

DNA-Based Stock-of-Origin Assignments of Chinook Salmon Smolts Outmigrating Past Chandler Trap (Yakima River) in 2005

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Abstract

A stock-of-origin assignment procedure using 11 microsatellite loci was used to estimate the percentages of smolts from each of three spring and two fall Chinook salmon stocks outmigrating past Chandler Trap (Yakima River) from January – July 2005. Smolt outmigration in the Yakima River is comprised of a mixture of three spring stocks (upper Yakima River, American River, and Naches River) and two fall stocks (lower Yakima River and Marion Drain). A blind analysis using 100 known-origin samples resulted in approximately 97% (96/99) of the known-origin samples being correctly identified to their stock-of-origin. Comparison of morphological assessment and genetic assignment as a spring or fall Chinook smolt conducted for the April, May, and June – July time strata identified 1,003/1,044 (96.1%) smolts the same. Mixture analysis was conducted on a proportional subsample of 1,320 smolts. Assessment of five time strata (January – February, March, April, May, and June – July) during the outmigration revealed the largest percentage of the spring smolts to be from the upper Yakima River stock. Then during April, the percentage of smolts from American River and Naches River increased while the upper Yakima spring stocks declined. There was a large increase of the lower Yakima fall stock during the May stratum (77.5%) and over 73% of the total were by the two fall stocks in June/July.