State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

MERCED RIVER FISH FACILITY ANNUAL REPORT
1973-74

by

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Region 4 - Anadromous Fisheries

Anadromous Fisheries Branch

Administrative Report No. 78-3

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ABSTRACT

This report describes the operation of the Merced River Fish Facility from July 1, 1973 through June 30, 1974. The facility consists of a spawning channel and three rearing ponds.

An estimated 150 1973 broodyear fall-run female king salmon (Oncorhynchus tshawytscha) spawned in the channel, and an estimated 753,000 eggs were deposited. Approximately 50,000 1972 broodyear yearling king salmon were produced and released into the Merced River.

In October 1973, 286,000 yearling Stanislaus River strain king salmon were released from the rearing ponds into the Merced River. The rearing ponds were then stocked with approximately 126,000 Stanislaus River strain fry and 34,000 Merced River juveniles removed from the spawning channel. The third rearing pond was constructed early in 1974 and stocked with 226,800 silver salmon (O. kisutch) for rearing to yearlings.

1/ Anadromous Fisheries Branch Administrative Report No. 78-3. Submitted September 1975.

INTRODUCTION

The Merced River Fish Facility is located immediately downstream from Crocker-Huffman Dam on the Merced River (a tributary to the San Joaquin River) about 24 km (15 miles) northeast of Merced. It is the terminal point for salmon migrating up the Merced River.

The facility was built by the Merced Irrigation District (MID) with Davis-Grunsky Act funds. Operations began in the fall of 1970.

The facility is comprised of a 1,333 m (4,372 ft) long spawning channel (The Reuben E. Schmidt Spawning Channel) and three 84 x 9 m (275 x 30 ft) rearing ponds. Each rearing pond has the capacity for approximately 150,000 king salmon yearlings. Menchen (1972) described the facility in detail.

The installation is operated by the California Department of Fish and Game with operating assistance and maintenance costs provided by MID.

Production Summary

Use and production of the facility in 1973-74 was the highest in its history (Table 1).

Table 1. Summary of Production, Merced River Fish Facility

Season	Females spawned	Eggs deposited	Yearlings released	Outmigrant fingerlings held June 30	Stanislaus R. fingerlings held June 30	Silver salmon fingerlings held June 30
1970-71	40	152,000			100,000	
1971-72	94	476,000	86,000	30,000	289,000	
1972-73	51	256,000	232,000	50,000+	325,000	
1973-74	150	753,000	336,000	34,000	126,000	226,800

SPAWNING CHANNEL PROGRAM

1973-74 Season

On October 18, 1973, the flow in the channel was increased from 2.0 m^3/sec (70 cfs) to 5.0 m^3/sec (175 cfs). This allowed 1973 fall-run adults access to the channel.

All adult salmon received in the channel entered voluntarily. No attempt was made to trap and count the fish as they entered. The number of spawners using the channel was estimated by recovering carcasses and counting redds.

The first salmon was seen entering the channel October 18, and the first redd was started October 25. As expected, most of the salmon entered the channel in November. Spawning peaked in early November and was completed by January 10, 1974.

On January 29, 1974, the flow in the channel was reduced to 1.1 m^3/sec (40 cfs).

A daily record was kept of redd construction in the channel. Markers were used to locate each redd as it was being made. This information is being used to determine how successful gravel manipulation has been in places where salmon did not spawn in the past. This season, most spawning took place in the same areas as the previous two seasons.

Carcass Recovery and Redd Count

The channel was inspected for carcasses 5 days each week. As many carcasses as possible were recovered by walking the full length of the channel. Fifty carcasses were recovered from the channel: 37 females and 13 males. All females recovered had spawned.

We counted 150 individual redds. The fact that only 37 female carcasses were observed was probably due to some carcasses being removed by predators or the spent females drifting out of the channel at night or on weekends when no observations were made.

Estimated Egg Deposition

We have no information on the fecundity of Merced River salmon. The Stanislaus River is in the same system (San Joaquin River drainage) as the Merced, and we have found that female fish in the Stanislaus average 5,020 eggs (Moccasin Creek Hatchery files). Therefore, we multiplied this figure by the estimated number of females that spawned in the channel (150) and derived an estimated potential deposition of 753,000 eggs.

KING SALMON REARING POND PROGRAM

Fish for the king salmon rearing pond program come from wild Stanislaus River stocks. Adult king salmon migrants are trapped and spawned at the river and the fertilized eggs hatched at Moccasin Creek Hatchery. The rearing ponds are then stocked with the resulting fry after they commence feeding.

1972 Brood Year

We released 286,000 1972 broodyear yearlings in the Merced River October 9-10, 1973 at an estimated average size of 43 g (10.5 fish/lb). In addition, approximately 50,000 yearling king salmon that had not migrated from the spawning channel were released in fall 1973.

1973 Brood Year

During March 1974, approximately 126,000 Stanislaus River fry were placed in the ponds. We also trapped an estimated 34,000 channel outmigrants for raising to yearling size.

AGE ANALYSIS

During the 1973-74 spawning season, scale samples were taken from adult king salmon both in the spawning channel and in the Merced River. The scales were examined for age and to determine if the first annulus was formed in fresh or salt water. Forty-two percent of the samples examined from river fish, and 66% of those from spawning channel fish had freshwater yearling annuli (Table 2).

Table 2. Analysis of Scale Samples from Merced River King Salmon, 1973-74

	Age				
	2	3	4	5	Combined
Number spawning channel samples	12	48	11		71
Number freshwater yearling annuli	11	26	10		47
% freshwater yearling annuli	92%	54%	91%		66%
Number river samples	19	24	12	2	57
Number freshwater yearling annuli	9	5	8	2	24
% freshwater yearling annuli	47%	21%	67%	100%	42%

SILVER SALMON REARING POND PROGRAM

On December 1, 1973 a cooperative agreement between the Department of Fish and Game and MID was made concerning the construction and operation of a third rearing pond for the purpose of raising silver salmon (O. kisutch). The agreement, which expires December 1, 1977, provides for construction and operation of the pond by the Department, with MID providing the land, water and power necessary for operation. The State retains the first 100,000 silver salmon produced for its management uses, and delivers the next 10,000 to McClure Reservoir for MID. The State fish are to be used in an experimental three-year program wherein yearling silver salmon are planted in various Southern California estuaries in an attempt to establish an offshore fishery for salmon.

The third rearing pond was constructed alongside pond #1 in January 1974. In March, 226,800 silver salmon fry were introduced into the new pond. Shortly after introduction, many of the fry apparently burrowed through the gravel and into the water supply pipe, through which they entered the spawning channel and pond #1. In order to prevent a recurrence of this incident, we plan to introduce larger fish in future years.

WATER TEMPERATURE

Water temperature in the channel was recorded with a 30-day recording thermometer located at the head of the channel. If was frequently checked for accuracy with a hand thermometer.

Water temperatures were near optimum for salmon production again this year (Table 3).

Table 3. Water temperatures (C)* Merced River King Salmon Facilities, 1973-74 Season

Month (1973)	Max.	Min.	Month (1974)	Max.	Min.
July	15.6	11.7	January	11.1	8.3
August	15.5	12.2	February	10.6	8.9
September	15.5	12.2	March	12.2	8.3
October	15.5	12.8	April	13.3	8.9
November	13.9	10.0	May	13.3	11.1
December	11.1	8.3	June	13.3	11.1

* Temperatures measured in F and later converted to C.

REFERENCE

Menchen, Robert S. 1972. Merced River King (Chinook) Salmon Spawning Channel annual report for 1970-71 season. Calif. Dep. Fish and Game, Anad. Fish. Admin. Rep. 72-6. 12 p.