Tracy Research Technical Report Abstract

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Karp, C., L. Hess and C. Liston, 1995. *Re-evaluation of Louver Efficiencies for Juvenile Chinook Salmon and Striped Bass at the Tracy Fish Collection Facility, Tracy, California, 1993.* April 19965.Tracy Fish Facility Studies, Volume 3, U. S. Bureau of Reclamation, Mid-Pacific Region and Denver Technical Services Center. 31 pp.

The Bureau of Reclamation’s Tracy Fish Collection Facility was constructed in the mid- 1950’s as part of the Central Valley Project. The facility uses a louver-bypass type of fish diversion system to separate fish from the exported flow. The fish are collected and held in holding tanks where they await transport back to the Sacramento-San Joaquin Delta. The louver system design was based on field tests conducted with young striped bass and chinook salmon and is generally believed effective for fish large enough (>38 mm) to sense them. However, its current efficiency is not well known not only for these species but also for the other > 35 fish species that are entrained in the export flows. We began to re-evaluate louver efficiencies for juvenile chinook salmon and striped bass using mark-release-recapture techniques. We defined louver efficiency as the proportion of fish recovered in the holding tanks relative to the number released upstream of each louver system. A total of 12 groups of juvenile striped bass and chinook salmon were released at four to six sites within the facility at various flow, tide, and day/night conditions. Holding tank recoveries were monitored for at least two hours following release. The majority of the fish that were louvered were recovered in the holding tanks within the one to two hour period following release. The secondary louvers were generally more effective (mean = 80.0 percent, range: 72 - 100 percent for chinook salmon and 30 - 90 percent for striped bass) than the primary louvers (mean = 59.3 percent, range: 13 - 82 percent for chinook salmon and 0 - 96 percent for striped bass) at diverting fish from the flow. However, fish released into the primary channel had greater opportunity to move upstream and away from the facility, or downstream either through the louvers or through the gap created by the primary louver cleaning process. These fish also may have been more vulnerable to predation, or may have found refuge within the system. Louver efficiencies of fish released at the trash-boom were generally similar to that of fish released directly into the primarychannel. Louver efficiency appeared to decline as the louvers became clogged with debris (e.g,, first two November experiments) and during the process of lifting the primary louvers for cleaning. Our experimental efficiencies were slightly lower than previously reported estimates, and we recommend a more comprehensive evaluation of flow dynamics (velocity profiles) and louver efficiency be conducted at the Tracy Fish Collection Facility to further identify conditions that enhance louver efficiency.