

## Fish Salvage at the SWP and CVP Facilities

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The U.S. Bureau of Reclamation has implemented 17 research and evaluation projects at the Tracy Fish Collection Facility (TFCF) to enhance their understanding of the facilities' fish screening ability and the need for improvements and replacements. The goals of the projects are to improve fish protection as well as improve the salvage of fish entrained into the TFCF. Projects range from evaluating louver efficiency to assessing debris loading problems to analyzing hydraulic and physical factors influencing composition of fish salvaged.

In 1997, monthly water export at the SWP ranged from a low of over 43,000 acre-feet (af) in January to a high of over 410,000 af in December while the CVP's lowest export rate was in February with 30,000 af exported and highest was in July and August with over 270,000 af exported (Figure 1). However, the largest

number of fish salvaged per acre-foot did not coincide with the highest export rates. The highest mean number of fish at the SWP occurred in June with 8.2 fish salvaged per acre-foot (Figure 2). The 4.5 fish salvaged per acre-foot in October at the CVP was the highest salvage rate of the year. Despite the single highest salvage rate at the SWP being nearly double that of the CVP, the CVP consistently had higher salvage rates than the SWP for every other month.

Prevalence of fish species of concern: striped bass, American shad, delta smelt, longfin smelt, splittail, and chinook salmon, varied by month and species. Striped bass were salvaged in great number at both facilities during the month of June when nearly 600,000 fish were salvaged at the SWP (Figure 3). The large number of

striped bass salvaged accounted for the high mean salvage that month. The majority of the striped bass salvaged in June were age 0, as most measured between 20 and 50 mm, whereas young-of-the-year fish salvage peaked in December.

During May, June, and July, many age 0 fish were salvaged at both facilities however some young-of-year were also recovered. American shad were most prevalent at the SWP (Figure 4) in July when most measured between 20 and 60 mm. However, a large number of young-of-year American shad were salvaged at the CVP in November, when most were between 70 and 122 mm. Salvage of delta smelt peaked in May and June at both facilities (Figure 5) with most being between 20 and 32 mm. Longfin smelt had a similar trend with the peak salvage in May (Figure 6) and most measuring between 20 and 34 mm. Splittail salvage was greatest at the SWP

in April (Figure 7) with most measuring the size of age 2 fish. At the CVP, salvage of splittail peaked during June when the majority measured between 36 and 82 mm.

Salvage of chinook salmon was highest from March through June and except for December, was consistently higher at the CVP than the SWP (Figure 8). Spring-run length salmon were salvaged in the greatest number in March and April, as most ranged between 80 and 110 mm. Winter-run sized salmon were found mainly during December and March and most were 115 and 144 mm. Fall-run sized salmon were salvaged in the largest numbers of all salmon races. Salvage of fall-run sized salmon peaked in May and June with most measuring from 70 to 105 mm. Of all races, late-fall run sized fish accounted for the least number salvaged with only 17 being salvaged in December ranging in size from 171 to 142mm.

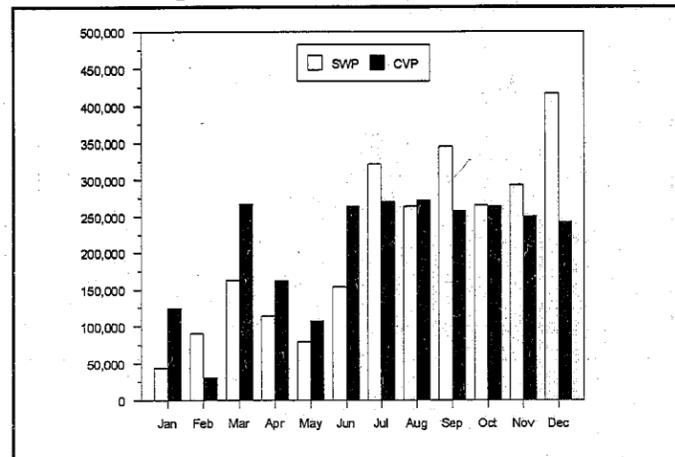


Figure 1. Monthly Mean Acre-feet Exported in 1997 by Facility

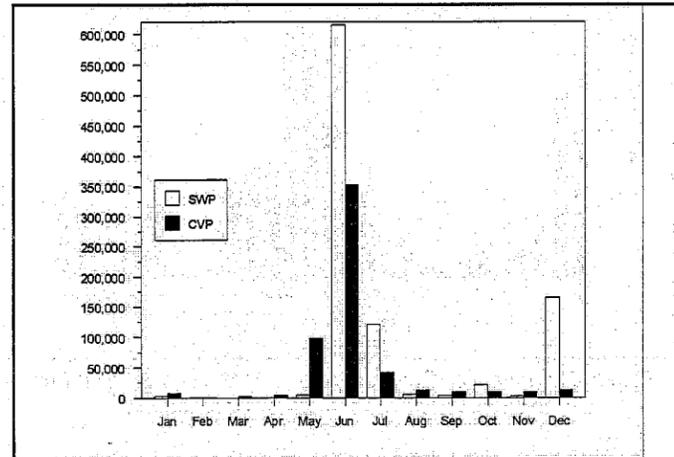


Figure 3. Number of Striped Bass Salvaged in 1997 by Month and Facility

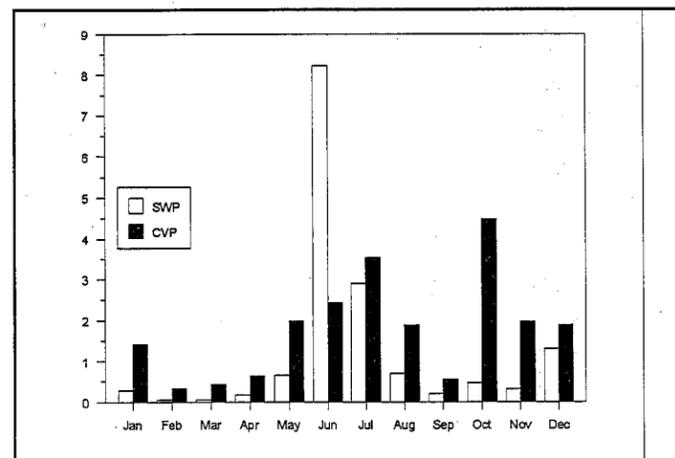


Figure 2. Number of Fish Salvaged Per Acre-foot of Water Exported in 1997

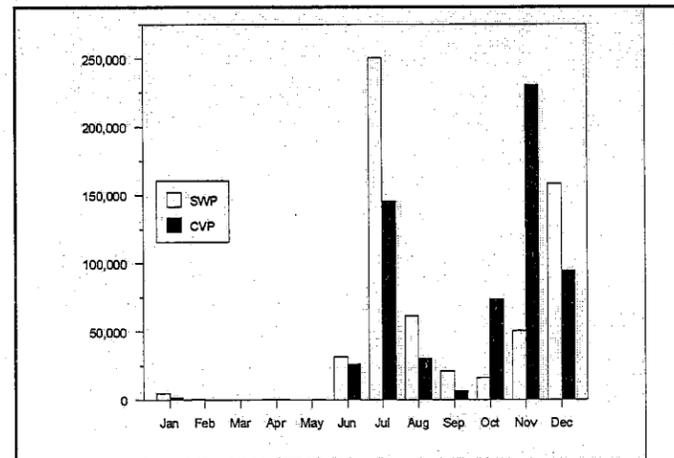


Figure 4. Number of American Shad Salvaged in 1997 by Month and Facility

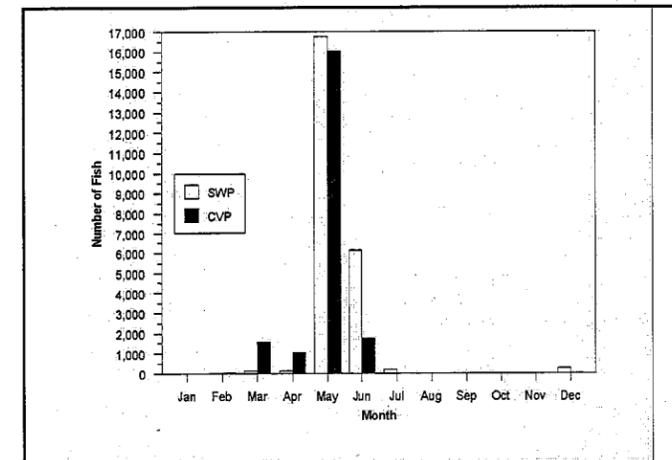


Figure 5. Number of Delta Smelt Salvaged by Month and Facility

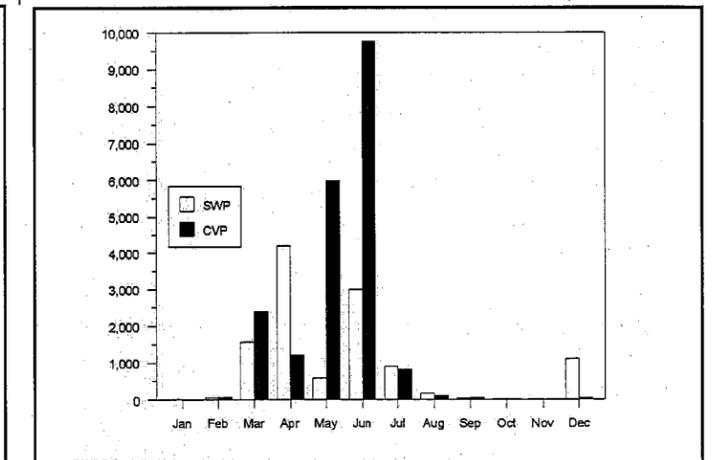


Figure 7. Number of Splittail Salvaged in 1997 by Month and Facility

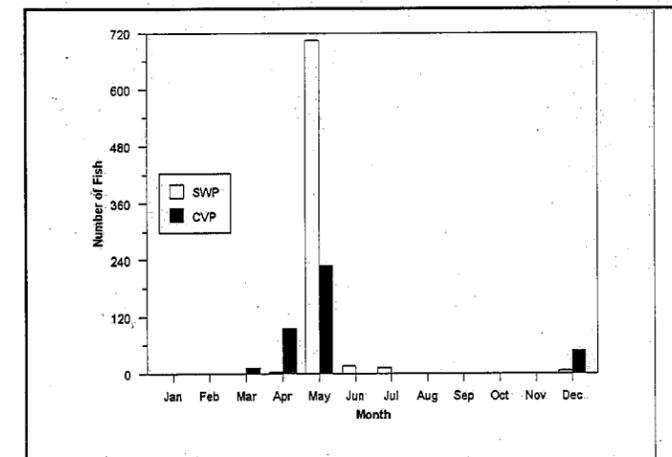


Figure 6. Number of Longfin Smelt Salvaged by Month and Facility

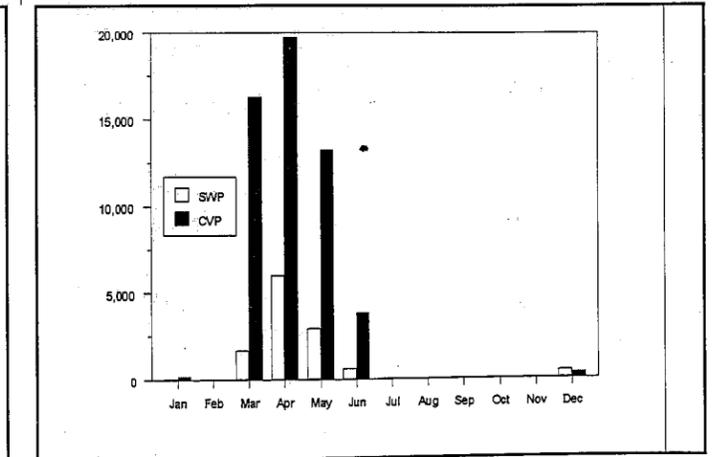


Figure 8. Number of Chinook Salmon Salvaged by Month and Facility