Tracy Research Technical Bulletin Abstract

Tracy Technical Bulletin 2020-1

Reyes, René C., Brandon J. Wu, and Zachary A. Sutphin. 2020. *Predation of Juvenile Delta Smelt in the Bypass Pipes and Secondary Channel at the Tracy Fish Collection Facility.* Tracy Fish Collection Facility Studies, Tracy Technical Bulletin 2020-01. Bureau of Reclamation, Mid-Pacific Region, 32 pp.

Fish loss due to predation negatively impacts fish salvage at the Bureau of Reclamation’s Tracy Fish Collection Facility (TFCF; Byron, California; Liston et al.1994, Fausch 2000); however, predation impacts to juvenile (20-40 mm) Delta Smelt (*Hypomesus transpacificus*)are not known. Results from Delta Smelt secondary screen efficiency experiments conducted without a predator removal event were compared to results from experiments conducted with a predator removal event to estimate the impact of Striped Bass (*Morone saxatilis*) predation on juvenile Delta Smelt in the fish bypass pipes and secondary channel. In one of the predator removal events, 21 of the 49 sub-adult Striped Bass (mean = 269 mm FL) stomachs contained juvenile Delta Smelt, suggesting Striped Bass negatively affect juvenile-sized Delta Smelt within the TFCF. Removal of Striped Bass from the bypass pipes and secondary channel significantly improved mean secondary channel traveling screen efficiency of juvenile Delta Smelt from 10.3% without predator removal to 50.2% with predator removal across the 5 secondary channel velocities tested (0.3, 0.46, 0.6, 0.76, and 0.9 m/s [1, 1.5, 2, 2.5, and 3 ft/s]). When Striped Bass were removed from the bypass pipes and secondary channel, secondary channel water velocity was a good predictor of secondary channel traveling screen efficiency with higher efficiencies measured at lower velocities.