

REF 90311

MERCED RIVER FISH FACILITY ANNUAL REPORT  
1974-75<sup>1/</sup>

by

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ABSTRACT

This report describes the operation of the Merced River Fish Facility from July 1, 1974 through June 30, 1975. The facility consists of a spawning channel and three rearing ponds.

Approximately 116,500 1973 broodyear yearling king salmon (Oncorhynchus tshawytscha) were produced and released into the Merced River. An estimated 92,920 yearling silver salmon (O. kisutch) were planted in McClure Reservoir, Merced County, and the Santa Margarita River, San Diego County.

An estimated 400 1974 broodyear fall-run female king salmon spawned in the channel, depositing approximately 2,008,000 eggs. Approximately 98,000 of the resulting fry were trapped and placed in a rearing pond where an outbreak of infectious hemopoetic necrosis (IHN) resulted in their having to be destroyed.

In May 1975, 227,000 silver salmon fry were introduced into two of the ponds to be reared to yearlings.

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<sup>1/</sup> Anadromous Fisheries Branch Administrative Report No. 78-4.  
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## 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 the MID.

### Production Summary

Use of the facility was the highest in its history (Table 1).

## SPAWNING CHANNEL PROGRAM

### 1974-75 Season

On October 15, 1974, the flow in the channel was increased to  $4.7 \text{ m}^3/\text{sec}$  (165 cfs). This allowed 1974 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 21 and spawning was completed by the last week in January.

On January 23, 1975, the flow in the channel was reduced to  $2.0 \text{ m}^3/\text{sec}$  (70 cfs).

### Carcass Recovery and Redd Count

The channel was inspected for carcasses 5 days each week. We recovered 78 carcasses from the channel: 54 females and 24 males.

We counted 400 individual redds. The fact that only 54 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.

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 yearlings released	Silver salmon fingerlings 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
1974-75	400	2,009,000	116,500	98,000*		92,920	294,000

\* Fish destroyed because of disease.

### 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 (400) and derived an estimated potential deposition of 2,008,000 eggs.

### KING SALMON REARING POND PROGRAM

Through 1973 fish for the king salmon rearing pond program came from wild Stanislaus River stocks. Adult king salmon migrants were trapped and spawned at the river and the fertilized eggs hatched at Moccasin Creek Hatchery. The rearing ponds were then stocked with the resulting fry after they commenced feeding.

#### 1973 Brood Year

We released 116,500 1973 brood year yearlings in the Merced River October 15, 1974.

#### 1974 Brood Year

In fall 1974 we were unable to obtain sufficient Stanislaus River eggs and decided to trap downstream migrants from the spawning channel for use in the yearling king salmon program.

On January 23, 1975, the flow in the spawning channel was reduced to 2.0 m<sup>3</sup>/sec (70 cfs). Slant screens were installed at the lower end of the channel, above the fishway. These screens contained four 10.2 cm (4 in) ports to pass fish through the screens. Rubber flex hoses attached to the downstream side of the ports discharged the downstream migrants into aluminum live boxes which served as traps. Between January 24 and March 18, 1975, we trapped approximately 98,000 downstream migrants in this manner and transferred them to holding pens in one of the rearing ponds (Figure 1).

Many rainbow trout (Salmo gairdnerii) entered the channel during the spawning period and were subsequently trapped along with the juvenile outmigrants. Stomach samples from some of these trout revealed heavy predation on the salmon, with as many as 60 fry being found in the stomach of a 20.3 cm (8 in) trout.

In an attempt to reduce predation we added an experimental grader to one of the traps. The grader consisted of a row of 1.9 cm (0.75 in) bars spaced to allow the king salmon fry to pass between them while preventing passage of the larger trout. This was only partially successful as the salmon fry would move back and forth between the compartments in the live cage, continuing to expose themselves to the adult trout.

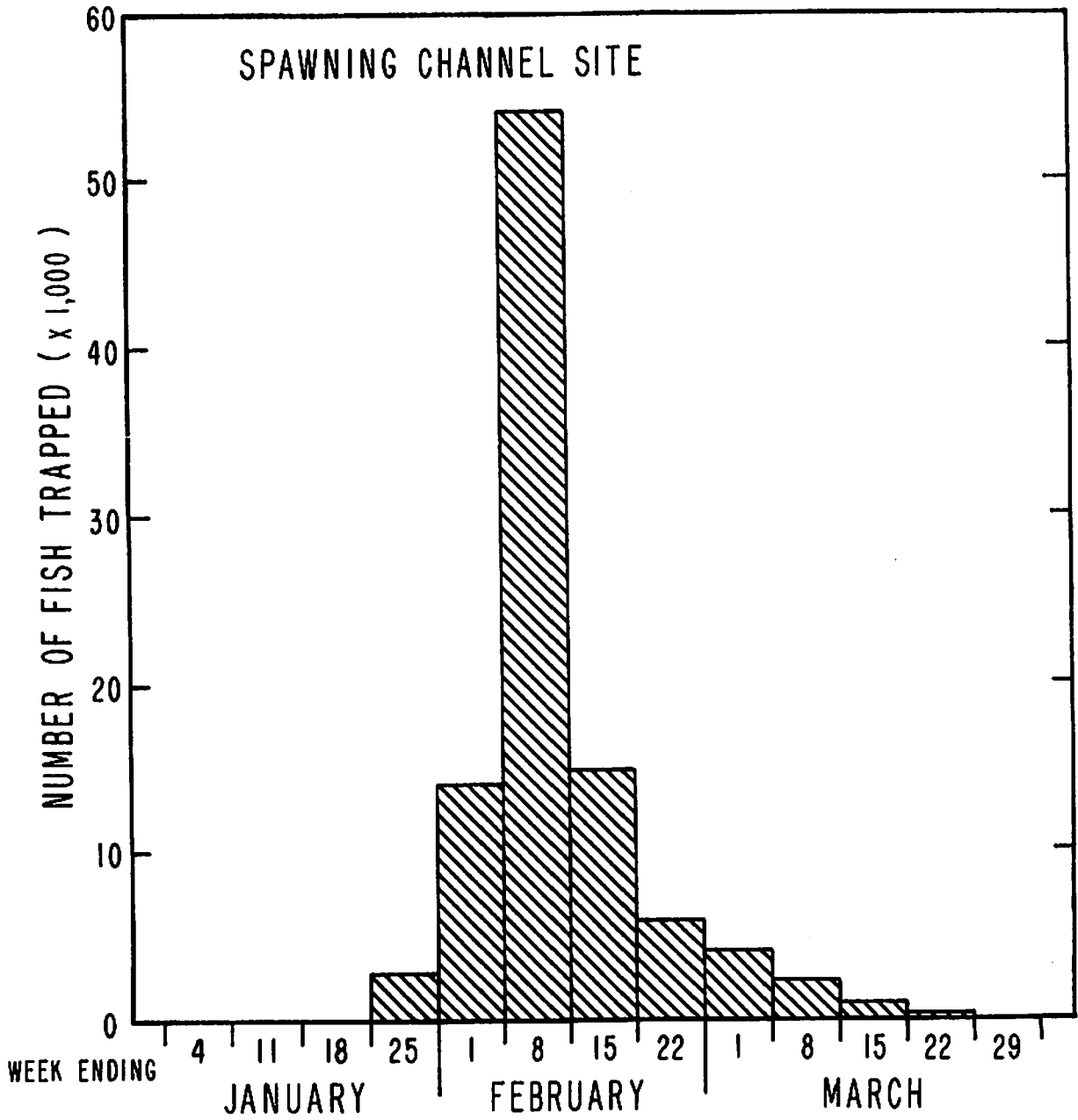


Figure 1. King salmon downstream migrant trapping, Merced River Fish Facility, 1975.

Disease

A severe outbreak of infectious hemopoetic necrosis (IHN) occurred in the 1974 broodyear king salmon just as trapping operations were concluding. The disease was diagnosed on March 17, 1975 and killed approximately 20,000 (20%) of the fish. We decided on March 24 to dispose of the remaining fish by burial.

This was the first record of IHN in the San Joaquin River system.

AGE ANALYSIS

During the 1974-75 spawning season, scale samples were taken from adult king salmon in both the spawning channel and the Merced River. The scales were examined for age and to determine if the first annulus was formed in fresh or salt water. Sixty-four percent of the samples examined from river fish, and 81% of those from spawning channel fish had freshwater yearling annuli (Table 2).

Table 2. Analysis of Scale Samples from Merced River King Salmon, 1974-75

	2	3	4	Combined
Number spawning channel samples	8	53	17	78
Number freshwater yearling annuli	4	46	13	63
% freshwater yearling annuli	50%	87%	76%	81%
Number river samples	1	15	6	22
Number freshwater yearling annuli	1	9	4	14
% freshwater yearling annuli	100%	60%	67%	64%

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.

In January 1975, 92,920 silver salmon were planted in two locations (Table 3).

Table 3. Silver Salmon Planting Summary

Date released	Strain	Number released	Average size	Release site
1/2/75	Alesea	10,120	41 g (11/1b)	McClure Reservoir
1/3/75	Alesea	82,800	41 g (11/1b)	Santa Margarita Reservoir

In May 1975, 294,000 silver salmon fry were introduced into two of the rearing ponds.

#### WATER TEMPERATURE

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

Water temperatures were near optimum for salmon production again this year (Table 4).

Table 4. Water temperatures (C)\* Merced River King Salmon Facilities, 1974-75 Season

Month (1974)	Max.	Min.	Month (1975)	Max.	Min.
July	No record		January	10.0	7.8
August	15.6	13.9	February	12.2	10.6
September	15.6	9.4	March	13.9	8.9
October	14.4	11.1	April	13.3	9.4
November	13.3	11.1	May	16.7	10.0
December	12.2	10.6	June	16.7	11.7

\* 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.