Title: Use of flow enhancement to improve late-summer rearing habitat for juvenile steelhead in the Potlatch River, ID

Habitat restoration efforts are being implemented in the Potlatch River, ID to rehabilitate the wild steelhead *Oncorhynchus mykiss* population. Steelhead productivity in the drainage is density dependent and is limited by available rearing habitat. Low late-summer flows severely restrict the amount of juvenile rearing habitat and are a primary limiting factor. We conducted low volume water releases from a headwater reservoir and monitored the associated downstream environmental conditions. Prior to initiating water releases the test reach had intermittent flow. Water releases of 0.5 – 1.0 cfs/ day were conducted from August 3rd – October 21st 2015. Water depth, temperature, dissolved oxygen, and electrical conductivity were recorded at eight monitoring stations downstream of the reservoir and habitat surveys were conducted bi-weekly to document total wetted length, pool abundance, and pool quality at each sampling station. Fish monitoring documented changes in juvenile steelhead distribution pre and post release as well as growth and survival analysis. Results showed that flow releases between 0.4 – 1.0 cfs re-connected the entire 16 km of stream habitat downstream of the reservoir in 33 days. Average water temperatures decreased 13%, dissolved oxygen levels increased 41%, and pool abundance increased 50% downstream of the reservoir. Prior to the water releases, juvenile steelhead distribution was concentrated in the lower 6 km of the study reach, with no fish documented in the upper 10 km. Impacts of the water releases on juvenile growth and survival will be evaluated from recaptures of previously PIT Tagged individuals during the 2016 outmigration. Overall, we estimate the water releases opened up an additional 8-10 km of potential rearing habitat, as well as improving the water quality of the entire 16 km study reach. This study showed that low-volume water releases are a viable and relatively low cost restoration strategy to supplement streamflow and improve juvenile steelhead rearing habitat.

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