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Presentation Title: Effects of Fishery-Related Fight Time and Air Exposure on Prespawn Survival and Reproductive Success of Adult Hatchery Steelhead

Abstract for the 2021 Pacific Coast Steelhead Management Meeting

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In recent years, increased scrutiny has been placed on the physiological effects of exhaustive exercise and air exposure on caught-and-released fish. Steelhead *Oncorhynchus mykiss* broodstock in the South Fork Clearwater River, Idaho, were collected by anglers during a winter fishery (water temperatures of 2–5°C); this enabled fight and air exposure times to be recorded to determine their influence on prespawn survival and progeny survival to the fry stage in the hatchery. The average fight time during angling was 164 s. Air exposure was measured when anglers landed fish and again during fish transport from the river to the hatchery vehicle; the longest interval of air exposure averaged 23 s during angling and 28 s during transport. Three-year average prespawn survival was 97.0% for 1,148 angler-caught fish, compared to 91.9% for 3,325 swim-in broodstock collected at the hatchery. The top mixed-effects logistic regression model estimated that the odds of progeny survival increased by 1.027 times with each additional day of the year until an adult fish spawned; this was likely a reflection of peak spawn time in the hatchery. Fight time and air exposure time did not influence progeny survival or prespawn mortality of adult steelhead captured by anglers.

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