

Vascular Plant Species Closely Associated With Old-Growth Forests in National Forests
Within the Range of the Northern Spotted Owl ("Short List")

Key for status codes and references appear at the end of this appendix.

Appendix 5-B
Vascular Plant Species Closely Associated with Old-Growth Forests

SCIENTIFIC NAME	COMMON NAME	STATUS			CRITERIA FOR OLD-GROWTH ASSOCIATION	REFERENCES
		FED	WA	OR CA		
<i>Achlys triphylla</i>	Vanilla leaf				1	13,35,36
<i>Adenocaulon bicolor</i>	Trail plant				1	11,14,35,36
<i>Adiantum pedatum</i>	Western maidenhair fern				1	35,36
<i>Altotropa virgata</i>	Candy stick				1	13,35,36,37
<i>Anemone deltoidea</i>	ThreeLeaf anemone				1	35,36
<i>Angelica tomentosa</i>	California angelica				2	11,12
<i>Apocynum pumilum</i>	Dogbane				2	12, 14
<i>Arceuthobium tsugense</i>	Dwarf mistletoe				1	35,36
<i>Arnica latifolia</i>	Mountain arnica				1	35,36,37,38
<i>Asarum caudatum</i>	Wild ginger				1	11,12,35,38
<i>Asarum hartwegii</i>	Wild ginger				2	11, 12
<i>Asarum wagneri</i>	Green-flowered wild ginger			C1	4	
<i>Bensoniella oregana</i>	Bensoniella	C2		C1 R,1B	3	4,8,19
<i>Berberis pumila</i>	Dwarf mahonia				2	11,12
<i>Boschniakia strobilacea</i>	Ground cone				2	11
<i>Botrychium ascendens</i>				C	4	28
<i>Botrychium crenulatum</i>	Southwestern moonwort	C2		C	3	
<i>Botrychium minganense</i>	Victorin's grape fern		S	2	3	24,35,37
<i>Botrychium montanum</i>	Mountain grape-fern			2	3	35,37
<i>Botrychium pumicota</i>	Crater Lake (pumice) grapefern	C1		C1 1A	4	17, 18
<i>Calypso bulbosa</i>	Fairy-Slipper				1	11,13,14,35,36
<i>Chamaecyparis lawsoniana</i>	Port Orford cedar				1	35,38
<i>Chamaecyparis nootkatensis</i>	Alaska yellow cedar				1	35,36,38
<i>Chimaphila menziesii</i>	Pipsissewa				1	35,36
<i>Chimaphila umbellata</i>	Common pipsissiwa				1	13,35,36,37
<i>Cimicifuga elata</i>	Tall bugbane		S	C	3	35,37
<i>Ctintonia uniflora</i>	Queen's cup				1	2,12,35,36
<i>Coptis asplenifolia</i>	Spleenwort-leaved goldthread		S		2	16,25
<i>Coptis laciniata</i>	Goldthread				1	35,36,37
<i>Corallorhiza maculata</i>	Pacific coral root				1	35,36,37
<i>Corallorhiza mertensiana</i>	Western coral-root				1	35,36,37
<i>Cupressus bakeri</i>	Baker's cypress			2	3	19
<i>Cypripedium fasciculatum</i>	Clustered lady's slipper		T	C	4	11
<i>Cypripedium montanum</i>	Mountain lady's slipper				3	8,11,12

Appendix 5-B
Vascular Plant Species Closely Associated with Old-Growth Forests (continued)

SCIENTIFIC NAME	COMMON NAME	STATUS				CRITERIA FOR OLD-GROWTH ASSOCIATION	REFERENCES
		FED	WA	OR	CA		
<i>Pentaria californica</i>	Toothwort					2	13
<i>Oisporum hookeri</i>	Fairy bell					1	13
<i>Dryopteris austriaca</i>	Spreading wood-fern					1	33,36
<i>Eburophyton austinae</i>	Phantom orchid					1	33,36,37
<i>Erythronium montanum</i>	Avalanche lily					1	35,36
<i>Fritillaria gentneri</i>	Gentner's mission-bells	C2		C		4	
<i>Gali um kamtschaticum</i>	Boreal bedstraw		S			2	16
<i>Gaultheria humifusa</i>	Western wintergreen					1	35,36
<i>Gaultheria ovatifolia</i>	Oregon wintergreen					1	35,36
<i>Gymnocarpium dryopteris</i>	Oak fern					1	35,36
<i>Habenaria orbiculata</i>	Large round-leaved rein-orchid					1	35,36
<i>Habenaria saccata</i>	Slender bog orchid					1	35,36
<i>Habenaria unalascensis</i>	Alaska rein-orchid					1	35,36
<i>Haplopappus Whitneyi discoides</i>	Whitney haplopappus				2	2	11,12,15
<i>Hemitomes congestum</i>	Gnome plant					2	13,15,35,47
<i>Hieracium scouleri</i>	Woolly-weed					2	39
<i>Hypopitys monotropa</i>	Pinesap					1	13,35,36,37
<i>Lathyrus potyphyttus</i>	Leafy peavine					1	35,38
<i>Linnea boreatis longifolia</i>	(No common name)					2	13
<i>Listera borealis</i>	Northern twayblade		S			3	40
<i>Listera caurina</i>	Western twayblade					1	11,12,35,36,37
<i>Listera convallarioides</i>	Broad-tipped twayblade					1	35,36
<i>Listera cordata</i>	Twayblade				4	1	35,36,37
<i>luzuta hitchcockii</i>	Smooth woodrush					1	35,36
<i>kysichitum americanum</i>	Skunk cabbage					1	35,36
<i>Melica subulata</i>	Melic grass					1	35,38
<i>Menziesia ferruginea</i>	Fool's huckleberry					1	35,36
<i>Mitelta breweri</i>	Brewer's mitrewort					1	35,36
<i>Monotropa uniflora</i>	Indian pipe					1	15,35,36,37
<i>Oxalis oregana</i>	Redwood sorrel					1	13
<i>Phlox adsurgens</i>	Woodland phlox					2	11,12,13
<i>Picea breweriana</i>	Brewer spruce					1	13,35,38
<i>Pityopsis californica</i>	Pinefoot					2	2,8,35,37
<i>Patanthera obtusata</i>	Small northern bog orchid		S			3	25
<i>Pieuricospora fimbriolata</i>	Fimbriate pinesap		S			3	8,13,30,35,37
<i>Poa laxiflora</i>	Loose-flowered bluegrass				2	3	20,31
<i>Polystichum munitum</i> var. <i>imbricans</i>	Imbricate sword-fern					2	11,12
<i>Pterospora andromedea</i>	Woodland pinedrops					1	11,12,15,35,36

Appendix 5-B

Vascular Plant Species Closely Associated with Old-Growth Forests (continued)

SCIENTIFIC NAME	COMMON NAME	STATUS				CRITERIA FOR OLD-GROWTH ASSOCIATION	REFERENCES
		FED	WA	OR	CA		
<i>Pyrota asarifolia</i>	Alpine pyrota					1	2,35,36,37,38
<i>Pyrota chtonantha</i>	Greenish wintergreen					1	35,36
<i>Pyrota dentata</i>	Toothleaf pyrota					1	35,38,39
<i>Pyrola picta</i>	White vein pyrola					1	35,36
<i>Pyrota picta</i> ssp. <i>dentata</i>	Nootka wintergreen					2	11,12
<i>Pyrota secunda</i>	One-sided pyrota					1	35,36,37,38
<i>Pyrola uniflora</i>	Single flowered pyrola					1	35,36
<i>Rubus lasiococcus</i>	Dwarf bramble					1	35,38
<i>Rubus nivalis</i>	Snow bramble					1	35,36,37
<i>Rubus pedatus</i>	Fiveteaved bramble					1	35,36
<i>Sarcodes sanguinea</i>	Snow Plant					2	15
<i>Satureja douglasii</i>	Yerba buena					1	35,38
<i>Setaginella oregana</i>	Oregon selaginella					1	35,36
<i>Silene nuda</i>	Not available			2		4	17
<i>Smilacina racemosa</i>	Solomons seat					1	13,35,36
<i>Smilacina stellata</i>	Star-flowered solomon-plume					1	35,36
<i>Streptopus amplexifolius</i>	Clasping-leaved twisted-stalk					1	35,36,37
<i>Streptopus roseus</i>	Rosy twisted-stalk					1	35,36
<i>Streptopus streptopoides</i>	Twisted-stalk					1	35,36
<i>Synthyris schizantha</i>	Fringed synthyris					1	35,36
<i>Taxus brevifolia</i>	Pacific yew					1	2,35,36,37,38
<i>Thuja plicata</i>	Western red cedar					1	35,36,37
<i>Tiarella trifoliata</i>	Three-leaved foamflower					1	35,36,37,38
<i>Tiarella unifoliata</i>	Coolwort foamflower					1	35,38
<i>Trillium ovatum</i>	Wake-robin					1	13,35,36
<i>Trillium ovatum</i> ssp. <i>oettingeri</i>	Salmon Mtns. Wakerobin				4	1	11
<i>Vaccinium alaskaense</i>	Alaska huckleberry					1	35,36
<i>Vaccinium membranaceum</i>	Thin-leaved huckleberry					1	35,36,38
<i>Vaccinium ovatifolium</i>	Oval-leaf huckleberry					1	35,36
<i>Vaccinium parvifolium</i>	Red huckleberry					1	35,38
<i>Vancouveria hexandra</i>	Inside-out flower					1	11,12,13
<i>Vancouveria planipetala</i>	Inside-out flower					1	11,12,13
<i>Viola americana</i> var. <i>viltosa</i>	American vetch					1	35,38
<i>Viola gabetla</i>	Pioneer violet					1	35,36
<i>Viola orbiculata</i>	Round-leaved violet					1	35,36
<i>Viola renifolia</i>	Kidney-leaved violet				EX	4	16,33,34
<i>Whipplea modesta</i>	Yerba de Selva					1	13
<i>Xerophyllum tenax</i>	Beargrass					1	35,36,38

Appendix 5-B
Vascular Plant Species Closely Associated With Old-Growth Forests

Key to Status Codes

FED == == => **Federally Listed Status of a Species.**

Codes used:

- E =endangered
- C =candidate
- C1 =category 1 candidate, taxa for which the U.S. Fish and Wildlife Service has sufficient information to support a proposal to list as threatened or endangered under the Endangered Species Act.
- C2 =category 2 candidate, U.S. Fish and Wildlife Service candidates that need additional information to propose as threatened or endangered under the Endangered Species Act.
- C3 =taxa which have proven to be more abundant or widespread than previously believed and/or which have no identifiable threats. This status is based only on the most recently published Candidate Notice of Review.

WA == == => **Status Listing for Species in Washington**

Codes used: Same as codes for Federal.

EX =extinct

OR == == => **Status Listing for Species in Oregon**

Codes used: Same as codes for Federal.

CA == == => **Status Listing for Species in California**

Codes used:

Endangered code same as Federal plus:

For State listed plants

- E = listed endangered
- R = listed rare

Appendix 5-B
Vascular Plant Species Closely Associated With Old-Growth Forests

Key to Status Codes (continued)

For Federal candidates and Federally listed plants

- T = Federally listed, threatened
- 1 = enough data is on file to support the Federal listing
- 1* = enough data is on file to support Federal listing, but plant presumed extinct
- 2 = threat and/or distribution data are insufficient to support Federal listing
- 2* = threat and/or distribution data are insufficient to support Federal listing; presumed extinct
- 3a = extinct
- 3b = taxonomically invalid
- 3c = too widespread and/or not threatened

- California Native Plant Society Codes

- 1 = List 1; plants extinct, rare or endangered in California and elsewhere
 - List 1A; presumed extinct
 - List 1B; rare and endangered in California and elsewhere
- 2 = List 2; plants rare or endangered in California, but more common elsewhere
- 3 = List 3; plants about which we need more information
- 4 = List 4; plants of limited distribution - watch list
 - Forest Plan Group A; plants most sensitive to habitat manipulation
 - Forest Plan Group B; plants found in wet meadows, bogs, seeps, etc.
 - Forest Plan Group C; plants moderately sensitive to habitat manip.

- California Native Plant Society R-E-D Code

R or "Rarity":

- 1 = rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time
- 2 = occurrence confined to several populations or to one extended population
- 3 = occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported

Appendix 5-B
Vascular Plant Species Closely Associated With Old-Growth Forests

Key to Status Codes (continued)

E or "Endangerment":

- 1 = not endangered
- 2 = endangered in a portion of its range
- 3 = endangered throughout its range

D or "Distribution":

- 1 = more or less widespread outside California
- 2 = rare outside California
- 3 = endemic to California

**- Forest Service Pacific Southwest Region's Sensitive Plant List 8/90
management sensitivity codes**

- 1 = current or potential threats or jeopardy from Forest management activities
- 2 = no or minimal threats or jeopardy from Forest management activities
- 3 = insufficient data at this time to evaluate threats or jeopardy from Forest management activities

Key to criteria for old-growth association: see Table 5-1

Appendix 5-B Vascular Plant Species Closely Associated With Old-Growth Forests

Reference Codes

- 1 = number not used
- 2 = Ruggiero, L.F.; Jones, L.L.C.; Aubry, K.B. 1991b. Plant and animal habitat associations in Douglas-fir forests of the Pacific Northwest: an overview. Pages 447-462 in Ruggiero et al., eds. Wildlife and vegetation of unmanaged Douglas-fir forests. Gem Tech. Rep. PNW-GTR-285. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 533 p.
- 3 = number not used
- 4 = Bingham, personal communication, May 20, 1992.
- 5 = Topik, Regional Ecologist, personal communication, 1992.
- 6 = Six Rivers National Forest. October 1992. FWS candidate or sensitive plant species of the Six Rivers National Forest known or suspected to occur in habitat conservation areas.
- 7 = Diversity Database California Department of Fish & Game, 1992.
- 8 = Lisa Hoover, Forest Botanist, Forest TE&S Plants Program, Six Rivers National Forest, 1992.
- 9 = Maria Knight, Forest Botanist, Forest TE&S Plants Program, Klamath National Forest, 1992.
- 10 = Dave Esle, Forest Botanist, Forest TE&S Plants Program, Mendocino National Forest, 1992.
- 11 = JuUe Nelson, Forest Botanist, Forest TE&S Plants Program, Shasta-Trinity National Forest, 1992.
- 12 = Sheila Logan, Zone Ecologist, Ecological Classification Program Data, Shasta-Trinity National Forest, 1992.
- 13 = Bingham, B. October 1992. Arcata, CA: Old-growth program, Forest Service, Pacific Southwest Research Station.
- 14 = Vivian Long, Botanist, Shasta-Trinity National Forest, 1992.
- 15 = Munz, P.A.; Keck, D.D. 1973. A California flora with supplement. Berkeley and Los Angeles, CA: UC Press. 1681 p.
- 16 = Hitchcock, C.L.; Cronquist. 1973. Flora of the Pacific Northwest. Seattle, WA: University of Washington Press.
- 17 = Carol Tyson, District Botanist, Winema National Forest, 1992.
- 18 = Cindi O'Neil, District Botanist, Deschutes National Forest, 1992.
- 19 = Linda Mullens, Botanist, Siskiyou National Forest, 1992.
- 20 = Larry Scofield, Botany Division of Resources, Salem BLO, Salem, OR., 1992.
- 21 = number not used
- 22 = Wayne RoUe, Botanist, Rogue River National Forest, 1992.
- 23 = Wagner, W.J.; Lord, L.P. 1956. The morphological and cytological distinctness of *Botrychium minganence* and *Botrychium lunaria* in Michigan. Bulletin of the Torrey Botanical Club. 83(4): 261-280.
- 24 = Steve Rust, Botanist, Wenatchee National Forest, 1992.
- 25 = Laura Potash, Botanist, Mt Baker-Snoqualmie National Forest, 1992.
- 26 = Meinke, R.J. Threatened and endangered vascular plants of Oregon: an illustrated guide. Portland, OR: U.S. Fish and Wildlife Service.

Appendix 5-B

Vascular Plant Species Closely Associated With Old-Growth Forests

Reference Codes (continued)

- 27 = Bierly, K.F.; Stockhouse, R.E., II. 1982. Coast fawn lilly (*Erythronium revolutum*) sensitive species conservation report. Contract # 400-0410-2-384. Prepared for USDA Forest Service, Siuslaw National Forest.
- 28 = John Gamon, Botanist, Washington National Heritage Program, 1992.
- 29 = Moldenke, A. 1981. Endangered and threatened plant status report. Eugene, OR: USDA Forest Service, Willamette National Forest.
- 30 = Species management guide for *Pleuricospora fimbriolata*. 1988. USDA Forest Service, Gifford Pinchot National Forest.
- 31 = Species management guide for loose-flowered bluegrass *Poa laxiflora*. 1988. USDA Forest Service, Siuslaw National Forest.
- 32 = Linda Kunze, Wetlands Ecologist, Washington Natural Heritage Program, 1992.
- 33 = An illustrated guide to the endangered, threatened and sensitive vascular plants of Washington. 1981. Olympia, WA: Washington Natural Heritage Program.
- 34 = Hulten, E. 1968. Flora of Alaska and neighboring territories. Stanford, CA: Stanford University Press.
- 35 = R-6 Ecology Data Base Analysis (Robin Leshner). Oct - Nov 1992.
- 36 = Jan Henderson and Robin Leshner, Ecologists, Mt. Baker-Snoqualmie and Olympic National Forests, 1992.
- 37 = Cindy McCaJn, Ecologist and Jenny Dimling, Botanist, Willamette National Forest, 1992.
- 38 = Tom Atzet, Pat Martinez and Lisa McCrimmon, Ecologist, Rogue River and Siskiyou National Forests, 1992.
- 39 = Brad Smith, Ecologist, Wenatchee and Okanogan National Forests, 1992.
- 40 = George Wootton, Botanist, Okanogan National Forest, 1992.

Additional Sources/References:

Eastman, D.C. 1990. Rare and endangered plants of Oregon. Beautiful America Publishing Co.

Meinke, R.J. 1982. Threatened and endangered vascular plants of Oregon, an illustrated guide.

Oregon Natural Heritage Program. 1991. Rare, threatened and endangered plants and animals of Oregon. Portland, OR.

Siddell, J.L. et al. 1979. Rare, threatened and endangered vascular plants in Oregon, an interim report. Natural Area Preserves Advisory Committee.

Spies, T.A. 1991. Plant species diversity and occurrence in young, mature, and old-growth Douglas-fir stands in western Oregon and Washington. Pages 111-121 in: Ruggiero, L.F.; Aubry, K.B.; Carey, A.B.; Huff, M.H., tech. coords. Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 533 p.

The Scientific Analysis Team Report

Fish Species and Stocks at Risk in National Forests Within the Range of the
Northern Spotted Owl

**Appendix 5-C
Fish Species and Stocks at Risk in National Forests Within the Range of the
Northern Spotted Owl.**

Anadromous Fish

Forest	Species/Race	Stock
California		
Mendocino	Chinook Fall	Lower Eel River
	Steelhead Trout Winter	Sacramento River
	Summer	Eel River
Six Rivers	Chinook Salmon Spring/ Summer	Klamath River Smith River
	Fall	Lower Klamath River Tributaries Smith River
	Coho Salmon	Klamath River
	Steelhead Trout Summer	Eel River Mad River Smith River Klamath River
	Coastal Cutthroat	California Coastal Streams
Shasta- Trinity	Chinook Spring/ Summer Fall	Klamath River Lower Klamath River Tributaries
	Stealhead Trout Winter Summer	Sacramento River Klamath River
	Klamath	Chinook Spring/ Summer Fall
Coho Salmon		Klamath River
Steelhead Trout Summer		Klamath River

Appendix 5-C

Fish Species and Stocks at Risk in National Forests Within the Range of the Northern Spotted Owl.

Anadromous Fish (continued)

Forest	Species/Race	Stock
<u>Oregon</u>		
Mt. Hood	Chinook Salmon Spring/ Summer	Sandy River Hood River
		Fall Hood River
	Coho Salmon	Clackamas River Sandy River Hood River
		Steelhead Trout Winter
	Summer	Lower Columbia River Tributaries above Bonneville Dam Hood River
	Sea-run Cutthroat Trout	Hood River
Willamette	Chinook Spring/ Summer	Willamette River
	Stealhead Winter	Calapooia River
Siuslaw	Chinkook Salmon Spring/ Summer	Alsea River Siletz River
		Fall Yachats River Yaquina River
	Coho Salmon	Siuslaw River Umpqua River Yachats River Alsea River

Appendix 5-C

Fish Species and Stocks at Risk in National Forests Within the Range of the Northern Spotted Owl.

Anadromous Fish (continued)

Forest	Species/Race	Stock
Siuslaw (continued)	Coho Salmon	Beaver Creek Siletz River Salmon River Nestucca River
	Chum Salmon	Umpqua River Alsea River Yaquina River Siletz River Nestucca River
	Steelhead Trout Winter	Siuslaw River Big Creek Tenmile Creek Yachats River Alsea River Yaquina River Siletz River Salmon River Nestucca River
	Summer	Siletz River
	Sea-run Cutthroat Trout	Oregon Coastal Streams
	Umpqua	Chinook Salmon Spring/ Summer
Coho Salmon		Umpqua River
Chum Salmon		Umpqua River
Sea-run Cutthroat Trout		Oregon Coastal Streams
Siskiyou	Chinook Salmon Spring/ Summer	Coquille River
	Fall	Winchuck River Pistol River Rogue River
	Coho Salmon	Winchuck River Chetco River Pistol River Rogue River

Appendix 5-C

Fish Species and Stocks at Risk in National Forests Within the Range of the Northern Spotted Owl.

Anadromous Fish (continued)

Forest	Species/Race	Stock
Siskiyou (continued)	Coho Salmon	Elk River Sixes River Coquille River
	Chum Salmon	Elk River Sixes River
	Steelhead Trout Winter Summer	Illinois River Rogue River
	Sea-run Cutthroat Trout	Oregon Coastal Streams
Rogue River	Coho Salmon	Rogue River
<u>Washington</u>		
Mt. Baker-Snoqualmie	Chinook Salmon Spring/ Summer	White River Stillaguamish River North Fork Nooksack River South Fork Nooksack River
	Coho Salmon	Nooksack River
	Steelhead Trout Winter Summer	Nooksack River Stillaguamish River Nooksack River
Olympic	Chinook Salmon Spring/ Summer	Skokomish River Dosewallips River Dungeness River Elwha River Wynoochee River
	Fall	Duckabush River Dosewallips River Dungeness River
	Coho Salmon	Lyre River Elwha River
	Chum Salmon	Hood Canal (early-timed) Elwha River

Appendix 5-C

Fish Species and Stocks at Risk in National Forests Within the Range of the Northern Spotted Owl.

Anadromous Fish (continued)

Forest	Species/Race	Stock
Olympic (continued)	Pink Salmon	Skokomish River Dungeness River Elwha River
	Steelhead Trout Winter	Skokomish River
	Sea-run Cutthroat Trout	Washington Coastal and Puget Sound Tributaries (except Grays Harbor and Hood Canal Tributaries) Grays Harbor and Hood Canal Tributaries
Gifford Pinchot	Steelhead Trout Winter	Lower Columbia River Tributaries above Bonneville Dam Toutle River Wind River
	Summer	Wind River
	Sea-run Cutthroat Trout	Toutle River Kalama River
Wenatchee	Sockeye Salmon	Wenatchee River
	Steelhead Trout Summer	Wenatchee River Entiat River
Okanogan	Chinook Salmon Spring/ Summer	Methow River Okanogan River
	Steelhead Trout Summer	Methow River Okanogan River

NOTE: Some stocks occur in more than one river system or National Forest.

Appendix 5-C

Fish Species and Stocks at Risk in National Forests Within the Range of the Northern Spotted Owl.

Resident Fish

<u>Forest</u>	<u>Species</u>
Shasta-Trinity	Red-band Trout
Mt. Hood	Red-band Trout
Willamette	Bull Trout
	Oregon Chub
	Oregon Chub
Umpqua	Bull Trout
Rogue River	Bull Trout
Deschutes	Bull Trout
Winema	Bull Trout
Mt. Baker-Snoqualmie	Bull Trout
Olympic	Olympic Mudminnow
Gifford Pinchot	Bull Trout
Wenatchee	Bull Trout
Okanogan	Bull Trout

Species Names

<u>Common Name</u>	<u>Scientific Name</u>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>O. kisutch</i>
Steelhead trout	<i>O. mykiss</i>
Redband trout	<i>O. mykiss gibbsi</i>
Sea-run cutthroat trout	<i>O. clarkii clarkii</i>
Sockeye salmon	<i>O. nerka</i>
Chum salmon	<i>O. keta</i>
Pink salmon	<i>O. gorbuscha</i>
Bull trout	<i>Salvelinus confluentus</i>
Oregon Chub	<i>Oregonichthys crameria</i>
Olympic mudminnow	<i>Novumbra hubbsi</i>

References

Nehlsen, W.; Williams, J.W.; Lichatowich, J.A. 1991. Pacific salmon at the crossroads: stocks at risk from California, Oregon, Idaho, and Washington. *Fisheries*. 16(2): 4-21.

Williams, J.E.; Johnson, J.E.; Hendrickson, D.A.; [and others]. 1989. Fishes of North America endangered, threatened, and of special concern. *Fisheries*. 14(6): 2-20.

The Scientific Analysis Team Report

Attributes of Terrestrial (Non-Fish) Vertebrates Closely Associated With Old-Growth
Forests in National Forests Within the Range of the Northern Spotted
Owl ("Short List")

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Appendix 5-D

Terrestrial Vertebrates ("Short List") - Amphibians and Reptiles

young
Canopy: growth
<=25% w/ classic
legacies old growth

P=Primary; S=Secondary
/ = most/fewest use; () = equal use; * = spec. hab. req.

Species	Breeding, foraging, and resting habitat										Microhabitat				
	Successional stages					Old growth stand structural stages					Talus	Logs	Duff/litt	Lg snags	Lg tree
	Young	Mid	Late successional	Old growth	Sparse	Comp	Class	OG							
Grass/forb	Shrub/sap	Pole	Mature	Old growth	Sparse	Comp	Class	OG	Talus	Logs	Duff/litt	Lg snags	Lg tree		
Amphibians															
Oregon Slender salamander	S	P/S	(PS)	(PS)	P/S			X	X			X			
Larch Mt. salamander			S	P	P						X				
Siskiyou Mt. salamander			P	P	P (assumed)						X				
Del Norte salamander		*	S/P	S/P	P/S	X					X				
Van Dyke's salamander			S	(PS)	P/S				X	X	X	X	X		
Dunn's salamander	S	S	S/P	(PS)	P		X	X	X	X	X	X	X		
Black salamander	(PS)	(PS)	P/S	(PS)	(PS)	X	X	X	X	X	X	X	X		
California slender salamander	S	S/P	(PS)	P/S	P/S		X	X	X	X	X	X			
Clouded salamander	P	P	(PS)	S	(PS)	X	X	X	X	X	X	X	X	X	
Pacific giant salamander			(PS)	(PS)	P/S	X	X	X	X	X	X	X	X		
Cope's giant salamander	P*	P*	(PS)*	(PS)*	P*		X	X				X			
Olympic salamander			P/S	P/S	P						X				
Northwestern salamander	(PS)	(PS)	S	(PS)	P/S		X	X			X	X			
Shasta salamander				P	P	X		X	X	X	X				
Roughskin newt	(PS)	(PS)	(PS)	P/S	P/S		X	X			X	X			
Tailed frog	S	S	P/S	P/S	P/S		X	X		X	X				
16 amphibian species															
Reptiles															
0 reptile species															

* = special habitat features required

Appendix 5-D
Terrestrial Vertebrates (“Short List”) - Amphibians and Reptiles (continued)

Species	Dispersal capability			Lehmkuhl vulner. risk rating	Brown versatll. rating	Migratory or resident (m or r)	Strong riparian assoc.?
	~ <60 ac Stand	~ <1.5K ac Landscape	across provinces Range				
Amphibians							
Oregon Slender salamander	X			28	20	R	
Larch Mt. salamander	X			28	10	R	
Siskiyou Mt. salamander	X			28	16	R	
Del Norte salamander	X				16	R	
Van Dyke's salamander	X			28	18	R	X
Dunn's salamander	X*			24	14	R	X
Black salamander	X				18	R	X
California slender salamander	X				26	R	
Clouded salamander	X			30	22	R	
Pacific giant salamander	X			29	17	R	X
Cope's giant salamander	X					R	X
Olympic salamander	X			28	13	R	X
Northwestern salamander	X			23	19	R	X
Shasta salamander	X					R	X
Roughskin newt	X			23	19	R	X
Tailed frog	X			24	14	R	X
16 amphibian species							
Reptiles							
0 reptile species							

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Amphibians and Reptiles (continued)

Species	Presence													
	By state			By physiographic province (from Draft Recovery Plan)										
	WA	OR	CA	Washington				Oregon			California			
			OLPE	WACA	WACAE	WA Lowln	ORCAW	ORCAL	OCOR	OR KLAM	CA KLAM	CA Cas	CA Coast	
Amphibians														
Oregon Slender salamander		X						X	X					
Larch Mt. salamander	X	X			X			X	X					
Siskiyou Mt. salamander		X	X								X	X		
Del Norte salamander		X	X								X	X		X
Van Dyke's salamander	X			X	X	X	X							
Dunn's salamander	X	X	X				X	X	X	X	X			X
Back salamander	*	X	X								X	X	X	X
California slender salamander		X	X								X			X
Clubbed salamander		X	X					X	X	X	X	X		X
Pacific giant salamander	X	X	X		X	X	X	X	X	X	X	X	X	X
Cope's giant salamander	X	X		X	X	X	X	X	X	X				
Olympic salamander	X	X	X	X	X	X	X	X	X	X	X	X		X
Northwestern salamander	X	X	X	X	X	X	X	X	X	X	X	X		X
Shasta salamander			X											X
Roughskin newt	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tailed frog	X	X	X	X	X	X		X	X	X	X	X	X	X
16 amphibian species														
Reptiles														
0 reptile species														

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Amphibians and Reptiles (continued)

Species	Degree of endemism			General abundance within NSO range	Population trend w/in NSO range			References
	Broad	Local	Restricted		Increasing	Stable	Decreasing	
Amphibians								
Oregon Slender salamander								
Larch Mt. salamander								
Siskiyou Mt. salamander		X		C			** X	2,3a,21-9
Del Norte salamander		*	X	S			** X	2,3a,21-9
Van Dyke's salamander			X	C			** X	2,3a,21-2,21-9
Dunn's salamander		X		S			** X	2,21-2,21-9
Black salamander	X	(x popn.)		C			** X	2,3a,21-9
California slender salamander		X		C			** X	2,3a,21-9
Clouded salamander	X			C			** X	2,21-9
Pacific giant salamander	X			C		X		2,21-9
Cope's giant salamander	X			C			** X	2,3a,14b,21-2,21-9
Olympic salamander	X			C?			** X	2,3a,21-2,21-9
Northwestern salamander		X		S			** X	21-9
Shasta salamander	X			C			** X	2,3a,21-2,21-9
Roughskin newt		X		C		X		2,3a,21-2,21-9
Tailed frog			X	S			** X	21-2
16 amphibian species	X			C			** X	2,3a,3b,21-2,21-9
Reptiles								
0 reptile species	X			S			** X	2,3a,21-2,21-9

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Amphibians and Reptiles (continued)

Species	Comments
Amphibians	
Oregon Slender salamander	
Larch Mt. salamander	
Siskiyou Mt. salamander	
Del Norte salamander	
Van Dyke's salamander	Disjunct pops in w. WA and so. ID
Dunn's salamander	rocks, streams, waterfalls (Beatty and Blaustein 1992)
Black salamander	
California slender salamander	
Clouded salamander	
Pacific giant salamander	
Cope's giant salamander	
Olympic salamander	
Northwestern salamander	
Shasta salamander	uses limestone areas
Roughskin newt	OG associate in WA only (Ruggiero et al. 1991)
Tailed frog	

16 amphibian species

Reptiles

0 reptile species

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Birds Part 1

P=Primary; S=Secondary
 / = most/few use; () = equal use; * = spec. hab. req.
 young
 Canopy: growth
 <=25% w/ classic
 legacies old growth

Species	Breeding, foraging, and resting habitat									Microhabitat				
	Successional stages					Old growth stand structural stages				Talus	Logs	Duff/litt	Lg snags	Lg tree
	Young	Mid	Late successional	Mature	Old growth	Sparse	Comp	Class	OG					
Marbled murrelet			S	S	P				X					X
Barrow's goldeneye				P	P				X				X	
Bufflehead				P	P				X				X	
Wood duck				P	P				X		X		X	
Hooded merganser				P	P				X				X	
Common merganser				P	P				X				X	X
Harlequin duck			P	P	P									
Northern goshawk			S	P/S	P/S	X			X					X
Bald eagle	S			S	(PS)	X			X				X	X
Barred owl			S	(PS)	(PS)	X			X				X	
Northern pygmy owl	S	S	S	P/S	P/S	X			X				X	
Northern spotted owl			S	S	P/S	X			X				X	X
Flammulated owl	P	P		P	P	X	X		X				X	
Great gray owl				P	P				X				X	X
Vaux's swift	P	P	S	S	P/S	X	X		X				X	X
Pileated woodpecker	S		S	S	P/S	X			X		X		X	X
Hairy woodpecker			S	S	P/S	X			X		X		X	
White-headed woodpecker			S	S	S/P				X				X	
Black-backed woodpecker			S	S/P	(PS)	X			X				X	
Three-toed woodpecker			S	(SP)	P/S	X			X		X		X	
Red-breasted sapsucker			S	S	S	X							X	

Appendix 5-D

Terrestrial Vertebrates ("Short List") - Birds Part I (continued)

Species	Dispersal capability			Lehmkuhl vulner. risk rating	Brown versatil. rating	Migratory or resident (m or r)	Strong riparian assoc.?
	~ <60 ac	~ <1-5K ac	across provinces				
	Stand	Landscape	Range				

BIRDS

Marbled murrelet				24	6	R/D	X
Barrow's goldeneye				27	9	M/D/R	X
Bufflehead				27	9	M/R	X
Wood duck				27	25	M/R	X
Hooded merganser				27	12	D/M/R	X
Common merganser				27	9	D	X
Harlequin duck					6	M	X
Northern goshawk				26	19	E	
Bald eagle					19	D/R	X
Barred owl					21	R	
Northern pygmy-owl					36	R	
Northern spotted owl				26	12	R	
Flammulated owl						M	
Great gray owl						R	
Vaux's swift				27	34	M	
Pileated woodpecker				27	27	R	
Hairy woodpecker				22	22	R	
White-headed woodpecker					12	E/R	
Black-backed woodpecker					16	R	
Three-toed woodpecker					15	D/M	
Red-breasted sapsucker			X	26	26	D/R	

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Birds Part 1 (continued)

Species	Presence													
	By state			By physiographic province (from Draft Recovery Plan)										
	WA	OR	CA	Washington			Oregon				California			
			OLFE	WACA	WACAE	WA Lowin	ORCAW	ORCAE	OCOR	OR KLAM	CA KLAM	CA Ccs	CA Coast	
BIRDS														
Marbled murrelet	X	X	X	X	X	X	X			X	X	X		X
Barrow's goldeneye	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bufflehead	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wood duck	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hooded merganser	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Common merganser	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Harlequin duck	X	X	X	X	X	X	X	X	X	X	X			X
Northern goshawk	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bald eagle	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Barred owl	X	X		?	X	X	X	X	X					
Northern pygmy owl		X	X	X	X	X	X	X	X	X	X	X	X	X
Northern spotted owl	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fammulated owl	X	X	X			X		X	X		?	X	X	X
Great gray owl		X						X	X		X			
Vaux's swift	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pileated woodpecker	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hairy woodpecker	X	X	X	X	X	X	X	X	X	X	X	X	X	X
White-headed woodpecker	X	X	X			X		X	X		X	X	X	X
Black-backed woodpecker	X	X	X		X	X		X	X		X	X	X	X
Three-toed woodpecker	X	X			X			X						
Red-breasted sapsucker	X	X	X	X	X		X	X	X	X	X	X	X	X

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Birds Part 1 (continued)

Species	Degree of endemism			General abundance within NSO range	Population trend w/in NSO range			References
	Broad	Local	Restricted		Increasing	Stable	Decreasing	

BIRDS

Marbled murrelet	X			S			X	2,3,5,7,9,16a,16b,21-10,21-12
Barrow's goldeneye	X			S			X	2,3,5,16a,16b,21-8,21-12
Bufflehead	X			C			?	2,3,5,9,16a,16b,21-8,21-12
Wood duck	X			C			?	2,3,5,16a,16b,21-8,21-12
Hooded merganser	X			S				2,3,5,16a,16b,21-8,21-12
Common merganser	X			C				2,3,16a,16b,21-8,21-12
Harlequin duck	X			S			X	1,2,5,7,9,16a,16b,21-8,21-12
Northern goshawk	X	X (OLY)		S			X	2,3,6,9,16a,16b,21-8,21-12
Bald eagle	X			S		?		1,2,7,16a,16b,21-1,21-6,21-8,21-12
Barn owl	X			C	X			2,16a,16b,12-8,21-12
Northern pygmy-owl	X			C				2,4,5,9,16a,16b,21-8,21-12
Northern spotted owl	X	X		S			X	2,3,5,16a,16b
Flammulated owl	X			C	Sharp - insufficient data			5,7,9,16a,16b,21-1,21-6,21-12
Great gray owl	X			S			X	5,9,16a,16b,21-1,21-4,2
Vaux's swift	X			C		X		2,3,4,7,16a,16b,13,21-6,21-8,21-12
Pileated woodpecker	X			S			X	2,3,4,5,7,9,14b,16a,16b,21-1,21-6,21
Hairy woodpecker	X			C			X	2,3,4,14b,16a,16b,21-1,21-8,21-12
White-headed woodpecker	X			S				2,7,9,16a,16b,21-1,21-8,21-12
Black-backed woodpecker	X			S			?	2,9,16a,16b,21-1,21-8,21-12
Three-toed woodpecker	X			S				2,9,16a,16b,21-8
Red-breasted sapsucker	X			C			X	1,2,3a,4,5,14b,16b,21-8,21-12

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Birds Part 1 (continued)

Species	Comments
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BIRDS	
Marbled murrelet	
Barrow's goldeneye	
Bufflehead	
Wood duck	
Hooded merganser	
Common merganser	
Harlequin duck	
Northern goshawk	
Bald eagle	
Barred owl	
Northern pygmy-owl	
Northern spotted owl	
Flammulated owl	
Great gray owl	
Vaux's swift	
Pileated woodpecker	
Hairy woodpecker	
White-headed woodpecker	
Black-backed woodpecker	
Three-toed woodpecker	
Red-breasted sapsucker	

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Birds Part 2

young
Canopy: growth
<=25% w/ classic
legacies old growth

P=Primary, S=Secondary
/ = most/less use; () = equal use; * = spec. hab. req.

Species	Breeding, foraging, and resting habitat								Microhabitat				
	Successional stages					Old growth stand structural stages			Talus	Logs	Duff/lit	Lg snags	Lg tree
	Young	Mid	Late successional	Old growth		Sparse	Comp	Class. OG					
Grass/forb	Shrub/sap	Pole	Mature	Old growth	Sparse	Comp	Class. OG	Talus	Logs	Duff/lit	Lg snags	Lg tree	
Williamson's sapsucker			S	S	S	X						X	
Northern flicker	P	S	S	P/S	P/S	X		X		X		X	
Western flycatcher				S	P	X		X					
Hammond's flycatcher			S	(PS)	P			X					X
Chestnut-backed chickadee		S	P	P	P	X	X	X				X	
Brown creeper			S	P/S*	P/S*	X		X				X	
Red-breasted nuthatch			S	P	P	X		X		X		X	
White breasted nuthatch		S	S	P	P	X		X				X	X
Pygmy nuthatch			S	P	P	X		X				X	
Winter wren		P	S	P	P		X	X		X			
Golden-crowned kinglet		S	P/S	P/S	P	X							
Hermit thrush		P	(PS)	P	P/S*	X							
Varied thrush		P	S	P/S*	P/S*	X							
Hermit warbler			P/S	P/S	P/S	X							
Wilson's warbler		P	S	S/P	S/P								
Warbling vireo		S/P	S/P	S	P	X							
Red crossbill			S	P/S	P/S	X							

38 bird species

S* = secondary use in subalpine and lodgepole veg types only

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Birds Part 2 (continued)

Species	Dispersal capability			Lehmkuhl vulner. risk rating	Brown versatil. rating	Migratory or resident (m or r)	Strong riparian assoc.?
	< 500 ac		across < 1.5K ac provinces				
	Stand	Landscape	Range				
Williamson's sapsucker			X		15	D/M	
Northern flicker			X	24	33	R	
Western flycatcher			X		24	M	
Hammond's flycatcher			X	25	26	M	
Chestnut-backed chickadee			X	13	28	R	
Brown creeper			X	19	29	R	
Red-breasted nuthatch			X	19	24	R	
White breasted nuthatch			X		17	R	
Pygmy nuthatch			X		8	R	
Winter wren			X	14	27	D	
Golden-crowned kinglet			X	16	27	R	
Hermit thrush			X	23	30	D/E	
Varied thrush			X	20	28	D/E	
Hermit warbler			X	18	25	M	
Wilson's warbler			X	24	33	M	
Warbling vireo			X		26	M	
Red crossbill			X	23	23	R	

38 bird species

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Birds Part 2 (continued)

Species	Presence													
	By state			By physiographic province (from Draft Recovery Plan)										
				Washington				Oregon				California		
	WA	OR	CA	OLPE	WACA	WACAE	WA LowIn	ORCAW	ORCAE	OCOR	OR KLAM	CA KLAM	CA Cas	CA Coast
Willamson's sapsucker	X	X	X			X			X		X	X	X	
Northern flicker	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Western flycatcher	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hammond's flycatcher	X	X	X	X	X	X	X	X	X			X	X	
Chestnut-backed chickadee	X	X	X	X	X	X	X	X		X	X	X	X	X
Brown creeper	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red-breasted nuthatch	X	X	X	X	X	X	X	X	X	X	X	X	X	X
White breasted nuthatch	X	X	X		X	X	X	X	X	X	X	X	X	X
Pygmy nuthatch	X	X	X			X			X			X	X	X
Winter wren	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Golden-crowned kinglet	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hermit thrush	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Varied thrush	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hermit warbler	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wilson's warbler	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Warbling vireo	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red crossbill	X	X	X	X	X	X	X	X	X	X	X	X	X	X

36 bird species

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Birds Part 2 (continued)

Species	Degree of endemism			General abundance within NSO range	Population trend w/in NSO range			References
	Broad	Local	Restricted		Increasing	Stable	Decreasing	
Williamson's sapsucker	X			C		X		2,5,13,21-1,21-8,21-12
Northern flicker	X			C			X	2,3a,3b,4,5,14b,16a,21-8,21-12
Western flycatcher	X			C			X	1,2,4,5,14b,16b,21-8,21-12
Hammond's flycatcher	X			C			X	1,2,3a,4,5,13,14b,21-8,21-12
Chestnut-backed chickadee	X			C			X	1,2,3a,3b,4,5,14b,16a,21-8,21-12
Brown creeper	X			C			X	1,2,3a,4,5,14b,16a,21-8,21-12
Red-breasted nuthatch	X			C			X	1,2,3a,4,5,14b,16a,21-8,21-12
White-breasted nuthatch	X			C			X	2,3b,4,5,14b,16a,21-8,21-12
Pygmy nuthatch	X			C				2,5,16a,21-8,21-12
Winter wren	X			C			X	1,2,3a,4,5,14b,16a,21-8,21-12
Golden-crowned kinglet	X			C			X	2,3a,3b,4,5,14b,16a,21-8,21-12
Hermit thrush	X			C			X	1,2,3a,4,5,13,14b,21-8,21-12
Varied thrush	X			C				2,3a,3b,4,5,16b,21-8,21-12
Hermit warbler	X			C			X	1,2,3a,4,5,14b,21-8,21-12
Wilson's warbler	X			C		X		1,2,3a,4,5,13,14a,21-8,21-12
Warbling vireo	X			C			X	1,2,4,5,13,14b,16a,21-8,21-12
Red crossbill	X			C			X	2,3a,3b,4,5,14b,16a,21-8,21-12

38 bird species

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Birds Part 2 (continued)

Species	Comments
Williamson's sapsucker	
Northern flicker	assoc'd w/ open forests
Western flycatcher	incr. assoc'n with stand age (Marcot 1985)
Hammond's flycatcher	
Chestnut-backed chickadee	incr. assoc'n with stand age (Marcot 1985)
Brown creeper	
Red-breasted nuthatch	+/- equal use pole & med sawt stages (Marcot 1985)
White breasted nuthatch	
Pygmy nuthatch	
Winter wren	shifts to late shrub stage in fall (Marcot 1985)
Golden-crowned kinglet	
Hermit thrush	
Varied thrush	
Hermit warbler	
Wilson's warbler	
Warbling vireo	
Red crossbill	

38 bird species

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Mammals Part 1

young
 Canopy: growth
 <=25% w/ classic
 legacies old growth

P=Primary; S=Secondary
 / = most/less use; [] = equal use; * = spec. hab. req.

Species	Breeding, foraging, and resting habitat										Microhabitat				
	Successional stages					Old growth stand structural stages					Talus	Logs	Duff/str	Lg snags	Lg tree
	Young	Mid	Late successional	Old growth		Sparse	Comp	Class. OG							
Grass/forb	Shrub/sap	Pole	Mature	Old growth											
Marten			S	P	P			X			X			X	X
Fisher			S	P	P	X		X	X	X	X			X	X
Dusky-footed woodrat		P	P	P	P	X	X	X		X	X		X		
Northern flying squirrel			S	P	P	X		X		X				X	X
Douglas squirrel		P	P	P	P	X	X	X		X				X	X
Townsend's chipmunk	S	S	P/S	P/S	P/S			X	X	X	X				
Red tree vole (P. longicaudus)			(PS)	S/P	S/P	X	X	X						X	X
Red tree vole (P. pomio)														X	X
Western red-backed vole			P	P	P	X	X	X		X	X	X			
Southern red-backed vole			P	P	P			X	X	X	X				
Forest deer mouse				P	P			X	X		X	X	X	X	
Deer mouse	S	P	(PS)	S	S	X	X				X	X	X	X	
Pacific shrew	S	P/S	S	S	S	X	X				X	X	X		
Shrew-mole	S	S	S/P	P/S	S/P			X	X		X	X	X		
Big brown bat	P/S		S	S/P	P/S	X		X						X	
Silver-haired bat	P		P	S/P	P/S	X	X	X							X
Hoary bat		P	P	P/S	P/S	X	X	X							X
Long-legged myotis	S	P	S/P	P/S	P/S			X	X					X	
Yuma myotis	P	P	S/P	P	P			X	X					X	
California myotis	P/S	S/P	P	P/S	S/P	X	X	X		X				X	X
Kean's myotis	P/S	P/S	S	S/P	S/P			X	X					X	

Appendix 5-D

Terrestrial Vertebrates ("Short List") - Mammals Part 1 (continued)

Species	Dispersal capability			Lehmkuhl vulner. risk rating	Brown versatil. rating	Migratory or resident (m or r)	Strong riparian assoc.?
	~<60 ac Stand	~<1-5K ac Landscape	across provinces Range				
MAMMALS							
Marten			X	26	23	R	X
Fisher			X	26	23	R	
Dusky-footed woodrat		?			28		?(rec plan)
Northern flying squirrel		?		28	26	R	
Douglas squirrel		?		28	26	R	
Townsend's chipmunk	X				32	R	
Red tree vole (<i>P. longicaudus</i>)	X			28	14	R	
Red tree vole (<i>P. pomo</i>)	X						
Western red-backed vole	X			21	16	R	
Southern red-backed vole	X			18	19	R	
Forest deer mouse	X			27		R	
Deer mouse	X				42	R	
Pacific shrew	X			28	28	R	X
Shrew-mole	X			226	34	R	X
Big brown bat			?	25	33	R	X
Silver-haired bat			?	25	28	M/R	
Hoary bat			?		25	M	X
Long-legged myotis			?	25	32	M/R	X
Yuma myotis			?	25	30	?	Feeding
California myotis			?	25	27	R	
Keen's myotis		?		25	21	?	Feeding

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Mammals Part 1 (continued)

Species	Presence													
	By state			By physiographic province (from Draft Recovery Plan)										
	WA	OR	CA	Washington			Oregon				California			
			OLPE	WACA	WACAE	WA Lowln	ORCAW	ORCAE	OCOR	OR KLAM	CA KLAM	CA Cas	CA Coast	
MAMMALS														
Marten	X	X	X	X	X	X	X	X	X	X	X	X		
Fisher	X	X	X	X	X	X		X	X	X	X	X		X
Dusky-footed woodrat		X	X					X		X	X	X	X	X
Northern flying squirrel	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Douglas squirrel	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Townsend's chipmunk	X	X		X	X	X	X	X	X	X	X			
Red tree vole (<i>P. longicaudus</i>)		X						X	X	X	X			
Red tree vole (<i>P. pomio</i>)			X								X		X	
Western red-backed vole		X	X					X	X	X	X	X	X	
Southern red-backed vole	X			X	X	X	X							
Forest deer mouse	X			X	X	X	X							
Deer mouse	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pacific shrew		X	X							X	X	X	X	X
Shrew-mole	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Big brown bat	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Silver-haired bat	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hoary bat	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Long-legged myotis	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yuma myotis	X	X	X	X	X	X	X	X	X	X	X	X	X	X
California myotis	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Keen's myotis	X			X			X							

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Mammals Part 1 (continued)

Species	Degree of endemism			General abundance	Population trend w/in NSO range			References
	Broad	Local	Restricted		Increasing	Stable	Decreasing	
MAMMALS								
Marten	X			S			X	1,2,3a,5,21-1,21-11
Fisher	X			S			X	2,3a,5,21-1,21-11
Dusky-footed woodrat	X			C				1,2,3a,5,21-3,21-4,21-11
Northern flying squirrel	X			C				1,2,3a,5,21-3,21-11
Douglas squirrel	X			C				2,3a,5,21-3,21-5,21-11
Townsend's chipmunk		X		C				1,2,3a,5,21-4,21-5,21-11
Red tree vole (<i>P. longicaudus</i>)		X		S				1,2,3a,5,11a,21-4
Red tree vole (<i>P. poro</i>)	X							1,2,5,21-11
Western red-backed vole		X		C				1,2,3a,5,19,21-4,21-11
Southern red-backed vole		X						1,2,3a,5,21-5
Forest deer mouse	X							1,2,3a,3b,21-5
Deer mouse	X			C				2,3a,5,21-3,21-5,21-11
Pacific shrew	X			C				2,3a,5,21-4,21-11
Shrew-mole	X							1,2,3a,5,21-3,21-5,21-11
Big brown bat	X			C				2,3a,5,21-3,21-11
Silver-haired bat	X							2,5,11c,21-3,21-5,21-11
Hoary bat	X			C				2,5,21-3,21-11
Long-legged myotis	X			C				2,3a,5,21-3,21-5,21-11
Yuma myotis	X			C				2,3a,5,19,21-3,21-11
California myotis	X			C				1,2,3a,5,19,21-3,21-11
Koenig's myotis		X						2,3a,21-5

Appendix 5-D
Terrestrial Vertebrates ("Short List") - Mammals Part 1 (continued)

Species	Comments
MAMMALS	
Marten	
Fisher	
Dusky-footed woodrat	
Northern flying squirrel	
Douglas squirrel	
Townsend's chipmunk	
Red tree vole (<i>P. longicaudus</i>)	
Red tree vole (<i>P. pomio</i>)	little data available on habitat needs
Western red-backed vole	
Southern red-backed vole	
Forest deer mouse	
Deer mouse	
Pacific shrew	
Shrew-mole	
Big brown bat	
Silver-haired bat	
Hoary bat	
Long-legged myotis	
Yuma myotis	
California myotis	
Keen's myotis	

Appendix 5-D
 Terrestrial Vertebrates ("Short List") - Mammals Part 2

P=Primary; S=Secondary
 / = most/less use; () = equal use; * = spec. hab. req.
 young canopy growth <=25% w/ classic legacies old growth

Species	Breeding, foraging, and resting habitat									Microhabitat				
	Successional stages					Old growth stand structural stages								
	Young	Mid	Late successional	Old growth		Spars	Comp	Class	OG	Talus	Logs	Duff/litt	Lg snag	Lg tree
Long-eared myotis		S	S/P	(P/S)	P/S	Feeding	X	X				X	X	
Fringed myotis	P	P	S	S	S	Feeding						X		
Little brown myotis	P	P	S/P	(P/S)	P/S	X	X	X		X		X		
Lynx	P	P	P/S	P/S	P/S									
Elk	P/S	P/S	P/S	(P/S)	(P/S)	X								

26 mammal species

across
 ~ <60 ac ~ <1.5K ac provinces

Species	Dispersal capability			Lehmkuhl vulner. risk rating	Brown versatil. rating	Migratory or resident (m or r)	Strong riparian assoc.?
	Stand	Landscape	Range				
Long-eared myotis			?	25	30	R	Feeding
Fringed myotis			?	25	30	?	Feeding
Little brown myotis			?	25	34	R	Feeding
Lynx			X		21	R	
Elk			X	28	32	M	

26 mammal species

Appendix 5-D

Terrestrial Vertebrates ("Short List") - Mammals Part 2 (continued)

Species	Presence														
	By state			By physiographic province (from Draft Recovery Plan)											
	WA	OR	CA	Washington			Oregon			California					
			OLPE	WACA	WACAE	WA LowIn	ORCAW	ORCAE	OCOR	OR KLAM	CA KLAM	CA Cas	CA Coast		
Long-eared myotis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Fringed myotis	X	X	X		X	X		X	X	X	X	X	X	X	
Little brown myotis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Lynx	X					X									
Elk	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

26 mammal species

not
really
endemic
to the
range
of the
NSO

la
endemic
to the
range
of the
NSO

very
tiny
range

qualit. rank
S = scarce
everywhere
C = common
somewhere

General abundance

Species	Degree of endemism			General abundance within NSO range	Population trend w/in NSO range			References
	Broad	Local	Restricted		Increasing	Stable	Decreasing	
Long-eared myotis	X			S				2,3a,5,19,21-3,21-5,21-11
Fringed myotis	X			C				2,3a,5,21-3,21-5,21-11
Little brown myotis	X			C				2,3a,5,21-3,21-11
Lynx	X			S				2,20,21-6
Elk	X			C				2,3a,21-4,21-6,21-11

26 mammal species

Appendix 5-D

Terrestrial Vertebrates ("Short List") - Mammals Part 2 (continued)

Species	Comments
Long-eared myotis	
Fringed myotis	
Little brown myotis	
Lynx	
Elk	

26 mammal species

Appendix 5-D
Attributes of Terrestrial Vertebrates

Key to Information on Habitat Attributes Database

Breeding, Resting, and Foraging Habitat

Successional stages - Reference 2 was the primary source of information. Information on various species was also provided by 3b, 7, 8, 9, 11a, 11b, 11c and 20.

Only vegetative communities used by northern spotted owls were assessed for use by each species for breeding, resting, and foraging. Those vegetative communities include: conifer hardwood, mixed conifer forest (southwest Oregon), temperate conifer forest, high temperate coniferous forest, subalpine forest parks and lodgepole pine (Cascades). Subalpine forest and lodgepole are only considered as dispersal habitat for northern spotted owls. Within this section the following codes denote the combined use of vegetative communities and successional stages for breeding, resting, and foraging of species.

P = Primary use of the successional stage for breeding, resting, and foraging by the species.

S = Secondary use of the successional stage for breeding, resting, and foraging by the species.

P/S = A combination of primary and secondary use of the successional stage, with disproportionately more primary use than secondary use by the species.

S/P = A combination of primary and secondary use of the successional stage, with disproportionately more secondary use than primary use by the species.

(PS) = A combination of primary and secondary use of the successional stage, with approximately half the use being primary and half being secondary by the species.

Young - Grass/forb = shrubs less than 40 percent crown cover and less than 5 feet tall; unit may range from mainly devoid of vegetation to dominance by herbaceous species (grasses and forbs); tree regeneration generally less than 5 feet tall and 40 percent crown cover.

Young - Shrub/sap = Shrubs greater than 40 percent crown canopy; average stand diameter greater than 1 inch dbh and tree canopy closure less than 60 percent; saplings are 1 to 4 inches dbh; poles 4 to 9 inches dbh.

Pole = Average stand diameters between 1 and 21 inches dbh and crown cover exceeding 60 percent.

Appendix 5-D Attributes of Terrestrial Vertebrates

Key to Information on Habitat Attributes Database (continued)

Late successional - Mature = Stand with average diameters exceeding 21 inches in dbh; crown cover may be less than 100 percent, decay and decadence required for old growth may be lacking, and dead and down material required by old growth is lacking.

Late successional - Old growth = Stands over 200 years old with at least two tree layers (overstory and understory), decay in living trees, snags, and down woody material. Some of the overstory layer may be composed of long-lived successional species (that is, Douglas-fir, western redcedar).

Stand structure - Reference 5 computer database was the primary source document for sparse structure types. Components and Classic OG were calculated from other attribute columns as explained below.

Sparse = An "X" denotes that the species' use of habitatypes with sparse canopy closure (less than 25 percent) was Moderate to High.

Components = primarily young growth with legacy components of older successional stages (i.e., down logs, large trees and snags). An "X" in this column denotes the primary use of shrub/sap or pole successional stages and the use of at least one of the four microhabitat components listed below (down logs, duff/litter, large snags, large trees).

Classic OG = classic old-growth forest with multistory and multispecies stands and a high decadence component. An "X" in this column denotes the primary use of old growth successional stage and the use of at least one of the four microhabitat components listed below.

Dispersal habitat = No primary information source documents were identified. This column is a description of habitat used by species for juvenile dispersal from natal areas, and adult dispersal from occupied habitats.

Microhabitat - References used were 2, 5, 7, 8, 9, and 19. Other sources included 11a, 11b, 11c and 20. An "X" denotes a close association (primary use) by the species with the specified habitat component (**talus, down logs, duff/litter, large snags, and large trees**).

Dispersal capability - No primary source documents were identified. An "X" in one of the following columns denotes the capability of juveniles and adults to disperse from natal and occupied habitat.

Stand = species will generally disperse in less than about a 60 acre area.

Landscape = species will generally disperse within approximately 60 acres to 5000 acres (subwatershed).

Appendix 5-D Attributes of Terrestrial Vertebrates

Key to Information on Habitat Attributes Database (continued)

Range = species has the capability to disperse across physiographic province boundaries.

Lehmkuhl vulnerability rating - Reference 3a was used. The rating is a risk rating of local extinction of species. The higher the rating value the higher the risk of local extinction. Risk score = 3 * (frequency + abundance) + 2 * (body size + vagility) + migratory status + variance in abundance. Scores for frequency, abundance and variation were assessed from data presented by Lehmkuhl and others. Total risk was calculated as the weighted sum.

Brown versatility rating - Reference 2. The rating is the sum of the number of plant communities and successional stages used for breeding plus the number of plants communities and successional stages used for feeding by a species. The higher the rating the higher the versatility of the species to use different vegetation communities.

Migratory Status - References 4, 11c, 16a, and 16b were used. Below are codes used to denote migratory status. More than one code was used for species which are known or suspected to have mixed migratory habits.

R = yearlong residents and nomads

M = latitudinal migrants including neotropical, lower-latitude nearctic, and high latitude nearctic migrants

D = displacement migrants

E = elevational migrants including seasonal downslope and upslope movements

Riparian Assoc. - References 1, 2, and 7 were used. An "X" denotes a strong riparian association for that species.

State and Physiographic province - Individual species range maps, which were derived from references 21-1 through 21-12 were used. An "X" denotes presence of the species in the state or province.

Degree of endemism - References 1, 3b, 16a, 16b, 16c and 18 along with individual species range maps, which were derived from reference 21-1 through 21-12, were used. An "X" in one of the following columns denotes the geographic range of the species as it relates to the range of the northern spotted owl.

Broad = geographic range extends beyond the range of the northern spotted owl (that is, not strictly endemic within the owl's range).

Local = geographic range does not extend beyond the range of the northern spotted owl but is fairly broad throughout at least one physiographic province therein.

Appendix 5-D Attributes of Terrestrial Vertebrates

Key to Information on Habitat Attributes Database (continued)

Restricted = geographic range is restricted to a small portion of the northern spotted owls' range, that is, occurs within a small portion of one or only a few physiographic provinces therein,

General abundance - References 13, 16a, 16b were used. Codes denote the general abundance of species throughout the range of the northern spotted owl.

S = scarce everywhere within the range of the northern spotted owl.

C = common in at least some areas within the range of the northern spotted owl.

Population trend - References 7, 9, 13, 14a, and 14b were used. Population trend of amphibians was based on trend in their preferred (macro)habitat.

References - References for information summarized in this data table are coded as listed below.

- 1 USDI. 1992. Recovery plan for the northern spotted owl - draft, appendix D. Portland, OR: U.S. Department of the Interior. 662 p.
- 2 Brown, E.R., tech. ed. 1985. Management of wildlife and fish habitats in forests of western Oregon and Washington. Portland, OR: USDA Forest Service, Pacific Northwest Region. Vol 2.
- 3a Lehmkuhl, J.F.; Ruggiero, L.F. 1991. Forest fragmentation in the Pacific Northwest and its Potential effects on wildlife. In: Wildlife and vegetation of unmanaged Douglas-fir forests. PNW-GTR-285. Portland, OR: USDA Forest Service, Pacific Northwest Region. 45-46 p.
- 3b Ruggiero, L.F. 1991. Wildlife habitat relationships and viable populations. In: Wildlife and vegetation of unmanaged Douglas-fir forests. PNW-GTR-285. Portland, OR: USDA Forest Service, Pacific Northwest Region. 456-462 p.
- 4 Marcot, B.G. 1984. Habitat relationships of birds and young-growth Douglas-fir in northwestern California. 161 & 233-234 p. Ph.D. dissertation.
- 5 Zeiner, D.C.; Laudenslayer, W.R., Jr.; Mayer, K.E.; White, M., eds. 1988. California's wildlife. Sacramento, CA: California Department of Forestry and Fire Protection. 166 p. 3 additional vol. 1 computer disk.

Vol I, Amphibians and reptiles. 1988.

Vol II, Birds. 1990.

Vol III, Mammals. 1990.

California Department of Fish and Game Wildlife Habitat Relationship System computer database; species sort by specified habitats

Appendix 5-D
Attributes of Terrestrial Vertebrates

Key to Information on Habitat Attributes Database (continued)

- 7 Rodrick, E.; Milner R., tech. eds. 1991. Management recommendations for Washington's priority habitats and species. Olympia, WA: Washington Department of Wildlife. 206 p.
- 8 Beatty, J.J.; Blaustein, A.R.; Storm, R.M. 1992. A report to the northern spotted owl recovery team (subgroup addressing other species and older forest ecosystems, Robert G. Anthony, Chairperson): the biology of amphibians and reptiles. Corvallis, OR: Oregon State University. 86 p.
- 9 Marshall, D. 1992. Sensitive vertebrates of Oregon. Portland, OR: Oregon Department of Fish and Wildlife. 226 p.
- 11a Huff, M.H.; Holthausen, R.S.; Aubry, K.B. 1992. Habitat management for red tree voles in Douglas-fir forests. PNW-GTR-302. Portland, OR: USDA Forest Service, Pacific Northwest Region. 22 p.
- 11b Carey, A.B. 1991. The biology of arboreal rodents in Douglas-fir forests. PNW-GTR-276. Olympia, WA: USDA Forest Service, Pacific Northwest Region. 53 p.
- 11c Christy, R.E.; West, S.D. [In press]. Biology of bats in Douglas-fir forests. PNW-GTR. Portland, OR: USDA Forest Service, Pacific Northwest Region. 64 p.
- 13 Sharp, B.E. 1992. Neotropical migrants on National Forest in the Pacific Northwest: a compilation of existing information. Portland, OR: Ecological Perspectives. 847 p.
- 14a Raphael, M.G. 1988. Long-term trends in amphibians, reptiles, and mammals in Douglas-fir forests of northwestern California. Management of amphibians, reptiles, and small mammals in North America: Proceedings of a symposium; 1988 July 19-21; Flagstaff, AZ. GTR-RM-166. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 23-31 p.
- 14b Raphael, M.G.; Rosenburg, K.V.; Marcot, B.G. 1988. Large-scale changes in bird populations of Douglas-fir forests, northwestern California. In: Jackson J.A., ed. Bird conservation. Madison, WI: University of Wisconsin Press, Ltd. 63-83 p.
- 16a Robbins, C.S.; Bertel, B.; Zim, H.S. 1966. A guide to field identification: birds of North America. Racine, WI: Golden Press New York. 344 p.
- 16b National Geographic Society. 1983. Field guide to the birds of North America. Washington, DC: National Geographic Society. 465 p.

Appendix 5-D
Attributes of Terrestrial Vertebrates

Key to Information on Habitat Attributes Database (continued)

- 16c Ehrlich, P.R.; Dobkin, D.S.; Wheye, D. 1988. The birder's handbook: a field guide to the natural history of North America birds. New York, NY: Simon and Schuster, Fireside.
- 18 Ingles, L.G. 1976. Mammals of the Pacific states: California, Oregon, Washington. Stanford, CA: Stanford University Press. 520 p.
- 19 Verner, J.; Boss, A.S. tech. coords. 1980. California wildlife and their habitats: western Sierra Nevada. GTR-PSW-37. Berkeley, CA: USDA Forest Service, Pacific Southwest Forest and Range Experiment Station. 443 p.
- 20 Butts, T.W. 1992, Lynx (*Felix lynx*) biology and management. A literature review and annotated bibliography. Missoula, MT: USDA Forest Service, Northern Region. 268 p.

The following references were used to develop the individual species range maps:

- 21-1 Marshall, D.B. 1992. Threatened and sensitive wildlife of Oregon's forests and woodlands. Portland, OR: Audubon Society of Portland: 66 p.
- 21-2 Zeiner, D.C.; Laudenslayer, W.P., Jr.; Mayer, K.E., eds. 1988. California's wildlife. Vol. I - Amphibians and reptiles. Sacramento, CA: California Department of Fish and Game. 272 p.
- 21-3 Ingles, L.G. 1965. Mammals of the Pacific states: California, Oregon, and Washington. Stanford, CA: Stanford University Press. 506 p.
- 21-4 Maser, C.; Mate, B.R.; Franklin, J.F.; Dyrness, C.T. 1981. Natural history of Oregon Coast mammals. Gen. Tech. Rep. PNW-133. Portland, OR: USDA Forest Service.
- 21-5 Dalquest, W.W. 1948. Mammals of Washington. Vol. 2. Lawrence, KS: University of Kansas. 144 p.
- 21-6 Rodrick, E.; Milner, R., tech. eds. 1991. Management recommendations for Washington's priority habitats and species. Olympia, WA: Washington Department of Wildlife. 189 p.
- 21-7 Hall, E.R.; Kelson, K.R. 1959. The mammals of North America, Vol. II. New York, NY: The Ronald Press.
- 21-8 Peterson, R.T. 1990. A field guide to western birds. Third edition. Boston, MA: Houghton Mifflin Co. 432 p.

Appendix 5-D
Attributes of Terrestrial Vertebrates

Key to Information on Habitat Attributes Database (continued)

- 21-9* Leonard, W.; Brown, H.; Jones, L., [and others]. [In press]. Amphibians of Washington and Oregon. Seattle, WA: Audubon Society. 30 p.
- 21-10* USDI Fish and Wildlife Service. Data via Oregon State Center for GIS.
- 21-11* Zeiner, D.C.; Laudenslayer, W.F., Jr.; Mayer, K.E.; White M., eds. 1990. California's wildlife. Vol. III - Mammals. Sacramento, CA: California Department of Fish and Game. 407 p.
- 21-12* Zeiner, D.C.; Laudenslayer, W.F., Jr.; Mayer, K.E.; White M., eds. 1990. California's wildlife. Vol. II - Birds. Sacramento, CA: California Department of Fish and Game. 731 p.

The Scientific Analysis Team Report

List of Expert Viability Panel Participants

Appendix 5-E
List of Expert Viability Panel Participants

Nonvascular Plants

Robin Leshner	Panel Leader, Forest Service, Mt. Baker-Snoqualmie National Forest, Mountlake Terrace, Washington
Joseph Ammirati	University of Washington, Department of Biology, Seattle, Washington
John Cristy	Oregon Natural Heritage Program, Portland, Oregon
William Denison	Oregon State University, Department of Botany and Plant Pathology, Corvallis, Oregon
Daniel Norris	Oregon State University, Department of Botany and Plant Pathology, Corvallis, Oregon

Vascular Plants

Joan Ziegltrum	Panel leader, Forest Service, Olympic National Forest, Olympia, Washington
Kenneth Berg	California Department of Fish and Game, Sacramento, California
Bruce Bingham	Forest Service, Pacific Southwest Forest and Range Experiment Station, Redwood Sciences Laboratory, Arcata, California
Rex Crawford	Washington Natural Heritage Program, Olympia, Washington
Lisa McCrimmon	Forest Service, Siskiyou National Forest, Grants Pass, Oregon
David Peter	Forest Service, Mt. Baker-Snoqualmie National Forest, Mountlake Terrace, Washington
Steven Rust	Forest Service, Wenatchee National Forest, Wenatchee National Forest

Invertebrates

Review was contracted with: David Olson	The Xerces Society, Portland, Oregon
Ingrith Deyrup-Olsen	University of Washington, Department of Zoology, Seattle, Washington

Appendix 5-E
List of Expert Viability Panel Participants (continued)

Fish

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Appendix 5-E
List of Expert Viability Panel Participants (continued)

David Manuwal	University of Washington, College of Forest Resources, Seattle, Washington
David Marshall	Consultant, Portland, Oregon
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Kimberly Nelson	Oregon State University, Cooperative Research Unit, Department of Fish and Wildlife, Corvallis, Oregon

Mammals

Robert G. Anthony	Panel leader, Oregon State University, Cooperative Research Unit, Department of Fish and Wildlife, Corvallis, Oregon
Andrew Carey	Forest Service, Pacific Northwest Research Station, Forestry Sciences Laboratory, Olympia, Washington
Stephen Cross	Southern Oregon State College, Department of Biology, Ashland, Oregon
Fredrick F. Gilbert	University of Northern British Columbia, Dean of Natural Resources/Environmental Studies, Prince George, British Columbia
James Hallot	Washington State University, Department of Zoology, Pullman, Washington
Christine McGuire	Western Washington University, Huxely College, Bellingham, Washington
Cynthia Zabel	Forest Service, Pacific Southwest Forest and Range Experiment Station, Redwood Sciences Laboratory, Arcata, California