

## - Region 2

## Abundance of Screenable Smolts at Glenn-Colusa Intake

The number of salmon smolts "saved" by the Glenn-Colusa Fish Screen will depend on a number of factors but the primary two are the production of smolts upstream from the intake and the diversion to total streamflow ratio.

Smolt Production - Population levels of adult fall-run salmon spawners in the upper Sacramento River have declined to half what they were 20 years ago with the majority of the decrease occurring above Red Bluff Dam. Seining for juvenile salmon by Bay/Delta Study in the last few years has shown a low abundance of salmon; May catches of 5/haul below Red Bluff to 15/haul above compared to seine catches of 20-100/haul in the Yuba and American in 1980-81 studies. The low abundance is especially surprising because Tehama-Colusa channel and Coleman NFH release millions of juvenile salmon in the upper river.

Future releases of smolt salmon from upstream hatcheries will be in the estuary, not the upper river therefore the number of smolts passing the Glenn-Colusa intake will decline. Water temperatures at Glenn-Colusa are suitable for salmon until sometime in July.

Decoto captured 13,299 wild salmon at the Glenn-Colusa bypass outlet during his studies of May 15 to July 25, 1974 (Decoto, 1978). Peak catches were in May.

Vogel, 1984 estimated numbers of salmon passing through the louver screen at the Tehama-Colusa Canal in 1982 and 1983. The average for the two years was 38,000 in May with 1,700 cfs diverted and 5,000 in June with 1,400 CFS. If we assume a 90% screen efficiency for the louvers, the comparable entrainment with a 3,000 cfs diversion and no louvers would be about 860,000. Assuming the predation loss in front of the T-C louvers and our rotary drum screen are the same and that the downstream migration loss from Red Bluff to Hamilton City equals the smolt production in that reach, the maximum number of smolts that will be "saved" would be about 860,000. Trucking of Coleman NFH salmon will lower that figure substantially.

Diversion Ratio - The Glenn-Colusa diversion of 3,000 cfs represents 20-30% of the total riverflow during May/June of most years. This will likely stay the same in the future as Shasta is operated to meet Delta demands unless additional storage is built on the upper Sacramento, such as Cottonwood Creek Project or enlarged Shasta. Present plans seem only to include a storage reservoir south of the Delta.

For purposes of evaluating the hatchery and trap/truck alternatives, I have assumed that the maximum number of smolts saved is 600,000.

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