

**Title:**

Precocial Salmon on the Spawning Grounds

**Authors:**

Christopher L. Johnson<sup>1</sup> (presenter), Todd N. Pearsons<sup>1</sup>, Brenda B. James<sup>2</sup>, and Gabriel M. Temple<sup>1</sup>

<sup>1</sup>Washington Department of Fish and Wildlife

600 Capitol Way North

Olympia, Washington 98501-1091

(509) 925-4467 ext 4

[johnsclj@dfw.wa.gov](mailto:johnsclj@dfw.wa.gov)

<sup>2</sup>Cascade Aquatics

**Summary of Presentation:**

We examined the hypothesis that the Cle Elum Supplementation Hatchery alters the assemblage of spring chinook salmon that precocially mature in freshwater. We counted the number of precocials on the spawning grounds between 1998 and 2003 while snorkeling in the upper Yakima River. The release of hatchery fish in the spring affected the natural abundance, distribution, age/size, and behavior of precocials observed on redds the following fall. The estimated number of age 0+, age 1+, and hatchery precocials observed on the spawning grounds between 1998 and 2003 during the peak of spawning ranged from 4 to 554, 16 to 42, and 11 to 52 respectively. Females that were spawned in the hatchery produced fewer precocials on redds two years later than females that spawned in the river ( $P < 0.05$ ). The lower number of hatchery precocials on the spawning grounds may be due to high mortality of precocials after they are released from the hatchery. During the peak of spawning, between 30% and 52% of all hatchery precocials observed on the spawning grounds within a year were in the lowest spawning reach examined, whereas only 0% to 9% of all age 0+ precocials and 0% to 15% of all wild age 1+ precocials were observed in this reach. Most hatchery precocials were observed downstream of spawning areas during the spawning season. Except for the year 2000, the hatchery precocials per female taken for hatchery broodstock was higher than naturally produced age 1+ precocials per female spawner and the absolute value of the differences was statistically significant ( $P < 0.05$ ), but the differences in means was not statistically different ( $P > 0.05$ ). The hatchery does not release age 0+ precocials, which is the predominant age of wild precocial, so it decreased the number of this age of precocial. Hatchery precocials were larger ( $P > 0.05$ ) and behaviorally dominated most interactions with wild precocials on redds. This could result in higher per-capita reproductive success because of better access to females. Altering natural rates of precocialism and precocial assemblages on the spawning ground poses ecological and genetic risks to wild fish.