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THE RESOURCE AGENCY
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
MERCED RIVER HATCHERY
2000-01

BY

MICHAEL D. COZART
SAN JOAQUIN VALLEY and SOUTHERN SIERRA REGION

LANDS AND FACILITIES BRANCH
ADMINISTRATIVE REPORT NO. _____

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ABSTRACT

This report summarizes the operation of the Merced River Hatchery (MRH) from July 1, 2000 through June 30, 2001. The hatchery was constructed to rehabilitate the fall run chinook salmon (*Oncorhynchus tshawytscha*) in the Merced River.

A total of 1,300,945 chinook salmon smolts (2000 brood year) were produced.

In the fall of 2000, 1,946 chinook salmon (959 males, 987 females) entered the hatchery. The 937 females artificially spawned produced 5,369,099, eggs in 14 spawnings.

INTRODUCTION

The Merced River Hatchery, formerly Merced River Fish Facility, is located immediately downstream from the 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 the 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.

In 1991 Merced River Hatchery underwent modernization funded by the Department of Water Resources (DWR). Modernization included 1000 linear feet of concrete raceways consisting of ten 100 foot ponds. A bird enclosure was constructed to eliminate fish eating birds. Ultraviolet units were placed at the water inlet of each raceway and into the water supply line to the hatchery building. A new water line from Crocker-Huffman Dam supplies more consistent volume to the raceways and an increased volume to the hatchery building. A permanent hatchery building houses 14 double stacks of Heath type incubator trays and hatch jars capable of incubating and hatching approximately three million chinook salmon eggs. Twelve nursery tanks, two with the capability to start feeding of approximately 100,000 swim-up size salmon each, and 10 that will hold 90,000 fingerlings each are located adjacent to the hatchery building. The adult salmon trapping facility, located in the fish ladder of the spawning channel, consists of a fyke trap entrance, holding pen and a hydraulic basket hoist. The adjoining spawning building houses an anesthetic tank with hydraulic basket hoist, a sorting table and spawning table. The spawning building was constructed in 1995 by funds from the Salmon Stamp Account. The hatchery is also comprised of one effluent settling basin and a 4,372 ft long spawning channel (the Reuben E. Schmidt Spawning Channel), which is no longer in operation. The installation is operated by the California Department of Fish and Game with partial funding assistance for operational costs by DWR.

PRODUCTION SUMMARY

The Merced River Hatchery trap was in operation on October 1, 2000. The first chinook salmon entered the trap on October 6, 2000. Trapping was terminated for the season on December 18, 2000. The combined production of chinook salmon for M.R.H. 2000-01 is summarized in Table 1. Chinook salmon smolts planted from M.R.H. in 2001, (Table 2). Smolts provided for net efficiency and vulnerability tests totaled 146,732 (Table 3). A total of 1,946 adult fish entered the trap and are recorded in Appendix Table 1. The number of returning chinook salmon since 1970 are shown in Appendix Table 2. Fork length of marked salmon trapped at Merced River Hatchery (Appendix Table 3). Chinook Salmon Code Wire Tag recoveries at Merced River Hatchery (Appendix Table 4). Appendix Figure 1 provides water temperatures for the

production year.

Table 1. Production Summary, Merced River Fish Facility, 2000-2001

SPECIES	NUMBER TRAPPED	NUMBER FEMALE SPAWNED	NUMBER EGGS INTO PRODUCTION	NUMBER FINGERLING PLANTED **	YEARLINGS PLANTED	POUNDS PLANTED **	ON HAND JUNE 30, 2001
CHINOOK 2000 BY							
MRFF	1,946	937	2,082,810	1,300,945	-00-	17,096	0
TOTAL	1,946	937	2,082,810	1,300,945	-00-	17,096	0

** 157,414 BY 2000, 1,031 pounds were used for net efficiency and vulnerability tests for the South Delta Study.

Table 2. 2000 BY Merced River strain Chinook salmon smolts planted from Merced River Hatchery, 2001.

RELEASED DATE	CODED WIRE TAG CODE	NUMBER TAGGED	NUMBER UNTAGGED	SIZE NUMBER/LB	RELEASE SITE
04-02-01		0	100	145.0	U.C. DAVIS GENOMIC LAB
04-21-01	06-44-15 06-44-16 06-44-17 06-44-18	101,018	0	68.4	HATCHERY OUTLET MERCED R.
04-22-01	06-44-12 06-44-13 06-44-14	25,000 AM	0	79.8	LA GRANGE TUOLUMNE R.
04-22-01	06-44-12 06-44-13 06-44-14	25,000 PM	0	79.8	LA GRANGE TUOLUMNE R.

04-23-01	06-44-12 06-44-13 06-44-14	26,419	0	79.8	LA GRANGE TUOLUMNE R.
04-24-01	06-44-19 06-44-20 06-44-21	53,130	0	66.0	HATFIELD ST PARK MERCED R.
04-26-01	06-44-19 06-44-20 06-44-21	23,086	0	66.0	HATFIELD ST PARK MERCED R.
04-26-01	06-44-44	25,423	0	65.8	OLD FISHERMAN CLUB SAN JOAQUIN R.
04-28-01	06-44-43	25,452	0	64.6	OLD FISHERMAN CLUB SAN JOAQUIN R.
04-30-01	06-44-29 06-44-30 06-44-31	75,826	0	60.8	DURHAM FERRY SAN JOAQUIN R.
05-01-01	06-44-32	25,838	0	58.2	MOSSDALE SAN JOAQUIN R.
05-01-01	06-44-33	26,107	0	58.6	MOSSDALE SAN JOAQUIN R.
05-04-01	06-44-34	25,708	0	58.5	JERSEY POINT SAN JOAQUIN R.
05-04-01	06-44-35	25,720	0	59.0	JERSEY POINT SAN JOAQUIN R.
05-07-01	06-44-36 06-44-37 06-44-38	76,323	0	61.8	DURHAM FERRY SAN JOAQUIN R.
05-08-01	06-44-39	25,552	0	57.5	MOSSDALE SAN JOAQUIN R.
05-08-01	06-44-40	25,688	0	58.0	MOSSDALE SAN JOAQUIN R.
05-08-01	06-44-22 06-44-23 06-44-24 06-44-25	99,785	0	67.3	HATCHERY OUTLET MERCED R.
05-10-01	05-24-18	25,446	0	64.0	MOSSDALE SAN JOAQUIN R.
05-11-01	06-44-42	25,700	0	59.0	JERSEY POINT SAN JOAQUIN R.
05-11-01	06-44-41	26,040	0	59.0	JERSEY POINT SAN JOAQUIN R.

05-11-01	06-44-26 06-44-27 06-44-28	25,309	0	65.0	HATFIELD ST PARK MERCED R.
05-11-01		0	78,120	144.0	HATCHERY OUTLET MERCED R.
05-11-01		0	83,880	246.0	HATCHERY OUTLET MERCED R.
05-13-01	06-44-26 06-44-27 06-44-28	26,000	0	65.0	HATFIELD ST PARK MERCED R.
05-13-01	06-44-26 06-44-27 06-44-28	24,570	0	65.0	HATFIELD ST PARK MERCED R.
05-14-01		0	40,964	243.0	HATCHERY OUTLET MERCED R.
05-14-01		0	100	96.0	U.C. DAVIS GENOMIC LAB
05-22-01	06-01-11-08-04	24,884	0	52.5	KNIGHTS FERRY STANISLAUS R.
05-22-01	06-01-11-08-05	25,436	0	53.0	KNIGHTS FERRY STANISLAUS R.
05-25-01	06-01-11-07-15	25,797	0	53.3	2 RIVERS PARK STANISLAUS R.
05-31-01		0	110	90.0	DOS REIS SAN JOAQUIN R.
TOTAL		940,257	203,274		

Table 3. Chinook salmon smolts provided by Merced River Hatchery for net efficiency and vulnerability test in the Merced, Stanislaus, Tuolumne and San Joaquin Rivers in 2001.

- Merced River Salmon Habitat Enhancement Project Smolt Survival Studies-

RELEASE DATE	PANJET MARK	NUMBER RELEASED	SIZE NUMBER/LB	RELEASE LOCATION
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01-18-01	GREEN UPPER CAUDAL	1,000	1200.0	HAGAMAN ST PARK
01-26-01	RED LOWER CAUDAL	1,010	1000.0	HAGAMAN ST PARK
02-01-01	GREEN UPPER CAUDAL	2,029	950.0	HAGAMAN ST PARK
02-06-01	RED LOWER CAUDAL	1,070	500.0	HAGAMAN ST PARK
03-07-01	GREEN LOWER CAUDAL	2,014	600.0	HAGAMAN ST PARK
03-22-01	RED UPPER CAUDAL	2,016	425.0	HAGAMAN ST PARK
03-29-01	GREEN ANAL	2,014	305.0	HAGAMAN ST PARK
04-03-01	PEACH UPPER CAUDAL	24	145.0	HAGAMAN ST PARK
04-06-01	GREEN UPPER CAUDAL	2,016	250.0	HAGAMAN ST PARK
04-18-01	RED LOWER CAUDAL	2,008	125.0	HAGAMAN ST PARK
04-26-01	RED ANAL	2,053	110.0	HAGAMAN ST PARK
05-02-01	RED UPPER CAUDAL	2,055	116.0	HAGAMAN ST PARK
05-10-01	RED DORSAL	2,017	100.0	HAGAMAN ST PARK
05-16-01	RED LOWER CAUDAL	2,050	96.0	HAGAMAN ST PARK
05-24-01	RED ANAL	2,020	96.0	HAGAMAN ST PARK
05-31-01	RED UPPER CAUDAL	1,618	96.0	HAGAMAN ST PARK
TOTAL		27,014		
ROBINSON RANCH				
04-16-01	PINK UPPER CAUDAL	3,043	174.0	ROBINSON RANCH
04-22-01	PINK LOWER CAUDAL	3,150	126.0	ROBINSON RANCH
05-09-01	PINK DORSAL	3,021	104.0	ROBINSON RANCH

05-21-01	PINK UPPER CAUDAL	3,249	94.0	ROBIBSON RANCH
TOTAL		12,463		
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HENDERSON PARK				
04-16-01	ORANGE UPPER CAUDAL	5,028	174.0	HENDERSON PARK
04-22-01	ORANGE LOWER CAUDAL	5,031	126.0	HENDERSON PARK
05-09-01	ORANGE DORSAL	5,015	100.0	HENDERSON PARK
05-21-01	ORANGE UPPER CAUDAL	5,024	96.0	HENDERSON PARK
TOTAL		20,098		
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GALLO RANCH DFG				
04-16-01	MAGENTA LOWER CAUDAL	708	174.0	GALLO RANCH
04-16-01	MAGENTA DORSAL	717	174.0	GALLO RANCH
04-16-01	MAGENTA UPPER CAUDAL/ANAL	672	174.0	GALLO RANCH
04-22-01	MAGENTA LOWER CAUDAL/ANAL	784	126.0	GALLO RANCH
04-22-01	MAGENTA DORSAL	718	126.0	GALLO RANCH
04-22-01	MAGENTA UPPER CAUDAL	702	126.0	GALLO RANCH
05-09-01	MAGENTA UPPER CAUDAL	711	100.0	GALLO RANCH
05-09-01	MAGENTA DORSAL ANAL	711	100.0	GALLO RANCH

05-09-01	MAGENTA LOWER CAUDAL	738	100.0	GALLO RANCH
05-21-01	MAGENTA UPPER CAUDAL/ANAL	807	94.0	GALLO RANCH
05-21-01	MAGENTA DORSAL	806	94.0	GALLO RANCH
05-21-01	MAGENTA LOWER CAUDAL	802	94.0	GALLO RANCH
TOTAL		8,876		
MID-NATURAL RESOURCE SCIENCE GALLO RANCH				
01-31-01	PINK LOWER CAUDAL	633	950.0	GALLO RANCH
01-31-01	PINK UPPER CAUDAL	507	950.0	GALLO RANCH
03-01-01	PINK/PURPLE UPPER CAUDAL	810	463.0	GALLO RANCH
03-01-01	PINK LOWER CAUDAL	810	463.0	GALLO RANCH
03-19-01	PURPLE LOWER CAUDAL	651	425.0	GALLO RANCH
03-19-01	PURPLE UPPER CAUDAL	746	425.0	GALLO RANCH
04-02-01	PURPLE UPPER CAUDAL	400	145.0	GALLO RANCH
04-02-01	PURPLE/BLUE LOWER CAUDAL	600	145.0	GALLO RANCH
04-02-01	UNMARKED/MARKED ON SITE	300	145.0	GALLO RANCH
04-25-01	GREEN UPPER CAUDAL	327	125.0	GALLO RANCH
04-25-01	GREEN/ANAL LOWER CAUDAL	462	125.0	GALLO RANCH
04-27-01	GREEN ANAL	375	110.0	GALLO RANCH

05-04-01	GREEN UPPER CAUDAL	487	105.0	GALLO RANCH
05-04-01	GREEN/ANAL LOWER CAUDAL	360	105.0	GALLO RANCH
05-26-01	UNMARKED/MARKED ON SITE	600	92.0	GALLO RANCH
TOTAL		8,068		
GRAND TOTAL		76,519		

-Tuolumne River Rotary Screw Trap vulnerability tests-

RELEASE DATE	CWT/PANJET MARK	NUMBER RELEASED	SIZE NUMBER/LB	RELEASE LOCATION
01-17-01	BLUE UPPER CAUDAL	2,020	1200.0	GRAYSON
02-07-01	BLUE LOWER CAUDAL	2,038	500.0	GRAYSON
02-21-01	BLUE UPPER CAUDAL	2,117	800.0	GRAYSON
02-28-01	YELLOW UPPER CAUDAL	2,016	168.0	GRAYSON
03-13-01	YELLOW LOWER CAUDAL	1,505	540.0	GRAYSON
03-20-01	BLUE LOWER CAUDAL	1,025	189.0	GRAYSON
03-20-01	BLUE DORSAL	1,009	189.0	GRAYSON
03-20-01	YELLOW UPPER CAUDAL	1,022	189.0	GRAYSON
03-27-01	BLUE ANAL	2,014	305.0	GRAYSON
03-30-01	PEACH UPPER CAUDAL	41	305.0	GRAYSON
04-03-01	PEACH UPPER CAUDAL	60	145.0	GRAYSON

04-10-01	YELLOW LOWER CAUDAL	2,035	100.0	GRAYSON
04-17-01	06-44-45 BLUE UPPER CAUDAL	2,069	119.0	GRAYSON
04-24-01	06-44-45 YELLOW DORSAL YELLOW UPPER CAUDAL/DORSAL	507	110.0	GRAYSON
04-24-01	06-44-45 BLUE UPPER CAUDAL	505	110.0	GRAYSON
04-24-01	06-44-45 BLUE LOWER CAUDAL	510	110.0	GRAYSON
05-01-01	06-44-45 BLUE ANAL	3,055	92.0	GRAYSON
05-08-01	06-44-45 YELLOW LOWER CAUDAL	3,025	96.0	GRAYSON
05-15-01	06-44-45 BLUE UPPER CAUDAL	3,010	92.0	GRAYSON
05-22-01	06-44-45 YELLOW ANAL	3,511	92.0	GRAYSON
05-24-01	06-44-45 BLUE LOWER CAUDAL	1,607	92.0	GRAYSON
TOTAL		34,701		

- Stanislaus River Rotary Screw Trap vulnerability tests-

RELEASE DATE	CWT/PANJET MARK	NUMBER RELEASED	SIZE NUMBER/LB	RELEASE LOCATION
01-06-01	YELLOW PINK GREEN ORANGE CAUDAL	3,320	1328.0	OAKDALE AND CASWELL
03-15-01	YELLOW BLUE PINK CAUDAL	3,510	540.0	CASWELL
04-10-01	YELLOW BLUE GREEN CAUDAL/DORSAL	2,400	150.0	OAKDALE AND CASWELL
04-23-01	GREEN AND BLUE UPPER CAUDAL	1,500	126.0	OAKDALE
05-21-01	BLUE UPPER CAUDAL	1,500	92.0	OAKDALE
05-22-01	BLUE UPPER CAUDAL	1,502	92.0	OAKDALE
05-23-01	PINK UPPER CAUDAL	1,500	96.0	CASWELL
05-23-01	ORANGE LOWER CAUDAL	1,500	96.0	CASWELL
05-24-01	PINK LOWER CAUDAL	1,500	96.0	CASWELL
05-30-01	BLUE UPPER CAUDAL	1,500	96.0	CASWELL
TOTAL		19,732		

-San Joaquin River-

MOSSDALE Kodiak Trawl vulnerability tests-

RELEASE DATE	CWT/PANJET MARK	NUMBER RELEASE	SIZE NUMBER/LB	RELEASE LOCATION
04-12-01	PEACH UPPER CAUDAL	1,553	150.0	MOSSDALE
04-12-01	PEACH LOWER CAUDAL	1,500	150.0	MOSSDALE
04-26-01	PEACH DORSAL	1,514	110.0	MOSSDALE
04-26-01	PEACH ANAL	1,521	110.0	MOSSDALE
05-10-01	PEACH LOWER CAUDAL	1,523	100.0	MOSSDALE
05-10-01	PEACH UPPER CAUDAL	1,527	100.0	MOSSDALE
05-22-01	PEACH ANAL	1,523	96.0	MOSSDALE
05-22-01	PEACH DORSAL	1,521	96.0	MOSSDALE
TOTAL		12,182		

OLD RIVER BARRIER EVALUATION				
RELEASE DATE	CWT/PANJET MARK	NUMBER RELEASE	SIZE NUMBER/LB	RELEASE LOCATION
04-26-01	BLUE DORSAL	3,000	110.0	OLD RIVER BARRIER
04-26-01	BLUE UPPER CAUDAL	3,010	110.0	OLD RIVER BARRIER
04-26-01	BLUE UPPER AND LOWER CAUDAL	500	110.0	OLD RIVER BARRIER
04-26-01	BLUE UPPER CAUDAL/ANAL	502	110.0	OLD RIVER BARRIER
05-09-01	GREEN LOWER CAUDAL	3,132	108.0	OLD RIVER BARRIER
05-09-01	GREEN DORSAL	518	108.0	OLD RIVER BARRIER
05-09-01	GREEN ANAL	521	108.0	OLD RIVER BARRIER
05-09-01	GREEN UPPER CAUDAL	3,097	108.0	OLD RIVER BARRIER
TOTAL		14,280		

HATCHERY OPERATION

All BY 2000 fish were reared on a diet of Bio Diet starter and grower. A total of 18,300 lbs of food produced 17,096 lbs of fish, yielding a conversion rate of 1.07.

The facility had 3,000 visitors in fiscal year 2000-01.

Approximately 4,800 eyed MRH Chinook salmon eggs were supplied to 53 teachers, representing 48 elementary and high school that participated in the 2001 "Salmonids-In-The-Classroom" program in the San Joaquin River Basin area. Approximately 200 Chinook salmon fingerlings were supplied for various laboratory studies through out the state.

CHINOOK SALMON MAINTENANCE PROGRAM

History of the 2000 Run

The first Chinook salmon entered the MRH trap on October 6, 2000. Of the 1,946 salmon trapped, 683 were adult males, 932 adult females and 331 Grilse (276 males and 55 females). A total of 5,369,099 eggs were taken from 937 females during 14 spawnings, for an average fecundity of 5,730 eggs. The average fertility of eggs was 72.5 percent. Spawning was terminated December 18, 2000. Production Goals for Merced River Hatchery are set at 2 million eggs and 1.4 million smolts. Based on previous 10 year egg production records, a percentage from each egg lot are selected for production. Spawning procedures for 2000 were as follows: Single adult female eggs were divided into three or four pans, depending on egg volume, and each pan was fertilized with a different 3 year or older male. Grilse females were spawned in the same procedure using 3 year or older males for fertilization. When a shortage of adult 3 year or older males occurs grilse males are used with 3 year old or older females. Genetic concerns regarding out-of-basin Chinook salmon smolt releases in the past years for the South Delta Study were addressed this year. Spawned coded wire tagged Chinook salmon were issued a number to identify all spawning combinations. CWT codes were identified within 24 hours as to their place of origin. All out-of-basin spawn combinations were disposed of. A total of 69,619 eggs taken in the 14 spawnings constituted out-of-basin contribution. Biological data collection: CWT heads, scales, otoliths, length frequency, ovarian fluids and DNA samples.

-Disease-

Enteric redmouth, *Yersinia ruckeri*, was not diagnosed in 2001. All fish were immersed vaccinated with Alpha Dip (Enteric Redmouth/Yersiniosis), Bacterins, ALPHARMA, (Bellevue, Washington) as a preventive treatment. *Tetracapsula bryosalmonae* (the cause of Proliferative Kidney Disease) was not identified during fish production period. Lab samples from CWT groups designated for VAMP releases were collected at the hatchery and release sites for fish health monitoring. Samples were collected tested by Ken Nichols and J. Scott Foott, U.S. Fish & Wildlife Service, California-Nevada Fish Health Center, 24411 Coleman Hatchery Road, Anderson, California 96007. Results were compiled in FY 2001 Investigational Report: Health Monitoring of Hatchery and Natural Fall-run

Chinook Salmon Juveniles in the San Joaquin River and Tributaries, April-June 2001

Appendix Table 1. Weekly adult Chinook salmon trapping data for Merced River Hatchery 2000-01.

Week of	Adults	Grilse	Total
OCT 01	1	0	1
OCT 08	8	8	16
OCT 15	50	32	82
OCT 22	112	50	162
OCT 29	162	66	228
NOV 05	406	58	464
NOV 12	449	53	502
NOV 19	254	47	301
NOV 26	99	11	110
DEC 03	49	5	54
DEC 10	21	1	22
DEC 17	4	0	4
DEC 18		TRAP CLOSED	
TOTAL			1,946

Appendix Table 2. Summary of Chinook salmon run to Merced River Hatchery.
^{1/} ^{2/}

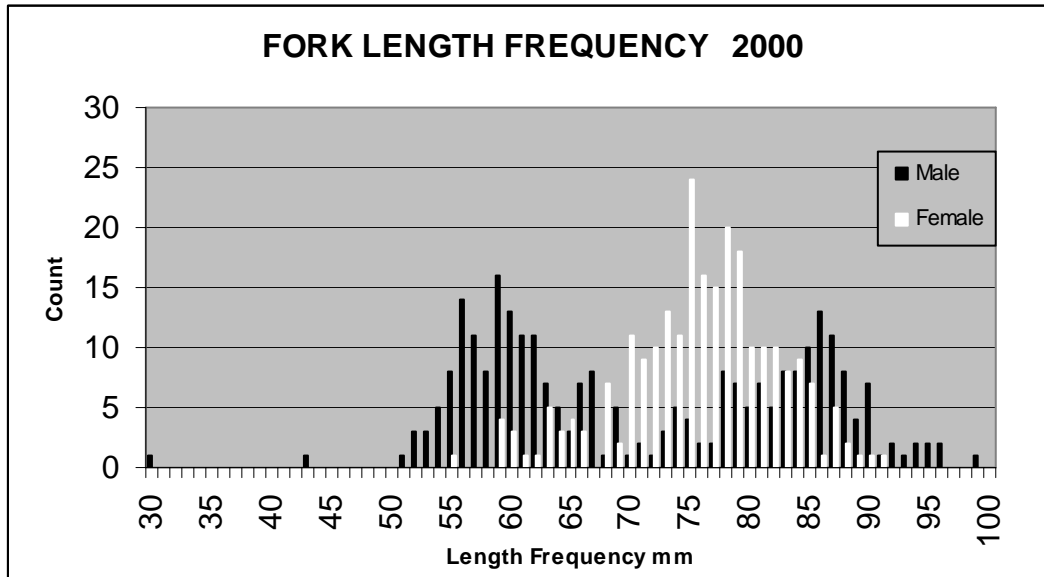
FISCAL YEAR	MALES	FEMALES	GRILSE ^{2/}	TOTAL
1970-71	59	40	^{1/}	99
1971-72	54	94	^{1/}	148
1972-73	14	51	^{1/}	65
1973-74	13	150	^{1/}	163
1974-75	24	400	^{1/}	424
1975-76	99	300	^{1/}	399
1976-77	86	260	^{1/}	346
1977-78	44	200	^{1/}	244
1978-79	14	45	^{1/}	61
1979-80	143	86	120	349
1980-81	43	106	8	157
1981-82	326	278	319	923
1982-83	90	67	32	189
1983-84	30	178	1587	1795
1984-85	713	858	167	1738
1985-86	514	610	87	1211
1986-87	271	217	162	650
1987-88	401	90	467	958
1988-89	165	250	42	457
1989-90	33	33	16	82
1990-91	17	11	18	46
1991-92	24	8	9	41
1992-93	97	24	245	368
1993-94	114	120	175	409
1994-95	359	240	344	943
1995-96	204	107	291	602

1996-97	464	275	402	1141
1997-98	451	365	86	946
1998-99	239	186	374	799
1999-00	396	234	1,007	1,637
2000-01	683	932	331	1,946

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 has been operated at the facility throughout each spawning season and actual counts are made. There are no records of number of grilse prior to 1978.

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

Appendix Table 3. Length Frequency Distribution (to nearest whole centimeter) of Coded Wire Tagged chinook salmon trapped at Merced River Hatchery 2000.



Based on Code Wire Tag carcass recoveries in the San Joaquin River basin the cut off length for 2 year old fish since 1997 has been 67cm (26.5 in) for males and 64cm (25 in) for females.

Appendix Table 4. Chinook salmon coded wire tag (CWT) recoveries, Merced River Hatchery (MRH), 2000.

CWT CODE	NUMBER RECOVERED	BROOD YEAR	HATCHERY OF ORIGIN	RELEASE SITE	RELEASE DATE
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06-01-11-05-02	53	97	MRFF	HATFIELD ST PARK MERCED R.	5-05-98
06-01-11-05-13	2	96	MRFF	HATCHERY OUTLET MERCED R.	4-20-97
06-01-11-05-15	2	96	MRFF	HATCHERY OUTLET MERCED R.	4-22-97
06-01-11-06-01	4	96	MRFF	HATCHERY OUTLET MERCED R.	4-22-97
06-01-11-06-03	1	96	MRFF	HATFIELD ST PARK MERCED R.	4-22-97
06-01-11-07-02	1	96	MRFF	HATFIELD ST PARK MERCED R.	5-14-97
06-01-11-07-03	2	97	MRFF	LA GRANGE TUOLUMNE R.	4-15-98
06-01-11-07-04	1	97	MRFF	LA GRANGE TUOLUMNE R.	4-15-98
06-01-11-07-05	1	97	MRFF	LA GRANGE TUOLUMNE R.	4-15-98
06-01-11-07-06	1	97	MRFF	LA GRANGE TUOLUMNE R.	4-15-98
06-01-11-07-07	1	97	MRFF	OLD FISHERMAN CLUB SAN JOAQUIN R.	4-16-98
06-01-11-07-08	4	97	MRFF	OLD FISHERMAN CLUB SAN JOAQUIN R.	4-17-98
06-01-11-07-09	38	97	MRFF	HATCHERY OUTLET MERCED R.	5-03-98
06-01-11-07-10	31	97	MRFF	HATCHERY OUTLET MERCED R.	5-03-98
06-01-11-07-11	35	97	MRFF	HATCHERY OUTLET MERCED R.	5-03-98
06-01-11-07-12	29	97	MRFF	HATCHERY OUTLET MERCED R.	5-03-98
06-01-11-07-13	22	97	MRFF	HATFIELD ST PARK MERCED R.	5-05-98
06-01-11-07-14	1	98	MRFF	HATCHERY OUTLET MERCED R.	5-05-99
06-01-11-08-02	1	98	MRFF	HATCHERY OUTLET MERCED R.	5-05-99
06-01-11-08-03	1	98	MRFF	HATCHERY OUTLET MERCED R.	5-05-99
06-01-11-08-06	6	97	MRFF	DOS REIS PARK SAN JOAQUIN R.	4-17-98

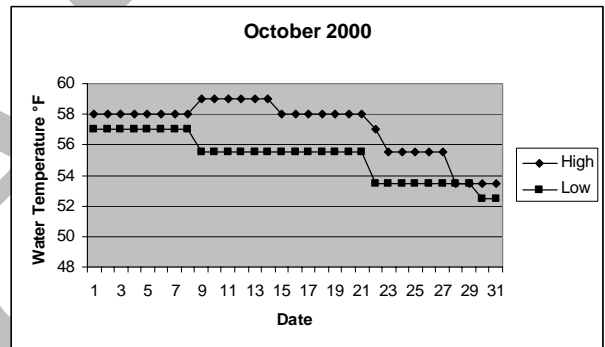
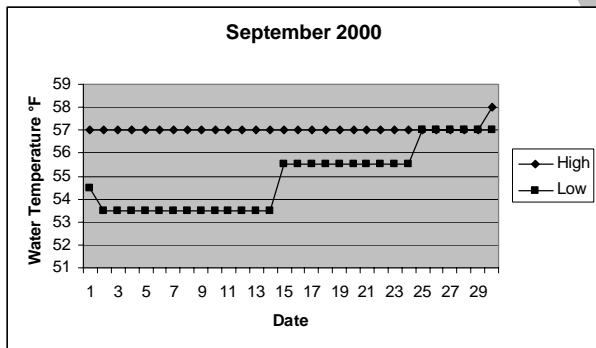
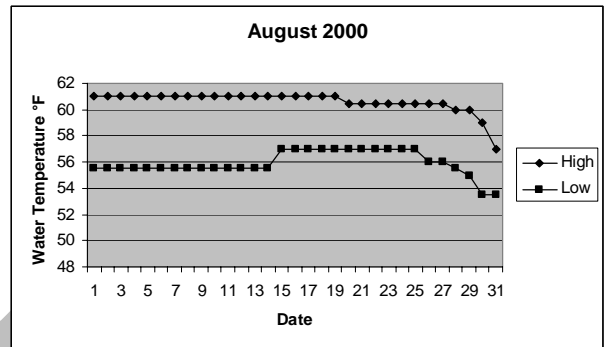
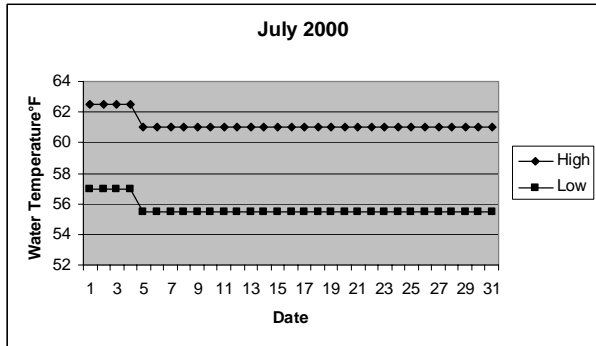
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06-01-11-08-10	3	97	MRFF	MOSSDALE SAN JOAQUIN R.	4-16-98
06-01-11-08-11	4	97	MRFF	MOSSDALE SAN JOAQUIN R.	4-16-98
06-01-11-08-12	7	97	MRFF	JERSEY POINT SAN JOAQUIN R.	4-20-98
06-01-11-08-13	4	97	MRFF	JERSEY POINT SAN JOAQUIN R.	4-20-98
06-01-11-08-15	6	98	MRFF	JERSEY POINT SAN JOAQUIN R.	4-21-99
05-23-08	1	98	COLEMAN NFH	GEORGINANA SLOUGH SAN JOAQUIN R.	1-12-98
05-23-22	1	98	COLEMAN NFH	PORT CHICAGO SAN JOAQUIN R.	12-22- 98
05-52-07	1	99	COLEMAN NFH	COLEMAN NFH BATTLE CR/SAC R.	1-04-00
06-02-35	1	97	MOKELUMNE	JERSEY POINT SAN JOAQUIN R.	4-28-98
06-02-39	1	97	MOKELUMNE	NEW HOPE LANDING SAN JOAQUIN R.	1998
06-02-40	2	97	MOKELUMNE	CARQUINEZ STRAITS SAN JOAQUIN R.	6-12-98
06-02-41	4	97	MOKELUMNE	CARQUINEZ STRAITS SAN JOAQUIN R.	6-12-98
06-02-44	1	99	MOKELUMNE	WOOD BRIDGE XXXXXX R.	2000
06-02-47	3	98	MOKELUMNE	SHERMAN ISLAND SAN JOAQUIN R.	1999
06-02-48	3	98	MOKELUMNE	SHERMAN ISLAND SAN JOAQUIN R.	5-00-99
06-25-20	20	97	MRFF	HATCHERY OUTLET MERCED R.	4-12-98
06-25-21	10	97	MRFF	HATFIELD ST PARK MERCED R.	4-14-98
06-25-22	6	97	MRFF	HATFIELD ST PARK MERCED R.	4-14-98

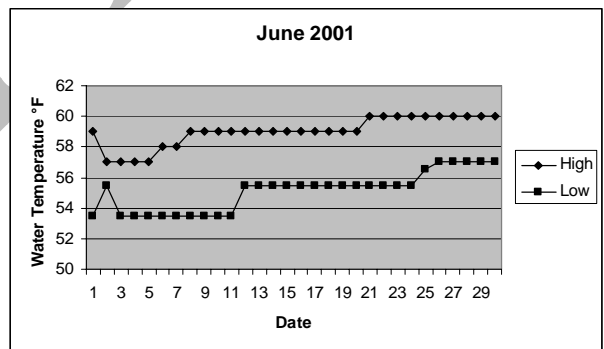
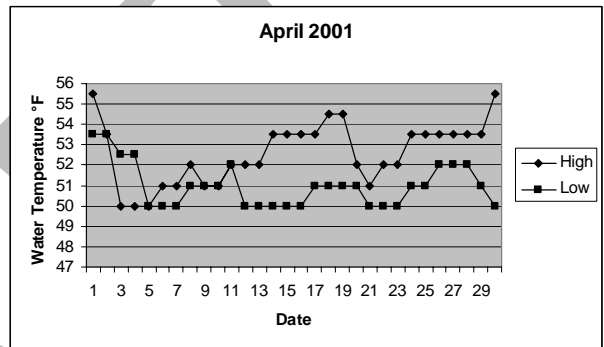
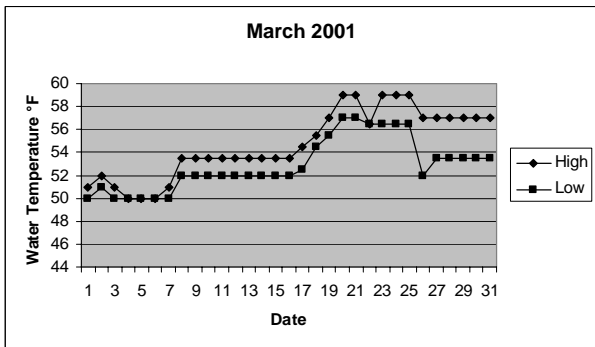
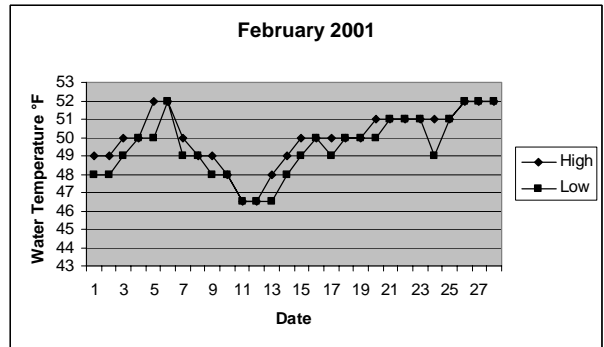
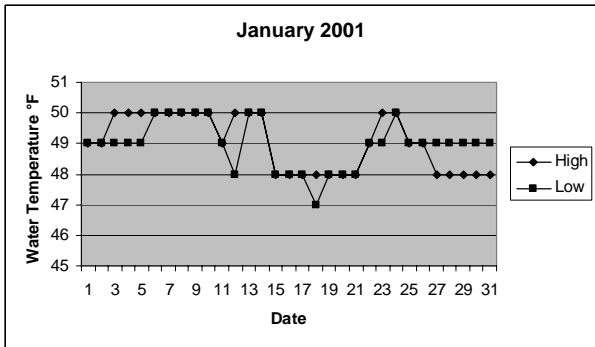
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06-25-45	2	96	MRFF	DOS REIS SAN JOAQUIN R.	4-29-97
06-25-47	1	96	MRFF	JERSEY POINT SAN JOAQUIN R.	5-02-97
06-25-49	2	96	MRFF	JERSEY POINT San Joaquin R.	5-12-97
06-25-50	1	96	MRFF	DOS REIS PARK SAN JOAQUIN R.	5-27-97
06-26-33	1	98	FEATHER R	WICKLAND NET PEN	6-07-99
06-26-42	3	98	MRFF	MOSSDALE SAN JOAQUIN R.	4-19-99
06-26-44	5	98	MRFF	MOSSDALE San Joaquin R.	4-19-99
06-26-45	5	98	MRFF	DOS REIS PARK San Joaquin R.	4-19-99
06-26-46	6	98	MRFF	DOS REIS PARK San Joaquin R.	4-19-99
06-26-47	5	98	MRFF	JERSEY POINT SAN JOAQUIN R.	4-21-99
06-29-39	1	98	NIMBUS	TIBURON NET PEN	8-28-99
06-45-23	9	97	MRFF	HATCHERY OUTLET MERCED R.	4-12-98
06-45-24	14	97	MRFF	HATCHERY OUTLET MERCED R.	4-12-98
06-45-28	13	98	MRFF	HATCHERY OUTLET MERCED R.	4-14-99
06-45-29	13	98	MRFF	HATCHERY OUTLET MERCED R.	4-14-99
06-45-30	12	98	MRFF	HATCHERY OUTLET MERCED R.	4-14-99
06-45-31	12	98	MRFF	HATFIELD ST PARK MERCED R.	4-16-99
06-45-32	13	98	MRFF	HATFIELD ST PARK MERCED R.	4-16-99
06-45-34	4	98	MRFF	HATFIELD ST PARK MERCED R.	5-07-99
06-45-35	5	98	MRFF	HATFIELD ST PARK MERCED R.	5-07-99
06-45-36	4	98	MRFF	HATFIELD ST PARK MERCED R.	5-07-99

06-45-38	1	98	MRFF	OAKDALE REC STANISLAUS R.	6-01-99
06-45-45	1	99	MRFF	HATFIELD ST PARK MERCED R.	4-14-00
06-46-04	4	98	MRFF	OLD FISHERMAN CLUB SAN JOAQUIN R.	4-18-99
06-46-05	4	98	MRFF	OLD FISHERMAN CLUB SAN JOAQUIN R.	4-19-99
06-45-06	4	98	MRFF	MOSSDALE SAN JOAQUIN R.	4-20-99
06-49-12	1	96	MOKELUMNE R.	JERSEY POINT SAN JOAQUIN R.	4-30-97
06-49-16	1	98	MOKELUMNE R.	NEW HOPE LANDING	1999
06-49-17	1	98	MOKELUMNE R.	NEW HOPE LANDING	1999
06-49-20	4	98	MOKELUMNE R.	SHERMAN ISLAND SAN JOAQUIN R.	5-00-99
06-49-22	1	98	MOKELUMNE R.	SHERMAN ISLAND San Joaquin R.	5-00-99
06-49-23	3	98	MOKELUMNE R.	SHERMAN ISLAND San Joaquin R.	5-21-99
NO TAGS FOUND	29				
TOTAL	520				

Appendix Figure 1. Daily water temperature for Merced River Hatchery from July 1, 2000 through June 30, 2001.

DAILY WATER TEMPERATURES BY MONTH





DRAFT

DATA

