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DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
WARM SPRINGS SALMON AND STEELHEAD HATCHERY, 1991-92

by

Wilber F. Cartwright
Region 3, Inland Fisheries

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Administrative Report No. 94-5

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ABSTRACT

This report describes the operation of Warm Springs Salmon and Steelhead Hatchery from July 1, 1991 through June 30, 1992. Tables and Appendices present daily records of water temperatures, daily numbers of salmon and steelhead entering the Hatchery, and total number of salmonids reared and released.

One hundred and twenty-five chinook salmon, Oncorhynchus tshawytscha, 162 coho salmon, O. kisutch, and 1,591 steelhead trout, O. mykiss, were trapped at the Hatchery this season. There were 113,525 advanced fingerling chinook salmon, 142,575 yearling coho salmon and 1,146,663 fingerling, 60,750 advanced fingerling and 363,306 yearling steelhead trout planted and transferred.

^{1/} Inland Fisheries Administrative Report No. 94-5.
Submitted July 1993. Edited by K. A. Hashagen, California
Department of Fish and Game, 1416 Ninth Street,
Sacramento, CA 95814.

INTRODUCTION

This is the 12th annual report describing the operation of Warm Springs Salmon and Steelhead Hatchery. Copies of previous annual reports are available upon request from the Inland Fisheries Division, Rancho Cordova.

Warm Springs Hatchery is located on Dry Creek, 14 miles upstream from its confluence with the Russian River, 2 miles south of Healdsburg, Sonoma County. The Hatchery was constructed by the Department of the Army, Corps of Engineers, to compensate for spawning and nursery areas blocked by the Warm Springs Dam - Lake Sonoma Project. The Department of Fish and Game, under agreement with the Department of the Army, operates the fish hatchery and related facilities.

This report summarizes the number of fish trapped and spawned, production of eggs and fish, and water temperatures from July 1, 1991 through June 30, 1992.

PRODUCTION SUMMARY

The ladder was opened October 15, 1991. The flows in Dry Creek were maintained between 80 to 100 cfs through most of the year, except for May when flows were 25 to 35 cfs, due to construction of an emergency water supply pipe for the Hatchery. One hundred twenty-five chinook, and 162 coho salmon, and 1,591 steelhead were trapped; 505,881 yearlings and 1,320,938 fingerlings were planted during the 1991-92 season (Table 1 and Appendix Table 1).

All fish were started on Bio-Diet and then fed Oregon Moist Pellets. Steelhead were converted to dry diet at 50 per lb. A total of 106,483 lb of fish was produced using 157,628 lb of feed, giving a conversion rate (pounds of feed to produce 1 lb of fish) of 1.48.

TABLE 1. Warm Springs Hatchery Production Summary

Species	Adults trapped	Females spawned	Dry Creek eggs taken	Other eggs rec'd	Eggs shipped	Fingerlings transferred and planted	Yearlings transferred and planted	Total pounds released
Chinook salmon								
1990 BY								
1991 BY	123	36	155,600			113,525		2,575
Coho salmon								
1990 BY							142,575	16,800
1991 BY	73	14	28,000	89,760				
Steelhead								
1991 BY						60,750	363,306	92,550
1992 BY	1,584	342	1,710,000			1,146,663		689
Totals	1,780	392	1,893,600	89,760	0	1,320,938	505,881	112,614

WATER QUALITY

This is the 7th season of propagation and rearing since Lake Sonoma has filled. The turbidity of the incoming water was consistently between 1.1 to 3.5 nephelometric turbidity units (NTU) most of the year. The only major variations occurred during December when they were 150 NTUs. The lowest turbidity recorded was 0.9 NTUs, taken in August.

DISEASE

There were no major disease problems at the Hatchery. Formaldehyde treatments controlled fungal growth (Saprolegnia parasitica) on the eggs during incubation. Minor outbreaks of Columnaris were controlled by administering Terramycin feed and Hyamine flushes. Minor outbreaks of BKD were controlled by administering Terramycin feed.

CHINOOK SALMON PROGRAM
History of the 1991-92 Season

There were 125 chinook salmon trapped at the Hatchery this season: 77 adult male, 46 adult female, and 2 grilse. The 36 females spawned produced 155,600 eggs, for an average of 4,322 eggs per female. These eggs produced 113,525 fish, which were released in Dry Creek.

TABLE 2. Chinook Salmon Plants, 1991-92

Date	Strain	Release site	Average size/lb	Number
04-23-92	Dry Creek	Dry Creek	45	63,000
04-23-92	Dry Creek	Dry Creek	43	50,525
Total				113,525

COHO SALMON PROGRAM
History of the 1991-92 Season

There were 162 coho salmon trapped at the Hatchery this season: 53 male, 20 female, and 89 grilse. The 14 females spawned produced 28,000 eggs, for an average of 2,000 eggs per female. These eggs produced approximately 26,035 fingerlings that are being retained for release as yearlings during the 1992-93 production year.

A total of 89,760 eggs was received from Noyo River. These eggs produced approximately 74,439 fingerlings that are also being retained for release as yearlings during the 1992-93 production year.

A total of 142,575 yearlings was planted from the Hatchery.

TABLE 3. Coho Salmon Plants, 1991-92

Date	Strain	Release site	Average size/lb	Number
12-10-91	Dry Creek	Dry Creek	3.0	2,775
12-10-91	Dry Creek	Dry Creek	3.0	2,400
01-02-92	Dry Creek	Dry Creek	10.0	41,250
01-03-92	Dry Creek	Dry Creek	9.9	44,550
02-28-92	Dry Creek	Dry Creek	8.0	44,800
02-29-92	Dry Creek	Dry Creek	8.0	6,800
Total				142,575

STEELHEAD TROUT PROGRAM
History of the 1991-92 Season

The first adult steelhead entered the trap on December 29, 1991, and the last on April 28, 1992. A total of 1,591 fish was trapped: 750 male, 834 female, and 7 half-pounders. The 342 females spawned produced 1,710,000 eggs, at an average of 5,000 eggs per female. Surplus adult fish were planted in the Russian River and some of its tributaries by the Mendocino County Fish and Game Commission, Cloverdale Casters, and the Hatchery staff (Table 7).

Extra eggs were taken this year to raise for the imprint ponds at Coyote Valley Fish Facility. Eggs were taken representing the entire spawning period.

TABLE 4. Fingerling Steelhead Trout Plants and Transfers, 1991-92

Date	Strain	Release site	Average size/lb	Number
03-26-92	Dry Creek	Dry Creek	2,000	62,070
04-03-92	Dry Creek	Dry Creek	2,000	80,650
04-06-92	Dry Creek	Dry Creek	2,000	115,540
04-13-92	Dry Creek	Dry Creek	2,000	155,580
04-15-92	Dry Creek	Dry Creek	2,000	282,640
04-17-92	Dry Creek	Dry Creek	2,000	21,400
04-24-92	Dry Creek	Dry Creek	2,000	19,838
04-29-92	Dry Creek	Dry Creek	2,000	18,000
04-30-92	Dry Creek	Van Arsdale (Transfer)	750	24,750
05-04-92	Dry Creek	Dry Creek	2,000	15,315
05-12-92	Dry Creek	Dry Creek	2,000	45,400
05-12-92	Dry Creek	Dry Creek	628	46,158
05-14-92	Dry Creek	Dry Creek	2,000	35,265
05-19-92	Dry Creek	Dry Creek	627	29,187
05-22-92	Dry Creek	Dry Creek	2,000	75,296
05-29-92	Dry Creek	Dry Creek	2,000	54,000
06-05-92	Dry Creek	Dry Creek	2,000	56,774
06-29-92	Dry Creek	Dry Creek	510	8,800
Total				1,146,663

TABLE 5. Advanced Fingerling Steelhead Trout Plants, 1991-92

Date	Strain	Release site	Average size/lb	Number
09-30-91	Dry Creek	Russian River	27	18,900
09-30-91	Dry Creek	Russian River	27	20,250
10-01-91	Dry Creek	Russian River	27	21,600
Total				60,750

TABLE 6. Yearling Steelhead Trout Plants, 1991-92

Date	Strain	Release site	Average size/lb	Number
10-10-91	Dry Creek	Russian River	12.0	6,000
10-10-91	Dry Creek	Louisiana Pacific Ponds (Transfer)	12.0	12,000
01-31-92	Dry Creek	Dry Creek	3.8	30,305
02-24-92	Dry Creek	Silverado Fisheries Base (Transfer)	5.0	10,125
03-02-92	Dry Creek	Dry Creek	3.5	27,387
03-03-92	Dry Creek	Dry Creek	3.8	26,885
03-03-92	Dry Creek	Dry Creek	4.0	21,800
03-30-92	Dry Creek	Dry Creek	3.4	22,015
03-30-92	Dry Creek	Dry Creek	3.7	19,425
03-31-92	Dry Creek	Dry Creek	2.9	12,470
03-31-92	Dry Creek	Dry Creek	4.8	31,680
03-31-92	Dry Creek	Dry Creek	4.6	18,860
04-01-92	Dry Creek	Dry Creek	3.3	22,770
04-01-92	Dry Creek	Dry Creek	2.5	13,812
04-02-92	Dry Creek	Dry Creek	3.4	22,865
04-02-92	Dry Creek	Dry Creek	5.7	32,490
04-03-92	Dry Creek	Dry Creek	5.3	18,682
04-03-92	Dry Creek	Dry Creek	4.1	13,735
Total				363,306

TABLE 7. Adult Steelhead Trout Plants, 1991-92

Date	Strain	Release site	Average size/ea	Number Males	Females
02-25-92	Dry Creek	Big Sulphur Creek	8-10 lb	12	8
02-25-92	Dry Creek	Frazier Creek	8-10 lb	7	4
02-25-92	Dry Creek	Russian River	8-10 lb	23	24
02-26-92	Dry Creek	Big Sulphur Creek	8-10 lb	5	5
02-28-92	Dry Creek	Forsythe Creek	8-10 lb	6	4
02-28-92	Dry Creek	Big Sulphur Creek	8-10 lb	5	5
02-28-92	Dry Creek	Russian River	8-10 lb	26	25
02-29-92	Dry Creek	Parson's Creek	8-10 lb	5	5
02-29-92	Dry Creek	Big Sulphur Creek	8-10 lb	6	4
03-02-92	Dry Creek	Forsythe Creek	8-10 lb	6	4
03-02-92	Dry Creek	Russian River	8-10-lb	19	26
03-11-92	Dry Creek	Box Canyon, W. Fork Russian River	8-10 lb	6	8
03-11-92	Dry Creek	Jack Smith Creek	8-10 lb	6	6
03-11-92	Dry Creek	Gibson Creek	8-10 lb	9	7
03-12-92	Dry Creek	Pena Creek	8-10 lb	10	10
03-12-92	Dry Creek	Russian River	8-10 lb	29	22
03-12-92	Dry Creek	Russian River	8-10 lb	25	37
03-13-92	Dry Creek	W. Fork Russian River	8-10 lb	27	40
03-13-92	Dry Creek	Russian River	8-10 lb	23	44
03-19-92	Dry Creek	W. Fork Russian River	8-10 lb	10	8
03-19-92	Dry Creek	Russian River	8-10 lb	83	99
Total				348	395

PUBLIC RELATIONS

All visitors to the Hatchery must enter through the Visitor Center, where they are counted. During the 1991-92 season, 99,151 people visited the Hatchery (Table 8). This is a 22% increase over the previous report period.

TABLE 8. Warm Springs Hatchery Monthly Visitation Data, 1991-92

<u>Month</u>	<u>Number of Visitors</u>
July	13,229
August	11,562
September	8,367
October	4,529
November	5,440
December	3,742
January	5,241
February	2,553
March	10,443
April	11,051
May	14,301
June	8,693
<hr/> Total	<hr/> 99,151

PPENDIX TABLE 1. Weekly Adult Salmon and Steelhead Trapping Data for Warm Springs Salmon and Steelhead Hatchery, 1991-92

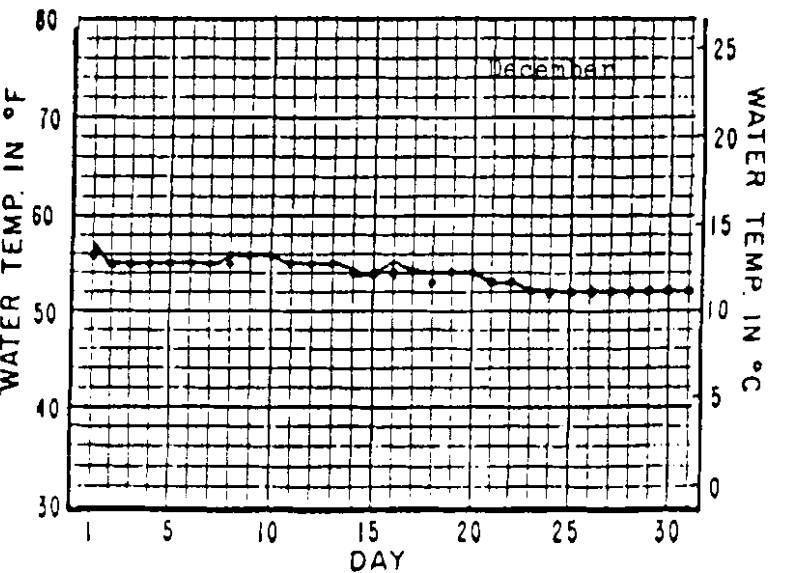
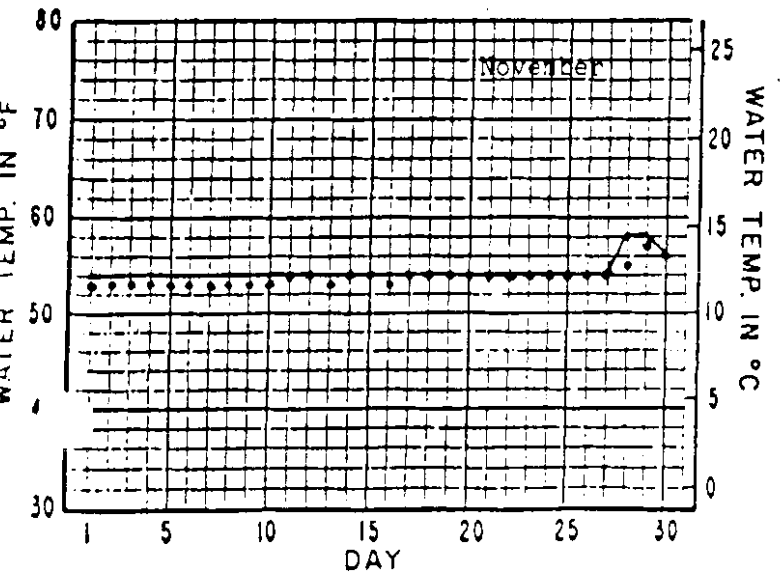
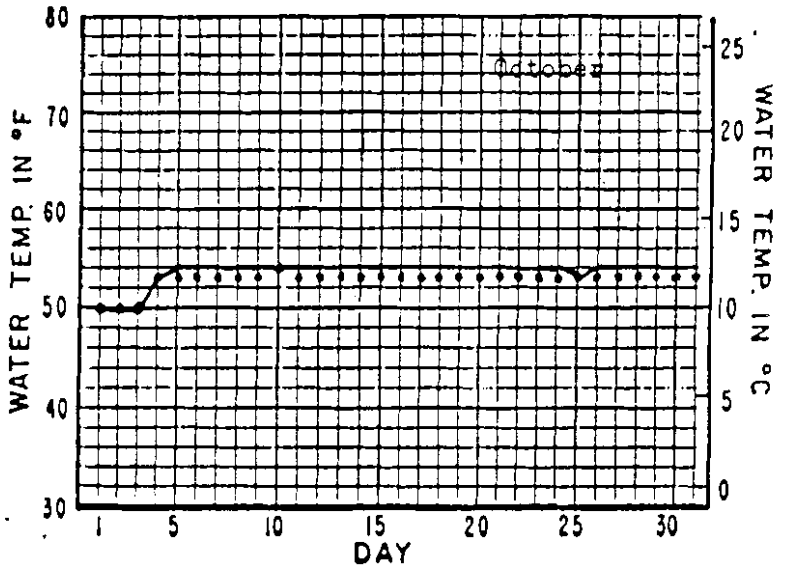
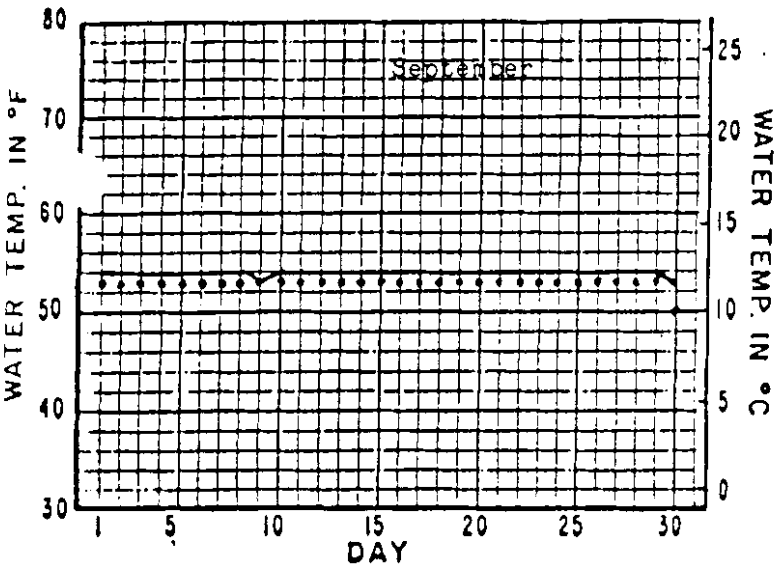
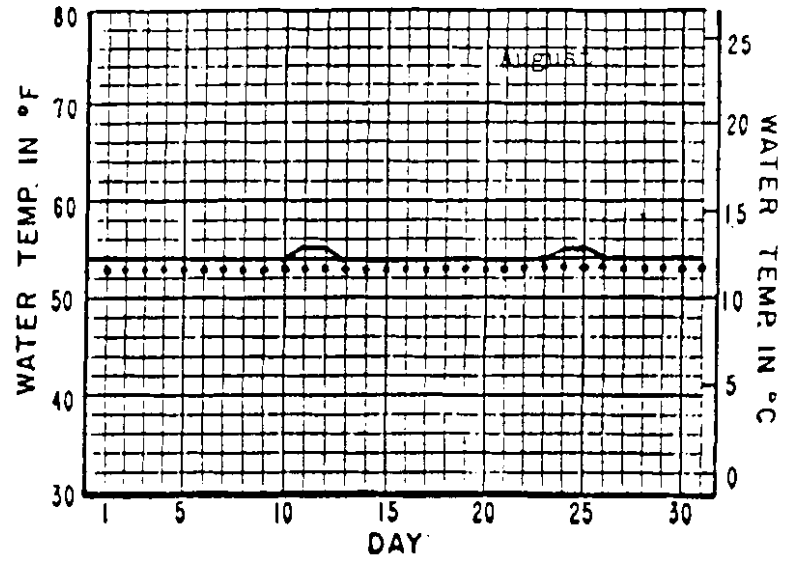
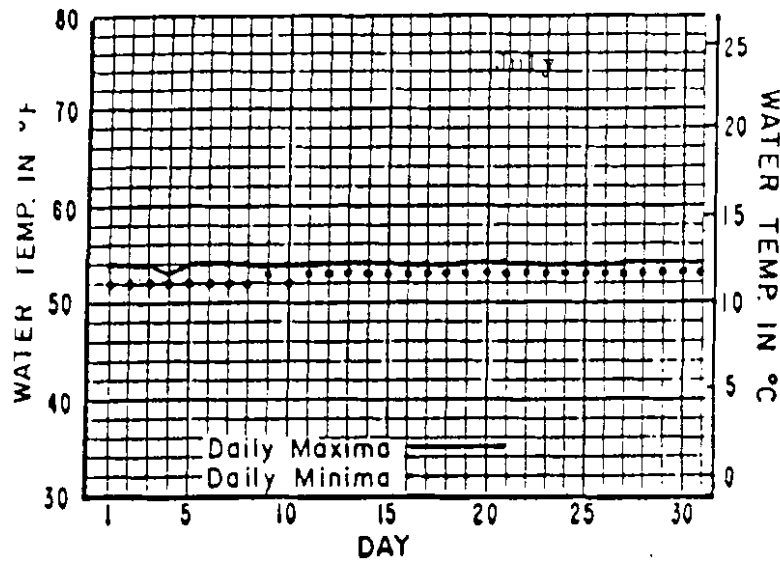
<u>Week</u>	<u>Chinook salmon</u>		<u>Coho salmon</u>		<u>Steelhead trout</u>	
	<u>Adults</u>	<u>Grilse</u>	<u>Adults</u>	<u>Grilse</u>	<u>Males</u>	<u>Females</u>
10/13/91 - 10/19/91	30	1				
10/20/91 - 10/26/91	44					
10/27/91 - 11/02/91	44					
11/03/91 - 11/09/91	3	1				
11/10/91 - 11/16/91	2					
11/17/91 - 11/23/91			1			
11/24/91 - 11/30/91				1		
12/01/91 - 12/07/91				7		
12/08/91 - 12/14/91			3	14		
12/15/91 - 12/21/91			11	7		
12/22/91 - 12/28/91			3	7		
12/29/91 - 01/04/91			48	48	5	4
01/05/92 - 01/11/92			1	3	4	9
01/12/92 - 01/18/92			4		7	9
01/19/92 - 01/25/92			1		11	12
01/26/92 - 02/01/92					29	33
02/02/92 - 02/08/92					38	36
02/09/92 - 02/15/92				1	153	152
02/16/92 - 02/22/92				1	66	70
02/23/92 - 02/29/92			1		52	89
03/01/92 - 03/07/92					88	109
03/08/92 - 03/14/92					67	116
03/15/92 - 03/21/92					96	113
03/22/92 - 03/28/92					36	35
03/29/92 - 04/04/92					56	26
04/05/92 - 04/11/92					17	14
04/12/92 - 04/18/92					18	7
04/19/92 - 04/25/92					5	
04/26/92 - 05/02/92					2	
Season Totals	123	2	73	89	750	834

APPENDIX TABLE 2. Summary of Fish Runs to Warm Springs Salmon and Steelhead Hatchery

<u>Year</u>	<u>Chinook salmon</u>			<u>Coho salmon</u>			<u>Steelhead trout</u>		
	<u>Males</u>	<u>Females</u>	<u>Grilse</u>	<u>Males</u>	<u>Females</u>	<u>Grilse</u>	<u>Males</u>	<u>Females</u>	<u>Half-pounders</u>
1980-81							148	185	
1981-82				2	2		124	235	
1982-83	1		1	515	277	194	322	242	
1983-84	2	1	1		1	8	1,039	923	
1984-85	7	1		32	44		369	468	
1985-86	65						812	484	4
1986-87	50	25	36	139	5	328	519	696	36
1987-88	176	4	124	164	155	257	660	375	10
1988-89	151	61	21	219	139	176	453	421	17
1989-90	8	6	3	35	35	100	428	260	15
1990-91	67		32	100	87	90	239	181	3
1991-92	77	46	2	53	20	89	750	834	7

APPENDIX FIGURE 1. Daily Water Temperatures for Warm Springs Salmon and Steelhead Hatchery from July 1, 1991, Through June 30, 1992

DAILY WATER TEMPERATURES BY MONTH



DAILY WATER TEMPERATURES BY MONTH

