**Title:**
Demographic Traits of Wild- and Hatchery-Origin Yakima River Basin Spring Chinook

**Authors:**
Curtis Knudsen, Oncorh Consulting, Olympia, WA
Steven Schroder, Washington Department of Fish and Wildlife, Olympia, WA
Jason Rau, Yakama Nation, Cle Elum, WA
Charlie Strom, Yakama Nation, Cle Elum, WA
Mike Hammlin, Washington Department of Fish and Wildlife, Cle Elum, WA
Paul Huffman, Yakama Nation, Toppenish, WA

knudsen@thurston.com, 360-357-3382

**Summary of Presentation:**
We compared spawn timing, size-at-age, age composition, and sex ratio of the three native Yakima River Basin spring chinook populations in 2001 and 2002. American River fish spawn earliest, are the largest at a given age, are older on average, and have the highest proportion of males. Upper Yakima River fish spawn latest, are smaller at age, have younger mean age, and the highest proportion of females. Naches basin fish, excluding American River, are intermediate in each of these traits. These differences are likely local adaptations in response to differing selection pressures related to migration rigor, gravel scouring during egg incubation, and water temperatures during both adult holding/spawning and egg incubation.

Within the upper Yakima River, we compared size-at-age, age composition, migration and spawn timing, fecundity, egg size and reproductive effort of hatchery- and wild-origin fish from 2001 and 2002; the first two years of hatchery adult returns. In both years, age-3 and age-4 hatchery fish were significantly smaller than wild fish of the same age: approximately 3 cm in age-3's and 2 cm in age-4's. Three- and four-year old hatchery fish weighed 0.3 and 0.4 kg less than wild fish, respectively. Hatchery age-5 fish, returning in 2002 for the first time, were also significantly smaller than wild age-5 fish by 4 cm and 1.1 kg. Because of the body size difference, hatchery females were also less fecund. In 2002, but not 2001, hatchery fish also had significantly smaller eggs, exhibited later passage at RAMF (5 days) and earlier spawn timing (7 days) than wild fish. Within hatchery OCT and SNT Treatment groups in 2001 and 2002, there was no significant difference in body weight, length or run timing at RAMF for ages 2 through 5.