The Effectiveness of Instream Structures for Improving Fish Habitat

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Abstract

Historic salmon runs in the Pacific Northwest (PNW) are considerably reduced due in part to passage barriers and degraded stream habitat. Despite the billions of dollars a year that government and private agencies spend on salmon habitat enhancement projects, wild salmon runs continue to decline (National Research Council 1996). Lack of time, money and basic guidelines for project evaluation has resulted in a variety of salmon habitat enhancement projects that are implemented with limited pre- and post-restoration monitoring and no evaluation (Kondolf and Mitcheli 1995). Without a clear understanding of whether or not projects meet their objectives, time and money will continue to be wasted and a valuable resource may be lost.

The purpose of this study is to determine if log and boulder weirs are effective in improving anadromous fish pool habitat in six streams in the Umatilla National Forest (NF) in northeastern Oregon. Measures of stream characteristics such as habitat unit type, depth, area, temperature, substrate, cover, and woody debris input are some of the variables most often used to describe fish habitat (Hunter 1991). Since the objective of log and boulder weirs in the Umatilla NF was to create suitable low-flow pool habitat, primary fish pool habitat variables evaluated were pool frequency, depth, area, volume, and pool-riffle ratio. In addition, habitat unit frequency and the standard deviation of riffle width were evaluated as surrogates for stream complexity. US Forest Service (USFS) Level II Stream Surveys conducted before treatment and many years after treatment were used to assess the habitat conditions in both the treated and control reaches. I hypothesize that log and boulder weirs improve fish habitat by increasing pool frequency, area, volume and depth, improving the pool-riffle ratio, and increasing steam complexity. Secondly, I propose that stream reaches treated with log and boulder weirs meet scientifically and agency defined target value for the variables mentioned above.

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