The Past, Present, and Future of the Williamson River Delta: Big Changes in the Upper Basin

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One of the largest and most significant restoration projects in the Upper Klamath Basin was recently completed on approximately 5,500 acres of the Williamson River Delta. This $8.7 million project was designed to re-establish the hydrologic connection between Agency Lake, Upper Klamath Lake, the Williamson River and the Williamson River Delta, thereby restoring deltaic wetland ecosystem function to as close to historical condition as feasible for the benefit of two primary objectives: (1) to restore habitat for larval and juvenile Lost River and shortnose suckers, and (2) to improve water quality conditions in Upper Klamath Lake.

In 2006 restoration occurred on the north half of the Delta. Initial steps involved creating a restoration design plan, having construction companies bid on the proposed design, choosing a company to do the earthmoving work, and beginning the process of removing levees, filling toe drains, and recreating historic flow paths through the Delta. Klamath tribal members monitored all ground disturbing activities to insure that cultural resources were not disturbed. In year one 700,000 cubic yards of material was moved on the north and south halves of the Delta, and restoration proceeded ahead of schedule. In 2007 we used explosives to remove two miles of levee, used mechanical means to remove levees along the Williamson River, and lower the perimeter levees between the main levee breaches to below the high water mark. Over one million cubic yards of material was moved in 2007. In 2008, we moved over 800,000 cubic yards of material, sculpting riparian benches and breaching lakeshore levees on the south half of the Delta. Additional earthwork completed in 2009 helped refined previously work to better achieve the desired outcomes.

We developed a monitoring program to assess the results of this restoration on endangered suckers and water quality in the lake; preliminary results reaffirm that suckers are benefitting from the restored habitats. We believe the long-term benefits of this project will aide in the recovery of the two endangered suckers and lessons learned from this project will help inform future restoration of additional lake-fringe wetlands at the north end of Upper Klamath and Agency Lakes.

The was a project of partners, funded and supported by the National Fish and Wildlife Foundation, Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, Oregon Watershed Enhancement Board, North American Wetlands Conservation Council, PacifiCorp, Environmental Protection Agency, Ducks Unlimited and the Klamath Tribes.

Monitoring Fishery Effects of Salmonid Habitat Restoration

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Considerable resources are devoted to salmonid habitat restoration on the Klamath River. Restoration efforts have typically focused on limiting factors such as water quality and fish passage – with considerable attention now being given to dam removal itself. Monitoring is a critical though often under-funded aspect of restoration. Moreover, even though restoration is often intended to enhance salmon populations and fisheries, monitoring (when it does occur) focuses almost exclusively on population effects – or at least on limiting factors affecting populations. In cases where restoration is intended to enhance fisheries, fishery monitoring is also important and should be conducted with the

same rigor as physical or biological monitoring. For instance, fishery monitoring should be conducted pre-restoration and not just "after the fact" to provide an adequate basis for comparison. Given the complex nature of fishery behavior, it is also important that monitoring include collection of economic and other data that allow the effects of restoration to be distinguished from other factors that also influence fishery behavior. Ideally monitoring should provide an opportunity to derive "lessons learned" that can be applied to similar restoration projects on other rivers. This presentation discusses data needs for monitoring fishery effects associated with major salmonid restoration projects, existing gaps in such data, and how those gaps might be filled.

Restoration Prior to Dam Removal: the Key to a Low-impact Dam Removal Strategy?

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In early 2009 the California State Coastal Conservancy released a conceptual restoration plan for how a restored Klamath River would look and function after dam removal, prepared by an interdisciplinary team of restoration scientists and engineers. This document included a preliminary plan for what work would be necessary to accomplish successful restoration of the river for the reintroduction of anadromous fish extirpated since dam closure. It involved historical techniques, innovative hydraulic and sediment transport modeling, and site reconnaissance to reconstruct likely geomorphic and ecologic processes and conditions prior to dam closure and assess the likely processes and conditions during and after dam removal. That information was combined with the river restoration planning and implementation experience of the team to develop a comprehensive restoration planning document that includes potential restoration actions and techniques, conceptual restoration plans for each of the three main reservoir areas, including floodplain and in-channel restoration actions, and preliminary cost estimates.

Based on this work and the timeline and details outlined in the recent Klamath Hydroelectric Settlement Agreement, this presentation provides recommendations for immediate (pre-dam removal) restoration actions necessary to achieve successful restoration of the river ecosystem after dam removal. While restoration in the areas submerged by the dams obviously must wait for dam removal, more rapid implementation in non-inundated areas is imperative because of the response time-lag in system conditions relative to the need to provide high-quality habitat in these un-impounded areas immediately after the river is re-opened after dam removal. These actions include measures on the Klamath River in the J.C. Boyle peaking reach, in creeks tributary to the reservoirs, and in key watersheds downstream of Iron Gate Dam. Pre-dam removal action in these areas also supports necessary habitat improvements required to maintain habitat (and aquatic species populations) outside the mainstem of the river. This is important because this habitat and these populations will provide the basis for recovery/repopulation of the mainstem river downstream of Iron Gate after the brief impacts of sediment discharge from dam removal, and will ostensibly be the organisms repopulating the river now inundated by the reservoirs.

Proceedings of the Klamath Basin Science Conference, Medford, Oregon, February 1–5, 2010

Edited by Lyman Thorsteinson, Scott VanderKooi, and Walter Duffy

Open-File Report 2011–1196

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia K. McNutt, Director

U.S. Geological Survey, Reston, Virginia: 2011

Suggested citation:
Thorsteinson, Lyman, VanderKooi, Scott, and Duffy, Walter, eds., 2011, Proceedings of the Klamath Basin Science Conference, Medford, Oregon, February 1–5, 2010: U.S. Geological Survey Open-File Report 2011-1196, 312 p.