# Modeling the Effects of Condit Dam Removal on Tule Fall Chinook Salmon Spawning Habitat

**\*James R. Hatten[a], Thomas R. Batt[a], Gary J. Barton[b], Joseph J. Skalicky[c], and** Rod Engle[c]

**\*Presenter (509-538-2299, jhatten@usgs.gov)**

[a]**U.S. Geological Survey, Western Fisheries Research Center, Columbia River Research Laboratory, Cook, WA.**

[b]**U.S. Geological Survey, Idaho Water Science Center, Boise, ID.**

[c]U.S. Fish and Wildlife Service, Columbia River Fisheries Program Office, Vancouver, WA

## Abstract

Condit Dam was constructed in 1912 on the White Salmon River in Klickitat and Skamania Counties, Washington. Built for hydropower generation without fish ladders, it measures 144-m long by 38-m high. For almost 100 years Condit Dam blocked 53 km of steelhead habitat and 23 km of salmon habitat, but a settlement agreement paved the way for Condit dam to be breached in October 2011, with the remaining structure to be removed in 2012. Consulting agencies determined that dam removal would benefit salmonids above Condit Dam, by providing access to new spawning and rearing areas, but were unclear what impacts dam removal would have on threatened tule fall Chinook salmon spawning habitat below the dam. The depressed status of tule fall Chinook salmon, combined with uncertainties related to dam removal, raised concerns. The goal of our project is to quantify the effects of dam removal on tule fall Chinook salmon spawning habitat in the lower White Salmon River below Condit Dam. Meeting this goal required an assessment of tule fall Chinook salmon spawning habitat prior to dam breaching in 2011, followed by a post-dam assessment in 2012. Thus, we established a baseline dataset that describes the bathymetry, substrate composition, and river hydraulics (2D) that were associated with spawning habitat in fall 2011. Following this, we constructed a probability model of spawning habitat by linking the physical conditions of the river to redd locations prior to dam breaching. The habitat model was over 80% accurate in identifying spawning and non-spawning locations based upon river depth, substrate composition, and velocities. We will employ the same methodologies in the summer of 2012 to evaluate how river bathymetry, substrate composition, and hydraulics have changed in the lower White Salmon River and what effects this will have on predicted tule fall Chinook salmon spawning habitat.