Red Bluff Technical Report Abstract

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Bigelow, J.P. and R.R. Johnson, 1997. Estimates of Survival and Condition of Juvenile Salmonids Passing Through the Downstream Migrant Fish Protection Facilities at Red Bluff Diversion Dam on the Sacramento River, Spring and Summer 1994, Red Bluff Research Pumping Plant Report Series, Volume 1, United States Department of the Interior, Fish and Wildlife Service and Bureau of Reclamation, Red Bluff, California. 79 pp.

Comparisons were made of survival between fingerling chinook salmon Oncorhynchus tshawytscha (fish) which passed through the bypass facility at Red Bluff Diversion Dam (treatments) and fish which did not (controls). No direct mortality occurred in recaptured treatment fish (N=5,253). Survival 3 d after treatment was high at 99.4%. There was no significant difference in survival between treatment and control groups 3 d after trials. Significant differences (P--0.049) in survival 7 d after trials were inconsistent, with higher treatment survival (92.8%) than control groups (91.8%). Many treatment fish (40%) were not sampled for survival due to passage delays. Descaling and other injuries incurred by treatment groups which passed through the bypass in less than 9 min, and late-treatment groups that remained in the bypass from 10 to 15 min were compared to descaling and other injuries incurred by control groups. Descaling was low (< 8%, mean) in all treatments. There was no significant difference in descaling between treatment and control groups, or between late treatment and control groups. Fish with one or more injuries were few in all trials. There was no significant difference in number of injured fish between treatment and control groups, or between late treatment and control groups. Many fish (24 %) were not sampled for descaling or other injuries due to passage delays. Time of fish passage through the bypass varied from 4 min to over 2 h. Most fish (68.2%) passed through without delay (< 8 min). Some fish (12.0%) remained in the bypass longer than 60 min. Plasma glucose, an indicator of stress, was significantly higher for treatment groups (185 mg/dL + 44, mean + SD) than control groups (126 mg/dL + 37) 3 h after treatment. Plasma glucose levels remained significantly higher than baseline levels (103 mg/dL + 36) longer in treatment (12 h) than control groups (24 h). Nitrogen supersaturation was 124% and total dissolved gas pressure was 116% in water exiting the bypass facility. Recommendations for future evaluations are included.

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