

GEORGE ROBERT PESS  
NOAA – NMFS - NWFSC  
2725 Montlake Blvd. E  
Seattle, WA 98112  
Telephone: (206) 860-3450  
Email: [george.pess@noaa.gov](mailto:george.pess@noaa.gov)

### **EDUCATION**

- 2004-2009 UNIVERSITY OF WASHINGTON, SCHOOL OF AQUATIC AND FISHERY SCIENCES Seattle, WA. PhD Thesis title - Patterns and Process of salmon colonization.
- 1990-1992 YALE SCHOOL OF FORESTRY & ENVIRONMENTAL STUDIES. New Haven, CT.  
M.F.S. Masters of Forest Science with a concentration in Forest Hydrology and Watershed Management.
- 1983-87 BOWDOIN COLLEGE. Brunswick, ME.  
A.B. Economics & Environmental Studies.

### **PROFESSIONAL EXPERIENCE**

- 2010-present AFFILIATE ASSOCIATE PROFESSOR – University of Washington, School of Aquatic and Fishery Sciences  
Courses taught – Stream and Watershed Restoration, Alaska Salmon Program
- 1998-present NORTHWEST FISHERIES SCIENCE CENTER, NOAA FISHERIES Seattle, WA. PROGRAM MANAGER  
Conduct and manage research relating stream and watershed restoration strategies and actions to the biological and physical response of salmonid populations in the Pacific Northwest. Research focuses on how salmonid populations respond to a variety of restoration actions including in-stream structure placement, reconnection of isolated habitats, and dam removal. Expertise in salmonid behavior, fluvial geomorphology, fisheries biology, stream and salmon ecology, and forest hydrology.
- 1993-98 THE TULALIP TRIBES Marysville, WA STREAM ECOLOGIST  
Design, coordinate, and implement efforts to analyze the direct and cumulative effects of forest practices on salmon habitat in the Stillaguamish and Snohomish Rivers

### **Selected peer-reviewed publications**

I have contributed to over 215 peer-reviewed articles since 1994. Example journals include Canadian Journal of Fisheries and Aquatic Sciences, Transactions of the American Fisheries Society, Bioscience, Water Resources Research, PLOS One, Fisheries, Bioscience, and Nature: Scientific Reports.

Morley, S.A., Foley, M.M., Duda, J.J., Beirne, M.M., Paradis, R.L., Johnson, R.C., McHenry, M.L., Eloffson, M., Sampson, E.M., McCoy, R.E. and Stapleton, J., 2020. Shifting food web structure during dam removal—Disturbance and recovery during a major restoration action. PloS one, 15(9), p.e0239198.

- Pitman, K.J., Moore, J.W., Sloat, M.R., Beaudreau, A.H., Bidlack, A.L., Brenner, R.E., Hood, E.W., Pess, G.R., Mantua, N.J., Milner, A.M. and Radić, V., 2020. Glacier Retreat and Pacific Salmon. *BioScience*, 70(3), pp.220-236.
- Bellmore, J.R., Pess, G.R., Duda, J.J., O'connor, J.E., East, A.E., Foley, M.M., Wilcox, A.C., Major, J.J., Shafroth, P.B., Morley, S.A. and Magirl, C.S., 2019. Conceptualizing ecological responses to dam removal: If you remove it, what's to come? *BioScience*, 69(1), pp.26-39.
- Hall, J.E., Greene, C.M., Stefankiv, O., Anderson, J.H., Timpane-Padgham, B., Beechie, T.J. and Pess, G.R., 2018. Large river habitat complexity and productivity of Puget Sound Chinook salmon. *PloS one*, 13(11), p.e0205127.
- Ritchie, A.C., Warrick, J.A., East, A.E., Magirl, C.S., Stevens, A.W., Bountry, J.A., Randle, T.J., Curran, C.A., Hilldale, R.C., Duda, J.J. and Gelfenbaum, G.R., 2018. Morphodynamic evolution following sediment release from the world's largest dam removal. *Scientific reports*, 8.
- Beechie, T. J., G. R. Pess, H. Imaki, A. Martin, J. Alvarez, D. Goodman. 2015. Comparison of potential increases in juvenile salmonid rearing habitat capacity among alternative restoration scenarios, Trinity River, California. *Restoration Ecology*, 23(1):75-84. <http://dx.doi.org/10.1111/rec.12131>
- Pess, G. R., T. P. Quinn, S. R. Gephard, R. Saunders. 2014. Re-colonization of Atlantic and Pacific rivers by anadromous fishes: linkages between life history and the benefits of barrier removal. *Reviews in Fish Biology and Fisheries*, 24:88. 10.1007/s11160-013-9339-1
- Beechie, T., H. Imaki, J. Greene, A. Wade, H. Wu, G. Pess, P. Roni, J. Kimball, J. Stanford, P. Kiffney, and N. Mantua. 2012. Restoring salmon habitat for a changing climate. *River Research and Applications*. DOI: 10.1002/rra.2590.

### **Awards and service**

- NOAA Employee of the year - 2019
- NOAA Restoration Center Excellence in Restoration Award – 2014
- American Fisheries Society Certificate of Achievement Award – WA/BC chapter 2013
- NOAA Employee of the year, honorable mention – 2012
- NOAA Bronze Medal – 2010
- Selected to NOAA's Puget Sound steelhead Technical Recovery Team to define populations and population viability for listed Puget Sound steelhead - 2010
- Selected to NOAA's Oregon Coast coho salmon Biological Review Team to re-determine status of listed Oregon Coast coho salmon - 2009
- University of Washington, School of Aquatic and Fishery Sciences, Faculty Merit Award, spring 2009
- American Fisheries Society Western Division – 2006 Eugene Maughan graduate student scholarship
- NOAA Employee of the year, honorable mention – 2005
- Puget Sound Steelhead Biological Review Team – NOAA 2005
- American Geophysical Union (AGU) – 2005 Annual meeting. Best student paper award
- NOAA's Advanced Studies program – 2004 and 2005
- NOAA Employee of the year, honorable mention – 2001

## Full peer reviewed publications

- Quinn, T.P., Pess, G.R., Sutherland, B.J., Brenkman, S.J., Withler, R.E., Flynn, K. and Beacham, T.D., 2021. Resumption of Anadromy or Straying? Origins of Sockeye Salmon in the Elwha River. *Transactions of the American Fisheries Society*.
- Fraik, A.K., McMillan, J.R., Liermann, M., Bennett, T., McHenry, M.L., McKinney, G.J., Wells, A.H., Winans, G., Kelley, J.L., Pess, G.R. and Nichols, K.M., 2021. The Impacts of Dam Construction and Removal on the Genetics of Recovering Steelhead (*Oncorhynchus mykiss*) Populations across the Elwha River Watershed. *Genes*, 12(1), p.89.
- Munsch, S.H., Andrews, K.S., Crozier, L.G., Fonner, R., Gosselin, J.L., Greene, C.M., Harvey, C.J., Lundin, J.I., Pess, G.R., Samhuri, J.F. and Satterthwaite, W.H., 2020. Potential for ecological nonlinearities and thresholds to inform Pacific salmon management. *Ecosphere*, 11(12), p.e03302.
- Duda, J.J., Hoy, M.S., Chase, D.M., Pess, G.R., Brenkman, S.J., McHenry, M.M. and Ostberg, C.O., 2021. Environmental DNA is an effective tool to track recolonizing migratory fish following large-scale dam removal. *Environmental DNA*, 3(1), pp.121-141.
- Morley, S.A., Foley, M.M., Duda, J.J., Beirne, M.M., Paradis, R.L., Johnson, R.C., McHenry, M.L., Elofson, M., Sampson, E.M., McCoy, R.E. and Stapleton, J., 2020. Shifting food web structure during dam removal—Disturbance and recovery during a major restoration action. *PloS one*, 15(9), p.e0239198.
- Pitman, K.J., Moore, J.W., Sloat, M.R., Beaudreau, A.H., Bidlack, A.L., Brenner, R.E., Hood, E.W., Pess, G.R., Mantua, N.J., Milner, A.M. and Radić, V., 2020. Glacier retreat and Pacific salmon. *BioScience*, 70(3), pp.220-236.
- Clark, C., Roni, P., Keeton, J. and Pess, G., 2020. Evaluation of the removal of impassable barriers on anadromous salmon and steelhead in the Columbia River Basin. *Fisheries Management and Ecology*, 27(1), pp.102-110.
- Duda, J., Anderson, J.H., Beirne, M.M., Brenkman, S.J., Crain, P., Mahan, J., McHenry, M., Pess, G., Peters, R. and Winter, B., 2019. Complexities, context, and new information about the Elwha River. *Frontiers in Ecology and the Environment*, 17(1), pp.10-11.
- Stefankiv, O., Beechie, T.J., Hall, J.E., Pess, G.R. and Timpane-Padgham, B., 2019. Influences of valley form and land use on large river and floodplain habitats in Puget Sound. *River Research and Applications*, 35(2), pp.133-145.
- Bellmore, J.R., Pess, G.R., Duda, J.J., O'Connor, J.E., East, A.E., Foley, M.M., Wilcox, A.C., Major, J.J., Shafroth, P.B., Morley, S.A. and Magirl, C.S., 2019. Conceptualizing ecological responses to dam removal: If you remove it, what's to come?. *BioScience*, 69(1), pp.26-39.

- Ohlberger, J., Brenkman, S.J., Crain, P., Pess, G.R., Duda, J.J., Buehrens, T.W., Quinn, T.P. and Hilborn, R., 2019. A Bayesian life-cycle model to estimate escapement at maximum sustained yield in salmon based on limited information. *Canadian Journal of Fisheries and Aquatic Sciences*, 76(2), pp.299-307.
- Hall, J.E., Greene, C.M., Stefankiv, O., Anderson, J.H., Timpane-Padgham, B., Beechie, T.J. and Pess, G.R., 2018. Large river habitat complexity and productivity of Puget Sound Chinook salmon. *Plos one*, 13(11), p.e0205127.
- Ritchie, A.C., Warrick, J.A., East, A.E., Magirl, C.S., Stevens, A.W., Bountry, J.A., Randle, T.J., Curran, C.A., Hilldale, R.C., Duda, J.J. and Gelfenbaum, G.R., 2018. Morphodynamic evolution following sediment release from the world's largest dam removal. *Scientific reports*, 8(1), pp.1-13.
- Hines, D., Liermann, M., Seder, T., Cluer, B., Pess, G. and Schoenebeck, C., 2017. Diel shifts in microhabitat selection of steelhead and Coho salmon fry. *North American Journal of Fisheries Management*, 37(5), pp.989-998.
- Liermann, M., Pess, G., McHenry, M., McMillan, J., Elofson, M., Bennett, T. and Moses, R., 2017. Relocation and recolonization of coho salmon in two tributaries to the Elwha River: Implications for management and monitoring. *Transactions of the American Fisheries Society*, 146(5), pp.955-966.
- Peters, R.J., Liermann, M., McHenry, M.L., Bakke, P. and Pess, G.R., 2017. Changes in streambed composition in salmonid spawning habitat of the Elwha River during dam removal. *JAWRA Journal of the American Water Resources Association*, 53(4), pp.871-885.
- Foley, M.M., Bellmore, J.R., O'Connor, J.E., Duda, J.J., East, A.E., Grant, G.E., Anderson, C.W., Bountry, J.A., Collins, M.J., Connolly, P.J. and Craig, L.S., 2017. Dam removal: Listening in. *Water Resources Research*, 53(7), pp.5229-5246.
- Cram, J.M., Torgersen, C.E., Klett, R.S., Pess, G.R., May, D., Pearsons, T.N. and Dittman, A.H., 2017. Spatial variability of Chinook salmon spawning distribution and habitat preferences. *Transactions of the American Fisheries Society*, 146(2), pp.206-221.
- Hall, J. E., P. Roni, T. R. Bennett, J. R. McMillan, K. Hanson, G. R. Pess, R. E. Moses, M. McHenry, W. Ehinger. 2016. Life history diversity of steelhead in two coastal Washington watersheds. *Transactions of the American Fisheries Society*. 45 (5), 990-1005. <http://dx.doi.org/10.1080/00028487.2016.1194893>
- Bennett, S., G. R. Pess, N. Bouwes, P. Roni, R. E. Bilby, S. Gallagher, J. Ruzycski, T. W. Buehrens, W. Ehinger, J. H. Anderson, C. E. Jordan, B. Bowersox, C. M. Greene. 2016. Progress and challenges of testing the effectiveness of stream restoration in the Pacific Northwest using intensively monitored watersheds. *Fisheries*, 41(2):93-103. <http://dx.doi.org/10.1080/03632415.2015.1127805>

- Gayeski, N., G. R. Pess, T. J. Beechie. 2016. A Life-Table Model Estimation of the Parr Capacity of a Late-Nineteenth Century Puget Sound Steelhead Population. FACETS, 1:83-104. doi:10.1139/facets-2015-0010.
- Roni, P., C. Johnson, T. De Boer, G. Pess, A. Dittman, and D. Sear. 2015. Interannual variability in the effect of physical habitat and parentage on Chinook salmon egg-to-fry survival. Canadian Journal of Fisheries Sciences. 73(7): 1047-1059, 10.1139/cjfas-2015-0372
- Bartz, K. K., M. J. Ford, T. J. Beechie, K. L. Fresh, G. R. Pess, M. Rowse, M. B. Sheer, R. Kennedy. 2015. Trends in developed cover adjacent to habitat for threatened salmon in Puget Sound, Washington, U.S.A. PLoS ONE. 10(4)  
<http://dx.doi.org/10.1371/journal.pone.0124415>
- Beechie, T. J., G. R. Pess, H. Imaki, A. Martin, J. Alvarez, D. Goodman. 2015. Comparison of potential increases in juvenile salmonid rearing habitat capacity among alternative restoration scenarios, Trinity River, California. Restoration Ecology, 23(1):75-84.  
<http://dx.doi.org/10.1111/rec.12131>
- East, A., G. R. Pess, J. Bountry, C. Magirl, A. Ritchie, J. Logan, T. Randle, M. Mastin, J. J. Duda, M. Liermann, M. McHenry, T. J. Beechie. 2015. Large-scale dam removal on the Elwha River, Washington, USA: river channel and floodplain geomorphic change. Geomorphology, 228:765-786. <http://dx.doi.org/10.1016/j.geomorph.2014.08.028>
- Warrick, J.A., Bountry, J.A., East, A.E., Magirl, C.S., Randle, T.J., Gelfenbaum, G.R., Ritchie, A.C., Pess, G.R., Leung, V., Duda, J.J., 2015. Large-scale dam removal on the Elwha River, Washington, USA: source-to-sink sediment budget and synthesis. Geomorphology 246: 729-750. doi:10.1016/j.geomorph.2015.01.010.
- McMillan, J. R., G. R. Pess, M. Liermann, S. A. Morley, M. McHenry, L. A. Campbell, T. P. Quinn. 2015. Using redd attributes, fry density, and otolith microchemistry to distinguish the presence of steelhead and rainbow trout in the Elwha River Dam removal project. North American Journal of Fisheries Management, 35(5):1019-1033.  
<http://dx.doi.org/10.1080/02755947.2015.1074965>
- Roni, P., T. J. Beechie, C. E. Jordan, G. R. Pess. 2015. Basin scale monitoring of river restoration: recommendations from case studies in the Pacific Northwest USA. In Fish habitat management. AFS Symposium 78. 73-98. American Fisheries Society. Bethesda, Maryland.
- Kendall, N., J. R. McMillan, M. R. Sloat, T. W. Buehrens, T. P. Quinn, G. R. Pess, K. V. Kuzischchin, M. M. McClure, R. W. Zabel. 2015. Anadromy and residency in steelhead and rainbow trout *Oncorhynchus mykiss*: a review of the processes and patterns. Canadian Journal of Fisheries and Aquatic Sciences, 72(3):319-342. doi:10.1139/cjfas-2014-0192

- Ward, E. J., J. H. Anderson, T. J. Beechie, G. R. Pess, M. J. Ford. 2015. Increasing hydrologic variability threatens depleted anadromous fish populations. *Global Change Biology*.
- Liermann, M. C., Rawding, D., Pess, G. R., & Glaser, B. 2015. The spatial distribution of salmon and steelhead redds and optimal sampling design. *Canadian Journal of Fisheries and Aquatic Sciences*, 72(3), 434-446. doi:10.1139/cjfas-2014-0181.
- Roni, P., T. J. Beechie, G. R. Pess, and K. Hanson. 2014. Fact and fiction regarding wood placement in streams. *Canadian Journal of Fisheries and Aquatic Sciences*. 72(3) 466-478. doi:10.1139/cjfas-2014-0344.
- Buehrens, T. W., P. M. Kiffney, G. R. Pess, T. R. Bennett, S. M. Naman, G. T. Brooks, T. Quinn. 2014. Increasing juvenile coho salmon densities during early recolonization have not affected resident coastal cutthroat trout growth, movement, or survival. *North American Journal of Fisheries Management*, 34(5):892-907.
- Kiffney, P. M., Buhle, E. R., Naman, S. M., Pess, G. R., & Klett, R. S. 2014. Linking resource availability and habitat structure to stream organisms: an experimental and observational assessment. *Ecosphere* 5 (4): 39. 10.1890/ES13-00269.1
- McMillan, J. R., R. Pess, G., McHenry, M. L., Moses, R., & Quinn, T. P. 2014. Documentation of Unusual, Fall Spawning by Coastal Cutthroat Trout in the Elwha River System, Washington. *Transactions of the American Fisheries Society*, 143(6), 1605-1611. <http://dx.doi.org/10.1080/00028487.2014.963255>
- Naman, S. M., Kiffney, P. M., Pess, G. R., Buehrens, T. W., & Bennett, T. R. 2014. Abundance and body condition of sculpin (*Cottus* spp.) in a small forest stream following recolonization by juvenile Coho Salmon *Oncorhynchus kisutch*. *River Research and Applications*, 30(3), 360-371. 10.1002/rra.2643
- Anderson, J. H., G. R. Pess, R. W. Carmichael, M. J. Ford, T. Cooney, C. Baldwin, M. M. McClure. 2014. The next link will exit from NWFSC web site Planning Pacific salmon and steelhead reintroductions aimed at long-term viability and recovery. *North American Journal of Fisheries Management*, 34(1):72-93. <http://dx.doi.org/10.1080/02755947.2013.847875>
- Pess, G. R., T. P. Quinn, S. R. Gephard, R. Saunders. 2014. Re-colonization of Atlantic and Pacific rivers by anadromous fishes: linkages between life history and the benefits of barrier removal. *Reviews in Fish Biology and Fisheries*, 24:88. 10.1007/s11160-013-9339-1
- Peters, R.J., J.J Duda, G.R. Pess, M. Zimmerman, P. Crain, Z. Hughes, A. Wilson, M.C. Liermann, S.A. Morley, J.R. McMillan, K. Denton, D. Morrill, and K. Warheit. 2014. Guidelines for Monitoring and Adaptively Managing Restoration of Chinook Salmon (*Oncorhynchus tshawytscha*) and Steelhead (*O. mykiss*) on the Elwha River. U.S. Fish and Wildlife Service, Olympia.



- Pess, G. R., Quinn, T. P., Schindler, D. E. and Liermann, M. C. 2013. Freshwater habitat associations between pink (*Oncorhynchus gorbuscha*), chum (*O. keta*) and Chinook salmon (*O. tshawytscha*) in a watershed dominated by sockeye salmon (*O. nerka*) abundance. *Ecology of Freshwater Fish*. doi: 10.1111/eff.12088.
- Beechie, T., G. Pess, S. Morley, L. Butler, P. Downs, A. Maltby, P. Skidmore, S. Clayton, C. Muhlfeld, and K. Hanson. 2013. Watershed assessments and identification of restoration needs. Pages 50-113. In *Stream and Watershed Restoration: A guide to restoring riverine processes and habitats*. Edited by P. Roni and T. Beechie. John Wiley and Sons, Ltd. U.K.
- Roni, P., G. Pess, K. Hanson, and M. Pearsons. 2013. Selecting appropriate stream and watershed restoration techniques. Pages 144-188. In *Stream and Watershed Restoration: A guide to restoring riverine processes and habitats*. Edited by P. Roni and T. Beechie. John Wiley and Sons, Ltd. U.K.
- Skidmore, P., T. Beechie, G. Pess, J. Castro, B. Cluer, C. Thorne, C. Shea, and R. Chen. 2013. Developing, designing, and implementing restoration projects. 2103, Pages 215-253. In *Stream and Watershed Restoration: A guide to restoring riverine processes and habitats*. Edited by P. Roni and T. Beechie. John Wiley and Sons, Ltd. U.K.
- Beechie, T., P. Roni, and G. Pess. 2013. Synthesis: Developing comprehensive restoration programs. Pages 280-289. In *Stream and Watershed Restoration: A guide to restoring riverine processes and habitats*. Edited by P. Roni and T. Beechie. John Wiley and Sons, Ltd. U.K.
- Lisi, P. J., Schindler, D. E., Bentley, K. T., & Pess, G. R. 2012. Association between geomorphic attributes of watersheds, water temperature, and salmon spawn timing in Alaskan streams. *Geomorphology*. <http://dx.doi.org/10.1016/j.geomorph.2012.12.013>.
- Anderson, J. H., G. R. Pess, P. M. Kiffney, T. R. Bennett, P. Faulds, T. P. Quinn. 2013. Dispersal of colonizing juvenile coho salmon (*Oncorhynchus kisutch*): tributary immigration and the influence of emergence date and kin association. *Ecology of Freshwater Fish*, 22:30-42. doi:0.1111/j.1600-0633.2012.00589.x
- Ward, E., G. R. Pess, K. Anlauf-Dunn, C. E. Jordan. 2012. Applying time series models with spatial correlation to identify the scale of variation in habitat metrics related to threatened coho salmon (*Oncorhynchus kisutch*) in the Pacific Northwest. *Canadian Journal of Fisheries and Aquatic Sciences*. 69(11): 1773-1782, 10.1139/f2012-096
- Beechie, T., H. Imaki, J. Greene, A. Wade, H. Wu, G. Pess, P. Roni, J. Kimball, J. Stanford, P. Kiffney, and N. Mantua. 2012. Restoring salmon habitat for a changing climate. *River Research and Applications*. DOI: 10.1002/rra.2590.

- Brenkman, S. J., J. J. Duda, C. E. Torgersen, E. Welty, G. R. Pess, R. Peters, M. McHenry. 2012. A Riverscape Perspective of Pacific Salmonids and Aquatic Habitats Prior to Large-Scale Dam Removal in the Elwha River, Washington, USA. *Fisheries Management and Ecology*, 19(1):36-53. doi:10.1111/j.1365-2400.2011.00815.x
- Cram, J., C. E. Torgersen, R. Klett, G. R. Pess, D. May, T. N. Pearsons, A. Dittman. 2012. Tradeoffs between homing and habitat quality for spawning site selection by hatchery-origin Chinook salmon. *Environmental Biology of Fishes*. doi:10.1007/s10641-012-0026-1
- Johnson, C.L., P. Roni, and G. Pess. 2012. Parental effect as a primary factor limiting egg-to-fry survival of spring Chinook Salmon in the Upper Yakima River Basin, *Transactions of the American Fisheries Society*, 141:5, 1295-1309
- Pess, G. R., R. Hilborn, K. Kloehn, T. P. Quinn. 2012. The influence of population dynamics and environmental conditions on pink salmon recolonization after barrier removal. *Canadian Journal of Fisheries and Aquatic Sciences*, 69:970-982. doi:10.1139/F2012-030
- Roni, P., T. Bennett, R. Holland, G. Pess, K. Hanson, R. Moses, M. McHenry, W. Ehinger & J. Walter 2012. Factors affecting migration timing, growth, and survival of juvenile Coho Salmon in two coastal Washington watersheds. *Transactions of the American Fisheries Society*, 141:4, 890-906
- Fullerton, A. H., S. T. Lindley, G. R. Pess, B. E. Feist, E. A. Steel, P. McElhany. 2011. Human influence on the spatial structure of threatened Pacific salmon metapopulations. *Conservation Biology*. doi:10.1111/j.1523-1739.2011.01718.x
- Kiffney, P., T. Buehrens, G. Pess, S. Naman, and T. Bennett. 2011. Recolonization of anadromous fish in the Cedar River above Landsburg Diversion Dam: a ten-year evaluation. Report of the National Marine Fisheries Service to the Seattle Public Utilities. Seattle, Washington.
- Pess, G. R., M. Liermann, M. L. McHenry, R. J. Peters, T. R. Bennett. 2012. Juvenile salmonid response to the replacement of engineered logjams (ELJs) in the Elwha River. *River Research and Applications*. 28 (7): 872-881 DOI: 10.1002/rra.1481
- Pess, G. R., P. M. Kiffney, M. Liermann, T. R. Bennett, J. H. Anderson, T. P. Quinn. 2011. The influences of body size, habitat quality, and competition on the movement and survival of juvenile coho salmon, *Oncorhynchus kisutch*, during the early stages of stream recolonization. *Transactions of the American Fisheries Society*, 140:883-897. doi:10.1080/00028487.2011.587752
- Roni, P., G. Pess, T. Beechie, and S. Morley. 2010. Estimating changes in Coho Salmon and steelhead abundance from watershed restoration: how much restoration is needed to measurably increase smolt production? *North American Journal of Fisheries Management*. 30: 1469-1484



- Fullerton, A.H., K.M. Burnett, E.A. Steel, R.L. Flitcroft, G.R. Pess, B.E. Feist, C.E. Torgersen, D.J. Miller, and B.L. Sanderson. 2010. Hydrologic connectivity for riverine fishes: measurement challenges and research opportunities. *Freshwater Biology* 55: 2215-2237. 10.1111/j.1365-2427.2010.02448.x
- Roni, P, G.R. Pess, and S.A. Morley. 2010. Monitoring salmon stream restoration: guidelines based on experience in the American Pacific Northwest. Pages 119-147 in P. Kemp, editor. *Salmonid fisheries: freshwater habitat management*. Wiley-Blackwell, Oxford, UK. (Published July 2010).
- Anderson, J.H., P.L. Faulds, W.I. Atlas, G.R. Pess, T.P. Quinn. 2010. Selection on breeding date and body size in colonizing coho salmon, *Oncorhynchus kisutch*. *Molecular Ecology* 19:2562-2573.
- Pess, G.R., S. Brenkman, G. Winans, M. McHenry, J. Duda, and T. Beechie 2010. The Elwha river dam removal: A major opportunity for salmon and steelhead recolonization. *The Osprey* 65: 4-8
- Beechie, T.J., D.A. Sear, J.D. Olden, G.R. Pess, J.M. Buffington, H. Moir, P. Roni, and M.M. Pollock. 2010. Process-based principles for restoring dynamic river systems. *BioScience* 60: 209-222.
- Pess, G.R. Patterns and Processes of Salmon Colonization. 2009. PhD dissertation. University of Washington.  
[http://www.fish.washington.edu/research/publications/ms\\_phd/Pess\\_G\\_PhD\\_Sp09.pdf](http://www.fish.washington.edu/research/publications/ms_phd/Pess_G_PhD_Sp09.pdf)
- Coe, H., Kiffney, P, Pess, G. and M. McHenry. 2009. Periphyton and invertebrate response to log placement in large Pacific coastal rivers. *River Research and Applications* 25:1025-1039
- Jensen, D., A. Steel, A. Fullerton, and G. Pess. 2009. Impact of fine sediment on egg-to-fry survival of Pacific salmon: a meta-analysis of published studies. *Reviews and Fisheries and Fisheries Science* 17:348-359
- Greene, C.M., and G.R. Pess. 2009. Multispecies modeling for salmon: alternatives, challenges, and opportunities. Pages 429-454. In E. Knudsen, H. Michael, and C. Steward, eds. *Pacific Salmon Environment and Life History Models: Advancing Science for Sustainable Salmon in the Future*. American Fisheries Society Symposium 71.
- Beechie, T.J., G.R. Pess, M.M. Pollock, M.H. Ruckelshaus, P. Roni. 2009. Chapter 33: Restoring rivers in the 21st century: science challenges in a management context. Pages 695-716. Editors R.J. Beamish and B.J. Rothschild. In *The Future of Fisheries Science in North America*, Springer, Heidelberg.

- Beechie, T., G. Pess, P. Roni, and G. Giannico. 2009. Setting river restoration priorities: a review of approaches and a general protocol for identifying and prioritizing actions. *N. Am. J. Fish. Mgmt.* 28:891-905.
- Waples, R.S., T.J. Beechie and G. R. Pess 2009. Evolutionary history, habitat disturbance regimes, and anthropogenic changes: what do these mean for resilience of Pacific salmon populations?. *Ecology and Society* 14 (1): 3. [online] URL: <http://www.ecologyandsociety.org/vol14/iss1/art3/>
- Kiffney, P.M., G.R. Pess, J.H. Anderson, P. Faulds, K. Burton, and S.C. Riley. 2009. Changes in fish communities following recolonization of the Cedar River, WA, USA, by Pacific salmon after 103 years of local extirpation. *River Research and Applications* 25: 438-452
- Waples, R. S., G. R. Pess, and T. Beechie. 2008. Evolutionary history of Pacific salmon in dynamic environments. *Evolutionary Applications* 1:189-206.
- Pess, G. R., M. L. McHenry, T. J. Beechie, and J. Davies. 2008. Biological impacts of the Elwha River dams and potential salmonid responses to dam removal. *Northwest Science* 82 (Special Issue):72-90.
- McHenry, M. L., and G. R. Pess. 2008. An overview of monitoring options for assessing the response of salmonids and their aquatic ecosystems in the Elwha River following dam removal. *Northwest Science* 82 (Special Issue):29-47.
- Brenkman, S. J., G. R. Pess, C. E. Torgersen, K. K. Kloehn, J. J. Duda, and S. C. Corbett. 2008. Predicting recolonization patterns and interactions between potamodromous and anadromous salmonids in response to dam removal in the Elwha River, Washington State, USA. *Northwest Science* 82 (Special Issue):91-106.
- McClure, M. M., S. M. Carlson, T. J. Beechie, G. R. Pess, J. C. Jorgensen, S. M. Sogard, S. E. Sultan, D. M. Holzer, J. Travis, B. L. Sanderson, M. E. Power, R. W. Carmichael. 2008. Evolutionary consequences of habitat loss for Pacific anadromous salmonids. *Evolutionary Applications*.
- Beechie, T.J., G.R Pess, and H. Moir. 2008. Hierarchical controls on salmonid reproductive biology. Pages 83 to 101 in D. Sear, P. DeVries, and S. Greig, editors. *Salmon spawning habitat in rivers: physical controls, biological responses and approaches to remediation.* American Fisheries Society Symposium 65:83-101.
- Roni, P., McHenry, M., Pess, G. and Tim Beechie. 2008. Evaluating changes in salmon spawning habitat and spawners in the Elwha River following dam removal. Pages 301 to 319 in D. Sear, P. DeVries, and S. Greig, editors. *Salmon spawning habitat in rivers: physical controls, biological responses and approaches to remediation.* American Fisheries Society Symposium 65:301-319.

- Anderson, J. H., P. M. Kiffney, G. R. Pess, T. P. Quinn. 2008. Distribution and growth of juvenile coho salmon (*Oncorhynchus kisutch*) during colonization of newly accessible habitat. *Transactions of the American Fisheries Society*, 137:772-781.
- Rice, S., P. Kiffney, C. Greene, and G.R. Pess. 2008. The ecological importance of tributaries and confluences. In *River confluences, tributaries, and the fluvial network*. Pages 209-237 in Eds. S. Rice, A.G. Roy, and B. Rhodes. *River Confluences, Tributaries and the Fluvial Network*. John Wiley and Sons, Ltd. England.
- Roni, P., D. Van Slyke, B. A. Miller, J. L. Ebersole, and G. R. Pess. 2008. Adult coho salmon and steelhead use of boulder weirs in Southwest Oregon streams. *North American Journal of Fisheries Management* 28:970-978
- McMillan, J.R., S. Katz, and G.R. Pess. 2007. Observational evidence of spatial and temporal structure in a sympatric anadromous (winter steelhead) resident rainbow trout mating system on the Olympic Peninsula, WA. *TAFS* 136:736-748
- Bisson, P.A., T.J. Beechie, and G.R. Pess. 2007. Reconciling fishing with conservation in watersheds. Pages 587-602. In *Reconciling fishing with conservation, Proceedings of the Fourth World Fisheries Congress, Vancouver, BC*. American Fisheries Society Symposium. AFS, Bethesda, MD.
- Roni, P., T. R. Bennett, S. A. Morley, G. R. Pess, K. Hanson, D. Van Slyke, P. Olmstead. 2006. Rehabilitation of bedrock stream channels: the effects of boulder weir replacement on aquatic habitat and biota. *River research and applications*, 22: 967-980.
- Coe, H., P. M. Kiffney, G. R. Pess. 2006. A comparison of methods to evaluate the response of periphyton and invertebrates to wood placement in large Pacific coastal rivers. *Northwest Science*, 80:298-307.
- Pess, G. R., S. A. Morley, J. L. Hall and R. K. Timm. 2005. *Monitoring Floodplain Restoration*. Chapter 6, Pages 127 to 165 in P. Roni, editor. *Monitoring stream and watershed restoration*. American Fisheries Society, Bethesda, MD.
- Pess, G., S. Morley and P. Roni. 2005. Evaluating Fish Response to Culvert Replacement and Other Methods for Reconnecting Isolated Aquatic Habitats. Chapter 10 Pages 268 to 276 in P. Roni, editor. *Monitoring stream and watershed restoration*. American Fisheries Society, Bethesda, MD.
- Greene, C., D. Jensen, E. Beamer, G. Pess, and E.A. Steel. 2005 Effects of environmental conditions during stream, estuary, and ocean residency on Chinook salmon return rates in the Skagit River, WA. *Transactions of the American Fisheries Society* 134:1562-1581.
- Bilby, R. E., W. Ehinger, T. P. Quinn, G. Volkhardt, K. Krueger, D. E. Seiler, G. R. Pess, C. E. Jordan, D. Poon. 2005. Study evaluates fish response to management actions. *Western Forester*, 50(2):14-15.

- Pollock, M.M., G.R. Pess, T.J. Beechie, and D.R. Montgomery. 2004. The importance of beaver ponds to coho salmon production in the Stillaguamish River basin, Washington, USA. *North American Journal of Fisheries Management* 24:749-759
- Benda, L., L. Poff, D. Miller, T. Dunne, G. Reeves, G. Pess, and M. Pollock. 2004. Network disturbance theory: landscape and river organization of environmental variance. *Bioscience*. 54:413-427
- Steel, E.A., B.E. Feist, D. Jensen, G.R. Pess, M. Sheer, J. Brauner, and R.E. Bilby. 2004. Landscape models to understand steelhead (*Oncorhynchus mykiss*) distribution and help prioritize barrier removals in the Willamette basin, Oregon, USA. 61:999-1011. *Canadian Journal of Aquatic and Fisheries Science*.
- Kiffney, P.M., C.J. Volk, T. Beechie, G. Murray, G. Pess, and R. Edmonds. 2004. A rare disturbance event alters community and ecosystem properties in West Twin Creek, Olympic National Park, Washington. *American Midland Naturalist* 152:268-303
- Pess, G.R., T.J. Beechie, J.E. Williams, D.R. Whittall, J.I. Lange, and J.R. Klochak. 2003. Chapter 8. Watershed assessment techniques and the success of aquatic restoration activities. Pages 185-201 in R.C. Wissmar and P.A. Bisson, editors, *Strategies for Restoring River Ecosystems: Sources of Variability and Uncertainty in Natural and Managed Systems*. American Fisheries Society, Bethesda, Maryland.
- 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* 6: 271-282.
- Pess, G. R., D. R. Montgomery, E. A. Steel, R. E. Bilby, B. E. Feist, H. M. Greenberg. 2002. Landscape characteristics, land use, and coho salmon (*Oncorhynchus kisutch*) abundance, Snohomish River, Wash., USA. *Canadian Journal of Fisheries and Aquatic Sciences*, 59:613-623.
- Pess, G.R., D.R. Montgomery, T.J. Beechie, and L. Holsinger. 2002. Anthropogenic alterations to the biogeography of salmon in Puget Sound. Pages 129-154 in D. Montgomery, S. Bolton, and D. Booth, eds., *Restoration of Puget Sound Rivers*, University of Washington Press, Seattle, WA.
- Beechie, T. J., G. R. Pess, E. M. Beamer, G. Lucchetti, R. E. Bilby. 2002. Role of watershed assessments in recovery planning for salmon. Pages 194-225 in Montgomery, D. R., S. Bolton, D. B. Booth. (Eds.) *Restoration of Puget Sound Rivers*. University of Washington Press, Seattle, WA.
- Abbe, T. B., G. R. Pess, D. R. Montgomery, K. Fetherston. 2002. Integrating Engineered Log Jam Technology into Reach-Scale River Restoration. Pages 443-482 in Montgomery, D. R., S. Bolton, D. B. Booth. (Eds.) *Restoration of Puget Sound Rivers*. University of Washington Press, Seattle, WA.

- Roni, P., T. J. Beechie, R. E. Bilby, F. E. Leonetti, M. M. Pollock, 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):1-20.
- Welty, J. J., T. J. Beechie, K. Sullivan, D. M. Hyink, R. E. Bilby, C. Andrus, G. R. Pess. 2002. Riparian Aquatic Interaction Simulator (RAIS): a model of riparian forest dynamics for the generation of large woody debris and shade. *Forest Ecology and Management*, 162:299-318.
- McClure, M. M., G. R. Pess. 2002. Revision of water conservation. In McGraw-Hill *Encyclopedia of Science and Technology*, 9th Ed.
- Beechie, T. J., B. D. Collins, G. R. Pess. 2001. Holocene and recent geomorphic processes, land use and salmonid habitat in two north Puget Sound river basins. Pages 37-54 in Dorava, J. B., D. R. Montgomery, F. Fitzpatrick, B. Palcsak. (Eds.) *Geomorphic processes and riverine habitat, Water Science and Application*. American Geophysical Union, Washington D.C..
- Beechie, T. J., G. R. Pess, P. Kennard, R. E. Bilby, S. Bolton. 2000. Modeling recovery rates and pathways for woody debris recruitment in northwestern Washington streams. *North American Journal of Fisheries Management*, 20:436-452.
- Montgomery D.R., E.M. Beamer, G.R. Pess, and T.P. Quinn. 1999. Channel type and salmonid spawning distribution and abundance. *Canadian Journal of Fisheries and Aquatic Science*. 56: 377-387
- Collins, B.D. and G.R. Pess. 1997. Evaluation of forest practices prescriptions from Washington State's watershed analysis program, *Journal of the American Water Resources Association*. 33: 969-996.
- Collins, B.D. and G.R. Pess. 1997. Critique of Washington State's watershed analysis program. *Journal of the American Water Resources Association*. 33: 997-1010.
- Montgomery, D.R., R.D. Smith, K.M. Schmidt, and G.R. Pess. 1995. Pool Spacing in Forest Channels. *Water Resources Research*. 31: 1097-1105.

#### Technical memorandums

- McMillan, J., R. Peters, M. McHenry, S. Brenkman, S. Morley, G. Pess, J. Anderson, T. Quinn, M. Foley, K. Denton, M. Moser, R. Paradis, H. Hugunin, J. Geffre, and A. Geffre. 2019. The Elwha River: what have we learned since dam removal? *Osprey* 93:14-17

Hillman, T., Pess, G. and Beechie, T., 2019. Evaluation of intensively monitored watershed projects. Report to NOAA Fisheries, Portland, OR. Evaluation of Intensively Monitored Watershed Projects.

Pess, G., and C. E. Jordan, editors. 2019. Characterizing Watershed-Scale Effects of Habitat Restoration Actions to Inform Life Cycle Models: Case Studies Using Data-Rich vs. Data-Poor Approaches. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-151.

Stefankiv, O., Hall, J.E., Timpane-Padgham, B.L., Nicol, C., Fogel, C., Beechie, T.J. and Pess, G.R., 2019. Salmon Habitat Status and Trends: Monitoring Protocols.

Hall, J.E., Stefankiv, A., Timpane-Padgham, B., Liermann, M., Beechie, T.J. and Pess, G.R., 2018. Puget sound habitat status and trends monitoring program: nearshore and large river delta geospatial data and habitat status and trends monitoring metrics.

McClure, M.M., Anderson, J.H., Pess, G.R., Cooney, T.D., Carmichael, R.W., Baldwin, C.M., Hesse, J.A., Weitkamp, L.A., Holzer, D.M., Sheer, M.B. and Lindley, S.T., 2018. Anadromous salmonid reintroductions: general planning principles for long-term viability and recovery.

Myers, J. M., J. J. Hard, E. J. Connor, R. A. Hayman, R. G. Kope, G. Lucchetti, A. R. Marshall, G. R. Pess, and B. E. Thompson. 2015. Identifying historical populations of steelhead within the Puget Sound Distinct Population Segment. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-128, 155 p.

Hard, J. J., J. M. Myers, E. J. Connor, R. A. Hayman, R. G. Kope, G. Lucchetti, A. R. Marshall, G. R. Pess, and B. E. Thompson. 2015. Viability criteria for steelhead within the Puget Sound Distinct Population Segment. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-129, 332 p.

Peters, R.J., J.J Duda, G.R. Pess, M. Zimmerman, P. Crain, Z. Hughes, A. Wilson, M.C. Liermann, S.A. Morley, J.R. McMillan, K. Denton, D. Morrill, and K. Warheit. 2014. Guidelines for Monitoring and Adaptively Managing Restoration of Chinook Salmon (*Oncorhynchus tshawytscha*) and Steelhead (*O. Mykiss*) on the Elwha River. U.S. Fish and Wildlife Service, Olympia.

Roni, P., G. R. Pess, T. J. Beechie, K. Hanson. 2014. Fish-habitat relationships and the effectiveness of habitat restoration. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-127, 154 p.

Beechie, T. J., G. R. Pess, H. Imaki. 2012. Estimated changes to Chinook salmon and steelhead habitat carrying capacity from rehabilitation actions for the Trinity River, North Fork Trinity to Lewiston Dam. Contract Report to the US Fish and Wildlife Service, 39 p.



- Stout, H. A., P. W. Lawson, D. L. Bottom, T. Cooney, M. J. Ford, C. E. Jordan, R. G. Kope, L. M. Kruzic, G. R. Pess, G. H. Reeves, M. D. Scheuerell, T. C. Wainwright, R. S. Waples, E. Ward, L. Weitkamp, J. G. Williams, T. H. Williams. 2012. Scientific conclusions of the status review for Oregon coast coho salmon (*Oncorhynchus kisutch*). U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-118, 242 p.
- Ward, L., P. Crain, B. Freymond, M. McHenry, D. Morrill, G. R. Pess, R. Peters, J. A. Shaffer, B. Winter, B. Wunderlich. 2008. Elwha River Fish Restoration Plan, developed pursuant to the Elwha River Ecosystem and Fisheries Restoration Act, Public Law 102-495. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-90, 168 p
- Hard, J. J., J. M. Myers, M. J. Ford, R. G. Kope, G. R. Pess, R. S. Waples, G. A. Winans, B. A. Berejikian, F. W. Waknitz, P. B. Adams, P. A. Bisson, D. E. Campton, R. Reisenbichler. 2007. Status review of Puget Sound steelhead (*Oncorhynchus mykiss*). U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-81, 117 p.
- Roni, P., K. Hanson, T. J. Beechie, G. R. Pess, M. M. Pollock, D. M. Bartley. 2005. Habitat rehabilitation for inland fisheries. Global review of effectiveness and guidance for rehabilitation of freshwater ecosystems. FAO Fisheries Technical Paper. No. 484, Food and Agriculture Organization of the United Nations, 116 p.
- Pess, G. R., T. J. Beechie, S. A. Morley, E. M. Beamer. 2004. Analyses for Phase II Recovery Planning: Identifying ecosystem restoration actions. Pages 40-59 in Beechie, T. J., P. Roni, E. A. Steel. (Eds.) Ecosystem recovery planning for listed salmon: An integrated assessment approach for salmon habitat. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-58, 183 p.
- Roni, P, T. Beechie, and G. Pess. 2004. Prioritizing restoration actions within watersheds. Pages 60 to 73 in Beechie, T., E.A. Steel, and P. Roni. 2004. Ecosystem Recovery Planning for Listed Salmon: An Integrated Assessment Approach for Salmon Habitat. NOAA Technical Memorandum NMFS-NWFSC-58, Seattle, Washington.
- Sanderson, B. L., E. A. Steel, T. J. Beechie, G. R. Pess, M. B. Sheer, C. A. Campbell. 2003. Analyses for Phase I recovery planning: setting recovery goals. Pages 18-39 in Beechie, T. J., E. A. Steel, P. Roni, E. Quimby. (Eds.) Ecosystem recovery planning for listed salmon: an integrated assessment approach for salmon habitat. U.S. Dept. Commerce, NOAA Technical Memorandum, NMFS-NWFSC-58, 183 p.
- Pess, G.R., M.M. Liermann, M. McHenry, T. Bennett, R. Peters, P. Kiffney, and H. Coe. 2002. Juvenile and adult salmonid response to the placement of logjams in the Elwha and Stillaguamish Rivers: preliminary results. Submitted to Stillaguamish Tribe of Indians, Washington Trout, Lower Elwha Tribe, and Salmon Recovery Funding Board. Olympia, WA.
- Pess G.R., B. D. Collins, M. M. Pollock, S. Grigsby, T. J. Beechie, and A. Haas. 2001. Historic and current factors that limit coho salmon (*Oncorhynchus kisutch*) production in the

Stillaguamish River basin, Washington State: implications for salmonid habitat protection and restoration. Prepared for Snohomish County Department of Public Works. Snohomish County, Washington.

- Kennard P., G.R. Pess, T.J. Beechie, B. Bilby, and D. Berg. 1999. Riparian-in-a-box: A manager's tool to predict the impacts of riparian management on fish habitat. In Proceedings of the Forest-Fish Conference: Land Management Practices Affecting Aquatic Ecosystems Calgary, AB May 1-4, 1996, Eds. M.K. Brewin and D.M.A. Monita, Information Report NOR-X-356 Canadian Forest Service-Northern Forestry Centre Alberta, pp. 483-490.
- Abbe, T.B., D.R. Montgomery, C. Petroff, and G.R. Pess. April 1997. Technical summary: North Fork Stillaguamish River habitat enhancement and bank protection project River Miles 21 to 23, Snohomish County, Washington. Unpublished report.
- Puget Sound Stock Review Group. 1997. Puget Sound Salmon Stock Review Group Report, 1997: An assessment of the status of Puget Sound Chinook and Strait of Juan De Fuca Coho stocks as required under the salmon fishery management plan. Pacific Fishery Management Council Portland, Oregon.
- Pess, G. 1995. Fish habitat module for Hazel watershed analysis (WAU). Washington State Department of Natural Resources - Northwest region. Unpublished report.
- Kennard, P., and G.R. Pess. 1994. Forest Management and Stream Degradation in Montague Basin - A Watershed Assessment, North Fork Stillaguamish River, Snohomish County, Washington State. Tulalip Tribes Environmental Department.
- Schuett-Hames, D., and G.R. Pess. 1994. "A Strategy to Implement Watershed Analysis Monitoring: An Assessment of Parameters and Methods, Monitoring Module Outline, and Recommendations for Program Development. Prepared for the Washington Forest Practices Association.
- Sullivan, K., D.R. Montgomery, G.R. Pess, and J. Buffington. 1993. Stream Channel Module in Standard Methodology for Conducting Watershed Analysis (Version 2.0). Washington Forest Practices Board.
- William M. Kier Associates. "Recommendations for Evaluating the Effectiveness of the California Forest Practice Rules as the Best Management Practices (BMPs) for the Protection of Water Quality." Prepared for the Best Management Practices Effectiveness Assessment Committee.
- William M. Kier Associates. "Long Range Plan For The Klamath River Basin Conservation Area Fishery Restoration Program." Prepared for the Klamath River Basin Fisheries Task Force.