

Phenotype Variability of Chinook Salmon on the Feather River Spawning Grounds: Using otolith strontium isotope ratios to determine run-timing and natal origins

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In-river spawning of hatchery-origin Chinook salmon is known to compromise the genetic integrity of natural-origin populations through outbreeding depression and genetic homogenization. To evaluate the effect of hatchery management on natural origin fish for Feather River Fall and Spring Run Chinook, we analyzed otolith strontium isotope profile from fish collected during carcass surveys. Our results showed 1.) a significant proportion (50-90%) of in-river spawning Chinook salmon were hatchery-origin fish, 2.) hatchery origin fish returned to the spawning ground 1-2 months earlier than natural origin fish and 3) significant genetic integration of Spring and Fall Run has homogenized run type. High rates of in-river spawning hatchery-origin Chinook documented in our study indicate that fitness of natural origin Chinook may be significantly impaired and suggest that introgression between hatchery and natural origin Chinook may be a factor contributing to the depressed status Central Valley Chinook salmon.