

Title:

Outmigration Survival of Supplemented and Wild Spring Chinook Smolts

Authors:

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Summary of Presentation:

The Yakima/Klickitat Fisheries Program (YKFP) has designed a supplementation program to enhance the Spring Chinook salmon (*Oncorhynchus tshawytscha*) in the Yakima Basin. The purpose of the YKFP is to test the assumption that new artificial production can be used to increase harvest and natural production. The first step in the sequence of evaluating this hypothesis is to determine if we can increase the survival of juveniles reared in the hatchery environment over that of fish reared in the wild, and maintain that survival advantage through the smolt outmigration period?

This paper describes the experimental design for monitoring the survival of outmigrating smolts from the new Semi-Natural Treatment (SNT) rearing techniques against the Optimum Conventional Treatments (OCT) of existing successful hatcheries in the Pacific Northwest. We also compare the survival of the supplementation smolts with that of outmigrating wild smolts. Survival is measured from release in the Yakima River to detection of PIT tags at McNary Dam on the Columbia River.

There were no significant differences in release-to-McNary survivals between the SNT and OCT fish in any of the brood years from 1997 through 1999 ($P > 0.2$). The release-to-McNary-Dam survival of brood-year 2000 (2002-outmigrant) smolts reared under the semi-natural treatment (SNT) was significantly less ($P = 0.045$) than that of smolts reared under the optimal conventional treatment (OCT). The SNT's pre-release survival was also significantly less than the OCT's ($P = 0.001$). For all nine pairs of raceways the survival from the SNT raceways to McNary was less than that of the OCT raceways, and for eight of the nine pairs, the level of Bacterial Kidney Disease (BKD) in the SNT raceways was higher than in the OCT raceways. Analysis of this new information is currently underway.

In the comparison of wild and hatchery smolt outmigration survival there was a significant difference only in outmigration-year 2000 ($P = 0.001$) with the wild survival index

exceeding that of the hatchery. Thus the supplemented smolts are surviving at a rate comparable to that of the wild smolts from release to McNary dam.