Factors Influencing Redd Observer Efficiency in the Wenatchee Basin

Chad Herring, WDFW

Andrew Murdoch, WDFW

Steelhead *Oncorhynchus mykiss* run escapements into the upper Wenatchee Basin have been calculated based on Tumwater Dam passage data since 1999. WDFW has been conducting steelhead spawning ground surveys in the Wenatchee Basin since 2001. Mean proportion of the run escapement accounted for on the spawning grounds was only 56% for 2004 thru 2009. The low proportion of run escapement accounted for on the spawning grounds generated two possible hypotheses: 1) spawning ground surveys are not covering all spawning habitat available in the basin; and 2) our ability to find steelhead redds or observer efficiency is lower than expected. Beginning in 2010, we began a three year study to calculate observer efficiency and to evaluate what factors influence observer efficiency. We measured a variety of habitat, environmental, biological and observer specific variables to see what effect they had on observer efficiency. We used a mark-resight approach slightly modified from Thurow and McGrath (2010) to determine observer efficiency and Spearman Rank correlation to determine which factors were significantly correlated with observer efficiency. Preliminary results after analyzing two years of data suggest that the factors that explain the most variation in observer efficiency are effort, visibility, stream width, channel complexity and density of redd like features. Interestingly, while experience wasn’t significantly related to correctly identifying steelheadredds it was significantly negatively correlated with falsely identifying features as steelhead redds. Also, calculations of total and net error rates of spawning ground surveys found surveyors consistently underestimated the total number of redds, except in a few occasions. These findings are similar to what Thurow and McGrath (2010) found conducting a similar study on spring Chinook *O. tshawytscha* in the Middle Fork Salmon River, Idaho. The methodology is repeatable and needs to be conducted in a variety of different habitat and environmental conditions, but does demonstrate that steelhead redd abundance can be estimated across a range of survey conditions.