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ANNUAL REPORT
TRINITY RIVER SALMON AND STEELHEAD HATCHERY
1985-86

by

Gerald W. Bedell
Region 1, Inland Fisheries

Inland Fisheries

Administrative Report No. 87-13

1987

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ABSTRACT

This report describes the operation of Trinity River Salmon and Steelhead Hatchery for the period July 1, 1985 through June 30, 1986. Chinook salmon, Oncorhynchus tshawytscha, coho salmon, O. kisutch, and steelhead trout, Salmo gairdneri, 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.

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INTRODUCTION

This is the twenty-eighth 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, 1985 through June 30, 1986. Copies of previous annual reports are available upon request from the Inland Fisheries Division, Rancho Cordova.

PRODUCTION SUMMARY

The ladder was opened on August 30 and spring-run chinook salmon began entering the trap. The run contained until about October 10, at which time the majority of the salmon arriving were fall-run. The run continued through December 5. Coho salmon were trapped from October 7, 1985 through January 6, 1986. Steelhead entered the hatchery from December 30, 1985 through March 27, 1986.

TABLE 1. Production Summary 1985-86

Species	Number trapped	Number females spawned	Eggs taken or received	Number fingerlings planted	Number yearlings planted	Total pounds planted	On hand June 30, 1986
Chinook salmon	23,902	2,553	8,144,628	5,352,235	1,713,568	215,283	1,560,700
Coho salmon	11,786	2,984	9,086,906	a/ 210,250 b/	901,913	77,374	776,000
Steelhead	461	151	992,754	0	450,122	83,010	807,000
Totals	36,149	5,688	18,224,288	5,562,485	3,065,603	375,667	3,143,700

a/ Approximately 7.1 million destroyed because of IHN.

b/ 563,854 Trinity River stock; 428,900 received from Iron Gate Hatchery

HATCHERY OPERATION

All production fish were reared on a diet of Oregon Moist Pellet (OMP). A total of 518,044 lbs of feed produced 375,667 lbs of fish during fiscal year 1985-86. The feed conversion rate (pounds of feed required to raise one pound of fish) was 1.4.

Although last year's poundage of fish produced was the highest ever at that time we have exceeded that figure this year by nearly 100,000 pounds. Also, the conversion rate dropped from 1.7 to 1.4. We attribute this increased production and efficiency to several factors - the most notable of which were a lack of predation and a fairly warm water year.

Planned modification of the hatchery raceways and water supply system failed to materialize because of lack of funds. Offsite rearing ponds built last year for use during the construction period were put to good use, however, by rearing yearling fall-run chinook salmon. Feed for these fish was purchased by the Department of Fish and Game and manpower was supplied by the California Conservation Corps.

A total of 12,285 people visited Trinity River Hatchery in 1985-86. 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 1985 Run

Chinook were first seen in the upper river below Lewiston Dam on June 6. The ladder was opened on August 30 and spawning operations began September 3.

Spring Run

Between September 3 and October 10 a total of 6,329 chinook salmon, mostly spring-run, were trapped at the hatchery. This number included 2,303 males, 1,820 females, and 2,206 grilse. Chinook salmon males <56 cm (22 inches) FL are considered grilse. The 1,394 females spawned during this period produced 4,383,490 eggs, an average of 3,145/female. Egg size averaged 83/oz.

Fall Run

There were 17,573 chinook salmon trapped from October 15 to December 5: 4,245 males, 1,001 females, and 12,327 grilse. All were assumed to be fall-run. The 1,159 females spawned produced 3,761,138 eggs, an average of 3,245/female. Egg size averaged 94/oz.

Marked Chinook Salmon Returns

There were 5,289 chinook salmon marked Ad and tagged with coded wire tags (CWT) trapped at the harchery during the 1985 season (Appendix Table 4).

Planting 1984 Brood Year Chinook Salmon

We planted a total of 1,713,568 chinook yearlings during this fiscal year (Table 2).

We planted a total of 510,000 chinook salmon (1984 brood year) as fingerlings during 1984-85. Of the 2,675,187 (spring and fall combined) 1984 brood year chinook salmon eggs taken, 2,223,568 (83%) were eventually planted as fish.

Table 2. Yearling Chinook Salmon Planted, 1985-86*

Date	Size/lb	Race	Release Site	Number
9/06/85	14.0	Spring	Hatchery	90,706
9/06/85	16.0	Spring	Hatchery	93,664
9/10/85	15.0	Fall	Hatchery	93,375
9/10/85	18.0	Fall	Hatchery	50,400
9/11/85	15.0	Fall	Hatchery	66,750
9/11/85	16.0	Fall	Hatchery	224,000
10/01/85	11.0	Spring	Hatchery	191,400
10/02/85	11.0	Spring	Hatchery	47,300
10/02/85	13.0	Spring	Hatchery	39,650
10/02/85	13.5	Spring	Hatchery	101,250
10/03/85	11.0	Fall	Hatchery	35,200
10/04/85	12.5	Fall	Hatchery	159,688
10/08/85	12.5	Fall	Steel Bridge	31,250
10/08/85	12.0	Fall	Junction City	25,500
10/09/85	11.0	Fall	Lime Point	26,400
10/10/85	11.0	Fall	Hatchery	100,045
10/10/85	12.0	Fall	Hatchery	61,200
10/11/85	14.0	Fall	Hatchery	119,700
2/26/86	6.0	Fall	Hatchery	52,350
2/28/86	5.6	Fall	Hatchery	103,740
Total				1,713,568

* All fish were Trinity River stock.

Planting 1985 Brood Year Chinook Salmon

A total of 5,352,235 chinook salmon fingerlings were planted in 1986 (Table 3).

Table 3. 1985 Brood Year Fingerling Chinook Salmon Planted in 1986

Date	Size/lb	Race	Release site	Number
5/06/86	89	Spring	Hatchery	524,210
5/14/86	76	Spring	Hatchery	355,300
6/02/86	70	Spring	Hatchery	202,300
6/02/86	71	Spring	Hatchery	133,125
6/03/86	69	Spring	Hatchery	148,350
6/03/86	86	Spring	Hatchery	266,600
6/04/86	87	Spring	Hatchery	241,425
6/05/86	82	Spring	Hatchery	446,900
6/06/86	69	Spring	Hatchery	524,400
6/09/86	77	Spring	Hatchery	46,200
6/09/86	53	Spring	Hatchery	257,050
6/10/86	59	Spring	Hatchery	150,450
6/11/86	89	Fall	Hatchery	340,425
6/13/86	109	Fall	Hatchery	114,450
6/16/86	71	Fall	Hatchery	205,900
6/19/86	62	Fall	Hatchery	54,250
6/20/86	81	Fall	Sawmill Site	498,150
6/24/86	75	Fall	Hatchery	588,750
6/27/86	80	Fall	Hatchery	254,000
Total				5,352,235

COHO SALMON MAINTENANCE PROGRAM

History of the 1985 Run

Coho salmon entered the hatchery from October 7, 1985 through January 6, 1986. We trapped 11,786 fish: 3,729 males, 3,919 females, and 4,138 grilse. We spawned 2,984 females from October 29 through December 5. They produced 9,086,906 eggs, an average of 3,045/female. Egg size averaged 99/oz.

Marked Coho Salmon Returns

A total of 5,087 of the coho salmon trapped was marked Ad and CWT (Appendix Table 4).

Planting 1984 Brood Year Coho Salmon

A total of 1,111,913 coho salmon was planted in 1985-86 (Table 4).

Table 4. Coho Salmon Fingerlings and Yearlings
Planted in 1985 and 1986*

Date	Race	Size/lb	Number
7/11/85	Trinity	57.0	103,000
10/30/85	Trinity	27.5	107,000
3/18/86	Trinity	13.5	138,038
3/19/86	Trinity	13.0	98,475
3/20/86	Trinity	12.0	339,200
3/20/86	Trinity	13.0	161,200
3/27/86	Trinity	12.5	165,000
<u>Total</u>			<u>1,111,913</u>

* All fish were planted at the hatchery

STEELHEAD MAINTENANCE PROGRAM

History of the 1985-86 Run

Adult steelhead entered Trinity River Hatchery from December 30, 1985 through March 27, 1986. The run consisted of 461 fish: 225 males and 236 females. From January 6 through March 27 we spawned 151 of the females. They produced 563,854 eggs, an average of 3,734/female. Egg size averaged 221/oz.

Steelhead Planted

We planted 450,122 steelhead in FY 1985-86 (Table 6).

TABLE 6. Steelhead Planted in 1985-86

Strain and brood year ^{1/}	Date released	Average size/lb	Mark	Release site	Number
TRIG 1984	9/17/85	1.9	LV	Hatchery	15,170
IG 1984	9/17/85	1.9	LV	Hatchery	3,793
TRIG 1984	3/14/86	1.0	RV	Hatchery	14,220
IG 1984	3/14/86	1.0	RV	Hatchery	3,555
TR 1985	4/03/86	5.5	None	Hatchery	137,088
IG 1985	4/04/86	7.5	None	Hatchery	79,688
IG 1985	4/08/86	9.5	None	Hatchery	34,675
IG 1985	4/09/86	10.0	None	Hatchery	59,000
IG 1985	4/10/86	10.0	None	Hatchery	44,500
IG 1985	4/16/86	10.0	None	Hatchery	26,750
IG 1985	5/20/86	9.5	None	Hatchery	31,683
Total					450,122

^{1/} TR=Trinity River; IG=Iron Gate

Marked Steelhead Returns

Of the 461 steelhead returning to Trinity River Hatchery, 24 were marked Ad and 1 was marked LP. The remaining 436 fish were not marked.

BROWN TROUT MAINTENANCE PROGRAM

No brown trout were spawned or planted during fiscal year 1985-86.

Appendix Table 1

Eggs and Fish Shipped from and Received at
Trinity River Hatchery, July 1, 1985 - June 30, 1986

Species	Number Received	Date	Origin
Winter run Steelhead eggs	282,020	3/03/86	Iron Gate Hatchery
Winter run Steelhead eggs	146,880	3/13/86	Iron Gate Hatchery
Total	428,900		

Appendix Table 2. Summary of Fish Runs to Trinity River
Salmon and Steelhead Hatchery,

Year	Chinook salmon			Coho salmon				
	Males	Females	Grilse	Males	Females	Grilse	Steelhead	Brown trout
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	1,130	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	1,716	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

Appendix Table 3
 Trinity River Salmon and Steelhead Hatchery Weather,
 and Water Data, and Counts of Fish during Spawning
 Operations, July 1, 1985, through June 30, 1986

July	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped				
	Air		Water				Chinook Salmon	Coho Salmon	Steelhead		
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse	Adults		
1	90	46	62	59	clear	456					
2	94	54	61	57	clear	454					
3	96	53	59	55	partly cloudy	456					
4	96	58	58	54	clear	454					
5	98	55	58	54	partly clear	453					
6	98	56	57	54	clear	451					
7	95	52	57	54	clear	449					
8	94	54	57	53	clear	454					
9	98	57	57	54	clear	469					
10	98	54	57	53	clear	465					
11	94	56	56	53	clear	462					
12	99	56	57	53	clear	463					
13	103	56	56	53	clear	467					
14	102	59	56	53	clear	464					
15	101	59	55	54	clear	460					
16	97	58	55	54	clear	460					
17	94	56	56	54	clear	457					
18	96	54	57	55	clear	455					
19	98	52	58	54	clear	454					
20	95	60	57	54	partly cloudy	450					
21	78	62	56	54	drizzles	452					
22	93	63	55	53	cloudy-clear	448					
23	100	56	56	54	clear	447					
24	102	57	57	53	clear	447					
25	103	58	57	53	clear	447					
26	103	62	57	54	clear	450					
27	102	60	57	54	partly cloudy	453					
28	92	62	57	54	clear	454					
29	82	54	55	54	clear	454					
30	76	58	58	55	partly cloudy	451					
31	70	56	56	53	cloudy-rain	454					

* From USGS records.

Appendix Table 3 (Continued)

August	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped				
	Air		Water				Chinook Salmon	Coho Salmon	Steelhead		
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse	Adults	Grilse	Steelhead
1	77	55	56	51	overcast	449					
2	87	49	56	53	fog-clear	446					
3	98	50	57	53	clear	445					
4	94	59	57	53	clear	444					
5	93	52	57	53	clear	451					
6	96	52	57	54	clear	449					
7	86	50	57	53	clear	447					
8	87	46	57	53	clear	446					
9	94	45	57	54	clear	445					
10	94	46	57	54	clear	444					
11	92	50	57	54	clear	444					
12	92	50	56	52	clear	445					
13	95	54	57	54	clear	446					
14	100	55	56	53	clear	448					
15	98	57	57	53	clear	446					
16	90	56	56	54	clear	452					
17	82	52	54	54	clear-windy	457					
18	75	49	56	54	rain-clear	458					
19	84	56	54	53	partly cloudy	463					
20	82	50	55	53	clear-cloudy	464					
21	86	50	55	53	clear	462					
22	90	48	55	53	clear	460					
23	93	48	55	52	clear	457					
24	99	51	56	52	partly cloudy	456					
25	98	52	56	52	clear	454					
26	90	56	56	52	clear	458					
27	88	52	55	52	clear	460					
28	88	48	55	52	clear	458					
29	88	46	55	53	clear	457					
30	86	47	55	52	clear	457					
31	90	44	55	52	partly cloudy	456					

*From USGS records.

Appendix Table 3 (Continued)

September	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 Steelhead		
1	70	47	54	52	cloudy-rain	374					
2	77	50	54	51	partly cloudy	346					
3	87	44	54	51	clear	346	140	67			
4	91	47	56	52	clear	345					
5	84	56	55	52	partly cloudy	344	21	10			
6	73	58	53	52	overcast	348					
7	63	57	52	52	cloudy-rain	348					
8	69	49	51	51	cloudy	363					
9	62	48	51	50	rain-cloudy	350	132	15			
10	66	48	51	50	cloudy-rain	352					
11	70	42	51	49	partly cloudy	351					
12	68	46	51	49	partly cloudy	350	208	12			
13	72	48	51	49	cloudy	351					
14	70	50	52	50	partly cloudy	352					
15	76	40	51	49	foggy-clear	354					
16	80	42	52	49	foggy-clear	354	348	19			
17	71	50	51	50	clear	354					
18	78	40	51	50	fog-clear	353					
19	77	39	52	50	partly cloudy	351	410	38			
20	86	42	52	49	clear	350					
21	89	44	54	50	clear	350					
22	87	43	55	50	clear	349					
23	90	42	54	51	clear	349	558	96			
24	92	44	53	50	clear	351					
25	94	45	53	49	clear	350					
26	93	46	53	49	clear	352	339	96			
27	88	48	53	49	clear	350					
28	85	48	53	49	clear	352					
29	80	41	53	48	clear	348					
30	80	47	53	49	clear	347	365	220			
Totals							2,521	573			

*From USGS records.

Appendix Table 3 (Continued)

October	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*				Fish trapped			
	Air		Maximum	Minimum		Chinook		Salmon	Coho	Salmon	Adults	Grilse	Steelhead
	Maximum	Minimum				324	325	327	327	647	644	2	2
1	86	43	53	51	partly cloudy	334							
2	90	46	53	50	clear	324							
3	94	46	53	50	clear	325							
4	94	44	52	49	clear	327							
5	90	45	51	48	partly cloudy	327							
6	75	45	40	48	partly cloudy	323							
7	68	42	42	48	clear	334							
8	63	30	48	46	clear	334							
9	68	30	48	46	clear	334							
10	78	30	48	46	cloudy	335							
11	68	42	42	48	foggy-clear	335							
12	70	30	48	46	clear	337							
13	72	30	49	46	clear	336							
14	80	30	50	47	clear	334							
15	82	32	50	47	clear	335							
16	77	33	50	47	clear	333							
17	80	38	51	48	clear	333							
18	80	38	51	48	clear	331							
19	68	37	50	48	partly cloudy	330							
20	58	46	49	48	light rain	331							
21	58	42	48	47	partly cloudy	327							
22	44	40	47	47	rain	332							
23	61	46	48	47	rain-clouds	330							
24	68	50	50	47	fog-clear	329							
25	70	48	50	47	partly cloudy	329							
26	64	46	51	48	foggy-clear	330							
27	71	45	51	49	foggy-clear	330							
28	70	42	50	48	clearing	330							
29	66	40	50	48	fog-clear	330							
30	66	44	50	48	fog-clear	330							
31	62	36	49	48	fog-clear	329							
Totals						6,002	11,430						
Cumulative Totals						8,523	12,003						

*From USGS records.

Appendix Table 3 (Continued)

November	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped					
	Air		Water				Chinook Salmon	Coho Salmon	Adults	Grilse		
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse				
1	69	38	49	47	fog-clear	330						
2	70	39	49	47	fog-clear	329						
3	66	38	49	46	fog-clear	330						
4	62	43	48	48	overcast	330	357	1,045	245	126		
5	63	34	49	47	fog-clear	330						
6	65	35	49	47	fog-clear	329						
7	68	40	49	47	fog-clear	329	240	759	490	333		
8	56	35	47	47	showers	330						
9	50	28	46	46	cloudy-rain	330						
10	46	29	46	45	cloudy-snow	330						
11	47	28	45	45	clear	330						
12	52	20	45	44	clear	330	104	228	812	404		
13	52	20	45	43	clear	330	63	246	295	83		
14	54	24	45	43	fog-clear	309						
15	43	34	44	44	rain	310	39	97	519	202		
16	51	40	45	44	partly clear	311						
17	49	30	45	44	partly cloudy	310						
18	50	26	45	44	fog-clear	316	32	103	987	362		
19	42	26	45	44	fog-cloudy	330						
20	50	27	45	44	fog-cloudy	331						
21	44	26	44	44	overcast	330	10	33	656	314		
22	51	27	44	44	partly cloudy	315						
23	38	32	44	44	snow-rain	297						
24	40	32	44	44	rain-fog	298						
25	46	37	44	44	partly clear	297		11	823	378		
26	43	34	45	44	overcast	295						
27	42	33	45	44	fog-rain	296		6	313	120		
28	40	33	44	44	snow-fog-rain	317						
29	48	34	45	44	rain-clear	330						
30	48	32	45	44	partly clear	330						
Totals							845	2,528	5,140	2,322		
Cumulative Totals							9,368	14,531	5,569	2,775.		

* From USGS records.

Appendix Table 3 (Continued)

December	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped					
	Air		Water				Chinook Salmon	Coho Salmon	Steelhead			
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse	Adults	Grilse		
1	43	33	45	44	cloudy-rain	322	1	1	866	389		
2	47	38	45	45	rain	308						
3	56	40	46	45	overcast	280						
4	54	38	46	45	overcast	298						
5	54	40	46	45	overcast	322						
6	47	41	46	46	rain	322						
7	48	40	46	46	cloudy-rain	323						
8	43	32	46	46	frozen rain	322						
9	48	35	46	45	partly cloudy	321			259	196		
10	46	30	45	45	fog-clear	320						
11	48	22	45	44	clear	320						
12	44	20	44	44	clear	320			164	113		
13	44	22	44	43	clear	317						
14	42	26	44	43	fog-overcast	316						
15	46	22	44	43	partly clear	316						
16	44	30	45	44	fog-clear	316			72	74		
17	45	30	45	44	fog-clear	316						
18	47	30	45	44	fog-clear	319						
19	46	32	45	44	fog-clear	318			68	80		
20	45	33	45	45	fog-clear	320						
21	44	31	45	45	fog-clear	320						
22	42	30	45	45	fog-clear	320						
23	44	32	45	45	fog-clear	320			50	61		
24	48	30	45	45	fog-clear	320						
25	48	29	45	45	fog-clear	319						
26	46	34	45	45	fog-clear	316			31	53		
27	46	32	45	45	fog-overcast	313						
28	49	31	45	45	partly cloudy	311						
29	47	31	46	45	drizzles	311						
30	52	42	46	46	cloudy	311			18	31		
31	55	46	47	46	fog-cloudy	311				9		
Totals							1	2	2,067	1,314		
Cumulative Totals							9,369	14,533	7,636	4,089		

*From USGS records.

Appendix Table 3 (Continued)

January	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped					
	Air		Water				Chinook Salmon	Coho Salmon	Adults	Grilse		
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse				
1	58	45	47	46	partly cloudy	311						
2	48	37	47	46	fog-drizzles	310			10	27		
3	53	44	47	46	partly cloudy	311				8		
4	48	39	47	46	fog-rain	310						
5	55	44	47	46	partly cloudy	311						
6	50	38	47	46	overcast-clear	309			2	22		
7	52	32	47	47	fog-clear	309				6		
8	54	34	47	46	light rain	308						
9	52	37	47	46	fog-overcast	308						
10	56	32	47	46	partly cloudy	308						
11	54	31	47	46	partly cloudy	308						
12	56	30	47	46	partly cloudy	308						
13	51	33	46	45	partly cloudy	308				2		
14	46	36	46	45	clear-rain	309						
15	44	38	45	45	light rain	311						
16	45	40	45	45	rain	322						
17	50	43	46	45	rain	316						
18	58	45	47	45	partly cloudy	311						
19	55	44	46	45	cloudy-rain	309						
20	50	35	46	45	mostly clear	308				1		
21	44	34	45	45	overcast	306						
22	50	38	45	45	partly cloudy	308						
23	52	34	45	45	partly cloudy	307						
24	53	34	45	45	fog-clear	307						
25	54	33	45	45	fog-clear	306						
26	53	35	46	45	fog-clear	302						
27	54	40	46	45	partly cloudy	303				3		
28	52	42	46	45	overcast-rain	306						
29	48	45	46	46	rain	309						
30	50	44	46	45	rain-overcast	310						
31	54	44	46	45	rain	313				5		
Totals							12	49	25			
Cumulative Totals						9,369	14,533	7,648	4,138	34		

*From USGS records.

Appendix Table 3 (Continued)

February	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped				
	Air Maximum	Air Minimum	Water Maximum	Water Minimum			Chinook Salmon Adults	Salmon Grilse	Coho Salmon Adults	Steelhead	
1	54	43	46	46	foggy-rain	312					
2	50	40	46	46	light rain	314					
3	49	40	46	46	rain-snow	313					
4	52	35	46	45	fog-cloudy	308					
5	54	35	46	45	partly cloudy	306					
6	52	32	47	45	fog-clear	305					
7	56	26	46	45	fog-clear	306				3	
8	56	23	46	45	clear	309					
9	58	25	46	45	clear	307					
10	54	28	47	45	fog-clear	309					
11	48	30	45	45	overcast	310					
12	40	34	45	45	rain	313					
13	54	34	47	45	overcast	310					
14	58	43	46	45	sprinkles	315					
15	54	42	46	45	cloudy-rain	316					
16	50	44	46	45	rain	421					
17	45	40	45	45	rain	1260					
18	55	44	46	45	rain	1750				29	
19	52	42	46	45	rain	848				45	
20	55	40	46	45	light rain	830				24	
21	44	39	46	46	fog-rain	882				23	
22	47	33	46	46	cloudy	1190					
23	69	47	49	46	cloudy-clear	1340					
24	74	46	49	49	fog-clear	1640				89	
25	70	47	49	49	overcast	2380				35	
26	73	47	50	47	fog-clear	2650				16	
27	75	46	50	47	fog-clear	2660				13	
28	74	44	49	46	fog-cloudy	2680				15	
Totals										292	
Cumulative Totals							9,369	14,533	7,648	4,138	326

*From USGS records.

Appendix Table 3 (Continued)

March	Temperature F					Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped				
	Air		Water					Chinook Salmon Adults	Coho Salmon Adults	Steelhead		
	Maximum	Minimum	Maximum	Minimum								
1	72	44	49	47	partly cloudy	2670						
2	77	44	49	47	fog-clear	2650						
3	78	43	49	46	fog-clear	2380				67		
4	76	42	50	47	fog-clear	2090				7		
5	77	42	49	47	fog-clear	2100				42		
6	78	44	47	46	fog-overcast	2090				4		
7	60	52	46	46	rain	3340				4		
8	58	44	45	45	cloudy-rain	5030						
9	48	37	45	45	fog-rain	6080						
10	51	38	45	44	rain	6150				1		
11	50	40	45	45	cloudy-rain	6150						
12	56	34	45	45	partly cloudy	6180						
13	54	36	45	45	cloudy	6180				1		
14	52	31	45	45	partly cloudy	6190						
15	45	30	45	45	rain	6210						
16	58	31	45	45	cloudy	6250						
17	61	38	46	45	fog-clear	6240						
18	68	34	47	45	fog-clear	5730						
19	76	36	47	45	fog-clear	4530						
20	78	38	47	46	clear	3880				2		
21	70	42	48	46	partly cloudy	2700						
22	69	38	49	46	fog-cloudy	1640						
23	66	41	49	47	cloudy-rain	836						
24	62	42	48	47	clear	617				5		
25	66	34	49	47	fog-clear	328						
26	75	41	52	48	partly cloudy	327						
27	78	41	53	49	partly cloudy	323				2		
28	80	42	53	49	fog-clear	318						
29	85	41	54	50	clear	320						
30	81	42	54	50	partly cloudy	321						
31	79	42	54	50	clear	316						
Totals										135		
Cumulative Totals										461		

*From USGS records.

Appendix Table 3 (Continued)

April	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	58	42	51	51	partly cloudy	310						
2	66	30	50	48	clear	320						
3	72	30	52	48	clear	323						
4	69	34	52	48	partly cloudy	325						
5	77	34	52	47	partly cloudy	325						
6	64	41	53	49	clear-cloudy	325						
7	56	50	50	50	rain-cloudy	325						
8	64	48	50	49	cloudy	324						
9	74	46	52	49	partly cloudy	321						
10	80	38	53	49	partly cloudy	321						
11	77	42	52	50	fog-clouds	321						
12	65	40	51	50	partly cloudy	324						
13	67	30	50	48	clear	322						
14	67	38	50	48	overcast	325						
15	60	42	49	48	rain-cloudy	325						
16	48	40	48	47	rain	324						
17	62	38	49	47	partly cloudy	323						
18	73	35	51	48	fog-clear	325						
19	82	38	54	50	cloudy-clear	327						
20	90	41	57	51	clear	330						
21	88	45	56	51	clear	385						
22	76	46	55	52	partly cloudy	406						
23	69	34	53	51	partly cloudy	399						
24	63	34	51	51	clear	395						
25	59	46	50	49	clear	394						
26	61	33	50	48	partly cloudy	391						
27	70	30	51	48	partly cloudy	389						
28	70	39	51	49	clear	390						
29	66	32	51	49	clear	386						
30	70	32	54	50	clear	387						

*From USGS records.

Appendix Table 3 (Continued)

May	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	Steelhead	
1	64	44	54	51	clear-cloudy	382						
2	57	48	52	51	rain	385						
3	60	41	51	51	cloudy-rain	383						
4	61	36	52	50	cloudy-rain	382						
5	54	43	50	50	rain-clear	382						
6	56	36	51	49	rain-cloudy	378						
7	70	37	53	50	fog-clear	370						
8	73	36	52	50	fog-clear	369						
9	77	37	54	52	clear-haze	366						
10	68	40	54	52	clear	366						
11	72	32	54	52	clear	366						
12	80	36	52	52	clear	368						
13	80	44	54	52	overcast	369						
14	76	42	55	52	clear	371						
15	78	36	55	52	clear	369						
16	84	38	54	53	clear	370						
17	91	41	55	53	clear	367						
18	92	45	55	53	clear-cloudy	369						
19	84	51	55	53	clear-cloudy	369						
20	72	46	54	53	partly cloudy	353						
21	60	41	55	51	clear	375						
22	75	32	55	53	partly cloudy	367						
23	78	46	54	53	partly cloudy	365						
24	88	42	55	54	clear	364						
25	89	51	57	54	clear	367						
26	90	52	57	52	partly cloudy	367						
27	89	56	58	56	clear	364						
28	94	52	58	57	clear	382						
29	98	54	59	57	clear	417						
30	100	60	61	58	clear	415						
31	100	60	62	61	partly cloudy	416						

*From USGS records.

Appendix Table 3 (Continued)

June	Temperature F				Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped					
	Air		Water				Chinook Salmon	Coho Salmon	Adults	Grilse		
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse	Adults	Grilse		
1	99	58	62	62	clear	453						
2	84	62	59	59	clear	518						
3	86	54	58	57	clear-cloudy	480						
4	77	54	55	55	partly cloudy	420						
5	76	56	55	54	partly cloudy	419						
6	78	56	55	54	partly cloudy	422						
7	82	54	56	54	partly cloudy	419						
8	87	46	57	55	clear	418						
9	90	48	57	54	clear	417						
10	97	49	57	54	clear	415						
11	99	50	57	55	clear	411						
12	98	58	57	55	clear	392						
13	93	59	56	55	partly cloudy	410						
14	84	58	56	55	partly cloudy	408						
15	81	50	57	56	clear	408						
16	76	50	56	55	partly cloudy	408						
17	77	52	57	56	partly cloudy	407						
18	74	48	56	54	clear	406						
19	81	42	56	55	clear	405						
20	84	44	56	55	clear	405						
21	92	47	57	56	partly cloudy	406						
22	99	53	58	56	clear	406						
23	101	54	58	55	clear	407						
24	101	62	58	56	partly cloudy	396						
25	95	55	59	56	clear	546						
26	87	62	57	57	overcast	632						
27	89	57	57	56	partly cloudy	630						
28	88	56	56	56	clear-cloudy	631						
29	88	49	58	56	clear	635						
30	93	52	58	55	clear	633						

From USGS records.

APPENDIX TABLE 4. Coded Wire Tag (CWT) Recoveries for Trinity River Hatchery (TRH), With Release Data ^{1/}

CWT Code	Race	Egg Source	Brood Year	RELEASE DATA			Year	RECOVERY DATA			Mean Male FL (cm)	Mean Female FL (cm)
				Date	Number	Size #/lb		Site	Actual CWT Recoveries	Expanded CWT Recoveries		
6-61-39	Spring chinook	TRH	80	9/28/81	34,601	10.1	TRH	82-83	54	54	44 (52) ^{a/}	^{b/} 56 (97) 66 (31) 72 (4)
								83-84	178	178	58 (81)	
								84-85	49	49	66 (18)	
								85-86	5	5	78 (1)	
6-61-35	Spring chinook	TRH	81	6/10-14/82	182,635	58.0	TRH	83-84	15	15	39 (15)	^{c/} 60 (13) 72 (49)
								84-85	37	37	58 (24)	
								85-86	81	81	79 (32)	
6-61-37	Spring chinook	TRH	81	10/6,7/82	98,637	13.0	TRH	83-84	13	13	40 (13)	^{c/} 58 (30) 73(170)
								84-85	121	121	57 (89)	
								85-86	305	305	77(135)	
6-61-41	Spring chinook	TRH	82	6/27/83	146,194	81.0	TRH	84-85	5	5	39 (5)	^{c/} 63 (15)
								85-86	29	29	66 (14)	

^{1/} Coded wire tag data obtained using funds provided in part through the Anadromous Fish Conservation Act (PL 89-304) under California Projects AFC-16 (Salmon and Steelhead Research, Management and Enhancement Project) and AFS-20 (Klamath-Trinity Salmon and Steelhead Research, Management and Restoration Project).

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APPENDIX TABLE 4. (Cont'd)

WT ode	Race	Egg Source	Brood Year	RELEASE DATA			RECOVERY DATA					
				Date	Number	Size #/lb	Site	Year	Actual CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)	Mean Female FL (cm)
5-61-38	Spring chinook	TRH	82	11/3/83	96,461	12.3	TRH	84-85 85-86	21 236	21 236	42 (20) 65 (174)	49 (1) 63 (62)
-61-40	Spring chinook	TRH	83	10/3/84	90,293	11.0	TRH	85-86	101	101	45 (101)	---
7-27-10	Spring chinook	CRF ^e / CRH	81	10/1/82	15,296	7.6	CRH	85-86	1	1	---	71 (1)
7-27-11	Spring chinook	CRH	81	10/1/82	19,113	8.1	CRH	85-86	1	1	81 (1)	---
100000d/	Springe/ chinook							84-85 85-86	23 48	23 61	53 (16) (37)	63 (1) 70 (11)
200000 ^f /	Springe/ chinook							85-86	6	6	54 (5)	73 (1)
400000g/	Springe/ chinook							85-86	3	3	56 (2)	74 (1)
5-61-18	Fall chinook	TRH	80	6/5/81	201,090	86.0	TRH	82-83 83-84 84-85 85-86	73 53 3 2	73 53 3 2	50 (71) 57 (18)	59 (35) 68 (3) 76 (2)

(Continued on next page)

APPENDIX TABLE 4. (Cont'd)

CWT Code	Race	Egg Source	Brood Year	RELEASE DATA			Site	Year	RECOVERY DATA			
				Date	Number	Size #/lb			Actual CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)	Mean Female FL (cm)
6-61-21	Fall chinook	TRH	80	9/28, 89/81	104, 160	16.7	TRH	82-83	312	49 (280)	---	57 (218)
								83-84	418	57 (200)	64 (12)	68 (32)
								84-85	43		75 (2)	82 (2)
								85-86	4			
6-61-19	Fall chinook	TRH	81	6/15, 16/82	192, 795	101.5	TRH	83-84	19	19	39 (19)	61 (12)
								84-85	31	58 (19)		
								85-86	51	74 (14)		73 (37)
6-61-22	Fall chinook	TRH	81	10/12/82	94, 991	16.7	TRH	83-84	13	13	40 (13)	62 (35)
								84-85	140	59 (103)		
								85-86	87	78 (34)		77 (53)
6-61-24	Fall chinook	TRH	82	6/27/83	138, 801	113.0	TRH	84-85	9	9	43 (9)	66 (21)
								85-86	46	64 (25)		

(Continued on next page)

APPENDIX TABLE 4. (Cont'd)

CWT Code	Race	Egg Source	Brood Year	RELEASE DATA			Year	RECOVERY DATA				
				Date	Number	Size #/lb		Actual Recoveries	CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)	Mean Female FL (cm)
6-61-23	Fall chinook	TRH	82	6/28/83	90,242	134.0	Steelbridge ^{b/}	84-85 85-86	6 14	6 14	46 65 (6) (9)	64 --- (5)
6-61-25	Fall chinook	TRH	82	6/28-29/83	90,694	146.7	Junction ^{1/} City	84-85 85-86	6 20	6 20	46 62 (6) (14)	68 --- (6)
6-56-07	Fall chinook	TRH	82	6/29/83	88,854	146.0	Lime ^{j/} Point	84-85 85-86	11 75	11 75	46 65 (11) (53)	67 --- (22)
6-61-29	Fall chinook	TRH	82	11/9/83	96,583	13.5	TRH	84-85 85-86	53 319	53 319	46 (52) 67(206)	54 (1) 67(111)
6-56-09	Fall chinook	TRH	82	11/14/83	20,765	11.3	Steelbridge	84-85 85-86	27 95	27 95	46 (27) 66 (64)	67 --- (31)

(Continued on next page)

APPENDIX TABLE 4. (Cont'd)

CWT Code	Race	Egg Source	Brood	RELEASE DATA			RECOVERY DATA				
				Date	Number	Size #/lb	Site	Year	Actual CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)
5-56-10	Fall chinook	TRH	82	11/14/83	20,902	13.4	Junction City	84-85 85-86	11 64	46 (10) 66 (42)	56 (1) 68 (22)
6-56-11	Fall chinook	TRH	82	11/15/83	21,223	11.0	Lime Point	84-85 85-86	14 49	46 (14) 66 (34)	68 (15)
6-61-26	Fall chinook	TRH	83	6/7/84	191,094	59.0	TRH	85-86	590	53(585)	59 (5)
6-56-08	Fall chinook	TRH	83	6/19/84	91,153	46.0	Steelbridge	85-86	350	54(315)	67 (5)
6-56-12	Fall chinook	TRH	83	6/20/84	97,311	49.0	Junction City	85-86	493	54(489)	60 (4)
6-56-13	Fall chinook	TRH	83	6/22/84	100,227	46.0	Lime Point	85-86	657	54(615)	59 (12)
6-61-13	Fall chinook	TRH	83	10/4/84	100,520	12.5	TRH	85-86	640	640	49(640)

(Continued on next page)

APPENDIX TABLE 4. (Cont'd)

WT Code	Race	Egg Source	Brood Year	RELEASE DATA			Year	RECOVERY DATA				
				Date	Number	Size #/lb		Actual CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)	Mean Female FL (cm)	
6-56-14	Fall chinook	TRH	83	10/16/84	25,547	12.1	Steelbridge	85-85	67	67	47 (67)	---
6-56-15	Fall chinook	TRH	83	10/17/84	25,754	13.4	Junction City	85-86	57	57	47 (57)	---
6-56-16	Fall chinook	TRH	83	10/18/84	26,171	14.1	Lime Point	85-86	37	37	47 (37)	---
6-63-01	Fall chinook	TRH	83	3/1/85	92,965	5.3	TRH	85-86	543	543	40(543)	---
100000	Fall ^k /chinook							84-85	19	19	55 (14)	70 (5)
								85-86	171	171	52(154)	66 (17)
200000	Fall ^k /chinook							85-86	30	30	53 (30)	---
400000	Fall ^k /chinook							85-86	12	12	55 (11)	83 (1)

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APPENDIX TABLE 4. (Cont'd)

CWT Code	Race	Egg Source	Brood Year	RELEASE DATA			Site	Year	RECOVERY DATA			
				Date	Number	Size #/lb			Actual CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)	Mean Female FL (cm)
6-56-06	Coho	TRH	81	4/13/83	33,949	14.5	TRH	84-85 85-86	6 245 1	6 245 1	36 (6) 65 (72)	67 (48) 73 (1)
6-56-45	Coho	TRH	82	2/23/84	46,418	13.3	TRH	84-85 85-86	33 218	33 218	43 (26) 69(119)	71 (97)
6-56-46	Coho	TRH	82	3/12/84	47,312	12.7	TRH	84-85 85-86	140 561	140 561	43(109) 69(272)	44 (1) 71(288)
6-56-47	Coho	TRH	82	4/2/84	47,351	11.0	TRH	84-85 85-86	294 786	294 786	43(234) 70(388)	53 (1) 71(390)

APPENDIX TABLE 4. (cont'd)

CWT Code	Race	Egg Source	Brood Year	RELEASE DATA			Year	RECOVERY DATA				
				Date	Number	Size #/lb		Actual CWT Recoveries	Expanded CWT Recoveries	Mean Male FL (cm)	Mean Female FL (cm)	
6-56-06	Coho	TRH	81	4/13/83	33,949	14.5	TRH	83-84 84-85	6 245	6 245	36 (6) 65 (72)	67 (48)
6-56-45	Coho	TRH	82	2/23/84	46,418	13.3	TRH	84-85	33	33	43 (26)	---
6-56-46	Coho	TRH	82	3/12/84	47,312	12.7	TRH	84-85	140	140	43(109)	44 (1)
6-56-47	Coho	TRH	82	4/2/84	47,351	11.0	TRH	84-85	294	294	43(234)	53 (1)
6-56-48	Coho	TRH	82	4/16/84	49,153	11.0	TRH	84-85	227	227	42(164)	46 (3)
6-56-49	Coho	TRH	82	4/30/84	45,761	9.3	TRH	84-85	145	145	42(106)	---
10-00-00	Coho							84-85	185	185	52(102)	64 (30)
20-00-00 f/	Coho							84-85	17	17	44 (10)	71 (1)

a/ Sample size in parenthesis.

b/ --- = None sampled.

c/ CRH = Cole Rivers Hatchery, Rogue River, Oregon.

d/ 10-00-00 = No CWT in head of Ad-marked fish.

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

f/ 200000 = CWT lost during dissection

g/ 400000 = CWT unreadable

h/ Steelbridge is 8.5 miles (13.6 km) downstream of TRH.

i/ Junction City is 32.2 miles (51.6 km) downstream of TRH.

j/ Lime Point is 38.4 miles (61.6 km) downstream of TRH.

k/ Assumed to be fall chinook by entry time into TRH.

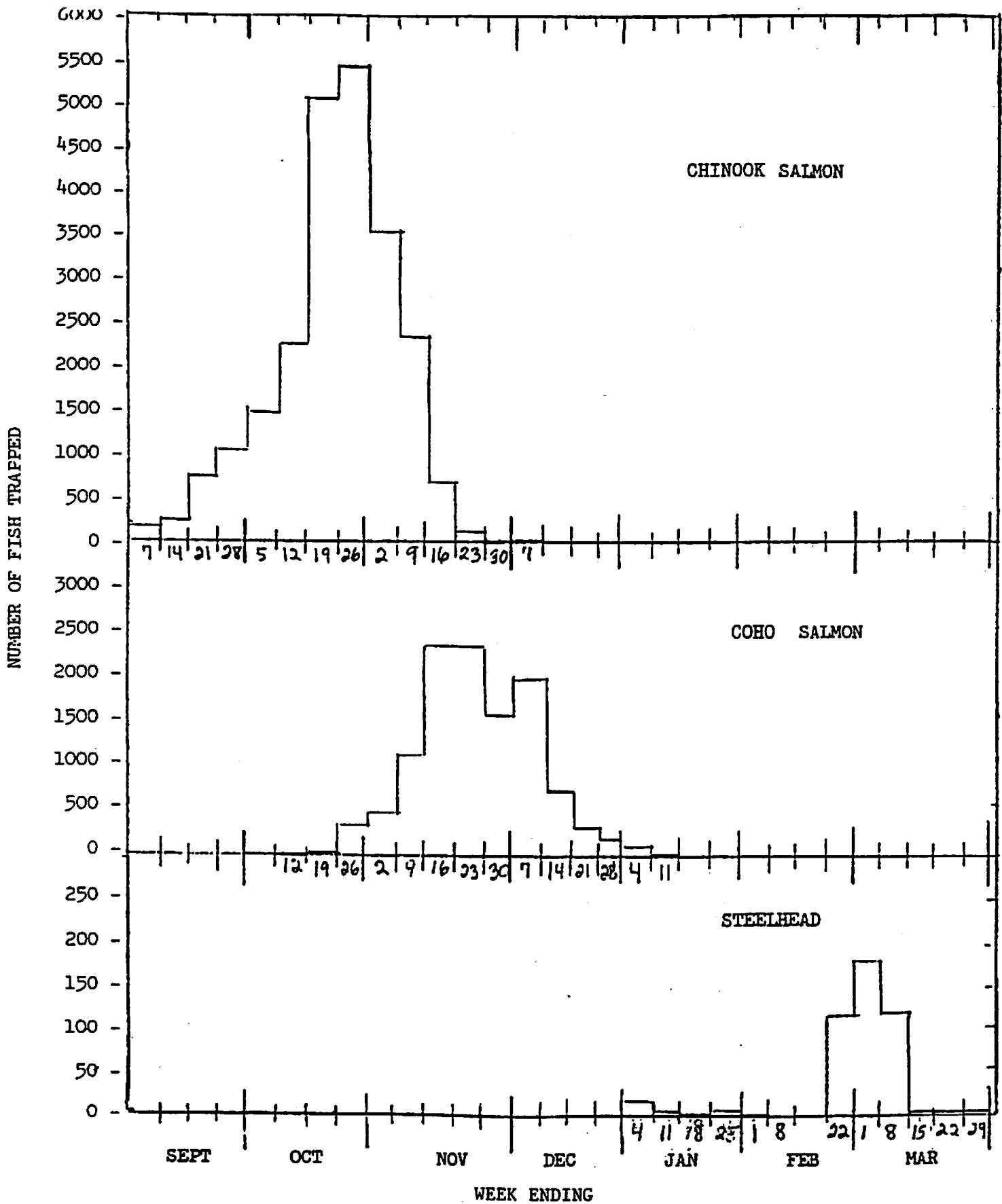


Figure 1. Salmon and steelhead trapped at Trinity River Fish Hatchery. Weekly counts during 1985-86 season.