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THE RESOURCE AGENCY  
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT  
MERCED RIVER HATCHERY  
2004-2005

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, 2004 through June 30, 2005. The hatchery was constructed to rehabilitate the fall run chinook salmon (*Oncorhynchus tshawytscha*) in the Merced River.

A total of 1,121,639 chinook salmon smolts (2004 brood year) were produced.

In the fall of 2004, 1,050 chinook salmon (606 males, 444 females) entered the hatchery. The 419 females artificially spawned produced 1,921,671 eggs in 12 spawnings.

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## 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 20, 2004. The first chinook salmon entered the trap on October 20, 2004. Trapping was terminated for the season on December 14, 2004. The combined production of chinook salmon for M.R.H. 2004-2005 is summarized in Table 1. Chinook salmon smolts planted from M.R.H in 2005, (Table 2). Smolts provided for net efficiency and vulnerability tests totaled 88,887 (Table 3). A total of 1,050 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, 2004-2005

SPECIES	NUMBER TRAPPED	NUMBER FEMALE SPAWNED	NUMBER EGGS INTO PRODUCTION	NUMBER FINGERLING PLANTED **	YEARLINGS PLANTED	POUNDS PLANTED **	ON HAND JUNE 30, 2002
CHINOOK 2004 BY							
MRFF	1,050	419	1,921,671	1,121,639	-00-	16,206	0
TOTAL	1,050	419	1,921.671	1,121,639	-00-	16,206	0

\*\* 88,887 BY 04, 1,028 pounds were used for net efficiency and vulnerability tests for the South Delta Study.

Table 2. 2004 BY Merced River strain chinook salmon smolts planted from Merced River Hatchery, 2005.

RELEASED DATE	CODED WIRE TAG CODE	NUMBER TAGGED	NUMBER UNTAGGED	SIZE NUMBER/LB	RELEASE SITE
04-17-05	06-46-76 06-46-77 06-46-78 06-46-79	93,121	0	69.3	HATCHERY OUTLET MERCED R.
04-18-05	05-51-36	53,410	0	76.3	OLD LA GRANGE BRIDGE TOULUMNE R.
04-18-05	05-51-36	25,444	0	76.3	OLD LA GRANGE BRIDGE TUOLUMNE R.
04-18-05	BISMARCK BROWN 06-46-76 06-46-77 06-46-78 06-46-79	10,048	0	69.3	HATCHERY OUTLET MERCED R.
04-19-05	06-46-80 06-46-81 06-46-82	57,040	0	71.3	HATFIELD ST. PARK MERCED R.

04-20-05	06-46-80 06-46-81 06-46-82	18,832	0	72.0	HATFIELD ST. PARK MERCED R.
04-20-05	05-11-69	25,412	0	73.6	OLD FISHERMAN CLUB SAN JOAQUIN R.
04-21-05	06-45-88	12	0	87.0	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-46-72 06-46-73 06-46-74 06-46-75	12	0	77.3	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-45-84 06-45-85 06-45-86 06-45-87	30	0	91.1	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-46-97	30	0	73.1	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-45-84 06-45-85 06-45-86 06-45-87	20	0	91.1	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-45-88	20	0	87.0	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-45-91	20	0	77.3	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-46-72 06-46-73 06-46-74 06-46-75	50	0	77.3	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-47-00	20	0	80.8	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-25-05	06-46-99	20	0	76.3	CAL-NEV FISH HEALTH CENTER COLEMAN N HATCHERY
04-26-05	06-46-83 06-46-84 06-46-85 06-46-86	102,396	0	68.5	HATCHERY OUTLET MERCED R.

04-28-05	06-46-87 06-46-88 06-46-89	60,300	0	67.0	HATFIELD ST PARK MERCED R.
04-29-05	06-46-87 06-46-88 06-46-89	16,878	0	67.0	HATFIELD ST PARK MERCED R.
05-02-05	06-46-72 06-46-73 06-46-74 06-46-75	101,317	0	65.3	DURHAM FERRY SAN JOAQUIN R.
05-03-05	06-45-91	25,172	0	62.5	DOS REIS SAN JOAQUIN R.
05-03-05	06-46-97	25,412	0	61.5	DOS REIS SAN JOAQUIN R.
05-03-05	06-46-98	26,307	0	63.3	DOS REIS SAN JOAQUIN R.
05-03-05	06-45-88	25,536	0	64.1	JERSEY POINT SAN JOAQUIN R.
05-08-05	06-46-92 06-46-93 06-46-94	76,888	0	87.3	HATCHERY OUTLET MERCED R.
05-09-05	06-45-84 06-45-85 06-45-86 06-45-87	101,478	0	61.0	DURHAM FERRY SAN JOAQUIN R.
05-10-05	06-45-90	25,742	0	63.5	DOS REIS SAN JOAQUIN R.
05-10-05	06-45-89	25,314	0	61.5	DOS REIS SAN JOAQUIN R.
05-10-05	06-46-99	25,674	0	60.5	DOS REIS SAN JOAQUIN R.
05-11-05	06-46-90 06-46-91	29,000	0	72.5	HATFIELD ST PARK MERCED R.
05-12-05	06-46-90 06-46-91	22,047	0	72.5	HATFIELD ST PARK MERCED R.
05-13-05	06-47-00	25,283	0	61.0	JERSEY POINT SAN JOAQUIN R.
05-20-05			7,565	89.0	HATCHERY OUTLET MERCED R.
06-02-05			983	39.6	HATCHERY OUTLET MERCED R.
TOTAL		1,024,176	8,548		

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 2005.

Merced River Salmon Habitat Enhancement Project Smolt Survival Studies.

RELEASE DATE	PANJET MARK	NUMBER RELEASED	SIZE NUMBER/LB	RELEASE LOCATION
MERCED RIVER HATCHERY				
04-05-05	BISMARK BROWN	10,600	106.0	HATCHERY OUTLET
04-18-05	BISMARK BROWN 06-46-76 06-46-77 06-46-78 06-46 79	*10,048	69.3	HATCHERY OUTLET
05-10-05	BISMARK BROWN	11,000	110.0	HATCHERY OUTLET
TOTAL		31,648		
ROBINSON RANCH				
04-07-05	BLUE LOWER CAUDAL	3,016	106.3	ROBINSON RANCH
04-19-05	BLUE UPPER CAUDAL	3,000	110.0	ROBINSON RANCH
05-04-05	BLUE DORSAL	3,000	36.3	ROBINSON RANCH
05-10-05	BLUE ANAL	3,000	68.3	ROBINSON RANCH
TOTAL		12,016		

HENDERSON PARK				
04-06-05	ORANGE UPPER CAUDAL	5,000	106.0	HENDERSON PARK
04-19-05	ORANGE LOWER CAUDAL	5,000	106.0	HENDERSON PARK
05-03-05	ORANGE DORSAL	5,019	68.3	HENDERSON PARK
05-11-05	ORANGE ANAL	5,000	68.3	HENDERSON PARK
TOTAL		20,019		
GALLO RANCH DFG				
04-07-05	GREEN UPPER CAUDAL	2,044	106.0	GALLO RANCH
04-19-05	GREEN LOWER CAUDAL	2,000	106.0	GALLO RANCH
05-04-05	GREEN DORSAL	2,000	68.3	GALLO RANCH
05-11-05	GREEN ANAL	2,000	68.3	GALLO RANCH
TOTAL		8,185		
MID-NATURAL RESOURCE SCIENCE GALLO RANCH				
05-23-05	WHITE UPPER CAUDAL	97	68.3	GALLO RANCH
05-27-05	PURPLE UPPER CAUDAL	500	46.5	GALLO RANCH
05-27-05	PURPLE LOWER CAUDAL	500	46.5	GALLO RANCH



06-02-05	PURPLE DORSAL	503	39.6	GALLO RANCH
06-02-05	PURPLE ANAL	500	39.6	GALLO RANCH
TOTAL		2,100		
GRAND TOTAL		73,827		

DFG STUDY Tuolumne River Rotary Screw Trap vulnerability tests

NO STUDIES WERE CONDUCTED THIS YEAR

Stanislaus River Rotary Screw Trap vulnerability tests

NO STUDIES WERE CONDUCTED THIS YEAR

San Joaquin River

MOSSDALE Kodiak Trawl vulnerability test

RELEASE DATE	CWT/PANJET MARK	NUMBER RELEASE	SIZE NUMBER/LB	RELEASE LOCATION
04-09-04	PURPLE UPPER CAUDAL	2,010	80.8	MOSSDALE
04-16-04	PURPLE LOWER CAUDAL	5,016	79.6	MOSSDALE

04-21-04	PURPLE DORSAL	2,007	64.3	MOSSDALE
04-29-04	PURPLE ANAL	5,009	64.2	MOSSDALE
05-07-04	PURPLE UPPER CAUDAL	2,039	56.0	MOSSDALE
05-13-04	PURPLE LOWER CAUDAL	5,008	67.2	MOSSDALE
05-20-04	PURPLE DORSAL	2,029	59.3	MOSSDALE
05-28-04	PURPLE ANAL	2,000	59.2	MOSSDALE
TOTAL		28,118		

#### HATCHERY OPERATION

Brood Year 2004 fish, Lots 1 through 5, were reared on a diet of Bio Diet starter and grower. A total of 10,020 lbs of food produced 10,605 lbs of fish, yielding a conversion rate of 1.06.

Brood Year 2004 fish, Lots 6 through 12, were reared on a diet of EWOS starter and grower. A total of 3,524 lbs of food produced 6,185 lbs of fish, yielding a conversion rate .06 .

The facility had 1,550 visitors in fiscal year 2004-2005.

Approximately 3,192 eyed MRH chinook salmon eggs were supplied to 69 teachers, representing 50 different elementary and high schools that participated in the 2005 "Salmonids-In-The-Classroom" program for the San Joaquin River Basin area. Approximately 16,507 chinook salmon green eggs were supplied to Kevin Williamson PhD, UC Davis Genomic Variation Lab, for further sex-reversal genetic studies. Approximately 12,011 green eggs were supplied to Carl Mesick, Carl Mesick Consultants, for spawning gravel survival studies on the Stanislaus River.

## CHINOOK SALMON MAINTENANCE PROGRAM

### History of the 2004 Run

The first chinook salmon entered the MRH trap on October 20, 2004. Of the 1,050 salmon trapped, 187 were adult males, 269 adult females and 594 Grilse (419 males and 175 females). A total of 1,921,671 eggs were taken from 419 females (165 were grilse females) during 12 spawnings, for an average fecundity of 4,586 eggs. The average fertility of eggs was 78.0 percent. Spawning was terminated December 14, 2004. 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 2001 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 not addressed this year. Biological data collection: CWT heads, scales, otoliths, length frequency, ovarian fluids and DNA samples. Approximately 16,507 eggs and an appropriate quantity of milt was collected from selected spawning days by Dr. Kevin Williamson PhD, UC Davis, Genomic Variation Laboratory, Davis, California. These samples were used for the Sex-reversal of male chinook salmon in the Central Valley study. Approximately 12,178 green eggs were supplied to Mr. Carl Mesick, consultant, for gravel

### -Disease-

Enteric redmouth, *Yersinia ruckeri*, was not diagnosed in 2005. All fish were immersed vaccinated with Ermogen (Enteric Redmouth/Yersiniosis), Bacterins, Aqua Health USA, Buhl, Idaho, as a preventive treatment. A fish health assessment by personnel from Ca-NV Fish Health Center, Coleman Fish Hatchery, was performed on the BY04 VAMP pre release fish groups. *Tetracapsula bryosalmonae* (the cause of Proliferative Kidney Disease) was clinically identified as a very minor infection in VAMP pre released groups therefore in our production fish also. No bacterial or viral pathogens were detected during production period. "Fish Health Assessment of VAMP Release Groups - 2005", CA-NV Fish Health Center, 24411 Coleman Fish Hatchery Rd, Anderson, California 96007.

Appendix Table 1. Weekly adult chinook salmon trapping data for Merced River Hatchery 2004-2005

Week of	Adults	Grilse	Total
OCT 20-04	1	1	2
OCT 24-04	57	51	108
OCT 31-04	78	112	190
Nov 07-04	159	233	392
Nov 14-04	82	117	199
NOV 21-04	51	52	103
NOV 28-04	20	18	38
DEC 05-04	5	8	13
DEC 12-04	3	2	5
DEC 14-04		TRAP CLOSED	
<b>TOTAL</b>	<b>456</b>	<b>594</b>	<b>1,050</b>

Appendix Table 2. Summary of chinook salmon run to Merced River Hatchery.  
<sup>1/</sup> <sup>2/</sup>

FISCAL YEAR	MALES	FEMALES	GRILSE <sup>2/</sup>	TOTAL
1970-71	59	40	<sup>1/</sup>	99
1971-72	54	94	<sup>1/</sup>	148
1972-73	14	51	<sup>1/</sup>	65
1973-74	13	150	<sup>1/</sup>	163

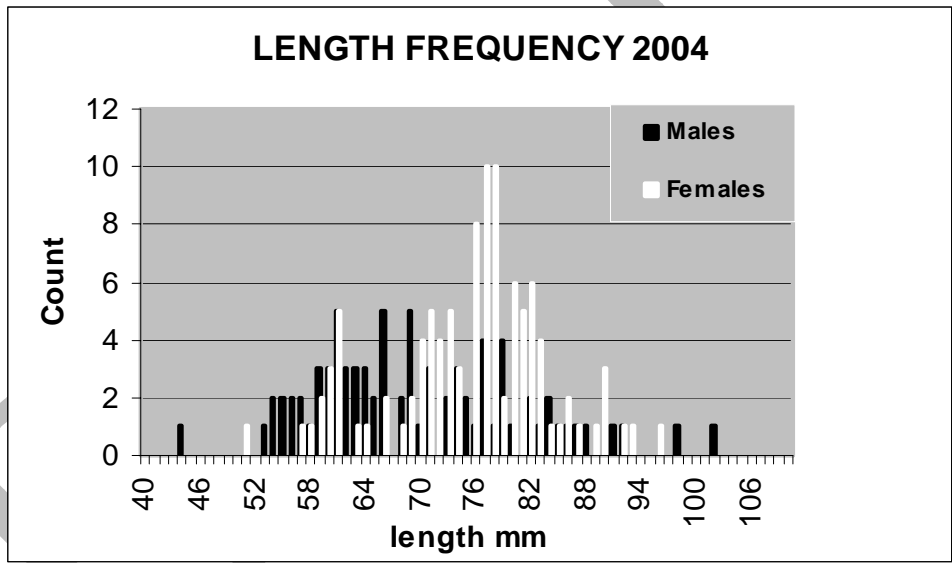
1974-75	24	400	<sup>1</sup> /	424
1975-76	99	300	<sup>1</sup> /	399
1976-77	86	260	<sup>1</sup> /	346
1977-78	44	200	<sup>1</sup> /	244
1978-79	14	45	<sup>1</sup> /	61
1979-80	143	86	120	349
1980-81	43	106	8	157
1981-82	326	278	319	923
1982-83	90	67	32	189
1983-84	30	178	1587	1795
1984-85	713	858	167	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
2001-02	473	657	533	1,663
2002-03	598	652	588	1,838
2003-04	169	223	157	549
2004-05	187	269	594	1,050

<sup>1</sup>/. 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.

<sup>2/</sup>. 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 2004.



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), 2004.

CWT CODE	NUMBER RECOVERED	BROOD YEAR	HATCHERY OF ORIGIN	RELEASE SITE	RELEASE DATE
06-02-82	1	02	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-03
06-02-83	1	02	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-03
06-27-42	3	02	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-03
06-27-44	15	02	MRFF	JERSEY POINT SAN JOAQUIN R.	4-03
06-27-49	1	02	MRFF	MOSSDALE SAN JOAQUIN R.	4-03
06-27-51	13	02	MRFF	JERSEY POINT SAN JOAQUIN R.	4-03
06-27-77	2	02	MRFF	HATCHERY OUTLET MERCED R.	5-03
06-27-78	1	02	MRFF	HATCHERY OUTLET MERCED R.	5-03
06-44-04	1	99	MRFF	JERSEY POINT SAN JOAQUIN R.	4-00
06-44-17	1	00	MRFF	HATCHERY OUTLET MERCED R.	4-01
06-44-19	1	00	MRFF	HATFIELD ST PARK MERCED R.	4-01
06-44-21	1	00	MRFF	HATFIELD ST PARK MERCED R.	4-01
06-44-26	1	00	MRFF	HATFIELD ST PARK MERCED R.	4-01
06-44-28	1	00	MRFF	HATFIELD ST PARK MERCED R.	5-01
06-44-30	1	00	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-01
06-44-34	2	00	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-01
06-44-35	1	00	MRFF	JERSEY POINT SAN JOAQUIN R.	5-01
06-44-36	1	00	MRFF	DURHAM FERRY SAN JOAQUIN R.	5-01

06-44-42	1	00	MRFF	JERSEY POINT SAN JOAQUIN R.	5-01
06-44-43	1	00	MRFF	OLD FISHERMAN CLUB SAN JOAQUIN R.	4-01
06-44-50	1	02	MRFF	HATCHERY OUTLET MERCED R.	5-03
06-44-51	1	01	MRFF	HATFIELD ST PARK MERCED R.	4-02
06-44-57	2	01	MRFF	MOSSDALE SAN JOAQUIN R.	4-02
06-44-58	3	01	MRFF	MOSSDALE SAN JOAQUIN R.	4-02
06-44-60	4	01	MRFF	JERSEY POINT SAN JOAQUIN R.	4-02
06-44-71	1	01	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-02
06-44-72	3	01	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-02
06-44-73	2	01	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-02
06-44-74	2	01	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-02
06-44-76	1	01	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-02
06-44-77	2	01	MRFF	DURHAM FERRY SAN JOAQUIN R.	4-02
06-44-78	1	01	MRFF	MOSSDALE SAN JOAQUIN R.	4-02
06-44-80	12	01	MRFF	JERSEY POINT SAN JOAQUIN R.	4-02
06-44-81	6	01	MRFF	JERSEY POINT SAN JOAQUIN R.	4-02
06-44-86	1	01	MRFF	HATFIELD ST PARK MERCED R.	4-02
06-44-90	1	02	MRFF	HATCHERY OUTLET MERCED R.	4-03
06-44-91	1	02	MRFF	HATCHERY OUTLET MERCED R.	4-03
06-44-93	1	02	MRFF	HATFIELD ST PARK MERCED R.	4-03
06-44-94	1	02	MRFF	HATFIELD ST PARK MERCED R.	4-03



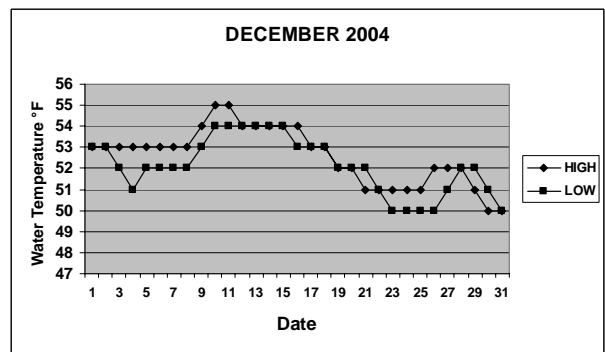
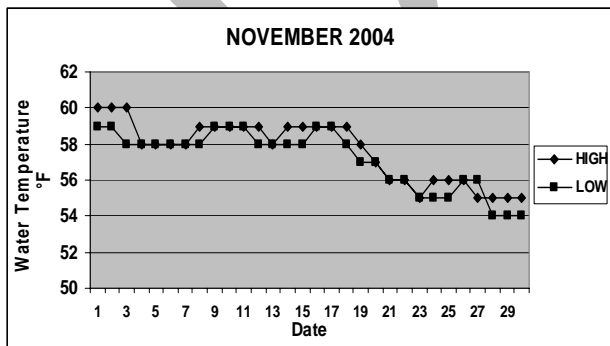
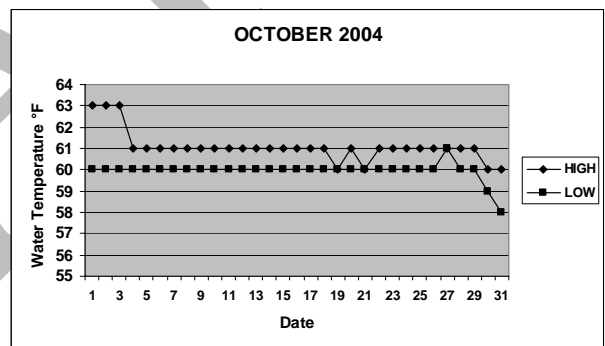
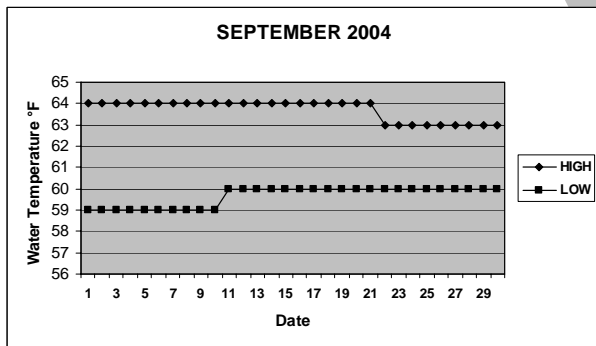
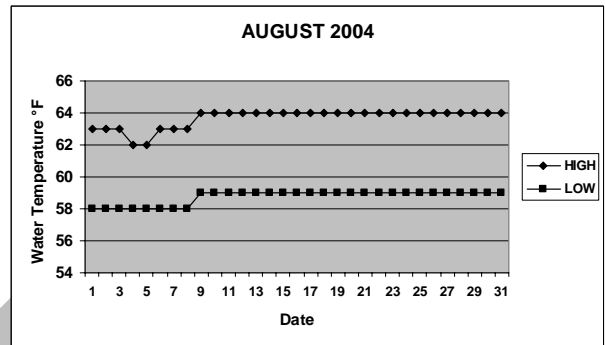
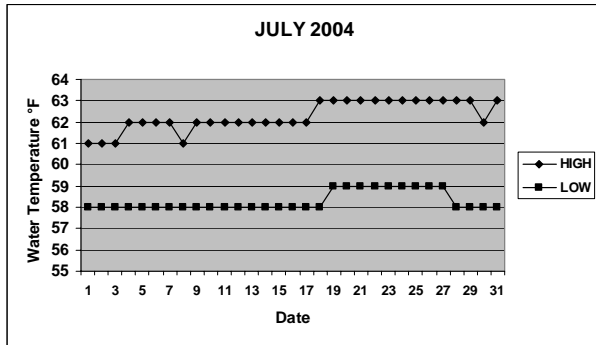
06-45-41	1	99	MRFF	HATCHERY OUTLET MERCED R.	4-00
06-45-47	2	02	MRFF	HATFIELD ST PARK MERCED R.	5-03
06-45-59	1	01	MRFF	OLD FISHERMAN CLUB SAN JOAQUIN R.	4-02
06-45-64	2	02	MRFF	HATFIELD ST PARK MERCED R.	4-03
06-45-66	2	02	MRFF	HATFIELD ST PARK MERCED R.	4-03
06-45-72	6	02	MRFF	HATFIELD ST PARK MERCED R.	4-03
05-16-99	1	03	COLEMAN	COLEMAN HATCHERY BATTLE CR.	2003
06-02-79	2	01	MOKE	STATEN ISLAND SAN JOAQUIN R.	2002
06-20-90	2	01	FEATHER	WICKLAND OIL NET PENS SAN JOAQUIN R.	2002
06-20-91	1	01	FEATHER	WICKLAND OIL NET PENS SAN JOAQUIN R.	2002
06-26-66	1	01	NIMBUS	WICKLAND OIL NET PENS SAN JOAQUIN R.	2002
06-27-22	3	01	MOKE	JERSEY POINT SAN JOAQUIN R.	2002
06-27-23	3	01	MOKE	JERSEY POINT SAN JOAQUIN R.	2002
06-27-37	2	01	FEATHER	WICKLAND OIL NET PENS SAN JOAQUIN R.	2002
06-27-73	1	01	FEATHER	CROCKETT	2002
06-44-53	6	01	MOKE	JERSEY POINT SAN JOAQUIN R.	2002
06-49-27	2	01	MOKE	STATEN ISLAND SAN JOAQUIN R.	2002
06-49-28	7	01	MOKE	SHERMAN ISLAND SAN JOAQUIN R.	2002
06-49-29	1	01	MOKE	SHERMAN ISLAND SAN JOAQUIN R.	2002
06-49-30	12	01	MOKE	SHERMAN ISLAND SAN JOAQUIN R.	2002

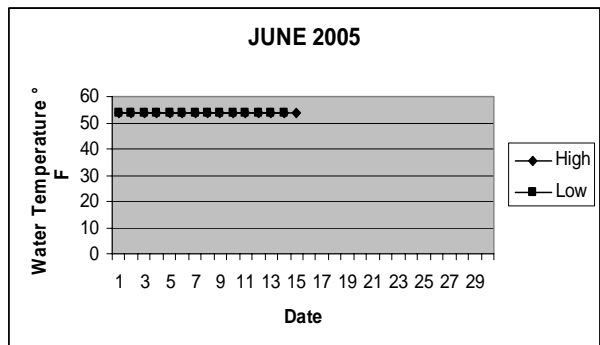
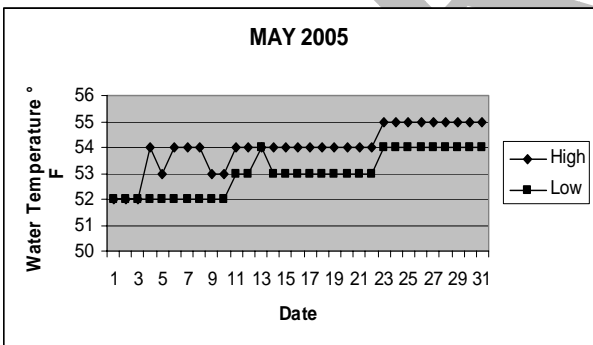
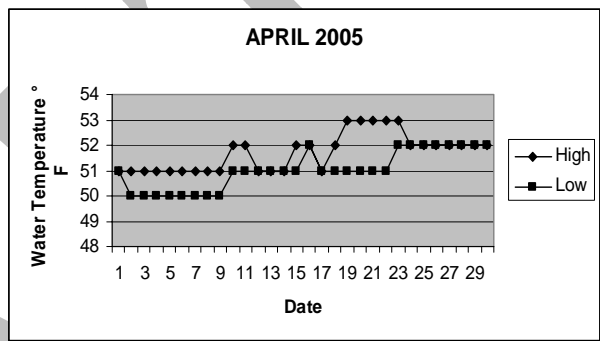
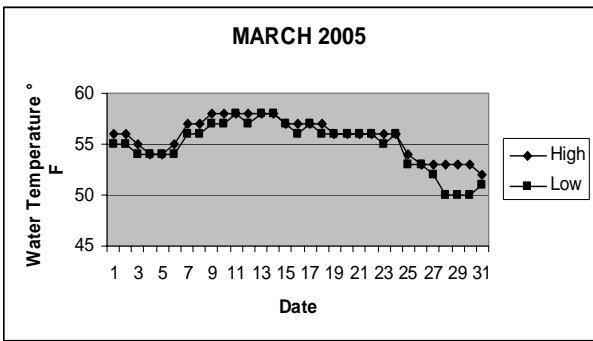
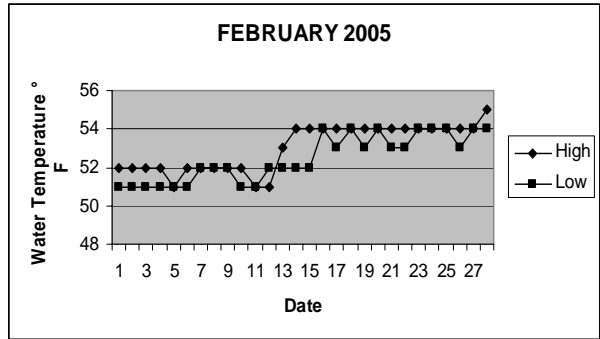
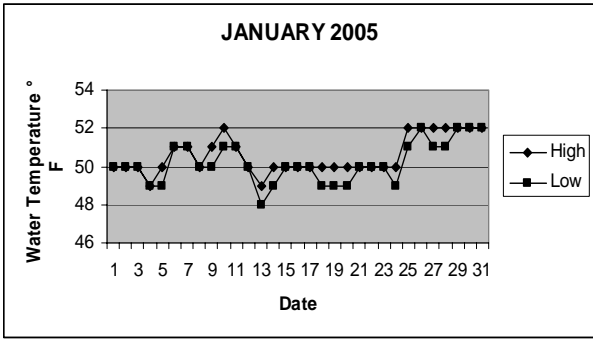
06-49-31	4	01	MOKE	SHERMAN ISLAND SAN JOAQUIN R.	2002
06-54-56	1	00	NIMBUS	WICKLAND OIL NET PENS SAN JOAQUIN R.	2001
06-54-58	2	00	NIMBUS	WICKLAND OIL NET PENS SAN JOAQUIN R.	2001
06-58-63	6	01	MOKE	JERSEY POINT SAN JOAQUIN R.	2002
NO TAGS FOUND	17				
<b>TOTAL</b>	<b>184</b>				

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Appendix Figure 1. Daily water temperature for Merced River Hatchery from July 1, 2004 through June 30, 2005.

**DAILY WATER TEMPERATURES BY MONTH**





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# DATA

