**Tracy Research Technical Report Abstract**

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The U.S. Department of the Interior, Bureau of Reclamation’s Tracy Fish Collection Facilities (TFCF) 10-minute-count screen is a critical tool used to acquire sub-samples and provide an estimate of fish entering into the facility. The introduction of a new screen in 1999, prior to fish screen entrainment comparisons, could possibly have altered TFCF salvage estimates. Three experiments were conducted during 2003 and 2004 to evaluate the entrainment efficiencies of the current and historical screens for juvenile delta smelt (Hypomesus transpacificus): (1) Wild Juvenile Delta Smelt Entrainment Comparison, (2) Evaluation of Bead Loss, and (3) Cultured Juvenile Delta Smelt Entrainment Comparison. In experiment No. 1 there was no significant difference between the mean number of juvenile delta smelt (20 to 31.5 mm in fork length [FL]) entrained using the current (40.1 percent ± 7.4; mean ± SE, n = 6) and historic (34.5 percent ± 7.9; n = 8) screens (P = 0.70). However, delta smelt with a greater maximum body depth than the maximum hole width were recovered outside of both screens. Experiment No. 2 was conducted to determine where, aside from screen holes, these fish may have been lost. The lowest success rate for entrainment of beads was achieved when no seal was used (8.6 percent for 4 mm, 41 percent for 10 mm). Entrainment of particles was highest (100 percent for beads > 5 mm) when seals were used on the top and bottom of the screen, demonstrating that loss was occurring at both locations. In experiment No. 3 eight conditions were tested, using the two screen types. Entrainment was evaluated with and without seals with two size classes of delta smelt (small, 20 to 25 mm in FL and large, 25 to 30 mm in FL). Entrainment of the small size class was significantly lower using the current screen with seals, compared to all three other treatment types (current + seal, 3 percent; current, 18 percent; historic + seal, 13 percent; historic, 15 percent; P = 0.002). However, no significant differences were detected among treatments of the large size class (current + seal, 23 percent; current, 33 percent; historic + seal, 59 percent; historic, 44 percent; P = 0.06). Experiments Nos. 1 and 3 suggest that there is no difference in entrainment between current and historic screens when seals are not used. Since seals were not used historically, we conclude that the current and historic salvage data sets are comparable.