**Tracy Research Technical Report Abstract**

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  Brandon J. Wu and Brent B. Bridges. 2014. *Retention Efficiency of the Tracy Fish Collection Facility Holding Tank Screens for 20–30 mm Fork Length Juvenile Delta Smelt during 30-Minute Fish Counts.* August 2014. 35 pp.

The retention efficiency of the woven wire mesh holding tank screens (average wire diameter = 2.1 mm, average square opening = 2.7 mm, average diagonal opening = 3.8 mm) at the Tracy Fish Collection Facility (TFCF; Bureau of Reclamation, Byron, California) for 20–30 mm fork length (FL) juvenile delta smelt (*Hypomesus transpacificus*) during 30-min collection periods was investigated. The overall holding tank screen retention efficiency for 20–30 mm FL juvenile delta smelt was 81.8 percent. Fork length and maximum body depth (MBD) were both good predictors of holding tank screen retention efficiency (P = < 0.001). In general, the retention of juvenile delta smelt increased with FL and MBD until 29 mm FL or 4.0 mm MBD, at which 100 percent of fish were retained by the holding tank screen. The loss of juvenile delta smelt up to 28 mm FL, with an average MBD of 3.9 mm, through the holding tank screen during this study suggests that the current screen openings at the TFCF are too large to consistently retain 20–30 mm FL juvenile delta smelt. It was estimated that 1,914 delta smelt were lost through the holding tank screens and 4,734 delta smelt passed, undocumented, through the fish count station screen during fish counts at the TFCF from 1993–2013. This suggests that the total expanded salvage of delta smelt during this period may have been reduced by as much as 26,592 fish. To avoid inaccuracies in delta smelt salvage estimates, as well as possible pump mortality at the C.W. “Bill” Jones Pumping Plant, it is necessary to eliminate the loss of delta smelt ≥ 20 mm FL through the holding tank screens, as well as all other screens that aid in the retention of fish during the salvage process at the TFCF. Results from this study suggest that it is necessary to reduce maximum screen openings to 2.1 mm (1.5-mm square opening) in order to consistently retain juvenile delta smelt ≥ 20 mm FL. This is comparable to the 2.3-mm maximum screen opening that was recommended by Sutphin et al. 2007 for the fish count station screen.