

State of California  
The Resources Agency  
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT  
TRINITY RIVER SALMON AND STEELHEAD HATCHERY, 2008-2009

By

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Inland Fisheries

Administrative Report No. 2009-

2009

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ABSTRACT

This report describes the operation of Trinity River Salmon and Steelhead Hatchery for the period July 1, 2008 through June 30, 2009. Chinook salmon, *Oncorhynchus tshawytscha*, coho salmon, *O. kisutch*, and steelhead, *O. mykiss*, were reared.

During this period 9,021 chinook salmon were trapped, 3,268 females spawned, 9,505,447 eggs taken and 4,181,798 chinook planted. There were 5,252 coho salmon trapped, 576 females spawned, 1,449,137 eggs taken and 459,546 coho planted. There were 2,499 steelhead trapped, 610 females spawned, 3,236,301 eggs taken and 820,429 steelhead planted.

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## INTRODUCTION

This is the fifty first consecutive fiscal year report covering operation of the Trinity River Salmon and Steelhead Hatchery, located near Lewiston, Trinity County. The hatchery was constructed by the United States Bureau of Reclamation (USBR) to compensate for spawning and rearing areas lost to the Trinity River Project. Operation and maintenance costs are paid by the USBR to mitigate this loss. The California Department of Fish and Game (DFG) began operation of the permanent installation on May 15, 1963. This report describes operation of the hatchery from July 1, 2008 through June 30, 2009.

## PRODUCTION SUMMARY

The ladder was opened on September 5, 2008 and spring run chinook salmon began entering the hatchery trap. The spring run continued through October 9, 2008 at which time the majority of the salmon arriving were fall run. The fall run continued until December 4, 2008.

Coho salmon were trapped from September 8, 2008 through January 23, 2009. Steelhead entered the hatchery from September 7, 2008 through March 13, 2009.

Table 1. Production Summary, Trinity River Hatchery 2008-2009.

Species	Number Trapped	Number females spawned	Eggs Taken	Number fingerlings planted	Number yearlings planted	Total pounds planted
Spring run chinook salmon	3,786	1,242	3,632,337	940,937	390,136	54,910
Fall run chinook salmon	5,235	2,026	5,873,110	2,018,580	832,145	71,326
Coho salmon	5,252	576	1,449,137		459,546	51,484
Steelhead	2,499	610	3,236,301		820,429	110,646
Total	16,772	4,454	14,190,885	2,959,517	2,502,256	288,366

## HATCHERY OPERATIONS

During the 2008-2009 spawning season, spring chinook, fall chinook, coho, and steelhead runs were adequate to meet production goals. Numbers of returning adults are discussed in the history of the 2008-2009 run pages to follow.

After hatch, all salmon were nutritionally started on Rangen Dry Starter, and then continued on Rangen Semi-Moist Feed until release. Steelhead were initially fed Rangen Semi-moist starter feed to a size of 50 fish per pound, and then were converted to Rangen 2.0/2.5 Dry feed using demand feeders. Our demand feed system, exclusive to steelhead, dispersed the feed upon the will of the fish, until the mid March release into the Trinity River. Salmon were fed by hand broadcasting when small, and once feed size reaches 1.3 mm it is then distributed by blower.

A combined total of 526,662 pounds of feed produced 288,366 pounds of fish for both smolt and yearling programs of all four fish varieties. The conversion rate was calculated at 1.83 pounds of feed required to rear one pound of fish.

No feed problems occurred this year with the Rangen feed and feeding protocols.

There were no serious outbreaks of disease during this time frame. BKD continues to be present in low levels for chinook and coho as has been the case in the hatchery and in the river. An assertive plan of quarantine and sterilization during spawning and egg handling, plus regular pond cleaning, has proved health effective especially for virus prevention. Chinook are also tested for virus and were determined virus free. Prophylactic chemical treatment procedures and low pond densities have also been essential to disease control including viral Infectious Hematopoietic Necrosis. Overall, Trinity River Hatchery fish health assessment was very good.

The Coho spawning protocol was continued this year to incorporate approximately 20% marked X unmarked adult pairings into the spawning matrix. Those pairings are retained and are an integral part of the hatchery coho production.

For steelhead spawning this year CO<sub>2</sub> was again successfully used instead of MS-222 as an anesthetic, to eliminate the 21 day holding period and increase survivability of spawned adults released from the hatchery.

The USBR had to again repair our temperature curtain with manually operated valves so that we can raise or lower the curtain as the conditions demand. Also, we have requested that the USBR replace the boom in Lewiston Lake (near the main lake temperature curtain) which was washed out by the higher spring flows. The absence of the boom has generated a much higher debris load on our intake rack which causes us some concern in regard to our flow. This is the third year for that request.

The Hoopa Valley Tribal Fisheries and the Trinity River Project monitor fish migration and populations as part of their management role in the Klamath River Basin. Data from coded wire tagging, trapping sites, and hatchery statistics are collected for run characteristics and regulation. "Constant fractional marking" was again implemented this year for chinook. Both chinook races are marked at the rate of 1 in 4 (25%).

Visitor counts to the installation totaled 5,779. This was slightly up from the previous year. Guided tours were provided to schools or other interested groups upon request. Work experience and job shadowing opportunities were utilized by career seeking individuals, through sponsoring agencies, in all facets of our fish rearing operation. Approximately 1,123 fly fisherpersons used the Trinity River fishing access in waters adjacent to the installation, from April until mid September. This reflects 1.75 times increase in fishers due to the early season. An earlier season was allowed again this year for the fly fishing area, to allow fishers more fishable conditions and time before the new higher spring flows start. Those flows generally make the area unfishable for fly fishers at that time.

A catch and keep regulation for up to 5 brown trout continued this year, which has had limited results due to a catch and release protocol which most fisherman that fish for them have adopted.

## CHINOOK SALMON MAINTENANCE PROGRAM

### The History of the 2008 Run

Chinook salmon began arriving at Trinity River Hatchery in mid May. The ladder and trap were opened for salmon entry on September 5, and sorting started on September 8. Eggs were collected through December 4.

#### Spring Run

A total of 3,786 spring run chinook were trapped between September 8 and October 9, 2008. This total included 1,893 females, 1,548 males and 345 grilse. Fish less than 55 cm fork length were counted as grilse. The 1,242 spring females spawned produced 3,632,337 green eggs, an average of 2,925/female. Egg size averaged 77.3/ounce.

#### Fall Run

Between October 27, 2008 through January 13, 2009, the fall run numbered 5,235 fish. This total included 2,584 females, 1,901 males and 750 grilse. The 2,026 fall females spawned produced 5,873,110 green eggs, an average of 2,899/female. Egg size averaged 72.6/ounce.

It should be noted here that the average eggs per female is not an accurate reflection of true fecundity because in high return years no effort is made to extract every egg from each female.

### Planting 2007 Brood Year Chinook Salmon

We planted a total of 1,222,281 Chinook yearlings this fiscal year. (Table 2).

Table 2. Yearling Chinook Salmon Planted 2008-2009.

Date	Fish/lb.	Race	Release site	Number
10/1-16/08	11.4	Spring	TRH	390,136
	17.2	Fall	TRH	832,145
			Total	1,222,281

### Planting 2008 Brood Year Chinook Salmon

A total of 2,959,517 chinook salmon fingerlings were planted in 2009 (Table 3).

Table 3. 2008 Brood Year Fingerling Chinook Salmon

Date	Fish/lb.	Race	Release Site	Number
6/1-8/09	37.9	Spring	TRH	307,458
	47.0	Spring	TRH	267,026
	54.5	Spring	TRH	366,453
	82.6	Fall	TRH	890,809
	98.6	Fall	TRH	1,127,771
			Total	2,959,517

### COHO SALMON MAINTENANCE PROGRAM

#### History of the 2008 Run

Coho salmon entered the hatchery from October 6, 2008 to January 6, 2009. We trapped 5,252 fish: 1,973 males; 2,594 females; and 685 grilse. We spawned 576 females. Coho females averaged 2,516 eggs/fish @ 96.7 eggs/ ounce and a total of 1,449,137 eggs were taken.

### Planting 2007 Brood Year Coho Salmon

A total of 459,546 Coho salmon yearlings were planted in 2009 (Table 4).

Table 4. Coho Salmon Yearlings Planted in 2009

Date	Size/lb.	Race	Release site	Number
3/15-20/09	7.1	Trinity	TRH	133,311
	8.5	Trinity	TRH	132,811
	8.3	Trinity	TRH	128,794
	8.7	Trinity	TRH	64,630
			Total	459,546

## STEELHEAD MAINTENANCE PROGRAM

### History of the 2008-2009 Run

The first Steelhead entered the hatchery on September 15, 2008. Fish were trapped through March 11, 2009, collecting 2,499 fish: 1,177 males and 1,322 females. Between December 23, 2008 and March 11, 2009, we spawned 610 females. They produced 3,236,301 eggs, with an average of 5,305/eggs per female. Eggs averaged 255.1/ounce.

### Planting 2008 Brood Year Steelhead

We planted a total of 820,429 yearling Steelhead in FY 2008-2009. (Table 5)

Table 5. Steelhead Planted in 2008-2009 FY

Strain & brood year	Date	Fish/lb.	Mark	Release site	Number
TR-08	3/15-27/09	7.1	Ad	TRH	77,450
		4.9	Ad	TRH	75,973
		4.7	Ad	TRH	66,194
		5.7	Ad	TRH	73,541
		6.0	Ad	TRH	78,286
		6.1	Ad	TRH	73,868
		12.2	Ad	TRH	103,804
		12.2	Ad	TRH	103,538
		15.5	Ad	TRH	109,061
		7.7	Ad	TRH	58,875
				Total	820,429



Appendix Table 1. Weekly Salmon and Steelhead Trapping Data for Trinity River Hatchery 2008-09.

Date		Chinook		Coho		Steelhead	
		Adults	Grilse	Adults	Grilse	Males	Females
9/8/08	S	477	24	0	0	0	0
9/11/08	S	98	13	0	0	0	0
9/15/08	S	436	34	0	0	0	1
9/18/08	S	202	23	0	0	0	0
9/22/08	S	618	31	0	0	1	0
9/25/08	S	533	45	0	0	0	0
9/29/08	S	446	46	0	0	2	1
10/2/08	S	330	54	0	0	1	1
10/6/08	S	220	49	3	2	4	2
10/9/08	S	81	26	1	4	5	4
10/27/08	F	618	210	145	257	3	2
10/30/08	F	306	151	86	63	2	1
11/3/08	F	730	139	414	114	3	8
11/6/08	F	662	94	558	76	22	16
11/7/08	F	89	32	46	15	4	8
11/10/08	F	657	81	300	35	14	9
11/12/08	F	373	20	485	39	11	17
11/13/08	F	95	9	113	12	10	9
11/17/08	F	292	7	476	27	19	21
11/18/08	F	51	0	130	7	11	10
11/20/08	F	200	1	312	9	29	41
11/24/08	F	169	1	379	6	22	22
11/26/08	F	88	4	229	2	17	14
12/1/08	F	110	0	365	8	51	56
12/4/08	F	12	0	144	3	27	20
12/8/08	F	21	1	149	2	20	20
12/11/08	F	4	0	83	1	6	9
12/15/08	F	3	0	52	3	23	12
12/18/08	F	4	0	31	0	22	14
12/23/08	F	0	0	30	0	10	12
12/30/08	F	0	0	33	0	59	63
1/6/09	F	0	0	3	0	70	44
1/13/09	F	1	0	0	0	160	109
1/20/09	F	0	0	0	0	105	165
1/27/09	F	0	0	0	0	106	125

Appendix Table 1 (continued). Weekly Salmon and Steelhead Trapping Data for Trinity River Hatchery 2008-09.

Date	Chinook		Coho		Steelhead	
	Adult	Grilse	Adult	Grilse	Male	Female
2/3/09	0	0	0	0	124	123
2/11/09	0	0	0	0	66	99
2/18/09	0	0	0	0	28	73
2/25/09	0	0	0	0	56	87
3/4/09	0	0	0	0	51	81
3/11/09	0	0	0	0	13	23
<b>Totals</b>	<b>7,926</b>	<b>1,095</b>	<b>4,567</b>	<b>685</b>	<b>1,177</b>	<b>1,322</b>

Appendix Table 2. Summary of Fish Runs to Trinity River Salmon and Steelhead Hatchery, 1958 – June 30, 2009.

Dates	Chinook			Coho			Steelhead
	Males	Females	Grilse	Males	Females	Grilse	
1958-59	1,269	1,744	878	240	34	33	2,880
1959-60	1,716	2,833	2,701	49	44	26	2,071
1960-61	1,493	1,287	4,130	84	54	70	3,526
1961-62	885	1,613	2,899	158	160	37	3,243
1962-63	1,308	1,608	6,535	7	0	9	1,687
1963-64	1,569	2,627	2,539	32	40	11	894
1964-65	1,974	3,042	1,287	23	25	2	6,941
1965-66	477	1,077	1,521	2	1	9	992
1966-67	1,052	1,002	2,876	45	173	807	135
1967-68	1,620	1,250	1,746	287	519	59	232
1968-69	1,797	2,102	873	3	1	34	554
1969-70	624	832	1,130	153	132	1,711	241
1970-71	773	725	2,946	1,410	1,396	341	87
1971-72	3,648	4,645	928	28	11	8	242
1972-73	5,217	4,825	339	28	30	2,612	271
1973-74	2,483	1,152	1,577	3,808	3,787	468	162
1974-75	4,547	2,840	677	33	22	40	372
1975-76	2,958	3,405	860	68	109	2,060	175
1976-77	2,845	1,901	2,878	1,171	1,414	223	13
1977-78	1,841	1,318	2,562	381	317	1,230	285
1978-79	4,478	5,135	1,287	580	995	2,080	683
1979-80	1,138	1,480	1,452	1,241	1,547	1,253	382
1980-81	2,745	2,271	224	753	1,070	1,500	2,019
1981-82	2,214	2,514	1,146	830	1,164	2,529	1,007
1982-83	1,874	1,683	4,112	1,686	2,112	1,000	715
1983-84	2,764	3,256	903	223	256	227	603
1984-85	1,923	1,157	664	574	676	7,611	142
1985-86	6,548	2,821	14,533	3,729	3,919	4,138	461
1986-87	13,109	9,376	5,462	1,309	1,593	5,230	3,780
1987-88	12,374	8,593	5,273	9,165	11,243	2,930	3,007
1988-89	19,391	12,594	4,401	5,713	5,802	1,301	817
1989-90	8,218	7,728	426	2,509	2,324	136	4,765
1990-91	1,677	2,166	413	666	706	263	927
1991-92	1,837	2,088	447	1,430	1,056	202	350
1992-93	2,237	2,452	1,110	1,157	1,084	1,351	551
1993-94	1,483	1,744	997	1,136	920	138	882
1994-95	4,394	3,078	5,313	69	43	76	376

Appendix Table 2 (continued). Summary of Fish Runs to Trinity River Salmon and Steelhead Hatchery, 1958 – June 30, 2009.

Dates	Chinook			Coho			Steelhead
	Males	Females	Grilse	Males	Females	Grilse	
1996-97	4,902	6,229	571	4,985	4,682	538	4,046
1997-98	5,185	4,500	1,712	398	458	1,731	419
1998-99	8,397	7,226	3,790	1,950	1,862	1,036	438
1999-00	2,216	2,973	1,980	1,264	1,783	396	1,584
2000-01	20,509	17,061	1,650	1,699	1,763	932	842
2001-02	11,699	12,706	750	4,844	4,960	986	2,381
2002-03	7,950	6,261	1,352	3,550	2,937	688	6,163
2003-04	22,231	22,013	911	4,789	5,493	1,546	10,283
2004-05	8,661	9,272	2,019	4,716	5,107	1,085	5,691
2005-06	9,767	10,287	375	7,059	9,251	1,977	8,147
2006-07	5,507	5,632	4,935	4,466	5,268	160	11,899
2007-08	11,402	12,659	89	1,202	1,737	314	11,395
2008-09	3,449	4,477	1,095	1,973	2,594	685	2,499