

REF 90479

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT
IRON GATE SALMON AND STEELHEAD HATCHERY, 1999-2000

by

Kimball W. Rushton
Region 1, Inland Fisheries

Inland Fisheries
Administrative Report No.

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ABSTRACT

This report describes the operation of the Hatchery from July 1, 1999 through June 30, 2000. 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 10,681 fall-run adult chinook salmon, Oncorhynchus tshawytscha, trapped, which produced 11,120,844 eggs. No spring-run chinook salmon were taken. The 151 adult coho salmon, O. kitsutch, produced 86,519 eggs. A total of 112 (12 fall-run and 100 spring-run) steelhead trout, O. mykiss, produced 46,389 eggs.

A total of 5,028,070 fingerling and 1,122,127 yearling chinook salmon, 77,147 yearling coho salmon, and 51,324 yearling steelhead was planted in FY 1999-2000

¹Inland Fisheries Administrative Report No.
Submitted March, 2001; Edited by
California Department of Fish & Game,
1416 Ninth Street, Sacramento, C 95814

INTRODUCTION

This report covers the 37th 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 33rd 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 eight miles east of Hornbrook, Siskiyou County.

NARRATIVE

Some of the significant improvements, purchases, changes in procedures or other items of interest that occurred during this report period include:

- ▶ Modifications to the original electro-anesthesia system that were started in May/June of 1999 were completed, smaller shock tank and basket and associated hydraulics. (Revenue: Hatchery O & M / Work by: Iron Gate Hatchery crew) (July/August 1999)
- ▶ A catwalk area in spawning building (north end, above the shock tank) was widened for better public viewing. (Revenue: Hatchery O & M / Work by Iron Gate Hatchery crew) (July, 1999)
- ▶ A portion of the hatchery roadways were paved. The paving starts at the cattle-guard at the entrance and extends past the residences as well as an area out in front of the office building. (Revenue: PacifiCorp / Contractor: Northwest Paving [Yreka]) (September, 1999)
- ▶ Both fish ladders were opened on September 13th.
- ▶ Our 7th annual open house was held Saturday, October 23rd.
- ▶ The Iron Gate Hatchery provided 909,000 eyed Chinook eggs to Mad River and Feather River Hatcheries for the Inland Chinook Program from our excess eggs. (November, 1999)
- ▶ River otters are getting into the auxiliary trap and eating some adult Steelhead. Checking the auxiliary trap more often and moving fish to main trap seems to be helping some. (January/ February/March 2000)
- ▶ BY 98 Coho were marked with a left maxillary (LM) clip and BY 99 Steelhead were marked with an adipose/right maxillary (AD/RM) clip by the hatchery crew

and volunteers. (January/February,2000)

- ▶ A 12' x 24" slab was poured for a new shed behind office building. (Revenue: Hatchery O & M / work by: Deadwood inmates and hatchery crew) (March,2000)
- ▶ An irrigation system with sprinklers, top soil, lawn and trees was put adjacent to the roadway into the hatchery. (Revenue: Hatchery O & M / Work by: Hatchery crew) (March, April, May 2000)
- ▶ The 17' valve was opened May 16th and closed June 16th. When opened water went from 46° to 50.5° F.

FALL CREEK REARING PONDS

Located about 11 miles past Iron Gate Hatchery between Iron Gate Reservoir and Copco Lake, the Fall Creek Rearing Ponds have been used regularly since 1979 to raise additional yearling Chinook Salmon. The Fall Creek Hatchery was built in 1919 and operated until 1948. Six of the remaining ponds (two above Copco road and four below the road) are used today and are usually referred to as the Fall Creek Rearing Ponds or the Fall Creek Facility.

Improvements to the Fall Creek Facility have been on-going throughout the 1999/2000 fiscal year. Significant modifications, innovations revisions are as follows:

- ▶ Concrete approachments were built and poured on both ends of the new footbridge that crosses Fall Creek. (Revenue: Klamath/Trinity Restoration Program [CDF&G] O & M / work by: Deadwood Conservation Camp)
- ▶ Installation of a three inch under ground pipeline from Fall Creek Falls to the upper ponds (approximately 400') providing volume for two nursery deep tanks and pressurized water for sprinkling and fire suppression.(Revenue: Klamath/Trinity Restoration Program [CDF&G] O & M / work by: Deadwood Conservation Camp)
- ▶ Five new entrance and walk through gates were purchased and installed throughout the facility. (Revenue: Klamath/Trinity Restoration Program [CDF&G] O & M / work by: Hatchery crew)
- ▶ The facility has become more A.D.A. compatible with the addition of a 24' x 24" cement slab poured for van handicap parking. Approximately 60' of sidewalk access to the lower four ponds were poured, along with a 10'x10' slab to accommodate an A.D.A. approved chemical toilet. (Revenue: Klamath/Trinity Restoration Program [CDF&G] O & M / work by: Deadwood Conservation Camp)
- ▶ The back lot of the facility (NW side of Fall Creek) had been cleared of vegetation. The area was rock and graveled for future site of a new feed tower. (Revenue: Klamath/Trinity Restoration Program [CDF&G] O & M / work by: Hatchery crew)

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, 1999 through June 30, 2000.

TABLE 1. Production Summary, Iron Gate Salmon and Steelhead Hatchery, 1999-2000

	Adults trapped	Eggs taken	Fingerlings planted	Yearlings planted	Total pounds planted
Chinook salmon					
1998 BY				1,122,127	111,886
1999 BY	10,681	11,120,844	5,028,070		54,772
Coho Salmon					
1998 BY				77,147	11,021
1999 BY	151	86,519			
Steelhead					
1999 BY				51,324	3,666
2000 BY	112	46,389			

CHINOOK SALMON MAINTENANCE PROGRAM

History of the 1999 Run

Fall-Run, 1999 Brood Year

A total of 14,120 fall-run chinook salmon was trapped: 5,246 males, 5,435 females, and 3,439 grilse (≤ 56 cm or 22 inches FL) (Figure 1). There were 3,937 females spawned; they produced 11,120,844 eggs, for an average of 2,824 eggs per female (Table 1). Twenty-two (22) lots of eggs were taken, with an average fertility of 76%. 5,028,070 chinook salmon fingerlings were released in June 2000.

Approximately 1,160,621 chinook salmon fingerlings were on hand as of June 30, 2000.

Distribution of the 1998 Brood Year Chinook Salmon

During November 1999, a total of 1,122,127 yearlings was planted at 10 /lb (Table 2).

Distribution of the 1999 Brood Year Chinook Salmon

There were 5,028,070 fingerling chinook salmon planted June 9-10, 2000 averaging 91.8/lb (Table 2).

Marked Chinook Salmon Recovered

Of the marked chinook salmon trapped during 1999-2000 (Appendix Table 1), 1047 were Iron Gate marks; the remainder (Ad) were of undetermined origin.

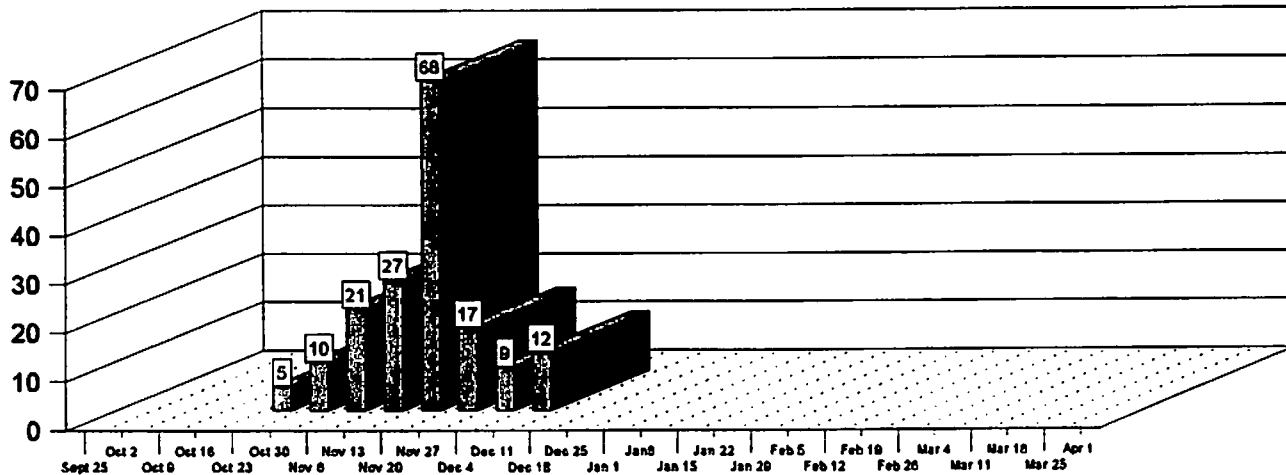
Figure 1. Trapping Data, Iron Gate Hatchery, 1999-2000

1999-2000 RUNS

CHINOOK SALMON, including Grilse



COHO SALMON, including Grilse



STEELHEAD

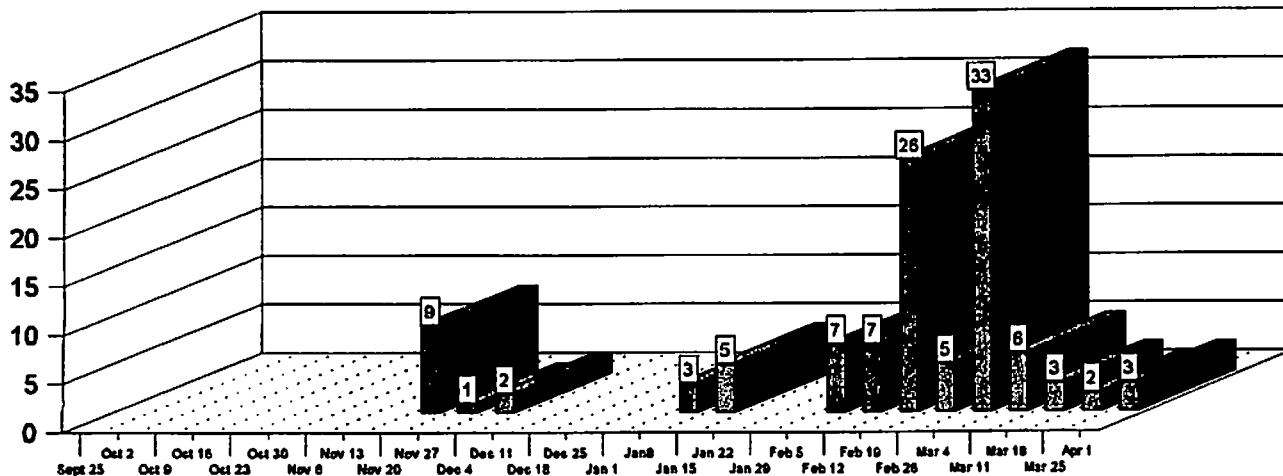


TABLE 2. Iron Gate Hatchery Chinook Salmon Distribution Data, 1999-2000

Race and brood year	Date released	Average size/lb	Number released	Release site	Mark/ Coded-wire tag number
Fall-run, 1998 Planted:					
	11/02/99	9.7	192,079	IGH	-
	11/03/99	10.1	930,048	IGH	
	11/06/99	11.00	98,582	IGH	
FISH NUMBER AND SIZE BY SERIES					
11/02	C SERIES	11.0	154,631		
11/02	D SERIES	9.0	154,682		
11/02	E SERIES	8.0	155,083		
11/03	F SERIES	10.00	154,715		
11/03	G SERIES	11.00	154,828		
11/03	H SERIES	13.00	154,800		
11/06	Fall Creek	11.0	98,582		
Total yearlings			1,122,127		
Fall-run, 1999 Planted:					
	6/09-10/99	95.0	4,845,939	IGH	
	6/09-10/99	95.0	51,641	IGH	0601020309
	6/09-10-99	95.0	52,964	IGH	0601020310
	6/09-10 /99	95.0	53,203	IGH	0601020311
	6/09-10 /99	95.0	24,323	IGH	0601020312
FISH NUMBER AND SIZE BY SERIES					
6/09	CWT FISH	95	101,385		
6/09	C SERIES	68	825,255		
6/09	D SERIES	82	829,553		
6/09	E SERIES	87	927,292		
6/10	CWT FISH	95	101,385		
6/10	F SERIES	101	826,426		
6/10	G SERIES	112	816,698		
6/10	H SERIES	142	600,024		
Total Fingerlings			5,028,070		

COHO SALMON MAINTENANCE PROGRAM

History of the 1999 Run

The first coho salmon entered the trap on October 21, 1999 and the last on December 6, 1999. A total of 169 fish was trapped: 90 males, 61 females, and 18 grilse (≤ 56 cm or 22 inches FL) (Figure 1). The 35 females spawned produced 86,519 eggs for an average of 2,472 eggs per female (Table 1). Approximately 55,937 fingerling coho salmon were on hand June 30, 2000.

Planting 1998 Brood Year Coho Salmon

There were 77,147 coho salmon planted during the 1999-2000 season (Table 3).

TABLE 3. Iron Gate Coho Salmon Planting Data, 1999-2000

Date	Average size/lb	Number released	Brood year	Release site	Mark/ coded wire tag number
3/30/00	7.0	75,460	1998	IGH	LM
3/30/00	7.0	1,687	1998	IGH	-
Total yearlings		77,147			

Marked Coho Salmon Recovered

The marked coho salmon recovered in the trap had the left maxillary clip used at Iron Gate Hatchery (Appendix Table 1).

STEELHEAD TROUT MAINTENANCE PROGRAM

History of the 1999-2000 Run

Between November 15 and November 29, 1999, a total of 12 steelhead entered the trap and were held for later spawning. One hundred (100) additional steelhead were trapped between January 3 and March 25, 2000 (Figure 1). The 26 females spawned produced 46,389 eggs for an average of 1,784 eggs per female. Approximately 36,000 steelhead fingerlings from the 2000 brood year were on hand June 30, 2000.

Planting 1999 Brood Year Steelhead

TABLE 4. Iron Gate Hatchery Juvenile Steelhead Planting Data, 1999-2000

Strain	Brood year	Date released	Average size/lb	Number released	Release site	Mark
SH	1999	4/28/00	14.0	51,324	IGH	AD/RM
Total yearlings				51,324		

Marked Steelhead Trapped

There were 58 fin-clipped steelhead trapped this year at Iron Gate Hatchery.

PUBLIC RELATIONS

During the 1999-2000 fiscal year, 2,765 people visited the Hatchery, including 780 people in organized groups.

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

CWT code	Egg source	Release Data					CWT Recovery Data					
		Brood Year	Date	Number	#/lb	Site	Year	Actual	Expanded	Male	Female	Unknown
0601020113	IGH	94	6/14-16/95	57,019	74.0	IGH	99-2000	1				
066321	IGH	94	11/13-15/95	33,972	7.5	IGH	99-2000	1				
066329	IGH	94	11/13-15/95	24,358	7.5	IGH	99-2000	2				
065701	IGH	94	11/13-15/95	28,244	7.5	IGH	99-2000	2				
0601020202	IGH	95	6/3-5/96	49,886	83.6	IGH	99-2000	3				
0601020203	IGH	95	6/3-5/96	59,158	83.6	IGH	99-2000	4				
0601020204	IGH	95	6/3-5/96	28,995	83.6	IGH	99-2000	3				
0601020205	IGH	95	6/3-5/96	53,760	83.6	IGH	99-2000	2				
0601020206	IGH	95	11/12-13/96	53,477	7.2	IGH	99-2000	133				
0601020207	IGH	95	11/12-13/96	39,695	7.2	IGH	99-2000	155				
0601020208	IGH	96	6/2-4/97	49,341	119.0	IGH	99-2000	21				
0601020209	IGH	96	6/2-4/97	49,708	119.0	IGH	99-2000	24				
063830	IGH	96	11/5-7/97	48,991	7.8	IGH	99-2000	125				
0601020210	IGH	96	6/2-4/97	48,435	119.0	IGH	99-2000	13				
0601020211	IGH	96	6/2-4/97	49,164	119.0	IGH	99-2000	20				
065230	TRH	96				TRH	99-2000	1				
063831	IGH	96	11/5-7/97	46,405	7.8	IGH	99-2000	125				
0601020212	IGH	97	6/8,10-11/98	57,375	63.0	IGH	99-2000	60				
0601020213	IGH	97	6/8,10-11/98	56,339	63.0	IGH	99-2000	45				
0601020214	IGH	97	6/8,10-11/98	49,400	63.0	IGH	99-2000	26				
0601020215	IGH	97	6/8,10-11/98	30,047	63.0	IGH	99-2000	15				
100000 ²	-	-	-	-	-	-	99-2000	38				
200000 ³	-	-	-	-	-	-	99-2000	8				
400000 ⁴	-	-	-	-	-	-	99-2000	1				

² 10 00 00 = No CWT in head of Ad-marked fish.

³ 20 00 00 = CWT lost in head dissection.

⁴ 40 00 00 = CWT lost after retrieval.

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

Season	Fall-trapped Spring-run ⁵		Fall-run					Spring-trapped Spring-run	
	Adult	Grilse	Males	Females	Total Adult	Grilse	Total Fall Run	Adults	Grilse
1962-63	0						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			948	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
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
1990-91	0	0	3,051	3,668	6,719	321	7,040	0	0
1991-92	0	0	1,733	2,269	4,002	65	4,067	0	0
1992-93	0	0	1,599	1,982	3,581	3,737	7,318	0	0
1993-94	0	0	9,202	11,626	20,828	883	21,711	0	0
1994-95	0	0	7,235	6,573	13,808	758	14,566	0	0
1995-96	0	0	12,310	10,371	22,681	259	22,940	0	0
1996-97	0	0	5,513	8,109	13,622	543	14,165	0	0
1997-98	0	0	6,707	6,908	13,275	452	13,727	0	0
1998-99	0	0	6,311	7,489	13,800	1,526	15,326	0	0
1999-2000	0	0	5,246	5,435	10,681	3,439	14,120	0	0

⁵ 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.

⁶ 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					Steelhead ¹		Total
	Males	Females	Adults	Grilse	Total	Fall-trapped early run	Spring-trapped late run	
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	1,266
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
1990-91	200	178	378	43	421	154	114	268
1991-92	176	184	360	404	764	107	100	207
1992-93	800	897	1,697	316	2,013	61	65	126
1993-94	361	314	675	29	704	56	107	163
1994-95	100	72	172	97	269	58	213	271
1995-96	708	793	1,501	59	1,560	11	1	12
1996-97	1,715	1,831	3,546	551	4,097	68	29	97
1997-98	825	1,047	1,872	302	2,174	35	92	127
1998-99	243	268	511	158	669	52	39	91
1999-2000	90	61	151	18	169	12	100	112

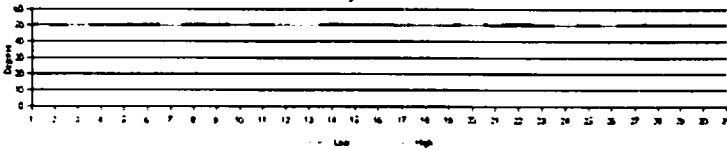
¹ Fall-trapped steelhead not differentiated from spring-trapped prior to 1969-70.

APPENDIX TABLE 4. Weekly Adult Salmon and Steelhead Trapping Data
Iron Gate Salmon and Steelhead Hatchery, 1999-2000

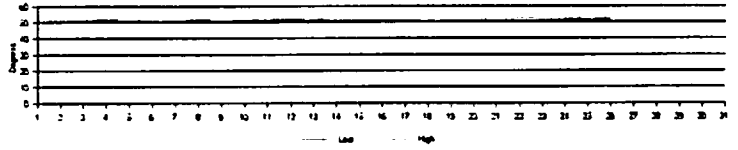
Week	Chinook Salmon		Coho Salmon		Steelhead	
	Adults	Grilse	Adults	Grilse	Fall	Spring
9/19-9/25	147	9				
9/26-10/2	289	23				
10/3-10/9	1,311	128				
10/10-10/16	3,351	754				
10/17-10/23	3,978	1,571		5		
10/24-10/30	1,165	582	6	4		
10/31-11/6	360	322	21			
11/7-11/13	50	29	26	1		
11/14-11/20	30	19	64	4	9	
11/21-11/27		2	16	1	1	
11/28-12/4			7	2	2	
12/5-12/11			11	1		
12/12-12/18						
12/19-12/25						
12/26-1/1						
1/2-1/8						3
1/9-1/15						5
1/16-1/22						
1/23-1/29						
1/30-2/5						7
2/6-2/12						7
2/13-2/19						26
2/20-2/26						5
2/27-3/4						33
3/5-3/11						6
3/12-3/18						3
3/19-3/25						2
3/26-4/1						3
Season Totals	10,681	3,439	151	18	12	100

DAILY WATER TEMPERATURES BY MONTH

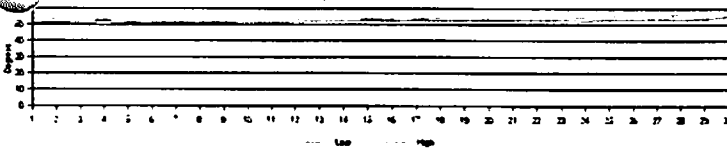
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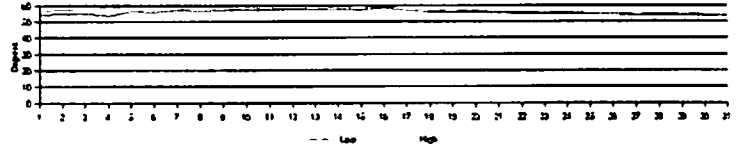
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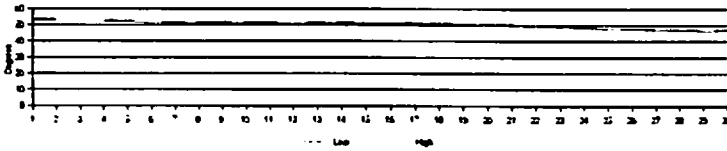
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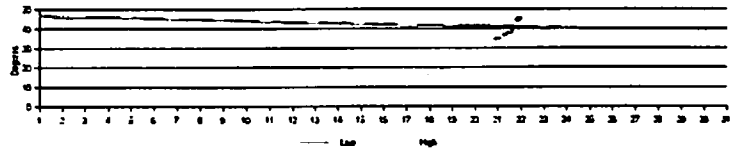
October 1999



November 1999

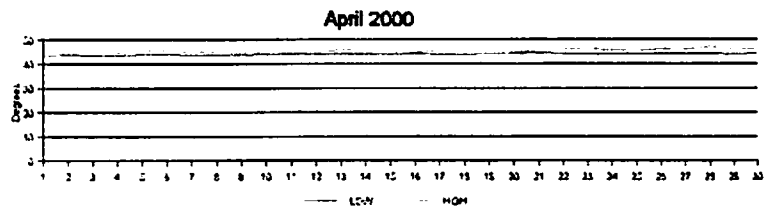
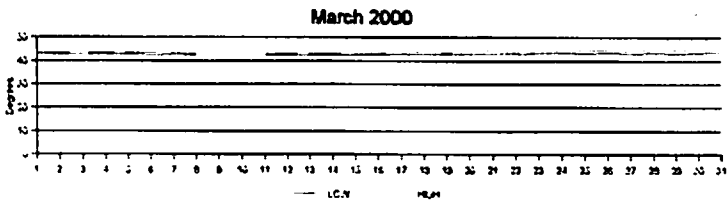
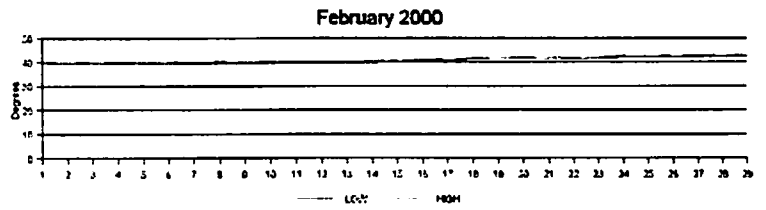
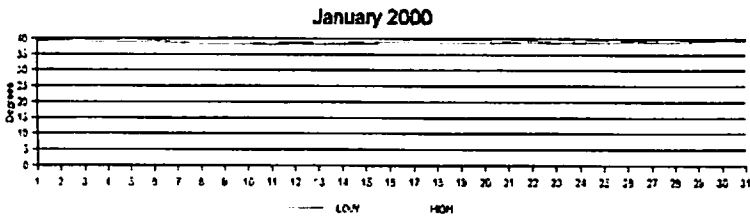


December 1999



APPENDIX FIGURE 1. (Cont'd) Daily Water Temperatures for Iron Gate Salmon/Steelhead Hatchery, 1999-2000
Temperature in Fahrenheit

DAILY WATER TEMPERATURES



BY MONTH

