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The Resources Agency
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
MERCED RIVER FISH FACILITY
1985-86

by

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Region 4, Inland Fisheries

Inland Fisheries
Administrative Report No. 87-15
1987

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ABSTRACT

This report summarizes the operation of the Merced River Fish Facility from July 1, 1985, through June 30, 1986. The facility was constructed to rehabilitate the fall run chinook salmon (Oncorhynchus tshawytscha) in the Merced River.

A total of 371,350 chinook salmon yearlings (1984 brood year) and 1,448,356 chinook salmon smolts and pre-smolts (1985 brood year) was produced and released into the San Joaquin River system.

In the fall of 1985, 1,124 adult chinook salmon (514 males, 610 females) entered the facility. Of the females, 382 were artificially spawned. They yielded 2,165,903 eggs in 14 spawnings. Surplus adult salmon (189 males, 208 females) were released to spawn in the channel this year, depositing an estimated 1,175,000 eggs. Based on data collected from previous spawning channel recoveries of 40% to outmigrants, this would be a production of 470,000 smolts.

^{1/} Inland Fisheries Administrative Report No. 87-15.
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INTRODUCTION

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

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

The facility is comprised of a 4,372-ft long spawning channel (the Reuben E. Schmidt Spawning Channel), three 275 x 30-ft rearing ponds and one effluent settling basin. A permanent hatchery building houses 17 double stacks of Heath incubator trays, capable of incubating and hatching approximately 2,500,000 chinook salmon eggs, and six nursery tanks with a capacity of approximately 50,000 swim-up size chinook salmon each. Five additional nursery tanks have been added with a capacity of 85,000 fingerling each. The adult salmon trapping facility is located in the fish ladder of the spawning channel. The trapping facility consists of a fyke trap entrance, two basket hoists, anaesthetic tank, sorting table and holding pen. The installation is operated by the California Department of Fish and Game with operating assistance and partial funding of maintenance costs provided by MID.

PRODUCTION SUMMARY

The fish trap began operating on October 8, 1985. The first chinook salmon entered the trap on October 13. Trapping was terminated for the season on December 8. A total of 1,211 fish was counted (Appendix Table 1).

The total production of chinook salmon for MRFF 1985-86 is summarized in Table 1. Numbers of returning chinook salmon since 1970 are shown in Appendix Table 2.

The Merced facility produced 371,350 yearling chinook salmon (1984 BY) which were planted into the Merced and San Joaquin rivers and Carquinez Strait in the fall of 1985 (Table 2). Coded wire tags (CWT) were applied to 166,788 of the released 84 BY yearlings (Table 2). Production of 85 BY fingerling was 1,448,356 with CWT applied to 653,030 of the released smolts (Table 3).

Table 1. Production Summary, Merced River Fish Facility, 1985-86

Species	Number trapped	Number females spawned	Eggs taken	Number fingerlings planted	Number yearling planted	Total pounds planted	On hand June 30 1986
Chinook 1984 BY MRFF					371,350	43,750	
Chinook 1985 BY MRFF	1,211	382	2,165,903	1,448,358		21,998	0
Totals	1,211	382	2,165,903	1,448,358	371,350	65,748	0

Table 2. Yearling Merced River Strain Chinook Salmon 1984 BY Planted from Merced River Fish Facility, 1985-86 ^{1/}

Released	CWT Code	Tagged	Untagged	Size/lb	Total Released	Location
10-14-85			63,000	7.5	63,000	MRFF
10-15-85	06-46-43	25,987	21,613	8.5	47,600	Benicia
10-16-85	06-46-41 06-46-42	45,700	10,100	9.0	55,800	San Joaquin River below Old River
10-16-85 10-17-85 10-18-85	06-46-44	43,453	98,397	8.0 to 9.5	141,850	Merced River Gallo Ranch
10-21-85 10-22-85	06-46-39 06-46-40	51,648	11,452	8.0 9.0	63,100	San Joaquin River above Old River
Totals		166,788	204,562		371,350	

^{1/} Data preliminary, subject to revision by Inland Fisheries Division, Sacramento.

Table 3. 1985 BY Fingerlings and Smolts, Merced River Strain Chinook Salmon Planted from Merced River Fish Facility, 1986^{1/}

Released	CWT Code	Tagged	Untagged	Size/lb	Total released	Location
3- 8-86			15,876	294.0	15,876	MRFF
3-14-86			20,448	288.0	20,448	MRFF
3-18-86			88,830	282.0	88,830	MRFF
3-20-86			38,762	261.4	38,760	MRFF
3-26-86			14,544	242.4	14,544	MRFF
4- 3-86			49,298	295.2	49,298	MRFF
4- 8-86			12,760	238.5	12,760	MRFF
4-14-86	06-46-56	108,920		77.8	108,920	Tuolumne River Mapes Ranch
	06-46-57					
4-14-86	06-46-54	106,680		76.2	106,680	Tuolumne River Old La Grange Bridge
	06-46-55					
4-28-86	06-46-48					
	06-46-49					
	06-46-50					Stanislaus River
	06-46-53	112,550		64.5	112,550	Knights Ferry
4-29-86	06-46-45					
	06-46-46					
	06-46-47					Stanislaus River
	06-46-52	110,175		56.5	110,175	American Trail Camp
5-29-86	06-46-58	90,664	177,526	46.0	268,190	San Joaquin River
	B6-11-01					Dos Reis Park
5-29-86	06-46-58	16,826	1,074	45.8	17,900	San Joaquin River
	B6-11-01					Mossdale
5-30-86	06-46-59	107,215		52.3	107,215	Old River Pump 12A
	B6-11-02					Stewart Road
5-30-86			351,250	58.5	351,250	MRFF
6-18-86			24,960	80.0	24,960	MRFF
Totals		653,030	795,328		1,448,356	

^{1/} Data preliminary, subject to revision by Inland Fisheries Division, Sacramento.

HATCHERY OPERATION

All BY 84 fish were reared on a diet of Oregon Moist Pellets and Abernathy formula dry pellets. A total of 66,984 lb of food produced 43,750 lb of fish yielding a conversion rate 1.53. All BY 85 fish were reared on a diet of Oregon Moist Pellets. A total of 22,012 lb of food produced 21,998 lb of fish yielding a conversion rate of 1.00.

The facility had 1,388 visitors in fiscal year 85-86. Tours were provided for organized groups and schools. Mt. Bullion Youth Correction Center provided 429 man-days of grounds maintenance labor for the facility.

CHINOOK SALMON MAINTENANCE PROGRAM

History of the 1985 Run

The first adult chinook salmon entered the trap on October 13, 1985. Of the 1,124 adult salmon trapped, 610 were females and 514 were males. The number of grilse trapped was 87. Anadromous Fisheries Branch designated 24 inches in total length or less for grilse identification during the 1985 season for the Merced and Tuolumne rivers.

A total of 2,165,903 eggs was taken from 382 females during 14 spawnings, for an average of 5,670 eggs/female. Average fertility of eggs was 74.5%. Spawning was terminated November 24, 1985. Surplus adult salmon, 208 females and 189 males, were released into the spawning channel this year. Based on average fecundity at MRFF, an estimated 1,175,000 eggs were deposited in the channel.

Approximately 15,000 eyed eggs were supplied to the USFWS at Yankton Field Research Lab, South Dakota for Selenium studies. From April 1, 1986 through August 1, 1986, 450 chinook salmon fingerlings were supplied for the ongoing smoltification thyroxine study at the University of California Berkeley. A total of 655,000 pre-smolts chinook salmon was supplied for coded wire tagging (CWT) at MRFF from March through mid-April 1986. Four CWT groups of approximately 100,000 each were released in the upper and lower sections of the Tuolumne and Stanislaus rivers for study of smolt survival in the San Joaquin River drainage. Approximately 215,000 CWT smolts were released in the San Joaquin and Old Rivers to evaluate the migration routes through the South Delta.

Marked Chinook Salmon Returns

One-hundred forty-six chinook salmon marked with an adipose clip, indicating the fish had been tagged with a coded wire tag, were trapped at the facility during the 1985 season (Appendix Table 3). CWT that were collected by hatchery personnel and anadromous fisheries personnel are currently being analyzed with the results to be published in a separate report.

Planting 1984 Brood Year Chinook Salmon

A total of 371,350 chinook salmon yearlings was produced and released into the San Joaquin River system and Carquinez Straits (Table 2).

Planting 1985 Brood Year Chinook Salmon

A total of 240,518 fingerlings and 376,210 smolts was produced and planted in the Merced River. A total of 215,600 CWT (108,920 and 106,680) was produced and planted in the upper and lower sections of the Tuolumne River. A total of 222,725 CWT (112,550 and 110,175) was produced and planted in the upper and lower sections of the Stanislaus River.

A total of 90,664 CWT and an additional 177,526 untagged smolts were released in the San Joaquin River at Dos Reis Park. Due to mechanical hauling problems, one truck load containing 16,826 CWT and 1,074 untagged smolts destined for Dos Reis Park was instead released at Mossdale (Highway 120) on the San Joaquin River. Smolt releases in Old River at Stewart Road Pump 12A were 107,215 CWT. Table 3 gives fish release location, date and size details.

A decision was made to defer rearing 1985 BY salmon yearlings at the facility. It was felt that with the high spring water releases, it would be an advantage to release all fingerlings in the spring. Facility maintenance and water supply line repairs were accomplished while the ponds were empty.

Appendix Table 1. Weekly Adult Chinook Salmon Trapping Data for Merced River Fish Facility, 1985-86

<u>Week</u>	<u>Adults</u>	<u>Grilse</u>	<u>Total</u>
Oct. 9-14	0	4	4
Oct. 15-21	35	4	39
Oct. 22-28	109	12	121
Oct. 29-Nov. 4	215	15	230
Nov. 5-11	234	17	251
Nov. 12-18	271	8	279
Nov. 19-25	102	11	113
Nov. 26-Dec. 2	110	12	122
Dec. 3-9	48	4	52
Totals	1,124	87	1,211

Appendix Table 2. Summary of Chinook Salmon Runs Entering Merced River Fish Facility^{a/}

<u>Fiscal Year</u>	<u>Males</u>	<u>Females</u>	<u>Grilse^{b/}</u>	<u>Totals</u>
1970-71	59	40	--	99
1971-72	54	94	--	148
1972-73	14	51	--	65
1973-74	13	150	--	163
1974-75	24	400	--	424
1975-76	99	300	--	399
1976-77	86	260	--	346
1977-78	44	200	--	244
1978-79	14	45	2	61
1979-80	143	86	120	349
1980-81	43	106	8	157
1981-82	326	278	319	923
1982-83	90	67	32	189
1983-84	30	178	1,587	1,795
1984-85	713	858	167	1,738
1985-86	514	610	87	1,211

a/ From 1970-71 through 1978-79, the annual run of adult female chinook salmon was estimated by using redd counts and carcass recoveries in the spawning channel. The number of male salmon shown are actual counts of recovered carcasses. Beginning in fiscal year 1979-80, an adult trap was operated at the facility throughout each spawning season and actual counts were made. There are no records of numbers of grilse until 1978.

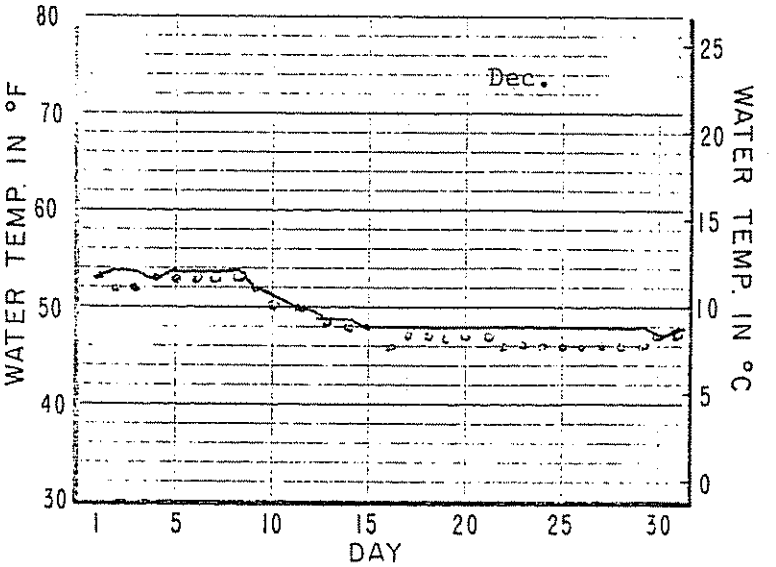
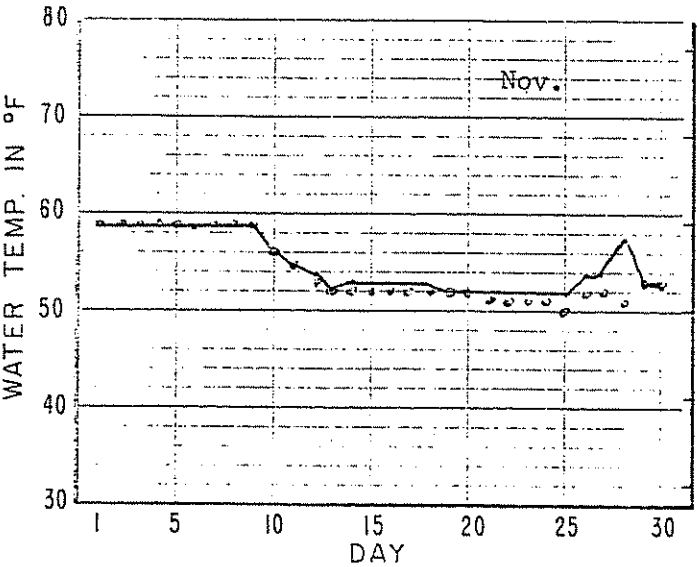
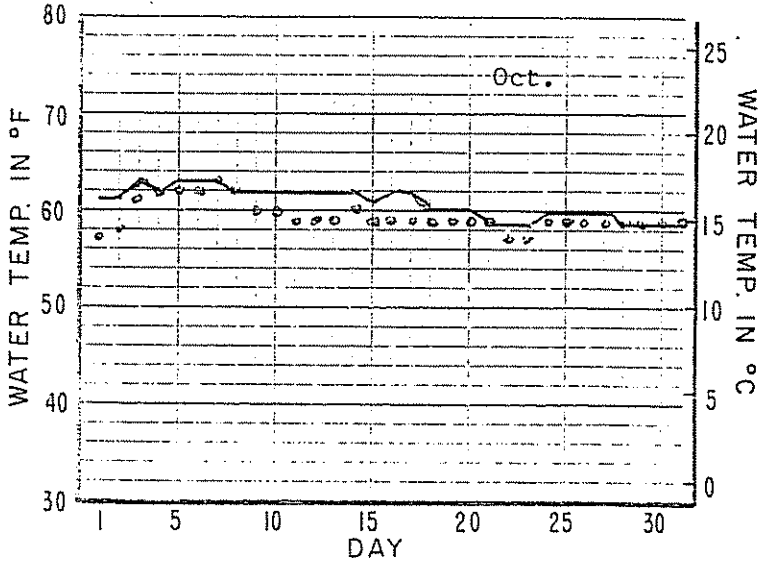
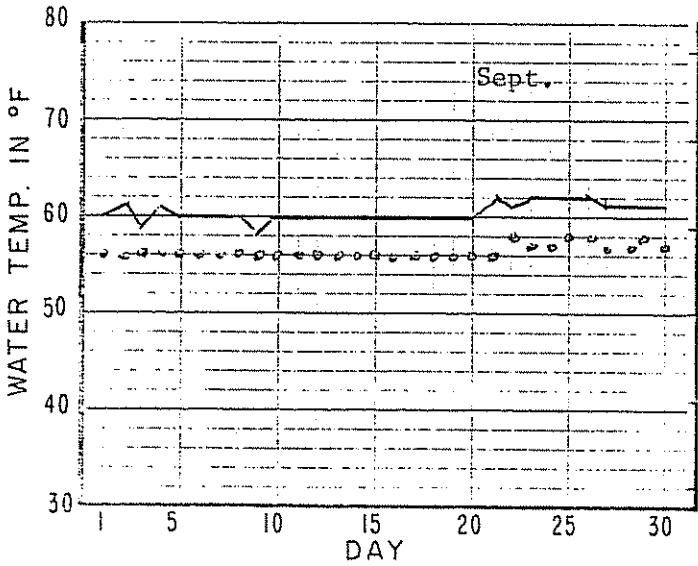
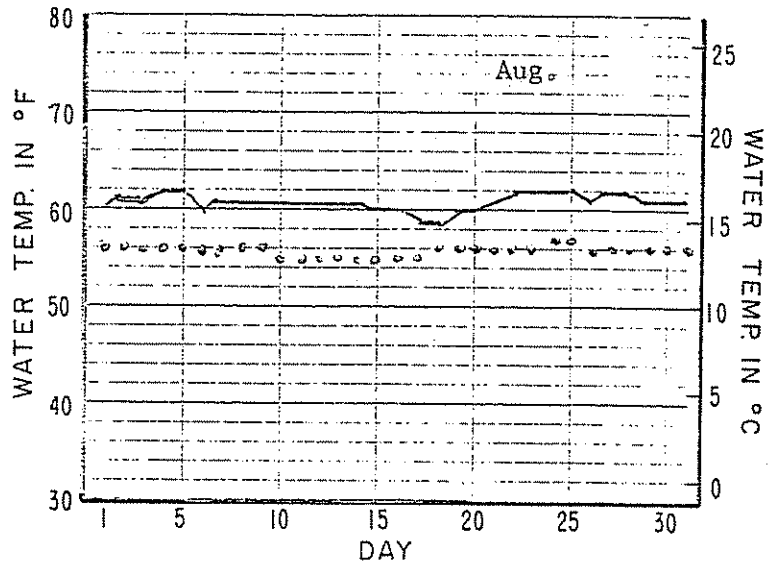
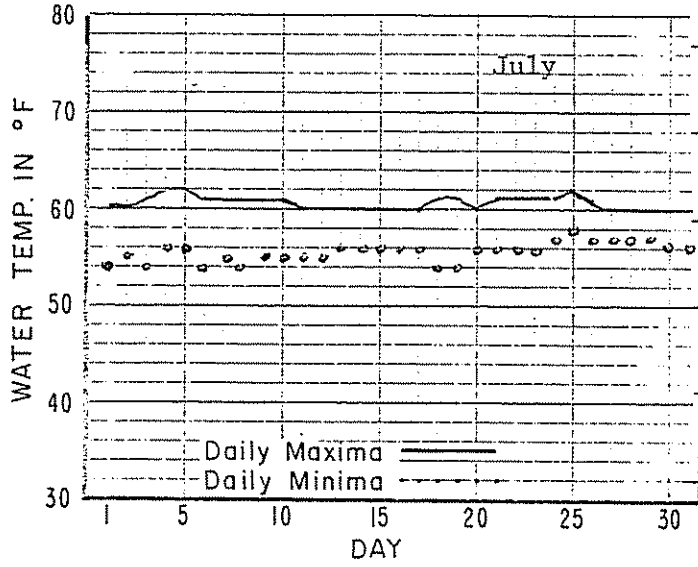
b/ The criteria for grilse was changed from 21 in. FL and less to 22 in. TL and less in 1983-84, to 23 in. TL and less in 1984-85, and to 24 in. TL and less in 1985-86.

Appendix Table 3. Fork Lengths (to nearest inch) of Marked Chinook Salmon Trapped at Merced River Fish Facility, 1985-86

<u>Fork length</u>	<u>Male</u>	<u>Female</u>
17		
18		
19	5	
20	3	
21	4	1
22	3	2
23	7	2
24	5	
25	3	2
26	1	1
27	1	2
28	2	6
29	1	5
30	5	10
31	8	9
32	4	13
33	5	6
34	6	7
35	2	1
36	7	3
37	3	
38	1	
39		
40		
<hr/>		
Totals	76	70

APPENDIX FIGURE 1. Daily Water Temperatures for Merced River Fish Facility from July 1, 1985 through June 30, 1986

DAILY WATER TEMPERATURES BY MONTH



DAILY WATER TEMPERATURES BY MONTH

