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ANNUAL REPORT  
TRINITY RIVER SALMON AND STEELHEAD HATCHERY, 1991-92

by

Gary R. Ramsden  
Region 1, Inland Fisheries

Inland Fisheries  
Administrative Report No. 93-3

1993

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ABSTRACT

This report describes the operation of Trinity River Salmon and Steelhead Hatchery for the period July 1, 1991 through June 30, 1992. 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, daily water temperatures, and fish trapping data for the fiscal year.

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<sup>1/</sup> Inland Fisheries Administrative Report No. 93-3.  
Submitted for publication October 1992. Edited by  
K.A. Hashagen, California Department of Fish and Game,  
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### INTRODUCTION

This is the 34th 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, 1991 through June 30, 1992. Copies of previous annual reports are available from the Inland Fisheries Division, Sacramento.

### PRODUCTION SUMMARY

The ladder was opened on September 12, and spring-run chinook salmon began entering the trap. The run continued through October 17, at which time the majority of the salmon arriving were fall run. The fall run continued until December 6, 1991 .

Coho salmon were trapped from October 7, 1989 through December 12, 1991. Steelhead entered the Hatchery from October 7, 1991 through March 24, 1992.

TABLE 1. Production Summary, 1991-92.

<u>Species</u>	<u>Number trapped</u>	<u>Number females spawned</u>	<u>Eggs taken or received</u>	<u>Number fingerlings planted</u>	<u>Number yearlings planted</u>	<u>Total pounds planted</u>
Spring-run chinook salmon	862	251	756,007	210,188	600,262	66,815
Fall-run chinook salmon	2,510	709	1,794,305	581,539	643,910	74,102
Coho salmon	2,688	615	731,645	0	439,523	61,535
Steelhead	350	119	544,795	0	964,488	154,750
Total	6,410	1,694	3,826,752	791,727	2,648,183	357,202

## HATCHERY OPERATIONS

All production fish were reared on a Biodiet starter and Oregon Moist Pellet (OMP). A total of 512,950 lb of feed produced 357,202 lb of fish during the fiscal year. The feed conversion rate (pounds of feed required to raise 1 lb of fish) was 1.44.

The number of returning salmon and steelhead were down again this year. The spring-run chinook egg take was 25% of the number required to meet maximum production goals. The fall-run egg take was at 30%. Fortunately, there were no Infections Hematopoietic Necrosis (IHN) outbreaks or other disease problems affecting production after incubation. An assertive control plan of quarantine and sterilization during the spawning process may have contributed to the low IHN level.

Coho salmon were spawned in lots of three females or fewer. Each lot was tested for Bacterial Kidney Disease (BKD). Eggs from positive samples were destroyed; 1,682,100 eggs were taken and 287,700 were destroyed as BKD positive. The remaining BKD negative eggs produced 731,645 eyed eggs and approximately 449,000 fry. The fry were treated with Erythromycin administered through a feeding schedule for secondary control.

Visitors to the installation totaled 7,827. Guided tours were provided to Trinity County elementary schools and a work experience program for local high school students.

Phase II of hatchery modernization was completed. The incubator heating system was modified to obtain head pressure. The unit was not utilized this winter due to warmer water temperatures during the incubation period of steelhead egg lots.

## CHINOOK SALMON MAINTENANCE PROGRAM

### History of the 1991 Run

Chinook salmon arrived in the upper Trinity River about June 1. The ladder and trap was opened on September 12 and spawning started on September 16.

### Spring Run

Between September 16 and October 17, a total of 862 chinook salmon, mostly spring run, was trapped at the Hatchery. This total included 385 males, 340 females, and 137 grilse. Fish less than <u>56</u> cm (22 inches) fork length (FL) were considered grilse. The 251 females spawned during this period produced 756,007 eggs, an average of 3,012/female. Egg size averaged 88 eggs/oz.

Fall Run

From October 18 to December 6, the fall run numbered 2,510 fish. This total included 1,452 males, 748 females, and 310 grilse. The 709 females spawned produced 1,794,305 eggs, an average of 2,531/female. Egg size averaged 99/oz.

Planting 1990 Brood Year Chinook Salmon

We planted a total of 1,244,172 chinook yearlings this fiscal year (Table 2).

TABLE 2. Yearling Chinook Salmon Planted in 1991-92

Date	Size/lb	Race	Release site	Number
10/8/91	9.9	Spring	TRH <i>Mixed up - CWT</i>	600,262
10/9/91	11.7	Fall	TRH	216,302
10/9/91	10.9	Fall	TRH	427,608
Total				1,244,172

*652,153,wo*  
*643910*  
*wo*

Planting 1991 Brood Year Chinook Salmon

A total of 791,727 chinook salmon fingerlings was planted in 1992 (Table 3).

TABLE 3. 1991 Brood Year Fingerling Chinook Salmon

Date	Size/lb	Race	Release site	Number
6/5/92	34.0	Spring	TRH	210,188
6/22/92	34.0	Fall	TRH	370,600
6/22/92	39.0	Fall	TRH	155,883
6/22/92	37.0	Fall	TRH	55,056
Total				791,727

*652,153,wo*  
*643910*  
*wo*

Marked Chinook Salmon Returns

There were 361 chinook salmon previously marked with an adipose fin-clip and tagged with coded-wire tags, trapped at the Hatchery during the 1991-92 season (Appendix Table 1). All fish had been released from the Trinity River Hatchery.

COHO SALMON MAINTENANCE PROGRAM

History of the 1991 Run

Coho salmon entered the Hatchery from October 7, to December 12. We trapped 2,688 fish: 1,430 males, 1,056 females, and 202 grilse. After selecting for BKD negative eggs, 731,645 eggs produced 449,000 fish for the yearling program. Coho females averaged 1,190 eggs at 91/ounce.

Planted 1990 Brood Year Coho Salmon

TABLE 4. Yearling Coho Salmon Planted in 1992

Date	Size/lb	Race	Release site	Number
4/3/92	3.8	Trinity	TRH	107,958
4/3/92	9.6	Trinity	TRH	187,776
4/3/92	10.6	Trinity	TRH	143,789
Total				439,523

#65657      Combined      AC Same  
 TRH Rep# 387,290.

Marked Coho Salmon Returns

There were five coho salmon trapped at Trinity River Hatchery that were previously marked with an adipose clip and coded-wire tagged (Appendix Table 1). All were released from the Hatchery.

STEELHEAD MAINTENANCE PROGRAM

History of the 1991-92 Run

The first steelhead entered the Hatchery on October 7, 1991. We trapped through March 28, 1992, collecting 350 fish; 168 males; and 182 females. Between December 16, 1991 and March 23, 1992, we spawned 119 females. They produced 544,795 eggs, for an average of 4,578/female; eggs averaged 214/ounces.

Steelhead Planted

We planted a total of 964,488 yearling and 2-year old steelhead in FY 1991-92 (Table 5).

Table 5. Steelhead Planted in 1991-92

Strain and brood year	Date released	Average size/lb	Mark	Release site	Number
TR 1990	4/3/92	1.1	RV	TRH	1,909
TR 1991	4/17/92	5.5	LV	TRH	73,398
TR 1991	4/17/92	5.9	LV	TRH	418,251
TR 1991	4/17/92	6.5	LV	TRH	338,130
TR 1991	4/17/92	8.1	LV	TRH	132,800
Total					964,488

TRP 2834  
- 925 molt  
1909 Surv

Marked Steelhead Returns

Of the 312 steelhead returning to Trinity River Hatchery, 229 were marked (Table 6).

TABLE 6. Marked Steelhead Returned, 1991-92

Mark	Number trapped	Mean fork length in inches	Probable origin				
			Brood year	Date planted	Location	Number	Strain
Ad	2	26.5	Unknown				
AdLV	4	15.5	1990	3/18/91	TRH	969,600	TR
AdLVRV	1	26.0	Unknown				
AdRV	24	17.0	1989	3/18/91	TRH/ Saw Mill	185,571	TR
LP	2	25.5	Unknown				
LV	51	22.5	1989	4/23/90	TRH	405,997	TR
RP	1	26.0	Unknown				
RV	142	23.0	1988	3/15/90	TRH	50,490	TR
RPLV	2	27.0	Unknown				

BROWN TROUT MAINTENANCE PROGRAM

No brown trout were spawned or planted in 1991-92.

APPENDIX TABLE 1. Marked Salmon Returns

Release and recovery data of coded-wire tagged Trinity River Hatchery-produced chinook and coho salmon, 1988-89 through 1991-92 seasons. a/

Release data								Recovery data				
CWT code b/	Species/Race	Egg source	Brood year	Date	Number	Size No/lb	Site	Year	Actual CWT recoveries	Expanded CWT recoveries	Mean fork lengths (ca)	
											Male	Female
6-61-66	Spring-run chinook	TRH	86	09/26/87	101,030	18.0	TRH	88-89	48	48	45 (47) c/	44 (1)
								89-90	285	285	65 (210)	64 (75)
								90-91	264	264	73 (106)	71 (158)
								91-92	4	4	78 (1)	72 (3)
6-61-67	Spring-run chinook	TRH	87	05/23/88	185,718	85.0	TRH	89-90	6	6	50 (6)	- (0)
								90-91	55	55	64 (23)	64 (32)
								91-92	13	13	70 (4)	68 (9)
6-61-69	Spring-run chinook	TRH	88	05/26/89	181,698	83.0	TRH	90-91	2	2	52 (2)	- (0)
								91-92	13	13	66 (10)	68 (3)
6-61-68	Spring-run chinook	TRH	88	10/24/89	98,820	13.3	TRH	91-92	9	9	56 (7)	59 (2)
6-56-39	Spring-run chinook	TRH	89	10/01/90	102,555	11.5	TRH	91-92	6	6	46 (6)	- (0)
100000 d/	Spring-run chinook e/	TRH						89-90	50	50	75 (24)	71 (26)
								90-91	34	34	64 (15)	68 (19)
								91-92	15	15	65 (9)	68 (6)
6-56-33	Fall-run chinook	TRH	87	06/02/88	172,980	117.0	TRH	89-90	10	10	51 (10)	(0)
								90-91	16	16	60 (12)	62 (4)
								91-92	11	11	70 (7)	73 (4)
6-56-31	Fall-run chinook	TRH	87	10/28/88	92,300	8.9	TRH	89-90	11	11	47 (11)	- (0)
								90-91	70	70	56 (56)	61 (14)
								91-92	72	72	71 (33)	72 (39)
6-56-35	Fall-run chinook	TRH	88	06/12/89	194,197	73.0	TRH	90-91	9	9	48 (9)	- (0)
								91-92	23	23	66 (12)	66 (11)
6-56-32	Fall-run chinook	TRH	88	10/27/89	97,569	15.5	TRH	90-91	7	7	42 (7)	- (0)
								91-92	161	161	61 (118)	62 (43)
6-55-22	Fall-run chinook	TRH	88	11/01/89	22,234	7.1	TRH	91-92	14	14	64 (9)	65 (5)
6-55-23	Fall-run chinook	TRH	88	11/01/89	24,131	8.1	TRH	91-92	10	10	61 (7)	64 (3)
61411	Fall-run chinook	TRH	89	05/18/90	201,622	156.0	TRH	91-92	2	2	54 (1)	60 (1)
6-56-34	Fall-run chinook	TRH	89	10/15/90	97,810	9.7	TRH	91-92	4	4	43 (4)	- (0)



APPENDIX TABLE 1. (continued)

Release and recovery data of coded-wire tagged Trinity River Hatchery-produced chinook and coho salmon, 1988-89 through 1991-92 seasons. (continued)

Release data								Recovery data						
CWT code b/	Species/ Race	Egg source	Brood year	Brood Date	Number	Size No/lb	Site	Year	Actual CWT recoveries	Expanded CWT recoveries	Mean fork lengths (cm)			
											Male	Female		
6-56-37	Fall-run chinook	TRH	89	10/16/90	23,628	8.0	TRH	91-92	1	1	46	(1)	-	(0)
6-56-41	Fall-run chinook	TRH	89	10/16/90	22,540	8.3	TRH	91-92	3	3	46	(3)	-	(0)
100000 d/	Fall-run chinook f/							89-90	47	47	73	(22)	68	(25)
								90-91	9	9	60	(4)	71	(5)
								91-92	15	15	62	(10)	63	(5)
6-56-60	Coho	TRH	89	03/18/90	51,088	12.0	TRH	91-92	5	5	43	(5)	-	(0)
100000 d/	Coho							91-92	3	3	41	(3)	-	(0)

a/ Only coded-wire tag groups recovered during the 1991-92 season are listed.

b/ CWT=coded-wire tag

c/ Sample size in parenthesis.

d/ 100000=No coded-wire tag found or lost during recovery.

e/ Assumed to be spring chinook by entry date into Trinity River Hatchery.

f/ Assumed to be fall chinook by entry date into Trinity River Hatchery.

APPENDIX TABLE 2. Summary of Fish Runs to Trinity River Salmon and Steelhead Hatchery.

	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	468	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
1989-90	8,218	7,728	426	2,509	2,324	136	4,765	0
1990-91	1,677	2,166	413	666	706	263	927	0
1991-92	1,837	<del>1,088</del>	447	1,430	1,056	202	350	0

2,088  
 Typing  
 Error

**APPENDIX TABLE 3. Eggs and Fish Shipped from and Received at  
Trinity River Hatchery, July 1, 1991-June 30,  
1992**

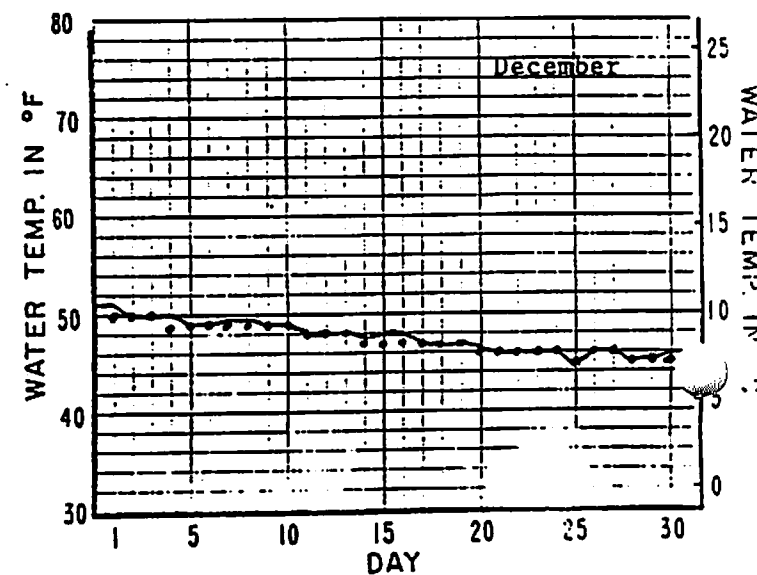
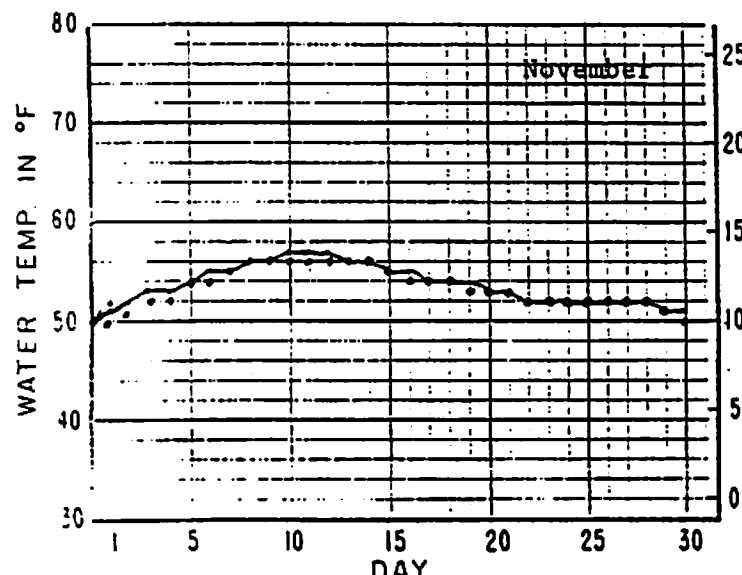
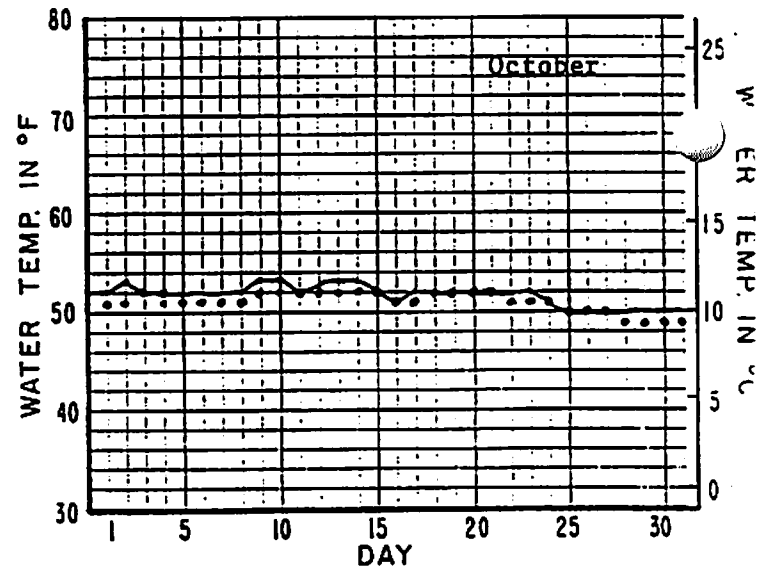
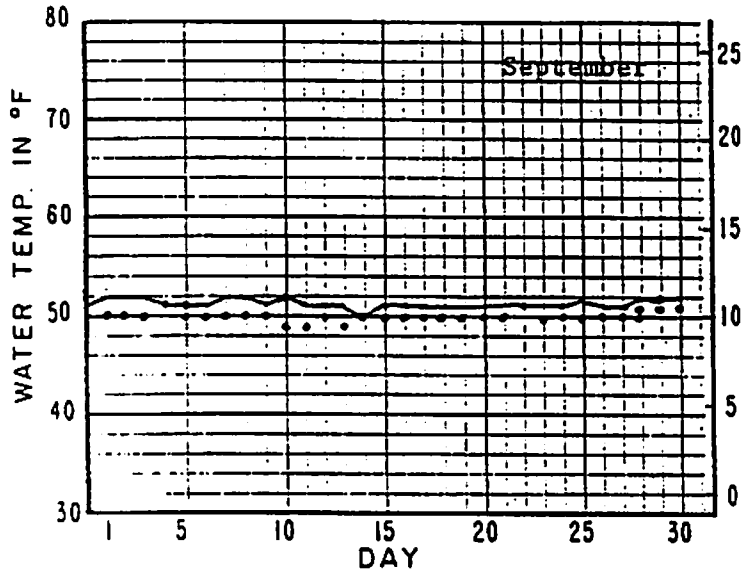
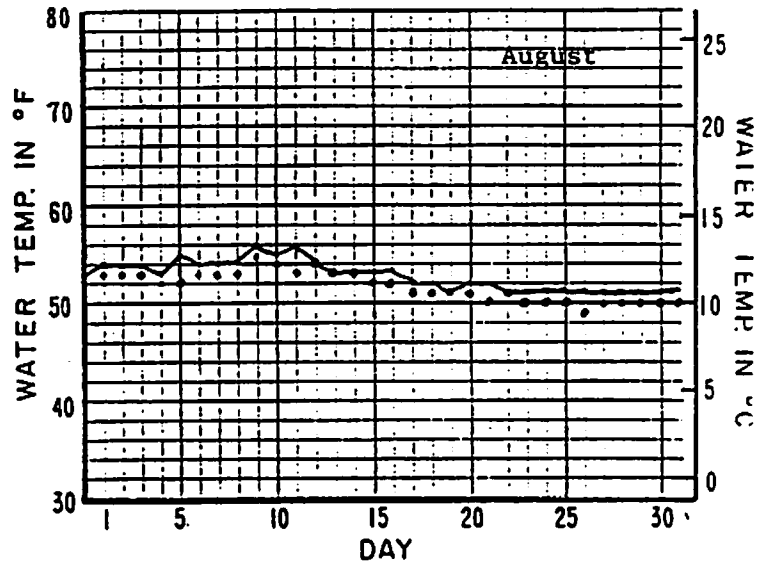
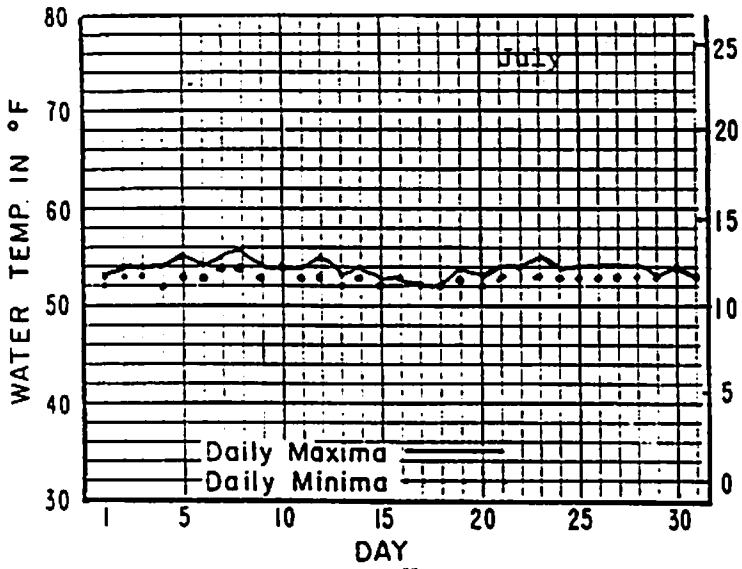
**No eggs or fish were shipped or received during this report  
period.**

APPENDIX TABLE 4. Weekly Adult Salmon and Steelhead Trapping Date, 1991-92

WEEK	Chinook		Coho		Steelhead	
	Adults	Grilse	Adult	Grilse	Male	Female
9/16-27/91	152	16				
9/22-28/91	177	24				
9/29-10/5/91	146	35				
10/6-12/91	96	23	1			1
10/13/-19/91	154	39	1	1	1	
10/20-26/91	374	67	10	5	1	
10/27-11/2/91	460	84	171	34	2	2
11/3-9/91	625	97	386	51	9	6
11/10-16/91	432	41	649	42	8	15
11/17-23/91	266	20	886	48	21	30
11/24-30/91	36	1	296	17	12	15
12/1-7/91	2		72	4	13	6
12/8-14/91	5		14		3	2
12/15-21/91						
12/22-28/91						
12/29-1/4/92						
1/5-11/92					3	5
1/12-18/92						
1/19-25/92					1	2
1/26-2/1/92					16	10
2/2-8/92					5	3
2/9-15/92					11	10
2/16-22/92					8	17
2/23-29/92					16	22
3/1-7/92					22	21
3/8-14/92					13	9
3/15-21/92					1	5
3/22-28/92					2	1
<b>Season</b>						
<b>Total</b>	<b>2,925</b>	<b>447</b>	<b>2,486</b>	<b>202</b>	<b>168</b>	<b>182</b>

Appendix Figure 1. Daily Temperatures for Trinity River  
Salmon and Steelhead Hatchery from July 1, 1991  
through June 30, 1992.

### DAILY WATER TEMPERATURES BY MONTH



Appendix Figure 1. (continued)

### DAILY WATER TEMPERATURES BY MONTH

