

State of California
The Resources Agency
Department of Fish and Game
Region 1, Inland Fisheries

REF 90083

ANNUAL REPORT
TRINITY RIVER SALMON AND STEELHEAD HATCHERY
THIRTEENTH YEAR OF OPERATION 1970-71¹/

by

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SUMMARY

King salmon, Oncorhynchus tshawytscha, entered the hatchery from September 1 through November 19. Silver salmon, O. kisutch, began entering the hatchery on October 13. The run ended on December 16. Steelhead trout, Salmo gairdnerii gairdnerii, were trapped at the hatchery from October 13 to April 23. A few brown trout, Salmo trutta, entered the hatchery from October 19 through November 30, 1970.

Production data are as follows:

Species	Number trapped	Number females spawned	Number eggs taken	Number fingerlings planted	Number yearlings planted	Total pounds planted	On hand June 30, 1971
King salmon	4,444	686	3,664,000*	1,665,494	750,000	67,340	400,000
Silver salmon	3,147	1,350	3,827,000	1,084,254	395,430	44,373	700,000
Steelhead trout	67	20	1,485,300+	0	705,423	125,601	955,900
Brown trout	23	2	‡	0	46,537	9,556	3,000
TOTALS	7,681	2,058	8,976,300	2,749,748	1,897,390	246,870	2,058,900

* Includes 1,617,000 received from Iron Gate Hatchery.

+ Includes 1,300,000 from Trinity River broodstock and 110,300 from Skamania

‡ Hatchery, Washougal River, Washington.

So few eggs were taken they were not recorded.

¹/ Anadromous Fisheries Branch Administrative Report No. 72-4.
Submitted August, 1971.

INTRODUCTION

This is the thirteenth consecutive fiscal year report covering operation of the Trinity River Salmon and Steelhead Hatchery, located near Lewiston, Trinity County. Copies of the previous reports are available upon request from the Anadromous Fisheries Branch, Sacramento.

The hatchery was constructed by the United States Bureau of Reclamation to compensate for spawning and rearing areas blocked by the Trinity River Project. The California Department of Fish and Game began operation of the permanent installation on May 15, 1963, with funds for operation and maintenance supplied by the Bureau. Operation of the hatchery from July 1, 1970 through June 30, 1971 is described in this report.

BUDGET

The estimated hatchery operating budget for fiscal year 1970-71 was \$252,100.00.

Total--Salary and Wages	\$106,000.00
Fish food	83,000.00
General expense	3,300.00
Chemicals	3,000.00
Nets and Seines	300.00
Liability Insurance	120.00
Telephone	500.00
Postage	100.00
Travel, instate	2,400.00
Recurring maintenance of facility	5,200.00
Vehicle operation, automobile	6,180.00
Rental of refrigeration unit	3,600.00
Equipment, field and oper. additional	9,000.00
Equipment, misc. replacement	200.00
Equipment, misc. additional	200.00
Subtotal	\$223,100.00
Administrative charges	29,000.00
TOTAL	\$252,100.00

Due to adjustments in Salary and Wages, Fish food, and Administrative charges, actual expenditures amounted to \$249,667.00.

HATCHERY OPERATION

Disease problems were at a minimum during the year. However, moderate losses from gill bacteria did occur among several of the early lots of spring-run king salmon. The outbreaks were controlled to some extent by

regular copper sulfate flushes and by feeding medicated feed. Undetermined but substantial losses were incurred at the hatchery as a result of predation by Kingfishers, Great Blue Herons, Gulls, Mink, and Raccoons.

All production fish were reared on a diet of Oregon Moist Pellet (OMP). Broodfish were started on OMP and then changed to dry broodstock pellets during the last 4 to 6 months before spawning. A total of 530,200 pounds of feed produced 246,870 pounds of fish during fiscal year 1970-71. Thus the conversion rate (pounds of feed required to produce a pound of fish) was 2.15.

For the second consecutive year at Trinity River Hatchery, eggs were taken from broodstock steelhead--fish from the 1968 brood year which were held at the hatchery for this purpose. Of the approximately 750 females on hand, 447 matured and were spawned, producing 1,300,000 eggs. Average size of fish spawned was 19.9 inches FL and 4 lb in weight. Eggs per female averaged 2,908 and numbered 229 per ounce.

Eggs received this year by transfer from other sources were as follows: king salmon, 1,617,000 from Iron Gate Hatchery; steelhead, 110,300 from Skamania Hatchery, Washougal River, Washington. An additional 722,950 fingerling king salmon were received from Iron Gate Hatchery and were planted in the Trinity River along with Trinity River Hatchery fingerling king salmon.

At the end of the spawning season, all of the trout, spawned and unspawned, were planted in the Trinity River from the hatchery downstream to Lime Point.

Beginning on April 15 and continuing through June 15, a special water release was made from Lewiston Dam. Water flow was increased daily in increments of 50 cfs until it reached a maximum of 800 cfs on May 27. The river remained at this level for about 2 weeks and then was gradually reduced to 150 cfs on June 15. These increased flows were at the request of the Department of Fish and Game and were intended to determine the effect on downstream migration of young salmonids.

Maintenance at the hatchery during the past year consisted mainly of cleaning and painting. No new construction nor major repairs were carried out during this period. Very late in the year installation was begun on 132 automatic feeders for the nursery tanks.

Visitors to the hatchery in 1970-71 numbered 14,215. An additional 2,454 anglers used the river adjacent to the hatchery during the fly fishing only season from June 1 to September 15. Guided tours were provided several of the larger groups, mostly from schools in the area.

MARKING PROGRAM

In 1964, a marking program was initiated at Trinity River Hatchery. Since then, well over two million king salmon, silver salmon, steelhead, and brown trout have been marked and released. This program is to aid in determining the planting size, time, and place of release which will provide the maximum catch plus return of spawners to the hatchery. By comparing the returns of fish which were marked and released at different sizes at different times of the year and in different areas, we hope to formulate an improved planting policy. An administrative report on results of the marking program to date is being prepared.

KING SALMON MAINTENANCE PROGRAM

History of the 1970 King Salmon Run

Spring-run king salmon were first observed in the Trinity River adjacent to the hatchery on June 2. However, they were few in number and remained so for most of the summer.

~~The fish ladder was opened on August 28. From that time through the 8th of October, 1,847 king salmon, thought to be mostly spring-run, were trapped. This number included 380 males, 309 females, and 1,158 grilse. Two hundred and thirty-one of the females were spawned producing 640,000 eggs. Average eggs per fish was 2,771 and egg size was 79 per ounce. A sample of 200 adult spring-run fish, males and females, averaged 27.4" FL.~~

When the run ended on November 19, 1970, a total of 4,444 king salmon had been trapped at the hatchery. This total included, in addition to the spring-run mentioned above, 2,597 fall-run fish of which ~~898~~ were ~~males, 416 females, and 1,788 grilse. Of all the females trapped, both spring- and fall-run, 4686 were spawned, 30 died in the holding ponds, and 9 were killed while still too green to be spawned successfully. There were 455 fall-run females spawned, this produced 1,407,000 eggs, an average of 3,092 per female. Egg size averaged 83 per ounce. A sample of 200 adult fall-run king salmon, males and females, averaged 29.9" FL.~~

Marked King Salmon Returns

During the 1970-71 season, 702 marked king salmon were trapped; 7 different marks were represented as listed below:

Mark	Brood year	Release data				Number recovered	Mean fork length at recovery in inches
		Date	Area	Number	Size		
LM	1964	5/25/65	Hatchery	100,000	192/lb	6	30.5
RM	1964	10/29/65	"	100,000	15.7/lb	3	30.2
Ad	1966	3/19/68	"	52,185	10.8/lb	280	28.0
LV	1967	12/3/68	"	100,000	17.4/lb	117	22.6
RV	1967	4/10/69	"	100,000	6.8/lb	288	21.6
Ad-LP	1968	10/15/69	"	200,000	13.8/lb	7	16.3
LV-RV*	1968	Spring '69	Alsea R., Oregon	30,000	4/lb	1	23.0

* Probable release data.

Planting 1969 Brood Year King Salmon

In November, 1970, 750,000 fall-run king salmon yearlings were planted in the Trinity River at the hatchery. They averaged 13.6 per pound and were not marked.

As reported in last year's report, the 1969 brood year spring-run juveniles were not held separately from the fall-run juveniles, and were planted as fingerlings. Last year only 19 spring-run females were spawned and produced 58,000 eggs.

Of the 2,401,000 king salmon (fall- and spring-run) eggs taken in 1969, 2,020,230 or 84.1% were later returned to the river as fish.

Planting 1970 Brood Year King Salmon

The 1970 fall-run king salmon fingerlings were released near the hatchery as follows:

<u>Date</u>	<u>Size</u>	<u>Number</u>
6/7/71	128/lb	102,400
6/7/71	118/lb	47,200
6/7/71	138/lb	27,600

VV
122
6/17/71

(Continued)

Date	Size	Number
6/8/71	127/lb	279,400
6/9/71	134/lb	46,900
6/9/71	142/lb	28,400
6/9/71	160/lb	64,000
6/9/71	154/lb	127,050
6/9/71	95/lb	80,750
6/10/71	90/lb	67,500
6/10/71	111/lb	55,500
6/10/71	108/lb	81,000
6/10/71	140/lb	98,000
6/11/71	150/lb	183,750
6/11/71	168/lb	67,200
6/11/71	217/lb	238,700
6/15/71	864/lb	14,688
6/15/71	736/lb	21,344
6/15/71	656/lb	34,112
TOTAL	142/lb	1,665,494

The fish were planted 2 miles downstream from the hatchery, below the old Lewiston Bridge. Of the total fingerlings planted, 942,544 were from Iron Gate Hatchery on the upper Klamath River.

About 400,000 Trinity River spring-run fingerlings are being held over for planting as yearlings in November, 1971.

SILVER SALMON MAINTENANCE PROGRAM

History of the 1970 Silver Salmon Run

Silver salmon began entering the hatchery on October 13. When the run ended on December 16, 1,410 males, 1,396 females, and 341 grilse had been trapped. Of the 1,396 females, 1,350 were spawned and 46 died in the holding ponds or were killed while still too green to be spawned successfully. There were 3,827,000 eggs taken, an average of 2,835 per female. Egg size averaged 86 per ounce. Average length of adults, excluding grilse, was 29.0" FL.

Planting 1969 Brood Year Silver Salmon

The 1969 brood year silver salmon yearlings, Trinity River stock and fish from eggs received from Alsea River Hatchery in Oregon, were planted in the Trinity River at China Slide as follows:

<u>Date</u>	<u>Strain</u>	<u>Size</u>	<u>Number</u>
11/9/70	Alsea	9.0/lb	26,100
11/10/70	"	8.0/lb	26,400
11/12/70	"	9.5/lb	51,200
11/16/70	"	9.3/lb	41,850
Subtotal	Alsea	9.0/lb	145,550
11/17/70	Trinity	12.3/lb	50,600
11/18/70	"	9.7/lb	60,120
11/19/70	"	9.8/lb	14,700
Subtotal	Trinity	10.6/lb	125,420
2/17/71	Trinity	13.2/lb	33,000
2/18/71	"	14.0/lb	53,060
Subtotal	Trinity	13.7/lb	86,060
2/18/71	Alsea	12/lb	13,200
2/19/71	"	12/lb	25,200
Subtotal	Alsea	12.0/lb	38,400
<hr/>			
TOTAL	Both strains	10.5/lb	395,430

Of the 291,000 1969 brood year Trinity River silver salmon eggs taken, 211,480 or 72.7% were later returned to the river as fish.

Of the 225,000 1969 brood year eggs received by transfer from the Alsea River, 183,950 or 81.8% were later planted in the Trinity River as fish.

Planting 1970 Brood Year Silver Salmon

Silver salmon fingerlings from the 1970 brood year were planted in the Trinity River near the hatchery as follows:

<u>Date</u>	<u>Size</u>	<u>Number</u>
6/1/71	147/lb	147,000
6/3/71	142/lb	67,876
6/3/71	162/lb	52,164
6/3/71	169/lb	33,800
6/3/71	163/lb	51,345
6/3/71	143/lb	40,755

(Continued)

<u>Date</u>	<u>Size</u>	<u>Number</u>
6/4/71	155/lb	93,000
6/4/71	158/lb	85,794
6/14/71	154/lb	308,000
6/15/71	163/lb	97,800
6/15/71	184/lb	106,720
TOTAL	157/lb	1,084,254

About 700,000 Trinity River silver salmon fingerlings are being held at the hatchery for planting as yearlings early in 1972.

STEELHEAD MAINTENANCE PROGRAM

History of the 1970-71 Steelhead Run

The 1970-71 steelhead run at Trinity River Hatchery was the lowest on record. Only 67 fish entered the trap during the period October 13, when the run began, until it ended on April 23. Of these, 29 were males and 38 females. Only 20 of the females were spawned successfully, the rest having died in the holding pond. A total of 75,000 eggs was taken for an average per female of 3,750. Egg size was 189 per ounce.

Marked Adult Steelhead Returns

Of the 67 steelhead trapped during 1970-71, 22 or 33% were marked and all originated from Trinity River Hatchery. Mark recoveries were as follows:

Mark	Brood year	Release data			Adult mark recoveries	
		Date	Area	Number	Size	Mean fork length in inches
LV	1966	May, 1967	Hawkins Bar 60 mi. below hatchery	100,000	44/lb	1 26.5
RM	"	Nov., 1967	"	50,000	6.9/lb	4 22.6
RV	"	March, 1968	"	27,057	6.9/lb	2 24.8
Ad	"	April, 1968	"	100,011	6.9/lb	1 26.5
LV-RM-	"	Nov., 1967	"	24,960	11.9/lb	1 26.0
D	1967	May, 1969	"	45,500	1.9/lb	4 22.5
RV-RM	"	Nov., 1968	"	50,000	3.9/lb	7 23.8
An-LV	1969	Oct., 1970	Hatchery	46,318	2.4/lb	2 19.3

Planting 1968 Brood Year Steelhead

The 1968 brood year Trinity River strain steelhead were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
3/30/71	4 lbs/fish	none	Lime Point	655
5/14/71	4 lbs/fish	none	Hatchery	237
TOTAL	4 lbs/fish	none	All areas	892

Most of these large fish were taken by anglers within a few days after they were planted.

Planting 1969 Brood Year Steelhead

Trinity River Strain

The 1969 brood year steelhead were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
10/25/70	2.9/lb	Ad-An	Pecwan	50,000
10/27/70	2.8/lb	An-RV	China Slide	50,000
10/29/70	2.4/lb	An-LV	Hatchery	46,318
3/17/71	1.3/lb	-	China Slide	2,214
3/18/71	1.3/lb	-	Hatchery	429
TOTAL	2.7/lb	All fish	All areas	148,961

Of the 1,105,000 1969 brood year Trinity River strain eggs taken, 699,231 or 63% were later returned to the river as fish, transferred to Iron Gate Hatchery, or are on hand as brood stock.

Eel River Strain

These fish, consisting of excess broodstock, were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
3/17/71	2.5/lb	-	China Slide	3,500
3/18/71	2.5/lb	-	Hatchery	3,782
TOTAL	2.5/lb	none	All areas	7,282

Where the
Hatchery
these come
from?
When?

Planting 1970 Brood Year Steelhead

Trinity River Strain

The 1970 brood year Trinity River strain steelhead were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
4/19/71	6.5/lb	LV (35,000)	Hatchery	35,100
4/19/71	10.0/lb	Tagged	"	200
4/20/71	9.7/lb	RV (35,000)	Pecwan	29,100
4/20/71	10.0/lb	Tagged	"	200
4/21/71	9.7/lb	-	"	22,310
4/22/71	10.0/lb	Tagged	China Slide	200
5/4/71	18.7/lb	-	Hatchery	43,478
5/4/71	34.0/lb	-	"	1,530
<u>TOTAL</u>	<u>10.1/lb</u>	<u>All fish</u>	<u>All areas</u>	<u>132,118</u>

Of the 198,000 1970 brood year eggs taken, 132,118 or 68% were later returned to the river as fish or are on hand as broodstock.

Trinity River Broodstock Strain

The 1970 brood year steelhead, Trinity River broodstock strain, were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
4/22/71	6.0/lb	-	China Slide	19,200
4/22/71	6.9/lb	-	"	11,040
4/23/71	4.8/lb	-	"	5,760
4/26/71	4.9/lb	-	"	17,150
<u>Subtotal</u>	<u>6.0/lb</u>		<u>China Slide</u>	<u>53,150</u>
4/21/71	6.3/lb	-	Pecwan	4,410
4/27/71	5.0/lb	-	"	15,000
4/28/71	4.6/lb	-	"	14,720
4/29/71	4.6/lb	-	"	15,295
<u>Subtotal</u>	<u>4.8/lb</u>		<u>Pecwan</u>	<u>49,425</u>

(Continued)

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
4/26/71	4.9/lb	-	Hatchery	4,040
5/3/71	5.2/lb	-	"	8,710
5/4/71	12.5/lb	-	"	16,250
5/5/71	13.0/lb	-	"	45,695
5/5/71	85.0/lb	-	"	850
Subtotal	10.3/lb		Hatchery	75,545
TOTAL	6.6/lb	none	All areas	178,120

Of the 337,000 broodstock steelhead eggs taken in 1970, 178,120 or 53% were later planted in the river as fish.

Roaring River Strain

On April 27 and May 11, 1970, steelhead eggs totaling 115,824 were received from Roaring River Hatchery in Oregon. The fish from these eggs were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
4/22/71	8.2/lb	-	China Slide	13,120
4/23/71	8.3/lb	Ad-RM (20,000)	"	24,900
4/23/71	8.3/lb	-	"	14,940
TOTAL	2.3/lb	All fish	China Slide	52,960

Of the 115,824 eggs received, 52,960 or 46% were later planted in the Trinity River as fish.

Washougal Strain

On April 6, 1970, 107,000 summer-run steelhead eggs were received from Skamania Hatchery on the Washougal River in Washington. The fish from these eggs were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
5/3/71	6.0/lb	Ad-IM (20,000)	Hatchery	54,900
5/4/71	13.0/lb	-	"	18,460
TOTAL	6.9/lb	All fish	Hatchery	73,360

Of the 107,000 eggs received, 73,360 or 69% were later planted in the Trinity River as fish.

*Recovery
Entered*

Iron Gate Strain

During the period April 30 through May 22, 1970, a total of 261,248 steel-head eggs were received from Iron Gate Hatchery on the Klamath River near Hornbrook, California. Fish from these eggs were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
5/5/71	27.0/lb	-	Hatchery	24,300
5/5/71	100.0/lb	-	"	2,100
5/5/71	20.0/lb	-	"	14,400
5/6/71	17.3/lb	-	"	70,930
<u>TOTAL</u>	<u>19.5/lb</u>	<u>none</u>	<u>Hatchery</u>	<u>111,730</u>

Of the 261,248 eggs received, 111,730 or 43% were later planted in the Trinity River as fish.

During fiscal year 1970-71 a total of 705,423 steelhead weighing 125,802 pounds were planted in the Klamath and Trinity rivers from Trinity River Hatchery.

BROWN TROUT MAINTENANCE PROGRAM

History of the 1970 Brown Trout Run

From October 19 through November 30, 1970, 23 brown trout, 14 males and 9 females, were trapped at the hatchery. Most of the fish measured less than 14" FL and were in poor condition. Only 2 of the females were successfully spawned and produced very few eggs. The rest of the fish, including most of the males, died soon after being trapped. None of the brown trout taken during the 1970 season were marked.

Planting 1968 Brood Year Brown Trout

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
10/28/70	3.2/lb	LV	China Slide	8,126
11/4/70	3.1/lb	RV	Klamath Glen	10,841
<u>TOTAL</u>	<u>3.1/lb</u>	<u>Both marks</u>	<u>All areas</u>	<u>18,967</u>

An additional 4,200 1968 brood year brown trout were transferred to Darrah Springs Hatchery for use as broodstock. However, they soon became heavily parasitized by a gill fluke and had to be disposed of.

Total 1968 brood year brown trout planted plus those transferred was 23,167 or 31% of the 75,644 eggs taken during 1968.

Planting 1969 Brood Year Brown Trout

The 1969 brood year brown trout were planted as follows:

<u>Date</u>	<u>Size</u>	<u>Mark</u>	<u>Area</u>	<u>Number</u>
3/29/71	12.3/lb	none	Hatchery downstream to Lime Point	23,370

There are about 3,000 1969 brood year brown trout yearlings on hand at the hatchery and will be planted in the Trinity River in November, 1971. Of the 53,000 brown trout eggs taken during 1969, 26,370 or 50% were later planted or are on hand as fish.

APPENDICES

TABLE A-1 Yearly Comparison of Fish Trapped at Lewiston. Compares the number of fish by species trapped at the Lewiston Fish Trapping Facilities and at the Trinity River Hatchery from July 1, 1970 through June 30, 1971.

TABLE A-2 Chart of Operation. Enumerates details of each activity.

TABLE A-3 Weather, Water, and Fish Data Report. Summarizes daily air and water temperatures, weather condition, river flow, and number of fish by species trapped at Trinity River Hatchery, July 1, 1970, through June 30, 1971.

FIGURE A-1 Shows weekly number of king salmon, silver salmon, and steelhead trout trapped.

TABLE A-1
Yearly Comparison of Fish Trapped at Lewiston
July 1, 1965 through June 30, 1971

Species	July 1, 1965 through June 30, 1966	July 1, 1966 through June 30, 1967	July 1, 1967 through June 30, 1968	July 1, 1968 through June 30, 1969	July 1, 1969 through June 30, 1970	July 1, 1970 through June 30, 1971
King salmon						
Male	477	1,052	1,620	1,797	624	773
Female	1,077	1,002	1,250	2,102	832	725
Total adults	1,554	2,054	2,870	3,899	1,456	1,498
Grilse	1,521	2,786	1,746	873	1,130	2,946
Totals	3,075	4,840	4,616	4,772	2,586	4,444
Silver salmon						
Male	2	45	287	3	153	1,410
Female	1	173	519	1	132	1,396
Total adults	3	218	806	4	285	2,806
Grilse	9	807	59	34	1,711	341
Totals	12	1,025	865	38	1,996	3,147
Steelhead trout						
Adults	992	135	232	554	241	67
Brown trout						
Adults	100	152	231	170	70	23

Chart of Operation
Trinity River Salmon and Steelhead Hatchery
1970-71

Species	Adult fish trapped	Females spawned	Eggs taken	Eggs and fish received by transfer	Fingerlings planted	Yearlings planted	Total pounds planted	Fish on hand June 30, 1970	Fish on hand June 30, 1971
King salmon									
Male	773								
Female	725								
Grilse	2,946								
Totals	4,444	686	2,047,000	1,617,000 ^{1/}	1,665,494 ^{2/}	750,000	67,340	768,000	400,000
Silver salmon									
Male	1,410								
Female	1,396								
Grilse	341								
Totals	3,147	1,350	3,827,000	0	1,084,254	395,430	44,373	457,400	700,000
Steelhead trout	67	20	1,375,000 ^{3/}	110,300 ^{4/}	0	705,423	125,601	1,026,000	955,900
Brown trout	23	2	5/	0	0	46,537	9,556	74,200	3,000
Totals	7,681	2,058	7,249,000	1,727,300	2,749,748	1,897,390	246,870	2,325,600	2,058,900

1/ From Iron Gate Hatchery.

2/ Includes 722,950 Iron Gate Hatchery strain fish.

3/ 75,000 from wild fish and 1,300,000 from broodstock.

4/ From Skamania Hatchery, Washougal, Washington

5/ There were so few eggs taken that they were not entered in the books

TA-3
Trinity River Salmon and Steelhead Hatchery
Weather, Water, and Fish Data Report
July 1, 1970, through June 30, 1971

Temperatures (Degrees F)

Air

Water

Fish trapped

Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped		
	Maximum	Minimum	Maximum	Minimum			King salmon Adults	Silver salmon Grilse	Steelhead trout
July 1	92	49	52	51	Clear	153			
2	100	53	53	52	Clear	153			
3	101	54	52	51	Clear	153			
4	104	58	53	50	Clear	153			
5	101	59	53	51	Partly Cloudy	153			
6	100	58	52	50	Clear	155			
7	100	52	52	51	Clear	155			
8	97	49	53	51	Clear	155			
9	94	48	52	50	Clear	157			
10	90	50	53	51	Clear	157			
11	95	51	53	50	Clear	157			
12	99	51	52	50	Clear	155			
13	100	52	53	51	Clear	155			
14	104	50	52	51	Clear	155			
15	100	48	52	51	Clear	155			
16	100	54	52.5	51	Clear	155			
17	101	50	52	51	Clear	155			
18	100	53	53	51.5	Clear	155			
19	104	55	53	51	Clear	153			
20	100	56	52	50.5	Clear	153			
21	95	55	51	49	Clear	153			
22	97	50	52	50	Clear	153			
23	101	52	53	50	Clear	153			
24	96	56	53	52	Clear	153			
25	99	56	53	52	Clear	230			
26	98	56	53	52	Clear	172			
27	92	56	53	52	Clear	141			
28	92	56	53	52	Clear	150			
29	91	48	53	52	Clear	146			
30	90	48	53	52	Clear	141			
31	90	47	53	52	Clear	153			

Totals

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)									
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*		Fish trapped	
	Maximum	Minimum	Maximum	Minimum				King salmon Adults	Silver salmon Adults
Aug. 1	94	50	53	52	Clear	153		Grilse	Steelhead trout
2	98	49	53	52	Clear	153			
3	101	50	52.5	50	Clear	150			
4	98	49	52	50	Clear	150			
5	94	48	52	50	Clear	150			
6	95	50	52	51	Clear	153			
7	90	51	52	51	Clear	153			
8	93	50	52	51	Clear	153			
9	102	49	53	56	Clear	153			
10	100	51	52	51	Clear	153			
11	104	52	52	51	Clear	153			
12	102	54	52	51	Clear	153			
13	101	51	52	51	Clear	153			
14	102	52	52	51	Clear	153			
15	100	54	52	51	Clear	153			
16	98	52	53.5	52	Clear	153			
17	96	52	52	51	Clear	153			
18	94	51	52	52	Clear	153			
19	94	48	52	51	Clear	153			
20	95	50	52	51	Clear	153			
21	94	48	52	51	Clear	153			
22	90	53	52	51	Partly Cloudy	155			
23	90	47	52	51	Clear	155			
24	92	48	52	51	Clear	155			
25	92	47	52	51	Clear	155			
26	91	44	52	50.5	Clear	157			
27	94	44	52	50.5	Clear	155			
28	95	45	52	50	Clear	155			
29	95	49	51.5	51	Clear	153			
30	84	54	52	51	Clear	153			
31	90	45	51.5	50.5	Partly Cloudy	155			
Totals									

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)										
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped			
	Maximum	Minimum	Maximum	Minimum			King salmon Adults	Grilse	Silver salmon Adults	Grilse
Sept. 1	92	45	51	51	Clear	180	8	16		
2	91	44	51	51	Clear	198				
3	90	46	51	51	Clear	198				
4	72	49	52	52	Partly Cloudy	198				
5	76	36	52	51.5	Clear	198				
6	90	47	51	51	Clear	198				
7	92	50	52	51.5	Clear	198				
8	93	54	52	51.5	Clear	198	27	76		
9	99	45	53	52	Clear	198				
10	99	48	53	52	Clear	198				
11	100	49	52	52	Clear	198	28	52		
12	85	45	52.5	52	Clear	198				
13	73	37	52.5	52	Clear	195				
14	80	30	52	51	Clear	198				
15	84	43	52	51	Clear	195	63	128		
16	90	40	53	51	Partly Cloudy	195				
17	89	46	53	52	Clear	198				
18	81	57	52	51	Partly Cloudy	198	33	81		
19	74	52	51	51	Partly Cloudy	198				
20	73	46	52	50.5	Partly Cloudy	198				
21	80	37	53	52	Clear	198	70	102		
22	93	38	52.5	52	Clear	198				
23	88	45	52.5	52	Clear	198				
24	85	35	52	51.5	Clear	198	89	125		
25	87	36	52	52	Clear	198				
26	94	42	51.5	51.5	Clear	198				
27	90	38	52	51.5	Clear	198	111	168		
28	88	40	52	52	Clear	198				
29	88	42	52	52	Clear	198				
30	90	39	51	51	Clear	198				
Totals							429	748		

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)											
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped				
	Maximum	Minimum	Maximum	Minimum			King salmon		Silver salmon		Steelhead trout
							Adults	Grilse	Adults	Grilse	
Oct. 1	95	40	51	50.5	Clear	198	72	116			
2	97	39	51.5	50.5	Clear	198					
3	92	39	51.5	51	Clear	198					
4	94	42	51.5	51	Clear	200					
5	83	43	51.5	50.5	Partly Cloudy	200	90	159			
6	70	38	52	51.5	Partly Cloudy	200					
7	74	32	52	52	Clear	200					
8	87	34	51	51	Clear	198	98	135			
9	75	39	50.5	50	Cloudy	198					
10	87	39	50.5	50	Clear	198					
11	88	36	50.5	50	Clear	198					
12	82	37	50	49.5	Clear	198					
13	85	29	51	50.5	Clear	198	107	197	1	1	1
14	84	28	50.5	50	Clear	200					
15	85	32	50.5	50	Clear	225	73	131		1	
16	81	34	50.5	50	Clear	248					
17	74	35	50	49.5	Overcast	245					
18	64	48	50	49.5	Rain	245					
19	60	45	50	49	Rain	245	188	246	3	3	
20	57	43	50	50	Cloudy	248					
21	57	42	50	49	Rain	245	26	57	1		
22	50	38	49	49	Rain	245	104	265	20	3	
23	52	47	48.5	48.5	Overcast - Rain	248					
24	53	33	48	47	Overcast	242					
25	57	39	47.5	47	Overcast	242					
26	60	37	48	47	Clear	242	160	311	37	7	
27	65	26	47.5	46.5	Clear	242					
28	70	30	47.5	46.5	Clear	236					
29	72	32	47.5	46.5	Clear	242	81	264	38	4	1
30	63	32	47.5	46.5	Overcast	242					
31	70	38	47	46	Clear	242					
Totals							999	1,881	100	19	2

*From U.S.G.S. Records

TABLE A-8 (Continued)

Temperatures (Degrees, F)											
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped				
	Maximum	Minimum	Maximum	Minimum			King salmon Adults	Grilse	Silver salmon Adults	Grilse	Steelhead trout
Nov. 1	72	34	48	46	Clear	245					
2	76	36	48	46.5	Clear	242	43	177	70	5	2
3	66	44	49.5	47.5	Clear	239					
4	56	47	49.5	48.5	Rain	245					
5	60	49	49.5	48.5	Rain	245	20	100	179	38	1
6	53	45	49	48.5	Rain	242					
7	52	42	49	47.5	Rain	242					
8	51	46	49.5	49	Rain	245					
9	58	47	48.5	48.5	Rain	245	3	30	453	77	2
10	55	42	49	49	Cloudy	242					
11	61	48	49	48.5	Rain	245					
12	58	36	49	49	Clear	242	2	5	306	25	1
13	58	35	49	49	Overcast	245					
14	61	38	49.5	49	Overcast	242					
15	58	34	48.5	48.5	Overcast	218					
16	61	40	49	48.5	Partly Cloudy	195	2	4	270	39	2
17	50	40	48.5	48	Overcast	195					
18	59	37	48	48	Clear	198					
19	50	34	48	48	Partly Cloudy	200		1	291	38	
20	46	36	48	48	Overcast	198					
21	48	39	47	47	Rain	195					
22	48	42	47	47	Rain	198					
23	49	46	48	47.5	Rain	198			346	48	4
24	50	48	47.5	47.5	Rain	200					
25	51	45	47.5	47.5	Rain	200					
26	46	34	47	47	Partly Cloudy	200					
27	34	32	47	46.5	Snow	200			309	27	3
28	38	32	46.5	46.5	Rain	203					
29	42	34	46.5	46.5	Rain	200					
30	41	32	45	45	Rain	198			224	15	
Totals							70	317	2,448	312	15

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)									
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped		
	Maximum	Minimum	Maximum	Minimum			King salmon Adults	Silver salmon Adults	Steelhead Trout
Dec. 1	41	30	45	45	Snow-Rain	177			
2	35	34	45	44.5	Snow	162			
3	39	37	44.5	43	Snow	160			
4	40	32	44	43	Cloudy	160		143	4
5	38	33	44	43.5	Cloudy	155			
6	45	34	44	43.5	Cloudy	160			
7	42	34	43	43	Rain	164			
8	44	36	43	43	Rain	160			
9	39	34	43	43	Overcast	157			
10	43	32	43	42.5	Overcast	155		57	4
11	50	32	43	43	Partly Cloudy	150			
12	44	26	43	43	Fog	155			
13	38	28	43	43	Snow	155			
14	42	33	43	43	Overcast	153			
15	40	34	43	43	Rain	155			
16	41	31	43	43	Rain	157		58	2
17	40	32	43	43	Overcast	157			
18	40	33	43.5	43.5	Overcast	157			
19	40	26	44	43	Clear	157			
20	32	31	43	43	Snow	155			
21	40	32	43	42.5	Overcast	155			
22	39	34	43	42	Overcast	155			
23	48	32	43	43	Overcast	155			
24	58	28	43.5	43	Overcast	155			
25	58	28	43	42	Partly Cloudy	155			
26	41	28	43	43	Overcast	155			
27	42	30	43	42	Rain,	153			
28	34	30	43	43	Snow	153			
29	43	32	43	43	Rain	153			
30	49	39	43	43	Overcast	155			
31	53	39	44	43	Partly Cloudy	155			
Totals								258	10

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)							Fish trapped		
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	King salmon		Steelhead trout
	Maximum	Minimum	Maximum	Minimum			Adults	Grilse	
Jan. 1	37	34	44	44	Rain-Snow	155			
2	42	22	44	43.5	Clear	154			
3	40	19	43	42	Clear	153			
4	43	17	44	43.5	Clear	153			
5	44	20	43.5	43.5	Clear	154			1
6	42	22	43	43	Clear	159			
7	45	25	43	42.5	Partly Cloudy	157			
8	46	28	43.5	43	Partly Cloudy	157			
9	49	30	44	43.5	Partly Cloudy	158			
10	52	36	44	44	Showers	159			
11	44	32	44	43.5	Rain	158			
12	40	24	44	44	Light Snow	159			
13	34	22	43.5	43.5	Snow	158			
14	39	26	43.5	43.5	Rain	157			
15	40	34	43	43	Rain-Snow	161			
16	37	32	43	43	Rain	178			
17	43	35	43	43	Rain	164			
18	54	40	44	43.5	Overcast	159			
19	50	42	44	43.5	Overcast	156			
20	52	40	44.5	44	Partly Cloudy	157			
21	50	32	44.5	43.5	Partly Cloudy	156			
22	44	27	44.5	44	Partly Cloudy	155			
23	42	30	44.5	44	Overcast	157			
24	50	32	44.5	44	Partly Cloudy	157			
25	56	30	44.5	44	Clear	156			
26	56	30	44	43.5	Clear	156			
27	58	33	44	43.5	Clear	158			
28	55	32	44	43.5	Clear	157			
29	60	33	43.5	43.5	Clear	155			
30	61	32	43.5	43.5	Clear	156			
31	60	33	44	43.5	Clear	157			
Totals									1

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)										
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped			
	Maximum	Minimum	Maximum	Minimum			King salmon Adults	Grilse	Silver salmon Adults	Grilse
Feb. 1	61	34	44	43.5	Clear	157				
2	57	33	44	43	Clear	157				
3	51	22	43.5	43	Clear	157				3
4	56	31	43	43	Overcast	155				
5	58	40	43.5	43	Overcast	155				
6	62	39	44.5	43.5	Clear	155				
7	62	30	45	43.5	Clear	155				
8	63	29	44.5	44	Clear	154				
9	59	30	44	44	Overcast	153				
10	68	33	45	44	Clear	153				
11	69	32	44.5	44	Clear	154				
12	64	33	44.5	44	Clear	150				
13	64	36	44.5	44	Clear	153				
14	50	34	44	43.5	Overcast	153				
15	54	34	44	43	Clear	150				
16	48	28	44	43.5	Overcast	149				
17	55	32	43.5	43.5	Clear	152				1
18	37	32	43.5	43.5	Snow-Rain	152				
19	48	26	43.5	43	Clear	150				
20	60	19	43.5	42.5	Clear	153				
21	52	26	43	42.5	Overcast	153				
22	56	33	43	43	Fair	153				
23	58	28	44	43	Clear	153				
24	54	32	43.5	43.5	Showers	155				
25	44	28	43.5	43	Snow-Clear	155				
26	47	20	43.5	43	Clear	153				
27	42	28	43	43	Snow	153				
28	40	32	43	43	Snow	150				
Totals										4

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)										
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped			
	Maximum	Minimum	Maximum	Minimum			King salmon Adults	Grilse	silver salmon Adults	Grilse
Mar. 1	46	21	44	43	Clear	150				
2	55	20	43	42.5	Clear	153				
3	54	35	43.5	43	Clear	150				
4	45	33	43.5	43.5	Clear	150				
5	54	22	44.5	43.5	Clear	150				
6	60	26	44.5	43.5	Cloudy	150				
7	56	34	44	43.5	Cloudy	148				
8	63	28	44.5	44	Clear	148				
9	60	27	45	44.5	Clear	148				
10	42	29	44.5	44	Rain	150				
11	50	40	44	44	Rain	155				
12	49	32	44	43.5	Snow-Rain	160				
13	50	30	43.5	43	Clear	155				
14	40	32	43.5	43	Snow-Rain	155				
15	54	33	43.5	43.5	Cloudy	153				
16	48	40	44	43.5	Rain	153				
17	58	30	44.5	43.5	Clear	150				1
18	68	26	46	44	Clear	150				
19	72	26	45.5	44.5	Clear	150				
20	71	32	47	44.5	Clear	150				
21	70	34	47	45.5	Clear	150				
22	49	42	45.5	45.5	Rain	153				
23	61	42	46	45.5	Rain	153				
24	60	38	45.5	45	Overcast	157				
25	42	41	45	45	Rain	169				6
26	51	40	45	45	Rain	164				
27	58	20	44	44	Clear	158				
28	58	20	44.5	44	Clear	157				
29	73	38	47	45.5	Clear	156				11
30	50	42	46.5	46	Cloudy	157				
31	63	24	47	46	Clear	159				
Totals										18

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)									
Date	Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*	Fish trapped		
	Maximum	Minimum	Maximum	Minimum			King salmon Adults Grilse	Silver salmon Adults Grilse	Steelhead trout
Apr. 1	72	28	49	46.5	Clear	154			9
2	72	32	49	46.5	Clear	153			1
3	76	30	49	47.5	Clear	153			
4	80	30	50	48	Clear	155			
5	74	33	49	48.5	Clear	155			12
6	64	38	49	49	Rain	155			
7	56	40	46.5	46.5	Cloudy	155			3
8	62	34	46.5	46	Rain	154			
9	50	45	46	46.5	Rain	154			
10	54	30	46	45	Light Showers	155			
11	60	32	45	44.5	Partly Cloudy	156			
12	69	34	47	45	Overcast	156			
13	58	44	46	45	Rain	157			
14	72	39	46	45	Clear	171			1
15	72	38	46	45	Clear	213			
16	58	38	46	45.5	Rain	264			
17	44	32	45.5	45.5	Overcast	300			
18	62	29	45	45	Clear	314			
19	72	34	46	45	Clear	364			
20	48	39	46	46	Rain	420			
21	62	26	46	45	Clear	475			
22	55	38	45	45	Rain	535			
23	54	33	45	45	Clear	610			1
24	52	38	45	45	Clear	672			
25	70	40	45	45	Clear	733			
26	66	36	47	45.5	Clear	784			
27	74	38	47	45.5	Clear	804			
28	70	36	47	45.5	Clear	801			
29	70	38	47	45.5	Overcast	801			
30	71	38	47	46	Clear	808			
Totals									27

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees, F)							Fish trapped		
Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*		King salmon	Silver salmon	Steelhead trout
Date	Maximum	Minimum	Maximum	Minimum			Adults	Grilse	Adults
May 1	67	41	47	45	Cloudy	815			
2	70	43	46	45	Rain	819			
3	64	46	45	45	Rain	822			
4	68	44	46	45	Overcast	818			
5	63	45	46	45	Partly Cloudy	817			
6	74	42	46	45	Clear	827			
7	73	43	47	46	Partly Cloudy	830			
8	50	44	46	46	Partly Cloudy	834			
9	74	47	46	46	Clear	840			
10	86	43	48	45	Clear	822			
11	84	43	49	46	Clear	812			
12	74	46	48	47	Overcast	816			
13	74	43	47	47	Clear	813			
14	80	36	48	46	Clear	797			
15	72	44	48	46	Cloudy	803			
16	65	33	46	46	Clear	844			
17	70	30	47	45	Clear	845			
18	80	34	47	46	Clear	830			
19	77	41	47	46	Clear	801			
20	69	41	47	46	Clear	718			
21	82	32	47	46	Clear	625			
22	82	44	47	46	Clear	606			
23	85	42	47	46	Clear	609			
24	75	56	50	46	Clear-Rain	608			
25	70	49	48	48	Rain	602			
26	66	40	46	46	Clear	597			
27	77	40	50	46	Cloudy	605			
28	62	49	47	46	Overcast	614			
29	73	51	48	46	Cloudy	610			
30	62	37	47	46	Partly Cloudy	608			
31	61	39	47	46	Overcast	604			
Totals									

*From U.S.G.S. Records

TABLE A-3 (Continued)

Temperatures (Degrees F)									
Air		Water		Weather	Flow of Trinity River at Lewiston (cfs)*		Fish trapped		
Date	Maximum	Minimum	Maximum	Minimum			King salmon Adults	Silver salmon Grilse	Steelhead trout
June 1	63	44	46	46	Overcast-Rain	606			
2	76	46	48	46	Clear	605			
3	76	44	49	46	Cloudy	604			
4	79	49	48	47	Cloudy-Rain	605			
5	82	42	50	47	Clear	608			
6	88	43	49	47	Clear	608			
7	86	48	49	46	Clear	559			
8	87	54	50	47	Clear	415			
9	84	52	50	47	Partly Cloudy	332			
10	81	48	49	47	Clear	314			
11	90	52	50	47	Clear	311			
12	84	46	50	47	Cloudy	311			
13	79	44	50	47	Clear	288			
14	86	44	50	47	Clear	241			
15	90	46	50	47	Clear	162			
16	93	48	50	47	Clear	148			
17	88	44	50	47	Cloudy	151			
18	78	59	50	49	Cloudy	152			
19	78	55	50	48	Cloudy	152			
20	94	50	50	48	Clear	152			
21	92	50	50	48	Clear	153			
22	90	50	50	48	Clear	153			
23	86	53	50	49	Clear	152			
24	86	46	50	49	Clear	149			
25	65	59	50	49	Rain	149			
26	73	57	49	49	Rain	150			
27	75	42	49	48	Cloudy	150			
28	83	38	49	49	Clear	151			
29	89	45	49	48	Clear	149			
30	93	44	50	49	Clear	149			
Totals									

*From U.S.G.S. Records

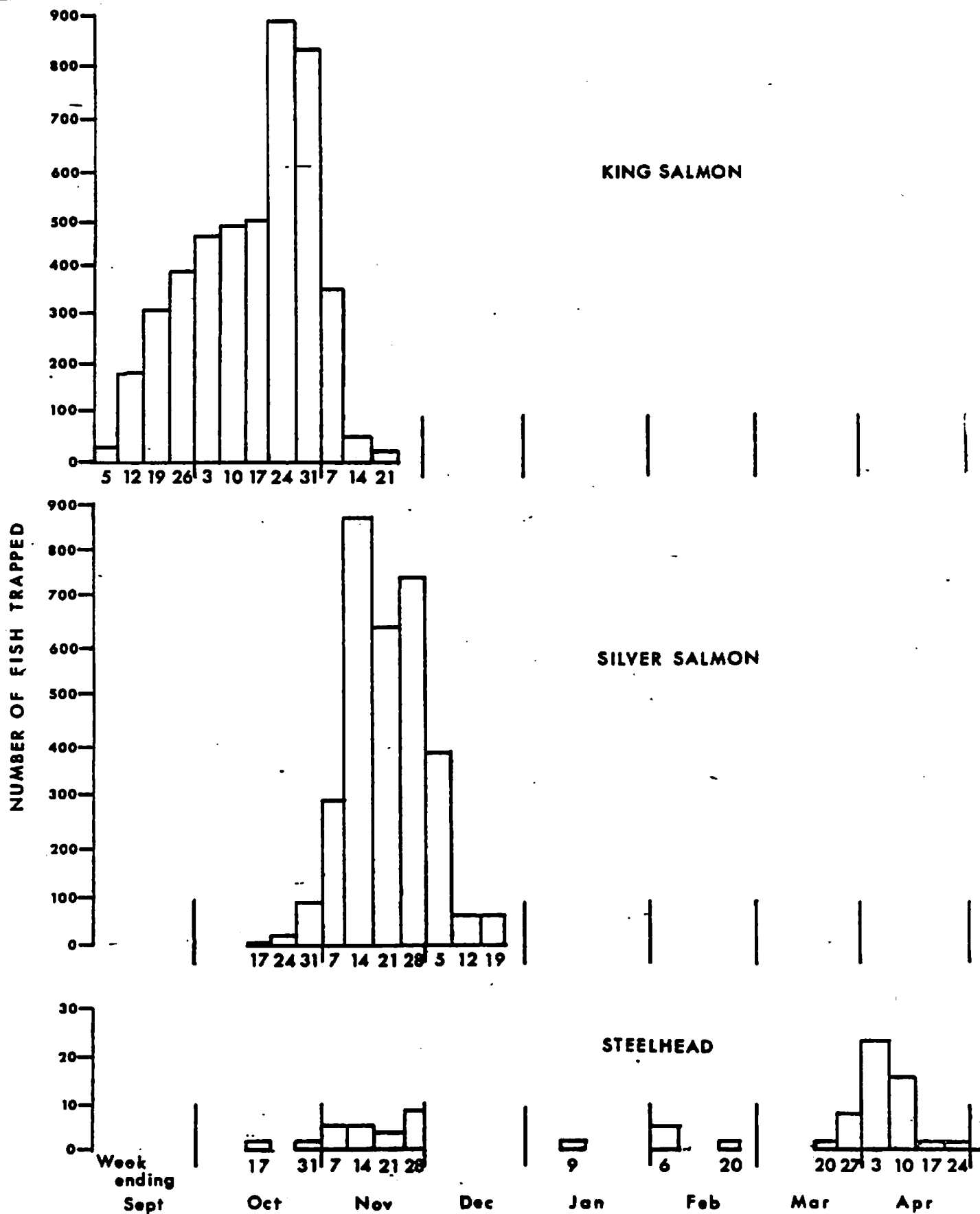


Figure A-1. Salmon and steelhead trapped at Trinity River Fish Hatchery. Weekly counts during 1970-71 season.