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State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
TRINITY RIVER SALMON AND STEELHEAD HATCHERY, 1986-87

by

Gerald W. Bedell
Region 1, Inland Fisheries

Inland Fisheries

Administrative Report No. 90-17

1990

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ABSTRACT

This report describes the operation of Trinity River Salmon and Steelhead Hatchery for the period July 1, 1986 through June 30, 1987. 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. 90-17
Submitted for publication November 1987. Edited by K. A. Hashagen, California Department of Fish and Game, 1416 Ninth Street, Sacramento, CA 95814

INTRODUCTION

This is the 29th 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, 1986 through June 30, 1987. Copies of previous annual reports are available from the Inland Fisheries Division, Sacramento.

PRODUCTION SUMMARY

The ladder was opened on August 29 and spring run chinook salmon began entering the trap (Table 1). The run continued through October 6, at which time the majority of the salmon arriving were fall run. The fall run continued until December 8, 1986.

Coho salmon were trapped from October 6 through December 29, 1986. Steelhead entered the Hatchery from October 14, 1986 through March 26, 1987.

TABLE 1. Production Summary, Trinity River Salmon and Steelhead Hatchery, 1986-87

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							
salmon	5,669	1,478	4,134,844	2,092,770	492,860	63,286	600,000
Fall run chinook salmon							
salmon	22,278	5,322	13,075,754	3,680,881	1,018,440	119,013	1,000,000
Coho salmon							
salmon	8,132	1,280	3,130,306	339,935	568,803	54,906	880,000
Steelhead							
Steelhead	3,780	841	2,884,335	0	536,743	65,644	1,515,997
Totals	39,859	8,921	23,225,239	6,113,586	2,616,846	302,849	3,995,997

HATCHERY OPERATION

All production fish were reared on a diet of Oregon Moist Pellet. A total of 406,956 lb of feed produced 302,849 lb of fish during fiscal year 1986-87. The feed conversion rate (pounds of feed required to raise 1 lb of fish) was 1.34.

This past year was most notable for the huge chinook salmon run, the largest in the history of the Hatchery, with a total of 27,947 fish. Over 17 million chinook eggs were taken and many of the trapped fish returned to the river to spawn naturally. Steelhead arrived at the Hatchery in numbers far exceeding our needs for hatchery production; the excess were returned to the river to spawn naturally. In both cases, eggs were taken from throughout the run to maintain genetic integrity and timing of return in future runs.

Approximately 7,000,000 of the fall run chinook eggs taken at Trinity River Hatchery were transferred as fry to the Sawmill rearing ponds and to a newly constructed rearing area on the Ambrose property located downstream at the mouth of Rush Creek. From these two facilities over 4,000,000 smolts were released into the Trinity River.

After many years of anticipation and false starts, construction to modernize the Hatchery became a reality. While confined to replacing the old and leaking pipeline at the present time, total modernization should proceed on schedule this coming year.

A total of 10,885 people visited the Hatchery this past year. Guided tours were provided for several of the larger groups, most of which were from schools in the area.

CHINOOK SALMON MAINTENANCE PROGRAM

History of the 1986 Run

Chinook salmon were first seen in the upper river at the Hatchery on May 27. The ladder was opened August 29 and spawning operations began September 2.

Spring Run

Between September 6 and October 6, a total of 5,669 chinook salmon, mostly spring run, was trapped at the Hatchery. This number included 2,764 males, 1,942 females, and 963 grilse. Chinook salmon males less than 56 cm (22 inches) FL are considered to be grilse. The 1,478 females spawned during this period produced 4,134,844 eggs, an average of 2,798 eggs/female. Egg size averaged 106/oz.

Fall Run

There were 22,278 chinook salmon trapped from October 9 to December 8. Of this number 10,345 were males; 7,434 females; and 4,499 grilse. The 5,322 females spawned produced 13,075,754 eggs, an average of 2,457 eggs/female. Egg size averaged 98/oz.

Marked Chinook Salmon Returns

There were 5,877 chinook salmon marked with an adipose fin clip and tagged with coded wire tags (CWT) trapped at the Hatchery during the 1986-87 season (Appendix Table 1).

Planting 1985 Brood Year Chinook Salmon

A total of 1,511,300 chinook yearlings was planted during this fiscal year (Table 2).

A total of 5,352,235 fingerling chinook salmon (1985 brood year) was planted during the last fiscal year. Of the 8,144,628 (spring and fall run combined) 1985 brood year chinook salmon eggs taken, 6,863,535 (84%) were eventually planted as fish.

TABLE 2. Yearling Chinook Salmon Planted from Trinity River Salmon and Steelhead Hatchery 1986-87^{1/}

BY 85

Date	Size/lb	Race	Release site	Number
10/01/86	11.0	Spring	Hatchery	166,650
10/02/86	13.0	Spring	Hatchery	62,400
10/02/86	11.0	Spring	Hatchery	105,875
10/03/86	12.0	Spring	Hatchery	157,935
10/08/86	13.5	Fall	Hatchery	224,100
10/17/86	12.0	Fall	Hatchery	156,000
10/21/86	14.0	Fall	Hatchery	31,850
10/22/86	12.0	Fall	Hatchery	91,500
10/22/86	13.0	Fall	Hatchery	98,800
10/23/86	12.0	Fall	Hatchery	161,040
10/24/86	13.5	Fall	Hatchery	98,550
10/27/86	12.0	Fall	Hatchery	156,600

Total 1,511,300

^{1/} All fish were Trinity River stock.

Planting 1986 Brood Year Chinook Salmon

A total of 5,773,651 chinook salmon fingerlings was planted in 1987 (Table 3).

Table 3. 1986 Brood Year Fingerling Chinook Salmon Planted
Trinity River Salmon and Steelhead Hatchery, 1987

Date	Size/lb	Race	Release site	Number
3/18/87	622.0	Fall	Hoopa Valley Hatchery	79,616
5/05/87	120.0	Spring	Hatchery	567,000
5/07/87	121.0	Spring	Hatchery	526,350
5/26/87	85.0	Spring	Hatchery	176,375
5/27/87	93.0	Spring	Hatchery	313,875
5/28/87	75.2	Spring	Hatchery	204,920
5/28/87	110.0	Spring	Hatchery	104,500
6/09/87	85.0	Spring	Hatchery	199,750
6/03/87	97.0	Fall	Hatchery	356,475
6/05/87	110.0	Fall	Hatchery	715,000
6/09/87	95.0	Fall	Hatchery	285,000
6/10/87	101.0	Fall	Hatchery	631,575
6/11/87	100.0	Fall	Hatchery	99,000
6/12/87	67.0	Fall	Hatchery	201,670
6/12/87	118.0	Fall	Hatchery	299,720
6/17/87	78.0	Fall	Hatchery	107,250
6/18/87	110.0	Fall	Hatchery	363,000
6/19/87	71.0	Fall	Hatchery	381,625
6/23/87	74.0	Fall	Hatchery	160,950
Total				5,773,651

COHO SALMON MAINTENANCE PROGRAM

History of the 1986 Run

Coho salmon entered the Hatchery from October 6 through December 29. We trapped 8,132 fish: 1,309 males, 1,593 females, and 5,230 grilse. We spawned 1,280 females from November 6 through December 15. They produced 3,130,306 eggs, an average of 2,446 eggs/female. Egg size averaged 96/oz.

Marked Coho Salmon Returns

A total of 1,369 of the coho salmon trapped had been marked with an adipose fin clip and CWT (Appendix Table 1).

Planting 1985 Brood Year Coho Salmon

A total of 908,738 coho salmon was planted during this fiscal year (Table 4).

TABLE 4. Coho Salmon Fingerlings and Yearlings Planted in 1986 and 1987^{1/}

Date	Race	Size/lb	Number
7/30/86	Trinity	63.0	157,500
8/01/86	Trinity	71.0	176,009
8/11/86	Trinity	63.0	6,426
3/19/87	Trinity	8.2	99,220
3/20/87	Trinity	8.7	77,213
3/23/87	Trinity	10.0	113,000
3/23/87	Trinity	16.8	94,920
3/24/87	Trinity	15.5	184,450
Total			908,738

^{1/}All fish were planted at the Hatchery.

STEELHEAD MAINTENANCE PROGRAM

History of the 1986-87 Run

Steelhead entered the trap at Trinity River Hatchery from October 14 through March 26. The run consisted of 3,780 fish: 2,146 males and 1,634 females. From December 29, 1986 through March 19, 1987, a total of 841 of the females was spawned. They produced 2,884,335 eggs, an average of 3,430 eggs/female. Egg size averaged 218/oz.

Steelhead Planted

We planted 536,743 steelhead in FY 1986-87 (Table 5).

TABLE 5. Steelhead Planted in 1986-87 FY

Strain and brood year	Date released	Average size/lb	Mark	Release site	Number released
IG 1985	9/26/86	4.7	LV	Hatchery	29,140
TR 1986	3/13/87	10.0	None	Hatchery	76,500
IG 1985	3/20/87	2.6	RV	Hatchery	28,000
TR 1986	3/30/87	9.3	None	Hatchery	51,380
TR 1986	3/31/87	10.0	None	Hatchery	126,000
IG 1986	4/01/87	9.8	None	Hatchery	81,585
IG 1986	4/03/87	10.0	None	Hatchery	48,750
TR 1986	4/06/87	9.9	None	Hatchery	85,388
					Total 536,743

Marked Steelhead Returns

Of the 3,780 steelhead returning to Trinity River Hatchery, 229 were marked (Table 6). All of the marked fish had originally been released from the Hatchery as yearling, 1.5, or 2 year old fish.

TABLE 6. Marked Steelhead Recovered at Trinity River Hatchery, 1986-87

Mark	Number trapped	Mean fork length inches	(range)	Probable origin				
				Brood year	Date planted	Location	Number	Strain
AD	1	22.0	(22.0)	1982	4/19/83	Hatchery	141,244	Trinity River
LV	17	18.8	(15.0- 21.0)	1984	9/17/85	Hatchery	18,963	Trinity River
RV	211	19.2	(14.5- 22.5)	1984	3/12/86	Hatchery	17,775	and Iron Gate ^{1/} Trinity River
								and Iron Gate ^{2/}

^{1/} 15,170 TR and 3,793 IG

^{2/} 14,220 TR and 3,555 IG

BROWN TROUT MAINTENANCE PROGRAM

No brown trout were spawned or planted during fiscal year 1986-87.

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

CWT code	Race	Release data						Recovery data					
		Egg source	Brood year	Date	Number	#/lb	Site	Year	Actual CWT recoveries	Expanded CWT recoveries	Mean male FL (cm)	Mean female FL (cm)	
6-61-37	Spring chinook	TRH	81	10/6,7/82	98,637	13.0	TRH	83-84	13	13	40 (13) ^{a/}	---b/	
								84-85	121	121	57 (89)	58 (30)	
								85-86	305	305	77 (135)	73 (170)	
								86-87	1	1	---	67 (1)	
6-61-41	Spring chinook	TRH	82	6/27/83	146,194	81.0	TRH	84-85	5	5	39 (5)	---	
								85-86	29	29	66 (14)	63 (15)	
								86-87	19	19	72 (7)	72 (12)	
6-61-38	Spring chinook	TRH	82	11/3/83	96,461	12.3	TRH	84-85	21	21	42 (20)	49 (1)	
								85-86	236	236	65 (174)	63 (62)	
								86-87	105	105	79 (46)	73 (59)	
6-61-40	Spring chinook	TRH	83	10/3/84	90,293	11.0	TRH	85-86	101	101	45 (108)	---	
								86-87	594	594	62 (403)	62 (191)	
6-61-43	Spring chinook	TRH	84	10/2/85	98,568	13.5	TRH	86-87	109	109	43 (108)	50 (1)	
100000 ^{c/}	Spring ^{d/} chinook							84-85	23	23	53 (16)	63 (7)	
								85-86	48	48	61 (37)	70 (11)	
								86-87	72	72	64 (45)	68 (27)	
200000 ^{e/}	Spring ^{d/} chinook							85-86	6	6	54 (5)	73 (1)	
								86-87	5	5	65 (2)	62 (3)	

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

CWT code	Race	Egg source	Brood year	Release data				Recovery data				Mean male FL (cm)	Mean female FL (cm)
				Date	Number	#/lb	Site	Year	Actual recoveries	CWT recoveries	Expanded CWT recoveries		
6-61-24	Fall chinook	TRH	82	6/27/83	138,801	113.0	TRH	84-85	9	9	43 (9)	---	
								85-86	46	46	64 (25)	66(21)	
								86-87	11	11	79 (2)	72 (9)	
6-61-23	Fall chinook	TRH	82	6/28/83	90,242	134.0	Steel-bridge f/	84-85	6	6	46 (6)	---	
								85-86	14	14	65 (9)	64 (5)	
								86-87	1	1	---	82 (1)	
6-61-25	Fall chinook	TRH	82	6/28-29/83	90,694	146.7	Junction City	84-85	6	6	46 (6)	---	
								85-86	20	20	62 (14)	68 (6)	
								86-87	2	2	---	77 (2)	
6-61-29	Fall chinook	TRH	82	11/9/83	96,583	13.5	TRH	84-85	53	53	46 (52)	54 (1)	
								85-86	319	319	67(206)	67(111)	
								86-87	20	20	83 (10)	76 (10)	
6-56-09	Fall chinook	TRH	82	11/14/83	20,765	11.3	Steel-bridge	84-85	27	27	46 (27)	---	
								85-86	95	95	66 (64)	67 (31)	
								86-87	8	8	70 (1)	80 (7)	
6-56-10	Fall chinook	TRH	82	11/14/83	20,902	13.4	Junction City	84-85	11	11	46 (10)	56 (1)	
								85-86	64	64	66 (42)	68 (22)	
								86-87	4	4	73 (3)	74 (1)	
6-56-11	Fall chinook	TRH	82	11/15/83	21,223	11.0	Lime Point h/	84-85	14	14	46 (14)	---	
								85-86	49	49	66 (34)	68 (15)	
								86-87	5	5	---	80 (5)	
6-61-26	Fall chinook	TRH	83	6/7/84	191,094	59.0	TRH	85-86	590	590	53(585)	59 (5)	
								86-87	228	228	66 (84)	67(144)	

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

CWT code	Race	Egg source	Brood year	Release data				Actual CWT recoveries	Recovery data		Mean male FL (cm)	Mean female FL (cm)
				Date	Number	#/lb	Site		Expanded CWT recoveries			
6-56-08	Fall chinook	TRH	83	6/19/84	91,153	46.0	Steel-bridge	85-86 86-87	350 76	350 76	54(345) 66 (23)	67 (5) 66 (53)
6-56-12	Fall chinook	TRH	83	6/20/84	97,311	49.0	Junction City	85-86 86-87	493 119	493 119	54(489) 67 (40)	60 (4) 67 (79)
6-56-13	Fall chinook	TRH	83	6/22/84	100,227	46.0	Lime Point	85-86 86-87	657 143	657 143	54(645) 66 (51)	59 (12) 66 (92)
6-61-13	Fall chinook	TRH	83	10/4/84	100,520	12.5	TRH	85-86 86-87	640 1,011	640 1,011	49(640) 65(564)	---
6-56-14	Fall chinook	TRH	83	10/16/84	25,547	12.1	Steel-bridge	85-86 86-87	67 150	67 150	47 (67) 64 (89)	---
6-56-15	Fall chinook	TRH	83	10/17/84	25,754	13.4	Junction City	85-86 86-87	57 109	57 109	47 (57) 64 (67)	---
6-56-16	Fall chinook	TRH	83	10/18/84	26,171	14.1	Lime Point	85-86 86-87	37 89	37 89	47 (37) 64 (64)	---
6-63-01	Fall chinook	TRH	83	3/1/85	92,965	5.3	TRH	85-86 86-87	543 2,319	543 2,319	40(543) 60(1,506)	---
6-61-27	Fall chinook	TRH	84	6/10/85	189,708	53.0	TRH	86-87	178	178	50(175)	50 (3)
6-56-17	Fall	TRH	84	6/10-12/85	98,906	54.9	Steel-bridge	86-87	71	71	50 (70)	54 (1)

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

CWT code	Race	Egg source	Brood year	Release data				Recovery data				
				Date	Number	#/lb	Site	Year	Actual CWT recoveries	Expanded CWT recoveries	Mean Male FL (cm)	Mean Female FL(cm)
6-56-18	Fall chinook	TRH	84	6/12-13/85	98,989	55.0	Junction City	86-87	57	57	51 (57)	---
6-59-19	Fall chinook	TRH	84	6/14, 17/85	94,100	54.1	Lime Point	86-87	105	105	51(104)	50 (1)
6-61-28	Fall chinook	TRH	84	10/10/85	97,070	11.0	TRH	86-87	126	126	44(125)	49 (1)
6-56-20	Fall chinook	TRH	84	10/8/85	30,459	12.5	Steel-bridge	86-87	18	18	46 (18)	---
6-56-21	Fall chinook	TRH	84	10/8/85	24,541	12.0	Junction City	86-87	11	11	46 (11)	---
6-56-22	Fall chinook	TRH	84	10/9/85	25,450	11.0	Lime Point	86-87	25	25	46 (25)	---
6-56-24	Fall chinook	TRH	84	2/27-28/86	102,512	5.6	TRH	86-87	161	161	38(159)	38 (2)
6-59-26	Fall chinook	IGH ^{1/}	83	11/1/84 & 12/1/84	23,725	43.7	IGH	86-87	1	1	---	61 (1)
H50606	Fall chinook	Bonneville ^{1/}	83	6/1/84	72,027	70.7	Columbia River	86-87	1	1	---	75 (1)
100000	Fall chinook							84-85	19	19	55 (14)	70 (5)
								85-86	171	171	52(154)	66(17)
								86-87	146	146	58 (93)	64(53)

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

CWT code	Race	Egg source	Brood year	Date	#/lb	Site	Year	Recovery data		
								Actual recoveries	CWT recoveries	Mean FL (cm)
200000	Fall chinook	k/						85-86 86-87	30 11	53 (30) 52 (8) 65 (3)

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 time into TRH.
- e/ 200000 = CWT lost during dissection.
- f/ Steelhead is 8.5 miles (13.6 km) downstream of TRH.
- g/ Junction City is 32.2 miles (51.6 km) downstream of TRH.
- h/ Lime Point is 38.4 miles (61.6 km) downstream of TRH.
- i/ IGH = Iron Gate Hatchery.
- j/ Bonneville Dam, Columbia River, Washington.
- k/ Assumed to be fall chinook by entry time into TRH.

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

code	Race	Egg source		Brood year	Date	Number	#/lb	Site	Year	Recovery data		
		Actual	CWT							Mean male	Mean female	FL (cm)
6-56-46	Coho	TRH	82	3/12/84	47,312	12.7	TRH	84-85	140	140	43(109)	44 (1)
								85-86	561	561	69(272)	71(288)
								86-87	1	1	---	82 (1)
6-56-50	Coho	TRH	83	3/21/85	50,878	7.5	TRH	85-86	971	971	47(781)	51(189)
								86-87	812	812	68(336)	69(476)
6-56-51	Coho	TRH	83	3/21/85	22,331	7.5	TRH	85-86	574	574	49(445)	52(126)
								86-87	328	328	69(150)	69(178)
6-56-52	Coho	TRH	84	7/11/85	99,293	57.0	TRH	86-87	34	34	54 (31)	64 (3)
5-56-55	Coho	TRH	84	10/30/85	104,822	27.5	TRH	86-87	8	8	41 (8)	---
6-56-53	Coho	TRH	84	3/18-19/86	45,601	13.0	TRH	86-87	185	185	42 (182)	46 (3)
7-21-61	Coho	Umpqua ¹ / ₂ River ³	4/1/85	25,992	9.5	Rock Creek ^m /River	86-87	1	1	---	70 (1)	
1000000	Coho						85-86	486	486	59(298)	66(188)	
							86-87	75	75	46 (51)	68 (24)	
2000000	Coho						85-86	26	26	52 (17)	67 (9)	
							86-87	3	3	50 (2)	63 (1)	

Footnotes:

^{1/} Umpqua River, Oregon.
^{m/} Rock Creek Hatchery, Umpqua River, Oregon.

APPENDIX TABLE 2. Eggs and Fish Shipped From Trinity River Hatchery, July 1, 1986
Through June 30, 1987

<u>Shipped</u>	<u>Number</u>	<u>Date</u>	<u>Destination</u>
Fall run Chinook fingerlings	79,616	3/18/87	Hoopa Valley
Fall run Chinook eggs	2,400,000	12/22/87	Sawmill Ponds
Fall run Chinook fingerlings	2,800,000	3/13/87	Ambrose Ponds
TOTAL SHIPPED: Fish -	2,879,616		
Eggs -	2,400,000		

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

	Chinook salmon			Coho salmon			Grilse	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	34	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	1,058	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	

APPENDIX TABLE 4. Trinity River Salmon and Steelhead Hatchery Weather and Water Data and Counts of Fish During Spawning Operations, July 1, 1986, Through June 30, 1987

July	Temperature °F			Weather	Flow of Trinity River at Lewiston (cfs)			Fish trapped		
	Air		Water		at Lewis		Chinook	Salmon	Coho salmon	Adults grilse
	Maximum	Minimum	Maximum	Minimum						Steelhead
1	98	54	58	56	clear					747
2	96	56	57	54	clear					813
3	90	57	54	52	clear					813
4	82	48	54	52	partly cloudy					812
5	89	43	53	52	clear					809
6	86	48	53	51	clear					811
7	86	52	53	50	clear					819
8	88	50	56	50	clear					810
9	90	52	55	52	clear					801
10	93	56	56	53	clear					800
11	94	56	57	53	clear					804
12	97	55	57	55	clear					799
13	93	55	59	55	clear					803
14	92	52	56	53	clear					799
15	92	54	57	54	clear					793
16	82	50	54	52	clear					793
17	85	50	56	52	clear					787
18	83	50	56	51	clear					787
19	95	46	56	52	clear					793
20	103	51	58	54	clear					793
21	103	56	59	54	clear					808
22	90	60	58	53	clear					810
23	86	56	57	53	partly cloudy					818
24	92	54	57	53	clear					818
25	88	56	56	53	partly cloudy					818
26	89	51	57	55	partly cloudy					803
27	88	52	58	55	clear					802
28	91	52	58	53	clear					681
29	93	41	58	53	clear					628
30	94	54	58	55	clear					628
31	100	56	60	55	clear					627

1/ From USGS records.

Appendix Table 4. (Continued).

August	Temperature °F			Weather	Trinity River at Lewiston (cfs)			Fish trapped		
	Air		Water		Maximum	Minimum		Chinook salmon	Coho salmon	Adults grilse
	Maximum	Minimum								Steelhead
1	100	56	60	55	clear					
2	100	56	60	54	clear					
3	102	58	57	54	clear					
4	103	59	58	54	clear					
5	98	58	58	55	clear					
6	96	54	56	53	clear					
7	98	56	56	53	clear					
8	100	54	56	52	clear					
9	101	53	58	53	clear					
10	95	55	58	54	clear					
11	96	56	58	53	clear					
12	99	54	57	53	clear					
13	100	57	57	55	clear					
14	98	54	58	53	clear					
15	96	53	56	52	partly cloudy					
16	89	52	58	53	clear					
17	90	55	55	53	clear					
18	98	52	56	52	clear					
19	100	52	56	52	clear					
20	96	54	56	53	high clouds					
21	96	53	56	52	clear					
22	95	52	55	52	partly cloudy					
23	98	50	56	52	clear					
24	92	49	58	53	partly cloudy					
25	93	53	54	51	partly cloudy					
26	86	51	54	52	clear-cloudy					
27	92	55	56	52	clear					
28	87	56	57	52	clear					
29	88	50	54	52	clear					
30	90	49	56	52	clear					
31	93	51	56	53	clear					

1/ From USGS records.

Appendix Table 4. (Continued).

September	Temperature °F			Weather	Trinity River at Lewiston (cfs)			Fish trapped		
	Air		Water		Maximum	Minimum		Chinook salmon	Coho salmon	Adults grilse
	Maximum	Minimum								Steelhead
1	96	51	57	53	clear			299		321
2	97	56	58	54	clear			299		125
3	103	54	57	53	clear			299		
4	101	56	58	54	clear			302	12	2
5	102	57	57	52	clear			301		
6	100	54	57	53	clear			302		
7	90	52	57	54	partly cloudy			302		
8	83	48	55	52	clear			305	219	54
9	80	40	54	51	clear			303		
10	86	42	54	50	clear			304		
11	86	46	55	50	clear			307	140	21
12	76	54	54	51	overcast			308		
13	77	40	52	49	partly cloudy			303		
14	48	46	52	50	cloudy			302		
15	56	48	50	49	overcast-rain			304	403	42
16	56	48	50	49	overcast-rain			310		
17	64	49	50	49	rain-overcast			310		
18	52	44	48	48	overcast-rain			311	342	30
19	63	46	49	48	overcast			310		
20	72	46	50	47	cloudy-clear			311		
21	74	43	50	47	partly-cloudy			311		
22	80	40	52	49	fog-clear			311	927	100
23	66	40	51	49	fog-overcast			316		
24	58	50	51	49	rain			314	605	90
25	58	44	49	48	partly cloudy			314		
26	52	44	48	48	rain			317		
27	68	42	49	47	partly cloudy			319		
28	72	40	50	47	foggy-clear			321		
29	86	41	51	48	fog-clear			320	658	143
30	76	46	51	49	fog-clear			317		
Totals								3,627	607	

1/ From USGS records.

Appendix Table 4. (Continued).

October	Temperature °F				Weather	Trinity River at Lewiston (cfs)	Fish trapped		
	Air		Water				Chinook salmon Adults grilse	Coho salmon Adults grilse	Steelhead
	Maximum	Minimum	Maximum	Minimum					
1	70	40	50	49	clear-windy	322			
2	70	40	51	49	clear	325	434	163	
3	80	36	52	49	clear	324			
4	81	38	53	49	fog-clear	323			
5	86	42	55	48	fog-clear	320			
6	86	43	53	51	clear	320	645	193	5
7	85	41	55	51	fog-clear	320			
8	84	45	55	52	fog-clear	323			
9	86	45	56	52	fog-clear	322	1,114	205	8
10	84	47	55	53	fog-clear	321			
11	80	43	55	52	fog-clear	320			
12	79	34	53	50	clear	318			
13	79	32	54	50	clear	316			
14	76	36	54	51	fog-clear	316	1,009	389	33
15	80	36	54	51	fog-clear	314			
16	70	38	50	49	clear	313	313	272	59
17	62	46	52	50	partly clear	317			5
18	69	44	51	50	partly cloudy	318			
19	73	43	50	49	fog-clear	317			
20	74	45	51	48	fog-clear	320	762	360	11
21	74	44	52	50	FOG-CLEAR	318			208
22	76	44	53	50	FOG-CLEAR	320	1,072	124	1
23	58	38	50	50	overcast	320	1,909	235	17
24	62	51	50	50	misty-cloudy	320			163
25	75	49	51	49	misty-clear	320			5
26	71	49	51	49	fog-cloudy	320			
27	68	48	52	48	partly cloudy	321	1,118	613	16
28	66	46	51	50	fog-clear	317			505
29	60	45	50	50	partly cloudy	316	2,125	307	33
30	63	46	50	48	cloudy-clear	316	1,110	380	8
31	66	40	50	48	partly cloudy	317			265
Totals							11,611	3,241	86
Cumulative totals							15,238	3,848	1,709
									31

^{1/} From USGS records.

Appendix Table 4. (Continued).

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November	Trinity River					Fish trapped		
	at Lewiston		Chinook salmon		Coho salmon	Adults grilse	Adults grilse	Steelhead
	Water	(cfs)*	Chinook	salmon	Adults grilse			
Maximum	Air	Water	Maximum	Minimum	Weather			
Minimum	Maximum	Minimum	Maximum	Minimum				
1	71	34	49	47	partly cloudy	316	434	163
2	70	33	49	47	fog-clear	314	2,337	651
3	70	32	49	47	fog-clear	312	128	71
4	69	38	50	48	fog-clear	312	128	80
5	66	40	50	48	fog-clear	311		
6	64	28	48	48	clear-windy	311	1,187	248
7	59	30	48	47	partly cloudy	313		
8	62	31	48	47	fog-clear	314		
9	67	34	48	46	partly cloudy	315	1,114	205
10	68	38	48	47	fog-clear	314	1,270	296
11	62	37	48	47	fog-clear	307		
12	62	36	48	46	fog-clear	306		
13	62	36	48	47	fog-overcast	305		
14	56	39	47	46	partly cloudy	306		
15	57	33	47	47	fog-clear	305		
16	53	39	47	47	partly cloudy	305		
17	58	37	47	46	fog-clear	306		
18	52	37	47	46	fog-lite rain	306		
19	58	38	47	46	fog-cloudy	306		
20	59	40	47	46	fog-overcast	302		
21	58	38	47	46	clearing	305		
22	60	33	47	46	partly cloudy	306		
23	53	34	47	46	partly cloudy	301		
24	50	40	47	46	fog-rain	302		
25	48	40	47	46	fog-clear	304		
26	53	36	46	46	fog-overcast	303		
27	52	37	46	46	cloudy	306		
28	43	32	46	46	cloudy-rain	306		
29	49	33	46	45	fog-clear	303		
30	50	33	46	45	partly foggy	302		
Totals						7,193	1,600	1,529
Cumulative totals						22,431	5,448	1,615
								4,312
								87
								118

1/ From USGS records.

Appendix Table 4. (Continued).

December	Temperature °F				Weather	Trinity River at Lewiston (cfs)*	Fish trapped				
	Air Maximum	Air Minimum	Water Maximum	Water Minimum			Chinook salmon Adults	Chinook salmon grilse	Coho salmon Adults	Coho salmon grilse	Steelhead
1	50	34	46	45	fog-clear	302					
2	49	38	46	45	fog-clear	301	39	12	442	265	42
3	54	38	46	45	fog-clear	298					
4	52	36	46	45	overcast-rain	299	8		114	119	19
5	44	37	45	45	rain	298					
6	53	40	45	45	cloudy-clear	299					
7	50	32	45	45	partly cloudy	297					
8	44	34	45	45	fog-clear	281	7	2	263	184	33
9	46	32	45	44	fog-clear	281					
10	46	30	45	44	fog-clear	299					
11	48	32	45	44	fog-clear	300			102	105	33
12	43	34	45	44	fog-cloudy	301					
13	43	33	45	44	rain-fog	302					
14	46	38	45	44	partly cloudy	300					
15	54	37	45	44	partly cloudy	297			107	105	20
16	47	33	45	44	fog-clear	297					
17	45	35	45	44	fog-clear	297					
18	47	35	45	44	rain-clearing	299			65	33	46
19	44	40	44	44	rain	304					
20	46	35	44	44	partly cloudy	302					
21	46	39	45	44	cloudy	301					
22	45	38	45	44	rain	299			105	55	38
23	48	40	45	44	cloudy-clear	300					
24	46	36	45	45	cloudy	301					
25	46	36	45	45	partly cloudy	300					
26	45	36	45	45	cloudy	298					
27	48	40	45	45	cloudy-clear	300					
28	47	37	45	45	fog-cloudy	302					
29	47	36	45	44	rain-cloudy	299			89	52	134
30	46	36	45	44	partly cloudy	302					
31	46	35	45	44	rain-cloudy	304					
Totals							54	14	1,287	918	365
Cumulative totals							22,485	5,462	2,902	5,230	483

1/ From USGS records.

Appendix Table 4. (Continued).

January	Temperature °F				Weather	Trinity River at Lewiston (cfs)*	Fish trapped				
	Air		Water				Chinook salmon Adults grilse	Coho salmon Adults grilse	Steelhead		
1	39	33	44	44	rain-snow	311			158		
2	43	35	45	45	cloudy	305					
3	44	35	45	44	rain	307					
4	50	34	45	44	cloudy	305					
5	48	36	45	44	cloudy-clear	302			130		
6	40	34	45	44	rain-cloudy	303			8		
7	48	31	44	44	partly cloudy	305			56		
8	42	32	44	44	overcast	305			55		
9	53	36	44	44	partly cloudy	305			43		
10	49	33	44	44	foggy-clear	307					
11	48	33	44	44	foggy-clear	305					
12	49	30	44	43	partly cloudy	304			204		
13	50	30	44	43	fog-clear	304			5		
14	52	28	44	43	fog-clear	305					
15	44	22	43	42	clear	305			51		
16	49	14	43	42	clear	306					
17	50	17	43	42	clear	306					
18	53	23	43	42	partly cloudy	303					
19	53	25	43	42	fog-clear	298					
20	54	22	43	42	clear	299			61		
21	53	24	43	42	overcast	302					
22	43	28	42	42	overcast	302			16		
23	47	33	42	42	snow-cloudy	303			3		
24	38	33	41	41	snow-cloudy	298					
25	47	33	42	41	partly cloudy	293					
26	52	36	43	42	partly cloudy	293			33		
27	52	38	44	42	fog-rain	299					
28	52	34	44	42	fog-rain	299			12		
29	50	38	44	43	fog-cloudy	299			15		
30	48	38	44	43	cloudy	301			19		
31	47	36	44	43	rain-cloudy	299					
Totals									869		
Cumulative totals							22,485	5,462	2,902	5,230	1,352

1/ From USGS records.

Appendix Table 4. (Continued).

February	Temperature °F				Weather	Trinity River at Lewiston (cfs)*	Fish trapped				
	Air Maximum	Air Minimum	Water Maximum	Water Minimum			Chinook salmon Adults	Coho salmon Adults	Steelhead		
1	46	36	44	43	cloudy	298			420		
2	40	33	44	43	rain	300			138		
3	44	37	44	43	overcast	299			116		
4	55	36	45	43	partly clear	300			67		
5	60	38	45	44	partly clear	299			46		
6	56	34	45	44	fog-clear	302					
7	62	34	46	44	partly cloudy	305					
8	62	33	47	45	partly cloudy	305					
9	48	40	46	45	overcast-rain	304			331		
10	48	44	47	46	cloudy-rain	304			120		
11	59	38	47	46	cloudy-rain	303			67		
12	58	38	47	46	cloudy	302					
13	53	40	46	46	rain	304			291		
14	50	36	46	46	cloudy	303					
15	53	37	46	46	partly cloudy	302					
16	51	32	46	45	partly cloudy	298					
17	60	35	47	46	overcast-clear	300			207		
18	60	32	47	46	fog-clear	300					
19	65	30	47	46	fog-clear	301			40		
20	63	29	47	46	fog-clear	303			27		
21	56	28	47	46	clouds-rain	298					
22	60	29	47	45	partly cloudy	300					
23	50	29	46	45	partly-cloudy	302			141		
24	53	23	46	45	clear	302					
25	56	22	46	45	clear	303					
26	63	22	46	44	clear	303					
27	67	26	47	44	clear	304			70		
28	68	24	47	44	fog-clear	303					
Totals									2,096		
Cumulative totals							22,485	5,462	2,902	5,230	3,433

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^{1/} From USGS records.

Appendix Table 4 (Continued)

March	Temperature °F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish Trapped					
	Air		Water				Chinook salmon		Coho salmon			
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse	Adults	Grilse		
1	68	30	47	45	partly cloudy	304						
2	48	42	46	46	rain-cloudy	304				61		
3	51	45	47	47	rain-cloudy	304				12		
4	58	44	47	47	overcast-rain	304						
5	55	46	47	47	rain	305						
6	59	36	48	46	overcast	299				43		
7	59	34	48	46	fog-overcast	347						
8	53	41	48	47	rain	316						
9	62	40	49	47	partly cloudy	313				63		
10	56	39	48	47	cloudy-rain	315						
11	48	39	48	47	rain	318						
12	53	44	48	48	rain	319				53		
13	58	38	48	47	partly cloudy	310						
14	56	35	48	47	rain-cloudy	308						
15	59	38	49	47	fog-cloudy	305						
16	64	32	49	48	fog-clear	303				51		
17	58	33	49	48	fog-cloudy	305						
18	50	32	48	48	rain-clear	304						
19	54	30	48	48	snow-cloudy	303				24		
20	50	30	49	47	fog-overcast	303						
21	46	32	49	47	snow-overcast	307						
22	55	33	49	47	cloudy	305						
23	58	37	50	48	rain-clearing	303				24		
24	66	32	50	49	fog-clear	302						
25	70	32	51	49	fog-clear	301						
26	70	38	52	50	fog-clear	301				16		
27	70	27	52	51	clear	302						
28	74	28	54	51	clear	302						
29	76	30	54	51	clear	301						
30	74	32	53	50	clear	299						
31	79	36	54	51	clear	299						
Totals										347		
Cumulative total							22,485	5,462	2,908	5,230	3,780	

1/ From USGS records.

Appendix Table 4 (Continued)

April	Temperature °F			Weather	Flow of Trinity River at Lewiston (cfs)*			Fish Trapped		
	Air		Water		Chinook salmon		Coho salmon	Adults grilse	Steelhead	
	Maximum	Minimum	Maximum	Minimum			Adults grilse			
1	80	36	54	52	fog-clear	456				
2	70	40	54	53	partly cloudy	566				
3	64	38	53	53	overcast	565				
4	70	36	54	53	fog clear	564				
5	70	36	53	53	cloudy-clear	560				
6	68	37	53	52	fog-overcast	558				
7	74	36	53	51	partly cloudy	555				
8	76	44	54	52	clear	557				
9	80	40	54	50	clear	553				
10	72	46	53	51	overcast-rain	556				
11	64	34	52	50	clear	556				
12	72	33	52	50	fog-overcast	555				
13	79	34	53	50	clear	547				
14	77	40	53	51	clear	543				
15	84	40	55	52	clear	541				
16	85	41	55	51	clear	540				
17	70	40	53	52	partly-cloudy	542				
18	56	34	52	51	clear-cloudy	543				
19	72	29	52	51	clear	547				
20	83	34	53	50	clear	539				
21	87	40	55	51	clear	537				
22	82	44	55	53	clear-clouds	537				
23	77	45	55	53	overcast	538				
24	80	40	55	53	clear	539				
25	86	40	55	53	clear	541				
26	91	42	55	53	clear	541				
27	90	48	57	54	clear	537				
28	80	53	57	55	overcast	534				
29	76	46	56	55	partly cloudy	533				
30	64	50	55	55	cloudy-rain	537				

1/ From USGS records.

Appendix Table 4 (Continued)

May	Temperature of			Weather	Flow of			Fish Trapped		
	Air		Water		Trinity River		at Lewiston		Coho salmon	
	Maximum	Minimum	Maximum		(cfs)*	Adults	grilse	Adults grilse	Steelhead	
1	56	44	54	54	partly cloudy	709				
2	65	40	54	53	partly cloudy	819				
3	82	44	55	54	fog-clear	815				
4	90	46	57	55	clear	818				
5	94	47	58	55	clear	818				
6	96	47	58	55	clear	820				
7	88	48	58	54	clear-cloudy	817				
8	85	50	56	55	partly cloudy	820				
9	91	45	57	54	partly cloudy	817				
10	91	44	58	55	clear	817				
11	94	46	59	54	clear	817				
12	88	51	57	55	clear-clouds	818				
13	88	52	60	57	clear	813				
14	92	52	58	55	clear	813				
15	92	52	59	56	clear	812				
16	83	52	58	54	partly cloudy	813				
17	84	52	56	54	partly-cloudy	595				
18	79	54	55	55	partly clear	476				
19	78	42	56	54	clear	476				
20	78	36	57	54	clear	478				
21	76	42	57	55	overcast	638				
22	78	50	57	57	partly cloudy	715				
23	75	53	56	56	clear-cloudy	721				
24	70	47	57	56	partly cloudy	720				
25	68	41	57	57	cloudy	722				
26	71	46	57	57	partly cloudy	722				
27	78	44	57	57	overcast	725				
28	78	42	58	56	overcast	724				
29	75	49	58	56	partly cloudy	720				
30	71	59	59	58	cloudy	720				
31	82	50	56	56	partly cloudy	721				

1/ From USGS records.

Appendix Table 4 (Continued)

June	Temperature °F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish Trapped		
	Air		Water				Chinook salmon Adults grilse	Coho salmon Adults grilse	Steelhead
	Maximum	Minimum	Maximum	Minimum					
1	86	39	59	57	clear	721			
2	96	42	60	57	clear	720			
3	95	50	60	57	partly-clear	722			
4	85	59	60	59	clear	720			
5	87	53	60	57	clear	722			
6	85	48	57	56	partly cloudy	724			
7	80	56	58	57	cloudy	723			
8	90	50	58	57	partly clear	724			
9	92	52	60	57	clear	722			
10	91	52	58	57	clear	728			
11	90	51	60	57	clear	724			
12	96	51	59	57	clear	727			
13	100	52	62	57	clear	709			
14	84	58	57	57	partly clear	711			
15	70	52	57	56	partly cloudy	717			
16	74	56	57	56	partly cloudy	722			
17	83	47	59	55	partly-cloudy	715			
18	88	46	57	56	clear	706			
19	89	50	60	57	clear	709			
20	82	58	56	56	overcast	709			
21	78	53	56	56	clear	711			
22	88	44	59	57	clear	710			
23	92	48	57	56	clear	709			
24	99	51	60	57	clear	706			
25	104	55	58	56	clear	710			
26	105	61	61	57	clear	710			
27	103	65	60	58	partly clear	707			
28	94	62	59	58	clear	708			
29	92	62	61	57	clear	711			
30	99	58	59	57	clear	717			

1/ From USGS records.