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ANNUAL REPORT  
TRINITY RIVER SALMON AND STEELHEAD HATCHERY, 1987-88

by

Gerald W. Bedell  
Region 1, Inland Fisheries

Inland Fisheries Division  
Administrative Report No. 90-11

1990

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ABSTRACT

This report describes the operation of Trinity River Salmon and Steelhead Hatchery for the period July 1, 1987 through June 30, 1988. Chinook salmon, Oncorhynchus tshawytscha, coho salmon, O. kisutch, and steelhead, O. mykiss, were reared.

Tables present the numbers of adults spawned and eggs and fish produced and planted. The appendix tables present the numbers of eggs and fish shipped and received, and daily weather, water temperature, and fish trapping data for the fiscal year.

<sup>1/</sup> Inland Fisheries Administrative Report No. 90-11.

Submitted for publication November 1988. Edited by K. A. Hashagen, California Department of Fish and Game, 1416 Ninth St., Sacramento, CA 95814.

### INTRODUCTION

This is the 30th 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 to compensate for spawning areas blocked by the Trinity River project. The California Department of Fish and Game began operation of the permanent installation on May 15, 1963. Operation and maintenance costs are paid by the Bureau.

This report describes operation of the Hatchery from July 1, 1987 through June 30, 1988. Copies of previous annual reports are available upon request from the Inland Fisheries Division, Sacramento.

### PRODUCTION SUMMARY

The ladder was opened on August 31 and spring run chinook salmon began entering the Hatchery trap. The run continued through October 8, at which time the majority of the salmon arriving were fall run. The fall run continued until December 10, 1987.

Coho salmon were trapped from October 1, 1987 through January 19, 1988. Steelhead entered the Hatchery from November 16, 1987 through March 21, 1988.

TABLE 1. Production Summary, Trinity River Salmon and Steelhead Hatchery 1987-88

Species	Number trapped	Number females spawned	Eggs taken or received	Number fingerlings planted	Number yearlings planted	Total pounds planted	On hand June 30, 1986
Spring-run chinook salmon	10,839	1,159	3,449,310	2,803,226	486,048	59,878	0
Fall-run chinook salmon	15,401	2,601	7,381,450	2,350,205	982,784	81,231	800,000
Coho salmon	23,338	1,832	3,723,280	0	347,256	24,804	500,000
Steelhead	3,007	921	3,285,734	0	925,100	120,025	900,000
Totals	52,585	6,513	17,839,774	5,153,431	2,741,188	285,938	2,200,000

## HATCHERY OPERATION

All production fish were reared on a diet of Oregon Moist Pellet after being started on Biodiet Starter feed. A total of 414,538 lb of feed produced 285,938 lb of fish during fiscal year 1987-88. The feed conversion rate (pounds of feed required to raise 1 lb of fish) was 1.45.

This past year was similar to the previous year in that large numbers of chinook and coho salmon returned to the Hatchery. Steelhead returns were down somewhat but provided more than enough eggs for the Hatchery program.

As of June 1, 1988, the Hatchery was completely shut down and dewatered so construction could begin on the new concrete raceways and fishway. Four hundred thousand coho and 900,000 steelhead were moved to the Sawmill site rearing ponds to be held until the new Hatchery ponds are ready for service in January 1989. They will then be returned to the Hatchery for release about April 1.

The Hatchery was closed to the public this past year but we did have several tours for school groups during spawning season.

## CHINOOK SALMON MAINTENANCE PROGRAM

### History of the 1987 Run

Chinook salmon arrived in the upper river near the Hatchery on June 9. The ladder was opened August 31 and spawning operations began September 8.

#### Spring Run

Between September 8 and October 8, a total of 10,839 chinook salmon, mostly spring run, was trapped at the Hatchery. This number included 5,155 males, 3,662 females, and 2,022 grilse. Chinook salmon males >56 cm (22 inches) FL are considered to be grilse. The 1,159 females spawned during this period produced 3,449,310 eggs, an average of 2,976 eggs/female. Egg size averaged 88/oz.

#### Fall Run

There were 15,401 chinook salmon trapped from October 13 to December 17. Of this number 7,219 were males, 4,931 females, and 3,251 grilse. The 2,601 females spawned produced 7,381,450 eggs, an average of 2,838 eggs/female. Egg size averaged 91/oz.

### Planting 1986 Brood Year Chinook Salmon

A total of 1,468,832 chinook yearlings was planted during this fiscal year (Table 2).

We planted a total of 5,773,651 chinook salmon (1986 brood year) as fingerlings during the last fiscal year. Of the 17,210,598 (spring and fall combined) 1986 brood year chinook salmon eggs taken, 7,242,483 (42%) were eventually planted as fish. It must be noted, however, that up to 5,000,000 excess eggs were destroyed before hatching.

TABLE 2. Yearling Chinook Salmon Planted, 1987-88

Date	Size/lb	Race	Release site	Number
9/21/87	19.0	Fall	Hatchery	241,300
9/22/87	18.0	Fall	Hatchery	204,300
9/22/87	19.0	Fall	Hatchery	218,500
9/22/87	17.0	Fall	Hatchery	107,100
9/22/87	15.0	Spring	Hatchery	202,050
9/24/87	18.0	Spring	Hatchery	283,998
9/24/87	11.0	Fall	Hatchery	44,550
9/25/87	19.0	Fall	Hatchery	65,075
2/17/88	8.5	Fall	Hatchery	75,004
3/01/88	9.0	Fall	Hatchery	26,955
Total				1,468,832

*Handwritten notes: "AC Same" written vertically next to the first four rows, and "AC Same" written vertically next to the last three rows.*

Planting 1987 Brood Year Chinook Salmon

A total of 5,153,431 chinook salmon fingerlings was planted in 1988 (Table 3).

TABLE 3. 1987 Brood Year Fingerling Chinook Salmon Planted in 1988

Date	Size/lb	Race	Release Site	Number
2/22/88	334	Spring	Hatchery	13,026
2/22/88	376	Spring	Hatchery	35,720
2/22/88	460	Spring	Hatchery	199,180
5/23/88	85	Spring	Sawmill Site	2,555,300
6/02/88	117	Fall	Ambrose Ponds	2,350,205
Total				5,153,431

*Handwritten notes: "reared off site" written below the first three rows. "247,926" written next to the first three rows. "AC Same" written next to the last two rows.*

Marked Chinook Salmon Returns

There were 4,684 chinook salmon marked with an adipose fin-clip and tagged with coded-wire tags (CWT) trapped at the Hatchery during the 1987-88 season (Appendix Table 1).

## COHO SALMON MAINTENANCE PROGRAM

### History of the 1987 Run

Coho salmon entered the Hatchery from October 1, 1987 through January 19, 1988. We trapped 23,338 fish (9,165 males, 11,243 females, and 2,930 grilse) and spawned 1,832 females from November 30 through December 17. They produced 3,723,280 eggs, an average of 2,032 eggs/female. Egg size averaged 86/oz.

### Planting 1986 Brood Year Coho Salmon

A total of 347,256 coho salmon yearlings was planted in 1988. All were planted at the outlet channel of the Sawmill Ponds. They were planted March 8 at a size of 14/1b.

*CWT - AC Same*

### Marked Coho Salmon Returns

There were 1,184 coho salmon marked with an adipose fin-clip and tagged with coded-wire tags (CWT) trapped at the Hatchery in 1987-88 (Appendix Table 2).

## STEELHEAD MAINTENANCE PROGRAM

### History of the 1987-88 Run

Steelhead entered Trinity River Hatchery from November 16, 1987 through March 21, 1988. The run consisted of 3,007 fish: 1,576 males and 1,431 females. From December 21, 1987 through February 29, 1988, we spawned 921 of the females. They produced 3,285,734 eggs, for an average of 3,568 eggs/female. Egg size averaged 208/oz.

### Steelhead Planted

We planted 925,100 steelhead in fiscal year 1987-88 (Table 4).

TABLE 4. Steelhead Planted in 1987-88

Strain and Brood year	Date released	Average size/lb	Mark	Release site	Number released
TR 1986	9/17/87	4	None	Ambrose Ponds	11,931
IG 1986	9/17/87	4	None	Ambrose Ponds	17,169
TR 1986	9/17/87	4	None	Hatchery	10,660
IG 1986	9/17/87	4	None	Hatchery	15,340
TR 1987	3/08/88	7	None	Sawmill Site	210,000
TR 1987	3/08/88	8	None	Sawmill Site	210,000
TR 1987	4/01/88	9	None	Ambrose Ponds	450,000
Total					925,100

Marked Steelhead Returns

Of the 3,007 steelhead returning to Trinity River Hatchery, 226 were marked (Table 5). All of the marked fish had originally been released from the Hatchery as year and a half or two-year-old fish.

TABLE 5. Marked Steelhead Recovered at Trinity River Hatchery, 1987-88

Mark	Number trapped	Mean fork inches	Length (range)	Probable origin				
				Brood year	Date planted	Location	Number	Strain
LV	57	25.4	(19.7-29.1)	1985	9/22/86	Hatchery	29,140	Iron Gate
RV	169	26.0	(20.5-31.1)	1985	3/20/87	Hatchery	28,000	Iron Gate

BROWN TROUT MAINTENANCE PROGRAM

No brown trout were spawned or planted in 1987-88.

APPENDIX TABLE 1. Coded Wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH) with Release Data, 1987-88

Release Data								Recovery Data				
CWT code	Race	Egg source	Brood year	Date	Number	Size lb	Site	Year	Actual CWT recoveries	Expanded CWT recoveries	Mean Male FL (cm)	Mean Female FL (cm)
6-61-41	Spring chinook	TRH	82	6/27/83	146,194	81.0	TRH	84-85	5	5	39 (5) <sup>a/</sup>	b/
								85-86	29	29	66 (14)	63 (15)
								86-87	19	19	72 (7)	72 (12)
								87-88	1	1	----	74 (1)
6-61-40	Spring chinook	TRH	83	10/03/84	90,293	11.0	TRH	85-86	101	101	45 (101)	---
								86-87	594	594	62 (403)	62 (191)
								87-88	377	377	75 (157)	73 (220)
6-61-43	Spring chinook	TRH	84	10/02/85	98,568	13.5	TRH	86-87	109	109	43 (108)	50 (1)
								87-88	769	769	62 (532)	62 (237)
6-61-42	Spring chinook	TRH	85	6/02/86	192,487	70.0	TRH	87-88	68	68	49 (67)	67 (1)
6-61-44	Spring chinook	TRH	85	10/03/86	101,091	12.6	TRH	87-88	51	51	44 (51)	---
7-31-11	Spring chinook	CRH <sup>c/</sup>	83	9/01/84	21,904	7.9	Rogue River	87-88	1	1	84 (1)	---
7-31-12	Spring chinook	CRH	83	9/01/84	22,021	7.9	Rogue River	87-88	1	1	---	81 (1)
100,000 <sup>d/</sup>	Spring <sup>e/</sup> chinook							85-86	48	48	61 (37)	70 (11)
								86-87	72	72	64 (45)	68 (27)
								87-88	91	91	61 (54)	68 (19)
200,000 <sup>f/</sup>	Spring <sup>e/</sup> chinook							85-86	6	6	54 (5)	73 (1)
								86-87	5	5	65 (2)	62 (3)
								87-88	4	4	62 (2)	64 (2)



(Continued)

APPENDIX TABLE 1. Coded-wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH), with Release Data, 1987-88

CWT code	Release Data			Brood year	Date	Number	Size lb	Site	Recovery Data				
	Race	Egk source	Year						Year	Actual CWT recoveries	Expanded CWT recoveries	Mean male Fl. (cm)	Mean female Fl. (cm)
6-61-26	Fall chinook	TRH	83	6/07/84	191,094	59.0	TRH	85-86 86-87 87-88	590 228 20	590 228 20	51 66 70	(585) (84) (6)	59 (5) 67 (144) 74 (14)
6-56-08	Fall chinook	TRH	83	6/19/84	91,153	46.0	Steel-bridge	85-86 86-87 87-88	350 76 5	350 76 5	54 66 74	(345) (23) (3)	67 (5) 66 (53) 75 (2)
6-56-12	Fall chinook	TRH	83	6/20/84	97,311	49.0	Junction City	85-86 86-87 87-88	493 119 10	493 119 10	54 67 76	(489) (40) (2)	60 (4) 67 (79) 73 (8)
6-56-13	Fall chinook	TRH	83	6/22/84	100,227	46.0	Lime Point	85-86 86-87 87-88	657 143 6	657 143 6	54 66 80	(645) (51) (2)	59 (12) 66 (92) 72 (4)
6-61-13	Fall chinook	TRH	83	10/04/84	100,520	12.5	TRH	85-86 86-87 87-88	640 1,011 128	640 1,011 128	49 65 76	(640) (564) (46)	--- 64 (447) 74 (82)
6-56-14	Fall chinook	TRH	83	10/16/84	25,547	12.1	Steel-bridge	85-86 86-87 87-88	67 150 20	67 150 20	47 64 76	(67) (89) (9)	--- 64 (61) 75 (11)
6-56-15	Fall chinook	TRH	83	10/17/84	25,754	13.4	Junction City	85-86 86-87 87-88	57 109 7	57 109 7	47 64 69	(57) (67) (7)	--- 65 (42) 77 (5)
6-56-16	Fall chinook	TRH	83	10/18/84	26,171	14.1	Lime Point	85-86 86-87 87-88	37 89 10	37 89 10	47 64 76	(37) (64) (4)	--- 64 (25) 74 (6)
6-63-01	Fall chinook	TRH	83	3/01/85	92,965	5.3	TRH	85-86 86-87 87-88	543 2,319 284	543 2,319 284	40 60 75	(543) (1,506) (63)	--- 60 (813) 73 (221)

(Continued)

APPENDIX TABLE 1. Coded-wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH), with Release Data, 1987-88

Release Data								Recovery Data						
CWT code	Race	Egg source	Brood year	Date	Number	Size lb	Site	Year	Actual CWT recoveries	Expanded CWT recoveries	Mean Male FL (cm)	Mean Female FL (cm)		
6-61-27	Fall chinook	TRH	84	6/10/85	189,708	53.0	TRH	86-87 87-88	178 226	178 226	50 66	(175) (95)	50 67	(3) (131)
6-56-17	Fall chinook	TRH	84	6/10-12/85	98,906	54.9	Steel-bridge	86-87 87-88	71 33	71 33	50 64	(70) (10)	54 68	(1) (23)
6-56-18	Fall chinook	TRH	84	6/12-13/85	98,989	55.0	Junction City	86-87 87-88	57 56	57 56	51 68	(57) (20)	67	--- (36)
6-56-19	Fall chinook	TRH	84	6/14-17/85	94,100	54.1	Lime Point	86-87 87-88	105 67	105 67	51 65	(104) (28)	50 68	(1) (39)
6-61-28	Fall chinook	TRH	84	10/10/85	97,070	11.0	TRH	86-87 87-88	126 608	126 608	44 61	(125) (435)	49 62	(1) (173)
6-56-20	Fall chinook	TRH	84	10/08/85	30,459	12.5	Steel-bridge	86-87 87-88	18 73	18 73	46 63	(18) (50)	63	--- (23)
6-56-21	Fall chinook	TRH	84	10/08/85	24,541	12.0	Junction City	86-87 87-88	11 58	11 58	46 62	(11) (41)	64	--- (17)
6-56-22	Fall chinook	TRH	84	10/09/85	25,450	11.0	Lime Point	86-87 87-88	25 80	25 80	46 62	(25) (67)	65	--- (13)
6-56-24	Fall chinook	TRH	84	2/27-28/86	102,512	5.6	TRH	86-87 87-88	161 1,359	161 1,359	38 59	(159) (1,048)	38 60	(?) (111)
6-56-23	Fall chinook	TRH	85	6/19/86	196,249	71.0	TRH	87-88	272	272	51	(271)	50	(1)
6-56-25	Fall chinook	TRH	85	10/24/86	97,368	13.5	TRH	87-88	93	93	46	(92)	66	(1)
H60405	Fall chinook	CNFH <sup>g/</sup>	83	3/01/84	48,480	435	Sacramento River	87-88	1	1	74	(1)	---	---

(Continued)

APPENDIX TABLE 1. Coded-Wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH), with Release Data, 1987-88

Release Data				Recovery Data								
CWT code	Race	Egg source	Brood year	Date	Number	Size lb	Site	Year	Actual CWT Recoveries	Expanded CWT Recoveries	Mean male FL (cm)	Mean female FL (cm)
100,000	Fall <sup>h/</sup> chinook							85-86	171	171	52 (154)	66 (17)
								86-87	146	146	58 (93)	64 (53)
								87-88	197	197	60 (129)	65 (68)
200,000	Fall <sup>h/</sup> chinook							85-86	30	30	53 (30)	----
								86-87	11	11	52 (8)	65 (3)
								87-88	10	10	62 (7)	71 (3)

Footnotes:

a/ Sample size in parenthesis

b/ --- = None sampled

c/ Cole Rivers Hatchery, Rogue River, Oregon.

d/ 100,000 = No CWT in head of Ad-marked fish.

e/ Assumed to be spring chinook by entry date into TRH.

f/ 200,000 = CWT lost during dissection.

g/ Coleman National Fish Hatchery, Sacramento River, California.

h/ Assumed to be fall chinook by entry date into TRH.

APPENDIX TABLE 2. Coded-Wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH), with Release Data, 1987-88

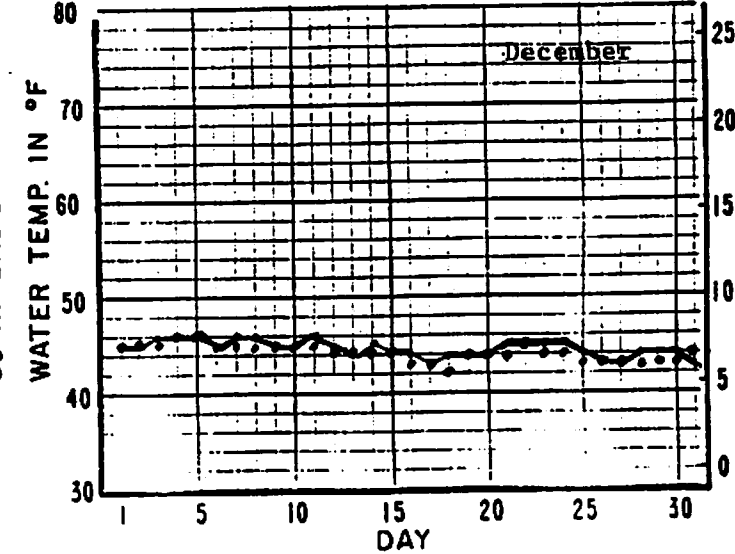
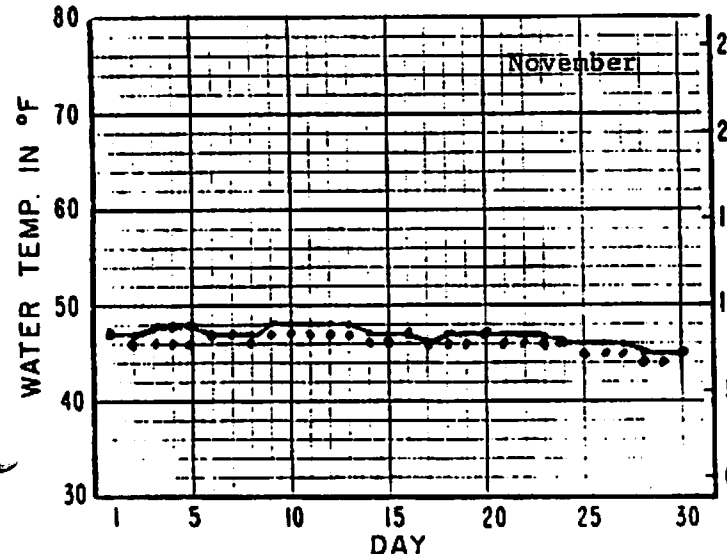
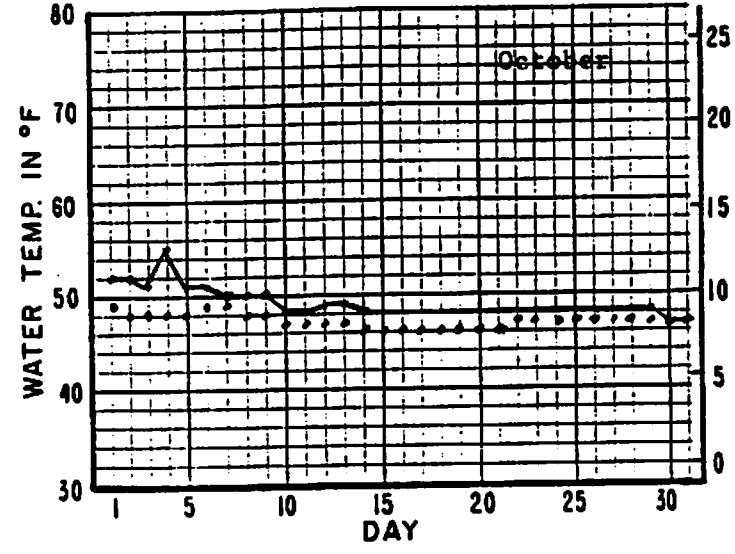
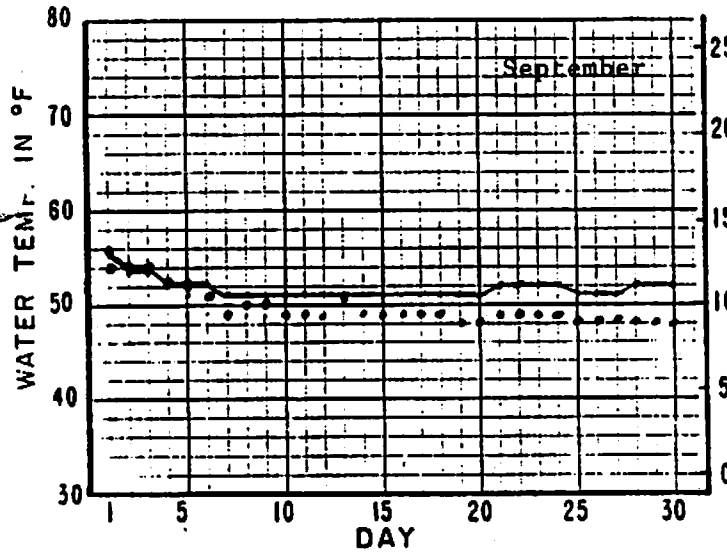
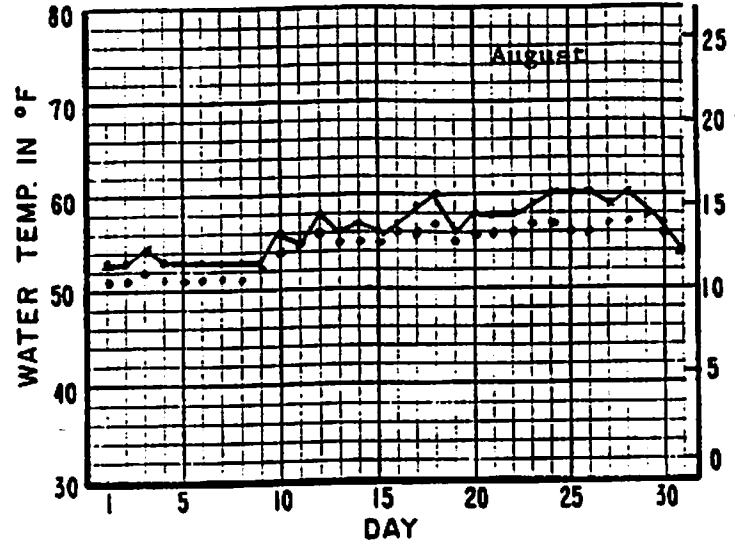
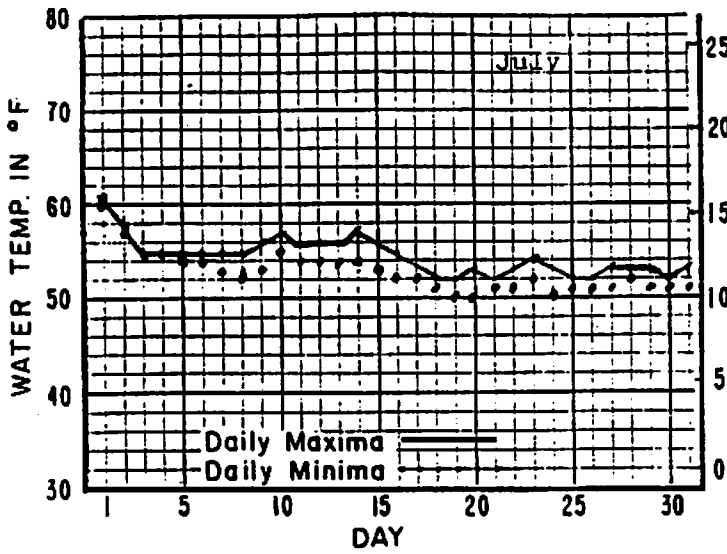
Release Data		Recovery Data											
CWT code	Race	Egg source	Brood year	Date	Number	Size lb	Site	Year	Actual CWT recoveries	Expanded recoveries	Mean male FL (cm)	Mean female FL (cm)	
6-56-52	Coho	TRH	84	7/11/85	99,293	57.0	TRH	86-87 87-88	34 96	34 96	54 66	64 67	(7) (51)
6-56-55	Coho	TRH	84	10/30/85	104,822	27.5	TRH	86-87 87-88	8 142	8 142	41 66	66	--- (84)
6-56-53	Coho	TRH	84	3/18-19/86	45,601	13.0	TRH	86-87 87-88	185 865	185 865	42 67	46 67	(3) (478)
6-56-54	Coho	TRH	85	7/30-8/11/86	87,124	63.4	TRH	87-88	81	81	52	62	(21)
100,000	Coho							86-87 87-88	75 174	75 174	46 61	68 66	(24) (78)
200,000	Coho							86-87 87-88	3 10	3 10	50 63	63	(1) (8)

APPENDIX TABLE 3. Summary of Fish Runs to Trinity River Salmon and Steelhead Hatchery

Year	Chinook salmon		Coho salmon			Grilse	Steelhead	Brown trout
	Males	Females	Grilse	Males	Females			
1958-59	1,269	1,744	878	240	343	33	2,880	80
1959-60	1,716	2,833	2,701	49	44	26	2,071	52
1960-61	1,493	1,287	4,130	84	54	70	3,526	82
1961-62	885	1,613	2,899	158	160	37	3,243	35
1962-63	1,308	1,608	6,535	7	0	9	1,687	49
1963-64	1,569	2,627	2,539	32	40	11	894	34
1964-65	1,974	3,042	1,287	23	25	2	6,941	145
1965-66	477	1,077	1,521	2	1	9	992	100
1966-67	1,052	1,002	2,876	45	173	807	135	152
1967-68	1,620	1,250	1,746	287	519	59	232	231
1968-69	1,797	2,102	873	3	1	34	554	170
1969-70	624	832	1,130	153	132	1,711	241	70
1970-71	773	725	2,946	1,410	1,396	341	67	23
1971-72	3,648	4,645	928	28	11	8	242	7
1972-73	5,217	5,825	339	28	30	2,612	271	111
1973-74	2,483	1,152	1,577	3,808	3,787	486	162	39
1974-75	4,547	2,840	677	33	22	40	372	32
1975-76	2,958	3,405	860	68	109	2,060	175	24
1976-77	2,845	1,901	2,878	1,171	1,414	223	13	49
1977-78	1,841	1,318	2,562	381	317	1,230	285	0
1978-79	4,478	5,131	1,287	580	995	2,080	683	0
1979-80	1,138	1,480	1,452	1,241	1,547	1,253	382	0
1980-81	2,745	2,271	2,242	753	1,070	1,500	2,019	0
1981-82	2,214	2,514	1,146	830	1,164	2,529	1,007	0
1982-83	1,874	1,683	4,112	1,686	2,112	1,000	715	0
1983-84	2,764	3,256	903	223	256	227	603	0
1984-85	1,923	1,157	664	574	676	7,611	142	0
1985-86	6,548	2,821	14,533	3,729	3,919	4,138	461	0
1986-87	13,109	9,376	5,462	1,309	1,593	5,230	3,780	0
1987-88	12,374	8,593	5,273	9,165	11,243	2,930	3,007	0

APPENDIX TABLE 4. Daily Water Temperatures for Trinity River Salmon and Steelhead Hatchery from July 1, 1987 through June 30, 1988.

### DAILY WATER TEMPERATURES BY MONTH



DAILY WATER TEMPERATURES BY MONTH

