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Mark-and-capture experiments were conducted to evaluate effects of hydraulic and environmental conditions on salvage efficiency of adult delta smelt (Hypomesus transpacificus) at Bureau of Reclamation’s Tracy Fish Collection Facility. A second order polynomial model explains a significant relationship between primary velocity and primary channel efficiency (P = 0.001), and the derivative of the polynomial equation [the maximum point of the graph (slope = 0)] where primary channel efficiency is optimized was equivalent to a mean channel velocity of 2.37 ft/s. Analysis of a multiple linear regression model indicates trashrack differential accounts for some of the ability to predict primary channel efficiency of delta smelt (P < 0.05). Water temperature, turbidity, time of day, and total number of non-experimental fish salvaged during data collection were not significant predictors. Data collected within Chinook salmon facility operational criteria (data isolated from the full data set), and modeled with linear regression, suggests adult delta smelt salvage efficiency may be maximized by increasing mean secondary channel velocity to maintain a primary bypass ratio near 1.6. Also, results of this “In-Criteria” data set suggest maintenance of conditions in the primary channel that minimize primary trashrack differential can improve adult delta smelt salvage efficiency.