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The Resources Agency
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
TRINITY RIVER SALMON AND STEELHEAD HATCHERY 1988-89

by

Gerald W. Bedell
Region 1, Inland Fisheries

Inland Fisheries Division
Administrative Report No. 90-12

1990

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ABSTRACT

This report describes the operation of Trinity River Salmon and Steelhead Hatchery for the period July 1, 1988 through June 30, 1989. 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.

^{1/} Inland Fisheries Administrative Report No. 90-12.
Submitted December 1989. Edited by K.A. Hashagen, California Department of Fish and Game, 1416 Ninth Street, Sacramento, CA 95814.

INTRODUCTION

This is the 31st 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, 1988 through June 30, 1989. Copies of previous annual reports are available upon request from the Inland Fisheries Division, Sacramento.

PRODUCTION SUMMARY

The ladder was opened on September 6, 1988 and spring-run chinook salmon immediately began entering the trap (Table 1). The run continued through October 8, 1988, at which time the majority of the salmon arriving were fall-run. The fall run continued until December 5, 1988.

Coho salmon were trapped from October 3, 1988 through January 19, 1989. Steelhead entered the Hatchery from November 17, 1988 through April 7, 1989.

Table 1. Production Summary, 1988-89

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	15,880	1,228	3,472,735	1,938,914	0	23,668	624,000
Fall-run chinook salmon	20,506	2,210	5,783,490	2,921,982	93,300	45,785	925,000
Coho salmon	12,816	1,160	2,735,090	0	421,100	32,392	647,000
Steelhead	817	346	1,048,873	0	530,200	62,376	640,000
Totals	50,019	4,944	13,040,188	4,860,896	1,044,600	164,221	2,836,000

HATCHERY OPERATION

All production fish were reared on BioDiet starter and Oregon Moist Pellet. A total of 378,848 lb of feed produced 164,221 lb of fish during fiscal year 1988-89. The feed conversion rate (pounds of feed required to raise one pound of fish) was 2.3. This poor conversion rate was a result of heavy predation on chinook salmon yearlings being reared at the unfenced Ambrose ponds.

This past year broke all records for numbers of spring-run and fall-run chinook salmon returning to the Hatchery (Appendix Table 3). There was also a very strong coho run but lower than the previous year's total. Steelhead numbers were down drastically from runs of the previous 2 years.

Phase I of the hatchery modernization was completed and the Hatchery reopened to visitors about mid-February 1989. Visitors from then through June 30 totaled 2,681. We provided several tours for schools in the area.

CHINOOK SALMON MAINTENANCE PROGRAM

History of the 1988 Run

Chinook salmon arrived in the upper river about June 1. The ladder was opened September 6 and spawning operations began September 8.

Spring-Run

Between September 8 and October 8, a total of 15,880 chinook salmon, mostly spring-run, was trapped at the Hatchery (Table 1). This number included 9,232 males, 5,873 females, and 775 grilse. Chinook males less than 56 cm (22 inches) FL were considered to be grilse. The 1,228 females spawned during this period produced 3,472,735 eggs, an average of 2,828 per female. Egg size averaged 90 per ounce.

Fall-Run

There were 20,506 chinook salmon trapped from October 11 to December 5. Of this number, 10,159 were males, 6,721 females, and 3,626 grilse. The 2,210 females spawned produced 5,783,490 eggs, an average of 2,617 per female. Egg size averaged 86 per ounce.

Planting 1987 Brood Year Chinook Salmon

We planted a total of 93,300 fall-run chinook yearlings this fiscal year (Table 2).

TABLE 2. Yearling Chinook Salmon Planted 1988-89

CWT marked AC

Date	Size/lb	Race	Release site	Number
10/28/88	8.9	Fall	Ambrose Ponds	93,300

rescued at →

Planting 1988 Brood Year Chinook Salmon

A total of 4,860,896 chinook salmon fingerlings were planted in 1989 (Table 3).

TABLE 3. ⁸⁸1987 Brood Year Fingerling Chinook Salmon Planted in 1989

Date	Size/lb	Race	Release site	Number
5/26/89	73	Spring	Hatchery	899,944
5/26/89	83	Spring	Hatchery	463,970
5/26/89	100	Spring	Hatchery	575,000
6/12/89	73	Fall	Hatchery	1,387,000
6/12/89	91	Fall	Hatchery	986,986
6/12/89	101	Fall	Hatchery	448,036
6/12/89	98	Fall	Hatchery	99,960
Total				4,860,896

AC same 1988-89
AC 2822022 1988-89

Marked Chinook Salmon Returns

There were 2,752 chinook salmon, previously marked with an adipose fin-clip and tagged with coded-wire tags (CWT), trapped at the Hatchery during the 1988-89 season (Appendix Table 1).

COHO SALMON MAINTENANCE PROGRAM

History of the 1988-89 Run

Coho salmon entered the Hatchery from October 3, 1988 to January 19, 1989. We trapped 12,816 fish: 5,713 males, 5,802 females, and 1,301 grilse. We spawned 1,160 females from November 7 through December 1. They produced 2,735,090 eggs, an average of 2,358/female. Egg size averaged 91/ounce.

Planting 1987 Brood Year Coho Salmon

A total of 421,000 coho salmon yearlings was planted in fiscal year 1988-89 (Table 4).

TABLE 4. Coho Salmon Yearlings Planted in 1989

Date	Size/lb	Race	Release site	Number
3/20/89	13	Trinity	Hatchery	421,100

Marked Coho Salmon Returns

There were 310 coho salmon, previously marked with an adipose fin-clip and tagged with coded-wire tags (CWT), trapped at the Hatchery during the 1988-89 season (Appendix Table 1).

STEELHEAD MAINTENANCE PROGRAM

History of the 1988-89 Run

Steelhead entered the Hatchery trap from November 17, 1988 through April 7, 1989. The run consisted of 817 fish: 401 males and 416 females (Table 1). From December 27, 1988 through April 7, 1989, we spawned 346 of the females. They produced 1,048,873 eggs, an average of 3,031/female. Egg size averaged 203/ounce.

Steelhead Planted

A total of 530,200 steelhead was planted in fiscal year (FY) 1988-89 (Table 5).

TABLE 5. Steelhead Planted in 1988-89 FY

Strain and brood year	Date released	Average size/lb	Mark	Release site	Number released
TR 1988	3/01/89	8.5	None	Sawmill Site	5,100
TR 1988	4/03/89	8.5	None	Hatchery	525,100
				Total	530,200

Marked Steelhead Returns

Of the 817 steelhead returning to Trinity River Hatchery, 169 were marked (Table 6). All of the marked fish had been released from the Hatchery as 1.5 or 2 year-old fish.

TABLE 6. Marked Steelhead Recovered at Trinity River Hatchery, 1988-89

Mark trapped	Number	Mean fork inches	Length (Range)	Probable origin				
				Brood year	Date planted	Location	Number	Strain
LV	22	22	(17.5-34.0)	1985	9/22/86	Hatchery	29,140	Klamath R.
RV	147	23	(19.5-31.0)	1985	3/20/87	Hatchery	28,000	Klamath R.

BROWN TROUT MAINTENANCE PROGRAM

No brown trout were spawned or planted in 1988-89.

APPENDIX TABLE 1. Coded-Wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH) with Release Data, 1988-89

CWT Code	Race	Recovery Data						Recovery Data				
		Egg Source	Brood Year	Date	Number	Size /lb	Site	Year	Actual CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)	Mean Female FL (cm)
6-61-40	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)
								88-89	3	3	---	76 (3)
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)
								88-89	232	232	74 (98)	71 (134)
6-61-42	Spring chinook	TRH	85	06/02/86	192,487	70.0	TRH	87-88	68	68	49 (67)	67 (1)
								88-89	382	382	69 (177)	66 (205)
6-61-44	Spring chinook	TRH	85	10/03/86	101,091	12.6	TRH	87-88	51	51	44 (51)	---
								88-89	1,026	1,026	66 (650)	63 (376)
6-61-45	Spring chinook	TRH	86	05/28/87	197,113	75.2	TRH	88-89	7	7	50 (7)	---
6-61-46	Spring chinook	TRH	86	09/24/87	101,030	18.0	TRH	88-89	48	48	45 (47)	44 (1)
100000	Spring chinook	c/ d/						86-87	72	72	64 (45)	68 (27)
								87-88	93	93	61 (54)	68 (39)
								88-89	160	160	65 (100)	65 (60)
200000	Spring chinook	c/ d/						86-87	5	5	65 (2)	62 (1)
								87-88	4	4	62 (2)	64 (2)
								88-89	8	8	66 (5)	72 (3)

(Heubach 6/02/89)

APPENDIX TABLE 1. Coded-Wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH) with Release Data, 1988-89 (Continued)

CWT Code	Release Data							Recovery Data				
	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	06/10/85	189,708	53.0	TRH	86-87	178	178	50 (175)	50 (3)
								87-88	226	226	66 (95)	67 (131)
								88-89	28	28	72 (6)	74 (22)
6-56-17	Fall chinook	TRH	84	6/10-12/85	98,906	54.9	Steel-bridge	86-87	71	71	50 (70)	54 (1)
								87-88	33	33	64 (10)	68 (23)
								88-89	3	3	82 (2)	67 (1)
6-56-18	Fall chinook	TRH	84	6/12-13/85	98,989	55.0	Junction City	86-87	57	57	51 (57)	---
								87-88	56	56	68 (20)	67 (36)
								88-89	7	7	75 (3)	72 (4)
6-56-19	Fall chinook	TRH	84	6/14-17/85	94,100	54.1	Lime Point	86-87	105	105	51 (104)	50 (1)
								87-88	67	67	65 (28)	68 (39)
								88-89	6	6	71 (3)	76 (3)
6-61-28	Fall chinook	TRH	84	10/10/85	97,070	11.0	TRH	86-87	126	126	44 (125)	49 (1)
								87-88	608	608	61 (435)	62 (173)
								88-89	173	173	72 (60)	73 (113)
6-56-20	Fall chinook	TRH	84	10/08/85	30,459	12.5	Steel-bridge	86-87	18	18	46 (18)	---
								87-88	73	73	63 (50)	63 (23)
								88-89	27	27	75 (8)	73 (19)
6-56-21	Fall chinook	TRH	84	10/08/85	74,541	12.0	Junction City	86-87	11	11	46 (11)	---
								87-88	58	58	62 (41)	64 (17)
								88-89	6	6	74 (5)	77 (1)
6-56-22	Fall chinook	TRH	84	10/09/85	25,450	11.0	Lime Point	86-87	25	25	46 (25)	---
								87-88	80	80	62 (67)	65 (13)
								88-89	29	29	72 (12)	72 (17)
6-56-24	Fall chinook	TRH	84	2/27-28/86	102,512	5.6	TRH	86-87	161	161	38 (159)	38 (2)
								87-88	1,359	1,359	59(1,048)	60 (311)
								88-89	337	337	74 (100)	72 (237)

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

CWT Code	Race	Release Data				Recovery Data						
		Egg source	Brood year	Date	Number	Size /lb	Site	Year	Actual recoveries	Expanded CWT recoveries	Mean male FL (cm)	Mean female FL (cm)
6-56-23	Fall chinook	TRH	85	6/19/86	196,249	71.0	TRH	87-88	272	272	51 (271)	50 (1)
								88-89	492	492	68 (232)	68 (260)
6-56-25	Fall chinook	TRH	85	10/24/86	97,368	13.5	TRH	87-88	93	93	46 (92)	66 (1)
								88-89	812	812	65 (563)	65 (249)
6-56-26	Fall chinook	TRH	86	6/11,17/87	202,486	89.0	TRH	88-89	20	20	49 (20)	---
6-56-29	Fall chinook	TRH	86	6/11/87	99,118	83.0	Sawmill Pond	88-89	3	3	52 (3)	---
6-56-30	Fall chinook	TRH	86	6/27/87	92,351	69.0	Ambrose Pond	88-89	7	7	51 (7)	---
6-56-27	Fall chinook	TRH	86	9/21/87	100,320	19.0	TRH	88-89	424	424	49 (415)	49 (9)
6-56-28	Fall chinook	TRH	86	9/24/87	26,730	11.0	TRH	88-89	45	45	50 (40)	51 (5)
100000	Fall f/ chinook							86-87	146	146	58 (93)	64 (53)
								87-88	197	197	60 (129)	65 (68)
								88-89	152	152	65 (85)	68 (67)
200000	Fall f/ chinook							86-87	11	11	52 (8)	65 (3)
								87-88	10	10	62 (7)	71 (3)
								88-89	20	20	62 (11)	66 (9)

Footnotes:

a/ Sample size in parenthesis.

b/ --- = None sampled.

c/ 100000 = No CWT in head of Ad-marked fish.

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

e/ 200000 - CWT lost during dissection or CWT not decoded.

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

g/ Number of effectively tag fish released corrected based on shed rate of coho entering Trinity River Hatchery in 1988-89.

Marked Coho Salmon Returns

APPENDIX TABLE 1. Coded-Wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH), with Release Data, 1988-89. (continued)

CWT Code	Race	Release Data				Recovery Data						
		Egg source	Brood year	Date	Number	Size /lb	Site	Year	Actual CWT recoveries	Expanded CWT recoveries	Mean male FL (cm)	Mean female FL (cm)
6-56-54	Coho	TRH	85	7/30- 8/11/86	71,124 g/	63.4	TRH	87-88	81	81	52 (60)	62 (21)
								88-89	265	287	65 (146)	67 (119)
6-56-56	Coho	TRH	86	3/08/88	51,721	14.0	TRH	88-89	44	48	43 (44)	---
7-40-04	Coho	CRH	85	6/01/87	26,803	9.8	CRH	88-89	1	1	71 (1)	---
100000	Coho							87-88	174	174	61 (96)	66 (78)
								88-89	111	121	58 (69)	67 (42)
200000	Coho							87-88	10	10	63 (2)	66 (8)
								88-89	20	22	64 (12)	66 (8)

Footnotes:

a/ Sample size in parenthesis.

b/ --- = None sampled.

c/ 100000 = No CWT in head of Ad-marked fish.

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

e/ 200000 = CWT lost during dissection or CWT not decoded.

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

g/ Number of effectively tag fish released corrected based on shed rate of coho entering Trinity River Hatchery in 1988-89.

APPENDIX TABLE 2. Eggs and Fish Shipped From and Received at Trinity River Hatchery, July 1, 1988 through June 30, 1989.

No eggs or fish were shipped from or received during this report period.

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

Year	Chinook salmon			Coho salmon			Steelhead	Brown trout	
	Males	Females	Grilse	Males	Females	Grilse			
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	
1988-89	19,391	12,594	4,401	5,713	5,802	1,301	817	0	

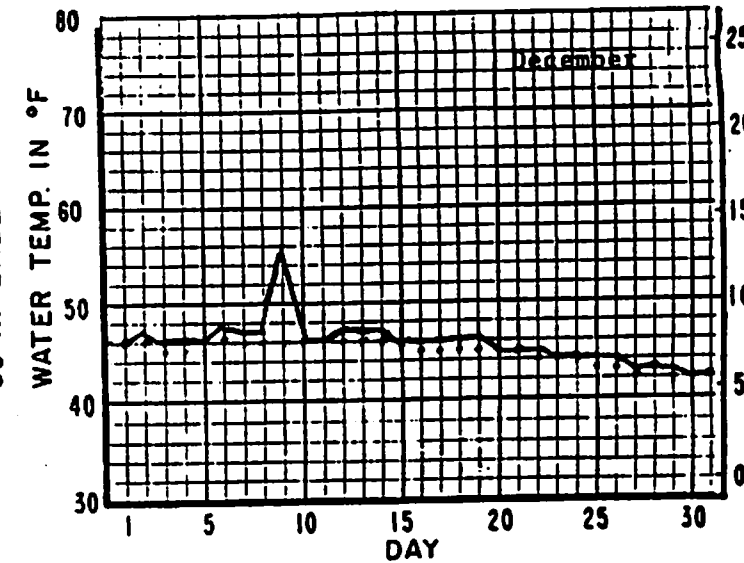
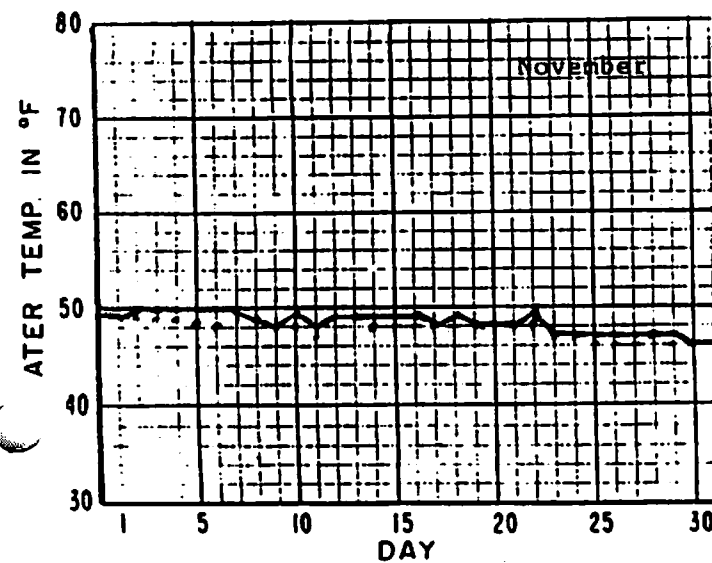
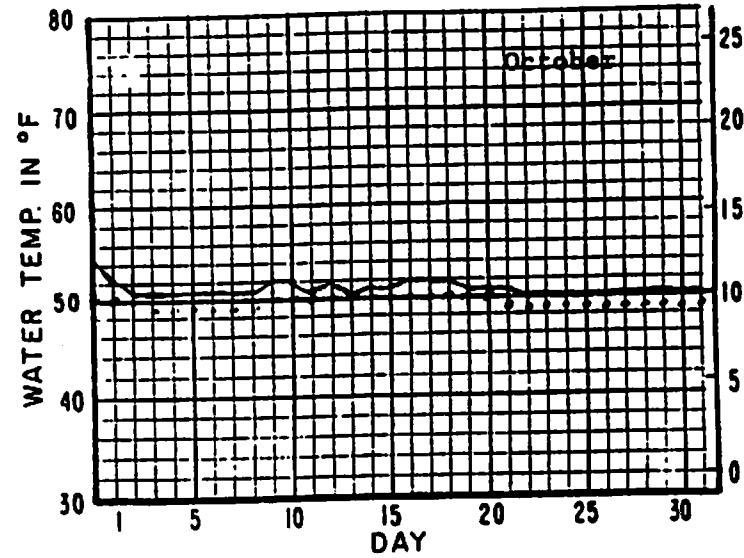
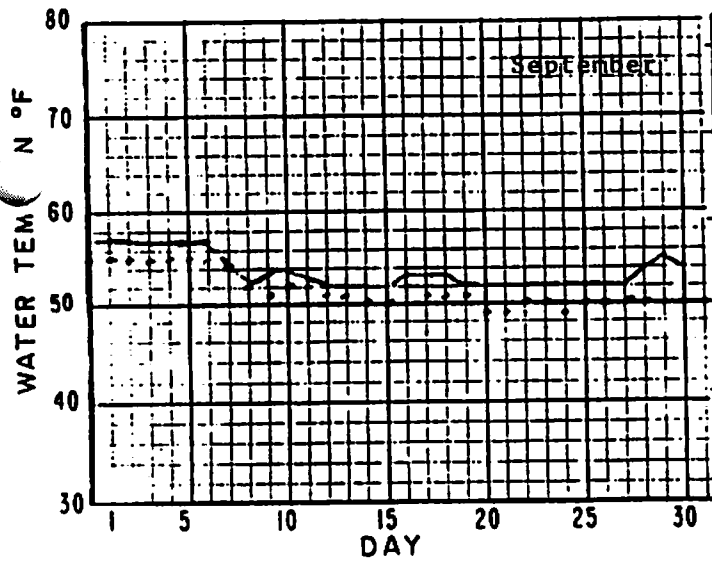
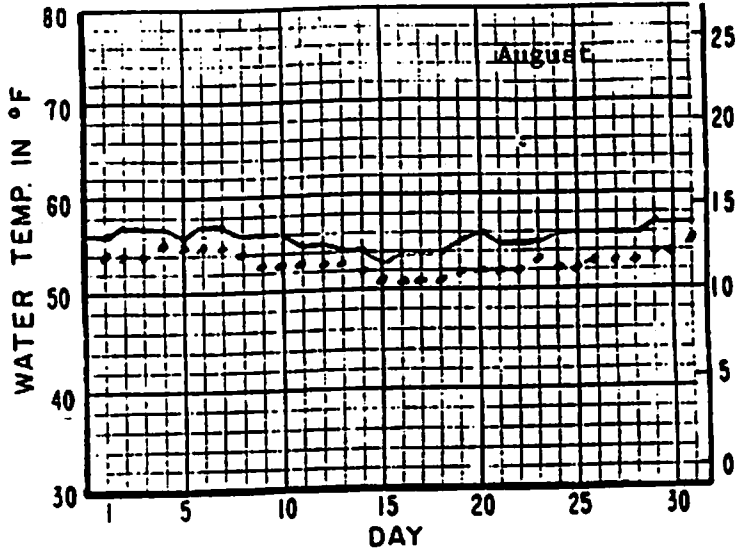
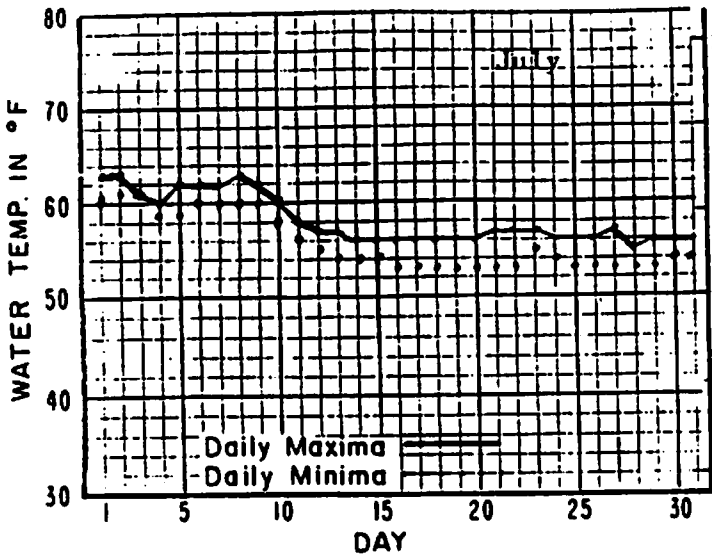
APPENDIX TABLE 4. Weekly Adult Salmon and Steelhead Trapping Date for 1988-89.

Week	Chinook salmon Adults Grilse	Coho salmon Adults Grilse	Steelhead trout Males Females
9/4-9/10/88	1,597	91	3
9/11-9/17/88	3,280	149	2
9/18-9/24/88	3,280	130	8
9/25-10/1/88	3,168	161	16
10/2-10/8/88	3,780	244	3
10/9-10/15/88	4,172	350	7
10/16-10/22/88	4,473	632	13
10/23-10/29/88	4,216	1,264	20
10/30-11/5/88	2,468	881	315
11/6-11/12/88	1,225	370	126
11/13-11/19/88	235	97	223
11/20-11/26/88	73	22	169
11/27-12/3/88	12	7	93
12/4-12/10/88	6	3	134
12/11-12/17/88			63
12/18-12/24/88		197	64
12/25-12/31/88		69	37
1/1-1/7/89		19	6
1/8-1/14/89		5	5
1/15-1/21/89		2	30
1/22-1/28/89			
1/29-2/4/89			
2/5-2/11/89			
2/12-2/18/89			
2/19-2/25/89			
2/26-3/4/89			
3/5-3/11/89			
3/12-3/18/89			
3/19-3/25/89			
3/26-4/1/89			
4/2-4/8/89			

Season Totals 31,985 4,401 11,515 1,301 401 416

Appendix Table 3. Daily Water Temperatures for Trinity River Salmon and Steelhead Hatchery from July 1, 1988 through June 30, 1989.

DAILY WATER TEMPERATURES BY MONTH



DAILY WATER TEMPERATURES BY MONTH

