

REFERENCES

- Angermeier, P. L. and I. Schlosser. 1995. Conserving aquatic biodiversity: beyond species and populations. In: *Evolution and the Aquatic Ecosystem: Defining Unique Units in Population Conservation*. Nielsen, J. L. (ed.) American Fisheries Society Symposium 17:402-414.
- Azous, A. L. and R.R. Horner. 1997. Wetlands and Urbanization; Implications for the Future. Washington Department of Ecology, King County Land and Water Resources Division, and the Univ. of Washington, Seattle.
- Beechie, T. and S. Bolton. 1999. An approach to restoring salmonid habitat-forming processes in Pacific Northwest watersheds. *Fisheries* 24(4):6-24.
- Beechie, T.J., E.A. Steel, P. Roni, and E. Quimby (editors). 2003. Ecosystem recovery planning for listed salmon: an integrated assessment approach for salmon habitat. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-58, 183 p.
- Beechie et al. 2010
- Berman, C.H., and T.P. Quinn. 1991. Behavioral thermoregulation and homing by spring chinook salmon, *Oncorhynchus tshawytscha* (Walbaum), in the Yakima River. *Journal of Fish Biology* 39:301-312.
- Booth, D. K. 2000. Forest cover, impervious-surface area, and the mitigation of urbanization impacts in King County, Washington. Unpublished paper. Center for Urban Water Resources, University of Washington, Seattle.
- Booth, D.B. 1991. Urbanization and the Natural drainage system – Impacts, Solutions, and Prognoses. *The Northwest Environmental Journal*, 7:93-118.
- Booth, D.B. 2010. Review of Thurston County’s “Methodology to a Watershed Based Approach to Federal and State Clean Water Act Regulations”. Submitted to Thurston County Department of Resource Stewardship.
- Booth, D.B. and C.R. Jackson. 1997. “Urbanization of Aquatic Systems: Degradation Thresholds, Stormwater Detection, and Limits of Migration,” *Journal of the American Water Resources Association*, Vol. 33, No. 5, pp. 1077-1089.
- Booth, D. B., J. R. Karr, S. Schauman, C. P. Konrad, S. A. Morley, M. G. Larson, P. C. Henshaw, E. J. Nelson, and S. J. Burges. 2001. Urban stream rehabilitation in the Pacific Northwest. Final Report of EPA Grant Number R82-5284-010. University of Washington.
- Booth, D.B., J.R. Karr, S. Schauman, C.P. Konrad, S.A. Morley, M.G. Larson, and S.J. Burges. In Press. Reviving Urban Streams: Land Use, Hydrology, Biology, and Human Behavior. *Journal of the American Water Resources Association*.
- Booth, D.B., R.A. Haugerud, and K.G. Troost, 2003. Geology, Watersheds, and Puget Lowland Rivers: chapter in D. Montgomery, S. Bolton, and D.B. Booth, eds., *Restoration of Puget Sound Rivers*: University of Washington Press. (pages 14 – 45).

- Brinson, M. M. 1993. A Hydrogeomorphic Classification for Wetlands. Wetlands Research Program Technical Report WRP-DE-4. U.S. Army Corps of Engineers, Springfield, VA.
- Brooks, K., K.M. Dvornich, M. Tirhi, E. Neatherlin, M. McCalmon, and J. Jacobson. 2004. Pierce County Biodiversity Network Assessment: August, 2004. Report to Pierce County Council, Pierce County, 146 pp.
- Center for Watershed Protection. 1997. National Pollutant Removal Performance Database for Stormwater Best Management Practices. For the Chesapeake Research Consortium.
- Davenport, T.E. 2003. *The Watershed Project Management Guide*. Lewis Publishers, Boca Raton, FL.
- Dinicola, R. S. 2001. Validation of a Numerical Modeling Method for Simulating Rainfall-Runoff Relations for Headwater Basins in Western King and Snohomish Counties, Washington. U.S. Geological Survey Water Supply Paper 2495.
- Doppelt, B., M. Scurlock, C. Frissell, and J. Karr. 1993. Entering the watershed, a new approach to save America's river ecosystems. The Pacific Rivers Council. Island Press. 462 pp.
- Ebersole, J. L., W. Liss, and C. Frissell. 1997. Restoration of stream habitats in the Western United States: restoration as re-expression of habitat capacity. *Environmental Management* 21(1):1-14.
- ESA Adolfson, in association with: Washington Department of Ecology, Department of Fish and Wildlife, Puget Sound Partnership, and EPA. 2007. Birch Bay Watershed Characterization: A Pilot Study Integrating Methods in Watershed Characterization and Land Use Planning. Prepared for: Whatcom County Planning and Development Services October 2007
- Euphrat, F. D. and B. P. Warkentin. 1994. A watershed assessment primer. US Environmental Protection Agency 910/B-94/005. EPA Region X, Seattle, WA.
- Feist, B.E., E.A. Steel, G.R. Pess, and R.E. Bilby. 2003. The influence of scale on salmon habitat restoration priorities. *Animal Conservation*. The Zoological Society of London, United Kingdom. 6:271-282.
- Frissell, C. A. 1996. A new strategy for watershed restoration and recovery of Pacific salmon in the Pacific Northwest. In: *Watershed and Salmon Habitat Restoration Projects: Guidelines for Managers of State Trust Lands*. Dominguez, L. (ed.). Washington Department of Natural Resources. Olympia, WA 90 pp.
- Frissell, C. and B. Doppelt. 1996. A new strategy for watershed protection, restoration and recovery of wild native fish in the Pacific Northwest. In: *Healing the Watershed, a guide to the restoration of watersheds and native fish in the West*. Pacific Rivers Council, Inc. 212 pp.
- Geist, D.R., and D.D. Dauble. 1998. Redd site selection and spawning habitat use by fall chinook salmon: the importance of geomorphic features in large rivers. *Environmental Management* 22:655-669.

- Geist, D.R., 2000. Hyporheic discharge of river water into fall Chinook salmon (*Oncorhynchus tshawytscha*) spawning areas in the Hanford Reach, Columbia River. *Can. J. Fish. Aquatic Sci.* 57: 1647-1656 (2000).
- Gersib, R. 2001. Characterizing wetland restoration potential at a river basin scale, Nooksack River Basin, Washington State. Draft Report. Washington State Department of Ecology.
- Gersib, R., L. Wildrick, C. Freeland, S. Grigsby, K. Bauersfeld, S. Butkus, R. Coots, and J. Franklin. 1999. Process-based river basin characterization: a case study Snohomish Basin, Washington. Washington State Department of Ecology. Olympia, WA.
- Gersib, R.. 1997. Restoring Wetlands at a River Basin Scale - A Guide for Washington's Puget Sound. Operational Draft. Washington State Department of Ecology.
- Gersib, R. A., B. Aberle, L. Driscoll, J. Franklin, B. Haddaway, T. Hilliard, J. Park, A. Perez, R. Schanz, A. Wald, and B. Wood. 2004. Enhancing Transportation Project Delivery Through Watershed Characterization: Methods Document. Washington State Department of Transportation. Available at the following web site: <http://www.wsdot.wa.gov/environment/watershed/docs/methods.pdf>
- Hansen, A. J, and R. L Knight et al 2005. Effects of Exurban Development on Biodiversity Patterns, *Ecological Applications*, 15(6), pp. 1893–1905
- Hill, K., E. Botsford, and D. B. Booth. 2003. A rapid landcover classification method for use in urban watershed analysis. University of Washington Department of Civil and Environmental Engineering, Water Resources Series Technical Report No. 173. <http://depts.washington.edu/cwws/Research/Reports/landcover03.pdf>
- Horner, R. 2010. Review of Thurston County's "Methodology to a Watershed Based Approach to Federal and State Clean Water Act Regulations". Submitted to Thurston County Department of Resource Stewardship.
- Hulse, D. et al., 2002. Willamette River Basin: trajectories of environmental and ecological change by The Pacific Northwest Ecosystem Research Consortium, Appendices - Uncertainty and Error, ed. David Hulse et al. Oregon State University Press, 2002.
- Hyatt, T. L., T. Z. Waldo and T. J. Beechie. 2004. A watershed scale assessment of riparian forests, with implications for restoration. *Restoration Ecology* 12:175-183.
- Karr, J. R. 1995. Clean water is not enough. *Illahee* 11(1-2):51-59.
- Karr, J. R. and D. R. Dudley. 1981. Ecological perspectives on water quality goals. *Environmental Management* 5: 55-68.
- Martin, D., L. Benda, and D. Shreffler. 2004. Core Areas: Habitats that Functionally Control the Spatial Structure of Salmon Populations. King County, Department of Natural Resources and Parks, Water and Land Resources Division, Science Section. Project No. T01426T.
- Leman, V.N. 1993. Spawning sites of chum salmon, *Oncorhynchus keta*: Microhydrological regime and viability of progeny of redds (Kamchatka River Basin). *Journal of Ichthyology* 33:101-117.

- Maune, D.F. Editor. 2007. Digital Elevation Technologies & Applications, 2nd Ed., American Society for Photogrammetry and Remote Sensing Press.
- May, C. and G. Peterson, 2003. East Jefferson County Salmonid Refugia Report
- McGarigal, K., S. A. Cushman, M. C. Neel, and E. Ene. 2002. FRAGSTATS: Spatial Pattern Analysis Program for Categorical Maps. Computer software program produced by the authors at the University of Massachusetts, Amherst. Available at the following web site:
<http://www.umass.edu/landeco/research/fragstats/fragstats.html>
- Montgomery, D. R. 1995. Input- and out-oriented approaches to implementing ecosystem management. *Environmental Management* 19(2):183-188.
- Montgomery, D. R., G. Grant, and K. Sullivan. 1995. Watershed analysis as a framework for implementing ecosystem management. *Water Resources Bulletin* 31(3):369-386.
- Montgomery, D. R., Pess, G., Beamer, E. M., and Quinn, T. P., 1998. Channel type and salmonid spawning distributions and abundance, *Canadian Journal of Fisheries and Aquatic Sciences*, v. 56, p. 377-387, 1999.
- Montgomery, D.R. 1999. Process domains and the river continuum. *Journal of the American Water Resources Association*. Vol. 35, No. 2, 397-410.
- Musgrave Ruth S. Musgrave and Mary Anne Stein 1993 *State Wildlife Laws Handbook: Chapter 2 Overview of Wildlife Law* Government Institutes Inc., Rockville, Maryland ISBN #: 0-86587-357-7
<http://www.animallaw.info/articles/arusHistoryStateWM.htm>
- Naiman, F. J., T. Beechie, L. Benda, D. Berg, P. Bisson, L. MacDonald, M. O'Connor, P. Olson, and E. Steel. 1992. Fundamental elements of ecological healthy watersheds in the Pacific Northwest coastal ecosystems. In: Naiman (ed.) *Watershed Management*, Springer-Verlag, p. 127-188.
- National Marine Fisheries Service [NOAA-Fisheries]. 1996. Making Endangered Species Act determinations of effect for individual or grouped actions at the watershed scale. Environmental and Technical Services Division, Habitat Conservation Branch. 28 pp.
- National Research Council. 1992. *Restoration of aquatic ecosystems*. National Academy Press, Washington, D. C.
- National Research Council. 1999. *New strategies for America's watersheds*. National Academy Press. Washington, D. C.
- NOAA Fisheries Service. March, 2003. *HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects*. NOAA Fisheries Service, Northwest Region.
- Omernik, J. M. 1995. Ecoregions: a spatial framework for environmental management. In: W. S. Davis and T. P. Simon (eds.) *Biological Assessment and Criteria, Tools for Water Re-source planning and Decision Making*. Lewis Publishers.

- Pess, G.R., D.R. Montgomery, E.A. Steel, R.E. Bilby, B.E. Fiest, and H.M. Greenberg. 2002. Landscape Characteristics, land use, and coho salmon (*Oncorhynchus kisutch*) abundance, Snohomish River, Wash., U.S.A. *Canadian Journal of Fisheries and Aquatic Management* 59:613-623
- Reeves, G. H., L. Benda, K. Burnett, P. Bisson, and J. Sedell. 1995. A disturbance-based ecosystem approach to maintaining and restoring freshwater habitats of evolutionarily significant units of anadromous salmonids in the Pacific Northwest. In: *Evolution and the Aquatic Ecosystem: Defining Unique Units in Population Conservation*. Nielsen, J. L. (ed.). American Fisheries Society Symposium 17:334-349.
- Reid, L. M. 1993. Research and cumulative watershed effects. USDA Forest Service Pacific Southwest Research Station General Technical Report PSW-GTR-141. 118 pp.
- Reynolds, O. and B. Wood. 2006. Henderson Inlet Watershed Characterization. Thurston County, WA. Methods document can be found at <http://www.co.thurston.wa.us/stormwater/chara/chara-home.html>
- Reynolds, O. and B. Wood. 2009. Totten and Eld Watershed Characterization. Thurston County, WA. Methods document can be found at <http://www.co.thurston.wa.us/stormwater/chara/chara-home.html>
- Reynolds, O. and B. Wood. 2010. Deschutes Watershed Characterization. Thurston County, WA. Methods document can be found at <http://www.co.thurston.wa.us/stormwater/chara/chara-home.html>
- Roni, P., T. J. Beechie, R. E. Bilby, F. E. Leonetti, M. M. Pollock, and G. R. Pess. 2002. A review of stream restoration techniques and a hierarchical strategy for prioritizing restoration in Pacific Northwest watersheds. *North American Journal of Fisheries Management* 22:1-20.
- Snyder, C.D., J.A. Young, R. Vilella, and D.P. Lemarie. 2003. Influences of upland and riparian land use patterns on stream biotic integrity. *Landscape Ecology* 18:647-664.
- Stelle, Jr., W. 1996. National Marine Fisheries Service letter dated September 4, 1996. Subject: Implementation of "Matrix of Pathways and Indicators" for evaluating the effects of human activities on anadromous salmonid habitat.
- Strecker, E., B. Wu, and M. Iannelli. 1997. Analysis of Oregon Urban Runoff Water Quality Data Collected from 1990 to 1996. Prepared for The Oregon Association of Clean Water Agencies by Woodward-Clyde Consultants.
- Sweeney, B. W., T. L. Bott, J. K. Jackson, L. A. Kaplan, J. D. Newbold, L. J. Standley, W. C. Hession, and R. J. Horwitz. 2004. Riparian deforestation, stream narrowing, and loss of stream ecosystem services. *Proceedings of the national Academy of Sciences of the United States of America* 101(39): 14132-14137.
- U.S. Environmental Protection Agency (USEPA). 2003a. Watershed-Based NPDES Permitting Policy Statement. In *Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Implementation Guidance*. USEPA, Washington, DC.

- U.S. Environmental Protection Agency (USEPA). 2003b. Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Implementation Guidance. USEPA, Washington, DC.
- U.S. Environmental Protection Agency (USEPA). 2007. Watershed-Based NPDES Permitting Technical Guidance (draft). USEPA, Washington, DC.
- US Fish and Wildlife Service. 1998. A framework to assist in making endangered species act determinations of effects for individual or grouped actions at the bull trout subpopulation at a watershed scale.
- Vaccaro, J.J., A.J. Hansen, Jr., and M.A. Jones, 1998. Hydrogeologic Framework of the Puget Sound Aquifer System, Washington and British Columbia. US Geological Survey Professional Paper 1424-D.
- Washington State Department of Ecology. 1993. Washington State Wetlands Rating System, Western Washington (second edition). Washington State Department of Ecology. Publication #93-74.
- Washington State Department of Ecology. 2003. Environmental Information Management System, On-line searchable database.
- Washington Department of Fish & Wildlife (WDFW) 2005. Washington's Comprehensive Wildlife Conservation Strategy (Olympia, Washington) Online at:
<http://wdfw.wa.gov/wlm/cwcs/cwcs.htm>
- Washington State Department of Fish and Wildlife. 1991. Washington Department of Wildlife. *Management Recommendations for Washington's Priority Habitats and Species*. Wildlife Management, Fish Management, and Habitat Management Divisions. Olympia, Washington.
- Washington State Department of Fish and Wildlife. 2001. *Priority Habitats and Species Database*. July 18, 2001. 2 pg + maps.
- Zielinski, J, 2002. *Watershed Vulnerability Analysis*. Center for Watershed Protection. Ellicott City, Maryland.

ⁱ Narrative criteria for indicator condition taken from US Fish and Wildlife Service (1998), numeric criteria added by authors

ⁱⁱ Revised 4/09. Schueler, T.R., L.Fraley-McNeil, and K. Capiella. Journal of Hydrologic Engineering, April 2009. pg 309-314. Revised 8/04 based on Booth, D.B., J.R. Karr, S. Schauman, C.P. Konrad, S.A. Morley, M.G. Larson, and S.J. Burges. In Press. Reviving Urban Streams: Land Use, Hydrology, Biology, and Human Behavior. Journal of the American Water Resources Association.

ⁱⁱⁱ NOAA Fisheries Service. March, 2003. HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects. NOAA Fisheries Service, Northwest Region

^{iv} NOAA Fisheries Service. March, 2003. HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects. NOAA Fisheries Service, Northwest Region

-
- v Narrative criteria for indicator condition taken from NOAA-Fisheries (1996) and US Fish and Wildlife Service (1998), numeric criteria added by authors
- vi Adapted from NOAA-Fisheries Service. March, 2003. HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects. NOAA-Fisheries Service, Northwest Region
- vii Narrative criteria for indicator condition taken from NOAA-Fisheries (1996) and US Fish and Wildlife Service (1998), numeric criteria added by authors
- viii NOAA-Fisheries Service. March, 2003. HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects. NOAA-Fisheries Service, Northwest Region
- ix Narrative and numeric criteria for indicator condition taken from NOAA-Fisheries (1996)
- x Narrative criteria for indicator condition taken from NOAA-Fisheries (1996) and US Fish and Wildlife Service (1998), numeric criteria added by authors
- xi Narrative criteria for indicator condition taken from NOAA-Fisheries (1996) and US Fish and Wildlife Service (1998)
- xii NOAA-Fisheries Service. March, 2003. HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects. NOAA-Fisheries Service, Northwest Region
- xiii Adapted from NOAA-Fisheries Service. March, 2003. HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects. NOAA-Fisheries Service, Northwest Region
- xiv Based on common criteria established by NOAA-Fisheries (1996) and the U.S. Fish and Wildlife Service (1998) for chemical contamination/nutrients
- xv Adapted from NOAA-Fisheries Service. March, 2003. HCD Stormwater Online Guidance, ESA Guidance for Analyzing Stormwater Effects. NOAA-Fisheries Service, Northwest Region