

**Buck Creek fish population and habitat analysis in preparation for the recolonization by anadromous salmonids.**

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**ABSTRACT:**

We assessed the physical and biotic conditions in the portion of Buck Creek potentially accessible to anadromous fishes. This creek is a major tributary to the White Salmon River above Condit Dam, which is slated for removal in October 2011. Habitat and fish populations were characterized in four stream reaches. Reach breaks were based on stream gradient, water withdrawals, and fish barriers. We found Buck Creek to be confined, with a single straight channel and low sinuosity. Boulders and cobble dominated the stream substrate, with limited gravel available for spawning. Large cobble riffles were 83% of the available habitat overall. Pools, comprising 15% of the surface area overall, were mostly formed by bedrock with low instream cover and complexity. Instream wood averaged 6 to 10 pieces per 100 m, 80% of which was less than 50 cm in diameter. Water temperature in Buck Creek rarely exceeded 16 °C and only in the lowest reach. Minimum summer discharge in Buck Creek was 3.3 cfs below an irrigation diversion (rkm 3.1) and 7.7 cfs at its confluence with the White Salmon River. Rainbow trout was the dominant fish species in all reaches, and the highest abundance of age-0 rainbow trout was in the most downstream reach. These analyses in Buck Creek may contribute to understanding the factors that limit fish abundance and productivity and will help identify and prioritize potential instream restoration actions. These baseline data will allow monitoring of changes in fish populations once Condit Dam is removed and anadromous fish recolonize Buck Creek.