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ANNUAL REPORT  
WARM SPRINGS SALMON AND STEELHEAD HATCHERY, 1998-99

by

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Central Coast Region

Wildlife and Inland Fisheries Division  
Administrative Report No.

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ABSTRACT

This report describes the operations of Warm Springs Salmon and Steelhead Hatchery from July 1, 1998, through June 30, 1999. Tables and Appendices presents daily record of water temperatures, daily numbers of salmon and steelhead entering the hatchery, and total number of salmonids reared and released.

Four chinook salmon, Oncorhynchus tshawytscha, eight coho salmon, O. kisutch, and 2,236 steelhead trout, O. mykiss, were trapped at the hatchery this season. There were 40,634 Dry Creek and Eel River chinook, 173,980 Dry Creek and Russian River fingerling steelhead, 36,852 Dry Creek and Russian River advanced fingerling steelhead, and 572,659 Dry Creek and Russian River yearling steelhead planted this season.

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## INTRODUCTION

This is the 19th annual report for operation of the Warm Springs Salmon and Steelhead Hatchery. It describes the operation of the Hatchery from July 1, 1998, through June 30, 1999. Copies of previous annual reports are available upon request from the Wildlife and Inland Fisheries Division, Sacramento.

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, 1998, through June 30, 1999.

## PRODUCTION SUMMARY

The ladder was opened October 19, 1998. The flows in Dry Creek were maintained between 90 and 300 cfs through most of the year, except for the winter months when flows were increased to 3,000 cfs. Four chinook salmon, *Oncorhynchus tshawytscha*, eight coho salmon, *O. kisutch*, and 2,236 steelhead trout, *O. mykiss*, were trapped at the hatchery this season. There were 40,634 Dry Creek and Eel River chinook planted (Table 2), 173,980 Dry Creek and Russian River fingerling steelhead planted (Table 3), 36,852 Dry Creek and Russian River advanced fingerling steelhead planted (Table 4), and 572,659 Dry Creek and Russian River yearling steelhead planted (Table 5).

All fish were started on Bio-Diet and then fed Oregon Moist Pellets. A total of 137,018 of fish was produced using 199,692 lbs. of feed, giving a conversion rate (pounds of feed to produce 1 pound of fish) of 1.45.

TABLE 1. Warm Springs Hatchery Production Summary

Species	Adults trapped	Females spawned	Dry Creek eggs taken	Other eggs rec'd	Eggs shipped	Fingerlings planted	Yearlings planted	Total pounds released
DC-Chin salmon								
1997 BY							11,730	2,300
1998 BY	1							
ER-Chin salmon								
1997 BY							28,904	3,640
1998 BY				104,000	21,280			
D. Coho salmon								
1997 BY								
1998 BY	3							
DC-SH								
1998 BY						46,062	341,339	85,630
1999 BY	2,231	184	920,000					
RR-SH								
1998 BY						164,770	231,320	45,448
1999 BY				535,000				
Totals	2,235	184	920,000	639,000	21,280	210,832	613,293	137,018

## WATER QUALITY

This is the 19th season of propagation and rearing since Lake Sonoma has filled. The turbidity of the incoming water was consistently at 2.25 nephelometric turbidity units (N.T.U.s) most of the year. The highest occurred during February when it reached 3.2 N.T.U.s. The lowest turbidity recorded was .3 N.T.U.s, taken in May.

## DISEASE

There were no major disease problems at the Hatchery. Minor outbreaks of Flexibacter-Psychrophilus required treatments with Pen G (Penicillin G). All fish are still being treated twice with Pen G, at swim-up stage and just prior to being released into ponds. This treatment has worked well and has minimized the outbreaks of Flexibacter-Psychrophilus.

## CHINOOK SALMON PROGRAM History of the 1998-99 Season

There were four chinook salmon trapped at the Hatchery this season: one adult male, zero adult female, and three grilse. No females were spawned this season. A total of 11,730 Dry Creek chinook BY-97 and 28,904 Eel River chinook BY-97 yearlings was planted this season (Table 2).

TABLE 2. Chinook Salmon Plants, 1998-99

Date	Strain	Release site	Average size/lb	Number
11-18-98	Dry Creek	Dry Creek	5.1	11,730
11-19-98	Eel River	Eel River	6.6	3,894
11-19-98	Eel River	Van Arsdale	8.2	11,480
11-19-98	Eel River	Van Arsdale	8.2	3,690
11-20-98	Eel River	Van Arsdale	8.2	4,100
11-20-98	Eel River	Van Arsdale	8.2	5,740
Totals				40,634

Only the Eel River chinook salmon were coded wire tagged this season. Tag codes were 06 - 51 - 28. No tags or marks were given to the Dry Creek chinook salmon.

#### COHO SALMON PROGRAM History of the 1998-99 Season

There were eight coho salmon trapped at the Hatchery this season: two males, one female, and five grilse. This year no coho salmon were spawned. No coho salmon BY- 97 were planted this year.

No coho salmon eggs from Noyo River were received this year.

STEELHEAD TROUT PROGRAM  
History of the 1998-99 Season

The first adult steelhead entered the trap on December 16, 1998, and the last on May 3, 1999. A total of 2,236 fish was trapped: 1,219 male, 1,012 female, and 5 half-pounder. The 184 females spawned produced 920,000 eggs, at an average of 5,000 eggs per female. All Russian River and Dry Creek steelhead were adipose fin clipped before being released. Sonoma County Water Agency biologists marked a total of 9,230 Dry Creek steelhead with dye on various fins. Three separate groups were released into the Russian River main stem, to see what impact an inflatable dam has on migrating steelhead. Surplus adult fish were planted in the Russian River at Comiskey Station by the Hatchery crew (Table 7).

TABLE 3. Fingerling Steelhead Trout Plants, 1998-99

<u>Date</u>	<u>Strain</u>	<u>Release site</u>	<u>Average size/lb</u>	<u>Number</u>
07-14-98	Russian River	Russian River, E.B.*	576	74,880
07-14-98	Russian River	Orr Creek	179	10,382
07-14-98	Russian River	Forsythe Creek	179	10,382
07-22-98	Russian River	Russian River, E.B.*	341	54,150
07-29-98	Dry Creek	Dry Creek	182	24,186
Total				173,980

TABLE 4. Advanced Fingerling Steelhead Trout Plants, 1998-99

<u>Date</u>	<u>Strain</u>	<u>Release site</u>	<u>Average size/lb</u>	<u>Number</u>
10-01-98	Dry Creek	Dry Creek	24	7,260
10-02-98	Dry Creek	Dry Creek	21	14,616
10-06-98	Russian River	Russian River, E.B.*	22	14,976
Total				36,852

\* Russian River, East Branch

TABLE 5. Yearling Steelhead Trout Plants. 1998-99

Date	Strain	Release site	Average size/lb	Number
09-29-98	Dry Creek	Dry Creek	11	16,225
09-30-98	Russian River	Russian River E.B*	10	15,994
10-01-98	Dry Creek	Dry Creek	16	6,000
12-16-98	Dry Creek	Dry Creek	3.8	65,854
01-14-99	Dry Creek	Dry Creek	4.2	26,670
01-14-99	Dry Creek	Dry Creek	4.1	28,085
01-14-99	Russian River	Russian River E.B*	4.9	52,996
01-15-99	Dry Creek	Dry Creek	3.9	13,260
02-07-99	Russian River	Russian River E.B*	4.9	32,082
02-09-99	Russian River	Russian River E.B*	4.4	17,002
02-09-99	Dry Creek	Dry Creek	4.1	57,170
02-10-99	Dry Creek	Dry Creek	3.9	16,770
02-16-99	Russian River	Russian River E.B*	4.7	28,825
03-01-99	Russian River	Russian River E.B*	4.7	25,278
03-01-99	Russian River	Russian River E.B*	4.8	13,181
03-12-99	Dry Creek	Dry Creek	3.2	16,065
03-15-99	Dry Creek	Dry Creek	3.3	64,560
04-09-99	Russian River	Russian River E.B*	5.4	45,962
04-12-99	Dry Creek	Dry Creek	2.9	21,450
04-21-99	Dry Creek	Russian River	4.0	1,700
04-27-99	Dry Creek	Russian River	4.0	1,680
05-11-99	Dry Creek	Russian River	3.0	5,850
Total				572,659

\* Russian River, East Branch



TABLE 6. Russian River Yearling Steelhead Transferred to Coyote Valley Fish Facility  
1998-99

<u>Date</u>	<u>Pounds</u>	<u>Number</u>
12-21-98	3,075	17,220
12-21-98	4,275	23,513
12-22-98	1,200	6,480
12-23-98	4,200	22,680
12-24-98	5,900	32,450
01-25-99	3,000	12,900
01-25-99	2,000	9,000
01-27-99	2,000	9,000
01-28-99	2,500	11,250
03-10-99	3,300	13,200
03-10-99	3,300	13,200
03-11-99	3,900	13,260
03-12-99	1,800	6,120
<u>Total</u>	<u>40,450</u>	<u>190,273</u>

TABLE 7. Adult Steelhead Trout Plants, 1998-99

Date	Strain	Release site	Average size/ea	Number	
				Females	Males
01-22-99	Dry Creek	Comiskey Station	8-10 lbs	36	87
01-28-99	Dry Creek	Comiskey Station	8-10 lbs	77	90
01-29-99	Dry Creek	Comiskey Station	8-10 lbs	50	70
02-05-99	Dry Creek	Comiskey Station	8-10 lbs	75	104
02-18-99	Dry Creek	Comiskey Station	8-10 lbs	143	98
02-25-99	Dry Creek	Comiskey Station	8-10 lbs	42	56
03-04-99	Dry Creek	Comiskey Station	8-10 lbs	32	87
03-11-99	Dry Creek	Comiskey Station	8-10 lbs	36	125
03-18-99	Dry Creek	Comiskey Station	8-10 lbs	34	57
03-25-99	Dry Creek	Comiskey Station	8-10 lbs	36	95
04-01-99	Dry Creek	Comiskey Station	8-10 lbs	25	77
04-23-99	Dry Creek	Comiskey Station	8-10 lbs	10	25
05-23-99	Dry Creek	Comiskey Station	8-10 lbs	7	19
Total				603	990

## PUBLIC RELATIONS

All visitors to the Hatchery must enter through the Visitor Center where they are counted. During the 1998-99 season, 61,644 people visited the Hatchery (Table 9).

TABLE 8. Warm Springs Hatchery Monthly Visitation Data, 1998-99

Month	Number of visitors
July	7,133
August	5,709
September	4,201
October	3,916
November	4,029
December	2,406
January	4,702
February	5,022
March	5,062
April	5,706
May	4,800
June	8,958
Total	61,644

APPENDIX TABLE 1. Weekly Adult Salmon and Steelhead Trapping Data for Warm Springs Salmon and Steelhead Hatchery, 1998-99

<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>
10/18/98-10/24/98	0	0	0	0	0	0
10/25/98-10/31/98	1	0	0	0	0	0
11/01/98-11/07/98	0	0	0	0	0	0
11/08/98-11/14/98	0	0	0	0	0	0
11/15/98-11/21/98	0	0	0	0	0	0
11/22/98-11/28/98	0	0	0	0	0	0
11/29/98-12/05/98	0	0	0	0	0	0
12/06/98-12/12/98	0	0	0	0	0	0
12/13/98-12/19/98	0	2	0	2	1	3
12/20/98-12/26/98	0	0	0	0	0	0
12/27/98-01/02/99	0	0	0	0	3	6
01/03/99-01/09/99	0	0	2	0	3	1
01/10/99-01/16/99	0	0	1	1	8	6
01/17/99-01/23/99	0	0	0	0	220	184
01/24/99-01/30/99	0	0	0	0	114	117
01/31/99-02/06/99	0	1	0	0	129	100
02/07/99-02/13/99	0	0	0	2	98	140
02/14/99-02/20/99	0	0	0	0	40	68
02/21/99-02/27/99	0	0	0	0	79	69
02/28/99-03/06/99	0	0	0	0	103	48
03/07/99-03/13/99	0	0	0	0	143	76
03/14/99-03/20/99	0	0	0	0	74	55
03/21/99-03/27/99	0	0	0	0	71	49
03/28/99-04/03/99	0	0	0	0	68	38
04/04/99-04/10/99	0	0	0	0	23	27
04/11/99-04/17/99	0	0	0	0	13	10
04/18/99-04/24/99	0	0	0	0	11	6
04/25/99-05/01/99	0	0	0	0	16	6
05/02/99-05/08/99	0	0	0	0	2	3
05/09/99-05/09/99	0	0	0	0	0	0
Season Totals	1	3	3	5	1,219	1,012

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	0	0	0	0	0	0	148	185	
1981-82	0	0	0	2	2	0	124	235	
1982-83	1	0	0	512	227	194	322	242	
1983-84	2	1	1	0	1	8	1,039	923	
1984-85	7	1	0	32	44	0	369	468	
1985-86	65	0	0	0	0	0	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	70	428	260	15
1990-91	67	0	32	100	87	90	239	181	3
1991-92	77	46	2	53	20	89	750	834	7
1992-93	15	22	3	250	113	215	1,378	1,289	2
1993-94	8	0	13	110	62	277	856	895	9
1994-95	59	9	17	310	392	63	3,561	4,525	14
1995-96	18	12	3	13	13	36	2,135	1,958	12
1996-97	25	11	7	68	68	12	1,729	1,910	9
1997-98	16	14	19	1	3	0	656	687	1
1998-99	1	0	3	2	1	5	1,219	1,012	5

AVERAGE WATER TEMPERATURE BY MONTH

<u>DATE</u>	*	<u>LOW TEMP</u>	<u>HIGH TEMP</u>	<u>MEAN TEMP</u>
July 1-31/1998		54 degrees	54 degrees	54 degrees
August 1-31/98		54 degrees	55 degrees	54 degrees
September 1-30/98		54 degrees	55 degrees	55 degrees
October 1-31/98		55 degrees	56 degrees	56 degrees
November 1-30/98		53 degrees	56 degrees	55 degrees
December 1-31/98		52 degrees	53 degrees	53 degrees
January 1-31/99		50 degrees	52 degrees	51 degrees
February 1-29/99		47 degrees	51 degrees	49 degrees
March 1-31/99		47 degrees	54 degrees	51 degrees
April 1-30/99		50 degrees	52 degrees	51 degrees
May 1-31/99		53 degrees	55 degrees	54 degrees
June 1-30/99		53 degrees	54 degrees	54 degrees

\* All temperatures are in degrees Fahrenheit