Testing and Improvement of the Oak Ridge Chinook salmon Model (ORCM) in the Tuolumne River, California

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The ORCM was developed between 1995 and 2000 (Jager et al. 1997). Mike Sale conceived of ORCM as a tool for evaluating alternative minimum flow regulations for New Don Pedro Dam. This spatially explicit, individual-based recruitment model was later used to predict seasonal patterns of flow that would maximize Chinook salmon recruitment from the Tuolumne River (Jager and Rose 2003). Since that time, nearly ten years of monitoring have been conducted by Tim Heyne and others at the California Department of Fish and Game, including rotary screw trapping of outmigrating juveniles.

This study, funded by the California Energy Commission, has two objectives. First, we will compare ORCM predictions to these monitoring data, evaluate discrepancies, and make improvements to the model or its parameters. Uncertainty in model predictions of salmon responses to flow will be quantified and reduced. Second, we will implement a routine to estimate the hydropower generation value associated with simulated flow regimes. This will improve our ability to evaluate tradeoffs between energy production and fish protection.

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