**Tracy Research Technical Report Abstract**

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Hanna, L., Bark, R., Bowen, M., Mefford, B., Lopez, R., and R. Siegle. 2010. *Passive and Passive-ActiveSeparator Fish Sorting Studies for Tracy Fish Collection Facility.* Tracy Fish Collection Facility Studies, Volume 27, U.S. Bureau of Reclamation, Mid Pacific Region and Denver Technical Service Center, 36 pp.

The Bureau of Reclamation's Hydraulic Investigations and Laboratory Services group in Denver, Colorado tested passive and passiveactive fish separator configurations under several conditions using a physical model. Test fish included rainbow trout (*Oncorhynchus mykiss*), Sacramento splittail (*Pogonichthys macrolepidotus*), and fathead minnow (*Pimephales promelas*). Investigations using the passive separator found best overall separation efficiencies occurred during a downwelling flow condition combined with a 5° separator angle and 122-cm/s (4-ft/s) channel velocity. Separator efficiencies were all equal to or greater than 92% for this test condition. Both angle and velocity of the passive separator influenced efficiency of fish separation of rainbow trout but did not affect results for fathead minnow or splittail. The highest average separator efficiency for rainbow trout occurred when the angle was 0°. Higher channel and approach velocities significantly increased separation of this species. There was also a statistically significant interaction effect between the two variables. The second configuration tested consisted of a passive separator similar to what had already been tested, followed by an active separator positioned 1.30 m (4.25 ft) downstream from the passive separator. Tests using this configuration demonstrated total sorting efficiencies in the range of 99–100% could be achieved for a single flow condition for all species tested. Slower velocities were found to significantly increase passive separator efficiency for sorting white suckers and total (i.e., passive and active) separator efficiency for sorting splittail. When spotlights illuminated the passive separator section of the passive-active separator configuration, separator efficiency improved for Chinook, splittail, and rainbow trout.