

ESTIMATING SURVIVAL CAPACITY AND DETERMINING MECHANISMS OF LATENT MORTALITY

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ABSTRACT

The main goals of this research study are to estimate survival capacity of transported and in-river yearling Chinook throughout the outmigration season in the Federal Columbia River Power System (FCRPS), determine possible influences on survival capacity and predict T:I ratios. To accomplish these goals, we collected at Bonneville Dam weekly samples of run-of-river yearling Chinook and individuals barged from Lower Granite Dam, and introduced them to challenges of increased water temperature and starvation. They were observed for loss of equilibrium and mortality.

The reciprocal of the average time to mortality ($1/m$), and vitality model parameters were determined, and related to possible factors of survival capacity. Transported vs. in-river migration, degree days, travel time, day of arrival at Bonneville Dam, and cumulative percent spill were tested by linear modeling. The best model determined by AIC was one that predicted $1/m$ from transport vs. in-river migration and degree days, and explained 85.1% of the variation. From the best models of survival capacity measures $1/m$ and vitality r , the ratio of post-Bonneville Dam survival between transported and in-river migrants (D) was determined.

The first year of this current study on yearling Chinook in the FCRPS has already shown promising results for measures of survival capacity based on relatively quick and simple challenge experiments. Futures studies will be briefly discussed.