

ANNUAL REPORT
IRON GATE SALMON AND STEELHEAD HATCHERY, 1989-90¹

REF 90215

by

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ABSTRACT

This report describes the operation of the Hatchery from July 1, 1987 through June 30, 1988. Appendix tables present daily records of water temperatures, weekly numbers of salmonids entering the Hatchery, total numbers of salmonids reared and released, and historical records.

There were 10,859 fall-run adult chinook salmon, Oncorhynchus tshawytscha, trapped, which produced 13,948,674 eggs. No spring-run chinook salmon were taken. An inland coho salmon program produced a total of 69,000 eggs from 27 females. The 910 adult coho salmon, O. kitsutch, produced 617,475 eggs. A total of 759 (286 fall-run and 473 spring-run) steelhead trout, O. mykiss, produced 475,364 eggs.

A total of 5,299,601 fingerling and 992,023 yearling chinook salmon, 122,962 yearling coho salmon, and 310,000 yearling steelhead was planted in FY 1988-90.

¹ Inland Fisheries Administrative Report No. 91-7.
Submitted September 1990; Edited by K. A. Hashagen,
California Department of Fish and Game, 1416 Ninth Street,
Sacramento, CA 95814.

INTRODUCTION

This report covers the 27th year of operation of the trapping facilities at Iron Gate Hatchery. These facilities were completed by the Pacific Power and Light Company in February 1962 and have been operated by the Department of Fish and Game during the spring and fall of each year.

The Hatchery was constructed by the Pacific Power and Light Company to compensate for spawning and nursery areas blocked by the Iron Gate Project. This is the 23rd report since the Hatchery was completed in February 1966. The Department of Fish and Game, under agreement with the Pacific Power and Light Company, began operation of the Hatchery in March 1966. The trapping facilities and Hatchery are located on the Klamath River 8 miles east of Hornbrook, Siskiyou County.

PRODUCTION SUMMARY

This report summarizes the numbers of fish trapped and spawned (Table 1 and Figure 1), production of eggs and fish (Table 1), and water temperatures (Appendix Figure 1) from July 1, 1989 through June 30, 1990.

TABLE 1. Production Summary, Iron Gate Salmon and Steelhead Hatchery, 1989-90

	Adults trapped	Eggs taken or received	Eggs transferred	Fingerlings planted and transferred	Yearlings planted	Total pounds planted and transferred
<u>Chinook salmon</u>						
1988 BY					992,023	124,580
1989 BY	10,859	13,948,674		5,299,601		23,448
<u>Coho salmon</u>						
1988 BY					122,962	7,883
1989 BY	910	617,475				
<u>Steelhead</u>						
1989 BY						
1990 BY	759	475,364			310,000	31,231

CHINOOK SALMON MAINTENANCE PROGRAM

History of the 1989 Run

Spring-Run, 1989 Brood Year

No spring-run chinook salmon appeared at the trap in 1989.

Fall-Run, 1989 Brood Year

A total of 11,690 fall-run chinook salmon was trapped: 5,070 males, 5,789 females, and 831 grilse (≤ 56 cm or 22 inches FL) (Figure 1). There were 4,214 females spawned; they produced 13,948,674 eggs, for an average of 3,310 eggs per female (Table 1). Fifteen lots of eggs were taken, with an average fertility of 47%. All chinook salmon fingerlings were released in May 1990.

Distribution of the 1988 Brood Year Chinook Salmon

During November 1989, a total of 992,023 yearlings was planted at 8/lb (Table 2).

Distribution of the 1989 Brood Year Chinook Salmon

There were 5,100,000 fingerling salmon planted May 21-22, 1990 at 233/lb (Table 2). From May 7 to June 7, 1990, a total of 199,601 fingerling salmon was transferred to the Klamath River Rearing Ponds (Table 2).

Marked Chinook Salmon Recovered

Of the marked chinook salmon trapped during 1989-90 (Appendix Table 1), 461 were Iron Gate marks and the remainder (Ad) were of undetermined origin. Coded wire tag data were 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).

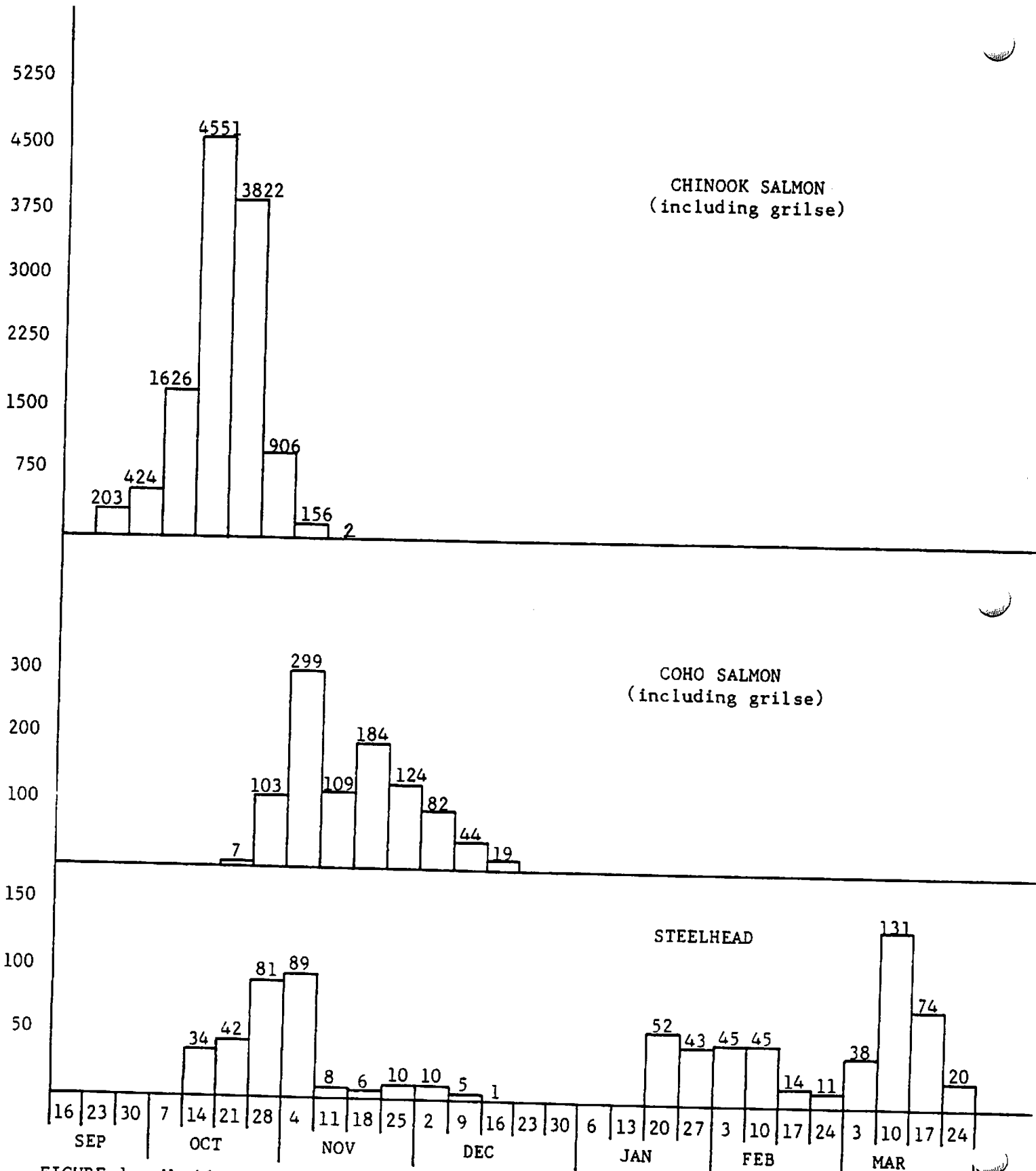


FIGURE 1. Weekly numbers of chinook salmon, coho salmon, and steelhead trapped at Iron Gate Salmon and Steelhead Hatchery, 1989-90 season.

TABLE 2. Iron Gate Hatchery Chinook Salmon Distribution Data, 1987-88

<u>Race and brood year</u>	<u>Date released</u>	<u>Average size/lb</u>	<u>Number released</u>	<u>Release site</u>	<u>Mark (Coded-wire tag number)</u>
Fall-run, 1988	Planted:				
	11/13-15/89	8.0	713,740	IGH	
	11/13-15/89	8.0	98,283	IGH	6-59-42
	11/14-17/89	7.8	180,000	IGH	
Total yearlings			922,023		
Fall-run, 1989	Transferred to Klamath River Rearing Ponds:				
	5/7/90	144	40,000	Bluff Creek	6-63-11 and 6-63-12
	5/11/90	124	40,000	Indian Creek	
	5/16/90	126	40,000	Bluff Creek	
	5/17/90	128	40,000	Indian Creek	6-63-13 and 6-63-14
	6/7/90	120	39,601	Elk Creek	6-63-15 and 6-63-16
	Planted:				
	5/21-22/90	233	4,909,501	IGH	
	5/21-22/90	233	190,499	IGH	0601020104
Total fingerlings			5,299,601		

COHO SALMON MAINTENANCE PROGRAM

History of the 1989 Run

The first coho salmon entered the trap on October 19, 1989 and the last on December 11, 1989. A total of 971 fish was trapped: 459 males, 451 females, and 61 grilse (≤ 56 cm or 22 inches FL) (Figure 1). The 267 females spawned produced 617,475 eggs for an average of 2,313 eggs per female (Table 1). An additional 69,000 eggs were supplied for an inland coho salmon program. During FY 1989-90, 1,000 yearling coho were supplied to the University of California at Berkeley for smoltification studies. Approximately 143,000 fingerling coho salmon were held for later release.

Planting 1988 Brood Year Coho Salmon

There were 122,962 coho salmon planted during the 1989-90 season (Table 3).

TABLE 3. Iron Gate Coho Salmon Planting Data, 1989-90

Date	Average size/lb	Number	Brood year	Release site	Mark (Coded wire tag No.)
3/6/90	14	34,932	1988	IGH	
3/6/90	14	46,030	1988	IGH	
3/23/90	20	42,000	1988	IGH	6-63-22
Total yearlings		122,962			

Marked Coho Salmon Recovered

Of the marked coho salmon recovered in the trap (Appendix Table 1), five were from Iron Gate Hatchery, two were from Cole Rivers Hatchery in Oregon, and the other one was of undetermined origin.

STEELHEAD TROUT MAINTENANCE PROGRAM

History of the 1989-90 Run

Between October 10 and December 31, 1989, a total of 286 steelhead entered the trap and were held for later spawning. An additional 473 steelhead were trapped between January 1 and March 22, 1990 (Figure 1). The 258 females spawned produced 475,364 eggs for an average of 1,842 eggs per female. Approximately 363,500 steelhead fingerlings from the 1990 brood year were on hand June 30, 1990.

Planting 1989 Brood Year Steelhead

There were 310,000 steelhead yearling planted in 1989-90 (Table 5).

TABLE 4. Iron Gate Hatchery Juvenile Steelhead Planting Data, 1989-90

<u>Strain</u>	<u>Brood year</u>	<u>Date released</u>	<u>Average size/lb</u>	<u>Number released</u>	<u>Release site</u>	<u>Mark brand</u>
KR	1989	5/15/90	10	310,000	IGH	
<hr/>						
Total				310,000		

Marked Steelhead Trapped

There were six marked steelhead trapped this year at Iron Gate Hatchery.

PUBLIC RELATIONS

During the 1989-90 fiscal year, 1,854 people visited the Hatchery, including 602 people in organized groups.

APPENDIX TABLE 1. Coded-Wire-Tag (CWT) Recoveries for Iron Gate Hatchery (IGH), with Release Data

CWT code	Egg source	Brood year	Release data			Recovery data						Mean FL (cm)	female	Unknown
			Date	Number	#/lb	Site	Year	CWT actual	Recoveries expanded	male				
FALL CHIN														
06 59 22	IGH	84	10/23/85 11/6-7/85	98,500	50.4	IGH	86-87 87-88 88-89 89-90	62 307 283 12	66 307 283 12	43(61) 66(192) 80(128) 86(7)	---	---	---	---
06 59 27	IGH	84	6/27/85	187,500	3.9	IGH	86-87 87-88 88-89 89-90	15 70 41 3	16 70 41 3	50(14) 70(26) 79(16) 79(1)	71(1) 67(44) 74(24) 78(2)	---	---	---
06 59 29	IGH	85	10/20/86	95,296	7.3	IGH	87-88 88-89 89-90	11 104 132	11 104 132	46(11) 69(7) 82(7)	---	66(34) 75(62)	---	---
06 59 34	IGH	85	6/13/86	147,356	---	IGH	87-88 88-89 89-90	18 58 9	18 58 9	56(16) 75(24) 90(4)	64(1) 72(34) 79(5)	---	---	---
06 63 02	IGH	85	11/12-19/86	15,720	7.2	IGH	88-89 89-90	9 5	9 5	61(5) 88(3)	62(4) 74(2)	---	---	---
06 63 03	IGH	85	11/12-19/86	18,875	7.2	IGH	87-88 88-89 89-90	1 11 25	1 11 25	40(1) 70(4) 84(13)	---	65(7) 77(12)	---	---
06 63 04	IGH	85	11/12-19/86	16,038	7.2	IGH	88-89 89-90	11 15	11 15	66(10) 85(4)	67(1) 78(11)	---	---	---
06 63 05	IGH	85	11/12-19/86	16,038	7.2	IGH	87-88 88-89 89-90	2 17 17	2 17 17	40(2) 71(8) 81(10)	---	66(9) 77(7)	---	---
06 63 06	IGH	85	11/12-19/86	21,225	7.2	IGH	87-88 88-89 89-90	3 25 40	3 25 40	44(3) 66(18) 77(17)	---	66(7) 76(23)	---	---
06 63 07	IGH	85	11/12-19/86	21,225	7.2	IGH	88-89 89-90	22 31	22 31	68(17) 79(11)	66(5) 74(20)	---	---	---
06 08	IGH	85	11/12-19/86	18,126	7.2	IGH	88-89 89-90	14 25	14 25	68(9) 82(13)	61(5) 77(11)	---	---	---

APPENDIX TABLE 1. Coded-Wire-Tag (CWT) Recoveries for Iron Gate Hatchery (IGH), with Release Data (cont't)

CWT code	Egg source	Brood year	Release data				Recovery data					
			Date	Number	#/lb	Site	Year	CWT actual	Recoveries expanded	Mean FL (cm) male	Female	Unknown
FALL CHIN (cont'd)												
06 63 09	IGH	85	11/12-19/86	17,596	7.2	IGH	87-88	1	1	40(1)	---	---
							88-89	22	22	69(12)	64(10)	---
							89-90	35	35	83(17)	75(18)	---
06 63 18	IGH	85	11/20/86	24,443	6.6	IGH	87-88	4	4	58(4)	---	---
							88-89	38	38	63(26)	65(12)	---
							89-90	36	36	80(19)	75(16)	---
06 59 42	IGH	86	11/20/87	97,800	12.0	IGH	89-90	12	12	66(6)	64(6)	---
05 59 60	IGH	86	6/26/87	180,600	90.0	IGH	89-90	5	5	71(2)	67(3)	---
06 63 32	IGH	86	11/20/87	23,770	11.0	IGH	88-89	6	6	47(6)	---	---
							89-90	38	38	68(20)	66(18)	---
06 59 36	IGH	87	10/19-26/88	57,600	8.0	IGH	89-90	10	10	50(10)	---	---
06 59 37	IGH	87	10/19-26/88	38,400	8.0	IGH	89-90	10	10	49(10)	---	---
86 02 01	IGH	87	5/16/88	157,380	129.0	IGH	89-90	1	1	51(1)	---	---
10 00 00d/	---	---	---	---	---	---	82-83	83	112	---	---	---
							83-84	129	196	---	---	---
							84-85	163	172	---	---	---
							85-86a/	1,245	1,245	76(603)	73(635)	---
							86-87	294	264	79(142)	75(151)	47(1)
							87-88	152	152	68(56)	71(96)	---
							88-89	147	147	71(80)	70(67)	---
							89-90	155	155	80(75)	75(79)	---
20 00 00e/	---	---	---	---	---	---	83-84	14	21	---	---	---
							84-85	65	69	---	---	---
							85-86a/	23	23	71(11)	73(12)	---
							86-87	22	22	76(11)	66(10)	68(1)
							87-88	8	8	73(6)	72(2)	---
							88-89	4	4	76(2)	66(2)	---
							89-90	4	4	83(1)	76(93)	---

APPENDIX TABLE 1. Coded-Wire-Tag (CWT) Recoveries for Iron Gate Hatchery (IGH), with Release Data (cont't.)

CWT code	Egg source	Brood year	Release data			Recovery data						
			Date	Number	#/lb	Site	Year	CWT actual	Recoveries expanded	Mean FL (cm) male	Mean FL (cm) female	Unknown
07 40 58	CRH	86	4/27/88	25,337	12.1	Rogue River	89-90	2	2	---	64(1)	---
06 59 38	IGH	87	3/15/89	36,800	13.0	IGH	89-90	5	5	42(4)	---	51(1)
UNIDENTIFIED												
10 00 00d/	---	---	---	---	---	---	89-90	1	1	---	---	---

a/ In 1985-86 heads were removed from 5,840 salmon entering IGH, but only 5,357 were Ad-clipped. Therefore, we assumed that the expanded number was equal to the actual number sampled.

b/ --- = Data not available.

c/ Sample size in parenthesis

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

e/ 20 00 00 = CWT lost in dissection

f/ 40 00 00 = Cwt unreadable

g/ 99 99 99 = Data was recorded but Cwt not found

APPENDIX TABLE 2. Summary of Chinook Salmon Runs, to Iron Gate Salmon and Steelhead Hatchery

Season	Fall-trapped Spring-run ^{1/}		Fall-run				Spring-trapped spring-run ^{1/}		
	Adult	Grilse	Males	Females	Total adult	Grilse	Total fall run	Adults	Grilse
1962-63	2/						1,339		
1963-64					1,723	448	2,171		
1964-65			837	1,651	2,488	110	2,598		
1965-66			141	224	365	313	678		
1966-67			1,129	1,610	2,739	325	3,064		
1967-68			850	1,275	2,125	562	2,687		
1968-69			946	1,690	2,636	72	2,708	50	6
1969-70	8	3	518	436	954	1,914	2,868	51	0
1970-71	2	0	2,889	7,395	10,284	219	10,503	10	0
1971-72	16	0	4,412	6,031	10,443	326	10,769	80	0
1972-73	97	4	1,126	1,897	3,023	476	3,499	49	0
1973-74	18	5	3,273	4,135	7,408	1,294	8,702	4	0
1974-75	19	8	4,024	5,371	9,395	410	9,805	0	0
1975-76	25	28	3,131	4,571	7,702	3,425	11,127	0	0
1976-77	13	0	4,604	7,991	12,595	1,130	13,725	0	0
1977-78	0	0	1,514	2,799	4,313	520	4,833	0	0
1978-79	17	0	3,027	3,918	6,945	925	7,870	0	0
1979-80	0	0	1,003	1,298	2,301	257	2,558	0	0
1980-81	0	0	948	1,464	2,412	451	2,863	0	0
1981-82	0	0	904	1,151	2,055	540	2,595	0	0
1982-83	0	0	3,805	4,548	8,353	1,833	10,186	0	0
1983-84	0	0	3,927	4,444	8,371	514	8,885	0	0
1984-85	0	0	2,484	2,846	5,530	764	6,094	0	0
1985-86	0	0	10,073	9,878	19,951	2,159	22,110	0	0
1986-87	0	0	9,093	8,003	17,096	1,461	18,557	0	0
1987-88	0	0	7,451	7,738	15,189	1,825	17,014	0	0
1988-89	0	0	6,967	9,139	16,106	609	16,715	0	0
1989-90	0	0	5,070	5,789	10,859	831	11,690	0	0

^{1/} Fall-trapped spring-run chinook salmon are the same brood year as the spring-trapped spring-run salmon of the preceding reporting period. Spring run not differentiated from fall run prior to 1968-69.

^{2/} Blanks indicate data not available.

APPENDIX TABLE 3. Summary of Coho Salmon and Steelhead Trout Runs to Iron Gate Salmon and Steelhead Hatchery

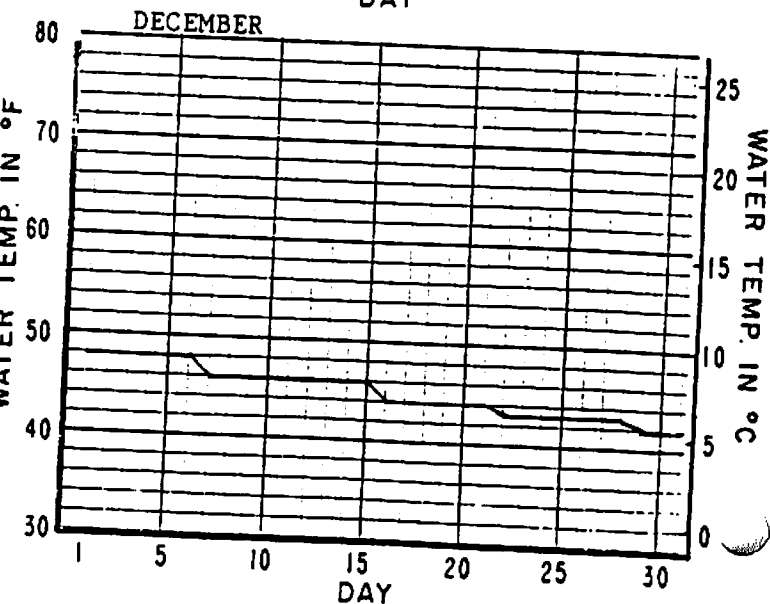
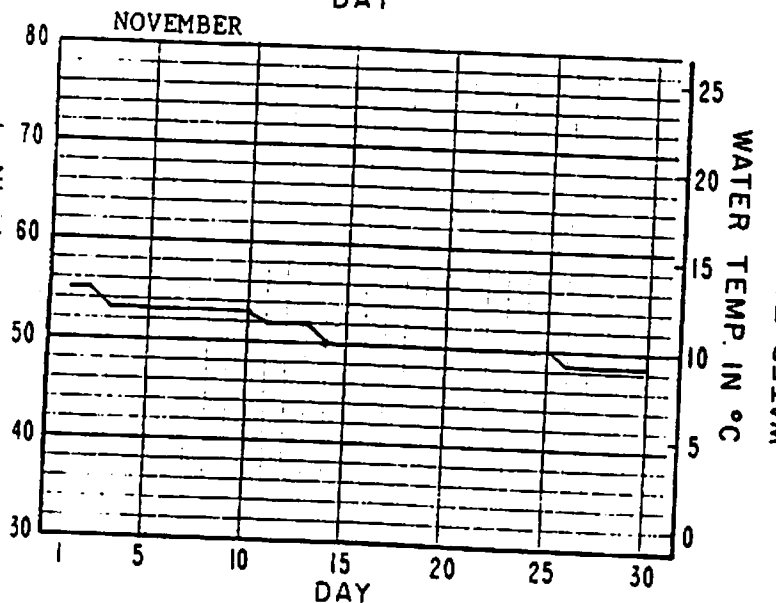
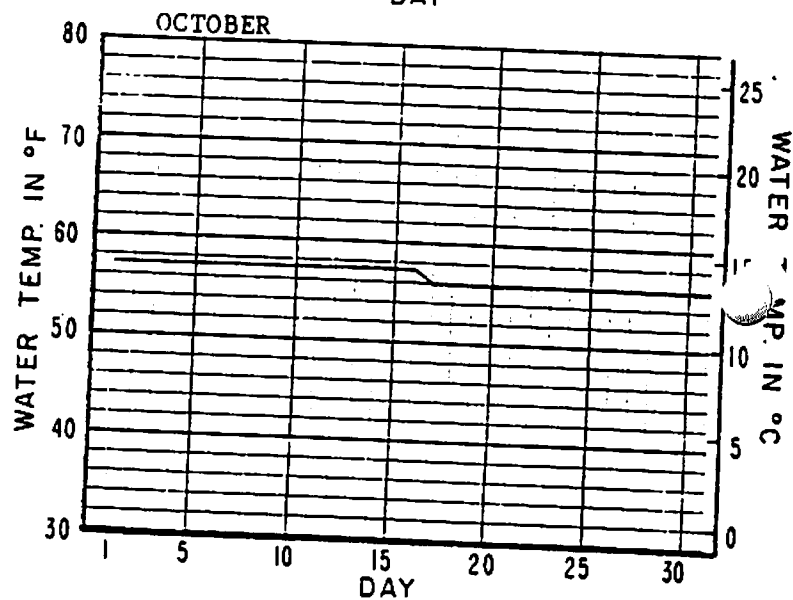
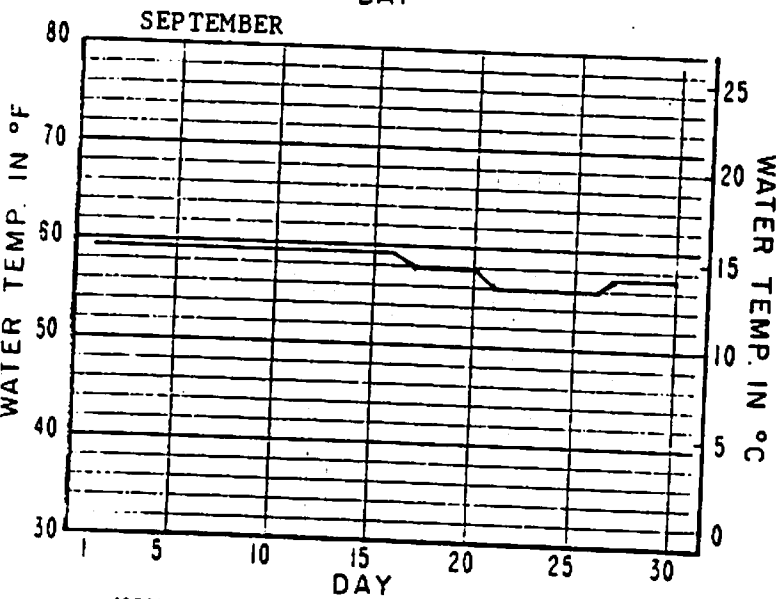
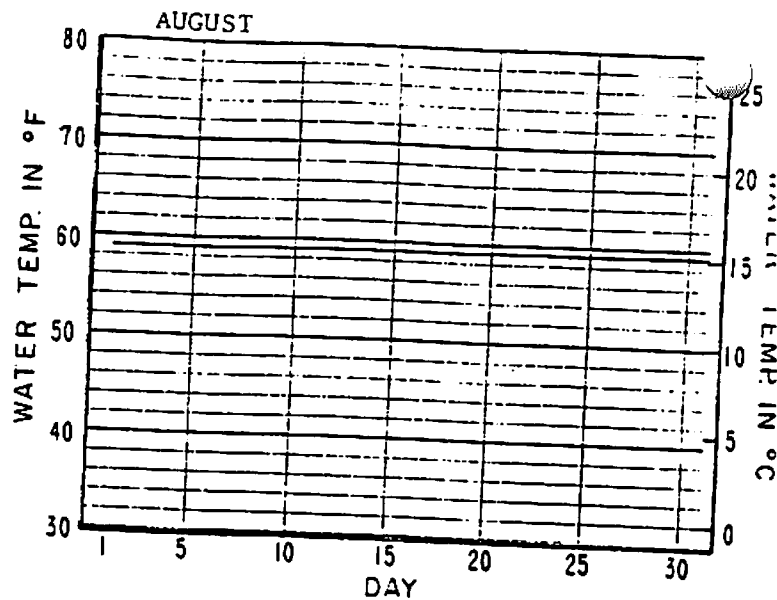
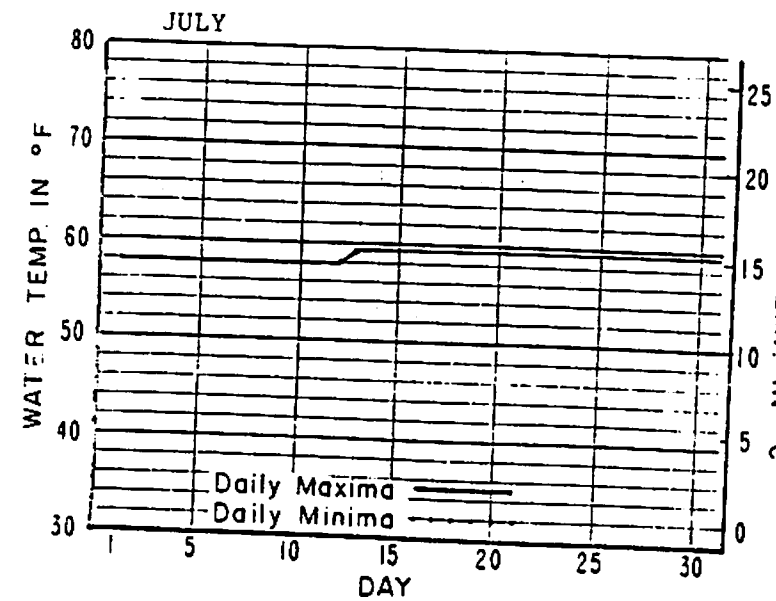
Season	Coho salmon					Steelhead ^{1/}		
	Males	Females	Adults	Grilse	Total	Fall-trapped early run	Spring-trapped late run	Total
1963-64	81	95	176	14	190			1,542
1964-65	0	0	0	0	0			1,065
1965-66	2	0	2	0	2			227
1966-67	2	2	4	0	4			299
1967-68	27	24	51	28	79			984
1968-69	14	10	24	333	357			370
1969-70	84	118	202	749	951	381	813	1,194
1970-71	716	671	1,387	236	1,623	292	2,073	2,365
1971-72	74	52	126	21	147	174	3,583	3,757
1972-73	38	18	56	35	91	226	1,060	1,286
1973-74	201	212	413	428	841	665	1,200	1,865
1974-75	193	263	456	41	497	1,062	2,165	3,227
1975-76	45	37	82	478	560	423	1,100	1,523
1976-77	581	795	1,376	381	1,757	695	1,246	1,941
1977-78	92	159	251	375	626	3,197	1,214	4,411
1978-79	263	236	499	250	749	812	1,267	2,079
1979-80	213	282	495	1,906	2,401	505	1,152	1,657
1980-81	580	1,220	1,800	251	2,051	359	888	1,247
1981-82	402	502	904	93	997	1,903	358	2,261
1982-83	499	634	1,133	496	1,629	1,267	1,436	2,703
1983-84	128	90	218	71	289	470	362	832
1984-85	444	350	794	211	1,005	373	1,012	1,385
1985-86	1,041	1,228	2,269	408	2,677	1,286	1,879	3,165
1986-87	315	422	737	288	1,025	1,347	1,487	2,834
1987-88	1,343	1,238	2,581	312	2,893	2,771	999	3,770
1988-89	669	700	1,369	323	1,692	1,604	1,739	3,343
1989-90	459	451	910	61	971	286	473	759

^{1/} Fall-trapped steelhead not differentiated from spring-trapped prior to 1969-70.

APPENDIX TABLE 4. Weekly Adult Salmon and Steelhead Trapping Data, for Iron Gate Salmon and Steelhead Hatchery, 1989-90

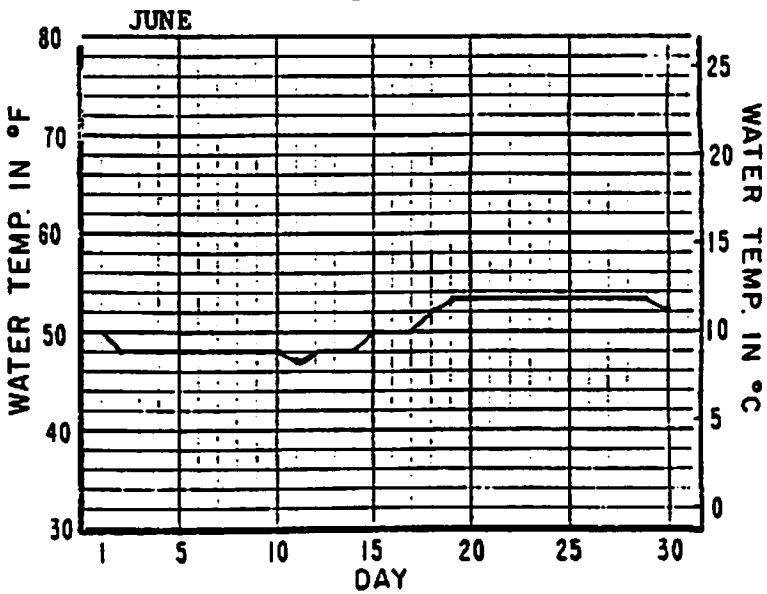
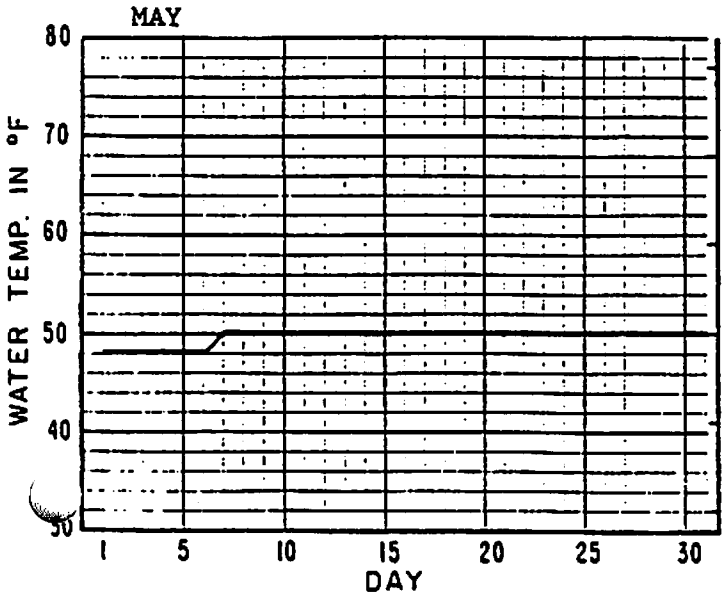
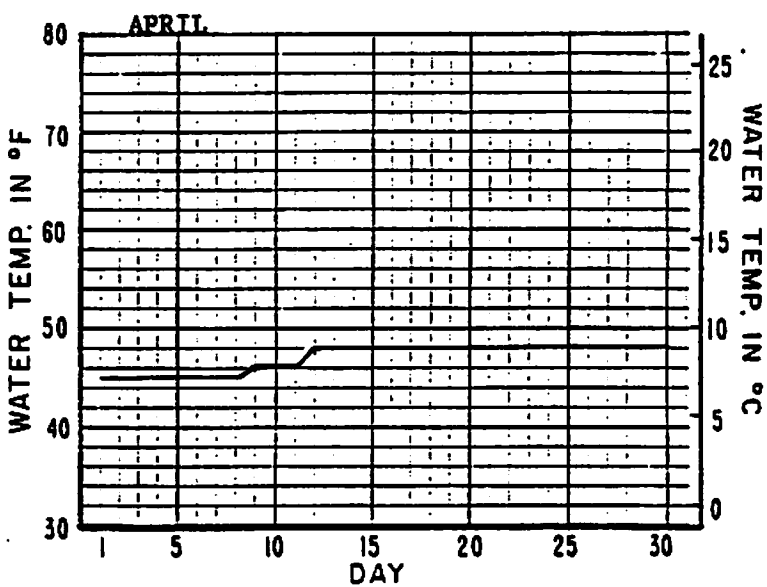
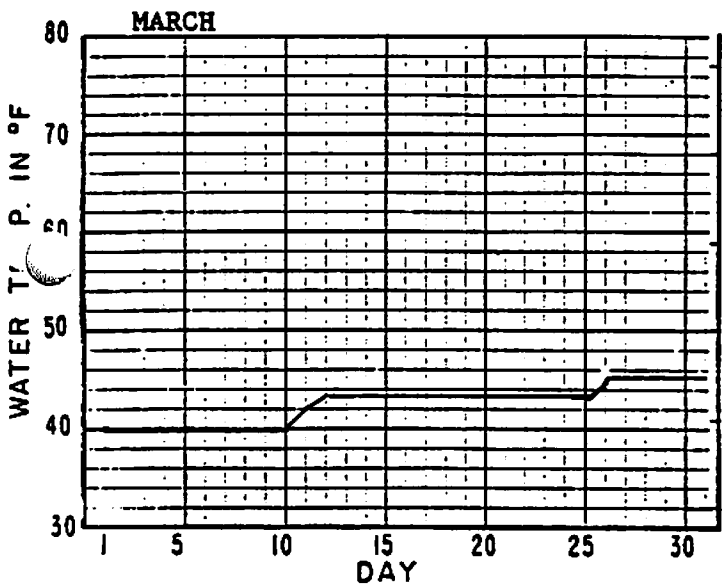
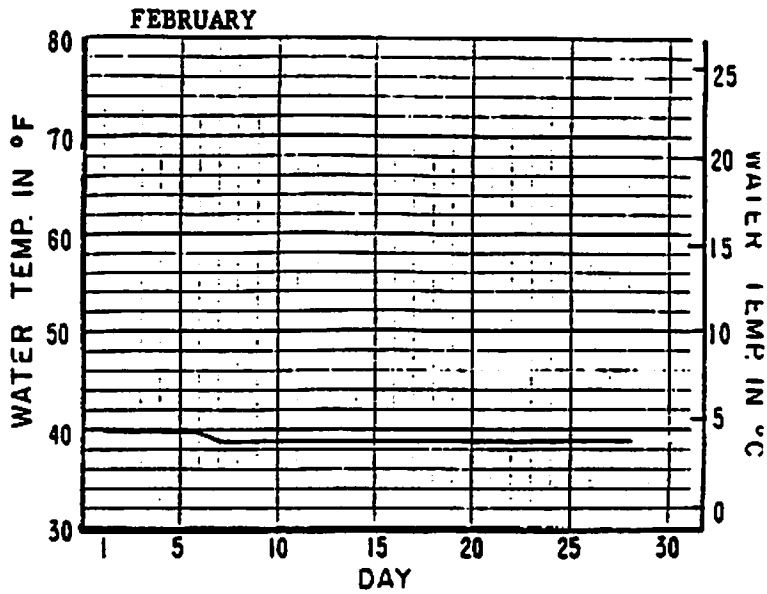
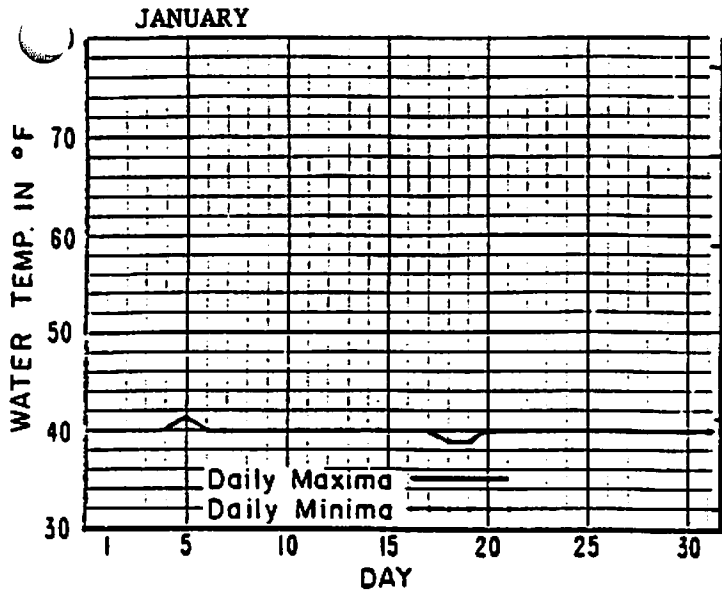
Week	Chinook salmon adults gillse	Coho salmon adults gillse	Steelhead trout fall spring
9/17-23	196	7	
9/24-30	404	20	
10/1-7	1,556	70	
10/8-14	4,339	212	
10/15-21	3,456	366	34
10/22-28	767	139	42
10/29-11/4	141	15	81
11/5-11		2	89
11/12-18		103	6
11/19-25		172	12
11/26-12/2		116	8
12/3-9		78	4
12/10-16		38	6
12/17-23		17	2
12/24-30			1
12/31-1/6			
1/7-13			
1/14-20			
1/21-27			
1/28-2/3			
2/4-10			
2/11-17			
2/18-24			
2/25-3/3			
3/4-10			
3/11-17			
3/18-24			
Season Totals	10,859	831	910
		61	286
			473

DAILY WATER TEMPERATURES BY MONTH



APPENDIX FIGURE 1. Daily Water Temperatures for Iron Gate Salmon and Steelhead Hatchery, 1989-90.

DAILY WATER TEMPERATURES BY MONTH



APPENDIX FIGURE 1 (Cont'd)