

FUNDING REQUEST

DATE OF PROPOSAL: June 2, 2003

PROJECT TITLE: Density Management and Riparian Buffer Studies: B. Aquatic Vertebrates and Habitats

LEAD SCIENTISTS: Deanna H. Olson and David Rundio

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OBJECTIVES OF THE STUDY:

- Complete analyses and technology transfer products from pre-treatment and year-1 and year-2 post-treatment surveys, to determine the immediate effects of forest density management practices within and adjacent to Interim Riparian Reserves on stream habitats and fauna (fishes and amphibians) in headwater ecosystems in western Oregon.
- Complete year-5 post-treatment surveys and analyses to determine the effects of forest density management practices within and adjacent to Interim Riparian Reserves on stream habitats and fauna (fishes and amphibians) in headwater ecosystems in western Oregon.

STATEMENT OF THE WORK:

This proposal is to complete final data collection and analysis for the Riparian Buffer Study, an on-going study addressing riparian management under the federal Northwest Forest Plan (NWFP) in western Oregon (Olson et al. 2002). The study is part of the BLM Density Management Studies (Thompson and Larson 2003), which is a set of inter-related research projects testing key assumptions of NWFP (FEMAT 1993, USDA and USDI 1994), particularly the effectiveness of alternative silvicultural manipulations (i.e., density management) of early-successional forests in accelerating the development of late-successional forest structure (Tappeiner et al. 1997).

Headwater streams and riparian areas occupy a large portion of the forested landscape in the region, and support unique assemblages that may contribute importantly to biological diversity and to ecological processes and functions that extend laterally (aquatic to upslope) and longitudinally (upstream to downstream) within watersheds. Many headwater organisms are

associated with late-successional forest characteristics, and thus may benefit from density management in or adjacent to riparian areas where headwater streams occur in young, even-aged forest stands. However, little is known about the short- and long-term effects of forest thinning on stream and riparian organisms to guide management or to evaluate the ability of Interim Riparian Reserves to meet desired goals. The Riparian Buffer Study was developed to address questions such as: How can riparian areas be managed to attain economic/forest-ecologic objectives while maintaining their aquatic-ecologic values? Can long-term riparian zone objectives, such as developing late-successional streamside forest characteristics, be achieved faster by alternative forest management practices? What short-to-long term benefits or risks relative to alternative forest management practices are associated with aquatic/riparian-dependent resources? Is it necessary to retain all lands within Interim Riparian Reserves prescribed by the NWFP to attain Aquatic Conservation Strategy (ACS) objectives at the watershed scale?

The Riparian Buffer Study was initiated in 1994 to test the effect of four levels of forest thinning (high, low, and variable retention, and unthinned control) applied in combination with four riparian reserve designs (streamside retention, variable-width, one site-potential tree height, and two site-potential tree height) on headwater stream habitats and fauna (amphibians and fishes) at 12 sites in young (30-50 yr), even-aged stands in western Oregon. Sampling was planned for one year prior to thinning (pre-treatment) and for years 1, 2, and 5 following thinning (post-treatment) (Table 1). Sites were staggered in their year of implementation (1994 – 2000), and are in various stages of completion. Pre-treatment and years 1 and 2 post-treatment sampling has been completed at all sites. Year 5 post-treatment sampling has been completed at three sites, is underway at four sites, and will be completed for the remaining five sites during 2004 and 2005.

The study already has produced new information and several products. Analysis of pre-treatment data has revealed species-habitat relationships and patterns between assemblage composition and hydrologic regimes (i.e., perennial and intermittent reaches). Companion studies have supported an analogous headwater vertebrate assemblage in unmanaged systems, and demonstrated the potential importance of interspecific interactions for structuring these headwater communities. Preliminary analysis of years 1 and 2 post-treatment data are ongoing, and some thinning effects with respect to the four riparian reserve widths are apparent for some species, but not for others.

The current proposal is for funding to complete:

1. Year 5 post-treatment sampling at five sites;
2. Data analysis for treatment effects with respect to upslope forest thinning intensity and riparian reserve width;
3. Final reports, manuscripts, and technology transfer.

METHODS:

Field surveys. Year 5 post-treatment sampling will be conducted according to the established study protocol. Surveys will be conducted twice a year, during the spring (wet season) and summer (dry season), at each site. Stream habitats will be inventoried for data on the frequency and dimensions of different habitat unit types (i.e., riffles or pools), substrate, and downed wood. A random subsample of habitat units will be sampled to estimate the abundance of aquatic and

streambank vertebrates. Aquatic habitats will be sampled using electroshocking or manual searches under cover objects. Streambanks will be sampled using time-constrained searches of forest-floor substrates and cover objects.

Data analysis. A variety of univariate and multivariate statistical methods will be used to assess treatment effects related to upslope forest thinning and riparian reserve width and to identify habitat associations and models for species and assemblages.

TIMELINE:

FY2004-2005: Complete data collection for year 5 post-treatment at five sites (Table1).
Complete data analysis for years 1 and 2 post-treatment at 11 sites.

FY2005-2006: Complete data analysis for year 5 post-treatment at 11 sites.
Complete final reports, manuscripts, and technology transfer.

ACCOMPLISHMENTS/PRODUCTS:

See attachment.

IS THIS PROJECT PART OF AN EXISTING PROJECT RELATED TO THE NWFP?

Yes, this continues an on-going study addressing riparian management under the NWFP.

DESCRIBE THE ABILITY OF THE RESEARCH FINDINGS OR PRODUCTS TO BE USED FOR A BROADER APPLICATION

The results will provide new information on the response of aquatic and riparian vertebrates to alternative riparian and upslope silviculture practices that is relevant to the management of young, even-aged forests on public and private lands in western Oregon. In addition, the findings will help to evaluate the effectiveness of Interim Riparian Reserves, as well as alternative reserve designs, for attaining Aquatic Conservation Strategy (ACS) objectives.

WHAT ARE THE CAPABILITIES OF THE LEAD SCIENTISTS ?

Deanna Olson, Ph.D.: Research Ecologist, USDA Forest Service, PNW, Corvallis, OR.

- 20 years experience in research and conservation planning on amphibians and fishes in the Pacific Northwest.

David Rundio: Biological Science Technician, USDA Forest Service, PNW, Corvallis, OR.

- 10 years experience in research on amphibians and fishes in the Pacific Northwest, including experimental design, sampling, data management, and analysis.

IS PART OF THE WORK BEING SUBCONTRACTED? Yes. We have an OSU cooperative agreement proposal with Dr. Klaus Puettmann (Dept. Forest Science), under which field crew personnel would be hired for field surveys in calendar years 2004 and 2005. Under a 2nd OSU cooperative agreement with Dr. Stevan Arnold (Dept. Zoology), a post-doctoral

statistical analyst will have partial duties as consultant for analyses for this project. Under a 3rd OSU cooperative agreement with Dr. Lisa Ganio (Dept. Forest Science, Dr. Gordon Reeves – Agency Cooperator), part time duties of a database manager will involve management of our study data.

REFERENCES:

- FEMAT. 1993. Forest Ecosystems Management: an ecological, economic, and social assessment. Report of the forest ecosystem management assessment team. Portland, Oregon: U.S. Department of Agriculture; U.S. Department of Interior [and others].
- Olson, D.H., Chan, S.S, and Thompson, C.R. 2002. Riparian buffers and thinning designs in western Oregon headwaters accomplish multiple resource objectives. Pp. 81-92 *In*: Johnson, A.C.; Haynes, R.W.; Monserud, R.A. (eds). *Congruent Management of Multiple Resources: Proceedings from the Wood Compatibility Workshop; December 5-7, 2001, Skamania Lodge, Stevenson, WA.* Gen. Tech. Rep. PNW-GTR-xx. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Tappeiner, J.C., Huffman, D, Marshall, D., Spies, T.A., and Bailey, J.D. 1997. Density, ages, and growth rates in old-growth and young-growth forests in coastal Oregon. *Canadian. J. Forest Research* 27: 638-648.
- Thompson, C.R., and L. Larsen. 2003. Density management studies status report. Oregon/Washington Bureau of Land Management.
- USDA and USDI. 1994. Record of Decision for amendments to Forest Service and Bureau of land Management planning documents within the range of the northern spotted owl. Standards and Guidelines for management of habitat for late-successional and old-growth related species within the range of the northern spotted owl. Interagency Publication.

BUDGET:

Justification--This funding request is written in response to the discontinuation of funds in FY04 for this project from the Northwest Forest Plan and Sustainable Management Systems research funding programs of the USDA Forest Service, Pacific Northwest Research Station. Anticipation of the closure of our previous funding source has led to the development of Cooperative Agreements with Oregon State University to complete some aspects of the work. These are listed in the table below as “Matching Funds.” In addition, we are requesting \$40,000 each year from the USDA Forest Service, as indicated below and listed as potential additional matching funds. Funds requested of USDI Bureau of Land Management in this proposal reflect the balance needed to complete year 5 surveys and finalize analyses of pretreatment data in comparison to post-treatment data in years 1, 2, and 5. Primarily, we ask for salary and operating costs for 2 persons. The first is a full-time Project Manager who will oversee the work and be directly involved in analyses and technology transfer; this person will be an established scientific author to assist the principal investigator in science products to various audiences. The second person requested is a Field Crew Leader and data manager, to be involved in the field

surveys to complete year 5 sampling. This person is preferably one who has first-hand knowledge of our study sites and procedures, whose duties will involve on-the-ground oversight of cooperator field crew operations, data entry and QA/QC, and metadata documentation. We have included field survey costs, and costs of travel to professional meetings for technology transfer to a variety of audiences.

Requested funds

	FY 2004	FY 2005	FY 2006	Total
Salary				
<u>Project manager</u> (GS-9, analyst, coauthor)				
Salary (12 mo. x 3 yr)	\$ 42,000	\$ 42,000	\$ 42,000	\$ 126,000
Benefits	\$ 14,700	\$ 14,700	\$ 14,700	\$ 44,100
Administrative costs	\$ 14,000	\$ 14,000	\$ 14,000	\$ 42,000
Total	\$ 70,700	\$ 70,700	\$ 70,700	\$ 212,100
<u>Field crew leader</u> (GS-7, onsite lead, data entry, QA/QC, metadata management)				
Salary (4 mo. x 3 yr)	\$ 12,000	\$ 12,000	\$ 12,000	\$ 36,000
Benefits	\$ 3,600	\$ 3,600	\$ 3,600	\$ 10,800
Administrative costs	\$ 4,700	\$ 4,700	\$ 4,700	\$ 14,100
Total	\$ 20,300	\$ 20,300	\$ 20,300	\$ 60,900
Supplies				
Misc. (boots, nets, GPS, field computer, copy costs, poster production, reprints, etc.)	\$ 2,000	\$ 2,000		\$ 4,000
Travel				
Vehicle costs and mileage, field site lodging, per diem	\$ 4,500	\$ 4,500		\$ 9,000
Travel to professional meetings, workshops, and demonstration tours	\$ 2,500	\$ 2,500	\$ 2,000	\$ 7,000
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Subtotal Requested Funds	\$ 100,000	\$ 100,000	\$ 93,000	\$ 293,000
Funds requested of USDA Forest Service	\$ 40,000	\$ 40,000	\$ 40,000	\$ 120,000
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Balance	\$ 60,000	\$ 60,000	\$ 53,000	\$ 173,000
SDO Overhead @ 19.5%	\$ 11,700	\$ 11,700	\$ 10,350	\$ 33,750
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TOTAL FUNDS REQEUSTED OF USDI BLM	\$ 71,700	\$ 71,700	\$ 63,350	\$ 206,750

Matching funds provided by PNW

	FY 2004	FY 2005	FY 2006	Total
Salary				
<u>Field crew</u>				
Provided by OSU coop agreement with PNW (K. Puettmann and D. Olson)	\$ 22,600	\$ 22,600		\$ 45,200
<u>Statistician</u>				
Provided by OSU coop agreement with PNW (S. Arnold and D. Olson)	\$ 10,000	\$ 10,000		\$ 20,000
<u>Database Manager</u>				
Provided by OSU coop agreement with PNW (L. Ganio and G. Reeves)	\$ 4,000	\$ 4,000	\$ 4,000	\$ 12,000
<u>Principal Investigator</u>				
D. Olson (~0.25 FTE)	\$ 25,000	\$ 25,000	\$ 25,000	\$ 75,000
TOTAL MATCHING FUNDS	\$ 61,600	\$ 61,600	\$ 29,000	\$ 152,200
<i>Matching funds requested of USDA Forest Service</i>	\$ 40,000	\$ 40,000	\$ 40,000	\$ 120,000

Table 1: Riparian Buffer Component Field Schedule

s = stream surveys, u = upslope transects, m = mollusk surveys, b = cover boards

Stand Age (yrs)	Site	Pre-treatment Surveys						Post-treatment Surveys							
		1994	1995	1996	1997	1998	1999	1998	1999	2000	2001	2002	2003	2004	2005
30-50	OM Hubbard		s					s	s			s			
	Keel Mtn		s		su				su	sum			sum		
	Soup Cr			s	s				s	s			s		
	Grant			s					s	s			s		
	Ten High				s						s	s		s	
	Green Peak					s	su			sumb	sumb			sumb	
	Delph Cr				s						s	s		s	
	Schooner Cr				s	s					s	s		s	
	Cougar			s					s	s			s		
	Bottom Line	su						s	s			s			
70-80	Callahan			s				s	s			s			
	Perkins				s					s	s			s	
	North Ward*				s										
Old Growth						2									

*Treatment not implemented

ATTACHMENT
**Products related to the BLM Density Management Studies:
Riparian Buffer Study Component – Aquatic Vertebrates and Habitats**

Publications:

2003

Rundio, David E. and Deanna H. Olson. 2003. Antipredator defenses of larval Pacific giant salamanders (*Dicamptodon tenebrosus*) against cutthroat trout (*Oncorhynchus clarki*). *Copeia* 2003(2): 392-397.

Sheridan, Chris D. and Deanna H. Olson. 2003 in press. Amphibian assemblages in zero-order basins in the Oregon Coast Range. *Canadian Journal of Forest Research*.

2002

Olson, Deanna H., Samuel S. Chan, and Charles R. Thompson. 2002. Riparian buffers and thinning designs in western Oregon headwaters accomplish multiple resource objectives. In: Johnson, A.C.; Haynes, R.W.; Monserud, R.A.; eds. *Congruent Management of Multiple Resources: Proceedings from the Wood Compatibility Workshop*; December 5-7, 2001, Skamania Lodge, Stevenson, WA. Gen. Tech. Rep. PNW-GTR-563. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 81-91.

2001

Hohler, David, James Sedell, and Deanna Olson. 2001. Aquatic conservation strategy. Pp 30-39 In: Richard W. Haynes and Gloria E. Prez (tech. eds.). *Northwest Forest Plan Research Synthesis*. Gen. Tech. Report, PNW-GTR-498, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

Olson, Deanna H. 2001. Ecology and management of montane amphibians of the U.S. Pacific Northwest. *Biota* 2:51-74.

Olson, D.H., J.C. Hagar, A.B. Carey, J.H. Cissel, and F.J. Swanson. 2001. Wildlife communities in westside and high montane forest. Chapter 7, pp. 187-212 In: Johnson, D.H. and T.A. O'Neil (Managing Directors), *Wildlife-habitat relationships in Oregon and Washington*, Oregon State University Press, Corvallis, OR.

Rundio, David E. and Deanna H. Olson. 2001. Palatability of southern torrent salamander (*Rhyacotriton variegatus*) larvae to Pacific giant salamander (*Dicamptodon tenebrosus*) larvae. *Journal of Herpetology* 35(1): 133-136.

2000

Olson, D.H., S.S. Chan, P. Cunningham, B. Hansen, A. Moldenke, R. Progar, P.S. Muir, B. McCune, A. Rosso, E.B. Peterson. 2000. Characterizing managed headwater forests – integration of stream, riparian, and upslope habitats and species in western Oregon: Companion projects to the BLM Density Management Studies. Pp. 539-540 In: *Proceedings of the Society of American Foresters 1999 National Convention*, 11-15 September, Portland, OR. SAF Publication 00-1, Bethesda, MD; ISBN 0-939970-81-3.

Olson, D.H., S.S. Chan, G. Weaver, P. Cunningham, A. Moldenke, R. Progar, P.S. Muir, B. McCune, A. Rosso, E.B. Peterson. 2000. Characterizing stream, riparian, upslope habitats and species in Oregon managed headwater forests. Pp. 83-88 In: Wiggington, J. and R. Beschta (eds.). *Riparian Ecology and Management in Multi-Land Use Watersheds*. International conference of the American Water Resources Association, 30 August, Portland, OR. AWRA Publication TPS-00-2, Middleburg, VA. 616 pp.

Tappeiner, J.C. II, D.H. Olson, and C.R. Thompson. 2000. Density management studies of western Oregon. Pp. 556-557 In: Proceedings of the Society of American Foresters 1999 National Convention, 11-15 September, Portland, OR. SAF Publication 00-1, Bethesda, MD; ISBN 0-939970-81-3.

1999

Nauman, R., D.H. Olson, L. Ellenburg, and B. Hansen 1999. *Plethodon dunni* (Dunn's salamander). Reproduction. *Herpetological Review* 30: 89-90.

1994-1998

Cissel, J.H., F.J. Swanson, G.E. Grant, D.H. Olson, S.V. Gregory [and others]. 1998. A landscape plan based on historical fire regimes for a managed forest ecosystem: the Augusta Creek study. General Technical Report PNW-GTR-422. Portland, Oregon: USDA Forest Service, Pacific Northwest Research Station.

USDA and USDI. 1996. Riparian Reserve Evaluation Techniques and Synthesis. Module of the Guide to Watershed Analysis. Riparian Reserve Technical Team, Regional Ecosystem Office, Portland, OR. Interagency publication.

Blaustein, A.R., J.J. Beatty, D.H. Olson, and R.M. Storm. 1995. The Biology of amphibians and reptiles in old-growth forests in the Pacific Northwest. General Technical Report PNW-GTR-337, Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 98 pp.

Published Abstracts:

2003

Olson, Deanna. 2003 in press. Sampling stream banks. *Northwestern Naturalist*.

Olson, Deanna, Samuel S. Chan, Loretta Ellenburg, and Cynthia Rugger. 2003 in press. Riparian buffers within a forest thinning context: effects on stream amphibians and riparian microclimates in headwater drainages. *Northwestern Naturalist*.

Rundio, David, Deanna Olson, Loretta Ellenburg, and Samuel Chan. 2003 in press. Effects of forest thinning on terrestrial salamanders and potential benefits of riparian reserves. *Northwestern Naturalist*.

Sheridan, Chris D. and Deanna H. Olson. 2003 in press. Amphibian assemblages in zero-order basins in the Coast Range of Oregon. *Northwestern Naturalist*.

2002

Moldenke, Andrew R., Robert A. Progar. and Deanna H. Olson. 2002. Northwest fauna in managed forested headwaters: invertebrates and vertebrates. *Northwestern Naturalist* 83: 77.

Morey, Steve and Deanna H. Olson. 2002. Rare salamanders on federal lands: 2002 research and management directions. *Northwestern Naturalist* 83: 78.

Nauman, Richard and Deanna H. Olson. 2002. The effect of clear cut edges on rare terrestrial salamanders in southwestern Oregon. *Northwestern Naturalist* 83: 78.

Rundio, David and Deanna H. Olson. 2002. Antipredator behaviors of Pacific giant salamander larvae against trout. *Northwestern Naturalist* 83: 83.

Sheridan, Chris D. and Deanna H. Olson. 2002. Amphibian communities and habitat use in zero-order basins in the Oregon Coast Range. *Northwestern Naturalist* 83: 84.

Thompson, Charley, Deanna H. Olson, Samuel Chan, Kathleen Maas-Hebner, and John Tappeiner. 2002. The density management and riparian buffer studies of western Oregon. *Northwestern Naturalist* 83: 86.

2001

DeGross, Douglas, Richard Nauman, Deanna H. Olson, and Lisa M. Ollivier. 2001. The role of federal reserved lands for salamander persistence in southwest Oregon and northwestern California. *Northwestern Naturalist* 82: 68.

Wessell, Stephanie J. and Deanna H. Olson. 2001. Upslope leave islands as refugia for sensitive plant and animal species in managed forests. *Northwestern Naturalist* 82: 84.

2000

Hansen, B.P., D. H. Olson, and C.D. Moyer. 2000. Demographics and age at metamorphosis of larval tailed frogs, *Ascaphus truei*, in a coastal Oregon stream. *Northwestern Naturalist* 81: 75.

Olson, D.H. 2000. Ecology and management of montane amphibians in the U.S. Pacific Northwest. *Biota* 1: 39.

Olson, D.H. and T.M. Davis. 2000. Terrestrial salamander sampling: development of a monitoring program. *Northwestern Naturalist* 81: 84.

Olson, D.H., G.W. Weaver, L.L. Ellenburg, B.P. Hansen, and R. Thompson. 2000. Stream vertebrates in managed headwater streams: habitat associations of assemblages and species. *Northwestern Naturalist* 81:84.

Rundio, D.E. and D.H. Olson. 2000. Palatability of southern torrent salamander larvae to Pacific giant salamander larvae. *Northwestern Naturalist* 81:86-87.

Weaver, G.W., D.H. Olson, L.L. Ellenburg, and B.P. Hansen. 2000. Sampling designs for aquatic vertebrates in managed headwater streams. *Northwestern Naturalist* 81: 91.

1999

Nauman, R.S. and D.H. Olson. 1999. Conservation planning for rare salamanders in the Pacific Northwest. *Northwestern Naturalist* 80:130.

Thompson, R., D. Olson, L. Ellenburg, and B. Hansen. 1999. Streambank plethodontids in headwater drainages. *Northwestern Naturalist* 80:133.

Recent Posters:

Nauman, Richard and Deanna H. Olson. 2003. The effect of forest edges on ground-dwelling organisms in southwestern Oregon. Innovations in Species Conservation: Integrative Approaches to Address Rarity & Risk, Portland, OR. April 2003.

Nauman, Richard and Deanna H. Olson. 2002. The effect of clear cut edges on rare terrestrial salamanders in southwestern Oregon. Society for Northwestern Vertebrate Biology, Hood River. April 2002.

Olson, Dede, Steve Morey, David Clayton, Richard Nauman, Ed Reilly, John Guetterman, Brenda Devlin, and Hart Welsh. 2003. Rare and uncommon terrestrial salamanders in northwestern forests. Innovations

in Species Conservation: Integrative Approaches to Address Rarity & Risk, Portland, OR. April 2003.

Olson, D.H., K. Ronnenberg, and W.P. Leonard. 2001. Forest-dwelling amphibians of the Pacific Northwest. Presentations to: U.S. Congressional Delegation (10/4/01, Corvallis FSL), Deputy Chief Forest Service (10/15-16/01, Wilsonville, OR); ARMI conference (12/01, Corvallis); Wildlife Society (2/02); SNVB (4/02)

Rundio, David E. and Deanna H. Olson. 2002. Antipredator defenses and distribution of headwater stream salamanders. Oregon Chapters of the Wildlife Society (Gleneden Beach, OR; February 2002); ALI Retreat (3/02, Welches); and the American Fisheries Society (Sunriver, OR; March 2002).

Sheridan, Chris D. 2002. Amphibian assemblages in zero-order basins. Presentations to: U.S. Congressional Delegation (10/4/01, Corvallis FSL), Deputy Chief Forest Service (10/15-16/01, Wilsonville, OR); Headwaters Research Cooperative workshop (12/01, Corvallis); ALI Retreat (3/02, Welches); CLAMS Symposium (6/02, Corvallis).

Thompson, Charley, Deanna H. Olson, Samuel Chan, Kathleen Maas-Hebner, and John Tappeiner. 2002. The density management and riparian buffer studies of western Oregon.

>20 poster displays and/or brochure distributions have been made, including:

- October 2001: Congressional staff (Smith, Hooley), Corvallis, OR
Deputy Chief FS, Wilsonville, OR
PNW - Olympia, WA
Headwaters Research Cooperative Workshop, Corvallis, OR
- Nov. 2001: Biodiversity Conference, Taiwan
Congressional staff (Wyden, DeFazio), Eugene, OR.
Region 6 Riparian Management Conference, Hood River, OR
- Dec. 2001: Western Forestry & Conser. Sci. Symp., Eugene, OR
Region 6, Watershed Restoration Workshop, Skamania, WA
Wood Compatibility Initiative Workshop, Skamania Lodge, WA
- Feb. 2002: OR Chapter, The Wildlife Society, Gleneden Beach, OR
OR Chapter, American Fisheries Society, Sunriver, OR
Small Stream Channels and their Riparian Zones Symp., Vancouver, BC
ALI Program retreat, Welches, OR
- March 2002: Silviculture Options conference, Corvallis, OR
Ministry of Air, Land, and Water, Riparian Ecology and Management, Riparian restoration best management practices Workshop, Richmond, BC
- April 2002: Society for Northwestern Vertebrate Biology, Hood River.
Mount Hood National Forest, OR
- May 2002: Western Division of the American Fisheries Society, Spokane, WA
- June 2002: Aquatic Level one and two teams, Keel Mountain, OR
Managing Landscapes for Diversity, Workshop, Sisters, OR

Tappeiner, J., C. Thompson, D. Olson, and S. Chan. 2001. Density Management Studies.

Presentations to:

- May 2001: National Silviculture Workshop, USDA Forest Service, Hood River, OR.
- August 2001: Thinning in LSRs Workshop, USDA Forest Service, Portland, OR.
- Sept. 2001: Society for American Foresters, Denver, CO, 9/14/01 (session cancelled, 9/11)

Wessell, Stephanie J., Deanna H. Olson, and Richard A Schmitz. 2003. Upslope leave islands as refugia for low-mobility species. Innovations in Species Conservation: Integrative Approaches to Address Rarity & Risk, Portland, OR. April 2003.

Recent presentations and related oral technology transfer:**2003**

Chan, Samuel S., David Larsen, Dede Olson, and Bill Emmingham. 2003. Density management effects on stand development and microclimate in headwater forests of western Oregon. North American Forest Ecology Workshop, Oregon State University, Corvallis, OR, June 16-20, 2003.

Olson, Dede. 2003. Alternative Riparian Buffer Widths in Commercial Thinning Operations: Effects on Aquatic Vertebrates. Young Stand Management Workshop, Springfield, OR, May 6, 2003.

Olson, Deanna H. 2003. Sampling stream banks. Stream Amphibian Workshop. Society for Northwestern Vertebrate Biology, Arcata, CA, March 19-22, 2003.

Olson, Deanna, Samuel S. Chan, Loretta Ellenburg, and Cynthia Rugger. 2003. Riparian buffers within a forest thinning context: effects on stream amphibians and riparian microclimates in headwater drainages. Society for Northwestern Vertebrate Biology, Arcata, CA, March 19-22, 2003.

Olson, Deanna, Loretta Ellenburg, and Cynthia Rugger. 2003. Density management and riparian buffer studies of western Oregon: amphibians and fishes. North American Forest Ecology Workshop, Oregon State University, Corvallis, OR, June 16-20, 2003.

Rundio, David, Deanna Olson, Loretta Ellenburg, and Samuel Chan. 2003. Effects of forest thinning on terrestrial salamanders and potential benefits of riparian reserves. Society for Northwestern Vertebrate Biology, Arcata, CA, March 19-22, 2003.

Sheridan, Chris D. 2003. Plant assemblages in zero-order basins in the Oregon Coast Range. North American Forest Ecology Workshop, Oregon State University, Corvallis, OR, June 16-20, 2003.

Sheridan, Chris D. and Deanna H. Olson. 2003. Amphibian assemblages in zero-order basins in the Coast Range of Oregon. Society for Northwestern Vertebrate Biology, Arcata, CA, March 19-22, 2003.

2002

Moldenke, Andrew R., Robert A. Progar, and Deanna H. Olson. 2002. Northwest fauna in managed forested headwaters: invertebrates and vertebrates. Society for Northwestern Vertebrate Biology, Hood River. April 2002.

Morey, Steve and Deanna H. Olson. 2002. Rare salamanders on federal lands: 2002 research and management directions. Society for Northwestern Vertebrate Biology, Hood River. April 2002.

Olson, Deanna H. 2002. The role of riparian reserves and leave islands in forest biodiversity management. Society for Conservation Biology, University of Kent, Canterbury, UK. July 2002.

Olson, Dede. 2002. Implications of thinning for wildlife: amphibians. OSU College of Forestry, Outreach Education Program, Silvicultural options for Sustainable Management of Pacific Northwest Forests: Integrating research results into management practice, March 2002.
[Http://outreach.cof.orst.edu/silvopt/presentations.htm](http://outreach.cof.orst.edu/silvopt/presentations.htm).

Rundio, David and Deanna H. Olson. 2002. Antipredator behaviors of Pacific giant salamander larvae against trout. Society for Northwestern Vertebrate Biology, Hood River. April 2002.

Sheridan, Chris and Deanna Olson. 2002. Amphibian assemblages in drainage heads in the Oregon Coast Range. Oregon Chapter of The Wildlife Society, Gleneden Beach, OR. February 2002.

Sheridan, Chris D. and Deanna H. Olson. 2002. Amphibian communities and habitat use in zero-order basins in the Oregon Coast Range. Society for Northwestern Vertebrate Biology, Hood River. April 2002.

Wessell, Stephanie J., Deanna H. Olson and Richard A. Schmitz. 2002. Upslope leave islands as refugia for sensitive plant and animal species in managed forests. Oregon Chapter of The Wildlife Society, Gleneden Beach, OR. February 2002.

2001

DeGross, Douglas, Richard Nauman, Deanna H. Olson, and Lisa M. Ollivier. 2001. The role of federal reserved lands for salamander persistence in southwest Oregon and northwestern California. Conference: "Crossing boundaries in forest management", 2001 Annual meeting of the Society for Northwestern Vertebrate Biology, March 28-30, Victoria, BC, Canada. 150 participants.

Olson, Deanna H. 2001. Riparian reserves: finding formulas to conserve fish and wildlife in headwaters. Session: Front country: considerations for the balancing act. Invited paper. Symposium: Conservation of riparian areas and waterways: Consideration for fish and wildlife habitat. Portland, OR. 12-13 February.

Olson, Deanna H. 2001. Amphibians in western forests: tip of the iceberg! Invited paper. Session: Diversity and management of northwestern amphibians. Annual meeting of the Oregon Chapters of the American Fisheries Society and The Wildlife Society, Portland, OR, 14-16 February, 600 participants.

Olson, D.H. 2001. Riparian buffer study and the aquatic vertebrate component. USFS Workshop on Thinning in LSRs, Portland, OR. August 2001.

Rundio, D. 2001. Palatability and distribution of torrent and giant salamanders in headwater streams. Annual meeting of the Animal Behavior Society, Corvallis, OR. July. 400 participants.

Wessell, Stephanie J. and Deanna H. Olson. 2001. Upslope leave islands as refugia for sensitive plant and animal species in managed forests. Conference: "Crossing boundaries in forest management", 2001 Annual meeting of the Society for Northwestern Vertebrate Biology, March 28-30, Victoria, BC, Canada. 150 participants.

2000

Hansen, B.P., D. H. Olson, and C.D. Moyer. 2000. Demographics and age at metamorphosis of larval tailed frogs, *Ascaphus truei*, in a coastal Oregon stream. Conference: Integrating Aquatic and Terrestrial Vertebrate Research and Management, Annual meeting of the Washington Chapter of the Wildlife Society and the Society for Northwestern Vertebrate Biology, March 15-17, Ocean Shores, WA.

Nauman, R.S. and D.H. Olson. 2000. The effect of clearcut edges on terrestrial salamanders in southwestern Oregon. 80th Annual Meeting of the American Society of Ichthyologists and Herpetologists, 14-20 June, La Paz, Mexico.

Olson, D. 2000. Understanding the ecology of riparian management areas, fish, wildlife and water quality: An overview of the ecological interactions. Invited paper in workshop: Riparian management areas: the ecology, functions and management. Northwest Forest Soils Council, Society of American Foresters, and Western Forestry and Conservation Association. April 24-25, Wilsonville, OR.

Olson, D.H. 1999. Standardized survey protocols to detect rare terrestrial salamanders in managed federal forests of the US Pacific Northwest. Conference: Monitoring Terrestrial Salamanders, 26-29 October, North Bay, Ontario, Canada.

Olson, D. 2000. Monitoring and surveying for amphibians: Practical advice. Invited paper in workshop, Amphibians and Forestry: Combining timber production and amphibian management, Western Forestry and Conservation Association, May 8, Olympia, WA.

Olson, D.H. 2000. Ecology and management of montane amphibians of the U.S. Pacific Northwest. First International Meeting on the Biology and Ecology of Alpine Amphibians and Reptiles, Nazarje, Slovenia, 1-3 September.

Olson, D.H. and T.M. Davis. 2000. Terrestrial salamander sampling: development of a monitoring program. Conference: Integrating Aquatic and Terrestrial Vertebrate Research and Management, Annual meeting of the Washington Chapter of the Wildlife Society and the Society for Northwestern Vertebrate Biology, March 15-17, Ocean Shores, WA.

Olson, D.H., G.W. Weaver, L.L. Ellenburg, and B.P. Hansen. 2000. Stream vertebrates in managed headwater streams: habitat associations of assemblages and species. Conference: Integrating Aquatic and Terrestrial Vertebrate Research and Management, Annual meeting of the Washington Chapter of the Wildlife Society and the Society for Northwestern Vertebrate Biology, March 15-17, Ocean Shores, WA.

Rundio, D.E. and D.H. Olson. 2000. Palatability of southern torrent salamander larvae to Pacific giant salamander larvae. Conference: Integrating Aquatic and Terrestrial Vertebrate Research and Management, Annual meeting of the Washington Chapter of the Wildlife Society and the Society for Northwestern Vertebrate Biology, March 15-17, Ocean Shores, WA.

Weaver, G.W., D.H. Olson, L.L. Ellenburg, and B.P. Hansen. 2000. Sampling designs for aquatic vertebrates in managed headwater streams. Conference: Integrating Aquatic and Terrestrial Vertebrate Research and Management, Annual meeting of the Washington Chapter of the Wildlife Society and the Society for Northwestern Vertebrate Biology, March 15-17, Ocean Shores, WA

Weaver, G.W. 2000. Influence of sample plot shape on efficiency of estimates of abundance of spatially patterned forest resources. International Union of Forest Research Organizations, August 6-12, Kuala Lumpur, Malaysia.

Weaver, G.W. 2000. Characterization of central tendency and spatial variability of growth and mortality of forests: a comparison of some statistical models. International Union of Forest Research Organizations, August 6-12, Kuala Lumpur, Malaysia.

Educational Activities, 2000-2003:

Public Arena

Salmon Watch, Program for Middle and High Schools, Riparian management field tour
Outdoor School, Program for Middle School, Riparian management field session
Forest Camp, Program for Middle and High Schools, Riparian ecology sessions
Discovering New Horizons, Program for Middle and High School girls, Riparian ecology

Technical/Professional Arena

Density Management and Riparian Buffer Studies Tours, 1996-present, Demonstration of alternative silvicultural treatments and riparian buffer widths in managed forest stands, 30-50 yrs old. Reporting of research findings of multiple resource production.
Various sites and participants, including:

2 Tours given in FY02:

April 2002, Delph Creek, Mount Hood, OR, 40 participants, Region 6 and BLM
June 2002, Keel Mountain, Lebanon, OR, 40 participants

3 Tours given in FY01:

May 2001, Delph Creek, Mount Hood, OR, 40 participants, Region 6 and BLM
July 2001, Bottom Line, west of Eugene, OR, 8 participants, BLM State Office
August 2001, Soup Creek, near Coos Bay, OR, 15 participants, Region 6

2 Tours given in FY00:

Green Peak site. PNW Northwest Forest Plan research review team. Approx. 10 persons, USFS and USGS.

BLM Mary's Peak Resource Area. CFER, USGS, OSU, BLM and USFS cooperators.
Approx. 30 persons.

Stream amphibian workshop, Humboldt State University, Arcata, CA, March 2003, 40 participants

OSU FW505, Reading and Conference, Conserving forest biodiversity, Fall 2002, 6 participants

OSU FW505, Reading and Conference, Culverts and faunal passage, Winter 2002. 3 participants.

OSU FS 453, Lecture: Amphibians in western forests, June 2001 and 2002, 150 participants/yr

OSU College of Forestry, Outreach Education Program, Silvicultural options for Sustainable Management of Pacific Northwest Forests: Integrating research results into management practice, March 2002. Lecture on effects of thinning on amphibians. About 100 participants
[Http://outreach.cof.orst.edu/silvopt/presentations.htm](http://outreach.cof.orst.edu/silvopt/presentations.htm).

OSU College of Forestry, Outreach Education Program, Silviculture for Diverse Forests, June 2002. Lecture on density management and riparian buffer strategies, and fish/amphibians. (Hansen and Olson) About 40 participants.

OSU FW505, Reading and Conference, Species-habitat relationships in Oregon and Washington, Spring 2001, 8 participants

Ecosystem Institute course, Amphibian ecology and management lecture and field tour, HJ Andrews, OR, July 1998-2001, 14 participants/yr

OSU FW 499, Riparian amphibian lecture/field tour (David Rundio), Riparian Entomology course, HJ Andrews, OR, August 2001, approx. 15 participants

Large Wood in Coastal Oregon Streams, Field tour, Oregon State University Wood Conference, Corvallis, OR, Approx. 20 participants (D. Olson and C. May, leads), 28 October 2000

Aquatic Monitoring Shortcourse, Amphibian ecology and monitoring, Utah State Univ., Logan, Utah, ~26 participants, September/October, 1995 – 2000.

Graduate Students

In Progress

Stephanie Wessell, OSU Dept. F&W (D. Olson co-advisor with Dick Schmitz), role of leave islands for species, Master's.

Jessica Rykken, OSU Dept. Entomol., (Tim Schowalter, advisor), Arthropods and riparian buffers, Ph.D.

David Waldien, OSU Dept F&W, (John Hayes, advisor), effects of down wood on small mammals. Ph.D.

Defended in 2001-2002

David Rundio, OSU Dept. F&W (D. Olson co-advisor with Stan Gregory) Savery Outstanding Master's Student Award OSU Dept. Fisheries and Wildlife, OSU College of Agriculture TG Scott Award, Master's student. Trout-salamander interactions. Master's, 2002

Chris Sheridan, OSU Dept. Forest Science (D. Olson co-advisor with Tom Spies). Plant and amphibian assemblages in zero order basins. Master's, 2002.

Margo Stoddard, OSU Dept. Forest Science (John Hayes, advisor), Headwater stream amphibians and forest management, Master's, 2001.

Kirsten McDade, OSU Dept. Forest Science (Chris Maguire, advisor), Demo project: ground dwelling vertebrate response to forest management, Master's, 2001.

Post-doctoral and collaborative projects with Universities

Dr. Nobuya Suzuki - OSU Dept. Zoology, Risk and uncertainty with conservation planning, and riparian buffer study statistical consultant, start date 8/15/03.

Dr. Klaus Puettmann – OSU Dept. Forest Science, Partnership to support year 2004-2005 field survey crew members for riparian buffer study.