

Estimated abundance of adult fall chum salmon in the middle Yukon River, Alaska, 2002

Abstract: Mark and recapture data were collected to estimate the abundance of fall chum salmon (*Oncorhynchus keta*) during 2002 in the middle Yukon River. A seasonal abundance estimate and weekly strata estimates of migrating fall chum salmon were generated for a period of approximately seven weeks between 29 July and 18 September. Fish were captured using two fish wheels for marking and one fish wheel for recovery. The mark and recovery sites were separated by a distance of 52 km. Spaghetti tags were applied to 5,518 fish at the marking sites. Throughout the season, 15,361 fish were examined for marks at the recovery site, and excluding multiple recaptures, 435 of these fish were recaptured with unique tag numbers. We checked all captured fish at the recovery site for primary and secondary marks, and found no evidence of tag loss. Likelihood ratio tests indicated an equal probability of recapture for fish marked and released at the north and south bank marking wheels. Logistic modeling of the probability of recapture showed no differences based on sex, length, or the interaction term. We concluded that no further stratification, beyond temporal weekly stratification, was required to produce an accurate estimate. Using a Darroch estimator, the estimated abundance of fall chum salmon migrating through the mainstem of the Yukon River in 2002 was 196,186 (SE 12,546). Additionally, we conducted a video recapture feasibility study concurrently with the effort of our recapture crew. When recapture rates of crew-generated data were compared to those of video recapture data, we found little difference between the two methods. The abundance estimate based on video-generated data (189,052; SE 12,505) accounted for only 1,454 (< 1%) more fish than the estimate generated from crew data (187,598; SE 12,148) for the same time period (strata 2-7). These results suggest that it is feasible to switch to a video-recapture system in the future without compromising the accuracy of the abundance estimate.

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