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ANNUAL REPORT
MERCED RIVER FISH FACILITY, 1986-87^V

by

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ABSTRACT

This report describes the operation of the Merced River Fish Facility from July 1, 1986 through June 30, 1987. The facility was constructed to rehabilitate the fall run chinook salmon, Oncorhynchus tshawytscha, in the Merced River.

A total of 444,405 chinook salmon smolts (1986 brood year) was produced and released into the San Joaquin River system.

In the fall of 1986, 488 adult chinook salmon (271 males, 217 females) entered the facility. Of the females, 188 were artificially spawned. They yielded 964,156 eggs in 21 spawnings. Surplus adult salmon (99 males, 42 females) were released to spawn in the channel this year, depositing an estimated 215,000 eggs. Based on data collected from previous spawning channel recoveries of 40% to outmigrants, this would be a production of 86,000 fry (presmolts and smolts).

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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. 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-foot 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 16 double stacks of Heath type incubator trap (Flex-A-Lite is the present manufacturer of this type of incubators), capable of incubating and hatching approximately 2,500,000 chinook salmon eggs, and 6 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 fingerlings 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 hydraulic 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 6, 1986. The first chinook salmon entered the trap on October 9, 1986. Trapping was terminated for the season on December 22, 1986. A total of 650 fish was counted (Appendix Table 1). The total production of chinook salmon for MRFF 1986-87 is summarized in Table 1. Numbers of returning chinook salmon since 1970 are shown in Appendix Table 2. The Merced Facility produced 444,405 chinook salmon smolts (1986 BY) which were planted into the Tuolumne, San Joaquin and Old Rivers in the spring of 1986 (Table 2). Coded wire tags (CWT) were applied to 433,760 of the released 86 BY smolts (Table 2).

TABLE 1. Production Summary, Merced River Fish Facility, 1986-87

Species	Number trapped	Number females spawned	Eggs taken	Number Fingerlings planted	Number yearlings planted	Total pounds planted	On hand June 30, 1987
<u>Chinook</u>							
1986 BY							
MRFF	650	188	964,156	444,405	0	6,126	316,487
Totals	650	188	964,156	444,405	0	6,126	316,487

TABLE 2. Merced River Strain Chinook Salmon Smolts 1986 BY Planted From Merced River Fish Facility, 1987

<u>Released</u>	<u>CWT Code</u>	<u>Tagged</u>	<u>Untagged</u>	<u>Size/lb</u>	<u>Total released</u>	<u>Location</u>
4-16-87	06-46-63 06-45-01 06-45-02	107,591		74.9	107,490	Tuolumne River at Riverdale Park
4-16-87	06-46-60 06-46-61 06-46-62	108,121		68.8	108,016	Tuolumne River at Old LaGrange Bridge
04-27-86	06-45-06 06-45-07 06-45-08	109,447		73.0	109,128	San Joaquin River at Dos Reis Park, Lathrop Road
4-27-87	06-45-03 06-45-04 06-45-05	108,601		74.0	108,476	Old River at Stewart Road Pump #12A
						<u>Efficiency and Vulnerability test</u>
4-29-87		1,632		68.0	1,632	San Joaquin River at Mile 82
4-30-87		1,160		84.0	1,160	San Joaquin River at Mile 82
4-30-87		700		84.6	700	San Joaquin River at Mile 82
5-1-87		3,130		84.6	3,130	3 miles below Old River confluence on San Joaquin River
5-14-87	Blue Dye Mark Dorsal	1,070		80.0	1,070	1/2 mile above San Joaquin River and Old River confluence in San Joaquin River
5-14-87	Blue Dye Mark Dorsal	1,070		80.0	1,070	Same as above
5-14-87	Blue Dye Mark Caudal Lower	1,204		86.0	1,204	Same as above
5-14-87	Blue Dye Mark Caudal Upper	1,204		86.0	1,204	Same as above
TOTALS		444,930			444,280	

HATCHERY OPERATIONS

All BY 1986 fish were reared on a diet of Bio Product Starter, Oregon Moist Pellets and Rangen salmon formula dry pellets. A total of 9,850 lb of food produced 6,125 lb of fish yielding a conversion rate 1.61.

The facility had 1,580 visitors in FY 1986/87. Tours were provided for organized groups and schools (Mt. Bullion Youth Correction Center provided 17 person days of grounds maintenance labor for the facility).

Chinook Salmon Maintenance Program

History of the 1986 Run

The first adult chinook salmon entered the trap on October 9, 1986. Of the 488 adult salmon trapped, 217 were females and 271 were males. The number of grilse trapped was 162. Grilse are fish 24 inches or less (fork length).

A total of 964,156 eggs was taken from 188 females during 21 spawnings, for an average of 5,128 eggs/female. Average fertility of eggs was 88.3%. Spawning was terminated December 22, 1986. Surplus adult salmon (42 females and 99 males) were released into the spawning channel this year. Based on average fecundity at MRFF, an estimated 215,376 eggs were deposited in the channel.

Marked Chinook Salmon Recoveries

One hundred forty-one 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 1986 season (Appendix Table 3). Heads were removed from all adipose fin-clipped fish for recovery of coded-wire tags by district biologists (see Appendix Table 4 for tag recovery results).

Planting 1985 Brood Year Chinook Salmon

A decision was made to defer rearing 1985 BY salmon yearlings at the facility. It was felt that with the high flow spring water releases, it would be an advantage to release all fingerlings in the spring of 1986.

Planting 1986 Brood Year Chinook Salmon

A total of 215,506 CWT smolts (108,016 and 107,490) was produced and planted in the upper and lower sections of the Tuolumne River. A total of 109,128 CWT smolts was produced and released in the San Joaquin River at Dos Reis Park. Smolts tagged with coded wire tags released in Old River at Stewart Road Pump 12A totalled 108,476 (Table 2).

APPENDIX TABLE 1. Weekly Adult Chinook Trapping Data, Merced River Fish Facility 1986/87

<u>Week</u>	<u>Adult</u>	<u>Grilse</u>	<u>Total</u>
1	8	3	11
2	36	9	45
3	62	18	80
4	30	37	67
5	119	31	150
6	92	32	124
7	64	22	86
8	33	4	37
9	19	2	21
10	20	1	21
11	<u>5</u>	<u>3</u>	<u>8</u>
TOTALS	488	162	650

APPENDIX TABLE 2. Summary of Chinook Salmon Runs Merced River Fish Facility^{1/}

<u>Fiscal Year</u>	<u>Males</u>	<u>Females</u>	<u>Grilse^{2/}</u>	<u>Total</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
1986-87	271	217	162	650

1/ 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.

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

APPENDIX TABLE 3. Fork Lengths (to nearest inch) of Marked Chinook Salmon Trapped at Merced River Fish Facility, 1986-87

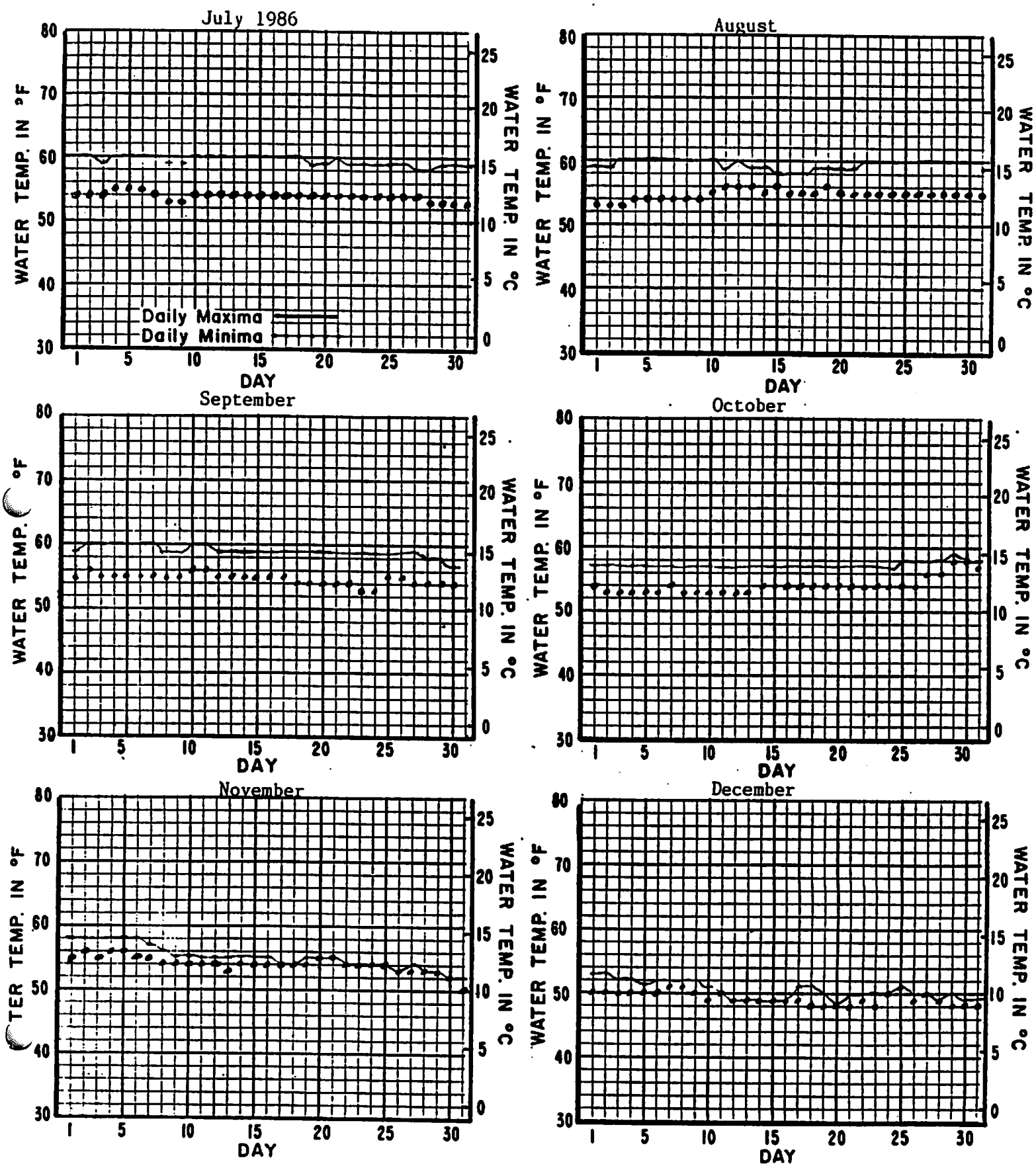
<u>Fork Length</u>	<u>Male</u>	<u>Female</u>
16	2	
17	1	
18	3	
19	4	
20	6	
21	3	1
22	2	
23	3	2
24	4	5
25	2	3
26	1	6
27	2	15
28	5	12
29	2	12
30	6	6
31	2	2
32	6	2
33	2	1
34	6	2
35	0	3
36	3	1
37	2	
38	1	
39	2	
40	2	
41	0	
42	<u>3</u>	<u> </u>
TOTALS	75	73

APPENDIX TABLE 4. Chinook Salmon Coded-wire Tag Recoveries Merced River Fish Facility, 1986-87

CWT code	Number released	Brood year	Hatchery	Release site	Release site
06-46-29	20	82	Merced River	M.R.F.F.	10-1-83
06-46-34	5	83	Merced River	Above Old R. Mossdale	10-17-84
06-46-35	2	83	Merced River	Above Old R. Mossdale	10-17-84
06-46-36	12	83	Merced River	Dos Reis	
06-46-37	17	83	Merced River	S.J.R.	10-18-84
06-46-38	48	83	Merced River	Dos Reis	
06-46-39	1	84	Merced River	S.J.R.	10-18-84
06-46-41	3	84	Merced River	Gallo Ranch Merced River	10-19-84
06-46-42	4	84	Merced River	Dos Reis	
06-46-43	1	84	Merced River	S.J.R.	10-21-85
06-46-44	9	84	Merced River	Above Old R. Mossdale	10-16-85
06-51-03	1	85	Warm Springs Hatchery	Above Old R. Mossdale	10-16-85
06-58-60	1	84	Feather River	Benicia	10-15-85
06-62-26	1	83	Feather River	Gallo Ranch	
06-62-42	2	84	Feather River	Merced River	10-17-85
10-00-00	9		No Tag		
20-00-00	5		CWT Lost		

APPENDIX FIGURE 1. Daily Water Temperatures for Merced River Fish Facility, 1986-87

DAILY WATER TEMPERATURES BY MONTH



APPENDIX FIGURE 1. (Continued)

DAILY WATER TEMPERATURES BY MONTH

