

4. CHAPTER FOUR - LIST OF PREPARERS

4.1 INTERDISCIPLINARY TEAM

The following individuals participated in the formulation and analysis of the alternatives and the subsequent preparation of this draft Environmental Impact Statement.

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A.S. Forest Management, Butler Community College, 1978
Forest Engineering Institute, Oregon State University, 1988
One year Fire Management experience Deschutes NF 1978
Nine years FS Timber Presale experience, Umpqua, Wenatchee, Ochoco NF 1979-1988
Eight years Forest Service Certified TS Administrator Ochoco, White Mtn NF 1989-1997.
Six years Forest Service Timber Sale Planning experience, 1997-present

4.1.2 RICK ABBOTT – CERTIFIED DISTRICT SILVICULTURIST/DISTRICT RESEARCH COORDINATOR

EMPLOYMENT HISTORY AND QUALIFICATIONS

B.S. Forest Management, Penn State University, 1978
Forest Engineering Institute, Oregon State University, Corvallis, Oregon, 1990
Five seasons USFS Presale, Fire, and Silvicultural experience
One year USFS presale experience
Three years Bureau of Indian Affairs timber sale administration experience
Ten years USFS timber sale planning experience
Four years USFS Silvicultural staff experience
Natural Resources Institute, Oregon State University, University of Washington, Washington State University, 1999-2000

4.1.3 JIM ARCHULETA - DISTRICT SOIL SCIENTIST

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B.S. Crop & Soil Science - 1997, Oregon State University, Corvallis OR.
A.S. Natural Resources - Haskell Indian Nations University, Lawrence KS.
Soil Scientist Trainee USDA 1994 - 1997, (NRCS-Franklin Co. KS 1 year, FS-Umpqua NF. three years).
District Soil Scientist, USDA Forest Service, Umpqua NF, 1997 - Present.

4.1.4 JEFF BOHLER – DISTRICT WILDLIFE BIOLOGIST

EMPLOYMENT HISTORY AND QUALIFICATIONS

B.S. Wildlife Management. University of Wisconsin-Stevens Point, 1984
Forestry Technician, Gunnison National Forest-Taylor River District, 1984
Wildlife Technician, Wisconsin Department of Natural Resources, 1985-1987
Fisheries Technician, Alabama Department of Game and Fish, 1987-1988
Biological Technician, Fremont National Forest-Silver Lake District, 1988
Wildlife Biologist, Malheur National Forest, Bear Valley & Long Creek Districts, 1988-1990
District Biologist, Colville National Forest-Kettle Falls District, 1990-1994
District Biologist, Arapaho-Roosevelt National Forest-Clear Creek District, 1994-1995
District Biologist, Colville National Forest-Republic District, 1995-1999
District Wildlife Biologist, Umpqua National Forest-Diamond Lake District, 1999-present

4.1.5 KEITH BOND – DISTRICT TRANSPORTATION DEVELOPMENT ENGINEER

EMPLOYMENT HISTORY AND QUALIFICATIONS

B.B.A. Finance and Business Economics, 1973, University of Oregon, Eugene
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4.1.6 BRADY DODD – PAST DISTRICT HYDROLOGIST

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B.S. Water Resources - State Univ. of New York at Brockport, 1992.
M.S. Forest Resources - Univ. of Idaho, 1995.
Hydrologist, USDA Forest Service, Clearwater National Forest 1995-1997.
Hydrologist, USDA Forest Service, Umpqua National Forest, 1997-1999.
Forest Hydrologist, Allegheny National Forest, 1999-present.

4.1.7 CLINT EMERSON-DISTRICT BOTANIST

EMPLOYMENT HISTORY AND QUALIFICATIONS

B.S. Botany/Plant Pathology Oregon State University, 1997
Two year experience District Botanist, Diamond Lake RD, 2000-present
One year experience Botanist Diamond Lake RD, 1999-2000
Two seasons Biological Technician (Plants) Tiller RD, 1997-1999
One year Botanical Consulting David Evans and Associates Inc, Portland, OR, 1998-1999

4.1.8 RICK GOLDEN – (PAST) DISTRICT FISHERIES BIOLOGIST

EMPLOYMENT HISTORY AND QUALIFICATIONS

B.S. Fisheries - Utah State University, 1987.
M.S. Pharmacy - Oregon State University, 1992.
Laboratory Technician, Utah Water Research Laboratory, 1985-1986.
Fishery Biologist, Nez Perce National Forest, 1992-1995.
Fishery Biologist, Diamond Lake Ranger District, Umpqua National Forest, 1995- 2001.
Forest Fisheries Biologist, Ouichita National Forest, 2001-present.

4.1.9 STEVE HOFFORD – FOREST HYDROLOGIST

EMPLOYMENT HISTORY AND QUALIFICATIONS

B.S. Watershed Science - Colorado State University, 1978
Hydrologic Technician, US Geological Survey, Denver Federal Center 1977-1978
Hydrologist, USDA Forest Service, Gifford Pinchott National Forest, 1978-1981
Hydrologist, USDA Forest Service, Umpqua National Forest, 1981-1992
Hydrologist, USDI Bureau of Land Management – Roseburg District Office, 1992-1994
Hydrologist, USDA Forest Service, Umpqua National Forest, 1994-present

4.1.10 RALPH KINGSBURY – (PAST) DISTRICT BOTANIST

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B.S. Botany, 1970, University of California, Davis, CA
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M.S. Forest Resources, 1989, University of Idaho, Moscow, ID
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Three years Forestry Technician experience, USFS
Eight years Forest Service botanist experience, USFS & NPS

4.1.11 MIKE KINNEY - DISTRICT ROAD MANAGER

EMPLOYMENT HISTORY AND QUALIFICATIONS

Wildlife Management, Colorado State, 1967
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Umpqua National Forest

4.1.12 ANGIE SNYDER - DISTRICT HERITAGE PROGRAM MANAGER

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4.1.13 ARTHUR MATTHEWS – (PAST) ASSISTANT DISTRICT TRANSPORTATION MANAGER

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A.S. forest technology, Umpqua community College, Roseburg, Oregon, 1969
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Five years of Silvicultural experience Champion International Corp., 1977-1981
Two years of Silvicultural experience Diamond Lake RD 1985-1987
Three years Pre-construction Engineering, Diamond Lake RD 1987-1990
Nine years Asst. District Transportation Manager, Diamond Lake RD 1990-2001
One year Forest Sign Coordinator, Umpqua National Forest 2001-present

4.1.14 JILL NAPPER – DISTRICT FUELS SPECIALIST

EMPLOYMENT HISTORY AND QUALIFICATIONS

A.S. Forest Technology, Lane Community College, 1985
Certificate of Completion of Technical Fire Management, Washington Institute and Colorado State University, 1992
A.A.S. Data Processing / Computer Programming, Lane Community college, 1988
Eighteen years of fire experience on the Umpqua National Forest

**5. CHAPTER FIVE - AGENCIES, ORGANIZATIONS, AND
PERSONS WHO PARTICIPATED DURING THE EIS SCOPING
PROCESS**

5.1. PARTICIPATING AGENCIES AND ORGANIZATIONS

Confederated Tribes of the Grand Ronde Community
Confederated Tribes of the Siletz
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Umpqua Watersheds - Francis Eatherington
Douglas County Board of Commissioners - Ron Yockim
Campaign Coordinator American Lands - Steve Holmer
Huffman & Wright - Hap Huffman
Scott Timber Co. - Mike Bermuth
DR Johnson Lumber Co. - Gerald Keck (Resource Manager)
Forest Conservation Council Southeastern Regional Office
Oregon Natural Resources Council - Doug Heiken (Western Oregon Field Representative)
Douglas Timber Operators, Inc.
Cascadia Wildlands Project - James Johnson
Friends of the Earth Northwest Office - Eric Espenhorst
John Muir Project - Chad Hanson (Executive Director)

5.2 PARTICIPATING MEMBERS OF THE PUBLIC

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Vanderford, Audrey
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Wilson, Bridget
Wilson, Jennifer
Wilson, Shannon
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Wisdom, Gerald & Robin
Witten, Steve
Worster, Beth
Young Seidemann, Jenny
Young Seidemann, Rick
Zukoski, Ted

6. CHAPTER SIX - REFERENCES**6.1 BOTANY REFERENCES**

Abrams, Leroy. 1923-1960. *Illustrated Flora of the Pacific States*, Vol. 1-4. Stanford University Press, Stanford, California.

Hitchcock, C. L., A. Cronquist, M. Ownbey, and J. W. Thompson. 1955-1969. *Vascular Plants of the Pacific Northwest*, Parts 1-5. University of Washington Press, Seattle, Washington.

Oregon Natural Heritage Program. 1998. *Rare, Threatened, and Endangered Plants and Animals of Oregon*. Oregon Natural Heritage Program, Portland, Oregon.

Peck, Morton E. 1934. *New Plants from Oregon*. *Proceedings of the Biological Society of Washington* 47:185.

Peck, Morton E. 1941. *A Manual of the Higher Plants of Oregon*. Binfords & Mort, Portland, Oregon.

USDA Forest Service. 1998. *Sensitive Plants of the Umpqua National Forest*. Pacific Northwest Region, Umpqua National Forest.

Wagner, David D. 1992. *Guide to the Species of Botrychium in Oregon*. USDA Forest Service Report. Mt. Hood National Forest. 50 pp.

Wagner, Warren H. Jr. and Florence S. 1990. *Notes on the Fan-leaflet Group of Moonworts in North America with descriptions of Two New Members*. *American Fern J.* 80(3): 73-81.

Burrill, Braunworth, William, Parker, Swan, Howard, Kidder. *Pacific Northwest Weed Control Handbook*. 1989. Extension Services of Oregon State Univ., Washington State Univ., and Univ. of Idaho.

Hickman, James C., Ed. 1993. *The Jepson Manual, Higher Plants of California*. University of California Press, Berkeley, California.

Hitchcock, C. L., and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press, Seattle, Washington.

USDA Forest Service, Forest Service Manual section 2081.03. 1995

USDA Forest Service, *A Guide to Conducting Vegetation Management in the Pacific Northwest*. 1989.

Whitson, Burrill, Dewey, Cudney, Nelson, Lee, Parker. 1996. *Weeds of the West*, Western Society of Weed Science.

- Arora, David. 1979,1986. *Mushrooms Demystified*. Ten Speed Press, Berkeley, California
- Hibler, Claire and O'dell, Thom. 1998. *Survey Protocols For Bridgeoporus nobilissimus (W.B Cooke) Volk, Burdsall and Ammirati*. USDA and USDI Publications. Corvallis, Oregon.
- Lawton, Elva. 1971, 1999. *Moss Flora of The Pacific Northwest*. Hattori Botanical Laboratory, Obi, Nichinan-shi, Miyazaki-ken, Japan.
- McCune, Bruce and Geiser, Linda. 1997. *Macrolichens of the Pacific Northwest*. Oregon State University Press and USDA Forest Service Publishing. Corvallis, Oregon.
- Schofield, Wilf. 1969, 1973, 1992. *Some Common Mosses of British Columbia*. Royal British Columbia Museum. Victoria, British Columbia, Canada.
- Smith, A.J.E.. 1991. *The Liverworts of Britain and Ireland*. Cambridge University Press. Cambridge, Great Britain.
- USDA-Forest Service and USDI-Bureau of Land Management. Jan. 2001. *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*.
- USDA and USDI. 1998. *Survey Protocols For Component 2 Lichens version 2*.
- USDA and USDI. 1999. *Survey Protocols For Protection Buffer Bryophytes version 2.0*
- Wagner, David and Christy, John. 1996. *Guide for the Identification of Rare, Threatened or Sensitive Bryophytes in the Range of the Northern Spotted Owl, Western Washington, Western Oregon, and Northwestern California*. USDI and USDA publication. Eugene, Oregon.
- Harper, K. A. and Macdonald, S. E.. 2001. *Structure and Composition of Riparian Boreal Forest: New Methods for Analyzing Edge Influence*. *Ecology*, 82(3) pp. 649-659.
- Chen, Jiquan; Franklin, Jerry F; Spies, Thomas. 1992. *Vegetation Responses to Edge Environments in Old-Growth Douglas-Fir Forests*. *Ecological Applications*, 2(4), pp. 387-396.
- Chen, Jiquan; Franklin, Jerry F; Spies, Thomas. 1993. *Contrasting microclimates among clearcut, edge, and interior of old-growth Douglas-fir forest*. *Agricultural and Forest Meteorology*, 63 pp. 219-237.

6.2 FIRE REFEEENCES

- Agee, James K. 1993. *Fire ecology of Pacific Northwest forests*. Washington, DC. Island Press
- Agee, James K. 2002. *The Fallacy of Passive Management*. *Concervation Biology In Practice*, Winter 2002, Volume 3, No. 1.
- Alexander, Martin E. 1988. *Help with making crown fire assessments*. In Fischer, William C.;Arno, Stephen F., comps. *Protecting people and homes from wildfire in the interior West: Proceedings of symposium and workshop; 1897 October 6-8; Missoula, MT*. Gen. Rep. INT-

251. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station: 147-156

Alexander, Martin E.; Yanick, Richard F. 1977. The effect of precommercial thinning on fire potential in a lodgepole stand. *Fire Management Notes* 38(3): 7-9

Anderson, Hal E. April 1982. Aids to determining fuel models for estimating fire behavior, General Technical Report INT-122

Behave System, Burn Subsystem, November 1989. Fire1 Program: Version 4.1.

Diamond Lake Ranger District 1998. Diamond Lake and Lemolo Lake Watershed Analysis. U.S. Department of Agriculture, Forest Service, Umpqua National Forest, Diamond Lake Ranger District. Idleyld Park, Oregon

Graham, R. T. 1982. Uneven-aged management in the northern Rocky Mountains. In: Proceedings, national silvicultural workshop: silviculture for all resources; 1987 May 11-14; Sacramento, CA. Washington, DC: U. S. Department of Agriculture, Forest Service, Timber Management: 290-297.

Philip N. Omi, Erik J. Martinson, March 25 2002. Final Report Effects of Fuels Treatment on Wildfire Severity, Western Forest Fire Research Center, Colorado State University as Submitted to the Joint Fire Science Program Governing Board.

Russell T. Graham, Alan E. Harvey, Threasa B. Jain, and Jonalea R. Tonn. September 1999. The Effects of Thinning and Similar Stand Treatments on Fire Behavior in Western Forests. PNW-GTR-463. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station. 27p.

Snell, Ken. November 2002. Proceeding from the Northwest Fuels Committee Fall Meeting, Portland Oregon.

6.3 FISHERIES REFERENCES

Rothstein, B. 1999. Order granting plaintiffs' motion for summary judgment; Pacific Coast Federation of Fishermen's Association et al. vs. National Marine Fisheries Service. United States District Court, Western District of Washington at Seattle.

Diamond Lake – Lemolo Lake Watershed Analysis, 1998

6.4 HYDROLOGY REFERENCES

MacDonald, L. H., A. W. Smart, and R. C. Wissmar. 1991. Monitoring Guidelines To Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska. Region 10, U. S. Environmental Protection Agency, Seattle, WA with Center for Streamside Studies, AR-10, College of Forest and College of Ocean and Fishery Sciences, University of WA, Seattle, WA. EPA 910/9-91-001.

Storck, Pascal, Travis Kern, and Susan Bolton. 1999. Measurement of Differences in Snow Accumulation, Melt, and Micrometeorology Due to Forest Harvesting. Northwest Science, volume 73 (special issue): p87-101.

Umpqua National Forest. 1990. Umpqua National Forest Standard and Guideline Procedures for Watershed Cumulative Effects and Water Quality.

Umpqua National Forest. 1998. Diamond Lake – Lemolo Lake Watershed Analysis. Diamond Lake Ranger District.

Ingebritsen. S.E., R.H. Mariner, and D.R. Sherrod. 1994. Hydrothermal systems of the Cascade Range, north-central Oregon: U.S. Geological Survey Professional Paper, 1044-L, 86 p.

Sherrod, D.R. 1995. letter to Paul Uncapher, Geologist, Umpqua National Forest, Supervisor's Office.

6.5 SILVICULTURAL REFERENCES

Umpqua National Forest 1998. Diamond Lake, Lemolo Lake Watershed Analysis. USDA Forest Service, Diamond Lake Ranger District. 243 pages.

Code of Federal Regulations 40, Protection of Environment, Chapter V, Council on Environmental Quality. Published by the Office of the Federal Register National Archives and Records Administration as a Special Edition of the Federal Register. 752 pages.

Forest Service Handbook 1909.15, USDA Forest Service.

U.S.D.A Forest Service. 1994. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.

U.S.D.A. Forest Service. 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Ranges of the Northern Spotted Owl.

Umpqua National Forest Land and Resource Management Plan. 1990. U.S.D.A. Forest Service, Umpqua National Forest.

U.S.D.A. Forest Service. 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures, Standards and Guidelines.

U.S.D.A. Forest Service. 2000. Final Supplemental Environmental Impact Statement For Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures, Standards and Guidelines.

U.S.D.A. Forest Service. 1988. Final Environmental Impact Statement For Managing Competing and Unwanted Vegetation.

Curtis, R. O., D.S. DeBell, C.A. Harrington, D.P. Lavender, J.B. St. Clair, J.C. Tappeiner, and J.D. Walstad 1998. *Silviculture for Multiple Objectives in the Douglas-fir Region*. U.S.D.A. Forest Service, General Technical Report, PNW-GTR-435.

Curtis, R.O. and A.B. Carey 1996. Timber Supply in the Pacific Northwest: managing economic and ecological values in Douglas-fir forests. *Journal of Forestry*. 94(9):4-7, 35-37.

Lippke, B.R., J. Sessions, A.B. Carey 1996. Economic Analysis of landscape management alternatives. CINTRAFOR Spec. Pap. 21. Seattle: University of Washington, College of Forest Resources. 157 pages.

Spies, T.A. and J.F. Franklin 1991. The structure of natural young, mature, and old-growth Douglas-fir forests in Oregon and Washington. In: Ruggiero, L.F. et al, eds. *Wildlife and vegetation of unmanaged Douglas-fir forests*. General Technical Report PNW-GTR-285. Portland, OR: U.S.D.A. Forest Service, Pacific Northwest Research Station: 91-109.

Atzet, T. et al 1996. *Field Guide to the Forested Plant Associations of Southwestern Oregon*. Technical paper R6-NR-ECOL-TP-17-96. U.S.D.A. Forest Service, Pacific Northwest Region.

Oliver C.D. and B.C. Larsen 1990. *Forest Stand Dynamics*. Wiley and Sons, Inc. New York.

Reineke, L.H. 1933. Perfecting a stand density index for even-aged forests. *Journal of Agriculture Research*. Vol. 46, No. 7, Washington, D.C.

Curtis, R. O., F. R. Herman, and D. J. DeMars 1974. Height growth and site index for Douglas-fir in high-elevation forests of the Oregon-Washington Cascades. *Forest Science*, Vol. 20, No. 4, 1974, pp. 307-316.

Agee, J. K. 1993. *Fire ecology of Pacific Northwest forests*. Washington, DC. Island Press.

Crookston, N. L. and Stage, A. R. 1999. Percent Canopy Closure and Stand Structure Statistics from the Forest Vegetation Simulator. General Technical Report RMRS-GTR-24. U.S.D.A. Forest Service, Rocky Mountain Research Station: 1-11.

Whitehead et al. 2001. *Reducing Stand and Landscape Susceptibility to Mountain Pine Beetle*. British Columbia Ministry of Forests website, Victoria, BC.

6.6 SOILS REFERENCES

Archuleta J.G. 1999. Unpublished monitoring report of Compaction and Mychorrizae Administrative study on the Diamond Lake R.D.

Andrus, C.W. and H.A. Froelich. 1983. An evaluation of four implements used to till compacted forest soils in the Pacific Northwest. *Res. Bull.* 45. 12 p For. Res. Lab., Oregon State Univ., Corvallis.

Brady, N.C., Weil R.R. 2000. *Elements of the Nature and Properties of Soils*, 12th edition. Prentice-Hall Inc.

Luce C. 1997. Effectiveness of Road Ripping in Restoring Infiltration Capacity of Forest Roads. *Restoration Ecology* 5(3): 265-270

Luce C. Personal communication during a Watershed Restoration Conference. Pack Forest, WA. 6 June 2001.

Kimmins, J. P. 1996. *Forest Ecology, A Foundation for Sustainable Management*. 2nd ed. Prentice-Hall. NJ. p61.

USDA Forest Service 1995. Upper Clearwater Watershed Analysis. Umpqua National Forest. P 84.

E.R. Ingham 1997. Abstract: The Soil Food Web. Understanding and Managing Compaction to Maintain Ecosystem Productivity, conference. Society of American Foresters, Central Oregon Chapter. October 1997. Bend OR.

Robichaud, P.R.; Brown, R.E. 1999. (Track 2: Wildland Hydrology), 419-426. June 30-July 2, 1999, Bozeman, MT. Herndon, VA: American Water Resources Association.

6.7 WILDLIFE REFERENCES

Banci, V. 1994. in *The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx and Wolverine*. USDA-Forest Service, Rocky Mountain Forest and Range Experiment Station, GTR RM-254. 184 pp.

Bookout, T.A. 1995. Yellow rail (*Coturnicops noveboracensis*). In *The Birds of North America*, No. 139 (A.Poole and F.Gills, Eds.). The Academy of Natural Sciences, Philadelphia, and the American Ornithologists' Union, Washington, D.C.

Corkran, C. C. and C. R. Thoms. 1996. *Amphibians of Oregon, Washington and British Columbia*. Lone Pine Publishing. 175 pp.

Gauthier, G. 1993. Bufflehead (*Bucephala albeola*). In *The Birds of North America*, No. 67 (A.Poole and F.Gill, Eds). Philadelphia: The Academy of Natural Sciences; Washington, D.C.:The American Ornithologists' Union.

Horn, R. 1999. Personal communication

Leonard, P. L. et al. 1993. *Amphibians of Washington and Oregon*. Seattle Audubon Society. 168 pp.

Nussbaum R.A., E.D. Brodie and R. M. Storm. 1983. *Amphibians and Reptiles of the Pacific Northwest*. University of Idaho Press. Moscow, ID. 332 pp.

Oregon Department of Fish and Wildlife. 1991. *Sensitive Vertebrates of Oregon*.

Oregon Department of Fish and Wildlife. 2000. *Living with Wildlife, Western Pond Turtle*. 4pp.

Powell R.A. and W. J. Zielinski. 1994. in *The Scientific Basis for Conserving Forest Carnivores: American Marten, Fisher, Lynx and Wolverine*. USDA-Forest Service, Rocky Mountain Forest and Range Experiment Station, GTR RM-254. 184 pp.

USDI. 1992. Draft recovery Plan for the Northern Spotted Owl. 662 pp.

USDI. 1998. Consultation Handbook Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

USDI. 2000. Canada Lynx Conservation Assessment and Strategy. 121 pp.

Verts, B.J. and L.Carraway. 1998. *Land Mammals of Oregon*. University of California Press, Berkley and Los Angeles, CA. 668 pp.

7. CHAPTER SEVEN - ACRONYMS AND ABBREVIATIONS

AAS	Associate of Applied Science Degree
AS	Associate of Science Degree
BE	Biological Evaluation
BLM	Bureau of Land Management
BMP	Best Management Practice
BS	Bachelor of Science Degree
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHU	Critical Habitat Unit
dbh	[Tree] Diameter at Breast Height
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
DLLWA	Diamond Lake Lemolo Lake Watershed Analysis Area
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEMAT	Forest Ecosystem Management Assessment Team
FS	Forest Service
FVS	Forest Vegetation Simulator
FY	Fiscal Year
GIS	Geographic Information System
GP	Graplepile
GSE	Ground Skidding Equipment
HCR	Harvest with Reserve Trees
HGR	Small Group Harvest
HP	Handpile
HPR	Harvest Partial Removal “post and pole unit” “partial harvest”??
HRP	Hydrologic Recovery Percentage
HSH	Harvest Shelterwood
HTH	Thinning
HUC	Hydrological Unit Code
IDT	Interdisciplinary Team
KV	Knutson - Vandenberg Act of 1924
LL	Loader Log
LRMP	1990 Umpqua National Forest Land and Resource Management Plan
LPA	Lemolo Planning Area
LSR	Late Successional Reserve
MA	Management Area
MBF	Thousand Board Feet
MEC	Mechanical Log
ML	Maintenance Level
NEPA	National Environmental Policy Act of 1969
NF	National Forest
NFMA	National Forest Management Act of 1976

NFP	Northwest Forest Plan
NFSL	National Forest System Lands
NOI	Notice of Intent
NRF	Nesting, Roosting, and Foraging Habitat
OCRA	Oregon Cascades Recreation Area
ODEQ	Oregon Department Environmental Quality
ONHP	Oregon Natural Heritage Program
ONRC	Oregon Natural Resources Council
PA	Proposed Action
RARE	Roadless Area Review and Evaluation
RMO	Road Management Objectives
ROD	Record of Decision
SKY	Skyline
tpa	trees per acre
TMDL	Total Maximum Daily Load
UB	Underburn
UNF	Umpqua National Forest
UPAD	Umpqua Project Activities Database
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	United States Forest Service
VQO	Visual Quality Objective
WEPP	Water Erosion Prediction Program

8. CHAPTER EIGHT - GLOSSARY

Abiotic: characterized by the absence of life or living organisms.

Activity center: a term used in northern spotted owl management to denote regular use of an area by owls. It may be a nest site, repeated presence of pairs, or territorial behavior by individuals.

Adaptive management areas: lands placed in a land-use designation for which adaptive management is mandated. Although a portion of timber harvest will come from these lands, they are intended for development and testing of new management approaches to integrate ecological, economic and other social objectives. Each area (approximately 10 in the North West Plan Forest Area) has a thinning prescription with a different emphasis.

Administratively withdrawn: areas removed from the suitable timber base through agency direction and land management plans.

Adfluvial: fish that migrate between lakes and rivers or streams.

Adversely affect: will have a negative affect on the environment.

Affect: will or may have an effect on.

Allocation: the assignment of sets of management practices to particular land areas to achieve goals and objectives.

Alluvial: material deposited by creeks and rivers, including gravel, sand, silt and clay.

Aluminum flashers: a marker used for the demarcation of forest operations.

Ameliorate: to improve or become more satisfactory.

Amenity: an object, feature, quality or experience that gives pleasure or is pleasing to the mind or senses. Typically used in land management planning to describe those resource properties for which market values are not or cannot be established.

Amenity value: conditions or features of the environment that increase the quality of experience for visitors and recreation users.

Anadromous: those species of fish that mature in the ocean and migrate into fresh water rivers and streams to spawn (e.g., salmon and steelhead).

Analysis Area: are described in the EIS where appropriate to define the area of potential impact at the appropriate scale. These scales are not always the same between resource areas and may be a portion of the Study Area, or a larger scale that extends beyond the Study Area;

examples include hydrology (sub-watersheds), wildlife (habitat blocks), or social-economic areas (where people are), etc.,

Animal damage: physical damage to forest tree seed, seedlings, and young trees through seed foraging, browsing, cutting, rubbing, or trampling, by mammals and birds.

Anthropogenic: of, relating to, or resulting from the influence of humans on nature.

Aquatic habitat: habitat that occurs in free water.

Aspect: the direction a slope faces with respect to the cardinal compass points.

At-risk: species that have been identified by agencies or in scientific literature as being in need of special management consideration because of low or declining populations.

Bark slippage: when trees are susceptible to damage because of sap flow and accelerated growth in the spring of the year, which makes bark easily damaged and or removed from the bole of the tree.

Basin: an extensive depressed area with no surface outlet.

Bedrock: solid rock underlying soils.

Best Management Practices (BMPs): management practices developed by the Forest Service designed to protect, maintain, or improve water quality by preventive rather than corrective means. Developed in compliance with the Clean water Act and coordinated with the United States Environmental Protection Agency and the State of Oregon.

Best Management Practices ratings: a rating system used to measure the effectiveness and ability to implement recommended mitigation measure.

Big game: large mammals that are hunted by humans. Big game includes elk and black tailed deer.

Biological control: deployment of host specific organisms to eliminate or control noxious weeds.

Biological diversity: the variety of life forms and processes, including a complexity of species, communities, gene pools, and ecological functions.

Biological Evaluation (BE): an evaluation of the effects on Threatened, Endangered, or Sensitive plant or wildlife species required by the Forest Service for the Proposed Action and each alternative.

Biological Opinion (BO): the document resulting from formal consultation that states the opinion of the US Fish and Wildlife Service or National Marine Fisheries Service as to whether or not a Federal action is likely to jeopardize the continued existence of listed species.

Blowdown: trees felled by high winds (see windthrow).

Bryophytes: plants of the phylum Bryophyta, including mosses, liverworts and hornworts, characterized by the lack of true roots, stems and leaves.

Bucked: to cut a length of wood.

Bulk density, soil: the mass of dry soil per unit bulk volume. The bulk volume is determined before drying to constant weight at 105 deg. C. The value is expressed in grams per cubic centimeter.

Bulk volume: the volume, including the solids and the pores, or an arbitrary soil mass.

Canopy: the foliar cover in a forest stand consisting of one or several layers.

Canopy closure: the degree to which the canopy blocks sunlight or obscures the sky.

Cavity nester: wildlife species, most frequently birds, that require cavities (holes) in trees for nesting and reproduction.

Cations: a positively charged ion.

Chipping: small piece of wood separated by chopping, cutting or breaking.

Classified roads: a road constructed or maintained for long-term highway vehicle use. May include public, private, or forest system roads.

Clear-cut harvest: a timber harvest method in which all trees are removed in a single entry from a designated area, with the exception of wildlife trees or snags, to create an even-aged stand.

Climax vegetation: the final vegetative community which emerges after a series of successive vegetational stages and perpetuates itself indefinitely unless disturbed by outside forces.

Coarse fragments: rock or mineral particles greater than 2.0 mm in diameter. Gravel is rock less than 7.6 cm (3 in), cobbles are diameters 7.6 to 25 cm (3 to 10 in), stones are 25 to 61 cm (10 to 24 in), and boulders are greater than 61 cm (24 in).

Coarse woody debris: portion of a tree that has fallen or been cut and left in the forest. Usually refers to pieces at least 20 inches in diameter.

Co-dominant trees: trees with crowns forming the general level of the main canopy in even-aged stands or, in uneven aged stands, the main canopy of the tree's immediate neighbors, receiving full light from above and comparatively little from the sides.

Cohort: a distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, e.g. 10-year age class, as used in inventory or management.

Colluvium: a general term applied to deposits on a slope or at the foot of a slope or cliff that were moved there chiefly by gravity.

Commercial thinning: the removal of generally merchantable trees from an even-aged stand of trees, usually to encourage growth of the remaining trees (see density management).

Commodity value: the economic value of outputs from the forest that are commercially sold to private operators.

Compaction (soil): an increase in bulk density and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Compressibility: the property of a soil pertaining to its susceptibility to decrease in bulk volume when subjected to a load.

Congressionally Reserved areas: areas that require Congressional enactment for their establishment, such as Wild and Scenic Rivers and Wilderness Areas.

Connectivity: a measure of the extent to which conditions among late-successional forest areas provide habitat for breeding, feeding, dispersal, and movement of late-successional associated wildlife and fish species.

Contiguous habitat: habitat suitable to support the life needs of species that is distributed continuously or nearly continuously across the landscape.

Core area: an area of late successional habitat reserved for spotted owls and averages approximately 100 acres.

Corridor: a defined tract of land, usually linear, through which a species must travel to reach habitat suitable for reproduction and other life-sustaining needs.

Cost efficiency: the usefulness of specified inputs (costs) to produce specified outputs (benefits). In measuring cost efficiency, some outputs including environmental, economic or social impacts, are not assigned monetary values but are achieved at specified levels in the least costly manner. Cost efficiency is usually measured using present net value, although use of benefit-cost ratios and rates-of-return may be appropriate.

Cost: the negative (adverse) effects. Costs may be monetary, social, physical or environmental in nature.

Critical habitat: under the Endangered Species Act, critical habitat is defined as (1) the specific areas within the geographic area occupied by a Federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species, when it is determined that such areas are essential for the conservation of the species.

Crown: the upper part of a tree or other woody plant that carries the main system of branches and the foliage.

Crustacean: any chiefly aquatic hard shelled species including lobsters, shrimps crabs barnacles woodlice etc..

Cultural (heritage) resource: any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence. This includes archaeological sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cumulative effects: those effects on the environment that result from the incremental effect of the action when added to the past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

Cull: a green tree, snag or log that is non merchantable or of low economic value because it does not meet commercial minimum specifications.

Decadent trees: trees which are decaying.

Decommissioning: to permanently terminate the function of a road and mitigate any adverse impacts to forest resources. May include blocking the entrance, assuring natural or artificial re-vegetation, removal of drainage structures, and re-establishing natural drainage patterns; and for system roads, removal from the Forest road inventory.

Density management: cutting (and removal) of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated.

Designated loader paths: paths where the log loader will travel and are located on the ground ahead of the logging operations and approved by the Forest Service.

Developed recreation: a site or area developed with permanent facilities designed to accommodate recreation users.

Discount factor: a factor applied to future monetary costs and benefits to convert them to 'present value', thus reflecting society's time preference for money. A four percent discount factor is required for Federal projects.

Dispersal habitat: habitat that allows safe movement of young or displaced animals in search of a new territory. For spotted owls, dispersal habitat is mature forests with a closed canopy that lacks toe structure needed for foraging or nesting.

Dispersed recreation: outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are primarily for access and protection of the environment rather than comfort or convenience of the user.

Dispersed trees: randomly scattered trees.

Displacement (soil): the removal and horizontal movement of soil from one place to another by mechanical forces such as a tractor.

Dominant trees: trees with crowns extending above the general level of the main canopy of even aged stands or, in uneven-aged stands, above the crowns of the tree's immediate neighbors, and receiving full light from above and partly from the sides.

Duff: the layer of loosely compacted debris underlying the litter layer on the forest floor.

Earth berm: an edge or shoulder running alongside a road.

Earthflow: the downslope movement of soil and weathered rock within well defined lateral boundaries (mass wasting).

Ecosystem: a unit comprising interacting organisms considered together with their environment (e.g., marsh, watershed, and lake ecosystems).

Ecosystem (ecological) services: a process to quantify or measure the value of natural ecological functions.

Ecotype: a locally adapted population of a widespread species. Such populations show minor changes of morphology and/or physiology which are related to habitat and are genetically induced.

Ectomycorrhizae: the symbiotic association of fungi with the outside of roots of vascular plants.

Edge effect: the zone along the edge of a stand affected by environmental conditions in the neighboring stands. Edge effect can be positive or negative, physical or biological, and varies depending on the condition causing the effect.

Endangered Species: any species of plant or animal identified through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register.

Endemic: species that are only known from a geographic area. Endemism can be narrow (one drainage) or regionally (Pacific Northwest) or continental (North America).

Entisols: mineral soils that have no distinct subsurface diagnostic horizons within 1 m of the soil surface. An order in the U.S. system of soil taxonomy.

Environmental safety standards: design standards developed to protect the environment during road construction and reconstruction.

Ephemeral streams: streams that contain running water only sporadically, such as during and following storm events. Ephemeral streams with a definable channel are considered “intermittent” when they show evidence of annual scour or deposition.

Epilimnetic flow: warmer water at and just below the surface of a lake that contributes to increased temperature in a stream segment below the outlet of a lake.

Epiphytic: a plant that derives its moisture and nutrients from the air and rain and that grows on another plant but is non-parasitic.

Erosion: the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep. There are different types of erosion: gully, sheet, rill are a few.

Eurasian: of or pertaining to Eurasia – mixed European or Asian

Evapotranspiration: refers to loss of water from the soil, including that by direct evaporation and by transpiration from plants.

Even-aged management: a silvicultural system which creates forest stands that are primarily of a single age or limited range of ages. Creation of even-aged stands may be accomplished through the clear-cut, seed tree or shelterwood methods.

Existence value: the value placed on a resource based on simply knowing that it exists in a certain state, irrespective of direct experience through visiting the site.

Extirpation: to remove utterly, to pull up by the roots.

Fifth field watershed: a hierarchical term used to describe a portion of a sub-basin watershed. Fifth field watersheds refer to one level in the progression of geographical sizes, generally 20 to 200 square miles in size. The Upper Rogue River is considered a fifth field watershed.

Fallow ground: uncultivated ground.

Fire hazard: refers to the predicted fire behavior of a given area and is based on current and predicted fuel loading.

Fire regime: the characteristic frequency, extent, intensity, severity and seasonality of fires in an ecosystem.

Fire risk: the probability that a fire will occur. It does not relate to the likelihood of a fire becoming large.

Fluvial: creek and rivers.

Forage: browse and non-woody plants available to livestock and wildlife for grazing.

Fourth field watershed: a term used to describe a portion of a basin watershed also commonly called a sub-basin.

Fragmentation: the process that divides a habitat into separate blocks and isolates the blocks through loss of connective habitat. Both block size and distance between blocks affect fragmentation.

Fuel loading: the weight of fuel at a given site; usually expressed in tons per acre. This value generally refers to the fuel that would be available for consumption by a fire.

Fuel model: an identifiable association of fuel elements of distinctive species, form, size, arrangement or other characteristics that will cause a predictable rate of fire spread and intensity under specific weather and topographic conditions.

Genetic trees: trees that are to serve as a seed source for future seedlings, selected for their superior growth and form.

Geomorphic: pertaining to the form or shape of those processes that affect the surface of the earth.

Geographic information systems (GIS): a computer system capable of storing and manipulating spatial (i.e., mapped) data.

Gradient: the degree of inclination or rate of descent.

Green tree: live tree.

Green tree retention (GTR): a Standard and Guideline from the Northwest Forest Plan that requires the retention of patches of live trees as well as snags within harvest units in order to provide for a biological legacy and to provide for habitat components through the next management cycle.

Groundwater: that portion of the water below the surface of the ground.

Group harvest: method of regenerating uneven-aged stands in which trees are removed, and new age classes are established in small groups.

Habitat: a place where a plant or animal naturally or normally lives and grows.

Hand piling: piling of limbs and branches from trees that have been cut during a logging operation in order to reduce the potential for a fire.

Hard snags: trees that have been dead for a short period of time and have only slightly decayed.

Harvest unit: an area where timber cutting and logging operations will take place.

Harvester- forwarder: a logging system where two separate pieces of equipment are used to fell the trees and then transport them to the landing. The harvester cuts the tree and then lays it next to the trail, whereby the forwarder comes by and loads the cut log onto a bunk where it is transported, fully suspended above the ground, to the landing.

Hazardous fuels: a fuel complex defined by kind, arrangement, volume, condition and location that forms a special threat of ignition or suppression difficulty.

Hazard tree: a tree that has been identified as a potential risk for structural failure that could cause injury to a person or property.

Helicopter logging: use of helicopters to transport logs from where they are felled to a landing.

Hiding cover: generally refers to any vegetation used by wildlife for security or to escape from danger. More specifically, any vegetation capable of providing concealment (e.g., hiding 90% of an animal) from human view at a distance of 200 feet.

Home range: the land area used by an animal throughout the year, providing food, shelter, and breeding opportunity. For migratory animals home range includes summer range, winter range and any migratory lands in between.

Horizontal structure: refers to the distribution of plant and animal communities across an area of land. The greater the number of communities, the greater the diversity of horizontal structure.

House log harvest: an area designated for logging that will provide logs to be used in construction

Huckleberry: edible fruit (reddish-purple); widespread member of Ericaceae (Heath family) in the American West. Although several species of huckleberry grow in southwestern Oregon, the thin-leaved huckleberry (*Vaccinium membranaceum*; found generally at elevations above 4,000 feet) is by far the most important in terms of traditional berry-gathering activities.

Hydraulic complexity: is the change in a stream from riffles, runs and pools.

Hydrologic recovery procedure: an analysis tool used to estimate the recovery and health of a stream.

Hydrologist: a resource specialist that is trained in the science of stream anatomy and the effects on water quality.

Hydrophobic soil: a condition that occurs when organic matter in litter and upper mineral soil layers is volatilized during a fire. This volatilized material condenses to form a water repellent layer that impedes infiltration.

Illuvial: a soil layer or horizon in which material carried from an overlying layer has been precipitated from solution deposited from suspension.

Impact: a spatial or temporal change in the environment caused by human activity.

Indicator species: in wildlife management, the welfare of a selected species is presumed to indicate the welfare of other species.

Indirect effect: caused by the action and are later in time or farther removed in the distance, but are still reasonably foreseeable.

Inorganic: chemical substances which are derived from the external physical environment, and which are not organic.

Interdisciplinary Team (IDT): a group of individuals with different training or knowledge in different resource areas assembled to perform a task or to solve a problem. The group works together to integrate the various disciplines while developing solutions.

Infiltration: downward entry of water into the soil.

Inoculum: material used in an inoculation.

Interior forest habitat: that portion of a mature forest stand that receives little edge effect. For the purpose of this analysis, it is any portion of the stand more than 300 feet away from the edge bordering an opening.

Inventoried Roadless Area: areas identified as part of Roadless Area Review and Evaluation II (RARE II) completed in the 1970's.

Irretrievable: the loss of an opportunity for production or use of a renewable resource.

Irreversible: actions which change either a non-renewable resource or which change a renewable resource to the point that it can only be recovered after 100 years or more.

Issue: a matter of controversy or dispute over resource management activities that is well defined or topically discrete. Under NEPA, significant issues are addressed in the design of alternatives.

Jackpot burning: prescribed ignition and burning of concentrations of slash or fuel as a result of harvest or post-harvest activities. Used where concentrations of slash are not continuous.

Key Watershed: a watershed containing habitat for potentially threatened species or stocks of anadromous salmonids. These watersheds are designated in the Northwest Forest Plan.

Ladder fuels: fuels that provide vertical continuity between the surface fuels and ground fuels in a forest.

Landscape: a heterogeneous land area with interacting ecosystems that are repeated in similar form throughout.

Large woody debris / material: pieces of wood larger than 10 feet long and 6 inches in diameter, in a stream channel.

Late-successional forests: a forest in its mature and / or old-growth successional stages.

Late successional reserves: land allocation under the Northwest Forest Plan with the objective to protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth forest related species, including the northern spotted owl. Limited stand management is permitted, subject to review by the Regional Ecosystem Office (USDA, USDI 1994b).

Late seral stand: see late-successional forests.

Leave trees: trees, pole-sized or larger retained in either a dispersed or aggregated manner.

Lithic scatter: a cultural resource, specifically an archaeological site, consisting largely of the debris (flakes, cores, and broken tools) left behind from the making or sharpening of prehistoric chipped-stone artifacts.

Loamy: intermediate in texture and properties between fine-textured and coarse-textured soils.

Logging systems: the use of specific logging equipment to achieve prescribed management objectives for an area planned for harvest.

Long-term impacts: an impact that continues for an extended period (over two years). May also be permanent.

Lop and scatter: a method of slash reduction where accumulations and concentrations are broken up (usually with chain saws) and dispersed from dense locations.

Maintenance level: (see road maintenance levels)

Management Area (MA): areas within the Rogue River National Forest that have been allocated by the Land and Resource Management Plan, as amended by the Northwest Forest Plan. Each area has different resource goals and activity Standards and Guidelines.

Management Indicator Species (MIS): an animal species whose presence in a certain situation or location is a fairly certain sign or symptom that particular environmental conditions are also present. Management Indicator Species are identified in the 1990 Rogue River National Forest Land and Resource Management Plan.

Management prescriptions: Written direction for lands administered by the Forest Service.

Mass-wasting: general term for the dislodgement and downslope transport of soil and rock material under the direct application of gravitational stresses.

Matrix: lands identified within the Northwest Forest Plan that are outside of Late-Successional Reserves, Administratively Withdrawn areas, and Riparian Reserves.

Merchantable: refers to a product that is marketable.

Microclimate: suite of climatic conditions measured in localized areas near the earth's surface. Microclimate variables important to habitat may include temperature, light, wind speed and moisture.

Micromhos: a measure of water's capacity to convey an electrical charge.

Migration routes: (see travel corridors)

Migratory corridors: (see travel corridors)

Mitigation: modification of actions that (1) avoid impacts by not taking a certain action or part of an action; (2) minimize impacts by limiting the degree or magnitude of the action and its implementation; (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (5) compensate for impacts by replacing or providing substitute resources or environments.

Model: an idealized representation of reality developed to describe, analyze, or understand the behavior of some aspect of it; often a mathematical representation of the relationships under study.

Mollusk: Invertebrate animals (such as slugs, snails, clams or squids) that have a soft unsegmented body usually enclosed in a calcareous shell.

Multistoried / multilayered: forest stands that contain trees of various heights and diameter classes and therefore support foliage at various heights in the vertical profile of a stand.

Mycorrhiza: the symbiotic association between certain fungi and plant roots which enhances the uptake of water and nutrients.

Mycorrhizal root dip jell: a jell mixture containing mycorrhizal fungal spores, formulated to inoculate the roots of sapling trees which are to be newly planted.

National forest system: the geographic inclusion of all National Forest lands in the United States.

National Register of Historic Places: a Federal list of those cultural resource sites and structures that are found to be of national, regional, or local significance and worthy of special consideration during the planning of Federal or Federally approved undertakings.

Natural disturbance processes:

Net Public Benefits (NPB): a conceptual comparison of all costs and benefits, whether or not they can be monetarily quantified.

Non-commercial density management: the practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster (see pre-commercial thinning).

Notice of intent: a notice that an environmental impact statement will be prepared and considered.

Noxious weeds: a plant specified by law or policy as being especially undesirable, troublesome, and difficult to control.

Obligate: restricted to a particular condition of life and must live in close association with a usual host in order to survive.

Obsidian: a volcanic glass, typically black. Due to its lack of crystallization and other special qualities, native people of southwestern Oregon favored obsidian for the making of arrowpoints and other chipped-stone tools.

Off-site pine plantation: refers to plantations within the Cascade portion of the Rogue River National forest that were planted with ponderosa pine seedlings brought in from Montana and Idaho that were from seed stock not necessarily similar to the conditions (elevation, aspect, temperature) of those areas where they were planted.

Old-growth forest: a forest stand usually at least 180-220 years old with moderate to high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood

(decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground.

Oligotrophic: characterized by low organic content.

Opportunity cost: the value of the foregone opportunities for alternative uses of a resource that are eliminated through the Proposed Action.

Optimal thermal cover: stands of coniferous trees with a multi-layered canopy where greater than 70 percent of the canopy is from trees over 40 feet in height. Stands are generally from 30-60 acres in size and the dominant trees are of relatively large size.

Option Value: the value placed on a resource from knowing that the resource will be available for one's use in the future.

Organic: compounds containing the element carbon, found in all living organisms.

Outstandingly Remarkable Values (ORVs): values among those listed in Section 1(b) of the Wild and Scenic Rivers Act: "scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values..."

Overstory: trees that provide the uppermost layer of foliage in a forest with more than one roughly horizontal layer of foliage.

Overstory removal: the final stage of shelterwood cutting where the remaining overstory trees are removed to allow the understory to grow. Generally occurs in a managed stand, but can occur in natural stands with similar characteristics.

Partial removal / harvest / cut: removal of a portion of the trees from the uppermost layer of a forest stand. Usually associated with a previous shelterwood treatment but may occur in a natural stand with a similar condition.

Particulates: small airborne dust and debris particles.

Patch: a small (20-60 acre) part of the forest. This term is often used to indicate a type of clear-cutting (patch cut) associated with the "staggered setting" approach to distributing harvest units across the landscape.

Paucity: refers to scarcity.

Peak flow: the highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial stream: a stream or portion of a stream that flows throughout the year. The groundwater table lies above the bed of the stream at all times.

Permeability class: quality of the soil which enables the transfer of water and air within the profile of the soil.

Photomorph: a group of biological organisms which requires light to survive.

Physiographic region: a geographic area having a similar set of biological and physical characteristics and processes because of the effects of climate and geology that result in patterns of soils and broad-scale plant communities. Habitat patterns, wildlife distributions and historical land-use patterns may differ significantly from those of adjacent regions.

Piscivorous: fish eating.

Pine health: a measurement of the overall vitality of an individual or group of pine trees.

Plankton: aggregate of passively floating or drifting organisms in a body of water.

Plant association: a plant community type based on land site potential, successional patterns, and species composition.

Plantation: a forest stand raised as a crop, either by seeding or planting.

Plant series: a level of vegetation classification that is identified by the most common species found in the plant community.

Pole: a tree between the size of a sapling and a mature tree.

Porosity: volume of pores in a soil sample (non-solid volume) divided by the bulk volume of the sample.

Post and pole harvest: an area designated for cutting of posts and poles.

Pre-commercial thinning: the practice of removing some of the trees less than merchantable size (less than 5 inches in diameter) from a stand so that remaining trees will grow faster (see non-commercial density management).

Prescribed fire: controlled application of fire to wild-land fuels in either their natural or modified state, under specified environmental conditions which allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and spread required to attain planned and approved resource management objectives.

Prescribed natural fuels treatment: see prescribed fire.

Probable Sale Quantity (PSQ): an estimate of scheduled timber yields from Matrix lands.

Propagule: a reproductive structure of brown algae.

Project Area: those lands in and immediately adjacent to units with proposed activities.

Proposed Action: a proposal that has caused the Forest Service to consider implementation of land management activities and to conduct analysis under the National Environmental Policy Act (NEPA).

Protection buffer: standards and guidelines for specific rare and locally endemic species, and other species in the upland forest matrix, in the 1994 Northwest Forest Plan standards and guidelines.

Public Use Value: the availability of an area for use by the public for outdoor recreation and tourism, for subsistence uses (firewood gathering, hunting) and the enhancement of the quality of life of local residents.

Puddling (soil): occurs when there is a physical change in soil properties, under moist conditions, due to shearing forces that destroy soil structure or reduce porosity.

Purpose and need: a statement that briefly specifies the underlying purpose and need for a project.

Pumice: an excessively, cellular, glassy lava; a sort of volcanic froth.

Pyroclastic: a general term applied to volcanic materials that have been explosively or aerially ejected from a volcanic vent.

Range of natural variability: an assessment of the long-term variation in natural conditions for a specific resource based on monitoring of areas relatively unaffected by humans.

Raptor: any bird adapted to sizing prey, e.g. falcon, eagle family etc...

REFOR: an electronic database used to track harvest and post-harvest activities.

Record of decision: document signed by a responsible official recording a decision that was preceded by the preparation of an environmental impact statement.

Redd: the spawning area or nest of trout or salmon.

Reforestation: the natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Regeneration: seedlings or saplings existing in a stand; or the act of establishing young trees naturally or artificially.

Regeneration harvest: timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished.

Region 6: Forest Service Pacific Northwest Region, including the National Forests of Washington and Oregon.

Regional Guide: the guide developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act. Regional guides provide Standards and Guidelines for addressing major issues and management concerns that need to be considered to facilitate National Forest planning.

Release: freeing a tree or group of trees from immediate competition by eliminating over topping or closely surrounding vegetation.

Relief culvert: a culvert designed to drain ditches on forest roads.

Remnant old-growth: large older trees scattered throughout a stand of younger trees that were most likely the seed source for the younger stand.

Reserve trees: trees, pole-sized or larger retained in either a dispersed or aggregated manner.

Residuum / residual: remainder or rest of something.

Restoration: activities designed to enhance or repair resources that were impacted from past management activities or natural events.

Rhizosphere: the part of the soil enclosing and influenced by the roots of a plant.

Riffle: shallow section of a stream or river with rapid current and a surface broken by gravel, rubble, or boulders.

Riparian: that which is related to, living or located in conjunction with, a wetland, the bank of a river or stream, or the edge of a lake or tidewater.

Riparian Reserve: designated riparian areas allocated in the Northwest Forest Plan to protect the riparian and/or streamside habitat zone. Widths of the Reserves are identified in Rogue River National Forest planning White Paper #36.

Ripping: the process of breaking up or loosening compacted soils.

Road: motorized vehicular routes managed for licensed vehicles.

Road density: usually measured in miles of road per square mile; is used as an indicator for potential concern for road related erosion and sediment yields, potential of storm drainage impacts, potential impacts to big game wildlife habitat, and overall watershed health.

Road Maintenance Levels: defines the level of service provided by, and maintenance required for a specific road. There are four Maintenance Levels (1-4).

Roadless area: see inventoried roadless area, or semi-primitive unroaded areas.

Road prisms: defined as the area from the top of the cut to the bottom of the fill of a road.

Rubber-tired skidder: a large wheeled tractor that is often articulated in the middle, which is used to drag logs to a landing. It is often equipped with an arch to raise one end of the log above the ground to facilitate dragging the log.

Runoff: portion of precipitation on an area that is discharged from the area through stream channels. Precipitation which is lost without entering the soil is called surface runoff.

Sanitation: the removal of dead or damaged trees, or trees susceptible to insect and disease attack to prevent the spread of pest or pathogens and to promote forest health.

Sale area map: a map that identifies individual harvest unit locations within a timber sale.

Salmonid: refers to fish of the family Salmonide. These include trout, salmon, and whitefish.

Salvage cutting: harvesting primarily to utilize dead and downed material and scattered, poor-risk trees that would not be merchantable if left in the stand until the next harvest entry.

Savannah: an extensive tropical vegetation dominated by grasses with varying admixtures of tall bushes and / or trees in open formation.

Scale: refers to the geographic area of consideration for analysis of a particular resource. Examples include small scale (stream reach) or large scale (river basin).

Scarp: a cliff formed by the movement downward of a section of land.

Scoping: a process used to determine the scope (level of controversy) of a proposed project through the solicitation of public comments as well as other agency and resource specialist concerns.

Seclusion habitat: areas that provide safety and lack of disturbance from humans.

Section 106: the “Section 106 compliance process” is the process mandated by the National Historic Preservation Act of 1966, as amended, whereby a Federal agency considers the potential effect of a proposed agency undertaking on significant cultural resources. The process typically involves field survey of a project area; documentation and evaluation of cultural resources that may be found within the project’s area of potential effect; agency determination of the effect (or lack thereof) of the proposed undertaking on those resources; and consultation with and review by the appropriate State Historic Preservation Office. The Section 106 process is implemented under the terms of Federal regulations 36 CFR 800.

Sediment: transported and deposited particles derived from rocks, soil, or biological material.

Sediment potential: rating system which measures the transported and deposition of particles or aggregates derived from rock, soil, or biological material.

Seed tree: an even aged regeneration method in which a new age class develops from seeds that germinate in fully-exposed micro-environments after removal of all the previous trees, except a small number of trees which are left to provide seed. Seed trees are removed after regeneration is established.

Selection cutting: a method of uneven-aged management involving the harvesting of single trees from stands (single-tree selection) or in groups (group selection) without harvesting the entire stand at any one time.

Semi-primitive unroaded areas: areas identified based on criteria developed under the Mill Creek Timber Sales and Related Activities EIS that have unroaded characteristics, in terms of roads and vegetative conditions.

Sensitive species: those species that (1) have appeared in the Federal Register as proposed for classification and are under consideration for official listing as endangered or threatened species

or (2) are on an official State list or (3) are recognized by the US Forest Service or other management agency as needing special management.

Seral stages: the series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage. Stages include early, mid, and late, and non-forest.

Settlement agreement: an agreement that is negotiated with plaintiffs that allows the agencies to continue their program of work.

Shelterwood: any regeneration cutting designed to establish a new tree crop under the protection of remnants of the old stand.

Shelterwood harvest / removal: removal of the uppermost layer of a forest stand. Usually associated with a previous shelterwood treatment but may occur in a natural stand in a similar condition.

Shelterwood seed cut: a regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in one or more cutting.

Short-term impacts: an impact that occurs during implementation of the action and/or for up to two years (or seasons) thereafter.

Silt: a soil textural class and a soil separate consisting of particles between 0.05 and 0.002 millimeters in equivalent diameter.

Silviculture: the art and science of managing forest ecosystems to ensure environmental, social, and economic sustainability. This involves the knowledge of the nature of forested ecosystems and vegetation; how they grow, reproduce, and respond to environmental changes, as well as how vegetation interacts with other components of the ecosystem.

Site potential trees: a tree that has attained the maximum height possible given site conditions where it occurs.

Site preparation: manipulation of the vegetation or soil of an area prior to planting or seeding. The manipulation follows harvest, wildfire or construction in order to encourage the growth of favored species.

Site productivity: the ability of a geographic area to produce biomass, as determined by conditions in that area.

Skid trail: a path created by dragging logs to a landing or gathering spot.

Skeletal soils: having little productivity and substance; shallow, rocky soils.

Skyline logging: a system for transporting felled logs to a landing where they are loaded on trucks. This method transports logs using a wire rope suspended between two high points. The

wire rope serves as an overhead track for a load-carrying carriage. A skyline system uses vertical lift to suspend at least one end of the log free of the ground during inhaul.

Slash: the residue left on the ground after felling, thinning or other accumulations that result from storms, fire, girdling, or poisoning. It includes unutilized logs, uprooted stumps, broken or uprooted stems, and the heavier branch wood, tops, twigs, bark and chips.

Snag: any standing dead, partially dead, or defective (cull) tree at least 10 inches in diameter and at least six feet tall.

Snag recruitment simulator: an analysis program that estimates the number, size and species of snags that will occur in a stand over time.

Snowdown: a term used to describe trees that were knocked down during a winter storm. Patches of trees were toppled by a combination of heavy, wet snow and high winds during the winter of 1995-96.

Socioeconomic: pertaining to, or signifying the combination or interaction of, social and economic factors.

Soil compaction: compression of the soil layers through mechanical pressure, which increases the soil density and decreases the soil aeration.

Soil displacement: soil particles moved from the soil surface by water, gravity or disturbance.

Soil moisture regime: condition of the soil in relation to moisture; dry, moist or wet.

Soil productivity: capacity or suitability of a soil, for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Soil texture: the relative proportions of the various soil separates in a soil and are based on the proportions of the various soil separates present.

Soil tilth: condition of the soil and its ability to provide for seedling emergence and root penetration.

Stand: an aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that is distinguishable from the forest in adjoining areas.

Standards and Guidelines: the primary instructions for land managers, and the principles specifying the environmental conditions or levels to be achieved and maintained (e.g., USDA and USDI 1994, 2001). Standards address mandatory actions, whereas Guidelines are recommended actions based on a land-management decision.

Stand health: a measurement of the vegetative condition of a forested area.

Stand replacement fire: a fire that is severe enough over a large enough area (for example 10 acres) to virtually eliminate an existing stand of trees and initiate a new stand.

Stocking: an indication of growing space occupancy relative to a pre-established standard. Usually expressed in number of trees per acre.

Stream channel: a body of running water that moves under gravity to progressively lower levels, in a relatively narrow but clearly defined channel on the surface of the ground.

Structure: the various horizontal and vertical physical elements of the forest.

Study Area: defined for the Mill Creek analysis as areas within and around the sub-watersheds associated with the Proposed Action.

Sub-alpine: a high elevation area just below timber line populated by mountain hemlock, white bark pine and lodgepole pine.

Subsoil: soil horizon layer below the surface or surface layer.

Subsoiling: a treatment to loosen compacted soil at the compacted layer without inversion and with a minimum of mixing with the tilled zone.

Substrate: a lower layer or a layer underneath something.

Succession: a series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax.

Suitable river: a river segment found, through administrative study, to meet the criteria for designation as a component of the National Wild and Scenic River System.

Surficial deposits: pumice soils that flowed into the area when Mt Mazama erupted.

Survey and manage: mitigation measure adopted as a standard and guideline within the Northwest Forest Plan Record of Decision and replaced with these standards and guidelines that is intended to mitigate impacts of land management efforts on those species that are closely associated with late-successional or old-growth forests whose long-term persistence is a concern. These measures apply to all land allocations and require land managers to take certain actions relative to species of plants and animals, particularly some amphibians, bryophytes, lichens, mollusks, vascular plants, fungi, arthropods, which are rare or about which little is known. These actions include: (1) manage known sites; (2) survey prior to ground-disturbing activities; (3) conduct extensive and general regional (strategic surveys).

Swamper burning: is the process of piling slash by hand and burning at the same time.

System road: also referred to as Forest development roads. Defined as a road wholly or partially within or adjacent to a National Forest boundary and necessary for protecting, administering, and using National Forest System Lands, which the Forest Service is authorized and over which the agency maintains jurisdiction.

Taxon: a species or other category of species resulting from the arrangement of plants and animals into natural, related groups.

Terrestrial: referring to species that are associated with the land; non-aquatic.

Thermal cover: stands of coniferous trees over 40 feet tall with greater than 70 percent crown closure that is not optimal thermal cover.

Threatened species: those plant or animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future.

Till: un-stratified glacial drift deposited by ice and consisting of clay, silt, sand, gravel, and boulders, intermingled in any proportion.

Timber stand improvement (TSI): measures such as thinning, pruning, release cutting, fertilization, prescribed fire, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Topography: hills, slopes and valleys in a landform.

Turbidity hazard: a hazard rating applied to estimate the likelihood of soil particles being transported into a water body.

Travel corridor: a route used by animals along a belt or band of suitable cover or habitat.

Unclassified roads: a road that is not constructed, maintained, or intended for long-term highway vehicle use, such as roads built for temporary access for timber harvest.

Underburning: prescribed burning with a low intensity, under a tree canopy.

Uneven-aged management: a combination of actions that simultaneously maintains continuous tall forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter and age classes.

Unique habitat: ecosystems embracing special habitat features such as talus slopes, meadows, and wetlands.

Unit boundary: the perimeter of an area designated for timber harvest.

Unroaded: (see semi-primitive unroaded areas)

Vascular plants: Plants that contain conducting or vascular tissue. They include seed-bearing plant (flowering plants and trees) and spore bearing plants (ferns, horsetails and club-mosses).

Vertical structure: refers to the appearance of vegetation from the forest floor to the tallest plants or trees defined by a limited area. Stands or areas that have many different heights are thought to have good vertical structure.

Volcanic ash: un-cemented pyroclastic material consisting of fragments mostly under 4 mm in diameter.

Waterbar: an erosion control device usually constructed by digging a small ditch or piling dirt or other debris to interrupt the flow of over-the-surface water. Usually constructed on steeper ground in skid trails where the mineral soil is exposed.

Watershed: the drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

Watershed analysis: a systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis is a stratum of ecosystem management planning applied to Watersheds of about 20-200 square miles.

Wetlands: areas that are inundated by surface water or groundwater with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetative or aquatic life that require saturated or seasonally saturated soil conditions for growth and reproduction.

White pine blister rust: is a fungus (*Cronartium ribicola*) that causes damage and can lead to eventual death of five needle pine trees in the Pacific Northwest.

Wild and Scenic Rivers: those rivers or sections of rivers designated as such by Congressional action under the Wild and Scenic River Act, or those sections of rivers designated as wild, scenic, or recreational by an act of the legislature of the state through which they flow.

Wilderness: areas designated by congressional action under the 1964 Wilderness Act. Wilderness is defined as un-developed Federal Land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are protected and managed to preserve their natural condition, which generally appear to have been affected primarily by the forces of nature with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude, or for a primitive and confined type of recreation; include at least 5,000 acres or are of sufficient size to make practical their preservation, enjoyment, and use in an un-impaired condition; and may contain features of scientific, educational, scenic, or historical value as well as ecological and geological interest (USDA, USDI 1994a).

Wildfire: any wildland fire that is not a prescribed fire.

Windthrow: a tree or trees uprooted or felled by the wind.

Yarding: the moving of logs from the stump to a central concentration area.

Young stands: forest stands not yet mature (generally, less than 50-80 years old; typically 20-40 years).