

REF 90172

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
FEATHER RIVER HATCHERY 1980-81

by

Donald L. Schlichting
Region 2, Inland Fisheries

Anadromous Fisheries Branch
Administrative Report No. 83-4

1983

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ABSTRACT

This report summarizes the operation of Feather River Hatchery from 1 July 1980 through 30 June 1981. Tables present temperatures and weather data, numbers of chinook salmon, Oncorhynchus tshawytscha, and steelhead, Salmo gairdneri, entering the hatchery, numbers of eggs taken and received, and numbers of fish released.

We trapped 3,812 chinook salmon and 547 steelhead and planted or transferred 9,618,917 chinook fingerlings, 1,961,546 chinook yearlings, 91,350 steelhead fingerlings, and 394,585 steelhead yearlings.

^{1/} Anadromous Fisheries Branch Administrative Report No. 83-4
Submitted January 1983.

INTRODUCTION

This report describes activities of the Feather River Hatchery during its 14th year of operation, 1 July 1980 through 30 June 1981. The hatchery is located near the upper Thermalito Bridge in Oroville, California; it was constructed by the California Department of Water Resources as part of the California Water Project to compensate for loss of spawning area above Oroville Dam. It is operated by the Department of Fish and Game with funds provided by the Department of Water Resources.

PRODUCTION SUMMARY

Personnel from the Feather River Hatchery trapped 3,812 chinook salmon, Oncorhynchus tshawytscha, and 547 steelhead, Salmo gairdneri, during the 1980-81 season (Table 1). Approximately 16,682,974 salmon eggs and 1,088,673 steelhead eggs were taken and received. We planted 11,580,463 salmon and 485,935 steelhead.

MARKING PROGRAMS

Personnel from Anadromous Fisheries Branch marked about 200,000 1979 brood year (BY) chinook salmon with an adipose clip (AD) and coded wire nose tag (CWT). The fish were divided into two groups of about 100,000 and planted in the Carquinez Strait and at Tiburon in August 1980. Delta Study personnel marked six groups of 1980 BY fall run chinook salmon AD and CWT. One group of about 200,000 was released in the Feather River at the hatchery, another group of about 10,000 was released at Rio Vista, about 155,000 at Discovery Park, 83,000 at Port Chicago, 50,000 at Tiburon, and 44,000 at the Maritime Academy in Carquinez Strait. All releases were made in June 1981. The entire 1980 BY summer run steelhead were marked with an AD only and the 101,250 fish were released in the Feather River at Yuba City in March and April of 1981. Three groups of about 40,000 each of the 1980 BY steelhead were released at Rio Vista, Verona, and Yuba City in March and April of 1981. The late run groups were marked AD and CWT.

CHINOOK SALMON MAINTENANCE PROGRAM

HISTORY OF THE 1980-81 RUNS

1980 BY Spring Run

The fish ladder was opened 1 September 1980 to allow the spring run chinook salmon adults to enter the hatchery. We received 122 spring run fish between 1 September 1980 and 22 September 1980. (Appendix Table 1). The spring run adults were sexed on 22 September 1980. At the time we had 64 males and 58 females on hand. Of the 58 females, we successfully spawned 41 from 22 September 1980 through 30 October 1980. The spawning yielded 215,658 eggs, for an average of 5,260 eggs per female.

An estimated 177,811 fingerlings were transferred to the ponds, indicating an average fertility rate of 82.4%. An estimated 168,758 fish remained on hand 30 June 1981 for planting as yearlings the following the season.

1980 BY Fall Run

The first fall run chinook salmon entered the hatchery on 26 September 1980 (Appendix Table 1). The season total was 3,690 fish. We spawned 1,697 females between 26 September 1980 and 22 December 1980 and took 9,268,440 eggs, for an average of 5,462 eggs per female. Fry production totaled 7,699,061, with an estimated 415,387 lost to infectious hematopietic necrosis (IHN) and bird predation. Between 14 May 1981 and 30 June 1981, we planted 2,672,681 fall run 1980 BY smolts. An estimated 4,610,493 remained on hand as of 30 June 1981.

1980 BY Fall Run Nimbus

About 7,198,876 1980 BY fall run eggs were received from Nimbus Hatchery between 24 November 1980 and 1 December 1980. A total of 6,267,200 fry survived to be planted in the Feather River at the hatchery between 17 February 1981 and 27 February 1981.

RECOVERY OF MARKED CHINOOK SALMON

All chinook salmon entering the hatchery were examined for marks. We received a total of 267 marked fish (Appendix Table 2).

CHINOOK SALMON PLANTING

We planted an estimated 9,619,417 fingerlings and 1,961,546 yearling chinook salmon this season (Tables 1 and 2).

STEELHEAD MAINTENANCE PROGRAM

HISTORY OF THE 1980-81 PRODUCTION

1981 BY

Steelhead were not counted or held until 26 September 1980. From 26 September 1980 through 16 March 1981, 8 marked fish were received (Appendix Table 3).

The total run was 547 fish: 329 males and 218 females. We successfully spawned 207 females (Table 3). Steelhead were divided into two categories: "early" (adults arriving before 15 December 1980) and "late" (fish arriving after 15 December 1980). We trapped 133 "early" fish and took a total of 179,752 eggs and 414 "late" fish and took a total of 658,941 eggs, for a combined total of 838,693 eggs. An estimated 167,038 "early" fish were transferred to the ponds, for a survival rate of 92.9%. An estimated 584,000 "late" fish were transferred to the ponds, for an estimated survival rate of 88.6%. Losses amounted to about 10,698 in the "early" fish and 28,299 in the "late" fish. We had on hand 30 June 1981, 156,340 1980 BY "early" steelhead and 555,701 1981 BY "late" steelhead.

TABLE 1. Feather River Hatchery Production Summary, 1980-81

Species brood year	Adults trapped or received	Females spawned	Eggs taken or received	Fish planted		Estimated number on hand
				fingerlings	yearlings	
Chinook salmon spring run						
1979 BY	0	0	0		154,934	0
1980 BY	122	41	215,658	0	0	168,758
Chinook salmon fall run						
1979 BY	0	0	0	679,036	1,806,612	0
1980 BY	3,690	1,697	9,268,440	2,672,681	0	4,610,493
Chinook salmon fall run Nimbus						
1980 BY	0	0	7,198,876 ^{a/}	6,267,200	0	0
Steelhead early						
1980 BY	0	0	0	0	64,995	0
1981 BY	133	40	179,752	0	0	156,340
Steelhead late						
1980 BY	0	0	0	0	148,830	0
1981 BY	414	167	658,941		0	555,701
Steelhead Nimbus						
1980 BY	0	0	0	91,350	51,010	0
1981 BY	0	0	199,980 ^{b/}	0	0	168,052
Steelhead Washougal						
1980 BY	0	0	0	0	101,250	0
Steelhead Klamath						
1980 BY	0	0	50,000 ^{c/}	0	28,500	0

- ^{a/} Received from Nimbus Hatchery as eggs.
^{b/} Received from Nimbus Hatchery as eggs.
^{c/} Received from Region 1 as fish.

TABLE 2. Chinook Salmon Planting Summary, Feather River Hatchery 1980-81

Brood year	Race	Month of release	Average size (G)	Number released	Mark	Release site
1979	Spring run	July 1980	34.4	15,925		Yuba River at Nelson Bar
		Oct. 1980	60	139,009		Feather River at hatchery
		Total		154,934		
1979	Fall run	July 1980	10	373,000		Sacto. River at Rio Vista
		July 1980	10.6	42,000		Carquinez Strait
		July 1980	12	62,836		Feather River at hatchery
		Aug. 1980	18.6	92,500	AD & CWT	Carquinez Strait
		Aug. 1980	16.5	108,700	AD & CWT	Tiburon
		Oct. 1980	40.7	1,652,592		Feather River at hatchery
		Jan. 1981	53	13,600		Sacto. River at Rio Vista
		Jan. 1981	53	11,050		Feather River at Verona
		Jan. 1981	53	129,370		Feather River at hatchery
		Total		2,485,648		
1980	Fall run	May 1981	8	793,981		Benicia
		June 1981	8	196,000	AD & CWT	Feather River at hatchery
		June 1981	6.3	9,450	AD & CWT	Sacto. River at Rio Vista
		June 1981	8	154,900	AD & CWT	Sacto. River at Discovery Park
		June 1981	8	83,725	AD & CWT	Port Chicago
		June 1981	10	50,625	AD & CWT	Tiburon
		June 1981	9	44,400	AD & CWT	Maritime Academy
		June 1981	7.4	282,300		Benicia
		June 1981	7	1,057,300		Maritime Academy
		Total		2,672,681		
1980	Fall run Nimbus	Feb. 1981	.28	6,267,200		Feather River at hatchery
		Total		6,267,200		

TABLE 3. Steelhead Spawning Data

Date <u>1980-81</u>	"Early" fish spawned		Date <u>1980-81</u>	"Late" fish spawned	
	<u>M</u>	<u>F</u>		<u>M</u>	<u>F</u>
12-29-80	9	9	12-29-80	10	8
1-5-81	5	7	12-31-80	3	1
1-13-81	4	8	1-5-81	8	9
1-19-81	9	3	1-13-81	11	23
1-26-81	12	6	1-19-81	17	20
2-2-81	11	5	1-26-81	40	23
2-9-81	10	1	2-2-81	40	27
2-17-81	8	1	2-9-81	23	10
			2-17-81	15	15
			2-23-81	9	8
			3-2-81	7	9
			3-9-81	4	5
			3-16-81	5	8
			3-23-81	5	1

1981 BY Nimbus

A total of 199,980 "late" steelhead eggs was received from Nimbus Hatchery to insure enough "late" steelhead for yearling production. On 30 June 1981 we had on hand 168,052 fish.

1980 BY Klamath

In an attempt to establish a *Ceratomyxa* resistant strain of steelhead, 50,000 1980 BY Klamath fry were shipped to Feather River Hatchery from Region 1 to add to the 26,015 1980 BY fry we had hatched from eggs at Feather River Hatchery. A total of 28,500 fish survived to be planted (Table 4). Mortality was high and the growth rate did not fit well into the hatching program, so the project was abandoned.

Steelhead Planting

We planted an estimated 485,935 steelhead during the 1980-81 season (Table 4).

VISITOR USE

During the 1980-81 fiscal year 44,645 people visited the installation.

TABLE 4. Steelhead Planting Summary, 1980-81

Date	Strain	Average size (G)	Number released	Mark	Release site
1980					
July	Nimbus	7	91,350		Feather River at hatchery
		Total	91,350		
1981					
March	Nimbus	89	25,050		Feather River at Yuba City
	Nimbus	74	12,000		Feather River at Verona
	Nimbus	74	13,960		Feather River at Yuba City
	Early Feather	74	22,080		Feather River at Yuba City
	Early Feather	74	23,155		Feather River at Verona
	Late Feather	112	43,560	AD & CWT	Feather River at Yuba City
	Early Feather	89	16,900		Feather River at Yuba City
	Early Feather	89	2,860		Feather River at Verona
	Late Feather	89	42,480	AD & CWT	Feather River at Verona
	Washougal	50	33,750	AD	Feather River at Yuba City
	Late Feather	74	17,110	AD & CWT	Sacto. River at Rio Vista
April	Late Feather	74	45,680	AD & CWT	Sacto. River at Rio Vista
	Washougal	50	32,400	AD	Feather River at Yuba City
	Washougal	50	35,100	AD	Feather River at Verona
	Klamath	22	28,500	AD & CWT	Feather River at Yuba City
		Total	394,585		

Appendix Table 3

Feather River Salmon and Steelhead Hatchery
Weather, Water, and Fish Data Report, 1980-81

July 1980	Temperature (C°)					Fish trapped					
	Air		Water		Weather	Chinook salmon		Steelhead		M	F
	Maximum	Minimum	Maximum	Minimum		Fall run		Spring run			
						Adults	Grilse	Adults	Grilse		
1	32.0	16.0	14.4	13.3	Pt. Cloudy						
2	30.0	18.0	14.4	13.9	Rain						
3	29.0	15.0	14.4	13.9	Clear						
4	29.0	13.0	14.4	13.9	Clear						
5	29.0	13.0	14.4	13.9	Clear						
6	29.0	13.0	14.4	13.9	Clear						
7	28.0	12.0	14.4	13.9	Clear						
8	26.5	10.0	14.4	13.9	Clear						
9	30.0	17.0	14.4	13.9	Clear						
10	31.5	14.0	15.0	14.4	Clear						
11	33.5	17.0	15.0	15.0	Clear						
12	30.0		15.0	14.4	Clear						
13	30.0	13.0	15.0	14.4	Clear						
14	32.5	14.0	15.6	14.4	Clear						
15	35.0	16.0	15.6	15.0	Clear						
16	39.0	19.0	16.1	15.6	Clear						
17	39.0	18.0	16.1	15.6	Clear						
18	34.0	18.0	16.1	13.3	Clear						
19	36.0	13.0	13.3	12.8	Clear						
20	37.0	17.5	13.3	12.8	Clear						
21	40.0	17.0	13.3	12.8	Clear						
22	41.0	18.0	13.9	13.3	Clear						
23	40.0	19.0	13.9	12.8	Clear						
24	42.0	18.0	13.3	13.3	Clear						
25	43.0	20.0	14.4	13.3	Clear						
26	45.0	21.0	14.4	13.9	Clear						
27	41.0	21.0	15.0	14.4	Clear						
28	34.5	23.0	15.0	14.4	Clear						
29	40.5	21.0	15.6	14.4	Clear						
30	39.0	24.0	15.6	14.4	Clear						
31	40.0	21.0	15.6	14.4	Clear						

Appendix Table 3 (Continued)

August 1980	Temperature (C°)					Fish trapped				Steelhead	
	Air		Water		Weather	Chinook salmon				M	F
	Maximum	Minimum	Maximum	Minimum		Fall run		Spring run			
						Adults	Grilse	Adults	Grilse		
1			15.6	14.4	Clear						
2	40.0	20.0	15.0	13.9	Clear						
3	39.0	18.0	15.0	13.9	Clear						
4	38.0	15.0	13.9	12.2	Clear						
5	32.0	16.0	12.8	12.2	Clear						
6	31.0	14.0	12.2	12.2	Clear						
7	32.0	15.0	12.8	12.2	Clear						
8	36.5	14.0	12.8	12.2	Clear						
9	36.0	15.0	12.8	12.2	Clear						
10	37.0	14.0	13.3	12.8	Clear						
11	39.0	15.0	13.3	13.3	Clear						
12	39.5	15.0	13.3	13.3	Clear						
13	32.5	14.0	13.3	13.3	Clear						
14	28.0	13.0	13.3	12.8	Clear						
15	32.0	13.0	13.9	12.8	Clear						
16	33.5	15.0	13.9	13.3	Clear						
17	33.0	16.0	13.9	13.3	Clear						
18	26.5	16.0	13.9	13.3	Clear						
19	31.0	12.0	13.9	13.3	Clear						
20	32.0	14.0	15.0	13.9	Clear						
21	33.0	14.5	15.0	14.4	Clear						
22	29.0	15.0	15.6	13.9	Clear						
23	32.0	14.0	15.6	14.4	Rain						
24	32.0	15.0	15.6	14.4	Clear						
25	32.0	14.0	15.6	14.4	Clear						
26	32.0	14.0	15.6	14.4	Clear						
27	30.0	13.0	15.6	13.3	Clear						
28	30.0	11.0	13.9	12.2	Clear						
29	27.0	10.0	12.8	11.7	Clear						
30	30.0	12.0	12.2	11.1	Clear						
31	31.5	13.5	12.2	11.7	Clear						

Appendix Table 3 (Continued)

September 1980	Temperature (C°)				Weather	Fish trapped				Steelhead	
	Air		Water			Chinook salmon					
	Maximum	Minimum	Maximum	Minimum		Fall run		Spring run		M	F
						Adults	Grilse	Adults	Grilse		
1	33.0	15.0	12.2	11.7	Clear						
2	33.0	15.0	12.2	11.7	Clear						
3	33.0	14.0	12.2	11.7	Clear						
4	34.0	13.0	14.4	12.2	Clear						
5	34.0	15.5	14.4	12.2	Clear						
6	31.0	13.5	13.3	11.7	Clear						
7			12.8	12.2	Clear						
8	30.5	15.0	12.8	11.7	Clear						
9	33.0	15.0	14.4	12.8	Clear						
10	30.0	16.0	14.4	12.8	Pt. Cloudy						
11	33.0	13.0	13.3	11.7	Clear						
12	31.0	15.0	12.8	11.7	Clear						
13	24.0	14.0	13.3	12.2	Pt. Cloudy						
14	22.0	10.5	14.4	12.8	Cloudy						
15	27.0	12.5	14.4	12.8	Pt. Cloudy						
16	30.0	11.0	13.9	12.8	Cloudy						
17	28.0	12.0	13.9	11.7	Cloudy						
18	25.0		11.7	11.1	Cloudy						
19	28.0	11.0	12.2	11.1	Clear						
20	27.0	11.5	12.8	11.7	Clear						
21	28.5	10.0	13.9	11.7	Clear						
22			12.2	11.7	Clear			122			
23	33.0	11.0	12.2	12.2	Clear						
24	36.0	14.0	12.2	11.7	Clear						
25	34.0	14.0	11.7	11.1	Clear						
26	31.5	15.0	12.2	11.7	Clear	11	7				2
27	28.0	10.0	12.2	11.1	Clear						
28			12.2	11.7	Clear						
29	33.0	12.0	12.2	11.1	Clear						
30	37.0	12.5	11.7	11.7	Clear						
Total						11	7	122			2

Appendix Table 3 (Continued)

October 1980	Temperature (C°)					Fish trapped				Steelhead	
	Air		Water		Weather	Chinook salmon				M	F
	Maximum	Minimum	Maximum	Minimum		Fall run		Spring run			
						Adults	Grilse	Adults	Grilse		
1			11.7	10.0	Clear	23	5				1
2	38.0		11.1	10.0	Clear						
3	37.0	16.0	11.1	10.0	Clear						
4	39.5	15.5	10.6	10.0	Clear						
5	37.0	15.5	10.6	9.4	Clear						
6	36.0	14.0	11.1	10.0	Clear	73	21				1
7	36.5	15.0	11.1	10.0	Clear						
8	34.0		11.7	10.0	Clear						
9	36.0	15.0	11.1	10.0	Clear	81	20			1	2
10	26.5	11.0	11.1	10.0	Clear						
11	20.0	8.0	11.1	10.0	Rain						
12	22.0	13.0	11.1	10.6	Rain						
13	17.0	11.0	11.1	10.6							
14			11.1	10.6	Cloudy	135	23			2	1
15	21.0	8.0	11.1	10.6	Clear						
16	16.0	7.0	11.1	10.0	Cloudy	98	48				
17	16.0	6.0	11.1	10.0	Clear						
18	24.0	6.5	11.1	10.0	Clear						
19	26.0	11.0	10.6	10.0	Clear						
20	29.0	10.0	11.1	10.0	Clear	148	49			10	4
21	26.0	12.0	11.1	10.0	Clear						
22	30.5	8.5	11.1	10.0	Clear						
23	27.0	10.5	11.1	10.0	Clear	124	49			1	2
24	22.0	11.0	11.1	10.0	Clear						
25	17.0	12.0	11.1	10.0	Clear						
26	20.5	8.0	11.1	10.6	Clear						
27	23.0	8.0	10.6	9.4	Clear	116	43				1
28	25.0	9.0	11.1	9.4	Clear						
29	26.0	9.0	11.1	10.0	Clear						
30	19.0	8.0	12.2	8.9	Cloudy	183	45			3	2
31	26.0	15.0	10.6	10.0	Clear						
Total						981	303			17	14
Cumulative total						992	310			17	16

Appendix Table 3 (Continued)

November 1980	Temperature (C°)					Fish trapped				Steelhead	
	Air		Water		Weather	Chinook salmon				M	F
	Maximum	Minimum	Maximum	Minimum		Fall run	Spring run				
						Adults	Grilse	Adults	Grilse		
1	18.0	8.0	11.7	10.0	Cloudy						
2	26.0	9.0	11.7	11.1	Clear						
3	27.5	9.0	11.7	11.1	Clear	422	55			3	3
4	30.5	8.5	11.7	11.1	Clear						
5	23.0	3.0	11.7	11.1	Cloudy						
6	28.0	8.0	11.1	10.6	Clear	260	27				2
7	19.5	12.0	11.1	10.6	Cloudy						
8	22.5	8.0	11.1	10.6	Cloudy						
9	19.0	7.0	11.1	10.6	Cloudy						
10	15.0	5.0	11.1	10.6	Cloudy	260	16			3	
11	18.0	7.0	11.1	10.6	Clear						
12	21.0	15.0	11.1	10.6	Clear						
13	21.5	2.0	11.1	10.6	Clear	220	12			2	2
14	18.0	8.0	11.1	10.6	Clear						
15	19.0	4.0	11.1	10.6	Clear						
16	15.0	7.0	11.1	10.6	Clear						
17	22.0	4.0	11.1	10.6	Clear	184	17			3	
18	19.0	4.0	10.6	10.6	Cloudy						
19	20.0	3.0	10.6	10.6	Clear						
20	21.0	2.0	11.1	10.6	Clear	134	15				2
21	20.0	3.0	11.1	11.1	Cloudy						
22	13.0	9.0	11.1	11.1	Cloudy						
23	15.0	9.0	11.1	11.1	Cloudy						
24	17.0	2.0	11.1	11.1	Clear	223	14			8	3
25	12.0	2.0	11.1	10.6	Cloudy						
26	19.0	1.0	10.6	10.6	Clear	48	2			1	2
27	19.0	4.0	11.1	10.6	Clear						
28	13.0	5.0	11.1	10.6	Clear						
29	13.5	9.0	10.6	10.6	Cloudy						
30	16.0	9.0	10.6	10.6	Cloudy						
Total						1751	158			20	14
Cumulative total						2743	468			37	30

Appendix Table 3 (Continued)

December 1980	Temperature (C°)					Fish trapped				Steelhead	
	Air		Water		Weather	Chinook salmon				M	F
	Maximum	Minimum	Maximum	Minimum		Fall run	Spring run				
								Adults	Grilse		
1	10.0	3.5	10.6	10.6	Rain	180	6			9	3
2			10.6	10.6	Rain						
3	11.0	10.0	10.6	10.6	Rain	70				10	7
4	14.0	7.0	10.6	10.6	Clear						
5	13.0	3.0	10.6	10.6	Clear						
6	13.5	1.0	10.6	10.0	Clear						
7	14.0	1.0	10.0	10.0	Clear						
8	14.0	0.0	10.0	10.0	Clear	110	2			7	3
9	12.0	- .5	10.0	10.0	Clear						
10	12.0	1.5	10.0	10.0	Clear						
11	13.0	- .5	10.0	10.0	Clear	34	1			22	4
12	14.0		10.0	10.0	Clear						
13	14.0	-1.0	10.0	9.4	Clear						
14	15.0	-1.0	9.4	9.4	Clear						
15	17.0	3.0	9.4	9.4	Clear	18				1	
16	17.0	14.0	9.4	9.4	Clear						
17	18.0	14.0	9.4	9.4	Clear						
18	15.0	8.0	10.0	9.4	Clear						
19	12.0	5.0	10.0	10.0	Cloudy	29	1			17	5
20	14.0	5.0	10.0	10.0	Fog						
21	11.0	7.0	10.0	10.0	Rain						
22	12.0	10.0	10.0	9.4	Fog	16	1			34	21
23	11.0	2.0	9.4	9.4	Fog						
24			9.4	9.4	Fog	10	1			15	10
25			9.4	9.4	Fog						
26			9.4	9.4	Fog						
27			9.4	9.4	Fog						
28			9.4	9.4	Fog					37	22
29			9.4	9.4	Fog						
30			9.4	9.4	Fog						
31	6.5		9.4	9.4	Fog					22	14
Total						467	12			174	89
Cumulative total						3210	480			211	119

Appendix Table 3 (Continued)

January 1981	Temperature (C°)				Weather	Fish trapped				Steelhead			
	Air		Water			Chinook salmon		Adults	Grilse	Adults	Grilse	M	F
	Maximum	Minimum	Maximum	Minimum		Fall run	Spring run						
1	5.0	4.0	9.4	9.4	Fog								
2	5.5	4.0	9.4	9.4	Fog								
3	5.0	3.0	9.4	9.4	Rain								
4	7.0	5.0	9.4	8.9	Clear								
5	8.0	6.0	8.9	8.9	Pt. Cloudy							18	15
6			9.4	8.9	Fog								
7			9.4	9.4	Clear								
8			9.4	9.4	Fog								
9			9.4	9.4	Fog								
10			9.4	9.4	Fog								
11			9.4	9.4	Fog								
12			9.4	9.4	Fog								
13			9.4	9.4	Clear							37	29
14			9.4	9.4	Clear								
15			9.4	9.4	Clear								
16			9.4	9.4	Clear								
17			10.0	9.4	Cloudy								
18			9.4	9.4	Cloudy								
19			10.0	9.4	Rain							17	11
20			10.0	9.4	Cloudy								
21	15.5	11.0	9.4	9.4	Cloudy								
22	14.5	11.0	9.4	9.4	Rain								
23	11.5	8.0	9.4	9.4	Rain								
24	14.0	7.0	9.4	9.4	Pt. Cloudy								
25	13.0	1.0	9.4	9.4	Clear								
26	10.0	6.0	9.4	9.4	Rain							20	12
27	12.5	7.0	9.4	9.4	Rain								
28	12.0	3.0	9.4	9.4	Rain								
29	12.0	6.0	9.4	9.4	Cloudy								
30	12.0	5.0	9.4	9.4	Clear								
31	13.0	1.5	9.4	9.4	Clear								
Total												92	67
Cumulative total												303	186

Appendix Table 3 (Continued)

February 1981	Temperature (C°)					Fish trapped				Steelhead	
	Air		Water		Weather	Chinook salmon				M	F
	Maximum	Minimum	Maximum	Minimum		Fall run	Spring run				
						Adults	Grilse	Adults	Grilse		
1	14.0	2.0	9.4	9.4	Clear						
2	16.5	4.0	9.4	8.9	Clear					8	5
3	19.0	2.0	8.9	8.9	Clear						
4	16.0	10.0	8.9	8.9	Clear						
5	13.0	6.0	8.9	8.9	Cloudy						
6	16.5	2.5	8.9	8.9	Clear						
7	12.0	5.0	8.9	8.9	Clear						
8	11.0	6.5	8.9	8.9	Cloudy						
9	17.0	7.0	8.9	8.9	Clear					9	15
10	14.0	7.0	8.9	8.9	Cloudy						
11	16.0	8.0	8.9	8.9	Rain						
12	19.0	6.0	8.9	8.9	Clear						
13	13.0	10.5	9.4	8.9	Rain						
14	20.0	13.0	8.9	8.9	Clear						
15	20.0	9.0	9.4	8.9	Clear						
16	18.0	8.5	9.4	8.9	Rain						
17	17.0	9.0	9.4	8.9	Cloudy					6	7
18	19.0		9.4	8.9	Clear						
19	25.0	6.0	9.4	8.9	Rain						
20	21.0	7.0	8.9	8.9	Clear						
21	18.0	8.0	9.4	8.3	Clear						
22	11.0	7.0	9.4	9.4	Clear					2	4
23			9.4	8.9	Cloudy						
24			8.9	8.9	Rain						
25	13.0	8.0	8.9	8.9	Rain						
26	12.5	7.0	8.9	8.3	Cloudy						
27	16.0	7.0	9.4	8.3	Cloudy						
28	14.0	6.0	9.4	8.9							
Total										25	31
Cumulative total										328	217

Appendix Table 3 (Continued)

April 1981	Temperature (C°)					Fish trapped				Steelhead	
	Air		Water		Weather	Chinook salmon				M	F
	Maximum	Minimum	Maximum	Minimum		Fall run		Spring run			
						Adults	Grilse	Adults	Grilse		
1	19.0	8.0	10.0	9.4	Clear						
2	19.0	4.0	9.4	9.4	Clear						
3	23.0	4.0	10.0	9.4	Clear						
4	27.0	6.0	10.6	10.0	Clear						
5	26.0	12.0	10.0	9.4	Clear						
6	25.0	9.0	11.1	10.0	Clear						
7	23.0	7.0	10.6	10.0	Clear						
8	21.0	7.0	11.1	10.6	Clear						
9	22.0	8.0	11.1	10.6	Clear						
10	20.0	8.0	11.7	10.6	Clear						
11	19.5	6.0	11.7	11.1	Clear						
12	22.0	7.0	11.7	11.1	Clear						
13			11.7	11.1	Clear						
14			12.2	11.1	Clear						
15	24.0	10.0	11.7	11.1	Cloudy						
16	24.0	7.5	12.2	11.1	Clear						
17	27.0	13.0	12.2	11.1	Clear						
18	17.0	11.0	11.7	11.7	Rain						
19	10.0	10.0	11.7	11.1	Rain						
20	20.0	9.0	11.1	10.6	Cloudy						
21	27.0	10.0	11.7	11.1	Clear						
22	30.0	12.0	11.7	11.1	Clear						
23	28.0	16.5	12.2	11.7	Clear						
24	23.5	12.0	12.2	11.7	Cloudy						
25	16.0	9.0	11.7	11.7	Rain						
26	18.0	9.0	12.2	11.7	Pt. Cloudy						
27	27.0	8.0	12.8	12.2	Clear						
28	33.0	13.0	13.3	12.8	Clear						
29	32.0	13.0	13.3	12.8	Clear						
30	33.0	15.0	12.8	11.7	Clear						

Appendix Table 3 (Continued)

May 1981	Temperature (C°)					Fish trapped				Steelhead	
	Air		Water		Weather	Chinook salmon				M	F
	Maximum	Minimum	Maximum	Minimum		Fall run	Spring run				
						Adults	Grilse	Adults	Grilse		
1	31.0	15.0	12.2	11.7	Clear						
2	24.0	11.0	12.2	11.7	Clear						
3	24.0	10.0	12.2	11.1	Clear						
4	23.0	10.0	12.2	11.7	Clear						
5	23.0	10.0	12.2	11.7	Clear						
6	23.0	10.0	12.2	11.7	Clear						
7			12.2	12.2	Clear						
8			12.2	11.7	Clear						
9			12.2	12.2	Clear						
10			12.8	11.7	Clear						
11			12.2	12.2	Clear						
12			12.2	12.2	Clear						
13	29.0	12.0	12.8	12.2	Pt. Cloudy						
14	23.0	13.0	12.8	12.2	Pt. Cloudy						
15	22.0	12.0	12.8	12.2	Clear						
16	24.0	7.0	12.8	12.2	Clear						
17	22.0	13.0	13.3	12.8	Rain						
18	20.0	14.0	12.8	12.2	Rain						
19	19.0	11.0	12.8	11.7	Cloudy						
20			13.3	12.2	Pt. Cloudy						
21			13.3	12.8	Clear						
22			12.8	12.8	Clear						
23			13.3	12.8	Clear						
24			13.3	13.3	Rain						
25			13.3	12.8	Cloudy						
26			13.9	12.8	Pt. Cloudy						
27			13.9	13.3	Clear						
28			13.9	13.3	Clear						
29			13.9	13.3	Clear						
30			13.3	13.3	Clear						
31			13.3	12.8	Clear						

Appendix Table 3 (Continued)

June 1981	Temperature (C°)				Weather	Fish trapped				Steelhead	
	Air		Water			Chinook salmon					
	Maximum	Minimum	Maximum	Minimum		Fall run		Spring run		M	F
						Adults	Grilse	Adults	Grilse		
1			13.3	12.8	Clear						
2			13.9	13.3	Clear						
3			13.9	13.9	Clear						
4			14.4	13.9	Clear						
5			15.0	14.4	Clear						
6			15.0	14.4	Clear						
7			15.0	13.9	Cloudy						
8			15.0	13.9	Clear						
9			14.4	13.9	Clear						
10			14.4	13.9	Pt. Cloudy						
11			14.4	13.9	Clear						
12			14.4	13.9	Clear						
13			15.0	13.9	Clear						
14			15.0	14.4	Clear						
15			15.0	15.0	Clear						
16			15.6	15.0	Clear						
17			15.6	15.0	Clear						
18			15.6	15.0	Clear						
19			16.1	15.6	Clear						
20			16.1	15.6							
21			16.1	15.6							
22			16.1	15.6	Clear						
23			15.6	15.0	Clear						
24			15.0	12.2	Clear						
25			13.3	12.2	Clear						
26			12.8	12.2	Clear						
27			12.2	12.2	Clear						
28			12.2	11.7	Clear						
29			12.8	11.7	Clear						
30			13.9	12.8	Clear						

Appendix Table I

Fork Lengths (to Nearest Inch) of Marked Chinook Salmon
Trapped at Feather River Hatchery, 1980-81

FL (inches)	AD	
	M	F
15		
16		
17		
18		
19	1	
20	3	
21	2	2
22	1	2
23	5	1
24	8	4
25	7	5
26	5	4
27	8	14
28	5	12
29	7	20
30	7	12
31	4	19
32	11	9
33	9	7
34	14	9
35	11	6
36	10	
37	9	2
38	6	1
39	1	
40	4	
41		
42		
43		
44		

Appendix Table 2

Fork Lengths (To Nearest Inch) of Marked Steelhead
Trapped at Feather River Hatchery, 1980-81

FL inches	RVLV		LV		AD	
	M	F	M	F	M	F
17	1					1
18						
19						
20					1	
21						
22	1			2		
23						
24						
25	1					1