APPENDIX X: Effects of Herbicides on Wildlife Species

Appendix prepared by Alan Dyck, Forest Wildlife Biologist, December 2006.

All invasive plant treatment methods have the potential to temporarily disturb, displace, or directly harm various wildlife species. All methods are considered as part of the biological evaluation for the species in the project area. The primary focus of this analysis, however, is the effects from herbicides on wildlife. During scoping comment periods for the Invasive Plant FEIS (2005a), the public expressed specific concern about herbicides and their effects on wildlife species. Little concern was expressed about the effects of other kinds of treatment (manual, mechanical and cultural). The effects or disturbance to threatened and endangered wildlife is analyzed, and included in the discussion of alternatives.

The wildlife analysis considers the effects of herbicide treatment on Special Status Species, including threatened, endangered, and sensitive species and survey and manages species, as well as those animals considered Management Indicator Species (MIS) in the Forest Plan. Some discussion on the effects to landbird is included with emphasis on Partners in Flight watch list species. For most species, the size and distribution of actual treatment areas, the dispersed populations of terrestrial wildlife, and the foraging area and behavior of individual animals eliminate the potential for direct effects at the population level. Herbicide effects analysis relies on information in the SERA Risk Assessments (2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f) unless otherwise noted. The risk assessments used peer-reviewed articles from public scientific literature, current U.S. Environmental Protection Agency (EPA) documents available to the public, and Confidential Business Information[1] to evaluate toxicity and risk from the herbicides analyzed. Detailed information on the herbicide analysis conducted for this EIS, including the potential for endocrine disruption and synergistic effects, is documented in the Invasive Plant FEIS (2005a), Appendix P, Summary of Herbicide Effects to Wildlife.

The Invasive Plant FEIS (2005a) quantitative estimates of worst-case doses of herbicide have been calculated using information such as body size, diet, and water concentrations to calculate the potential dose a certain type of animal might receive. The estimated dose was compared to the toxicity index (i.e., threshold dose). An estimated dose less than the toxicity index resulted in no plausible adverse effect. An estimated dose greater than the toxicity index was called a potential adverse effect. If an estimated dose exceeded the toxicity index, it was further evaluated to determine if the dose exceeded a known LOAEL (Lowest-Observed-Adverse-Effect Level). The LOAEL is the lowest dose of a chemical in a study, or group of studies, that produces statistically or biologically significant increases in frequency or severity of adverse effects between the exposed and control populations.

[1] Confidential Business Information (CBI) is defined as information that contains trade secrets, commercial or financial information, or other information that has been claimed as confidential by the submitter (EPA/OPP, 2004). Individuals must apply for and be granted access to CBI.

Generally, this analysis was conducted for both acute and chronic exposures. (Note that this discussion is on exposure, which differs from acute or chronic effects. The acute and chronic effects imply toxic or non-effects to wildlife.) An acute exposure is a single exposure or multiple brief exposures occurring within a short time (e.g., 24 hours or less in humans). A chronic exposure are exposures that extend over the average lifetime or for a significant fraction of thee lifetime of the species (for a rat, chronic exposures is typically about two years) (Invasive Plant FEIS, 2005a). When data were insufficient to develop an estimate of chronic dose, acute doses were evaluated against the chronic toxicity index. When the acute dose is less than the chronic toxicity index, there is no plausible risk to the animal, because actual chronic exposures would be less than acute exposures. When the acute dose is greater than the chronic toxicity index, no estimate of risk could be made and potential effects remain uncertain because existing data do not provide sufficient information. The general results of the herbicide analysis have been applied to the specific focal species that were analyzed by the Forest Wildlife Biologist is summarized in Table X-3. The analyzed effects are predicted if none of the standards and guidelines presented in the Invasive Plant ROD (2005b) would be used and no Project Design Criteria (PDC) (Section 2.2) implemented. This analysis was conducted to look at what herbicides could harm wildlife species in order to determine the potential effects and help determine PDC that need to be implemented to reduce risk. Assumptions were made regarding whether the species would be exposed to acute or chronic levels of exposure and are described for the table. Habitat use and foraging strategies used by the species which could lead to different exposure scenarios were based on species knowledge and the professional judgment of the Forest Wildlife Biologist. Species information referenced, especially for mollusk, is based on Mt. Hood National Forest Wildlife Surveys conducted in 1997, 1998, 1999, 2000, 2001, and 2002. The Land Mammals of Oregon (Verts and Carraway, 1998) was consulted on mammal habitat and life history.

Data on toxicity of herbicides to amphibians are more limited than data for mammals and birds. "Little information exists about effects of herbicides, especially operational treatments, on some taxa such as amphibians and reptiles. However, the data available suggest that because of application timing (late summer-early autumn), habitat preference (wet areas, generally not harvested or treated), and the secretive nature of amphibians, they are unlikely to be exposed, and therefore, affected either directly or indirectly by herbicide treatments in northern forested ecosystems" (Lautenschlager and Sullivan, 2004). Consequently, quantitative estimates of dose from exposure scenarios for all herbicides have not been created for amphibians in the SERA Risk Assessments (2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f).[2] Quantitative exposure scenarios were conducted for amphibians when sufficient data existed to support the scenario (e.g., sulfometuron methyl). Toxicity data and exposure scenarios for fish provide a reasonable surrogate for effects on amphibians because several studies have found that amphibians are less sensitive, or about as sensitive, as fish to some herbicides (Berrill et al., 1994; Berrill et al., 1997; Perkins et al., 2000). Comparison of toxicity values for fish and amphibians for the herbicides analyzed indicate similar sensitivities See SERA Risk Assessments (2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f) for more information.

[2] Amphibian exposure scenarios are available for sulfometuron methyl.

With a few exceptions, the toxicity index used in this analysis for each herbicide represents a sub-lethal effect. Tables X-1 and X-2 list the toxicity indices used in the analysis and the potential effects to wildlife at the LOAEL. All toxicity indices represent the lowest dose (e.g. most sensitive endpoint) from the species most sensitive to herbicide effects, for which adequate data are available.

The same methodology was used to quantitatively estimate risk from the use of surfactants added to herbicides prior to their use. Most surfactants used are based on a component known as nonylphenol polyethoxylate (NPE). The use of NPE-based surfactants in any of the 10 herbicides considered in this EIS could result in toxic effects to mammals and birds that eat contaminated vegetation or insects at typical and high application rates. Use of NPE is not likely to adversely affect amphibians found in the Pacific Northwest for normal operations. Overspray or accidental spills, however, could produce concentrations of NPE that could adversely affect amphibians, particularly in small stagnant ponds.

Table X-1: Toxicity indices used and LOAELs reported for Mammals. Table from Invasive Plant FEIS (2005a), page 4-47. Classified by herbicides analyzed in this EIS (SERA 2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f) and NPE surfactants (Bakke, 2003b).

Herbicide	Duration[1]	Endpoint	Dose	Species	Effect Noted at LOAEL
Chlorsulfuron	Acute	NOAEL	75 mg/kg	Rabbit	Decreased weight gain at 200 mg/kg
	Chronic	NOAEL	5 mg/kg/day	Rat	Weight changes at 25 mg/kg/day
Clopyralid	Acute	NOAEL	75 mg/kg	Rat	Decreased weight gain at 250 mg/kg
	Chronic	NOAEL	15 mg/kg/day	Rat	Thickening of gastric epithelium at 150 mg/kg/day
Glyphosate	Acute	NOAEL	175 mg/kg	Rabbit	Diarrhea at 350 mg/kg
	Chronic	NOAEL	175 mg/kg/day	Rabbit	Diarrhea at 350 mg/kg
Imazapic	Acute	NOAEL	350 mg/kg	Rabbit	Decreased body weight at 500 mg/kg
	Chronic	NOAEL[2]	45 mg/kg	Dog	Microscopic muscle effects at 137 mg/kg
Imazapyr	Acute	NOAEL	250 mg/kg	Dog	No effects at highest doses tested
	Chronic	NOAEL	250 mg/kg/day	Dog	No effects at highest doses tested
Metsulfuron methyl	Acute	NOAEL[3]	25 mg/kg	Rat	Decreased weight gain at 500 mg/kg
	Chronic	NOAEL	25 mg/kg/day	Rat	Decreased weight gain at 125 mg/kg
Picloram	Acute	NOAEL	34 mg/kg	Rabbit	Decreased weight gain at 172 mg/kg
	Chronic	NOAEL	7 mg/kg	Dog	Increased liver weight at 35 mg/kg[4]
Sethoxydim	Acute	NOAEL	160 mg/kg[5]	Rabbit	Reduced number of viable fetuses, some dam mortality at 480 mg/kg
	Chronic	NOAEL	9 mg/kg/day	Dog	Mild anemia at 18 mg/kg/day
Sulfometuron methyl	Acute	NOAEL	87 mg/kg	Rat	Decreased body weight at 433 mg/kg

Herbicide	Duration[1]	Endpoint	Dose	Species	Effect Noted at LOAEL
	Chronic	NOAEL	2 mg/kg/day	Rat	Effects on blood and bile ducts at 20 mg/kg/day
Triclopyr[6]	Acute	NOAEL	100 mg/kg	Rat	Malformed fetuses at 300 mg/kg
	Chronic[7]	NOAEL	0.5 mg/kg/day	Dog	Effect on kidney at 2.5 mg/kg/day
	Chronic	NOAEL	1 mg/kg/day	Rat & Dog	Effects on kidney, blood, and liver at 5 mg/kg/day
NPE Surfactants	Acute	NOAEL	10 mg/kg	Rat	Slight reduction of polysaccharides in liver at 50 mg/kg/day
	Chronic	NOAEL	10 mg/kg/day	Rat	Increased weights of liver, kidneys, ovaries, and decreased live pups at 50 mg/kg/day

1. An acute dose is one that occurs over a short time. A chronic dose is a smaller amount given repeatedly over time.
2. Imazapic – NOAEL calculated from a LOAEL of 137 mg/kg/day and application of a safety factor of 3 to extrapolate from a LOAEL to a NOAEL.
3. The acute NOAEL of 24 mg/kg is very close to the chronic NOAEL, so chronic value is used for acute exposures as well.
4. USEPA/OPP 1998.
5. Source of the value used by EPA (180 mg/kg) is not well documented, so the lower value of 160 mg/kg from a rabbit study is used as the toxicity index for this analysis.
6. Triclopyr BEE and TEA have equal toxicities to mammals (SERA, 2003c).
7. Value taken from Quast et al. 1976 as cited in SERA, 2003c. This represents an extremely conservative approach, explained in more detail in the write up on triclopyr later in this document.

SERA (2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f) and Bakke (2003b)

Table X-2: Toxicity indices used and LOAELs reported for Bird. Table from Invasive Plant FEIS (2005a), page 4-47. Classified by herbicides analyzed in this EIS (SERA 2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f) and NPE surfactants (Bakke, 2003b).

Herbicide	Duration[1]	Endpoint	Dose	Species	Effects Noted at LOAEL
Chlorsulfuron	Acute	NOAEL	1686 mg/kg	Quail	No significant effects at highest dose
	Chronic	NOAEL	140 mg/kg/day	Quail	No significant effects at highest dose
Clopyralid	Acute	NOAEL	670 mg/kg	Mallard & Quail	No signs of toxicity reported, LOAEL not determined
	Chronic[2]	NOAEL	15 mg/kg/day	Rat	Thickening of gastric epithelium at 150 mg/kg/day
Glyphosate	Acute	NOAEL	562 mg/kg	Mallard & Quail	No effects at highest dose
	Chronic	NOAEL	100 mg/kg	Mallard & Quail	No effects on reproduction at highest dose
Imazapic	Acute	NOAEL	1100 mg/kg	Quail	No effects at highest dose
	Chronic	NOAEL	113 mg/kg/day	Quail	Decreased weight gain in chicks at 170 mg/kg/day
Imazapyr	Acute	NOAEL	674 mg/kg	Quail	No effects at highest dose
	Chronic	NOAEL	200 mg/kg/day	Mallard & Quail	No effects at highest dose
Metsulfuron methyl	Acute	NOAEL	1043 mg/kg	Quail	No significant effects at highest dose
	Chronic	NOAEL	120 mg/kg/day	Mallard & Quail	No significant effects at highest dose
Picloram	Acute	NOAEL	1500 mg/kg	Chicken & pheasant	No effect to reproduction. LOAEL not reported
	Chronic[3]	NOAEL	7 mg/kg/day	Dog	Increased liver weight at 35 mg/kg/day
Sethoxydim	Acute	LOAEL	>500 mg/kg	Mallard & Quail	No or low mortality at highest doses tested. LOAEL not available.
	Chronic	LOAEL[4]	10 mg/kg/day	Mallard	Decreased number of normal hatchlings at 10 mg/kg/day
Sulfometuron methyl	Acute	LOAEL	312 mg/kg	Mallard	Decreased weight gain at 625 mg/kg/day
	Chronic[5]	LOAEL	2 mg/kg/day	Rat	Effects on blood and bile ducts at 20 mg/kg/day
Triclopyr BEE[6]	Acute	LD_{50}	388 mg/kg	Quail	50 percent mortality at 388 mg/kg
	Chronic	NOAEL	10 mg/kg/day	Mallard & quail	Decreased survival of offspring, reduced eggshell thickness at 20 mg/kg/day
Triclopyr TEA	Acute	LD_{50}	535 mg/kg	Quail	50 percent mortality at 535 mg/kg
	Chronic	NOAEL	10 mg/kg/day	Mallard & Quail	Decreased survival of offspring, reduced eggshell thickness at 20 mg/kg/day
NPE Surfactants[7]	Acute	LOAEL	10 mg/kg	Rat	Slight reduction of polysaccharides in liver at 50 mg/kg/day

Herbicide	Duration[1]	Endpoint	Dose	Species	Effects Noted at LOAEL
	Chronic	LOAEL	10 mg/kg/day	Rat	Increased weights of liver, kidneys, ovaries, and decreased live pups at 50 mg/kg/day

1. An acute dose is one that occurs over a short time. A chronic dose is a smaller amount given repeatedly over time.
2. Chronic toxicity studies in birds are not available, so the value from mammal studies is used.
3. Chronic toxicity studies in birds are not available, so the value from mammal studies is used.
4. Based on one study in which a NOAEL was not determined, so the LOAEL is used.
5. Birds may be somewhat less sensitive than mammals, but data are limited, so the lower value from mammal studies is used.
6. Unlike in mammals, the toxicities of triclopyr BEE and triclopyr TEA are different for birds, so the indices of the two forms of triclopyr are presented separately
7. Data on birds is not available in published literature, so values from mammals are used.

Source: SERA (2001b, 2003a, 2003b, 2003c, 2004a, 2004b, 2004c, 2004d, 2004e, 2004f) and Bakke (2003b)

Summary of Effects to Species Exposed to Herbicides

Table X-3 summarizes effects of herbicides in individuals of target species. Basic assumptions for Table X-3 are:

1. Aquatic organisms such as aquatic salamanders would have the same sensitivity to herbicides as fish.

2. Small insectivorous birds that defend territories may feed in the same area and are subject to chronic exposures. Exposures to herbicides by the three Partners in Flight watch listed insectivorous migratory birds, however, is probably low since these species forage higher in the canopy and forage mostly on insects above the spray zone. These species may occasionally eat species from the ground or that fly into the canopy but this incidence of exposure would be low. Other land birds may forage lower and could be subjected to higher levels of exposure.

3. Grouse may return to the same areas to feed on a regular basis, especially if the food supply is close to a breeding display area. As a result, chronic exposures may occur.

4. Bats feed over a large enough area to not be subjected to chronic exposures.

5. Mustelids travel widely and would not be in the same area long enough to be subjected to chronic exposures.

6. Northern Spotted Owls and peregrine falcons forage over a large territory and would not be subjected to chronic exposures.

7. Aquatic birds that forage on fish or macro invertebrates would not find a concentration of herbicides in the water high enough to be exposed at levels that could get toxic.

8. Woodpeckers and hummingbirds would not be exposed to herbicide because of their feeding methods. Their food sources are protected. Since the beetles and ants that the woodpeckers feed on are buried inside of decaying wood, and since the nectar of flowers is inside the "throat" of the flower which is formed by the elongated petals, the food source of these two groups of birds is not likely to be contaminated by spraying herbicides.

9. Deer and Elk would occasionally feed in the same area for multiple days leading to chronic exposures.

10. The impacts to mollusk may be greater than depicted in the table based their skin may absorb herbicides more than the invertebrates that were used in the analysis. The likelihood of the sensitive mollusk being in the areas targeted for spraying, however, is extremely low based on habitat types. Since the potential is there, they are included in the table.

Table X-3: Summary of Effects Analysis to Individuals of Target Species prior to implementation of Invasive Plant ROD (2005b) and Project Design Criteria. For species: T=Threatened; E=Endangered; S=Sensitive; P=Proposed. Symbology for effects analysis: ↓↓ Doses are anticipated to be below the toxicity index; ▲ Doses are anticipated to be above the toxicity index; **Unk**. Effects are unknown and there are no surrogate species.

Species	HERBICIDE										
	Clopyra-lid	Chlor-sulfuron	Glyphosate	Imazapic	Imazapyr	Metsulfuron methyl	Picloram	Sethoxydim	Sulfo-meturon methyl	Triclopyr	NPE
Threatened, Endangered and Sensitive Species											
Northern Spotted Owl (T)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Northern Bald Eagle (T)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Oregon Slender Salamander (S)	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
Larch Mountain Salamander (S)	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
Oregon Spotted Frog (S)	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
Cope's Giant Salamander (S)	↓↓	↓↓	▲	↓↓	↓↓	↓↓	▲	↓↓	↓↓	▲	↓↓
Cascade Torrent Salamander (S)	↓↓	↓↓	▲	↓↓	↓↓	↓↓	▲	↓↓	↓↓	▲	↓↓
Painted Turtle (S)	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
Northwestern Pond Turtle (S)	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
Horned Grebe (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Bufflehead (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Harlequin Duck (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
American Peregrine Falcon (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Grey Flycatcher (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Black Swift (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Baird's Shrew (S)*	▲	↓↓	↓↓	↓↓	↓↓	↓↓	▲	↓↓	▲	▲	▲

Species	HERBICIDE										
	Clopyra-lid	**Chlor-sulfuron**	**Glyphosate**	**Imazapic**	**Imazapyr**	**Metsulfuron methyl**	**Picloram**	**Sethoxydim**	**Sulfo-meturon methyl**	**Triclopyr**	**NPE**
Pacific Fringe-tailed Bat (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	▲
Pacific pallid bat (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	▲
California Wolverine (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Pacific Fisher (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Crater Lake Tightcoil (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Dalles Sideband *(S)*	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Puget Oregonian (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Columbia Oregonian (S)	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Management Indicator Species											
Pileated Woodpecker	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
American Marten	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Deer and Elk	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	▲	↓↓
Gray Squirrel	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Migratory Birds and Partners in Flight Watch list species (management)											
Hermit Warbler	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Blue Grouse	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	▲	▲
Rufous Hummingbird	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Willow Flycatcher	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓
Band-tailed Pigeon	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	▲	▲
Olive-sided Flycatcher	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓	↓↓

Life History and Occurrence of Wildlife Species Used For Evaluation of Alternatives

Northern Spotted Owl (*Strix occidentalis caurina*): Threatened

A. Habitat

Old growth coniferous forest is the preferred nesting, roosting and foraging habitat of spotted Northern Spotted Owls in Oregon. Old growth habitat components that are typical for Northern Spotted Owls are: Multilayered canopies, closed canopies, large diameter trees, abundance of dead or defective standing trees, and abundance of dead and down woody material. The following describes Northern Spotted Owl habitat as defined in the *Programmatic Biological Assessment for Projects with the Potential to Modify the Habitats of Northern Spotted Owls and/or Bald Eagles or Modify Critical Habitat of the Northern Spotted Owl*, Willamette Province, FY 2005-2006 (Reference).

Suitable habitat for the Northern Spotted Owls consists of habitat used by owls for nesting, roosting *and* foraging (NRF). Generally this habitat is 80 years of age or older, multi-storied and has sufficient snags and down wood to provide opportunities for nesting, roosting and foraging. The canopy closure generally exceeds 60 percent. A wildlife biologist makes site-specific determinations and delineations of suitable habitat.

Dispersal habitat for the Northern Spotted Owls generally consists of mid-seral stage stands between 40 and 80 years of age with canopy closures of 40 percent or greater and an average dbh of 11 inches. Northern Spotted Owls use dispersal habitat to move between blocks of suitable habitat; juveniles use it to disperse from natal territories. Dispersal habitat may have roosting and foraging components, enabling Northern Spotted Owls to survive, but the habitat lacks structure suitable for nesting. A wildlife biologist makes site-specific determinations and delineations of dispersal habitat.

Critical Habitat Units (CHUs): Designation of critical habitat serves to identify lands that are considered essential for the conservation and recovery of listed species. The functional value of critical habitat is to preserve options for the species eventual recovery. The Service's primary objective in designating critical habitat was to identify existing Northern Spotted Owl habitat and highlight specific areas where management considerations or protections should be given highest priority. CHUs were distributed in a manner that would facilitate demographic interchange.

Since the designation of Northern Spotted Owl critical habitat in 1992, the Northwest Forest Plan (USDA & USDI 1994a) developed as a conservation strategy for all late-successional forest species, including the Northern Spotted Owl. Like critical habitat, the Northwest Forest Plan (USDA Forest Service and USDI BLM, 1994) was based on the work of the Interagency Science Committee. In addition, the Northwest Forest Plan incorporated recommendations from the Northern Spotted Owl recovery team and addressed the needs of other late-successional forest-associated species.

Primary Constituent Elements

Primary constituent elements are environmental factors the FWS determines are essential to a species' conservation. For the Northern Spotted Owl the primary constituent elements of critical habitat have been identified as the physical and biological features that support nesting, roosting, foraging, and dispersal (USDI, 1992a).

Current Information

In 2004, the FWS initiated a 5-year review of the Northern Spotted Owl, *Scientific evaluation of the status of the Northern Spotted Owl* (Courtney et al., 2004). The review collates and analyzes the recent body of knowledge related to the Northern Spotted Owl since it was listed as a threatened species in 1990. The review includes a summary of current threats to the Northern Spotted Owl, including the barred owl, West Nile virus, habitat modification, and forest management challenges associated within the existing legal framework. Also included in the 5-year review is a report entitled, *Status and Trends in Demography of Northern Spotted Owls, 1985-2003* (Anthony et al., 2004).

The information in Coutney et al. (2004) and Anthony et al. (2004) was reviewed by Alan Dyck, Forest Wildlife Biologist for the Forest. The results of the 5-year review do not alter how the Forest Wildlife Biologist determines the effects to the Northern Spotted Owl or its habitat. This project was also reviewed for consistency with the Northwest Forest Plan (USDA Forest Service and USDI BLM, 1994). As a result of the review, the effects to the habitat and the owl has not changed and the information in Courtney et al. (2004) does not alter the effects determination made for the treatment of invasive plants.

B. Re-Field Review

Habitat Available Within the Project Area

Yes. The Proposed Action (Alternative 2) has approximately 2373 acres of the treatment areas that are either adjacent to or bisect suitable Northern Spotted Owl habitat. Also, there are approximately 2976 treatment acres of dispersal habitat. Of these acres, 2175 acres that would receive broadcast boom spray treatments in/or adjacent to suitable habitat (Table X-4). Approximately 2582 treatment acres are in or adjacent to Northern Spotted Owl critical habitat and 2068 acres are in Late Successional Reserve (LSR). LSRs are a Northwest Forest Plan land allocation: this land allocation is managed to protect and enhance conditions of forest ecosystems, which serve as habitat for late-successional and old-growth related species, including the Northern Spotted Owl.

Disturbance Noise Levels from Invasive Plant Treatments

To determine if sound level disturbance would impact Northern Spotted Owls, a sound level reading was made on the truck and spray pump used by Hood River County. Two distances were measured for sound levels on a dirt parking area on a cold clear morning at 10 yards and 35 yards. At 10 yards, the decibel reading was 72 decibels and at 35 yards it was 64 decibels. In a white paper for the FWS, Kent Livesey analyzed the research on Northern Spotted Owl disturbance factors (BA 2003). In the document Livesey states, "...we estimated these sound-only levels to be: 40 dB for the ambient sound level; 44 dB for the detect threshold; 57 dB for the alert threshold; 70 dB for the disturbance threshold; and 92 for the injury threshold." The Willamette Province Level One Team has interpreted this information and assigned a threshold for disturbance effects calls. When the sound levels reach the disturbance threshold 70 decibels, the effect determination is *May Affect, Not Likely to Adversely Affect* Northern Spotted Owls when the sound level reaches 92 decibels and above, the effect determination is *May Affect, Likely to Adversely Affect* Northern Spotted Owls. If sound levels are below 70 decibels, there is no effect anticipated. These effect determinations are reflected in the distance charts that are located in the Programmatic Biological Assessment (Reference).

C. Field Reconnaissance

A Level A survey was conducted for the project area in addition to examining some habitat during field reconnaissance. There is a high potential for species presence in some locations based on current field reconnaissance, GIS (Geographic Information System) analysis, and on historic data.

D. Analysis of Direct and Indirect Effects

Alternative 1 – No Action

Effects to the owl would be limited to the existing planned invasive plant treatments. The habitat would continue to function as Northern Spotted Owl suitable or dispersal habitat. The effects analysis indicates that there would be no toxic effects to Northern Spotted Owls from the use of herbicides on the 450 acres of treatment on the Forest and 150 acres on the Scenic Area. The possible indirect effect of noise from the use of pumps and equipment used for broadcast boom spraying and mechanical treatment methods have been analyzed and the sound levels compared to the sound standards described by Livesey of the FWS Lacey Office and found to be below the disruption threshold and is therefore negligible. The majority of the invasive plant treatments that would create noise occur along roads and openings. The Fish and Wildlife Service has indicated in the Biological Opinion for the FY06-07 LAA Disturbance activities, Willamette Planning Province Owls that Northern Spotted Owls rarely nest at or immediately adjacent to road or edges (Kerns et al. 1992, Perkins 2000). These effects are analyzed in the Biological Opinion for Effects to Northern Spotted Owls (Strix occidentalis caurina) from the Willamette Planning Province Fiscal Year 2006 – 2007 activities that have the potential to adversely affect, due to disturbance, on U.S. Department of the Interior; Bureau of Land Management, Eugene District and Salem District, and the U.S. Department of Agriculture; Mt. Hood National Forest, Willamette National Forest and the Columbia River Gorge National Scenic Area (FWS Reference Number 1-7-05-F-0663)

Alternative 2 – Proposed Action

The Proposed Action would bisect or be adjacent to Northern Spotted Owl suitable, dispersal, critical habitat and LSRs. The treatment areas are in habitats (mostly roads or openings) that cross or are within a GIS polygon designated as one of the categories of Northern Spotted Owl habitat. The breakdown of treatment acres in or adjacent to Northern Spotted Owl habitat is as follows: 2373 acres Northern Spotted Owl suitable habitat, 2976 acres dispersal habitat, 2582 critical habitat, and 2068 acres are in or adjacent to LSR. Approximately 18 percent of the proposed treatment areas would be in or adjacent to suitable Northern Spotted Owl habitat. The Proposed Action is to treat 2175 acres of areas in or adjacent to suitable habitat by broadcast boom spraying with a broadcast boom spray truck. There would be no impact to any of the primary constituent elements of Northern Spotted Owl habitat. The benefit to the habitat would be eliminating invasive plants that would otherwise out compete native vegetation which principle prey species use for foraging. The indirect effect of noise and disturbance would be negligible due to the very small area of suitable habitat and low noise created by mechanical and sprayers in the project area. The majority of the invasive plant treatments that would create noise occur along roads and openings. The Fish and Wildlife Service has indicated in the Biological Opinion for the FY06-07 LAA Disturbance activities, Willamette Planning Province Owls that Northern Spotted Owls rarely nest at or immediately adjacent to road or edges (Kerns et al. 1992, Perkins 2000). Sound level readings of the truck mounted boom sprayer were 64 decibels at 35 yards and were below the disturbance threshold, so the determination is No Effect from disturbance. Implementation of this project would have no impact to habitat connectivity cells. There are no negative effects to habitat.

Table X–4: Treatment Acre by Alternative and Northern Spotted Owl Habitat Type

Habitat Type or Treatment	Treatment Acres Bisecting or Adjacent		
	Alternative 1	Alternative 2	Alternative 3
Suitable habitat	<1235	2373	2373
Broadcast Boom spraying in suitable habitat	<415	2175	507
Dispersal habitat	<1235	2976	2976
Critical Habitat	<1235	2582	2582
Broadcast Boom spraying in Critical Habitat	<415	2222	548
Manual and/or mechanical treatment only	635	82.5	10417

Alternative 3 – Restricted Herbicide Use Alternative

Distribution of habitat types adjacent to the treatment areas is the same as Alternative 2. From the table above it is clear that the difference in the alternatives is the amount of area that would be sprayed with a broadcast boom sprayer. There would only be 507 treatment acres adjacent to suitable habitat sprayed by broadcast boom sprayer in this alternative. The toxic effect analysis indicates no effect to Northern Spotted Owls from herbicide. Exposure to herbicides would negligible since herbicides would rarely if ever be sprayed in suitable habitat and the chances of Northern Spotted Owls or their prey coming into contact with the chemicals is below any threshold for concern. The analysis for disturbance shows a negligible effect of the treatment on Northern Spotted Owl survival or recruitment and no effect to their habitat. **Effects to NRF and Dispersal Habitat on a Local and Watershed Scale**: There are no effects to the primary constituent elements of NRF (suitable) or dispersal habitat. There would be no changes in the age or structure, understory layer, down logs, or snag habitat. There may be improvements in forage for prey species in some situations. The removal of invasive plant species may improve prey habitat and contribute to improved prey conditions.

Effects to Critical Habitat: This project occurs adjacent to and in 2582 acres of critical Northern Spotted Owl habitat. No components in the Proposed Action or Restricted Herbicide Use Alternatives including herbicide, manual, mechanical, and cultural treatments would affect the ability of critical habitat to aide the recovery of the Northern Spotted Owl. There are no changes to the primary constituent elements of the habitat by any of the treatment methods.

Effects to Northern Spotted Owl on a province scale (Willamette Province): The FWS issued an opinion on the effects noise disturbance of the herbicide treatments in the programmatic biological assessment titled, Programmatic Biological Assessment for Activities with the Potential to Disturb Northern Spotted Owls and/or Bald Eagles in the Willamette Province FY2006-2007." The conclusion reached is the following: "After reviewing the current status of the bald eagle and Northern Spotted Owl, including critical habitat, the environmental baseline for both species, the effects of the Proposed Action, and the cumulative effects, it is the Service's biological opinion that the FY 2005-2006 Habitat Modification Projects in the Willamette Province are not likely to jeopardize the continued existence of the bald eagle or Northern Spotted Owl and is not likely to destroy or adversely modify designated critical habitat for the Northern Spotted Owl" (USDI, 2005). The acres contained in the programmatic biological assessment were for the effects of the projects in treatment areas covered in Alternative 1. After taking noise level readings of herbicide spray equipment that would be used to treat invasive plants in the project area, it is clear that sound levels are below the disturbance threshold established by the Level One Team; therefore, there is no need for further consultation for disturbance to this species for invasive plant treatment from herbicide spraying. The sound levels generated by other manual and mechanical treatments also are considered below the disturbance threshold.

Effects to Northern Spotted Owl on the entire range of the species (Washington, Oregon, and California): The Record of Decision for Amendments to USDA Forest Service and USDI Bureau of Land Management Project Documents within the Range of the Northern Spotted Owl established a system of land allocations and a set of standards and guidelines that is considered to be consistent with maintaining viability for the Northern Spotted Owl across its range (USDA Forest Service and USDI BLM 1994). This EIS meets all the Standards and Guidelines set forth within this decision document.

Early Detection / Rapid Response Strategy

This provision creates the possibility of invasive plant treatment outside of the original mapped treatment areas. Expanding the area of treatment would have no effect on habitat, exposure to herbicide, or disturbance of Northern Spotted Owls. The actions created by the treatments pose no risk to Northern Spotted Owl survival or reproduction.

Cumulative Effects

Currently, the only foreseeable future actions on USDA Forest Service lands within the watersheds that might be considered cumulative herbicide use and invasive plant treatments to the Proposed Action are those projects already approved and listed in the No Action Alternative and the EDRR. There would continue to be management activity within these watersheds that have the potential to adversely impact Northern Spotted Owl individuals due to disturbance. These types of projects would continue to be consulted on with the FWS. There are no actions outside of USDA Forest Service lands that become a cumulative effect for Northern Spotted Owls because there is no impact to Northern Spotted Owl habitat, the effect of noise is local and would not be considered cumulative and the herbicides used do not bioaccumulate. The possibility that there could be 13,000 acres of treatment per year with EDRR does not alter the determination of effects to the habitat or herbicide effects on the owl. The analysis of spray equipment noise levels and the type of equipment being used for cultural, manual and mechanical treatment has eliminated the concern for disturbance to Northern Spotted Owl nesting, foraging, or reproductive success.

E. Mitigation Measures

Mitigation measures or seasonal restrictions are proposed for the treatment of invasive plants in suitable habitat in the LSR and Congressionally Withdrawn land allocations. These restrictions would only be applied to areas of suitable habitat in these land allocations. There are 48 treatment sites in LSR totaling approximately 2068 acres for the Proposed Action. Of these sites there are 1058 acres that are suitable Northern Spotted Owl habitat. Treatment of invasive plants must occur during the critical breeding season for Northern Spotted Owls, but the noise levels produced by the treatment methods would not reach the level of harm. As a result, there is no need for further mitigation.

F. Communication with U.S. Fish & Wildlife Service

The Northern Spotted Owl was listed as threatened throughout its range under the ESA (55 CFR 26114) on June 22, 1990. Any action that would result in a beneficial effect or could result in an adverse impact to the Northern Spotted Owl would result in a may effect determination and would require consultation with the FWS.

Consultation with the FWS was initiated on for the treatment of invasive species in three separate consultation avenues. Disturbance effects of invasive plant treatments were analyzed and consulted on in the Programmatic Biological Assessment for Activities with the Potential to Disturb Northern Spotted Owls and/or Bald Eagles in the Willamette Province FY2006-2007 (Reference) and the Willamette Province Level One Team was given a presentation on the effects analysis and subsequent determination made on the effects to the Northern Spotted Owl and its habitat from the treatment of these invasive plants. The Level One Team was informed that the Forest and Scenic Area had determined that the effect from the use of herbicide, manual, mechanical, and cultural treatment of invasive plants was no effect to the Northern Spotted Owl or its habitat. The team was reminded that the disturbance effects had been analyzed in the Programmatic Biological Assessment. There was only one comment from the Level One Team on the use of herbicides: the comment was related to the use of picloram and its effects to fish through impacts to their food source. The comment was forwarded to the fisheries biological on the interdisciplinary team. The Level One Team made no comments on the effects determination.

A letter was sent on July 25, 2006 to the U.S. Fish and Wildlife Service outlining the effects determinations based on project alternatives information. The effects determination based on the analysis is no effect to Northern Spotted Owls or their habitats. The effects determination from disturbance is no effect to Northern Spotted Owls.

3.10.5.1 Northern Bald Eagle (*Haliaeetus leucocephalus*): Threatened

A. Habitat

The bald eagle is a permanent resident in Oregon. Their nests are usually located in multi-storied stands with old-growth components, and are near water bodies that support an adequate food supply. Nests, which usually consist of a bulky platform of sticks, are usually located in the super-canopy of trees or on a cliff. Nest sites are usually within one-quarter mile of water in the Cascades.

Adequate forage sources are possibly the most critical component of bald eagle breeding and wintering habitat. Fish, waterfowl, rabbits, and various types of carrion comprise the most common food sources for eagles in the Pacific Recovery Plan area. Wintering bald eagles perch on a variety of substrates, proximity to a food source being the most important factor influencing perch selection. Eagles tend to use the highest perch sites available that provides a good view of the surrounding area. Communal roosts are invariably near a rich food source and in forest stands that are multi-storied and have at least a remnant old growth component.

B. Re-Field Review

Habitat available within the project area

Yes. There are five areas outlined on the Forest and Scenic Area that are designated as part of the Bald Eagle recovery area. Two of these areas have eagles nesting in them. Two of the other areas do have eagles utilizing them throughout the year and may have undocumented nesting. All of the areas do have some invasive treatments planned (Sites #). There are three areas designated as bald eagle habitat areas (A13) in the Forest Plan which have proposed treatments. The habitat could be utilized as nesting, roosting, or perching habitat for the bald eagle.

C. Field Reconnaissance

A Level A survey was conducted. There is some potential for this species to inhabit the project area. Birds are nesting in the Timothy Lake and Clear Lake Areas as well as Rock Creek Reservoir, just off the Doewar. No communal roost areas are known for the Forest. There has been consistent use by adults in two areas of the Forest and nesting occurs within a half mile of some of the roadside treatment areas.

D. Analysis of Direct and Indirect Effects

Effects Common to All Alternatives

No effect to the bald eagles would occur from ingesting or contacting herbicides. The effects analysis (Appendix X, Table X-3) showed no anticipated toxic effects to bald eagle. The concentrations of herbicides from invasive plant treatment would not be elevated to a point where there would be any observable effect to eagles.

Alternative 1 – No Action

This alternative includes some pre-existing invasive plant treatments, including herbicide, manual, and mechanical treatment methods. There are three roadside treatment areas (Sites #) that are within a half-mile, but over one-quarter mile of a previously occupied bald eagle nest near Rock Creek Reservoir. These areas are outside the disturbance distance of the bald eagle nest. The nest was not occupied in 2005 but was successful in fledging young the previous year (Thurman, 2005). Due to of the proximity to the treatment areas, it is possible that people working in the treatment area could potentially create nest site disturbance. It is unlikely, however, given the nest was established in the proximity to the roads being proposed for treatment. There is already a fair amount of recreation at the lake near the nest site and the invasive plant treatments could potentially add to this disturbance. It is more likely that the nest is hidden from the road well enough to not be impacted by the treatments.

Alternatives 2 & 3 – Proposed Action & Restricted Herbicide Use Alternatives

Effects to Habitat: Bald eagles usually nest within one-quarter mile of a water body in the Cascades. Eagles utilize large trees with platform nest. Diets vary with location and food availability. Eagles on the Forest primarily forage on fish although it is possible for them to eat carrion and dead or injured waterfowl on the lakes.

There are three proposed treatment sites (Sites #) that are in mapped bald eagle habitat that was identified as part of the Forest Plan. There are 369 acres of treatment area that are adjacent to or within these bald eagle habitat areas (A13) land allocations.

The primary constituent elements of bald eagle habitat include nest trees within a quarter mile of a water body and large trees for nesting and roosting. There are no treatments that would affect the availability of these habitat elements.

Effects to Individuals: There are two nest sites (thought to be alternates for the same pair) in the Clear Lake and Timothy Lake area (Sites #). These nest sites have produced young in the past (Isaacs, Frank B. and Robert G Anthony, March 2006). The distance from treatment areas to the nest sites is slightly over six tenths of mile for the nearest roadside treatment area. This distance is outside the disturbance distance for bald eagles.

Effects to Population: None expected since no effects to individuals and no effects to habitat occurring with project implementation.

Early Detection /Rapid Response Strategy

This provision creates the possibility of invasive plant treatment outside of the original mapped treatment areas. Expanding the area of treatment would have no effect on habitat or from exposure to herbicide. There is a possibility of treatment areas moving closer to a nest tree and within the disturbance zone of eagles. If the treatment area expands into the area within a quarter mile of a bald eagle or one half mile line of sight it would be necessary to adhere to a seasonal restriction outlined in the PDC H.1. (Section 2.2) or re-consult with the Fish and Wildlife Service.

Cumulative Effects

No cumulative effects for the treatment of invasive plants from herbicide, manual, mechanical or cultural treatments or the EDRR.

E. Mitigation Measures

None.

F. Communication with U.S. Fish & Wildlife Service

The northern bald eagle is listed as threatened throughout its range under the ESA (55 CFR 26114) on June 22, 1990. Any action that would result in a beneficial effect or could result in an adverse impact to the bald eagle would result in a may effect determination and would require consultation with the FWS.

Consultation with the U.S. Fish and Wildlife Service was initiated for invasive plant treatment in July of 2005 through the document titled "Programmatic Biological Assessment for Activities with the Potential to Disturb Northern Spotted Owls and/or Bald Eagles in the Willamette Province FY2006-2007." There were no effects to bald eagle from invasive plant treatment that were determined and therefore the Fish and Wildlife Service Biological Opinion did not list any terms or conditions March 2005.

3.10.5.2 Canada Lynx (*Lynx Canadensis*): Threatened

A. Habitat

In the Pacific Northwest, lynx are associated with high elevation, boreal forests that typify northern latitudes. They are found primarily above 4000 feet in Washington. Although scarce in Oregon, lynx range and habitat in Oregon and Washington is unclear. High quality lynx habitat is comprised of a mosaic of early successional forests with high prey densities (especially snowshoe hare) for foraging, and of late-successional forests with an accumulation of down logs used for denning, thermal and security cover. Intermediate successional stages are used mainly for travel and landscape connectivity but may also provide foraging opportunities.

B. Re-Field Review

Habitat available within the project area

No. In a letter dated August 2 of 2001 (USDA, 2001) and updated on December 3 of 2003 (USDA, 2003), the Forest has made a determination, based on the best available scientific and commercial data, that the Canada lynx and its habitat are currently not present on the Forest and Scenic Area. This letter is consistent with the January 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and Mitigation Measure Standards and Guidelines (USDA Forest Service and USDI BLM, 2001), and is consistent with the Lynx Conservation Assessment and Strategy (Ruediger, 2000) as specified in this Record of Decision.

The Lynx Nationwide Survey protocol was implemented and resulted in no lynx being located on the Forest and Scenic Area. Forest-wide winter tracking surveys have been conducted during the winters of 1994-1995, 1995-1996, 2000-2001, 2001-2002, 2002-2003, and 2003-2004. No lynx were detected during these surveys.

No further analysis needed due to lack of habitat.

Larch Mountain Salamander (*Plethodon larseli*): Sensitive

A. Habitat

Habitat is mainly restricted to the talus slopes of the Columbia River Gorge, although the species is now known to occur at several locations in the Cascade Mountains of Washington. The Larch Mountain salamander could be found near the surface under rocks during wet weather, but it retreats to considerable depths in the talus during cold and dry weather. Individuals could occur far from streams and seepages, and seem to be less common in perpetually wet talus, compared to than in talus that varies from wet to dry with seasonal rainfall. In most cases, Larch Mountain Salamanders remains under bark, rocks, leaves, and logs unless it is raining or extremely wet.

B. Re-Field Review

Habitat available within the project area

Yes. Some of the invasive plants treatment areas occur within the identified Larch Mountain salamander distribution range as defined in the Northwest Forest Plan. Some of the treatments do occur near or directly adjacent to talus slopes. Treatments in the Scenic Area and on the north side of the Forest have the greatest likelihood of being near Larch Mountain salamander populations.

C. Field Reconnaissance

Level A surveys were conducted. There is a low potential for this species to inhabit the project area due to the low distribution of this species. Some of the roads being treated, however, do have potential habitat for Larch Mountain salamanders.

Oregon Slender Salamander (*Batrachoseps wrighti*): Sensitive

A. Habitat

The only amphibian endemic to Oregon, this species is found predominantly on the western slopes of the Cascade Range from the Columbia River south to southern Lane County. Sites have been found in Lane, Linn, Clackamas, and Multnomah counties as well as a few sites on the eastern slopes of the Cascades in Hood River and Wasco counties. Sites are generally scarce, occurring in scattered and often widely separated colonies. Sites are sometimes locally common.

The Oregon Slender salamander is found in moist and dry woods consisting of Douglas-fir, maple, hemlock, and red cedar. It is most common in mature Douglas-fir forests and appears to be dependent on mature and old growth stands. Individuals are found under rocks, wood, or bark and wood chips at the base of stumps as well as under the bark and moss of logs. They are also found in rotting logs, in holes and crevices in the ground, and in termite burrows. Nests that have been located were found under bark and in rotten logs.

B. Re-Field Review

Habitat available within the project area

Yes. All the older stands have potential Oregon Slender salamander habitat.

C. Field Reconnaissance

Level A surveys were conducted. There is a low potential for this species to inhabit the treatment areas because most treatment occurs along roadsides and openings, and this species occurs where there is a forest canopy.

Cope's Giant Salamander (*Dicamptodon copei*): Sensitive and Cascade Torrent Salamander (*Rhyacotriton cascadae*): Sensitive)

A. Habitat

Cope's Giant Salamander: Cope's Giant salamander prefers streams and seepages in moist coniferous forests. They limit their occurrence to waters with temperatures in the 8 to 14 ^{o}C range. They would also inhabit cold clear mountain lakes and ponds. They occur in suitable areas from sea level up to approximately 4,430 feet elevation. The Cope's Giant salamander breed and rear its young within the cracks and crevices of the rocky substrates within the stream course. They sometimes leave streams on wet rainy nights but remain on wet rocks and vegetation near the stream. This salamander is most frequently found on pieces of wood in streams, under logs, bark, rocks or other objects near streams.

Cope's Giant salamander has the potential to be negatively affected by increased sedimentation, resulting from project activities adjacent to or intersecting streams and water sources. Sediment deposition within the substrate could impair preferred habitat characteristics. Also, sedimentation of streams could lead to asphyxiation of embryos and larvae as well as a degradation of over-wintering habitat that may result in local extinctions. There is no information on the impact of herbicides on these aquatic salamanders so the assumption is that they would have the same sensitivity to herbicides as fish (See Section 3-9 – Aquatic Organisms and Habitat).

Cascade Torrent Salamander: The range of this species is from the coastal mountains on the Olympic Peninsula in Washington south to Mendocino County in California. Also, there is a known population in the Cascade Mountains of southern Washington and northern Oregon, with a local disjunctive population in the southern Oregon Cascades.

The Cascade Torrent salamander is most abundant in rocks bathed in a constant flow of cold water, but also occurs in cool rocky streams, lakes, and seeps. Individuals from this species require microclimatic and microhabitat conditions generally found only in older forests.

The diet of this salamander consists of aquatic and semi-aquatic invertebrates, including amphipods, springtails, fly larvae, worms, snails, and spiders. They search for prey under rocks and other objects in streams. Adults occasionally are found under surface objects a few feet from water after heavy rains, but they are the most aquatic of our metamorphosed salamanders and should be expected only in saturated stream-side talus and in streams. Experiments have shown that this species are among the most sensitive of all terrestrial northwestern salamanders to loss of body water and would die quickly in a desiccating environment.

The Cascade Torrent salamander has the potential to be negatively affected by increased sedimentation resulting from project activities adjacent to or intersecting streams and water sources. Sediment deposition within the substrate could impair preferred habitat characteristics. Also, sedimentation of streams could lead to asphyxiation of embryos and larvae as well as a degradation of overwintering habitat that may result in local extinctions. There is no information on the impact of herbicides on these aquatic salamanders so the assumption is that they would have the same sensitivity to herbicides as fish (See Section 3-9 – Aquatic Organisms and Habitat).

B. Re-Field Review

Habitat available within the project area

Yes. There are sites within the invasive plant treatment project area that include perennial or intermittent streams, wet areas, or seeps.

Cope's Giant Salamander: This species' range is predominantly west of the Cascade Range. Potential habitat for this species does exist within the Forest and Scenic Area in the proposed treatment areas on the westside of Cascades.

Cascade Torrent Salamander: Potential habitat for this species does exist within the project area. Areas on the westside of the Cascades in the proposed treatment areas appear to have all the habitat characteristics essential to the species.

C. Field Reconnaissance

A Level A survey was conducted based on a low potential for species occurrence and Project Design Criteria H.2. (Section 2.2) that would reduce or eliminate risk to there species. Field surveys have not been accomplished.

American Peregrine Falcon (*Falco peregrinus anatum*): Sensitive

A. Habitat

The most critical habitat components for Peregrine Falcons are suitable nest sites, usually cliffs, overlooking fairly open areas with an ample food supply. They nest along seacoasts, near marshes, and even in cities, but they are not well suited to life in interior forests. They usually nest or roost near a marsh, lake, or coast where water birds are plentiful.

B. Re-Field Review

Habitat available within the project area

There are suitable cliffs within sight and adjacent to the treatment areas.

C. Field Reconnaissance

A Level A survey was conducted based on known sites for species occurrence and low risk from herbicide use as indicated by the herbicide effects analysis.

Northern Painted Turtle (*Chrysemys picta*): Sensitive and Western Pond Turtle (*Clemmys marmorata marmorata*): Sensitive

A. Habitat

Northern Painted Turtle: An aquatic turtle that frequents ponds, marshes, small lakes, ditches and streams where the water is quiet or sluggish and the bottom is sandy or muddy, and there is considerable vegetation. Mudbanks, logs, partially submerged branches, and rocks are preferred for sunning.

Western Pond Turtle: The western pond turtle inhabits ponds, marshes, and the slow-moving portions of creeks and rivers that have rocky or muddy bottoms. Partially submerged logs, vegetation mats, mudbanks, rocks and tree branches provide areas for sunning. Western pond turtles have been found to occur from sea level up to around 2000 feet. During the winter months these turtles usually hibernate in bottom mud.

B. Re-Field Review

Habitat available within the project area

Northern Pond Turtle: Yes. Although not immediately adjacent to the ponds in the Scenic Area, the treatment sites are near the known sites for turtles on the eastern area of the Scenic Area. There are no known sightings of these species on the Forest. The USDA Forest Service, Pacific Northwest Regional Forester's Sensitive Species list only has this species as suspected to occur on the Forest.

Painted Turtle: No. The only known painted turtle sites on the administrative units are on the Washington side of the Scenic Area. Although potential habitat exists, there are no known locations. This species is easy to detect when present so it is not anticipated that any turtles are located in the project area or the EDRR area.

C. Field Reconnaissance

A Level A survey was conducted based on a low potential for species occurrence outside of the known areas. No observations have been made of any of the two species outside of the known locations in the Scenic Area. There is a potential for the turtles to live in areas previously unknown but these species are fairly conspicuous when they occur in a location. They are usually seen sunning on logs or exposed rocks and are easily observed.

Horned Grebe (*Podiceps auritus*): Sensitive and Bufflehead (*Bucephala albeola*): Sensitive

A. Habitat

Horned Grebe: The Horned Grebe breeds throughout most of Alaska and Canada and, locally, just south of the Canadian border. It also breeds in northern Eurasia. Its habitat consists of areas with much open water surrounded with emergent vegetation.

Bufflehead: The Bufflehead is a northern species that breeds from Alaska across Canada and south to Oregon, northern California, and Wisconsin. This species nests near mountain lakes surrounded by open woodlands containing snags. In many areas, the preferred nest trees are aspen, but they would also nest in ponderosa pine or Douglas-fir.

B. Re-Field Review

Habitat available within the project area

Horned Grebe: Yes. This species occurs both on the Forest and Scenic Area as a winter resident and as a migrant. No breeding has been observed or documented for this species on the Forest or Scenic Area.

Bufflehead: Yes. Buffleheads have been recently documented as breeding on the Forest at two locations monitored by the Wetland Wildlife Watch program. This species occurs both on the Forest and Scenic Area as a winter resident and as a migrant.

C. Field Reconnaissance

Annual surveys for wetland species (Wetland Wildlife Watch program) are performed by the Northwest Ecological Research Institute for the Forest. A comprehensive survey of amphibians and birds is performed in an attempt to locate breeding individuals and populations of wetland species. Although there are annual sightings of bufflehead and horned grebes this past year is the first year of any documented breeding of buffleheads and there has been no documented breeding of horned grebes. Habitat and individuals are recorded in the fall, winter, and early spring but these species move on before the annual invasive plant treatment would commence.

Harlequin Duck (*Histrionicus histrionicus*): Sensitive

A. Habitat

This species occurs from Iceland and Greenland west to eastern Canada. It is absent from the central part of North America, and the "western" population ranges from eastern Siberia east through Alaska, and south to the Sierra Nevada of California and the mountains of southwestern Colorado. In the Northwestern United States, the Harlequin duck breeds along relatively low-gradient, slower-flowing reaches of mountain streams in forested areas.

B. Re-Field Review

Habitat available within the project area

Yes. Level A surveys were conducted. Existing knowledge of the duck was incorporated. There is habitat for this species throughout the Forest and Scenic Area. There are several areas where this duck has been recorded throughout this area.

C. Field Reconnaissance

Harlequin ducks have received some attention from biologists on the Forest because of their sensitivity to human intrusion and their secretive and cryptic nature. Several locations on the Forest have been surveyed for this duck to establish use. A few of these areas have invasive plant treatments (Sites #).

Wolverine (*Gulo gulo*): Sensitive

A. Habitat

Populations in the Cascade Mountains are small and scattered. Wolverines are usually found in high temperate coniferous forests, from mid-elevation (around 4000 feet) to moderately high elevation (above timberline), depending on the season. Common tree species are sub-alpine fir and lodgepole pine. They prefer to feed along rivers and streams and in wet meadows. The den is usually in a rock crevice, cave, or beneath a talus slope. Territories may encompass 10 to 80 square miles. Wolverines have been recorded traveling as far as 500 miles. Wolverines are believed to prefer areas of minimal people presence and high levels of solitude and seclusion. They are usually associated with wilderness, primarily because they are so vulnerable to the activities of humans.

B. Re-Field Review

Habitat available within the project area

Yes. Wolverines have no real habitat preference, but instead appear to seek high elevations for denning and solitude. Wolverines are dependant on carrion for a large part of their diet and focus on big game populations rather than on specific habitats. Historic sightings of wolverines both verified and unverified are within a few miles of the treatment areas. Snow Bunny Snow Park had one verified track sighting in 1990 and one wolverine was found dead on interstate 84 in that same year. The best possible denning habitat for wolverines on the project area is on the north side of the Forest. The proposed treatment areas, however, occur in areas that lack solitude and seclusion qualities due to the open road densities, management activities, businesses, homes, and recreational opportunities in the area. It is unlikely, but possible, that a wolverine would be present in the treatment areas.

Recent intensive field surveys on the Forest have not been accomplished. The last time broad based surveys were conducted over the watershed was during the winter of 1993-1994 and 1994-1995. Some survey efforts have been ongoing to the east at the Badger Creek Wilderness and on the east and north sides of the Forest, but there have been no verifiable sightings of wolverine or signs of presence. The length of time with no verifiable sightings is 15 years. This fact calls into question if wolverines still exist on the Forest, Scenic Area, or even in the Oregon Cascades.

C. Field Reconnaissance

A Level A survey and strategic surveys were conducted based on a low potential for detecting species occurrence. No observations were made of wolverine or their tracks during field reconnaissance. The lack of sightings of this species is not a reliable indicator of species presence or absence. Since, the home range of wolverines is documented to be in the hundreds of miles, any wolverine that is present in the Cascades of Oregon may potentially travel or forage in the project area.

Baird's Shrew (*Sorex bairdii permiliensis*): Sensitive

A. Habitat

This species is endemic to Oregon. Its range is from northwestern Oregon from the Pacific coast east to the Cascades, and from the Columbia River south to Benton and Lane Counties.

Little published information exists that assigns with certainty habitat characteristics to the Baird's Shrew. In 1986, two specimens were collected in an open Douglas-fir forested area with numerous rotting logs in Polk County. The habitat of the Baird's shrew could be described as moist coniferous forests with a shrubby understory. Individuals of the species tend to forage near logs and rocks.

For the purpose of effects analysis on the Forest and Scenic Area, it is assumed that areas on the westside of the Cascades suitable for Northern Spotted Owls are also suitable for Baird's shrews. Since this hypothesis has not been tested it may or may not be valid.

B. Re-Field Review

Habitat available within the project area

Yes. As stated above, little is known about this species. The location and habitat characteristics of the forested areas of the invasive plant treatment areas does seem to fit with what little is known about the species. The affected area is probably similar to that of the Northern Spotted Owls on the westside of the Cascades.

C. Field Reconnaissance

A Level A survey was conducted. There is a moderate potential for this species to inhabit the areas adjacent to the treatment areas. In a few locations, such as those where English ivy would be manually or mechanically treated, the treatment areas may be occupied by Baird's shrews. The habitat in these areas appears to be similar to those described for the shrew.

Pacific Fringe-tailed Bat (*Myotis thysanodes vespertinus*): Sensitive

A. Habitat

Little to nothing is known about this subspecies of the Fringed Myotis (*Myotis thysanodes*); only one source of information for the Pacific Fringe-tailed bat appears to exist. The distribution of this species is in California, Oregon, and Washington. No habitat data could be found on the Pacific Fringe-tailed bat, so habitat information and the following analysis are based on what is known for the Fringed Myotis.

Although the Fringed Myotis is found in a wide variety of habitats throughout its range, it seems to prefer forested or riparian areas. Most Oregon records are west of the Cascade Mountains. Its nursery colonies and roost sites are established in caves, mines, and buildings. The species is thought to forage by picking up food items from shrubs or the ground. It consumes beetles, moths, harvestmen, crickets, craneflies, and spiders.

B. Re-Field Review

Habitat available within the project area

Yes. This species is considered suspected on the Forest. Until recently there were no verified records that had been documented for this species on the Forest. But recently in personal communication with Mark Perkins, a bat researcher that conducted bat surveys on the Mt. Hood National Forest in the 1990's, a documented occurrence was discovered. This species was documented on the Clackamas Ranger District during surveys conducted by Perkins (Perkins, 2006).

Bats often forage along roads and the Pacific Fringe-tailed bat may use roads for foraging and bridges for roosting. This species uses caves and may be found in caves, abandoned mines, or rock openings throughout the Forest and Scenic Area.

C. Field Reconnaissance

A Level A survey was conducted. There is a moderate potential for this species to inhabit the treatment areas.

Pacific Pallid Bat (*Antrozous pallidus pacificus*): Sensitive

A. Habitat

The Pacific Pallid Bat prefers dry climates and, therefore, is found in Eastern and Southern Oregon. This bat has colonies in buildings, caves, hollow trees, rock piles, mines and will roost under bridges with the proper structure. It is described as a semi-desert species; however, it also uses woodland edges and rocky areas. It has been documented in the drier areas of the Scenic Area.

The species forages by picking up food items from shrubs or the ground. It consumes beetles, moths, harvestmen, crickets, craneflies, and spiders.

B. Re-Field Review

Habitat available within the project area

Yes. This species is considered documented on the Scenic Area. No verified records have been documented for this species on the Forest. Bats often forage along roads and the Pacific Pallid Bat may use roads for foraging and bridges for roosting. This species uses caves and may be found in caves, abandoned mines, or rock openings throughout the eastern portion of the Scenic Area.

C. Field Reconnaissance

A Level A survey was conducted. There is a moderate potential for this species to inhabit the treatment areas.

Fisher (*Martes pennanti*): Sensitive

A. Habitat

In the northwest part of its range, the fisher occupies a wide variety of densely forested habitats at low to mid-elevations. The fisher is a moderate- to wide-ranging species and is considered rare in Oregon. West of the Cascade Range, all records for the species are for sites at elevations of 328 to 5906 feet, and are located in the Sub-alpine fire, western hemlock, and Sitka spruce zones. The species tends to frequent riparian corridors. They are known to occasionally use cut-over areas, but this is not their optimal habitat.

Research has shown that the habitat for fishers could be enhanced by minimizing forest fragmentation, both in the remaining old-growth and in second-growth forests; maintaining a high degree of forest-floor structural diversity in intensively managed plantations; preserving large snags and live trees with dead tops; maintaining continuous canopies in riparian zones; and protecting wetland habitat.

B. Re-Field Review

Habitat available within project area

Yes. The older forested stands have the structural characteristics of fisher habitat. Although these watersheds have been fragmented through past management, there remain enough unfragmented stands of old-growth and second-growth forests, including some of the stands proposed for treatment, that potential low quality habitat exists for the fisher. Fishers were reduced to extremely low numbers in Oregon as recently as 1950. There was a transplant of fishers into south central Oregon and those populations remain viable. No recent verifiable records exist for fishers on the Forest or Scenic Area. A few track sightings were recorded as potentially being fisher but these are unreliable due to the size overlap with American Marten (*Martes americana*). It is speculated that fishers have been extirpated from the Forest and Scenic Area.

C. Field Reconnaissance

A Level A survey was conducted. There is a low potential for this species to inhabit the project area. Since the early 1990's, an ongoing effort to establish any presence of fishers on the Forest and Scenic Area has been unsuccessful. Track surveys and remote cameras have been utilized to attempt to locate this species. Two track records from the 1990s made this species appear to be a potential species on this Forest. Further inspection of the recorded data sheets indicated that the tracking crew was not sure about the actual species and even indicated it could have been a raccoon. This combines with the fact that there is size overlap between marten and fisher makes the records very suspect and, therefore, not considered a verified record by the Forest. Despite continued efforts and even remote camera surveys, following the track discovery, no fisher evidence has been recorded.

It is the Forest Wildlife Biologist determination that fishers are not present on the Forest or Scenic Area.

Crater Lake Tightcoil (*Pristiloma arcticum crateris*): Sensitive

A. Habitat

Crater Lake Tightcoil habitat is found above 2000 feet elevation in moist conifer forests and among mosses and other vegetation near wetlands, springs, seeps, and riparian areas. This species may be found on logs, among sedges, attached to decaying leaf surfaces, in litter, or inside other shells (USDI BLM, 1999).

B. Re-Field Review

Habitat available within project area

Yes. Crater Lake Tightcoil has been found very rarely on the Forest and Scenic Area in the past. The habitat in the project area fits the habitat where this species has been found to occur. The project area does have mosses, wetlands, springs and seeps.

C. Field Reconnaissance

A Level A survey was done and it was determined that habitat for this species was present in the project area. In checking four years of protocol surveys from other projects in the vicinity of the proposed treatment areas, there are no records for this species. This is due in part to the fact that this species has not been found in most years when surveys have occurred.

Habitat for this species is present in the project area and, therefore, presence is assumed although it is anticipated that this species would not be within the treatment areas. In most cases, the species is not likely to be in the treatment areas because the microclimate requirements for the species would not be present. The species is not anticipated in the roadside treatment areas. The seeps and springs would have buffers that would protect the individuals occurring in the treatment areas (Project Design Criteria H.2.).

Dalles Sideband (*Monadenia fidelis minor*), Puget Oregonian (*Cryptomastix devia*), Columbia Oregonian (*Cryptomastix hendersoni*): Sensitive

A. Habitat

Dalles Sideband: This species is usually found in steppe or dry forest plant communities, on terraces or rocky slopes, within 61 feet of springs and seeps (USDI BLM, 1999). This habitat is associated with the eastside of the Forest and Scenic Area. Key components of the habitat are rock outcrops, talus, shrubs, and riparian vegetation.

Puget Oregonian: This species is found in moist conifer forest with hardwood component at low elevations through upper, western hemlock zone (USDI BLM, 1999). Key features of the habitat are large big-leaf maple trees (logs; sword ferns under canopy); other hardwood trees.

Columbia Oregonian: This species is found in steppe or open forest near springs and seeps at low to mid-elevations (USDI BLM, 1999). Key features of the habitat are talus, logs, shrubs and leaf litter.

B. Re-Field Review

Habitat available within the project area

Dalles Sideband: Yes. There is habitat for this species on the eastside of the Forest and Scenic Area. The majority of the time this species conserves moisture by living under rocks and logs, or in saturated wet areas, such as springs and seeps.

Puget Oregonian: Yes: There is habitat for this species in isolated pockets throughout the proposed treatment area. Big leaf maple and other hardwoods occur in saturated soils and primarily in riparian areas.

Columbia Oregonian: Yes. Spring and seeps occur in the proposed treatment areas.

C. Field Reconnaissance

A Level A survey was done and it was determined that habitat for these species was present in the project area.

Habitat for these species is present in the project area and, therefore, presence is assumed. It is anticipated, however, that this species would not be within the treatment areas, in most cases because the microclimate requirements for the species would not be present. The species are not anticipated in the roadside treatment areas. The seeps and springs would have buffers that would protect the individuals occurring in the project areas (Project Design Criteria H.2.).

Management Indicator Species (MIS)

Pileated woodpecker (*Dryocopus pileatus*)

The pileated woodpecker is a Forest MIS. Concern over pileated woodpeckers arises from their association with mature forest habitat, a habitat type that has been affected by logging throughout the woodpeckers range. Breeding bird survey data collected between 1966 and 1991 shows no significant change in the population in the western United States (Bull, 2003). Pileated woodpeckers occur throughout the proposed treatment areas.

A. Habitat

Pileated woodpeckers are associated with older, mature forest stand because of their dependence on both large-diameter trees with decay and on snags for nesting, roosting, and foraging (Bull, 2003). Pileated woodpeckers have large home ranges. Telemetry studies in northeast Oregon have found that pileated woodpecker pairs had an average home range size of 543 acres. Home ranges averaging 1,181 acres and ranging from 660 to 2,609 acres have been reported for the Oregon Coast Range (Marshall et al., 1996).

The pileated woodpecker is most commonly found in mature to old-growth mixed conifer forests; although hardwood forests located in valley bottoms are also utilized. Necessary habitat components for this species include large diameter snags or living trees with some decay which are used for both nesting and roosting sites; both large diameter trees and logs which are used for foraging; and a dense canopy to provide cover which protects them from predators (Bull, 2003).

The pileated woodpeckers diet consists of carpenter ants, thatching ants, beetles, and occasionally wild fruits and nuts. The pileated woodpecker is a resident species that breeds throughout coniferous forests in western Oregon and Washington. Each pair excavates a new nest cavity each spring, usually in a dead tree at an average height of 50 feet above the ground. Courtship begins in February and March, nesting occurs from late March to early May, and nestlings are present from late May until early July. Adults are not migratory and do not exhibit seasonal movements outside of the nesting territory. Juveniles disperse from their natal area in the fall. In an Oregon study, an average juvenile dispersal distance of 2 miles was recorded, with a range 0 to 5.2 miles (Bull, 1987). Timber harvest has the most significant effect on habitat for this woodpecker. Forest fragmentation likely reduces population density and makes birds more vulnerable to predation as they fly between forest fragments (Bull, 2003).

B. Occurrence in Proposed Treatment Areas

Suitable habitat for the pileated woodpecker is present throughout the proposed treatment areas in mature forest with a relatively closed canopy.

American Marten (*Martes americana*)

The American marten is a Forest MIS. Concern for this species arises out of their association with mature and old-growth forest.

A. Habitat

Martens are associated with forested habitat and appear to prefer closed canopy mature forests. They have been observed using alpine areas and could use forest opening if there is sufficient down wood to provide cover (Csuti et al., 2001). The home range size of martens varies, with home ranges of approximately 6 square miles reported from Minnesota (Mech & Rogers, 1977 *in* Ruggerrio et al., 1994) and home ranges of approximately 0.32 square mile reported in Montana (Burnett, 1981 *in* Ruggerio et al., 1994). In Oregon, the home range of a male American marten is generally about 1 square mile in size and the home range of a female is generally about 0.25 square mile, with separation of home range territories within sexes and overlap between sexes being common (Maser, 1998). Martens are generally considered to be forest dependent species and have been observed to avoid large forest openings, although non-forested habitats are used by martens, particularly during summer above tree line. Martens have been observed crossing openings, particularly during winter (Ruggiero et al., 1994).

Martens are primarily carnivorous and feed on small mammals including shrews, voles, woodrats, rabbits, squirrels, and mountain beaver, although marten's prey items also include birds, insects, and fruits (Csuti et al., 2001).

B. Occurrence in Proposed Treatment Areas

In Oregon, martens are known to inhabit the Coast Ranges, the Cascades and the Blue Mountains. The higher elevation sites would be within the areas that martens exist on the Forest. Numerous remote camera and tracking surveys have documented this species occurring widely on the Forest and Scenic Area. With the large home ranges it is always possible that this species would travel through an area that has been treated.

Deer and Elk

The effects to deer and elk are almost identical, since their habitat requirements and forage are so similar.

Deer: There are two different subspecies of mule deer that occur in Oregon: the subspecies expected to occur within the treatment areas is the black-tailed deer (*Odocoileus hemionus)*. The black tailed deer is a Forest MIS. Concern over this species arises from its status as an important game species.

Elk: Elk (*Cervus elaphus*) are Forest MIS. Two subspecies of elk occur on the Forest and Scenic Area. Roosevelt Elk (*Cervus elaphus roosevelti*) occur on the westside of the Cascades, and Rocky Mountain Elk (*Cervus canadensis nelsoni*) on the eastside of the Cascades. Concern over this species arises from its status as an important game species.

A. Habitat

Deer and elk are considered ecotone species, using edge habitats between open areas and forests. They are also known to utilize old-growth coniferous forest, and are often found far from forest edges in this habitat. Deer and elk breed from September to November. One or two young are born in May or June. Migration patterns vary considerably throughout the range of the subspecies. Populations inhabiting higher elevations in summer migrate down-slope to lower elevations when accumulations of snow make forage unavailable, while other populations move short distances to preferred food patches or do not migrate at all.

Dietary habits of deer and elk are relatively broad. Although traditionally considered a browser, deer are actually intermediate between browsers and grazers, with grasses and forbs making up a high proportion of the diet during some years and seasons. Browse consisting mainly of the tender new shoots of woody plants makes up approximately three-fourths of deer diets annually. In spring and summer, the new green growth of forbs and grasses could make up over half the food eaten. The fruits, nuts, buds, shoots and leaves of a wide variety of trees, shrubs, and vines as well as mushrooms, lichens, and other foods are regularly consumed.

Grasses and sedges make up the bulk of elk diets, with forbs and browse utilized to a lesser extent. Elk require a juxtaposition of forest for cover and open habitats for forage. Dispersal corridors between summer and winter ranges must provide these requirements, along with relative freedom from human disturbance. River corridors are often used as migration corridors.

Travel corridors between summer and winter range, freedom from human disturbance in fawning areas, and cover to escape harsh environmental conditions and predators are important components of high-quality deer and elk habitat. Within the Cascades elk typically begin migrating in June up-slope to summer range following new plant growth as it becomes available. Calving areas are defined as the upper reaches of winter range which offer open brush and grassy areas near water and nearby forested areas for cover. The elevation of calving varies with the depth of the snow pack and the availability of forage and cover. Young are born in early June and within a week or two, cow-calf herds are formed.

B. Occurrence in Proposed Treatment Areas

Suitable habitat for both deer and elk is present in the Study Area and individuals of this species have been observed within the treatment areas.

Analysis of State Listed Species for Scenic Area Analysis

Oregon State Endangered, Threatened, Sensitive and Candidate Species with historic or suspected range in the Scenic Area as defined by the1992 Management Plan for the Columbia River Gorge National Scenic Area that have not been addressed in the body of this EIS.

Table X-5: Summary table of effects for Oregon State Endangered (E), Threatened (T), Sensitive (S) and Candidate (C) Species. The sensitive species are broken down into Sensitive-Critical (SC), Sensitive-Vulnerable (SV), and Sensitive-Undetermined (SU).

Project Name: Site-Specific Invasive Plant Treatment EIS		**State: Oregon**			
SPECIES (population segment)	**STATUS***	**PREFIELD REVIEW Usual Habitat in OR/WA**	**Species Presence**		**Effect Determination**
			Habitat Present?	**Species Present?**	
Columbia spotted frog *(Rana luteiventris)*	C, WA-C, OR-SU	Columbia basin (east of Cascades Range): In or near permanent slow ponds, streams, marshes with abundant vegetation (one known site at Conboy). No currents sites in Scenic Area.	Y	N	No Effect
Northern leopard frog *(Rana pipiens)*	WA-E, OR-SC	Lowland marsh/ponds with dense vegetation; presently found in Grant county only. Likely extirpated in Gorge.	Y	N	No Effect
Western toad *(Bufo boreas)*	WA-C, OR-SV	Widespread distribution in WA and OR: Most common near marshes and small lakes (breeding sites in mid-spring); can travel readily overland and be found along streams/seeps.	Y	Y	Effect Unknown
Tailed frog *(Ascaphus truei)*	OR-SV	Clear, cold, fast forest streams with little silt and (often) cobble substrate.	Y	Y	No Effect
Cascades frog *(Rana cascadae)*	OR-SV	High elevation streams (1500-6000') as well as mountain meadows and moist forests	Y	Y	No Effect
Northern red-legged Frog (**West Cascades**) *(Rana aurora)*	OR-SU	Moist forests and forested wetlands, breeding in cool ponds and slow streams.	Y	Y	Effect Unknown
California Mountain king snake *(Lampropeltis zonata)*	WA-C, OR-SV	Main population in CA and Klamath mountains, with disjunct pop. in Columbia River Gorge (Klickitat, Skamania county area): oak/pine woodland, rocky riparian within logs/rocky cover. No confirmed specimens on OR side of Scenic Area, although unconfirmed sightings have been reported at The Dalles and Maupin areas.	Y	N	No Effect
Sharptail snake *(Contia tenuis)*	WA-C, OR-SV	East slope of WA Cascades, Columbia R. Gorge, W OR: rocky slopes and open pine and oak woodland w/prey species of small slugs	Y	Y	Effect Unknown
Ferruginous hawk *(Buteo regalis)*	WA-T, OR-SC	Open prairie and shrub steppe in eastern WA and OR.	Y	N	No effect

Project Name: Site-Specific Invasive Plant Treatment EIS		**State: Oregon**			
			Species Presence		
SPECIES (population segment)	**STATUS***	**PREFIELD REVIEW Usual Habitat in OR/WA**	**Habitat Present?**	**Species Present?**	**Effect Determination**
Northern goshawk *(Accipiter gentilis)*	WA-C, OR-SC	Typically more common east of Cascades in a wide variety of forest ages, structural conditions, and successional stages. Uses stands of mature forest as nesting sites. Typically found between 1900 and 6100 feet in Oregon.	Y	Y	No effect
Flammulated owl *(Otus flammeolus)*	WA-C, OR-SC	E. Cascades: cavity nester in mature pine and mixed conifer, at mid-elevations. Winters S. of US border	Y	Y	No effect
Barrow's goldeneye (**breeding population**) *(Bucephala islandica)*	OR-SU	Cascade range: breeds along ponds, sloughs and lakes in mountainous areas, using tree cavities or nest boxes. Winters in large rivers or marine habitat.	Y	Not Breeding	No effect
American white pelican *(Pelecanus erythrorhynchos)*	WA-E, OR-SV	Gregarious birds that nest in large colonies on islands within shallow water and marshes free of human disturbance and mammalian predators. Post breeders sometimes seen in Col R. (such as Klickitat Delta). Winters in S US through Mexico.	Y	Y	No effect
Yellow-billed cuckoo *(Coccyzus americanus)*	WA-C, OR-SC	Historic range in WA and OR. No reported breeding occurrences since the 1950's, although individuals have been sighted east of Cascades sporadically. Riparian forests, with cottonwood/thick willow; Neotropical migrant. Considered extirpated from WA and OR.	Y	N	No effect
Lewis' woodpecker *(Melanerpes lewis)*	WA-C, OR-SC	Open pine/oak woodland, conifer forests, and riparian woodland; neotropical migrant. Commonly seen in east areas of Scenic Area in dry forest types of oak and pine.	Y	Y	No effect
White-headed woodpecker *(Picoides albolarvatus)*	WA-C, OR-SC	Central/E. WA/OR in mature and open coniferous forests, esp. ponderosa pines. Cavity nester. Unknown numbers in Scenic Area.	Y	Y	No effect
Three-toed woodpecker *(Picoides tridactylus)*	OR-SC	Range in Oregon cascades in forests with Pine or Spruce component with bark beetle availability (diseased/ dying/ burned trees). Very limited habitat in Scenic Area.	Y	Y	No effect
Black-backed woodpecker *(Picoides arcticus)*	WA-C, OR-SC	Uncommon Cascades resident usu. at higher elevations (>3000'). East Cascades in WA. Scattered distribution as populations are highly associated with post-fire habitats in mature forests (stand-replacement fires with snags), dependent on high density of dead and insect-ridden trees.	Y	Y	No effect

Project Name: Site-Specific Invasive Plant Treatment EIS		**State: Oregon**			
			Species Presence		
SPECIES (population segment)	**STATUS***	**PREFIELD REVIEW Usual Habitat in OR/WA**	**Habitat Present?**	**Species Present?**	**Effect Determination**
Williamson's sapsucker *(Sphyrapicus thyroideus)*	OR-SU	East slopes of Cascades: breeds in coniferous mountain forests at mid to high elevation. Prefers large snags for nesting. Majority of population migrate to Southwest U.S. for winter.	Y	Unk	No effect
Willow flycatcher **(East Cascades pop.)** *(Empidonax adastus)*	OR-SU	Associated with shrub habitat. Dependent on willow thickets in riparian zones for nesting and migration. Neotropical migrant.	Y	Y	No effect
Purple martin *(Progne subis)*	OR-SC, WA-C	Western WA/OR up through Gorge to Western Wasco County: Nests in artificial & natural snags/crevices, often over water. Forages over open water/fields/forest canopy. Winters in South America.	Y	Y	No effect
Bank swallow *(Riparia riparia)*	OR-SU	East of Cascades along waterways or roadcuts where vertical cliffs of soil are exposed adjacent to large open area. Neotropical migrant.	Y	Y	Minor effect
White-tailed jackrabbit *(Lepus townsendii)*	WA-C, OR-SU	East of Cascades: open areas with native bunchgrass, sagebrush plains, can also be found in coniferous forests and subalpine meadows. On periphery of habitat in Scenic Area at the Dalles/Dallesport.	Y	Y	No effect
Washington ground squirrel *(Spermophilus washingtoni)*	WA-C, OR-E	Presently found in Columbia basin of WA state in sagebrush/grassland w/ sandy soils; also Giliam, Morrow and Umatilla counties, OR. May have historically been within the eastern edge of Scenic Area.	Y	N	No effect
Western gray squirrel *(Sciurus griseus)*	OR-SU, WA-T	Oak & mixed oak woodland, typically within ½ mile of water source. Core range for WA in Klickitat county	Y	Y	No effect
Townsend's big-eared bat *(Corynorhinus townsendii)*	WA-C, OR-SC	Roosts and hibernaculum sites within caves, buildings, mines and bridge undersides, with exacting temp, humidity, and physical requirements. Very intolerant of human disturbance which results in loss of critical fat reserves during torpid period.	Y	Y	Minor effect
Silver-haired bat *(Lasionycteris noctivagans)*	OR-SU	Found throughout Oregon: among the most common bats in forested areas of America, most closely associated with coniferous or mixed coniferous and deciduous forest types, especially in areas of Old Growth. They form maternity colonies almost exclusively in tree cavities or small hollows	Y	Y	Minor effect
Western small-footed myotis *(Myotis ciliolabrum)*	OR-SU	West Cascades and eastward: Rears its young in cliff-face crevices, erosion cavities, and beneath rocks on the ground as well as hibernating in caves or mines. Relatively little is known about this species.	Y	Y	Minor effect

Project Name: Site-Specific Invasive Plant Treatment EIS		**State: Oregon**			
			Species Presence		
SPECIES (population segment)	**STATUS***	**PREFIELD REVIEW Usual Habitat in OR/WA**	**Habitat Present?**	**Species Present?**	**Effect Determination**
Long-eared myotis *(Myotis evotis)*	OR-SU	Statewide: found in coniferous roost in tree cavities and beneath exfoliating bark in both living trees and dead snags.	Y	Y	Minor effect
Long-legged- myotis *(Myotis volans)*	OR-SU	Statewide: especially dependent on wooded habitats of coniferous forests, usually at elevations of 4,000 to 9,000 feet. Nursery colonies found in large mature trees that provide crevices or exfoliating bark, along openings or along forest edges where they receive a large amount of daily sun. Also found in rock crevices, cliffs, and buildings. Long-legged myotis forage over ponds, streams, water tanks, and in forest clearings, often on moths.	Y	Y	Minor effect