

SCREENING AGRICULTURAL DIVERSIONS
IN THE SACRAMENTO-SAN JOAQUIN DELTA

BY

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INTRODUCTION

The Sacramento-San Joaquin Delta (Figure 1) consists of numerous islands and channels located at the confluence of California's Sacramento and San Joaquin Rivers. The islands are surrounded by levees and are intensively farmed. Channels serve as homes for many resident species of fish and as pathways for migratory species such as chinook salmon and American shad. A resource conflict develops when farmers divert irrigation water from channels by means of pumps and siphons. Because the agricultural diversions are not screened, they entrain various fish life stages, particularly eggs, larvae, and juveniles. The most commonly used irrigation methods in the Delta, subsurface and overhead sprinklers probably result in complete mortality of those organisms entrained in the diversions.

The Department of Water Resources (DWR) examined agricultural diversions in some detail to estimate fish losses caused by entrainment, primarily losses of juvenile chinook salmon and striped bass, and the technical feasibility of screening the hundreds of diversions located in the Delta. This report documents the results of this study. It must be pointed out that there are very few data available on diversion rates, losses through diversions, effective screen designs for the Delta pumps and siphons, or the potential costs associated with installing and maintaining effective screening systems. I was forced to make a lot of assumptions and to stretch the available data past comfortable limits. Because of the above limitations, the report contains only suggestions as to the magnitude of fish losses and the costs of screening. No attempt has been made to extrapolate from losses of small fish to the impact of the projected losses on adult populations.

For purposes of this report, the discussion of fishery resources is generally limited to populations of chinook salmon and striped bass that pass through and/or live in the Delta. The reasons for this limitation are two-fold. First, these two animals are economically the most important fish in the system; second, more data exist for these fish than any others. Other fish species are briefly discussed when data are available.

BACKGROUND INFORMATION

The environmental setting for the Delta and its primary fish and wildlife resources has been thoroughly described in numerous publications (see, in particular, DWR, 1974; PGandE, 1981; and DFG, 1966) and need not be described in detail here. There are, however, a few comments which may provide the