

FINAL REPORT

PERIOD COVERED: October 15, 1996 - September 30, 1997

PROJECT NUMBER: 96-FP-12

COOPERATIVE AGREEMENT: 14-48-0001-96731, MOD 1.

I. PROGRAM INFORMATION:

A. Restoration Program Task: Fish Protection

Project Title: California Department of Fish and Game Bogus weir operation, spawning surveys, sport harvest estimate, and monitoring of Iron Gate Hatchery returns.

II. PROGRAM OBJECTIVES

The objectives of the program are to:

- A. Continue to monitor escapement of hatchery and natural spawning chinook salmon in Bogus Creek.
- B. Estimate adult chinook sport harvest in the Klamath River.
- C. Mark chinook and coho yearlings produced at Iron Gate Hatchery (IGH) so that their contribution to harvest and returns can be determined in future years.

III. Tasks

Task 1. Conduct the upper Klamath River creel survey between the I-5 crossing and IGH. An estimate of adult chinook salmon harvest will be generated for the fishery that takes place after IGH achieves its minimum escapement of 8,000 adult salmon and the 28-day regular season has concluded.

Angling regulations in effect for the 1996 season allowed for resumption of adult chinook salmon harvest in the Klamath River between Interstate-5 (I-5) and IGH after the regular 28-day season (which starts when the lower river allotment is reached) had lapsed and, if and when, escapement to IGH reached 8,000 adult chinook. Due to this year's liberal in-river harvest quota, the lower river allotment of 7,850 adult chinook was not reached. Regulations prohibiting the take of additional adult chinook salmon were not implemented and harvest between the falls at Coon Creek and IGH (Area 3) was not constrained by the 28-day season. Because the criteria which allows for additional harvest above I-5 were not met, no creel census upstream of the I-5 crossing was implemented.

For the 1996 season, fall chinook salmon harvest above I-5 is included in the catch estimate developed for Area 3 (Klamath River above Coon Creek Falls [River Mile 34]) and is based on the on the catch of fall chinook in the lower Klamath River (mouth to RM 34). For the season, an estimated 753 grilse and 4,390 adult chinook salmon were harvested by sport anglers in Area 3.

Task 2. Remove and decode coded-wire tags (CWTs) collected during other DFG field activities and at IGH for the fall of 1996 (excluding the Trinity River Basin).

Heads from 542 chinook salmon (528 adults and 14 grilse) were recovered at Iron Gate Hatchery. We also recovered heads from 82 adipose-marked (Ad) chinook salmon (73 adult and 9 grilse) seen in the lower Klamath River creel census, and from 13 Ad-marked chinook adults collected during the spawner surveys and weir operations (Tables 1 and 2). No Ad+CWT coho salmon were observed this year.

Estimates of the contributions to the fisheries and spawning escapements, based on sampling by Project personnel, were generated for each CWT code (Tables 1 and 2).

Lengths (mm FL) of fish recovered for each CWT code are provided in Table 3.

Task 3. Conduct coded-wire tagging of chinook 1996 brood IGH yearling production. Conduct maxillary clipping of 1995 brood coho production.

In April 1997, a total of 103,394 chinook salmon was adipose fin-clipped (Ad) and coded-wire tagged (CWT) for the yearling release. On November 6, 1997, IGH personnel released 1,085,526 brood year (BY) 1996 fall chinook yearlings from the hatchery. Included in this release were 95,396 effectively coded-wire tagged fish (bi-codes 06-08-30 and 06-08-31, see Attachments I & II).

Marking (left maxillary clip) of Brood Year (BY) 1995 coho salmon rearing at Iron Gate Hatchery was completed between March 19 and March 24, 1997. A total of 82,136 coho was marked. These fish were released below the hatchery in April 1997.

Task 4. Conduct weir and spawning ground surveys on Bogus Creek.

Weir operations on Bogus Creek which began on September 28, 1996, were discontinued November 4, 1996. The Bogus Creek facility was operated as a fish marking station instead of a counting station this year and was operated for

6 hours/day, seven days/week, to sample and mark fish (operculum punched). The remainder of the time, the trap was left open to allow the fish to pass freely.

Spawning ground surveys occurred above the weir between October 17 and November 21 to recover fish previously marked at the weir. To accomplish this, Bogus Creek was divided into reaches and surveyed twice weekly. Based on the recovery of marked fish, we estimate 10,254 (95% CI 9,434 - 11,146) chinook occupied Bogus Creek above the weir for spawning.

An additional 543 chinook salmon were counted during spawner surveys of the 0.5-mile reach of the creek between its mouth and the weir. This brought the total number of chinook salmon spawning in Bogus Creek in 1996 to 10,797 (377 grilse and 10,420 adults). For the 1996 season, Bogus Creek accounted for 27.7% of the total adult spawner escapement in the Klamath River upstream of the Trinity River confluence.

During the operation of the weir in 1996, Project personnel captured, marked and released 1,202 adult and 5 grilse chinook salmon at the Bogus Creek facility. No coho salmon or steelhead were observed. During the spawning ground surveys, crews encountered and examined approximately 5,300 chinook salmon carcasses.

Task 5. Data analysis and report writing.

Data developed as a result of Tasks 1 through 4 were entered into computer database files (Dbase IV files), edited and summarized during this reporting period. These files were subsequently analyzed to produce the results provided above.

Quarterly reports detailing progress during the contract period were prepared and submitted for the following quarters:

October 15, 1996 through December 31, 1996
 January 1, 1997 through March 31, 1997
 April 1, 1997 through June 30, 1997,
 July 1, 1997 through September 30, 1997

Prepared by: Mark S. Pisano Date: January 26, 1998

Mark S. Pisano
 Associate Biologist and Leader,
 Klamath River Project

Table 1. Spawning escapement observations and estimates of coded-wire tagged (CWT) chinook and coho salmon in the Klamath River basin (excluding the Trinity River basin), 1996.

CWT code	Release location	Run/Release		Natural spawners		Iron Gate Hatchery		Total	
		BY	size ^{a/}	Obs	Exp	Obs	Exp	Obs	Exp
<u>Chinook salmon</u>									
100000 ^{b/}				10	25	159	159	169	184
0601020108	Iron Gate Hat	92	Ff	2	4	101	101	103	105
0601020109	Iron Gate Hat	92	Ff	0	0	97	97	97	97
053342	Cappel Creek	92	Fy	0	0	1	1	1	1
065902	Iron Gate Hat	92	Fy	0	0	124	124	124	124
0601020110	Iron Gate Hat	93	Ff	0	0	16	16	16	16
0601110308	Iron Gate Hat	93	Ff	0	0	1	1	1	1
0601110309	Iron Gate Hat	93	Ff	0	0	2	2	2	2
0601080503	Trin Riv Wild	93	Ff	1	3	0	0	1	3
066319	Iron Gate Hat	93	Fy	0	0	4	4	4	4
066333	Iron Gate Hat	93	Ff	0	0	13	13	13	13
066336	Iron Gate Hat	93	Fy	0	0	10	10	10	10
0601020113	Iron Gate Hat	94	Ff	0	0	2	2	2	2
0601020114	Iron Gate Hat	94	Ff	0	0	1	1	1	1
0601020115	Iron Gate Hat	94	Ff	0	0	1	1	1	1
0601020201	Iron Gate Hat	94	Ff	0	0	2	2	2	2
066321	Iron Gate Hat	94	Fy	0	0	4	4	4	4
066329	Iron Gate Hat	94	Fy	0	0	4	4	4	4

Coho salmon

No Ad+CWT coho salmon were observed this year by KRP personnel.

^{a/} Fy = fall-run, yearling release; Ff = fall-run, fingerling release.

^{b/} This code represents heads for which no tag data was obtained (head lacked tag; tag lost or unreadable).

Table 2. Sport catch observations and estimates of coded-wire tagged (CWT) chinook salmon harvested in the Klamath River basin (excluding the Trinity River basin), 1996 (no Ad+CWT coho were observed in 1996).

CWT code	Release location	Run/Release		Creel census zone ^{b/}		Upper river zone ^{b/}		Total	
		BY	size ^{a/}	Obs	Exp	Obs	Exp	Obs	Exp
100000 ^{a/}				12	29	0	3	12	32
0601080307	Trin Riv Wild	91	Ff	1	2	0	0	1	2
065702	Iron Gate Hat	91	Fy	1	2	0	0	1	2
0601080314	Horse Linto	92	Ff	1	2	0	0	1	2
0601020108	Iron Gate Hat	91	Ff	2	5	0	2	2	7
0601020109	Iron Gate Hat	92	Ff	3	7	0	2	3	9
0601080403	Trin Riv Wild	92	Ff	1	2	0	0	1	2
0601080404	Trin Riv Wild	92	Ff	2	5	0	0	2	5
065733	Trin Riv Hat	92	Ff	6	14	0	0	6	14
0601080315	Horse Linto	92	Fy	3	7	0	0	3	7
053341	Camp Cr	92	Fy	3	7	0	0	3	7
053342	Cappel Cr	92	Fy	1	2	0	0	1	2
053343	Pecwan Cr	92	Fy	1	2	0	0	1	2
065748	Trin Riv Hat	92	Fy	7	16	0	0	7	16
065749	Trin Riv Hat	92	Fy	7	16	0	0	7	16
065902	Trin Riv Hat	92	Fy	6	14	0	3	6	17
0601040106	Trin Riv Hat	92	Sf	1	2	0	0	1	2
065734	Trin Riv Hat	92	Sy	2	5	0	0	2	5
0601080311	Trin Riv Wild	93	Ff	2	5	0	0	2	5
0601080312	Trin Riv Wild	93	Ff	1	2	0	0	1	2
062928	Horse Linto	93	Fy	1	2	0	0	1	2
065705	Trin Riv Hat	93	Fy	4	9	0	0	4	9
066336	Iron Gate Hat	93	Fy	1	2	0	0	1	2
065708	Trin Riv Hat	93	Sy	2	5	0	0	2	5
065709	Trin Riv Hat	93	Sy	2	5	0	0	2	5
0601020113	Iron Gate Hat	94	Ff	0	0	0	2	0	2
0601020114	Iron Gate Hat	94	Ff	0	0	0	1	0	1
0601020115	Iron Gate Hat	94	Ff	0	0	0	1	0	1
0601020201	Iron Gate Hat	94	Ff	0	0	0	2	0	2
065021	Trin Riv Hat	94	Ff	1	4	0	0	1	4
065022	Trin Riv Hat	94	Ff	2	8	0	0	2	8
065222	Trin Riv Hat	94	Fy	2	5	0	0	2	5
066321	Iron Gate Hat	94	Fy	1	2	0	4	1	6
066329	Iron Gate Hat	94	Fy	0	0	0	4	0	4
065220	Trin Riv Hat	94	Sf	1	4	0	0	1	4
065221	Trin Riv Hat	94	Sy	2	5	0	0	2	5

^{a/} Fy = fall-run, yearling release; Ff = fall-run, fingerling release; Sf = spring-run, fingerling; Sy = spring-run, yearling.

^{b/} Creel census zone extended from the mouth of the Klamath River to the falls at Coon Creek (river mile [RM] 34); the upper river zone extended from the falls (RM 34) to Iron Gate Dam (RM 190).

^{c/} This code represents heads for which no tag data were obtained (head lacked tag; tag lost or unreadable).

Table 3. Fork lengths of coded-wire tagged (CWT) chinook salmon collected from the Klamath River basin (excluding the Trinity River basin), 1996.

CWT code	Release location	Run/Release		Number recovered	Fork length (mm)	
		BY	size ^{a/}		Mean	(range)
100000 ^{b/}				181	749	(410-970)
0601080307	Trin Riv Wild	91	Ff	1	760	
065702	Iron Gate Hat	91	Fy	1	850	
0601080314	Horse Linto	92	Ff	1	770	
0601020108	Iron Gate Hat	91	Ff	105	789	(580-1020)
0601020109	Iron Gate Hat	92	Ff	100	790	(560-1050)
0601080403	Trin Riv Wild	92	Ff	1	800	
0601080404	Trin Riv Wild	92	Ff	2	705	(680-730)
065733	Trin Riv Hat	92	Ff	6	737	(650-900)
0601080315	Horse Linto	92	Fy	3	777	(710-830)
053341	Camp Cr	92	Fy	3	767	(710-800)
053342	Cappel Cr	92	Fy	2	705	(680-730)
053343	Pecwan Cr	92	Fy	1	670	
065748	Trin Riv Hat	92	Fy	7	709	(620-770)
065749	Trin Riv Hat	92	Fy	7	736	(620-860)
065902	Trin Riv Hat	92	Fy	130	749	(490-1020)
0601040106	Trin Riv Hat	92	Sf	1	730	
065734	Trin Riv Hat	92	Sy	2	690	(670-710)
0601020110	Iron Gate Hat	93	Ff	16	679	(600-760)
0601110308	Iron Gate Hat	93	Ff	1	760	
0601110309	Iron Gate Hat	93	Ff	2	705	(700-710)
0601080311	Trin Riv Wild	93	Ff	2	740	(700-780)
0601080312	Trin Riv Wild	93	Ff	1	610	
0601080503	Trin Riv Wild	93	Ff	1	770	
066333	Iron Gate Hat	93	Ff	13	625	(560-690)
066336	Iron Gate Hat	93	Fy	11	594	(520-700)
062928	Horse Linto	93	Fy	1	640	
065705	Trin Riv Hat	93	Fy	4	583	(530-670)
066319	Iron Gate Hat	93	Fy	4	645	(600-720)
065708	Trin Riv Hat	93	Sy	2	585	(540-630)
065709	Trin Riv Hat	93	Sy	2		Not recorded
0601020113	Iron Gate Hat	94	Ff	2	475	(470-480)
0601020114	Iron Gate Hat	94	Ff	1	490	
0601020115	Iron Gate Hat	94	Ff	1	480	
0601020201	Iron Gate Hat	94	Ff	2	450	(450-450)
065021	Trin Riv Hat	94	Ff	1		Not recorded
065022	Trin Riv Hat	94	Ff	2	440	(400-480)
065222	Trin Riv Hat	94	Fy	2	430	(400-460)
066321	Iron Gate Hat	94	Fy	5	430	(410-470)
066329	Iron Gate Hat	94	Fy	4	460	(410-560)
065220	Trin Riv Hat	94	Sf	1	420	
065221	Trin Riv Hat	94	Sy	2	375	(360-390)

^{a/} Fy = fall-run, yearling release; Ff = fall-run, fingerling release; Sy = spring-run, yearling release; Sf = spring-run, fingerling release.

Attachment I. CWT Release Report, Coded-wire tag code 06-08-30.

1. Assigned to: Mark Pisano of Klamath River Project (CDFG)
2. Species: Chinook salmon *Race: fall-run
*Egg Lot No.: _____ Brood Year: 1996
3. Release Location: Iron Gate Hatchery
4. Date Group Released: First (mm/dd/yy): 11/05/97
Last (mm/dd/yy): 11/07/97
5. Rearing Type: Hatchery Wild Mixed
6. Purpose of Release Group: Production
7. Total Number Tagged: 53,098
8. Number of Shed Tags: 1,490
9. Mortality Prior to Release: 2,617
10. Number Correctly Tagged: 48,991
11. Unmarked Release Number: 508,485
12. Method for determining unmarked number released:
 Book Estimates
 Actual Count
 Weight Sample Method
13. Quality Control Days: 30
14. Number/lb. at Release: 7.8/lb
- *15. Average Length in mm FL: _____
16. Expected Survival: Normal
 Destroyed
 Problem at Release
17. Rearing Location: Iron Gate Hatchery
18. Stock of Release Group: Iron Gate Hatchery
- *19. Comments: Released with 06-08-31.

*Optional information, all other fields must be completed.

Attachment II. CWT Release Report, Coded-wire tag code 06-08-31.

1. Assigned to: Mark Pisano of Klamath River Project (CDFG)
2. Species: Chinook salmon *Race: fall-run
*Egg Lot No.: _____ Brood Year: 1996
3. Release Location: Iron Gate Hatchery
4. Date Group Released: First (mm/dd/yy): 11/05/97
Last (mm/dd/yy): 11/07/97
5. Rearing Type: Hatchery Wild Mixed
6. Purpose of Release Group: Production
7. Total Number Tagged: 50,296
8. Number of Shed Tags: 1,411
9. Mortality Prior to Release: 2,480
10. Number Correctly Tagged: 46,405
11. Unmarked Release Number: 481,645
12. Method for determining unmarked number released:
 Book Estimates
 Actual Count
 Weight Sample Method
13. Quality Control Days: 30
14. Number/lb. at Release: 7.8/lb
- *15. Average Length in mm FL: _____
16. Expected Survival: Normal
 Destroyed
 Problem at Release
17. Rearing Location: Iron Gate Hatchery
18. Stock of Release Group: Iron Gate Hatchery
- *19. Comments: Released with 06-08-30.

*Optional information, all other fields must be completed.