**2016 Pacific Coast Steelhead Management Meeting**

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**Title:** Modeling impacts of summer and winter steelhead catch and release sport fisheries

**Abstract:** Fisheries managers have implemented catch and release (C&R) regulations to protect populations and maximize recreational angling opportunity of wild anadromous *Oncorhynchus mykiss* (i.e., steelhead) across their entire range. However, steelhead released from a C&R fishery are still susceptible to post-release hooking mortality and these mortality estimates are necessary to evaluate the impact of non-retention recreational fisheries on wild steelhead populations. Existing studies have demonstrated that C&R mortality for salmonids can vary widely depending on environmental conditions, hook location, gear type, and angling technique. Additional synthesis is needed to apply these results to specific fisheries. Using a Bayesian framework and logistic regression, we first evaluated the influence of various covariates on the C&R mortality rates of wild steelhead using individual data collected from northern California and Washington State populations. Based on these results, we then developed a predictive model and used it to estimate the C&R mortality for released wild steelhead from four Washington State fisheries. Lastly, we analyzed the association between gear-type (jig, lure, fly, bait), race (summers vs. winters), and hooking location (critical vs. non-critical) to evaluate the impact of fishing regulations on C&R mortality rates. Overall, our flexible model, when combined with population specific hook location and temperature data, allows fishery managers to more accurately assess the impacts of C&R regulations on wild steelhead populations.