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July 5, 2023

### **MEMORANDUM**

**TO: Fish and Wildlife Committee Members**

**FROM: Maureen Hess**

**SUBJECT: Presentation on Improved productivity of naturalized spring Chinook salmon following reintroduction from a hatchery stock in Lookingglass Creek, Oregon**

### **BACKGROUND:**

**Presenter:** Hayley Nuetzel – Fishery Scientist/Project Leader, Columbia River Inter-Tribal Fish Commission

**Summary:** Hayley will update the Committee on a recent publication, associated with Project #2009-009-00, which showed that fish reintroduced from a hatchery stock possess the adaptive capacity to positively contribute to natural productivity and recovery goals.

**Relevance:** The 2014 Columbia River Basin Fish and Wildlife Program and the 2020 Addendum outlines two strategies that are supported by the efforts of the Basinwide Supplementation Evaluation (BSE) Project (#2009-009-00): 1. The use of hatcheries for reintroduction, and 2. Fish propagation including hatchery programs. The BSE Project supports these strategies by implementing research, monitoring, and evaluation related to hatchery supplementation and reintroduction programs for Salmon and Steelhead. This additionally supports the Council's commitment to an adaptive management approach (Part Four of the 2014 Program).

Workplan: Fish and Wildlife Division Workplan; Program Implementation and Performance

Background: The Basinwide Supplementation Evaluation (BSE) Project was initiated by the Columbia River Inter-Tribal Fish Commission in 2009 to lend research, monitoring and evaluation (RM&E) support to tribally managed hatchery supplementation and reintroduction programs for Salmon and Steelhead throughout the Columbia River Basin. While multiple studies are supported by the BSE project, the presentation update for the Committee will focus on one study that evaluated action effectiveness of a reintroduction program for Spring Chinook. Results from the BSE Project are published (as noted in the abstract below) and used in adaptive management decision processes that guide future analyses, recovery actions, and management decisions.

#### *Abstract*

Supplementation of depressed salmonid populations with hatchery production has been questioned due to domestication effects, which may reduce reproductive fitness. However, for extirpated populations, reintroduction typically requires use of hatchery stocks. We evaluated this strategy by monitoring the naturalization of spring Chinook salmon reintroduced to Lookingglass Creek, OR (Grande Ronde Basin), from a captive brood, hatchery stock. We compared the reproductive success (RS) of naturally spawning natural-origin relative (NOR) to hatchery-origin (HOR) adults across 9 brood years. Individual RS (the number of progeny produced) was estimated by pedigree reconstruction analyses, and then analyzed by generalized linear models to estimate the effect of parental origin, while controlling for potentially confounding covariates. When evaluating RS by juvenile progeny, NOR spawners were more likely to be reproductively successful, and when successful, produced more progeny on average than successful HOR counterparts. We found a similar advantage when evaluating RS by adult progeny, although the origin effect was not as important among successful spawners. Results suggest fish reintroduced from a hatchery stock possess the adaptive capacity to positively contribute to natural productivity and recovery goals.

More Info:

#### [Journal Publication](#)

Project #2009-009-00 Basinwide Supplementation Evaluation Project:

- 2021-2022 Anadromous Fish Habitat and Hatchery Review – [Project proposal](#) and [Council Decision](#)
- Initial review in 2009 – [Council Decision](#)
- CBFish.org – [Additional project information](#)