ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT
OREGON

PROJECT TITLE: Evaluation of the Effects of Elk Creek Dam on Migratory Salmonids

PROJECT PERIOD: 1 October 2002 to 30 September 2003

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SUMMARY

Objectives for 2003

Project objectives were to: (1) transport migratory salmonids around Elk Creek Dam and (2) determine the proportion of wild adult anadromous salmonids that return to Elk Creek.

Accomplishments in 2003

Objective one was completed. However, the proportion of wild fish that returned to Elk Creek could not be determined for the 2002-03 return year.

Findings in 2003

Trap catches of mature salmonids in the 2002-2003 return year totaled 1,382 unmarked and 68 marked coho salmon (*Oncorhynchus kisutch*), 1,277 wild and 12 hatchery steelhead (*O. mykiss*), 10 marked and 21 unmarked chinook salmon (*O. tshawytscha*), and 170 wild cutthroat trout (*O. clarki*). Juvenile salmonids trapped and transported included 118 wild steelhead.

A minimum of one adult coho salmon and two adult steelhead died, and one adult steelhead was injured, as a result of trap and transport. In addition, samplers found 33 dead adult steelhead lodged against the upstream side of the weir. Mortality may have resulted because the weir often prevents the downstream passage of adult fish. Some of the dead steelhead found on the weir may have otherwise survived to make a subsequent spawning run.

INTRODUCTION

Elk Creek enters the Rogue River at River Kilometer (RK) 244. Elk Creek Dam is located 2.6 km upstream from the creek mouth. The basin covers about 351 sq km, of which 343 sq km are upstream of Elk Creek Dam. Mean monthly flow is less than 10 cubic feet per second (cfs) in late summer and is 400-600 cfs in winter. Mean monthly flow in winter peaks between 1,000 and 1,800 cfs.

Coho salmon, steelhead, chinook salmon, and cutthroat trout spawn in the Elk Creek Basin. Coho salmon in southern Oregon and northern California have been listed as threatened by the National Marine Fisheries Service (NMFS) under the Endangered Species Act. Small numbers of spring chinook salmon and fall chinook salmon spawn in Elk Creek when flow increases enough in autumn to permit upstream migration. Adult cutthroat trout also migrate into Elk Creek, although these fish do not appear to be anadromous.

Elk Creek Dam is one of three dams authorized by the United States Congress and constructed by the United States Army Corps of Engineers (USACE) in the Rogue River Basin of southwestern Oregon. The other dams, Lost Creek and Applegate, are fully operational. A court order halted construction of Elk Creek Dam in 1987 after dam height reached 83 feet.

Blockage of spawning areas used by anadromous fish in the Elk Creek Basin was to be mitigated by the production of coho salmon and steelhead at Cole M. Rivers Hatchery. Mitigation was to begin when the dam was fully

constructed. A diversion tunnel through the dam was altered after construction in an attempt to provide upstream passage for adult salmonids.

Spawning surveys and trap catches of juveniles suggested that few adult coho salmon or steelhead passed the dam during the 1991-92 run year even though Oregon Department of Fish and Wildlife (ODFW) staff observed hundreds of adult salmonids immediately downstream of the dam. These observations increased concern that adult salmonids were unable to pass Elk Creek Dam.

In response to that concern, a trap-and-haul operation began at Elk Creek Dam in autumn of 1992. Adult salmonids were trapped below the dam and were trucked and released upstream of the dam during the 1992-93 and 1993-94 run years. Trap catches totaled 38 coho salmon and 119 steelhead in 1992-93, and 86 coho salmon and 120 steelhead in 1993-94. Returns in both run years were very low compared with ODFW estimates of historic returns that averaged 1,560 coho salmon, 1,000 summer steelhead, and 2,000 winter steelhead (USACE 1980).

The USACE funded the Elk Creek Dam Fisheries Evaluation Project in the spring of 1995. The project goal was to develop strategies to restore the natural production of self-sustaining migratory salmonids to a level appropriate for the habitat available in the Elk Creek Basin. Findings from the first seven years of work were reported by Satterthwaite et al. (1996a), Satterthwaite et al. (1996b), Satterthwaite and Leffler (1997), Satterthwaite (1998), Satterthwaite (1999), Satterthwaite (2000), Satterthwaite (2001), and Satterthwaite (2002).

In autumn of 1995, the USACE announced plans to remove a portion of, or all of, the spillway of Elk Creek Dam to provide unobstructed passage for juvenile and adult salmonids. As a consequence of this decision, ODFW reduced the scope of the Elk Creek Dam Fisheries Evaluation Project. Revised project objectives since 1997 were: (1) transport migratory salmonids around Elk Creek Dam, (2) determine the proportion of wild adult anadromous salmonids that return to Elk Creek, and (3) determine if transported coho salmon spawn in widely distributed areas upstream of Elk Creek Dam. However, objective three was dropped for the 2002-2003 sampling season based on the analysis of data collected during 1996-2002 (Satterthwaite 2002).

METHODS

Collection and Transport of Salmonids

The fish collection facility operated continuously from 22 October 2002 through 13 May 2003 and was checked a minimum of once daily. Samplers recorded the species, fin marks or tags, and classified the fish based on visual estimates of fork length. Samplers classified chinook salmon less than 60 cm as jacks, coho salmon less than 50 cm as jacks, and steelhead less than 41 cm as half-pounders. Project staff transported and released all fish, except coho salmon of hatchery origin, in Elk Creek about one km upstream from the dam. Coho salmon of hatchery origin were killed in accordance with the National Marine Fisheries Service handling permit issued to ODFW. Coho salmon were classified as hatchery fish if a fin clip, or a maxillary clip, was evident.

RESULTS AND DISCUSSION

Collection and Transport of Salmonids

Trap catches of adult salmonids in the 2002-2003 return year totaled 1,382 unmarked and 68 marked coho salmon, 1,277 wild and 12 hatchery steelhead, 12 marked and 10 unmarked chinook salmon, and 170 wild cutthroat trout. Weekly trap catches are presented in Table 1 and in Table 2.

Project staff observed that a minimum of three adult salmonids died as a result of trap and transport. Samplers found one dead adult coho salmon in the trap on 17 December, but could not determine the cause of mortality. Two adult steelhead trout were found dead in the trap on 26 January. Both of these fish were apparently killed when they became lodged between the pickets in the trap. Another wild steelhead was found injured in a similar manner on 10 April.

In addition, there was an indication that trap and transport may have caused delayed mortality among adult salmonids. Samplers found 33 dead adult steelhead on the upstream side of the weir. These fish may have died because they were unable to migrate downstream through or over the weir. Had the weir not been present, some of these fish may have survived to make another spawning migration during the succeeding year.

Table 1. Number of mature chinook salmon trapped at the fish collection facility on Elk Creek, 2002-2003 return year. Jacks were less than 60 cm long. Data may include fish transported multiple times.

Week of capture	Jacks		Adults	
	Marked	Unmarked	Marked	Unmarked
11/05-11/11	0	2	1	0
11/12-11/18	3	7	3	5
11/19-11/25	2	6	1	1
Annual total	5	15	5	6

Proportion of Fish that Returned to Elk Creek

The return rates of wild coho salmon and steelhead to Elk Creek are estimated as the number of wild fish trapped in Elk Creek as compared to the number of cohorts that pass the fish counting station at Gold Ray Dam. Estimates of fish passage at Gold Ray Dam have yet to be completed by ODFW for the 2002-2003 return year.

ACKNOWLEDGMENTS

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Table 2. Number of mature coho salmon, steelhead, and cutthroat trout trapped at the fish collection facility on Elk Creek, 2002-2003 return year. Coho salmon jacks were less than 50 cm long and half-pounders were less than 41 cm long. All cutthroat trout were longer than 30 cm and none exhibited hatchery marks. Data may include fish transported multiple times. All fish were released upstream of Elk Creek Dam except that coho salmon known to be of hatchery origin were killed rather than released.

Week of capture	Coho salmon				Steelhead				Cutthroat trout
	Jacks		Adults		Half-pounders		Adults		
	Unmarked	Marked	Unmarked	Marked	Wild	Hatchery	Wild	Hatchery	
10/22-10/28	0	0	0	0	0	0	0	0	0
10/29-11/04	0	0	0	0	0	0	0	0	0
11/05-11/11	11	9	131	15	0	0	0	0	0
11/12-11/18	8	2	109	5	0	0	14	0	2
11/19-11/25	2	2	15	1	0	0	0	0	0
11/26-12/02	0	2	9	1	0	0	0	0	0
12/03-12/09	0	0	0	0	0	0	0	0	0
12/10-12/16	9	4	858	10	1	0	152	0	34
12/17-12/23	3	0	186[a]	2	0	0	163	0	48
12/24-12/31	1	1	19	4	8	0	181	1	38
01/01-01/07	1	0	11	2	4	0	68	1	34
01/08-01/14	0	0	2	1	0	0	24	0	2
01/15-01/21	0	0	4	5	0	0	6	0	0
01/22-01/28	0	0	0	0	0	0	91[a]	2[a]	6
01/29-02/04	0	0	3	1	3	0	31	0	3
02/05-02/11	0	0	0	1	0	0	2	1	0
02/12-02/18	0	0	0	0	1	0	31	1	2
02/19-02/25	0	0	0	0	0	0	21	0	0
02/26-03/04	0	0	0	0	0	0	9	0	0
03/05-03/11	0	0	0	0	0	0	103	0	0
03/12-03/18	0	0	0	0	2	0	110	1	0
03/19-03/25	0	0	0	0	0	0	92	0	0
03/26-04/01	0	0	0	0	0	0	80	2	0
04/02-04/08	0	0	0	0	0	0	19	0	1
04/09-04/15	0	0	0	0	0	0	34	2	0
04/16-04/22	0	0	0	0	0	0	10	1	0
04/23-04/29	0	0	0	0	0	0	15	0	0
04/30-05/06	0	0	0	0	0	0	1	0	0
05/07-05/13	0	0	0	0	0	0	1	0	0
Annual total	35	20	1,347	48	19	0	1,258	12	170

[a] Includes one fish, of each type, that died in the trap .

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