

20 March 2007 *Curriculum Vitae*

CHRISTOPHER A. FRISSELL

Senior Staff Scientist

The Pacific Rivers Council

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Birth: 1 December 1960, Chehalis, Washington

Education: Ph.D. in Fisheries Science, Oregon State University, 1992
M.S. in Fisheries Science, Oregon State University, 1986
B.A. with High Honors in Zoology, University of Montana, 1982

Appointments:

Senior Staff Scientist, The Pacific Rivers Council, 2000-present.
Research Associate Professor, The University of Montana, Flathead Lake Biological Station, 1998-2000 (presently Affiliate Faculty status)
Research Assistant Professor, The University of Montana, Flathead Lake Biological Station, 1993-1998
Research Assistant Professor, Department of Fisheries and Wildlife, Oregon State University, 1994-1997
Postdoctoral Research Associate (Faculty), Department of Fisheries and Wildlife, Oregon State University, 1992-1994
Research Assistant (Faculty), Oak Creek Laboratory of Biology, Department of Fisheries and Wildlife, Oregon State University, 1985-1992

Fields of Interest:

Cumulative impacts of human activities and natural processes on stream habitat and stream biota
Ecology, biogeography, and conservation biology of fishes and aquatic biota in relation to landscape change
Aquatic ecosystem conservation and restoration strategies
Geomorphology and landscape ecology in design of integrated conservation reserves
Restoration and recovery planning and design

Professional Societies:

Society for Conservation Biology, 1991-present
American Fisheries Society, 1985-present
Ecological Society of America, 1987-present
North American Benthological Society, 1983-present

Graduate Students Mentored

- Cavallo, B.J. M.S. in Organismal Biology and Ecology, The University of Montana, 1997. Thesis title: Floodplain habitat heterogeneity and the distribution, abundance, and behavior of fishes and amphibians in the Middle Fork Flathead River Basin, Montana.
- Adams, S. B. Ph.D. in Organismal Biology and Ecology, The University of Montana, 1999. Dissertation title: Mechanisms Limiting a Vertebrate Invasion: Brook Trout in Mountain Streams of the Northwestern USA.
- Hitt, N.P., M.S. in Organismal Biology and Ecology, The University of Montana, 2002, Distribution and potential invasion of introduced rainbow trout in the upper Flathead River drainage.
- Carnefix, G. M.S. in Organismal Biology and Ecology, The University of Montana, 2002. Thesis title: Movements and ecology of bull trout in Rock Creek, MT.
- Hastings, K. Ph.D. in Organismal Biology and Ecology, The University of Montana, 2005. Dissertation title: Long-term persistence of isolated fish populations in the Alexander Archipelago.

Appointments to Peer Review Panels and Scientific Advisory Committees:

- Landscape Pattern Task Group, *State of the Nation's Ecosystems* report. 2003-2007. H. John Heinz III Center For Science, Economics and the Environment. Washington, DC.
<http://www.heinzctr.org/Programs/Reporting/Working%20Groups/Fragmentation/index.shtml>
- Science Review Team, King County Normative Flow Studies Project. 2002-2005, Seattle, WA. <http://dnr.metrokc.gov/wlr/BASINS/flows/science-review-team.htm>
- Science Advisory Panel, Westside. Governor's Salmon Restoration Funding Board, Washington State, February 2000.
- Ecological Work Group, Multi-species Framework Process and Subbasin Assessment Process, Northwest Power Planning Council 1998-2000.
- Peer review panelist for U.S. Environmental Protection Agency/National Science Foundation Water and Watersheds Grants Program for 1997. 7-9 May 1997.
- Scientific Group for the Governor's Bull Trout Restoration Team, State of Montana, 1994-present
- Oregon Department of Environmental Quality, 1992-95: Temperature Standards Review Subcommittee of the Technical Advisory Committee, Triennial Water Quality Standards Review
- Scientific Assessment Panel for amphibian species, Eastside Oregon-Washington and Upper Columbia Basin EIS, US BLM and US Forest Service, 1994
- Oregon Department of Forestry, 1990-93: Technical Advisory Group for the Forest Practices Monitoring Program; Wetlands Technical Group; Stream Protection Advisory Panel

Theses and Dissertations:

- Frissell, C.A. 1992. Cumulative effects of land use on salmon habitat in southwest Oregon coastal streams. Doctoral dissertation, Oregon State University, Corvallis.
- Frissell, C. A. 1986. A hierarchical stream habitat classification system: development and demonstration. M.S. thesis, Oregon State University, Corvallis.
- Frissell, C. A. 1982. Colonization and development of community structure in coexisting Ephemerellid mayflies (Ephemeroptera, Ephemerellidae). Senior Thesis, Watkins Scholarship Program, The University of Montana, Missoula.

Member of Board of Editors for Journals:

Conservation Biology, 1996-2000

Reviewer for Journals and Agency Publications:

Canadian Journal of Fisheries and Aquatic Sciences, *Conservation Biology*, *Ecological Applications*, *Environmental Management*, *Fisheries*, *Freshwater Biology*, *North American Journal of Fisheries Management*, *Oikos*, *Transactions of the American Fisheries Society*, *Fundamental and Applied Limnology*, USDA Forest Service General Technical Reports

Articles Published in Scientific Journals:

- Olson, D.H., P.D. Anderson, C.A. Frissell, H. H. Welsh, Jr., and D. F. Bradford. 2007. Biodiversity management approaches for stream-riparian areas: perspectives for Pacific Northwest headwater forests, microclimates, and amphibians. *Forest Ecology and Management*, In Press.
- Poole, G.C., J.A. Stanford, S.W. Running, and C.A. Frissell. 2006. Multiscale geomorphic drivers of groundwater flow paths: subsurface hydrologic dynamics and hyporheic habitat diversity. *Journal of the North American Benthological Society*. 25(2): 288-303.
- Poole, G. C., J. A. Stanford, S. W. Running, C. A. Frissell, W. W. Woessner, and B. K. Ellis. 2004. A patch hierarchy approach to modeling surface and sub-surface hydrology in complex flood-plain environments. *Earth Surface Processes and Landforms* 29: 1259–1284.
- Karr, J. R., J. J. Rhodes, G. W. Minshall, F. R. Hauer, R. L. Beschta, C. A. Frissell, and D. A. Perry. 2004. The effects of postfire salvage logging on aquatic ecosystems in the American West. *BioScience* 54:1029-1033.
- Hitt, N.P., and C.A. Frissell. 2004. A case study of surrogate species in aquatic conservation planning. *Aquatic Conservation: Marine and Freshwater Ecosystems*. 14:625–633.
- Beschta, R.L., J. J. Rhodes, J. B. Kauffman, R. E. Gresswell, G. W. Minshall, J. R. Karr, D.A. Perry, F.R. Hauer, C. A. Frissell. 2004. Postfire Management on Forested Public Lands of the Western United States. *Conservation Biology* 18: 957–967.

Articles Published in Scientific Journals, continued

- Hitt, N.P., Frissell, C.A., Muhlfeld, C.C. and F.W. Allendorf. 2003. Spread of hybridization between native westslope cutthroat trout, *Oncorhynchus clarki lewisi*, and non-native rainbow trout, *O. mykiss*. *Canadian Journal of Fisheries and Aquatic Sciences* 60: 1440-1451.
- Ebersole, J.T., W.J. Liss, and C.A. Frissell. 2003. Thermal heterogeneity, stream channel morphology and salmonid abundance in northeast Oregon streams. *Canadian Journal of Fisheries and Aquatic Sciences* 60:1266-1280.
- Poole, G. C., J. A. Stanford, C. A. Frissell and S. W. Running. 2002. Three-dimensional mapping of geomorphic controls on flood-plain hydrology and connectivity from aerial photos. *Geomorphology* 48(4):329-347.
- Adams, S.B., and C.A. Frissell. 2002. Changes in distribution of nonnative brook trout in an Idaho drainage over two decades. *Transactions of the American Fisheries Society*, 131:561-568.
- Adams, S.B., and C.A. Frissell. 2001. Thermal habitat use and evidence of seasonal migration by tailed frogs, *Ascaphus truei*, in Montana. *Canadian Field-Naturalist* 115: 251-256.
- Adams, S.B., C.A. Frissell, and B.E. Rieman. 2001. Geography of invasion in mountain streams: consequences of headwater lake fish introductions. *Ecosystems* 296-307.
- Ebersole, J.L., W.J. Liss, and C. A. Frissell. 2001. Relationship between stream temperature, thermal refugia, and rainbow trout *Oncorhynchus mykiss* abundance in arid-land streams in the northwestern United States. *Ecology of Freshwater Fish* 10:1-10.
- Adams, S.A., C.A. Frissell, and B.E. Rieman. 2000. Movements of non-native brook trout in relation to stream channel slope. *Transactions of the American Fisheries Society* 129:623-638
- Trombulak, S.C., and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation Biology* 14:18-30.
- Baxter, C.V., C.A. Frissell, and F.R. Hauer. 1999. Geomorphology, logging roads and the distribution of bull trout (*Salvelinus confluentus*) spawning in a forested river basin: implications for management and conservation. *Transactions of the American Fisheries Society*, 128:854-867.
- Independent Scientific Group. 1999. Scientific issues in the restoration of salmonid fishes in the Columbia River. *Fisheries* 24(3):10-19.
- Currens, K.P., F.W. Allendorf, D. Bayles, D.L. Bottom, C.A. Frissell, D. Hankin, J.A. Lichatowich, P.C. Trotter, and T.A. Williams. 1998. Conservation of Pacific salmon: response to Wainwright and Waples. *Conservation Biology* 12:1148-1149.
- Poole, G.C., C.A. Frissell, and S.C. Ralph. 1997. In-stream habitat unit classification: inadequacies for monitoring and some consequences for management. *Journal of the American Water Resources Association* 33:879-896.
- Ebersole, J.L., W.J. Liss, and C.A. Frissell. 1997. Restoration of stream habitats in the western United States: restoration as re-expression of habitat capacity. *Environmental Management*. 21:1-14.

Articles Published in Scientific Journals, continued

- Allendorf, F.W., D. Bayles, D.L. Bottom, K.P. Currens, C.A. Frissell, D. Hankin, J.A. Lichatowich, W. Nehlsen, P.C. Trotter, and T.H. Williams. 1997. Prioritizing Pacific salmon stocks for conservation. *Conservation Biology* 11:140-152.
- Frissell, C.A., and D. Bayles. 1996. Ecosystem management and the conservation of aquatic biodiversity and ecological integrity. *Water Resources Bulletin* 32:229-240.
- Stanford, J.A., J.V. Ward, W.J. Liss, C.A. Frissell, R.N. Williams, J.A. Lichatowich, and C.C. Coutant. 1996. A general protocol for restoration of regulated rivers. *Regulated Rivers: Research and Management* 12:391-413.
- Nawa, R., and C.A. Frissell. 1994. Measuring scour and fill of gravel streambeds with scour chains and sliding bead monitors. *North American Journal of Fisheries Management* 13:634-639.
- Frissell, C.A. 1993. Topology of extinction and endangerment of native fishes in the Pacific Northwest and California, USA. *Conservation Biology* 7:342-354.
- Frissell, C.A., R.K. Nawa, and R. Noss. 1992. Is there any conservation biology in "New Perspectives?" A response to Salwasser. *Conservation Biology* 6:461-464.
- Frissell, C.A., and R.K. Nawa. 1992. Incidence and causes of failure of artificial habitat structures in streams of western Oregon and Washington. *North American Journal of Fisheries Management* 12:182-197.
- Frissell, C.A., W.J. Liss, C.E. Warren, and M.D. Hurley. 1986. A hierarchical framework for stream habitat classification: viewing streams in a watershed context. *Environmental Management* 10:199-214.

Symposium Articles Published:

- Poole, G.C., J.A. Stanford, S.W. Running, and C.A. Frissell. 2000. A Linked GIS/modeling approach to assessing the influence of flood-plain structure on surface- and ground-water routing in rivers. *Proceedings of the 4th International Conference on Integrating Geographic Information Systems (GIS) and Environmental Modeling*. Held 2-8 September 2000, Banff, Alberta. B. Parks, editor.
- Clancy, C., C. Frissell, and T. Weaver. 1998. Removal or suppression of introduced fish to aid bull trout recovery. *Proceedings of the Wild Trout XI Conference*, held August, 1997 in Bozeman, MT.
- Li, H.W., K. Currens, D. Bottom, S. Clarke, J. Dambacher, C. Frissell, P. Harris, R.M. Hughes, D. McCullough, A. McGie, K. Moore, R. Nawa, and S. Thiele. 1995. Safe havens: refuges and evolutionarily significant units. *American Fisheries Society Symposium* 17:371-380.
- Frissell, C.A., W.J. Liss, and D. Bayles. 1993. An integrated, biophysical strategy for ecological restoration of large watersheds. In D.F. Potts ed., *Changing Roles in Water Resources Management and Policy*. Proceedings of a symposium of the American Water Resources Association, held 27-30 June, 1993, Bellevue, WA.

Symposium Articles Published, continued

- Frissell, C.A., and R.K. Nawa. 1989. Cumulative impacts of timber harvest on fisheries: "All the King's horses and all the King's men..." In C. Toole, (ed.), *Proceedings of the Seventh California Salmon, Steelhead and Trout Restoration Conference*. February 24-26, Arcata, CA. California Sea Grant Publication UCSGEP-89-02.
- Frissell, C.A., and T. Hirai. 1988. Life history patterns, habitat change, and productivity of fall chinook stocks of southwest Oregon. In B. Sheperd (ed.) *Proceedings of the Northeast Pacific Chinook and Coho Workshop*, Bellingham, Washington, 3-4 October 1988. North Pacific International Chapter, American Fisheries Society.

Books and Book Chapters Published:

- Frissell, C.A., N.L. Poff, and M.E. Jensen. 2001. Assessment of biotic patterns in freshwater ecosystems. Chapter 27 in Bourgeron, P., M. Jensen, and G. Lessard (eds.) *A Guidebook for Integrated Ecological Assessments*. Springer-Verlag, NY.
- Jensen, M.E., I. Goodman, and C.A. Frissell. 2001. Design and use of aquatic biophysical classifications and maps. Chapter 26 in Bourgeron, P., M. Jensen, and G. Lessard (eds.) *A Guidebook for Integrated Ecological Assessments*. Springer-Verlag, NY.
- Welsh, H.H., T.D. Roelofs, and C.A. Frissell. 2000. Aquatic ecosystems of the redwood region. Pages 165-199 in R. Noss (ed.) *The Redwood Forest: History, Ecology, and Conservation of the Coast Redwoods*. Island Press, Washington, DC.
- Frissell, C.A., and S.C. Ralph. 1998. Stream and watershed restoration. Pages 599-624 in R.J. Naiman and R.E. Bilby (eds.) *Ecology and Management of Streams and Rivers in the Pacific Northwest Coastal Ecoregion*. Springer-Verlag, NY.
- Frissell, C.A. 1997. Ecological principles. Pages 96-115 in J.E. Williams, M.P. Dombeck, and C.A. Wood (eds.) *Watershed Restoration: Principles and Practices*. The American Fisheries Society, Bethesda, MD.
- Frissell, C.A., W.J. Liss, R.K. Nawa, R.E. Gresswell, and J.L. Ebersole. 1997. Measuring the failure of salmon management. Pages 411-444 in D.J. Stouder, P.A. Bisson, and R.J. Naiman (eds.) *Pacific Salmon and their Ecosystems: Status and Future Options*. Chapman and Hall, New York, NY.
- Frissell, C.A. 1996. A new strategy for watershed protection, restoration and recovery of wild native fish in the Pacific Northwest. Pages 1-24 in B. Doppelt (ed.) *Healing the Watershed: A Guide to the Restoration of Watersheds and Native Fish in the West*. The Pacific Rivers Council, Eugene, OR.

Books and Book Chapters Published, continued

- Frissell, C.A., and D.G. Lonzarich. 1996. Habitat use and competition among stream fishes. Pages 493-510 in F.R. Hauer and G.A. Lamberti (eds.) *Methods in Stream Ecology*. Academic Press, San Diego, CA.
- Doppelt, B., M. Scurlock, C. Frissell, and J. Karr. 1993. *Entering the Watershed: A New Approach to Save America's River Ecosystems*. Island Press, Washington, DC.

Final Research Reports and Miscellaneous Publications since 1993:

- Frissell, C.A., P. H. Morrison, S.B. Adams, L. H. Swope, and N.P. Hitt. 2000. Conservation Priorities: an Assessment of Freshwater Habitat for Puget Sound Salmon. Trust for Public Land, Northwest Regional Office, 1011 Western Suite 605, Seattle, WA.
http://www.tpl.org/tier3_cd.cfm?content_item_id=9280&folder_id=262.
- Frissell, C.A. 1999. An ecosystem approach for habitat conservation for bull trout: groundwater and surface water protection. Flathead Lake Biological Station, Open File Report 156-99, The Univ.of Montana, Polson, MT
- Hitt, N.P. and C.A. Frissell. 1999. Wilderness in a landscape context: a quantitative approach to ranking aquatic diversity areas in western Montana. Paper presented at the Wilderness Science Conference, 23-27 May, Missoula, MT.
- Montana Bull Trout Scientific Group. 1998. The relationship between land management activities and habitat requirements of bull trout. Report prepared for the Montana Bull Trout Restoration Team, Office of the Governor, Helena, MT.
- Frissell, C.A. 1998. Landscape refugia for conservation of Pacific salmon in selected river basins of the Olympic Peninsula and Hood Canal, Washington. Flathead Lake Biological Station, Open File Report 147-98, The Univ.of Montana, Polson, MT.
- Frissell, C.A. 1997. Ecological benefits of wildland reserves: The proposed Copper Salmon Wilderness in southwest Oregon. Flathead Lake Biological Station, Open File Report 150-97, The University of Montana, Polson, MT.
- Huntington, C.W., and C.A. Frissell. 1997. Aquatic conservation and salmon recovery in the North Coast Basin of Oregon: A crucial role for the Tillamook and Clatsop State Forests. Report prepared for Oregon Trout, Portland, OR.
- Williams, R.N., L.D. Calvin, C.C. Coutant, M.W. Erho, Jr., J.A. Lichatowich, W.J. Liss, W. E. McConnaha, P.R. Mundy, J.A. Stanford, R.R. Whitney, D.L. Bottom, and C.A. Frissell. In press. *Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem*. Independent Scientific Group, Northwest Power Planning Council, Portland, OR.
- C.A. Frissell, J.L. Ebersole, W.J. Liss, B.J. Cavallo, and G.C. Poole. 1996. Potential effects of climate change on thermal complexity and biotic integrity of streams: seasonal intrusion of non-native fishes. Final Report for USEPA Environmental Research Laboratory, Duluth, MN. Oak Creek Laboratory of Biology, Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR.

Final Research Reports and Miscellaneous Publications since 1993, continued

- Bottom, D.L., J.A. Lichatowich, and C.A. Frissell. 1996. Variability of marine ecosystems and relation to salmon production. Report prepared for Theme 2 of the Pacific Northwest Coastal Ecosystem Region Study Workshop, Troutdale, OR, 12-14 August.
- Clancy, C., C. Frissell, and T. Weaver. 1996. Assessment of methods for removal or suppression of introduced fish to aid bull trout recovery. Report prepared by the Montana Bull Trout Scientific Group for the Montana Bull Trout Restoration Team. Montana Fish, Wildlife and Parks, Helena, MT.
- Frissell, C.A., J. Doskocil, J. Gangemi, and J. Stanford. 1995. Identifying priority areas for protection and restoration of riverine biodiversity: a case study in the Swan River basin, Montana, USA. Flathead Lake Biological Station, Open File Report 136-95, The University of Montana, Polson, MT.
- Beschta, R.L., C.A. Frissell, R. Gresswell, R. Hauer, J.R. Karr, G.W. Minshall, D.A. Perry, and J.J. Rhodes. 1995. Wildfire and salvage logging: recommendations for ecologically sound post-fire salvage logging and other post-fire treatments on federal lands in the West. The Pacific Rivers Council, Eugene, OR.
- Frissell, C.A. 1993. The shrinking range of the Pacific Salmon. Report and status and range maps prepared for the Pacific Northwest Salmon Study, The Wilderness Society, Washington, DC.
- Frissell, C.A., and W.J. Liss. 1993. Valley segment classification for the streams of Great Basin National Park, Nevada. Report prepared for the Cooperative Park Studies Unit, College of Forestry, Oregon State University, Corvallis, OR.
- Frissell, C.A. 1993. Panacea or placebo? An ecologist's view of captive breeding. *Wild Fish* July/August 1993:7-12. The Wilderness Society, Portland, OR.
- Frissell, C.A. 1993. A new strategy for watershed restoration and recovery of Pacific salmon in the Pacific Northwest. Report prepared for The Pacific Rivers Council, Eugene, Oregon. Oak Creek Laboratory of Biology, Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR.

Selected Papers and Seminars Presented Since 1993 (___=presenter):

- Frissell, C.A. 2007. Setting regional priorities for watershed restoration. 25th Salmonid Restoration Conference, Salmonid Restoration Federation, 9-10, Santa Rosa, CA.
- Frissell, C.A., and G. Carnefix. 2007. (Abstract) Spawning abundance of bull trout (*Salvelinus confluentus*) in relation to geomorphology, temperature and roads in tributaries of Rock Creek Basin (Missoula and Granite Counties), Montana, US. Annual Meeting of the Montana Chapter of the American Fisheries Society, 13-16 February, Missoula, MT.
<http://www.fisheries.org/units/AFSmontana/2007%20MCAFS%20Annual%20Meeting%20Program.pdf>

Selected Papers and Seminars Presented Since 1993, continued

- Frissell, C.A. 2006. Post-fire management effects on streams. NCSSF Disturbance, Management, and Biodiversity Symposium, National Commission for Science and Sustainable Forestry, 26-27 April, Denver, CO.
- Frissell, C.A., and G. Carnefix. 2005. (Abstract) Indicators of landscape pattern for freshwater ecosystems. 20th Annual Symposium of the US-International Association for Landscape Ecology, 12-16 March, Syracuse, NY.
- Frissell, C.A. 2004. Managing risk and uncertainty: National Forest management and freshwater conservation. Regional Centennial Forum: The Forest Service In the Pacific Southwest Region. US Forest Service, 5-6 November, Sacramento, CA.
- Frissell, C.A. 2001. (Abstract) What to do first with limited time, money, and staff. Watershed Restoration Workshop: Integrating Practical Approaches. Oregon Chapter of the American Fisheries Society, 13-15 November, Eugene, OR.
- Ebersole, J.L., Colden V. Baxter, Hiram W. Li, and William J. Liss, and Frissell, C.A. 2001. (Extended abstract) Detecting temporal dynamics and ecological effects of smallmouth bass invasion in northeast Oregon streams. *In*: Proceedings, American Fisheries Society Special Symposium: Practical Approaches for Conserving Native Inland Fishes of the West. Montana Chapter and Western Division of the American Fisheries Society, 6-8 June, The University of Montana, Missoula, MT.
- Carnefix, G., C. Frissell, and E. Reiland. 2001. (Extended abstract) Complexity and stability of bull trout (*Salvelinus confluentus*) movement patterns in the Rock Creek drainage, Missoula and Granite counties, Montana. *In*: Proceedings, American Fisheries Society Special Symposium: Practical Approaches for Conserving Native Inland Fishes of the West. Montana Chapter and Western Division of the American Fisheries Society, 6-8 June, The University of Montana, Missoula, MT.
- Frissell, C.A. 1999. (Abstract) Groundwater processes and stream classification in the montane West. Invited paper, Symposium #7: Aquatic Classification Schemes for Ecosystem Management: Making the Transition from Methods Development to Application and Validation. Annual Meeting of the Ecological Society of America 7-12 August, Spokane, WA.
- Frissell, C.A. 1999. Fisheries and watershed processes: strategies for protection and restoration. Invited paper, Annual Meeting of the Cal-Neva Chapter of the American Fisheries Society, 24-27 March, Redding, CA.
- Frissell, C.A. 1999. Surface-subsurface flow linkages in rivers and their importance for river flow conservation. Invited paper, Symposium on Water Quality and Hydropower Re-licensing, Annual Meeting of the Cal-Neva Chapter of the American Fisheries Society, 24-27 March, Redding, CA.
- Frissell, C.A. 1999. Dams, uncertainty, and the salmon ecosystem. Keynote Address, Annual Meeting of the Idaho Chapter of the American Fisheries Society and The Wildlife Society, 4-6 March, Boise, ID
- Frissell, C.A. 1998. Climate forcing of thermal habitat in Pacific Northwest rivers: Buffering effects of floodplain forests and hyporheic processes. (Abstract) Symposium on Climate Change Impacts to Freshwater Fish Habitats, Annual Meeting of the American Fisheries Society, 23-27 August, Hartford, CT.

Selected Papers and Seminars Presented Since 1993, continued:

- Frissell, C.A. 1998. Ecosystem concepts in large-scale restoration. (Abstract).
Montana Chapter of the American Fisheries Society, 3-5 February, Helena, MT.
- Frissell, C.A. and B.J. Cavallo 1997. Aquatic habitats used by larval western toads (*Bufo boreas*) on an intermontane river floodplain and some landscape conservation implications (Abstract). Annual Meeting of the Ecological Society of America, 10-14 August, Albuquerque, NM.
- Stanford, J.A. (presented by C.A. Frissell). 1997. Conservation and enhancement of alluvial rivers: the importance of hyporheic linkages. (Abstract). Symposium on Ecological Effects of Roads, Society for Conservation Biology, 7-10 June, Victoria, British Columbia, Canada.
- Frissell, C.A., and G.C. Poole . 1997 Management of Riparian Zones in Western Montana: Present Issues and Emerging Challenges. (Abstract). Annual Meeting of the American Fisheries Society, 23-28 August, Monterey, CA.
- Frissell, C.A., and J.T. Gangemi. 1997. Roads and the conservation of aquatic biodiversity and ecological integrity. (Abstract). Society for Conservation Biology, Victoria, British Columbia, Canada, 7-10 June.
- Frissell, C.A. 1997. Spatial assessment of biological status and biodiversity loss. Invited seminar, National Research Center for Statistics and the Environment, University of Washington, Seattle, WA, 14 January.
- Frissell, C.A., and B.J. Cavallo 1996. Thermal and hydrologic diversity of aquatic habitats mediated by floodplain complexity and hyporheic flow exchange in an alluvial segment of the Middle Fork Flathead River, Montana, USA. (Abstract). Annual Meeting of the N. Am. Benthological Society, Kalispell, MT, 3-8 June.
- Frissell, C.A. 1995. Ecological principles for watershed restoration. (Abstract). Invited paper for Workshop on Watershed Restoration: Principles and Practices, Annual Meeting of the American Fisheries Society, Tampa, FL, 27-31 August.
- Frissell, C.A. 1995. Managing native fish and their ecosystems: let's get (spatially) explicit! (Abstract). Invited panel presentation at Montana Chapter of the American Fisheries Society, Chico Hot Springs, MT, 6-10 February.
- Frissell, C.A. 1995. Birth in the fast lane: sediment transport, human disturbance, and reproductive strategies of salmonid fishes in Pacific Northwest streams. (Abstract). Invited paper for Symposium on Influence of Geomorphic Processes on Terrestrial and Aquatic Ecosystem patterns and Processes, Annual meeting of the Ecological Society of America, Snowbird, UT, 31 July-3 August .
- Frissell, C.A. 1995. Resource management impacts on bull trout populations. Invited panel presentation for Searching for Solutions: Solving the Bull Trout Puzzle Science and Policy Conference, Andrus Center for Public Policy, Boise State University, Boise, ID, 1-2 June.
- Frissell, C.A. 1995. Watershed dynamics: natural pattern and process and some consequences for ecosystem management. Invited presentations at Managing Terrestrial Ecosystems Relative to Past and Present Disturbances: A Workshop Integrating Fire, Range, Fish and Wildlife Habitat and the Practice of Silviculture in the Northern Region. U.S. Forest Service, Missoula, MT, 14-16 March.

Selected Papers and Seminars Presented Since 1993, continued:

- Ebersole, J.L., C.A. Frissell, and W.J. Liss (Ebersole and Frissell, co-presenters). 1995. Invasion of non-native fishes in northeast Oregon and western Montana streams: potential impacts of climate change. (Abstract). Oregon Chapter of the American Fisheries Society, Ashland, OR, 15-17 February.
- Frissell, C.A. 1994. Watershed restoration strategies. (Invited presenter and session convener) Watersheds '94 Expo, US Environmental Protection Agency and Center for Streamside Studies, University of Washington. Bellevue, WA, 27-30 September.
- Frissell, C.A. 1994. A hierarchical approach to restoration of riverine ecosystems. Invited paper at Symposium on Aquatic Habitat Restoration in Northern Ecosystems, Alaska Chapter of the American Fisheries Society, Girdwood, AK, 20-22 September.
- Frissell, C.A. 1994. An integrated, biophysical strategy for ecological restoration of large watersheds (Abstract). Annual Conference of The Universities Council on Water Resources, Big Sky, MT, 3-5 August .
- Frissell, C.A., and J. A. Stanford. 1994. Designing a watershed reserve network to protect and restore aquatic biodiversity in the northern Rocky Mountains (Abstract). Annual meeting of the Montana Chapter of the American Fisheries Society, Billings, Montana, Billings, MT, 9 February.
- Frissell, C.A. 1994. The Endangered Species Act: principles for the protection and recovery of fishes. Invited panel presentation, annual meeting of the Idaho Chapter of the American Fisheries Society, McCall, ID, 24-26 February.
- Frissell, C.A., W.J. Liss, B. Doppelt, and D. Bayles. 1993. A new, ecologically based restoration strategy for Pacific salmon in the Pacific Northwest (Abstract). Annual meeting of the American Fisheries Society, Portland, OR, 29 August-2 September.

Technical Workshops Organized:

- Organizer and coordinator of Science Panel on Roads and Watersheds, sponsored by Pacific Rivers Council, 10-11 November 2006, Forest Grove, OR.
- Organizer and coordinator of the Recovery Science Panel for the Western Native Trout Campaign. Sponsored by Pacific Rivers Council, meeting 2-3 March 2002, Portland, OR.
- Organizer and coordinator of Biodiversity Workshop, Consortium for the Study of North Temperate Montane Ecosystems. A cooperative research venture of The University of Montana and Montana State University, supported by the NSF EPSCoR program. 4 February, 1997 Missoula, MT.
- Scientific Workshop on Large Basin Restoration: South Umpqua River. 16-18 September 1992, Roseburg, Oregon. Sponsored by The Pacific Rivers Council.
- Scientific Workshop on Large Basin Restoration: Lower Rogue River. 21-23 October 1992, Gold Beach, OR. Sponsored by The Pacific Rivers Council.

Other Workshops Attended by Invitation (since 1994):

- (With E. Bishop) Scientific Workshop on Large Basin Restoration: Grande Ronde River (co-organizer). 21-22 March 1993, La Grande, OR. Sponsored by The Pacific Rivers Council.
- (With W.J. Liss and R.K. Nawa) Stream Classification Workshop for staff of Oregon Department of Fish and Wildlife, 6-7 February 1990, Portland, OR.
- Invited Review Panelist, Workshop on Linking Habitat Characteristics to Salmon Data. 29-30 September 1999, National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, WA.
- Invited participant, Yellowstone to Yukon Aquatic Conservation Science Workshop. 20-22 August 1999, Flathead Lake Biological Station, The University of Montana, Polson, MT.
- Invited Panelist, Workshop on Options for Restoring Salmon Habitat in the Mainstem Snake and Columbia Rivers. Pacific Northwest National Laboratory-Battelle, 19 August 1999, Kennewick, WA
- Panelist at State of Oregon/National Marine Fisheries Service Memorandum of Agreement Committee Workshop: Cumulative Effects of State and Private Forest Practices on Salmon Habitat. 21 April 1998, Salem, OR.
- Invited participant in a scientific workshop, Multiple Stressors in Ecological Risk Management. Sponsored by the Society for Environmental Chemistry and Toxicology and the USEPA, 13-18 September 1997, Pellston, MI.
- Society for Conservation Biology Workshop: Communicating with the Media (panel member). 9 June 1997, Victoria, British Columbia, Canada.
- Invited speaker for a workshop, Continuing Education in Ecosystem Management. Sponsored by the University of Idaho. Catchment scale processes and linkages between landscape and stream conditions. 31 January 1997, Moscow, ID.
- The Nature Conservancy, Aquatic Classification Workshop (invited presenter). 9-11 April 1996, Cedar Creek Farm, MO.
- Kenai River Community Forum (keynote speaker and panelist). The Nature Conservancy of Alaska, USEPA and USFWS, 19-21 April, Soldotna, AK.
- Conservation Biology and Management of Interior Salmonids (invited presenter and session co-moderator). USDA Forest Service Intermountain Research Station and Utah State University, 4-5 October 1995, Logan, UT.
- Eastside Ecosystem Planning Workshop. Sierra Club Legal Defense Fund, 16 December 1994, Portland, OR.
- Co-instructor at workshop series on Watershed Restoration and the "Rapid Biotic Response Strategy" for Riverine Ecosystem Restoration, sponsored by The Pacific Rivers Council, 1993-95, California, Oregon, and Washington.
- Fire/Salvage and Aquatic Ecosystems Policy Workshop. The Pacific Rivers Council, 15 December 1994, Portland, OR.
- Panel on Forest Health Issues, Native Forest Network annual conference, 13 November 1994, Missoula, MT.
- Workshop on Watershed/Fisheries Cumulative Effects Analysis, sponsored by Headwaters, The Pacific Rivers Council, USDA Forest Service, and Bureau of Land Management. 29 September-2 October, 1994, Ruch, OR.

Other Workshops Attended by Invitation (since 1994), (continued)

Boise Funders' Scoping Meeting, sponsored by Bullit, Harder, and Lazar Foundations, 30-31 August 1994, Boise, Idaho. Workshop for a statewide process to prioritize restoration of watersheds and salmon populations, by invitation of Oregon Senate President Bill Bradbury, 18 May 1994, Salem, OR.

Scientific Task Force on Conservation Strategies for Protection of Proposed Wild and Scenic Rivers in California, The Pacific Rivers Council, 22 Feb. 1994, Davis, CA

Other Presentations (Selected):

Scientists Briefing for U.S. Senate staff on post-fire logging and forest management and freshwater resources. Washington, D.C., 18-19 September 2006.

Invited testimony on federal land management and the future of salmon and aquatic biodiversity in the Pacific Northwest, to the U.S. House of Representatives, Subcommittee on National Parks and Public Lands, Washington, D.C., 11 March 1993.

Briefing for Congressional representatives and staff on federal lands management and conservation and recovery of salmonid fishes and riverine ecosystems, Washington, D.C., 22 January 1993.

Invited testimony to the 1991 Oregon State Legislature, on panel representing the Oregon Chapter of the American Fisheries Society, on the status of native fishes, impacts of forest practices on fish habitat, and the need or changes in environmental regulation.

Invited testimony to the Oregon Board of Forestry Forest Issues Forum, December 1990, on cumulative impacts of forest practices on native aquatic species and the need for changes in forest management.

Worked with Oregon Public Broadcasting to describe our research project and its significance in a 15-minute segment of the television program, Oregon Field Guide, first aired in June 1990.

Presented seminars, informal presentations, lectures, and discussions at research review meetings, as guest speaker in classrooms and public interest groups, at state board meetings, at workshops, and on field trips with foresters, geotechnical personnel, fishery and watershed managers, and conservationists.