcanopy trees and shrubs for nesting; lowest elevations/valley margins, warmer sites; F-conifer canopy	Low
Chipping Sparrow	N-saplings; F-open forest, especially drier sites	Low
Common Nighthawk	N-nests on bare to sparsely vegetated ground in openings and open forests	Low
Downy Woodpecker	N-snags; F-deciduous riparian zone	Low
Hermit Thrush	N&F-conifer overstory with some shrubs and trees in understory	Low

Species Common Name	Primary Nesting (N) and Foraging (F) Habitat Attributes	Likelihood of Breeding in Project Area
House Finch	N&F-forest openings and open forests of the lower elevations and valley margins	Low
House Wren	N&F-snags/stumps for cavity/crevice nesting in openings and open forests	Low
Mourning Dove	N&F-forest openings and open forests, lowest elevations/valley margins; feeds on the ground	Low
Northern Goshawk	N&F-Mature stands with high basal area of trees, with high canopy closure.	Low
Northern Spotted Owl	See Biological Assessment and Evaluation	Low
Purple Finch	N&F-mixed conifer/deciduous forest edges and openings	Low
Purple Martin	N-large snag/snags (single pair and colonial nester) in large forest openings with low vegetative structure; F-over large forest openings, in adjacent valleys, or over large bodies of water	Low
Tree Swallow	N-snags; F-openings, especially near water	Low
Violet-green Swallow	N-snags with crevices/cavities; F-openings/edges	Low
Western Bluebird	N-snags; F-openings with sparse vegetation	Low
Western Scrub Jay	N&F-present in all types of conifer stands from the valley floor to near tree line	Low
White-crowned Sparrow	N&F-dense grass/forb habitat with scattered shrubs and trees in forest openings	Low
Yellow Warbler	N&F-willow and cottonwood riparian thickets and tick woodlands	Low
Yellow-rumped Warbler	N&F-open to semi-open conifer forest	Low
Turkey Vulture	N-large structures for nesting platforms; F-over open country	Low*
Acorn Woodpecker	N&F-mature/old-growth oak groves in the Willamette, Umpqua and Rogue River Valleys	X

Species Common Name	Primary Nesting (N) and Foraging (F) Habitat Attributes	Likelihood of Breeding in Project Area
Lewis's Woodpecker	N-Oregon white oak, ponderosa pine and riparian cottonwood communities. F-Open woodland habitat near water	X
Lincoln's sparrow	N&F-Flat and gently sloping mountain meadows where surface water is present	X
Mallard	N&F-Temporary and seasonal wetlands	X
Mountain Bluebird	N-Cavity nester in open terrain and high mountain meadows	X
Nashville Warbler	N&F-dense shrubs in forest openings/edges on drier sites	X
Northern Rough-winged Swallow	N&F -roadways, road-cut, and quarries with nearby open areas for foraging	X
Oregon Vesper Sparrow	N&F-grass/forb habitat with scattered shrubs in forest openings; Bureau Sensitive species	X
Pied-billed Grebe	N&F-lakes, pond, channels and sloughs with emergent vegetation.	X
Red-eyed Vireo	N&F-well developed riparian forests along major waterways	X
Red-winged Blackbird	N&F-marshes, ditches, hay-fields, pastureland and parks	X
Rock Wren	N&F-rock outcroppings, rocky slopes, rimrock, lava fields, rock quarries, forest clear cuts	X
Ruby-crowned Kinglet	N&F-High elevation forest, primarily east of the Cascade cest	X
Savannah Sparrow	N&F-open fields	X
Slender-billed Nuthatch	N&F-Common in oak and mixed forests in the Willamette Valley region.	X
Spotted Sandpiper	N&F -Found near water in a wide spectrum of habitat types	X
Townsend's Warbler	N&F-Elevations 4,000-5,600ft dense understudy of grand fir, fewer large trees and lower canopy densities.	X
Wood Duck	N-large snag adjacent to still or slow moving water	X
Wrentit	N&F-dense shrub layer	X

Species Common Name	Primary Nesting (N) and Foraging (F) Habitat Attributes	Likelihood of Breeding in Project Area
Yellow-breasted Chat	N&F-dense shrub layer, prefers the wettest sites, lowest elevations/valley margins	X

Partners and conservation plans used to derive the priority bird species list used in Table 7

1) USFWS BCC; U.S. Fish and Wildlife Service Birds of Conservation Concern (http://www.fws.gov/migratorybirds/reports/bcc2002.pdf). The area encompassed by this list is BCR 5 which includes more than western Oregon and Washington.
2) USFS/BLM Sensitive Species (policy/). The area encompassed by this list is Oregon and Washington.
3) ODFW Strategy; Oregon Department of Fish and Wildlife "Strategy" species for one or more of the western Oregon ecoregions as identified in the Comprehensive Wildlife Conservation Strategy (i.e., The Oregon Conservation Strategy) (http://www.dfw.state.or.us/conservationstrategy/contents.asp)
4) WDFW Strategy; Washington Department of Fish and Wildlife "Strategy" species for one or more of the western Washington ecoregions as identified in the Comprehensive Wildlife Conservation Strategy (http://wdfw.wa.gov/wlm/cwcs/cwcs.htm).
5) PIF SAD; Partners in Flight Species Assessment Database (www.rmbo.org/pif/jsp/BCRmap.asp): RC = Regional Concern; RS = Regional Stewardship. The area encompassed by this list is BCR 5 which includes more than western Oregon and Washington.
6) PIF CPLAN; Partners in Flight North American Landbird Conservation Plan (Rich et al. 2004) (http://www.partnersinflight.org/cont_plan/default.htm): SCI = Species of Continental Importance for the Pacific Avifaunal Biome.
7) WATCH List; National Audubon/American Bird Conservancy Continental Watch List 2007; Red = Highest Priority; Yellow = Second Priority (http://web1.audubon.org/science/species/watchlist/ and www.abcbirds.org/abcprograms/science/watchlist/index.html).
8) USFWS T/E; U.S. Fish and Wildlife Service Threatened and endangered list. http://www.fws.gov/Endangered/wildlife.html
9) ONHIC List; Oregon Natural Heritage Information Center List 2007. http://oregonstate.edu/ornhic/index.html
10) GBBDC List; U.S. Fish and Wildlife Service Game Birds Below desired Condition 2007 List http://www.fws.gov/migratorybirds/reports/status04/GBBDC%20LIST.pdf

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Appendix B. Migratory Bird Treaty Act Priority Species

MIGRATORY BIRD TREATY ACT INTERIM MANAGEMENT GUIDELINES

(WO IM2008-050; Dec. 18, 2007)

USDI – BLM Salem District – Cascades Resource Area

"Priority Species" are those species listed in the periodic report, Birds of Conservation Concern, published by the Fish and Wildlife Service Division of Migratory Bird Management; priority migratory bird species documented in comprehensive bird conservation plans (North American Waterbird Conservation Plan, United States Shorebird Conservation Plan, Partners in Flight {PIF} Bird Conservation Plan); species or populations of waterfowl that the North American Waterfowl Management Plan identifies as a high, or moderately high, continental priority; listed threatened and endangered bird species in 50 CFR 17.11; or MBTA-listed game birds below desired population sizes."

	Oregon Natural Heritage (Rank)	USFWS' Birds of Conservation Concern	BLM sensitive and T/E	Northern Pacific Rainforest (PIF)	Game Birds Below Desired Population Size
Acorn Woodpecker	4	X			
American Three-toed woodpecker	4				
American Peregrine Falcon	2	X	S		
Bald Eagle	4		S	PR	
Band-tailed Pigeon	4			MA	X
Belted Kingfisher				PR	
Black Swift	2	X	S	MA	
Black-backed woodpecker	4				
Black-throated Gray Warbler				PR	
Blue Grouse				MA	
Bullock's Oriole				MA	
Cassin's Vireo				MA	
Chestnut-				PR	

backed Chickadee					
Common Nighthawk	4				
Cooper's Hawk				MA	
Dusky Flycatcher				MA	
Golden-crowned Kinglet				MA	
Great Gray Owl	4		S		
Harlequin Duck	2		S		X
Hermit Warbler				PR	
Hutton's Vireo				PR	
Lewis's Woodpecker	2	X	S		
MacGillivary's Warbler				PR	
Mallard					X
Mountain Quail		X		PR	
Mourning Dove					X
Northern Goshawk	4	X			
Northern Pygmy-Owl				PR	
Northern Saw-whet Owl				PR	
Northern Spotted Owl	1		T/E	MA	
Olive-sided Flycatcher	4	X		MA	
Orange-crowned Warbler				PR	
Oregon Vesper sparrow	2	X	S		
Pacific-slope Flycatcher				PR	
Purple Finch				MA	
Purple Martin	2		S		
Red Crossbill				MA	

Red-breasted sapsucker				MA	
Ruffed grouse				MA	
Rufous Hummingbird		X		MA	
	Oregon Natural Heritage (Rank)	USFWS' Birds of Conservation Concern	BLM sensitive and T/E	Northern Pacific Rainforest (PIF)	Game Birds Below Desired Population Size
Slender-billed Nuthatch	4				
Spotted Towhee				PR	
Steller's Jay				PR	
Townsend's Warbler				PR	
Varied Thrush				PR	
Vaux's Swift				PR	
Western Bluebird	4				
Willow Flycatcher				MA	
Winter Wren				SCI	
Wood Duck					X
Wrentit				PR	
Yellow-breasted Chat		X			

REFERENCES

1. Altman, Bob. 2008. Conservation Strategy for Landbirds in Coniferous Forests of Western Oregon and Washington. Version 2. Oregon-Washington Partners In Flight.

2. Altman, B., and J. Hagar. 2007. Rainforest Birds: A Land Manager's Guide to Breeding Bird Habitat in Young Conifer Forests in the Pacific Northwest. U.S. Geological Survey, Scientific Investigations Report, 2006-5304. 60 p.

3. Jones and Stokes Associates, Inc. 1980. Wildlife Species Accounts: Life Histories and Habitat Relationships of Species Commonly Found in Old-Growth Conifer Forests of Western Oregon, Western Washington and Northwestern California. Prepared for: North West Timber Association, Eugene, Oregon and Western Forest Industries Association, Portland, Oregon. 394 p.

4. Lang, F.J. 1980. Timber Management Practices and Wildlife Species in Early Successional Douglas-fir Forests. Prepared for: Association of O & C Counties, Dr. R. E. Vincent, Contract Officer, Philomath, Oregon. Jones & Stokes Associates, Inc., Sacramento California. 55p.

5. Marshall, D.B., M.G. Hunter, and A.L. Contreras, Eds. 2003 Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, OR. 768 p.

6. Muir, P.S., Mattingly, R.L., Tappeiner II, J.C., Bailey, J.D., Elliott, W.E., Hagar, J.C., Miller, J.C. Peterson, E.B., and Stakey, E.E., 2002, Managing for biodiversity in young Douglas-fir forests of western Oregon: U.S. Geological Survey, Biological Resources Division, Biological Sciences Report USGS/BRD?BSR-2002-0006.

Appendix C: Forest successional stages and associated habitat attributes and focal species for landbird conservation in coniferous forests in western Oregon and Washington (Altman 2008).

FOREST STAGE	HABITAT ATTRIBUTE	FOCAL SPECIES
Old-Growth/Mature Forest (Multi-Layered/Late-Successional)	Large snags	Pileated Woodpecker
	Large trees	Brown Creeper
	Deciduous canopy/sub-canopy trees	Pacific-slope Flycatcher
	Mid-story tree layers	Varied Thrush
Mature/Young Forest (Multi-Layered/ Understory Reinitiating)	Closed canopy	Hermit Warbler
	Open mid-story	Hammond's Flycatcher
	Deciduous understory	**Wilson's Warbler**
	Forest floor complexity	Winter Wren
Young/Pole Forest (Understory Reinitiating/ Stem Exclusion)	Deciduous canopy trees	Black-throated Gray Warbler
Sapling/Seedling Forest (Stand Initiation/Early Successional)	Residual canopy trees	**Olive-sided Flycatcher**
	Snags	**Northern Flicker**
	Deciduous shrub layer	**Orange-crowned Warbler**
Unique Forest Habitats or Conditions	Mineral springs	**Band-tailed Pigeon**
	Nectar-producing plants	**Rufous Hummingbird**
	Large hollow snags	Vaux's Swift
	Landscape mosaic forest	**Blue (Sooty) Grouse**

Declining species shown in **BOLD.**