Chinook Salmon Survival

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Although we now sample at Chipps Island on a year-round basis, it has not been done historically. Comparing data generated in April-June 1995 with data from the same months in previous years showed a mid-range smolt abundance level at Chipps Island (Figure 1). It appears that fewer fish are migrating past Chipps Island in June than in 1976-1983. Part of this change may reflect the change in Coleman Hatchery release schedule to release the mass production earlier (now in late April).

The daily distribution of smolts passing Chipps Island between April 1 and June 30 was more protracted in 1995 than we typically see in dry years (Figure 2). The immense daily fluctuations in catch between years depend on hatchery releases as well as environmental conditions.

Survival in 1995, as indexed from marked fish released at various sites in the river and delta to Chipps Island was generally good, with indices of survival of 0.38-0.35 for upper Sacramento (Battle Creek) and Feather River (hatchery) releases.

Survival indices for smolts released at Miller Park (near Sacramento, above the Delta Cross Channel and Georgiana Slough) and KoKet (at Ryde, below the cross channel and Georgiana) were 0.63 and 0.87. The survival index for the Miller Park group was comparable to that for similar releases in 1991; the survival index for the Ryde group was higher than for the Miller Park group but much lower than similar Ryde releases in 1990 (1.36, 2.14, 1.67) and 1992 (1.62, 1.25). Water temperature at release was favorable at 59 degrees, the Delta Cross Channel gates were closed, average flow at Sacramento was high (about 73,000 cfs), and delta exports were moderate (4,000 cfs); therefore, high survival would have been expected. Further analysis is needed to assess why the survival index at Ryde was not higher.

Three additional groups were released in the San Joaquin River above (Mossdale) and below (Dos Reis) the head of Old River, which takes water directly to the export pumping facilities, on April 17, May 5, and May 17. Due to high flow in the San Joaquin River, a barrier was not installed at the head of Old River in 1995.

Surprisingly, for the April 17 releases, survival for the Mossdale group (0.22) was higher than for the Dos Reis group (0.15). Water temperatures was favorable (57F), and average flow at Vernalis was high (20,500 cfs) while these fish were in the system. Average export was moderate (3,900 cfs). It is unclear why the Mossdale group had

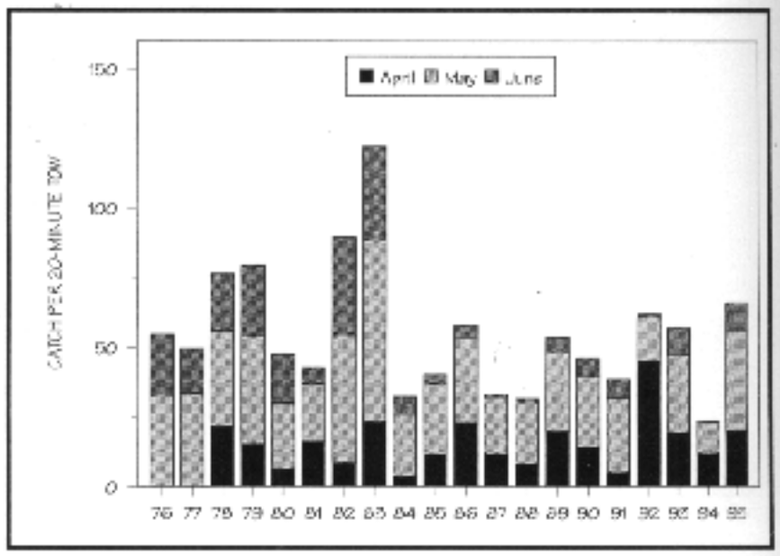

Figure 1
Monthly Salmonid Catch per 20-Minute Tow at Chipps Island
Did not sample in April 1976 and 1977.

a higher survival index than the Dos Reis group and why both weren't higher considering the favorable environmental conditions. A control group released at Jersey Point on April 19 had a survival of 0.46.

Survival indices for the May 5 releases were closer to expected levels, with the Mossdale group surviving at a much lower rate (0.10) than those released at Dos Reis (0.39). Vernalis flow was high (22,500 cfs), and exports were 4500-5200 cfs. Release temperatures were 62-63 degrees.

For the May 17 releases, relative differences between survival indices for the two groups were similar to the May 5 release, with Mossdale group surviving less (0.07) than the Dos Reis group (0.16). Average Vernalis flow was similar to the May 5 release, but exports were somewhat higher (5,600 cfs) starting May 19, and water temperature at release was also higher (63-65 degrees). Although Vernalis flow was very high for the spring of 1995, survival was not as high as expected. Were it physically possible to install a barrier at Old River under these flow conditions, survival for the Mossdale groups would likely have been increased.