

Title: Initial Morphological Comparison of Adult Upper Yakima and Naches Spring Chinook

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One trait that may change under domestication is fish body shape. Research with coho suggests that the hatchery environment may select for a more fusiform body shape because sustained swimming is more important in a hatchery environment than burst swimming. Because there is no volitional mate selection in the hatchery, selection for secondary sexual characteristics will also be reduced, and this may cause these characteristics to become less pronounced. This year we began morphological comparisons of adult Upper Yakima (both natural-origin and hatchery-origin) and Naches spring chinook by examining 2003 spawners. We examined 282 Upper Yakima natural-origin fish (103 ♂♂, 179 ♀♀), 97 Upper Yakima hatchery-origin fish (49 ♂♂ and 47 ♀♀), and 42 Naches fish (15 ♂♂ and 27 ♀♀) from photographs taken at CESRF and on the Naches spawning grounds. We digitized the images at 13 landmarks and used thin-plate spline analysis to evaluate morphological variation. The first two relative warps accounted for about 50% of the variation in both males and females. Scattergrams of the first two relative warps showed reasonably good separation of Naches and Upper Yakima, but no clear differences between Upper Yakima natural-origin and hatchery-origin fish. However, canonical variate analysis showed surprisingly good separation between the natural-origin and hatchery-origin fish. Fish of both sexes could be classified as to group (Naches, U. Yakima natural-origin, or U. Yakima hatchery-origin) with over 90% accuracy. The analysis is still incomplete in terms of characterizing the shape differences biologically, but it appears that the hatchery fish are less deep-bodied.