Red Bluff Technical Report Abstract

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  Borthwick, S.M., and E.D. Weber, 2001. Larval Fish Entrainment by Archimedes Lifts and an Internal Helical Pump at Red Bluff Research Pumping Plant, Upper Sacramento River, California. Red Bluff Research Pumping Plant Report Series, Volume 12, United States Department of the Interior, U. S. Fish and Wildlife Service and Bureau of Reclamation, Red Bluff, California. 20 pp.

Entrainment of larval fishes was monitored at Red Bluff Research Pumping Plant from March 1998 to February 1999 to determine species composition, density, sizes, and screen efficiencies. Samples were collected from a pump's bypass channel just downstream of the vertical wedgewire screens and from an area behind the vertical screens. Eleven species were captured, with prickly sculpin, *Cottus asper*, and Sacramento sucker, *Catostomus occidentalis*, composing 99 percent of the total catch numerically. Suckers were most abundant during April but were captured throughout the spring and summer. Numbers of prickly sculpin peaked in early June, but this species was the most abundant captured during all months. Entrainment rates appeared related to a combination of species abundance in the river and river stage/turbidity. Size-distributions were not significantly different between nets set in the bypass channel and those set behind the vertical screens for any species, indicating the vertical screens did not exclude most non-salmonid larval fish from export to the Tehama-Colusa Canal. Screen efficiency estimates indicated the vertical screens were 24 percent efficient at screening all species of larval fish combined, 22 percent at screening prickly sculpin, and 46 percent efficient at screening Sacramento sucker. Mean catch per unit effort (CPUE) was significantly greater at night than during the day or crepuscular periods for prickly sculpin, Sacramento sucker, and all species combined. Mean CPUE was significantly greater during the crepuscular period than during the day for Sacramento suckers but the difference was not significant for prickly sculpin.