Origin and Run-Timing of Hatchery Steelhead Strays into the Spawning Grounds of Two Eastside Tributaries of the Deschutes River, OR.

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The Steelhead endemic to the eastside tributaries of the Deschutes River have garnered a high-risk rating for viability due to the likelihood of high introgression rates between Snake River hatchery steelhead and native Mid-Columbia steelhead (Carmichael et al 2005). Some level of straying and gene flow occurs naturally in wild populations, however natural levels of gene flow and straying were presumed to be at a much lower rate than what was observed during spawning surveys. In the late 1990’s greater that 50% of the steelhead observed spawning in Deschutes eastside tributaries of Bakeoven and Buck Hollow creeks were determined to be of hatchery origin (ODFW, 2000); though their specific hatchery of origin was mostly unknown. Observations of fin-clips, coded wire tags, and PIT tags on steelhead at the Sherars Falls trap on the lower Deschutes suggested that many fish originated from the Snake River, but their retention and subsequent spawning in the Eastside tributaries was similarly unknown. Stray hatchery steelhead remaining to spawn with wild fish can impact the viability of the wild population thereby reducing the overall productivity. Through the Oregon Mid-Columbia Steelhead Recovery Plan, in 2010 we implemented a study to test if high introgression rates would affect productivity by excluding hatchery spawners from Bakeoven Creek, while allowing them to spawn in Buck Hollow Creek. From the first year of study, we have learned much about the origin of hatchery steelhead that remain to spawn in tributaries to the Deschutes. In general, hatchery steelhead arrive on the spawning grounds about one-month later than wild-origin steelhead. Through the use of coded-wire-tag observations, PIT tag observations, and genetic markers (parentage based tagging (PBT)), we determined the specific hatchery of origin for observed hatchery steelhead. Previously tagged strays originated from seven hatchery stocks, five hatcheries and 10 release sites. Hatchery sources included–Round Butte–Hagerman–Niagra Springs–Magic Valley and–Irrigon. One wild stray from the Snake River basin that was PIT tagged at Lower Granite Dam and barged for release downstream of Bonneville Dam was also detected. PBT analysis was completed on 110 fin-clip samples of hatchery fish collected at Bakeoven and Buck Hollow Creeks. From these samples, 37 were positively matched to hatchery of origin. The vast majority of these fish originated from Pahsimeroi hatchery (27 of 37), but also included Dworshak,–Lyons Ferry–Oxbow–and Sawtooth; which is consistent with Sherars Falls PIT tag observations. With more hatcheries’ joining the PBT baseline, we expect to identify a greater percentage of hatchery fish in the coming years.