

## Memorandum

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**Date:** October 16, 2007

**To:** Clatsop County

**From:** Willis E. McConnaha, Ph.D., Senior Fisheries Ecologist, Associate Principal

**cc:**

**Subject:** Dredging impacts on estuarine resources at Bradwood Landing

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Oregon's Department of Land Conservation and Development's letter commenting on the Bradwood Landing proposal noted that "[a]n exception is not required to apply a development management unit for a required navigational improvement, unless the proposed dredging will adversely affect the integrity of the estuarine ecosystem, requiring the application of a natural or conservation management unit." At your request, we have examined the impacts of dredging the turning basin at Bradwood Landing on juvenile salmonids (operational impacts only). Our conclusion is that the habitat modification resulting from the dredging will have little or no discernable effect on the integrity of the estuarine ecosystem. Our analysis has focused on juvenile Chinook salmon including subyearling and yearling varieties. However, the results should extend to other salmonids, especially coho salmon and steelhead.

Yearling migrants (most spring Chinook, steelhead and many coho) use the estuary primarily as a migrational corridor linking upriver production areas and the ocean. These fish move rapidly through the lower Columbia River and are most frequently found in the upper water column in the deeper, main channel areas. Subyearling migrants (most fall Chinook and some coho) rear and grow in the estuary prior to moving into marine waters. These fish are usually found in shallow water areas; we demarcate shallow and deep water areas at around 20 feet in depth.

Dredging of the turning basin at Bradwood Landing is projected to encompass about 57 acres off-shore of Bradwood Landing. The action will take the present depth of about 35 feet to a minimum of 43 feet in depth. In other words, the action will deepen areas that are already classed as "deep" habitats. Dredging will not affect the shallow water areas used by subyearling salmon, while the further deepening of deep-water areas is unlikely to be discernable for yearling salmon using the upper water column.

I would anticipate that other ecological effects of the dredging to be minimal as well. Certainly the dredging itself will have a direct effect on the benthic community. However, the estuarine river-bed is constantly shifting due to currents and sediment transport and communities are well adapted to this. I would expect the benthic community to rapidly recover following dredging.

## **Willis (Chip) McConnaha, Ph.D.**

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### **Education**

Ph.D., Environmental Science and  
Resources, Portland State University, 2002

M.S., Fisheries, University of Washington,  
1978

B.A., Geology, Indiana University, 1974

### **Professional Memberships**

American Fisheries Society

Certified Fisheries Scientist (No. 1596),

American Fisheries Society

Ecological Society of America

Dr. McConnaha serves as Senior Fisheries Ecologist and is an Associate Principal with Jones & Stokes. His prior experience includes his position as senior scientist and program manager with Mobrand Biometrics Inc. (MBI). Prior to this, he worked for 17 years as primary technical advisor and fisheries scientist with the Northwest Power Planning and Conservation Council where he helped design the Council's fish and wildlife program for the Columbia River. At the Council he was responsible for analysis of hydroelectric impacts and development of an ecosystem perspective to fisheries recovery. He created and participated on the Independent Scientific Advisory Board (ISAB) which advises the Council and NMFS on scientific matters related to fish and wildlife recovery. Dr. McConnaha has worked extensively throughout the Pacific Northwest on fishery issues, species recovery and watershed restoration. He has been employed by tribal, state and federal agencies and has a proven record of effective scientific work with a broad spectrum of public and private interests. He has led efforts to develop technical analysis and tools for use in species recovery and watershed planning. He has worked as part of the regional team to develop Ecosystem Diagnosis and Treatment (EDT), and created the Qualitative Habitat Assessment (QHA) tool and other analytical tools for fisheries and environmental analysis.

Dr. McConnaha is a co-author of the recently released book "*Return to the River—Restoring Salmon to the Columbia River*" published by Elsevier Press.

Dr. McConnaha is adjunct faculty at Portland State University where he teaches in the River Restoration Certification Program

### **Project Experience**

**Evaluation of potential impacts of floodplain restoration in the Willamette River—US Army Corps of Engineers.** Dr. McConnaha works as part of an inter-disciplinary team of hydrologists and geomorphologists to evaluate the potential biological and hydrogeomorphic impacts of restoring floodplain habitats along the

Willamette River. He is leading efforts to evaluate floodplain impacts for Chinook salmon and to develop methods to evaluate multi-species and ecological impacts of floodplain habitats.

**Role of large river habitats in the Willamette River on the recovery of Chinook and steelhead—National Marine Fisheries Service, Mid-Willamette Council of Governments.** Prepared an in-depth examination of the importance of floodplain and large-river habitats for Chinook salmon. A subsequent report summarized the importance of these habitats in the Willamette River and proposed a set of restoration priorities.

**Evaluation of impacts of Yolo Bypass (Sacramento River) on Chinook salmon—Metropolitan Water District of Southern California.** Dr. McConnaha developed a simple model to analyze impacts of the Yolo Bypass on juvenile and adult Chinook salmon in the Sacramento River. The results are being used to evaluate the need for improvements to the structure and management of the bypass.

**Analysis of potential for salmon recovery in urban environments—City of Portland, Oregon.** Serves as Project Manager and technical analyst for this project. Works with the City of Portland in developing a management plan for watersheds within the city and urban growth boundary. Provides technical analysis of Portland streams and lower Willamette River, and have contributed to the Portland Ecological Framework for urban watershed planning. This project is one of the first urban applications of the Ecosystem Diagnosis and Treatment (EDT) method, and focuses on small urban streams and the Willamette River. Analysis addressed restoration of a watershed affected by urbanization and agriculture. He is working with a multi-stakeholder group to analyze restoration options and to develop watershed plans for Portland streams.

**Clackamas, McKenzie, and Willamette River Watershed Assessment—Mid-Willamette Valley Council of Governments, Corvallis, OR.** Project Manager. Assessment of salmonid habitat limitations in the Clackamas, McKenzie and Willamette River watersheds. Worked with local watershed councils to devise strategies for restoration of salmonid habitat affected by logging, gravel mining and urbanization. Results were incorporated into the Willamette River Subbasin Plan submitted to the Northwest Power Planning and Conservation Council.

**Upper Columbia Salmon Recovery Planning—North Central Washington Resource Conservation & Development Council, Wenatchee, WA.** Serves as Project Manager and Technical Lead to assist in development of recovery plan for ESA listed salmon populations in the upper Columbia River. Advice and assistance are

provided to the Client on the development of management scenarios and technical analysis of recovery potential for upper Columbia populations.

**Evaluation of Fish Potential at Klamath Hydroelectric Project—**

**PacifiCorp, Portland, OR.** As part of PacifiCorp's Klamath Relicensing project, evaluated the potential of Klamath River Basin stream habitat upstream of Iron Gate Dam to support anadromous salmonids.

Analysis estimated habitat potential and evaluated factors limiting potential including the existing hydroelectric dams. Provided advice on fish passage at hydroelectric dams and on salmonid habitat issues.

**John Day River Subbasin Follow-Up—Columbia River Inter-Tribal Fish Commission (CRITFC), Portland, OR.**

Provided assistance to state and tribal planners to assess fish populations and habitat in the John Day River. Developed a set of practical recommendations use of analytical tools to evaluate habitat potential and develop restoration strategies.

Review results to date for spring Chinook performance and abundance with biologists and develop recommendations for modifications to life history tables or other areas. Provide advice and assistance as requested to the tribal and state managers to develop scenarios for the John Day populations.

**Regional Technical Support for Columbia River Subbasin Planning—Northwest Power and Conservation Council, Portland, OR.**

Project Manager. Provides technical advice to subbasin planners on salmonid habitat assessment and restoration planning. Worked with federal, state and tribal planners to develop watershed assessments for 35 major watersheds in the Columbia Basin affected by hydroelectric development, logging, agriculture and urbanization. Assisted local planners and fishery managers to incorporate results into watershed restoration plans submitted to Northwest Power Planning and Conservation Council. Continues to work with local and regional groups to evaluate restoration alternatives and to incorporate artificial production and harvest into subbasin and basin-wide restoration plans.

**Regional Technical Support for Subbasin Planning—Qualitative**

**Habitat Assessment—Northwest Power and Conservation Council,**

**Portland, OR.** Project Manager. Developed and applied the Qualitative Habitat Assessment (QHA), software tool that provides rapid, qualitative assessments of watershed conditions. I managed the QHA assessment of lower Columbia River tributaries as well as the Flathead and Kootenai systems in Montana and Idaho. QHA was used to develop a qualitative index of changes in salmonid habitat related to logging and mining.

**Squaxin Island Fisheries Management Analysis—Squaxin Island Tribe, Shelton, WA.** Project Manager. Evaluated stream habitat potential for coho in south Puget Sound streams to assist watershed planning for Squaxin Island Tribe. Assisted the tribe in development of stream restoration projects related to the effects of logging, urbanization and agriculture.

**Web Display of EDT for Pierce County—Pierce County, Washington.** Project Manager. Developed web interface for EDT outputs for Pierce County to provide citizen access to stream restoration problems and opportunities.

### **Prior Experience**

**Manager of Program Evaluation and Analysis—Northwest Power and Conservation Council.** Served as senior technical advisor to the Council on development of a regional program to mitigate for the impacts of the Columbia River hydroelectric system on fish and wildlife. Created and applied analytical tools for analysis of hydroelectric operations on salmon survival. He was a primary architect of the Council's ecosystem framework and adaptive management initiatives.

**Technical Representative and Coordinator—Independent Scientific Advisory Board.** Created and participated on the ISAB, a board of scientists organized to advise the Council and National Marine Fisheries Service on scientific matters pertaining to fish and wildlife restoration in the Columbia Basin. Under his direction, the ISAB provided the region with several groundbreaking analyses of issues ranging from artificial production to regional climate change.

**Staff Scientist—Columbia River Fish Passage Center.** Dr. McConnaha developed scientific studies of fish passage and survival in the Columbia River. He created analytical tools to explore the impacts of alternative hydroelectric operations on fish passage through the Columbia River hydroelectric system.

**Fisheries Biologist—Columbia River Intertribal Fish Commission.** Served as staff scientist dealing with harvest management, fish passage at hydroelectric facilities and habitat recovery. Was appointed to Scientific Advisory Group for the North Pacific Fishery Management Council. Represented Columbia River treaty tribes in federal court proceedings and regional fisheries forums.



## Reports and publications of Willis E. McConnaha

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- Brannon, E. L., K. P. Currens, D. Goodman, J. A. Lichatowich, W. E. McConnaha, B. E. Riddell, and R. N. Williams. 1999. Review of artificial production of anadromous and resident fish in the Columbia River Basin, Part I: A scientific basis for Columbia River Production programs. Northwest Power Planning Council. 139 pages
- Coutant, C. C., L. C. Calvin, M. W. Erho, 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. 1997. The normative river: An ecological vision for the recovery of Columbia River salmon. Pages 50-59 in D. J. Mahoney, ed. *Waterpower '97. Proceedings of the 1997 International Conference on Hydropower*. American Society of Civil Engineers, New York, NY.
- Lestelle, L., W. E. McConnaha, G. Blair, and B. Watson. 2005. Chinook salmon use of floodplain, secondary channel and non-natal tributary habitats in river of Western North America: Application to the Willamette River (Oregon) and Formulation of Species-Habitat Rules for EDT Analysis. Prepared by Mobrand-Jones & Stokes for Mid-Willamette Council of Governments--U.S. Army Corps of Engineers. 75 pages
- Lestelle, L., L. Mobrand, and W. McConnaha. 2004. Information structure of Ecosystem Diagnosis and Treatment (EDT) and habitat rating rules for Chinook salmon, coho salmon and steelhead trout. Mobrand Biometrics, Inc., 50 pages
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- McConnaha, W. E. 1999. The Columbia River Multi-Species Framework Project: Progress and Concepts. Pages 83-86 in R. Sakrison and P. Sturtevant, eds. *Watershed management to protect declining species*. American Water Resources Association, Seattle, WA.
- . Assessment of coho salmon habitat in an urban stream using species-habitat analysis. Portland State University, Environmental Sciences and Resources, Portland, OR. 225 pages
- . 2006. Valley floor habitats and the restoration Chinook and steelhead in the Willamette River. Prepared by Mobrand-Jones & Stokes for Mid-Willamette Valley Council of Governments. 32 pages
- McConnaha, W. E., and P. J. Paquet. 1996. Adaptive strategies for the management of ecosystems: the Columbia River experience. Pages 410-421 in L. E. Miranda and D. R. DeVries, eds. *Multidimensional approaches to reservoir fisheries management*. American Fisheries Society, Bethesda, MD.

- McConnaha, W. E., and B. Torell. 2004. Assessment of aquatic habitat in the Clackamas Basin. Pages 70 in D. Primozych and R. Bastach, eds. *Willamette River Subbasin Plan*. Mid-Willamette Council of Governments for the Northwest Power Planning Council, Portland, OR.
- . 2005. Preliminary assessment of habitat potential in the Middle Fork Willamette River for spring Chinook salmon. Prepared by Mobrand-Jones & Stokes for Mid-Willamette Council of Governments. 18 pages
- McConnaha, W. E., B. Torell, and B. Dykaar. 2006. Analysis of the potential benefits of floodplain habitat in the Middle Fork Willamette River using Geomorphic Splice Analysis. Prepared by Mobrand-Jones & Stokes for Mid-Willamette Valley Council of Governments, US Army Corps of Engineers, Oregon Department of Fish and Wildlife. 31 pages
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- Volkman, J. M., and W. E. McConnaha. 1993. Through a glass, darkly: Columbia River salmon, the Endangered Species Act, and adaptive management. *Environmental Law* 23:1249-1272 pages
- Williams, R. N., P. A. Bisson, D. Bottom, L. D. Calvin, C. C. Coutant, M. W. Erho, C. A. Frissell, J. A. Lichatowich, W. J. Liss, W. E. McConnaha, P. R. Mundy, J. A. Stanford, and R. R. Whitney. 1999. Scientific issues in the restoration of salmonid fishes in the Columbia River. *Fisheries* 24:3, 10-19 pages