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ANNUAL REPORT  
IRON GATE SALMON AND STEELHEAD HATCHERY, 1986-87

by

Curtis A. Hiser  
Region I, Inland Fisheries

Inland Fisheries  
Administrative Report No. 90-16

1990

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ABSTRACT

This report describes the operation of the Hatchery from July 1, 1986 through June 30, 1987. Tables present daily records of water temperatures, weekly numbers of salmonids entering the Hatchery, and total numbers of salmonids reared and released.

There were 17,096 fall-run chinook salmon, Oncorhynchus tshawytscha, trapped, which produced 17,282,525 eggs. No spring-run chinook salmon were taken. The 737 adult coho salmon, O. kitsutch, produced 955,941 eggs; and 2,834 steelhead, O. mykiss, (1,347 fall-run and 1,487 spring run) produced 929,792 eggs.

About 9,320,000 fingerling and 1,065,093 yearling chinook salmon, 205,000 yearling coho salmon, and 316,450 yearling steelhead were planted in FY 1986-87.

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<sup>1/</sup> Inland Fisheries Administrative Report No. 90-16  
Submitted November 1987. Edited by K. A. Hashagen, California  
Department of Fish and Game, 1416 Ninth Street, Sacramento,  
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INTRODUCTION

This report covers the 26th 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 22nd 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.

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, 1986 through June 30, 1987.

TABLE 1. Production Summary, Iron Gate Salmon and Steelhead Hatchery, 1986-87

	Adults trapped	Eggs taken or received	Eggs transferred	Fingerlings planted and transferred	Yearlings planted	Total pounds planted and transferred
<u>Chinook salmon</u>						
1985 BY				10,000	1,065,093	139,949
1986 BY	17,096	17,282,525	30,375	9,730,200		109,570
<u>Coho salmon</u>						
1985 by						
1986 by	737	955,941	457,061	205,000		13,667
<u>Steelhead</u>						
1986 BY						
1987 BY	2,834	929,792		316,460		24,658

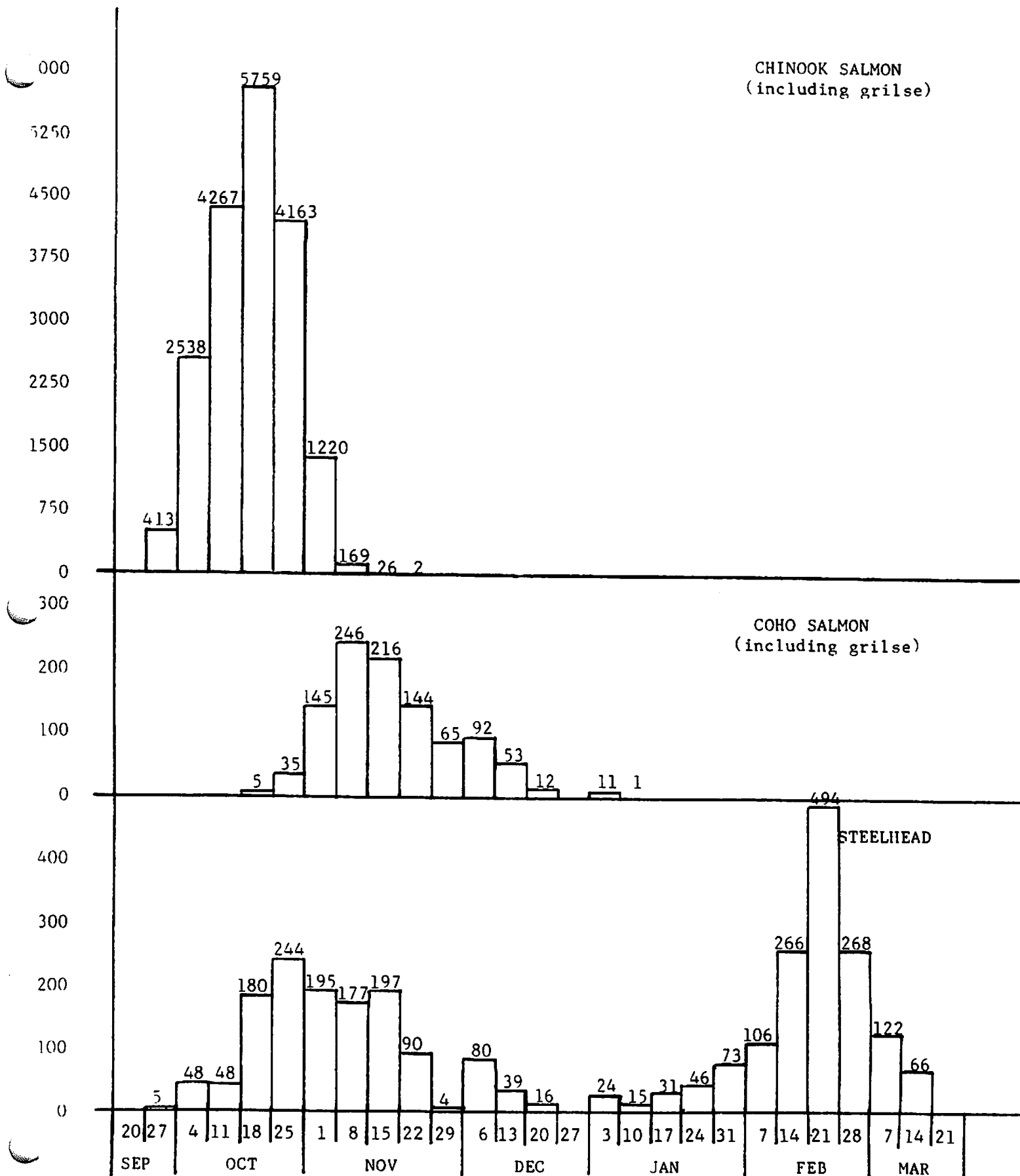


FIGURE 1. Weekly numbers of chinook salmon, coho salmon, and steelhead trapped at Iron Gate Salmon and Steelhead Hatchery, 1986-87 season.

CHINOOK SALMON MAINTENANCE PROGRAM  
History of the 1986 Run

Spring-Run, 1986 Brood Year

No spring-run chinook salmon appeared at the trap in 1986.

Fall-Run, 1986 Brood Year

A total of 18,557 fall-run chinook salmon was trapped: 9,093 males, 8,003 females, and 1,461 grilse ( $\leq 56$  cm or 22 inches FL). There were 6,200 females spawned, producing 17,282,525 eggs, for an average of 2,788 eggs per female. Prespawning mortality was 1,803 (29%). Twenty-five lots of eggs were taken, with an average fertility of 67%. In December, 30,375 eyed chinook salmon eggs were shipped to the Cappell Creek Facility for the Bureau of Indian Affairs. Approximately 1,100,000 chinook salmon fingerlings were on hand as of June 30, 1987.

Distribution of the 1985 Brood Year Chinook salmon

A total of 10,000 fingerlings was transferred to Tish Tang Creek July 9, 1986 for the Bureau of Indian Affairs. During November 1986, 1,065,093 yearlings were planted, ranging in size from 6.6 to 10 per pound (Table 2). In cooperation with the University of California at Berkeley, about 240 chinook salmon were sacrificed by Hatchery personnel for smoltification studies, done in cooperation with the University of California at Berkeley.

Distribution of the 1986 Brood Year Chinook Salmon

There were 9,320,000 fingerling salmon planted June 26, 1987 at 87/lb (Table 2). From May 13 to June 23, 1987, 370,000 fingerling salmon were transferred to the Klamath River Rearing Ponds (Table 2). Another 40,200 fingerling salmon were transferred to High Prairie Tank and Omagar Tank for the Bureau of Indian Affairs.

Marked Chinook Salmon Recovered

A total of 1,518 marked, fall-run chinook was trapped at the Hatchery in 1986-87 (Appendix Table 1). Returns to the Hatchery included fish released from the Hatchery (IGH), as well as from Trinity River Hatchery (TRH), Cole Rivers Hatchery (CRH), Bogus Creek (BOG) and Coleman National Fish Hatchery (CNFH). Two spring-run chinook were trapped (Appendix Table 1); both originated from Cole Rivers Hatchery on the Rogue River.

Coded wire tag data in Appendix Table 1 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).

TABLE 2. Chinook Salmon Distribution Data, Iron Gate Salmon and Steelhead Hatchery, 1986-87

Race and brood year	Date released	Average size/lb	Number released	Release site	(Coded-wire tag number)
Fall-run 1985	Transferred:				
	7/9/86	50	10,000	Tish Tang Ck.	---
	Planted:				
	11/12-19/86	10	19,978	IGH	6-63-2 <sup>1/</sup>
	11/12-19/86	10	25,000	IGH	6-63-3 <sup>1/</sup>
	11/12-19/86	10	4,210	IGH	- <sup>1/</sup>
	11/12-19/86	10	39,600	IGH	6-63-4 & 5 <sup>1/</sup>
	11/12-19-86	10	49,905	IGH	6-63-6 & 7 <sup>1/</sup>
	11/12-19/86	10	42,400	IGH	6-63-8 & 9
	11/20/86	7.3	99,060	IGH	6-59-29
	11/20/86	6.6	25,409	IGH	6-63-18 <sup>2/</sup>
	11/20/86	7.3	759,531	IGH	---
Total fingerlings			10,000		
Total yearlings			1,065,093		
Fall-run 1986	Transferred:				
	3/26/87	600	20,100	High Prairie Tk.	-
	3/26/87	600	20,100	Omagar Tank	-
	Transferred to Klamath River Rearing Ponds:				
	5/13-14/87	200	80,000	Indian Ck. Pd.	-
	5/18-19/87	200	80,000	Bluff Ck. Pd.	-
	5/26/87	185	40,000	Red Cap Ck. Pd.	-
	5/27/87	185	40,000	Camp Ck. Pd.	-
	6/3/87	132	40,000	Grider Ck. Pd.	-
	6/9/87	117	40,000	Elk Ck. Pd.	-
	6/22/87	100	25,000	Camp Ck. Pd.	-
	6/23/87	100	25,000	Red Cap Ck. Pd.	-
	Planted:				
	6/26/87	87	200,000	IGH	6-59-60
	6/26/87	87	9,120,000	IGH	-
Total fingerlings			9,730,200		

<sup>1/</sup> Fall Creek Hatchery fish  
<sup>2/</sup> Feed experiment - soft-moist feed.

## COHO SALMON MAINTENANCE PROGRAM

### History of the 1986 Run

The first coho salmon entered the trap on October 13, 1986 and the last on December 17, 1986. A total of 1,025 fish was trapped: 315 males, 422 females, and 288 grilse ( $\leq 56$  cm or 22 inches FL). The 338 females spawned produced 955,941 eggs for an average of 2,828 eggs per female. There were 457,061 eggs shipped to Mad River Hatchery. From July 1, 1986 through June 30, 1987, 2,700 fingerling and yearling coho were supplied to the University of California at Berkeley for smoltification studies. An additional 256 coho salmon were sacrificed at Iron Gate by Hatchery personnel for plasma sampling in cooperation with the University. Approximately 190,000 fingerlings were held for later release.

### Planting 1985 Brood Year Coho Salmon

There were 205,000 coho salmon planted during the 1986-87 season (Table 3).

TABLE 3. Coho Salmon Planting Data, Iron Gate Salmon and Steelhead Hatchery, 1986-87

Date	Average size/lb	Number	Brood year	Mark Release site	(Coded wire tag #)
3/24/87	15	43,200	1985	Beaver Creek	--
3/27/87	15	28,800	1985	Elk Creek	--
3/31/87	15	48,000	1985	Indian Creek	--
3/31/87	15	85,000	1985	IGH	--
Total yearlings		205,000			

### Marked Coho Salmon Recovered

Of the 724 marked coho salmon recovered in the trap (Appendix Table 1), 619 were of Iron Gate origin (IGH) and 13 of Mad River Hatchery origin (MRH).

## STEELHEAD TROUT MAINTENANCE PROGRAM

### History of the 1986-87 Run

Between September 26 and December 31, 1986, 1,347 steelhead entered the trap and were held for later spawning. An additional 1,487 steelhead were trapped between January 1 and March 9, 1987.

The 433 females spawned produced 929,792 eggs for an average of 2,147 eggs per female. Approximately 669,000 steelhead fingerlings from the 1987 brood year were on hand June 30, 1987.

Planting 1986 Brood Year Steelhead

We planted 316,450 steelhead yearling in 1986-87 (Table 4).

TABLE 4. Steelhead Planting Data, Iron Gate Salmon and Steelhead Hatchery, 1986-87

Strain	Brood year	Date released	Average size/lb	Number released	Release site	Mark brand
KR	1986	3/24/87	25	44,240	Iron Gate Lake	LP
KR	1986	3/24/87	25	72,210	Iron Gate Lake	--
KR	1986	4/27/87	10	200,000	IGH	--
<b>Total</b>				<b>316,450</b>		

Marked Steelhead Trapped

A total of 27 marked steelhead was trapped this season (Table 5). Of these, 1 was from Trinity River Hatchery and 24 (Ad) and 2 (Dor) were of unknown origin.

TABLE 5. Marked Steelhead Recovered, Iron Gate Salmon and Steelhead Hatchery, 1986-87<sup>1/</sup>

Release data							
Mark	Number trapped	Brood year	Race	Number released	Date released	Mean FL(mm)	Release site
Ad	24	--	--	--	--	--	--
Dor	2	--	--	--	--	--	--
LP	1	1978	IGH	324,774	3/29/79	175	TRH

<sup>1/</sup> Information supplied by Ivan Paulson, Fisheries Biologist, and Iron Gate files.

PUBLIC RELATIONS

During the 1986-87 fiscal year, 4,813 people visited the Hatchery, including 386 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							
			Date	Number	#/lb	Site	Year	CWT Recoveries actual	expanded	Mean FL (cm) male	female	Unknown
FALL CHIN												
06 59 01	IGH	78	11/5-15/79 11/23/79	190,680	49.8	IGH	86-87	1	1	---	73 (1)	---
06 59 06	IGH	80	10/26-30/81	87,450	50.4	IGH	82-83 83-84 84-85 85-86a/ 86-87	12 114 75 26 1	16 168 79 26 1	---	---	46(12) 59(114) ---
06 59 16	IGH	80	10/27/81	12,770	69.8	Indian Cr	86-87	2	2	72(2)	---	---
06 59 04	IGH	81	11/15-18/82	65,385	47.8	IGH	83-84 84-85 85-86a/ 86-87	2 36 146 1	2 38 146 1	---	---	44(2) ---
06 59 18	IGH	81	11/15-18/82	25,586	47.8	IGH	82-83 83-84 84-85 85-86a/ 86-87	2 1 13 125 4	3 1 14 125 4	---	---	39(1) ---
06 50 10	IGH	82	11/7-9/83 12/5/83	39,127	51.6	IGH	84-85 85-86a/ 86-87	24 376 81	25 378 87	---	49(18) 70(177) 80(58)	---
06 50 11	IGH	82	11/7-9/83 12/5/83	36,997	51.6	IGH	84-85 85-86a/ 86-87	34 261 81	36 261 86	50(28) 75(143) 77(37)	69(1) 69(115) 88(44)	---
06 59 08	IGH	82	11/7-9/83 12/5/83	70,171	60.5	IGH	84-85 85-86a/ 86-87	21 452 123	22 452 130	48(16) 72(258) 86(51)	65(1) 69(192) 77(72)	---
06 59 09	IGH	82	6/27-28/83	158,824	6.9	IGH	84-85 85-86a/ 86-87	9 112 30	10 112 32	49(7) 75(39) 85(14)	---	69(72) 74(16)
06 59 11	IGH	82	11/28-29/83	13,880	60.5	Klamath Glen	84-85 85-86a/ 86-87	9 51 7	10 51 8	49(16) 75(31) 97(2)	---	71(20) 75(5)

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

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 61 23	TRH	82	6/28/83	90,242	3.4	Steelbridge	86-87	1	1	49(1)	---	---
06 56 12	TRH	83	6/20/84	97,311	9.3	Junction City	85-86a/ 86-87	2 1	2 1	52(1) ---	68(1) 73(1)	---
06 56 15	TRH	83	10/17/84	25,754	33.9	Junction City	86-87	1	1	---	62(1)	---
06 59 23	IGH	83	6/28/84	191,352	6.1	IGH	85-86a/ 86-87	27 157	27 166	52(27) 70(79)	---	68(77) ---
06 59 24	IGH	83	6/25-29/84	97,566	5.1	Klamath Glen	85-86a/ 86-87	18 45	18 48	52(18) 70(27)	---	68(18) ---
06 59 25	IGH	83	11/21/84	94,738	43.7	IGH	85-86a/ 86-87	17 229	17 243	48(17) 66(142)	---	64(84) ---
06 59 26	IGH	83	11/14/84- 12/3/84	23,725	43.7	Klamath Glen	85-86a/ 86-87	3 27	3 29	62(3) 72(17)	---	64(10) ---
06 59 31	IGH	83	11/21/84	22,599	43.7	IGH	85-86a/ 86-87	10 88	10 93	45(10) 64(60)	---	65(27) ---
06 59 32	IGH	83	11/21/84	24,830	43.7	IGH	85-86a/ 86-87	16 135	16 143	49(14) 67(85)	65(1) 65(48)	---
06 59 33	IGH	83	11/21/84	23,766	43.7	IGH	85-86a/ 86-87	6 79	6 84	46(6) 66(58)	---	66(21) ---
06 63 01	TRH	83	3/1/85	92,965	85.6	TRH	86-87	2	2	60(2)	---	---
07 30 20	CRH	83	9/ /84	24,295	69.8	Rogue River	85-86a/ 86-87	1 4	1 4	58(1) 71(2)	---	63(2) ---
86 08 02	BOG	83	3/26-28/84 4/3-26/84	13,995	0.69	Bogus Creek	86-87	2	2	86(2)	---	---
86 04 04	CNFH	83	3/ /84	43,883	0.96	Sacra River	86-87	1	1	---	55(1)	---

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 56 19	TRH	84	6/14,17/85	94,100	8.4	Lime Point	86-87	4	4	49(4)	---	---
06 56 24	TRH	84	2/27-28/86	102,512	81	TRH	86-87	1	1	35(1)	---	---
06 59 22	IGH	84	10/23/85 11/6-7/85	98,500	50.4	IGH	86-87	62	66	43(61)	---	---
06 59 27	IGH	84	6/27/85	187,500	3.9	IGH	86-87	15	16	50(14)	71(1)	---
06 59 28	IGH	84	6/17-27/85	93,710	4.2	Klamath Glen	86-87	5	5	50(5)	---	---
06 59 35	IGH	84	11/26/85	24,275	50.4	Klamath Glen	86-87	7	8	45(7)	---	---
06 61 27	TRH	84	6/10/85	186,708	8.6	TRH	86-87	2	2	45(2)	---	---
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)
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)
40 00 00f/	---	---	---	---	---	---	85-86a/	1	1	53(1)	---	---
							86-87	3	3	---(2)	70(1)	---
SPRING CHIN												
07 31 14	CRH	83	9/ /84	21,620	57.4	Rogue River	86-87	1	1	61(1)	---	---
07 31 15	CRH	83	9/ /84	21,885	58.9	Rogue River	86-87	1	1	63(1)	---	---

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
COHO												
06 59 30	IGH	83	3/21/85	20,074	64.8	IGH	85-86a/ 86-87	369 525	369 525	45(332) 70(219)	55(7) 71(313)	---
06 59 43	IGH	84	2/28/86	37,224	26.7	IGH	86-87	94	94	43(92)	65(1)	---
06 59 61	MRH	84	3/27-28/86	21,441	43.2	Salmon River	86-87	13	13	46(12)	48(1)	---
10 00 00d/	---	---	---	---	---	---	84-85 85-86a/ 86-87	5 235 88	8 235 88	---	---	---
20 00 00e/	---	---	---	---	---	---	85-86a/ 86-87	16 3	16 3	49(12) 43(1)	71(1) 71(1)	---
40 00 00f/	---	---	---	---	---	---	85-86a/ 86-87	8 1	8 1	---	69(1)	---

a/ In 1985-86 heads were removed from 5,840 salmon entering IGH. However, the count of Ad-clipped fish, i. e. those carrying a CWT, was only 5,357 fish (3,259 chinook and 2,098 coho). Therefore, an accurate expansion of the actual number entering the hatchery in 1985-86 cannot be made. However, we believe that virtually all the Ad-clipped fish were sampled and therefore the expanded number should be very close to the actual number.

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

h/ 63 63 08 = Origin unknown

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

Season	Fall-trapped Spring-run <sup>1/</sup>		Fall-run				Spring-trapped Spring-run <sup>1/</sup>		
	Adults	Grilse	Total	Total	Adults	Grilse	Adults	Grilse	
1962-63 <sup>2/</sup>			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	5,330	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

<sup>1/</sup> 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.

<sup>2/</sup> Blanks indicate data not available.

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

Season	Coho salmon			Grilse	Total	Steelhead 1/ Fall-trapped		Total
	Males	Females	Adults			early run	Spring-trapped late run	
1963-64	81	95	176	14	190			1,546
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	1,285
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	1,288	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

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

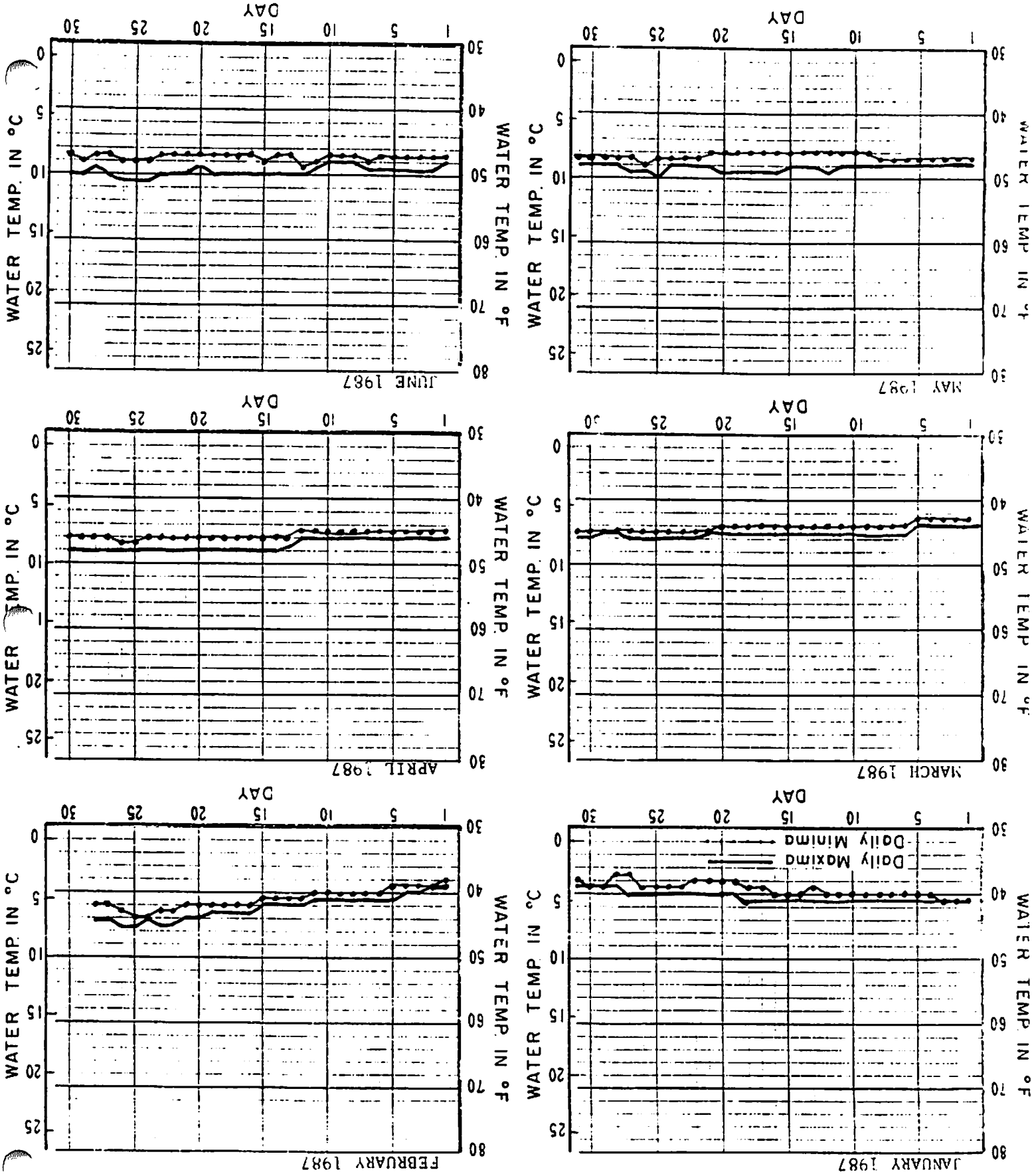


APPENDIX TABLE 5. Weekly Adult Salmon and Steelhead Trapping Data, Iron Gate Salmon and Steelhead Hatchery, 1986-87

Week	Chinook salmon Adults Grilse	Coho salmon Adults Grilse	Steelhead trout Fall	Steelhead trout Spring
9/21-27	385	28	5	
9/28-10/4	2,422	116	48	
10/5-11	4,090	177	48	
10/12-18	5,262	497	180	
10/19-25	3,699	464	244	
10/26-11/1	1,075	10	195	
11/2-8	138	176	177	
11/9-15	24	152	197	
11/16-22	1	128	90	
11/23-29		55	4	
11/30-12/6		77	80	
12/7-13		32	39	
12/14-20		8	16	
12/21/-27		4		
12/18-1/3		9	24	
1/4-10		1		
1/11-17			31	
1/18-24				
1/25-31				
2/1-7				
2/8-14				
2/15-21				494
2/22-28				268
3/1-7				122
3/8-14				66
<b>Totals</b>	<b>17,096</b>	<b>1,461</b>	<b>1,347</b>	<b>1,487</b>

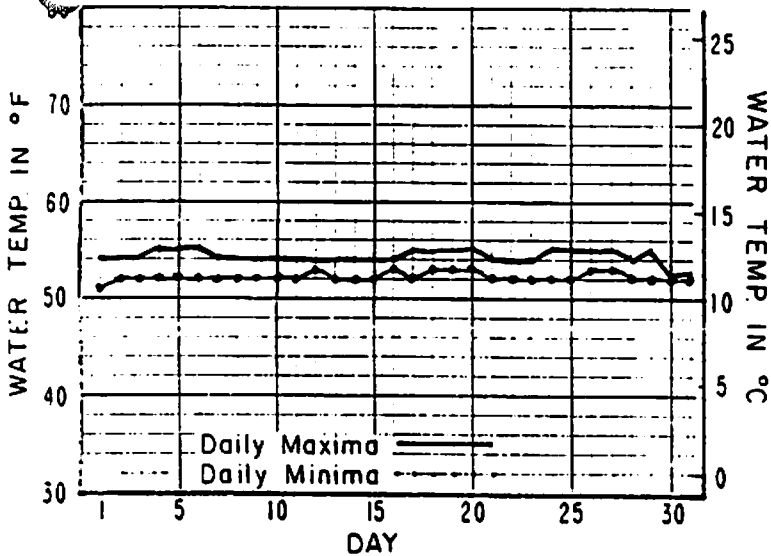


DAILY WATER TEMPERATURES BY MONTH

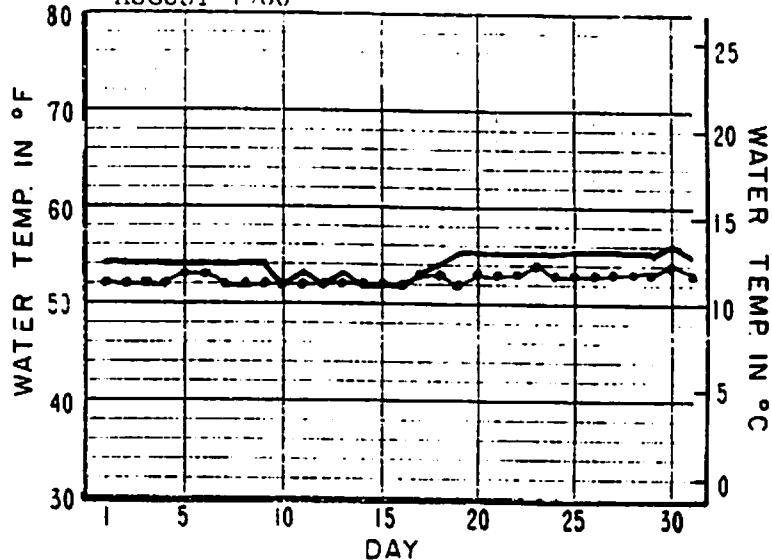


# DAILY WATER TEMPERATURES BY MONTH

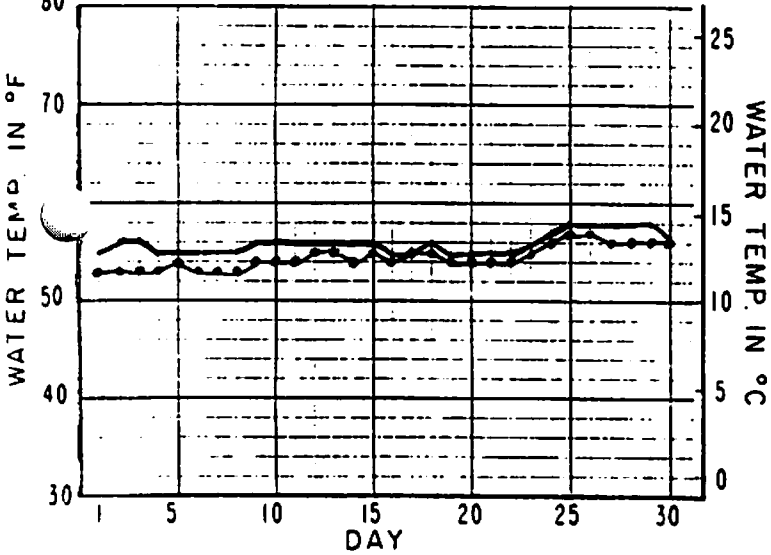
JULY 1986



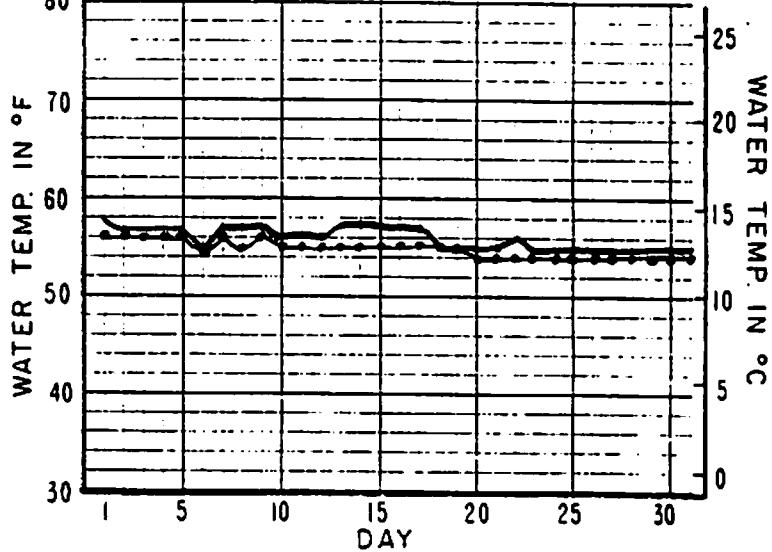
AUGUST 1986



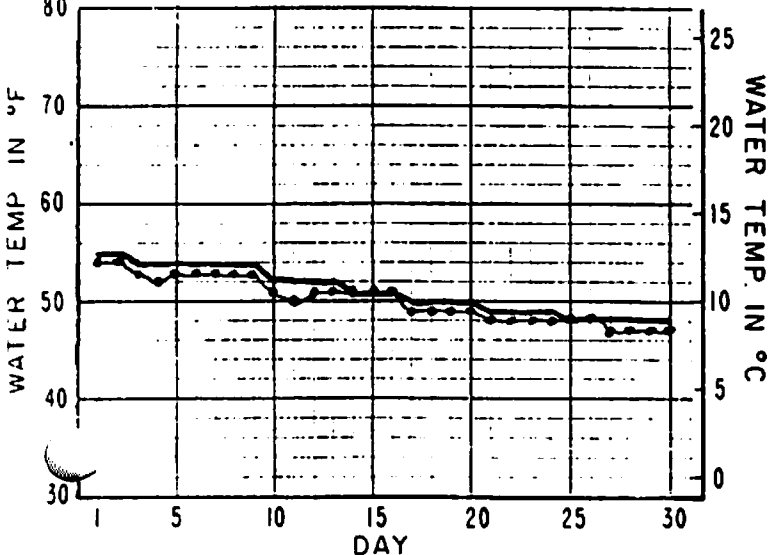
SEPTEMBER 1986



OCTOBER 1986



NOVEMBER 1986



DECEMBER 1986

