**Hall, Jason – NW Fisheries Science Center, NOAA**

**Presentation Title: Life history diversity of Steelhead (*Oncorhynchus mykiss*) in two coastal Washington watersheds**

Abstract for the 2018 Pacific Coast Steelhead Management Meeting

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We used passive integrated transponder (PIT) tags implanted in juvenile *Oncorhynchus mykiss* to monitor movement into and out of two coastal Washington State rivers, East Twin and West Twin Rivers. Movement patterns revealed at least 18 Steelhead *Oncorhynchus mykiss* life histories with variations in age and seasonal migration of juveniles, juvenile use of the ocean prior to migration, years spent in the ocean, season of adult return, and iteroparity. While most migrants left the river in their first fall or winter, we did not detect any returning adults from these age-0 migrants. Adults were only produced from age-1 and older migrants, with most being age-2 spring migrants that returned after two summers in the ocean. Our results indicate a positive relationship between fish length at tagging and probability of being detected as a migrant, while the probability of a migrant leaving at age-1 and older decreased with increasing length at tagging among fish that were detected as migrants. We hypothesize that fish attaining a large enough size early in life to survive overwintering but not big enough to trigger migration at age-0 were more likely to remain in the river to become age-1 migrants, which were more likely to produce a returning adult Steelhead. We also found evidence that density-dependent growth may influence juvenile Steelhead migration patterns and production of migrants as evidenced by increasing contributing adult Steelhead escapement being negatively related to average cohort body size, probabilities of fish being detected as migrants, and production of age-1 and older migrants. We anticipate that the findings of this study can be used to inform development of Steelhead recovery strategies for East Twin and West Twin Rivers, which have experienced recent declines in adult returns much like other North Pacific Ocean stocks.