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**Presentation Title: Shifting Summer Distributions of Juvenile Steelhead: Temperature, Fish Movements and Competitive Interactions**

Abstract for the 2018 Pacific Coast Steelhead Management Meeting

The Chehalis River is a 6,800 km2 watershed in western Washington with returns of 6,000 to 10,000 steelhead over the past decade. Summer low flows and warm temperatures reflect the rain dominant hydrology of this watershed, but these conditions have been exacerbated by land use practices and are predicted to be further impacted by climate change. Over the last decade, citizens and government officials have initiated a coordinated effort to address the combination of flooding and habitat degradation in this watershed. Ongoing research has revealed that summer habitat for salmon and steelhead is limited and influenced by both habitat and temperature conditions. The current study was conducted in the South Fork Newaukum River (a large tributary of the Chehalis River) where substantial restoration activity is planned. The study objectives were to describe fish assemblages, temperature, and habitat among five study reaches and to evaluate factors that were associated with juvenile steelhead distribution. Study reaches were delineated by landscape characteristics. Four spatially continuous riverscape surveys were conducted over a 37.5 km section of the main stem South Fork Newaukum between the months of May and September 2016. We observed an upstream-downstream pattern in fish assemblage and temperature, but habitat was relatively consistent among the study reaches. Juvenile salmonids (steelhead, coho) numerically dominated upstream reaches whereas cyprinids (redside shiner, northern pikeminnow, and dace) numerically dominated downstream reaches. Mean daily maximum stream temperatures in the month of August ranged from 14.7℃ (+1.1) in the upstream most reach to 21.2℃ (+1.8) in the downstream most reach. Juvenile steelhead were uniformly present throughout the survey area in May and September, but shifted upstream in the months of July to August concurrent with increasing temperatures and an upstream expansion of cyprinids. We used a generalized linear mixed effects model to explore the relative contributions of temperature, cyprinid species, and time on juvenile steelhead occupancy patterns. Results identify temperature ranges under which juvenile steelhead maintain dominance over native cyprinid competitors, consistent with temperatures identified in previous laboratory experiments. We suggest that the downstream two study reaches have good potential for supporting summer rearing if restoration activities are successful at cooling summer stream temperatures. Results also increase our understanding of juvenile steelhead summer distributions in rain dominant rivers more generally.