

Spring-run Chinook Salmon Egg Survival and Fry Emergence in the San Joaquin River Restoration Area

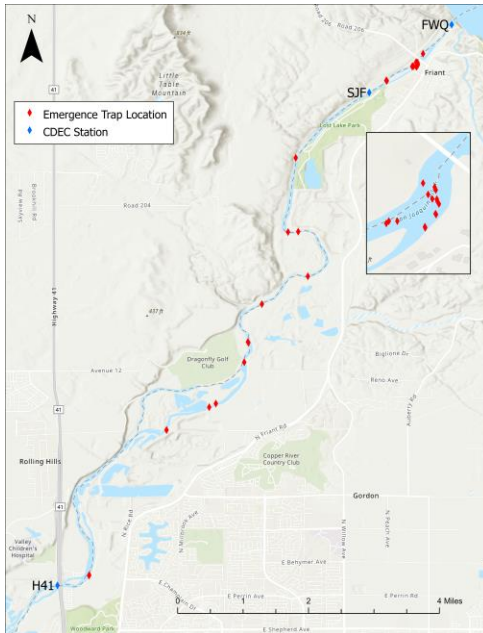
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Background

The US Fish and Wildlife Service and California Department of Fish and Wildlife conducted an emergence study from 2018 to 2021 to assess spawning and incubation success in Reach 1 of the Restoration Area. The study aims to help the San Joaquin River Restoration Program identify the quantity and quality of spring-run Chinook Salmon (SRCS) spawning habitat, inform the Restoration Administrator for Restoration Flow management, and guide potential habitat restoration. Objectives of the emergence study were:

1. Enumerate SRCS fry emergence
2. Estimate egg-to-fry survival
3. Document incubation timing

Study Area



Methods

Emergence traps consist of mesh netting attached to a metal frame placed on a salmon nest (redd). A canvas skirt around the edge of the mesh is buried to prevent fry from escaping. A plastic jar at the downstream funnel end collects the fry once they emerge and are swept downstream.



Traps were placed around 600 Accumulated Thermal Units (ATUs). ATUs are calculated by adding average daily water temperature from the closest CDEC station starting at date of redd discovery. 600 ATUs is roughly five days before the expected start of fry emergence. Traps were in place until ~1,700 ATUs, however they were removed early in 2018 and 2020 due to high flows. Traps were checked at least twice a week.

Average number of eggs from female SRCS on the San Joaquin River is unknown. Egg-to-fry survival (%) was estimated by dividing the number of fry that emerged from each trap by the average number of eggs produced per female from (1) Salmon Conservation and Research Facility (SCARF) broodstock, and (2) adults SRCS returning to the Feather River Fish Hatchery (FRFH).

Acknowledgements



Results

Emergence count and incubation timing

Year	# Traps	Mean Start ATU	Mean End ATU	Days of Emergence	Total Fry Captured	Excavated Eggs Recovered
2018	6	900	1060	1-37	165	911
2019	12	799	1318	1-81	8424	398
2020	5	750	1187	7-55	1883	1294
2021	6	632	1027	1-46	2874	1150

Four traps in 2018 and one trap in 2021 did not have any fry emergence and are not shown here.

Egg-to-fry survival

