



EVALUATION OF  
THE HATCHERY  
WILD  
COMPOSITION  
OF IDAHO  
SALMON AND  
STEELHEAD  
HARVEST

Performed for  
U.S. Fish and  
Wildlife Service



Lower Snake River Fish and Wildlife  
Compensation Plan

Contract No. 14-16-0001-89501 (RWG)

Period Covered: October 1, 1989 to December 31, 1990



By

Kent Ball  
Senior Fisheries Research Biologist

January 1992

**TABLE OF CONTENTS**

**Page**

ABSTRACT ..... 1

INTRODUCTION ..... 2

OBJECTIVES ..... 4

DESCRIPTION OF STUDY AREA ..... 4

METHODS ..... 4

    Creel Survey ..... 4

        Steelhead ..... 4

        Interview Schedule ..... 7

        Chinook Salmon ..... 7

    Data Analysis ..... 8

RESULTS ..... 9

    Steelhead ..... 9

    Chinook Salmon ..... 27

DISCUSSION ..... 27

    Harvest of Sawtooth Hatchery Releases ..... 27

    Harvest of East Fork Salmon River Releases ..... 31

    Harvest of Slate Creek Releases ..... 31

    Harvest of Deer Creek, French Creek, and Hammer Creek  
    Releases ..... 31

    Sources of Error ..... 32

        Chinook Salmon ..... 32

    Straying ..... 32

        Steelhead ..... 32

RECOMMENDATIONS ..... 33

ACKNOWLEDGEMENTS ..... 34

LITERATURE CITED ..... 35

APPENDICES ..... 36

**LIST OF TABLES**

Table 1. Steelhead season dates, bag limits and special  
restrictions for the Clearwater, Salmon and Snake rivers,  
1989-90 ..... 3

**LIST OF TABLES (Cont.)**

	<u>Page</u>
Table 2. River location codes for Idaho's anadromous fisheries	6
Table 3. Steelhead fishery interview data (unexpanded) from lower Snake River (01), September 1989-March 1990.	10
Table 4. Steelhead fishery interview data (unexpanded) from lower Clearwater River (03) and North Fork Clearwater River (05), October 1989-April 1990 .....	11
Table 5. Steelhead fishery interview data (unexpanded) from upper Clearwater River (04) and Middle Fork (06), October 1989-April 1990 .....	12
Table 6. Steelhead fishery interview data (unexpanded) from South Fork Clearwater River (07), November 1989-April 1990 .....	13
Table 7. Steelhead fishery interview data (unexpanded) from Salmon River Section 10, September 1989-March 1990 .	14
Table 8. Steelhead fishery interview data (unexpanded) from Salmon River Section 11, September 1989-March 1990 .	15
Table 9. Steelhead fishery interview data (unexpanded) from Salmon River Section 12, October 1989-March 1990 .	16
Table 10. Steelhead fishery interview data (unexpanded) from Salmon River Section 13, October 1989-March 1990 .	17
'Table 11. Steelhead fishery interview data (unexpanded) from Salmon River Section 14, September 1989-April 1990 .	18
Table 12. Steelhead fishery interview data (unexpanded) from Salmon River Section 15, September 1989-April 1990 .	19
Table 13. Steelhead fishery interview data (unexpanded) from Salmon River Section 16, October 1989-April 1990 .	20
Table 14. Steelhead fishery interview data (unexpanded) from Salmon River Section 17, October 1989-April 1990 .	21
Table 15. Steelhead fishery interview data (unexpanded) from Salmon River Section 18, March-April 1990	22
Table 16. Steelhead fishery interview data (unexpanded) from Salmon River Section 19, March-April 1990 . .	23

CONTENTS

**LIST OF TABLES (Cont.)**

	<u>Paste</u>
Table 17. Steelhead fishery interview data (unexpanded) from Salmon River Section 20, January-April 1990 . . . .	24
Table 18. Proportion of estimated harvest by river section that was examined for marks, 1989-90 .....	25
Table 19. Estimated number of hatchery steelhead harvested in the lower Snake, Clearwater, and Salmon rivers during the 1989-90 seasons .....	26
Table 20. Summary of 1989-90 harvest estimates and hatchery returns of steelhead produced by LSRCP hatcheries . .	28
Table 21. Spring chinook salmon coded wire tag recoveries from the Clearwater River, June 1990 .....	29
Table 22. Difference between the number of steelhead passing McNary Dam that can be accounted for upriver at Ice Harbor and Priest Rapids dams, 1983-89 .....	30

**LIST OF FIGURES**

Figure 1. Map of the steelhead harvest areas in Idaho	5
---	---

**LIST OF APPENDICES**

Appendix A. Coded wire tag recoveries and fin clips identified September 1989-April 1990; harvest estimates by month and river section; and total harvest estimates for the 1989-90 season .....	37
Appendix B. Steelhead groups returning to the Salmon River, 1989-90 .....	104
Appendix C. Steelhead groups returning to the Clearwater River, 1989-90 .....	106
Appendix D. Miscellaneous coded wire tag steelhead groups that were recovered by Idaho anglers in 1989-90 .....	108
Appendix E. Spring chinook salmon groups returning to the Clearwater River, 1990 .....	110

CONTENTS

## ABSTRACT

Steelhead trout Oncorhynchus mykiss and chinook salmon O. tshawytscha fisheries in Idaho are monitored to assess hatchery contribution, distribution, and return rates. Coded wire tags are retrieved from fish harvested by anglers, and harvest rates are calculated by month and river section.

During the fall 1989 and spring 1990 steelhead seasons, 39,687 anglers were interviewed and 7,829 adult steelhead examined, which was 21.5% of the total steelhead harvest. We retrieved 358 coded wire tags from 66 different tag groups. The total estimated harvest for the 1989-90 season was 46,357 hatchery and 19 wild-natural fish. The total estimated harvest of steelhead reared by the Lower Snake River Compensation Plan (LSRCP) was 6,258, and an additional 3,244 returned to hatcheries and off-site release locations. In the Salmon River, LSRCP fish supported about 65% of the hatchery harvest.

The estimated return of adults from 687,650 smolts released at Sawtooth Hatchery in 1987 was 2,204 (0.32%). Adults returning in 1987 were significantly reduced by low flows during their downstream migration. Adults returning from 1987 releases at Sawtooth Hatchery were exploited at 75%.

Anglers caught 369 chinook salmon from the Clearwater River drainage in June 1990. About 95% of the harvest was from LSRCP-reared fish released into the North Fork Clearwater River by Dworshak National Fish Hatchery.

Author:

Kent Ball  
Senior Fishery Research Biologist

8990LSRCP

## INTRODUCTION

Chinook salmon Oncorhynchus tshawytscha and steelhead trout O. mykiss are raised in Idaho hatcheries to mitigate for losses caused by the construction of hydroelectric dams. Adults returning to hatcheries in the Salmon and Clearwater River basins commingle with each other and with wild stocks. In the Snake River, fish destined for Idaho also commingle with adults returning to Oregon and Washington streams.

The main purpose of this project is to determine the composition of the anadromous fish harvest in the Idaho fishery and to estimate the adult harvest contribution from juveniles produced in LSRCP hatcheries. Contribution to the Idaho fishery is one of the measures of performance of LSRCP fish.

Harvest management of steelhead in Idaho is directed toward harvest of hatchery fish and protection of wild and naturally-produced fish. Currently, wild stocks are below escapement goals, and protection is necessary to perpetuate these fish over the long run. Beginning in 1984, all hatchery-produced steelhead smolts released in Idaho rivers and streams had their adipose fins excised before release so returning adults could be selectively harvested.

In the fall 1989 and spring 1990 seasons, all age groups of hatchery steelhead returning to Idaho were marked by fin clips, and regulations stated that "only steelhead with a missing adipose fin (as evidenced by a healed scar) may be kept." Consequently, the harvest of any wild (unmarked) steelhead was illegal. Table 1 lists the fall and spring regulations.

Representative groups of steelhead are marked with coded wire tags prior to release. Anglers are interviewed and fish snouts are retrieved in all major harvest areas to recover these tags from the fishery. Information is collected and used to estimate timing, straying, exploitation, harvest distribution, and relative abundance of wild and hatchery stocks. Total harvested numbers are estimated by a statewide harvest survey, and the harvest contribution for each hatchery program is derived from tag recoveries.

The first harvest season for LSRCP chinook salmon was opened in June 1990 in the Clearwater River drainage downstream and adjacent to Dworshak National Fish Hatchery. Harvest was directed on LSRCP-reared adults returning to that facility. The season was open on the North Fork Clearwater River (05) June 1-3, 8-10, and 15-17. On the mainstem Clearwater River (03), only that portion of the river from Big Canyon Creek to the downstream Ahsahka boat ramp was open from June 8-10 and 15-17. However, the June 15-17 fishing dates on Section 03 were subsequently deleted due to a conflict with power boat races. Limits were one per day, two in possession, and three per season (including jacks). All salmon were required to be checked in at checking stations. Fishing hours were 0400 to 2130 Pacific Daylight Time.

## OBJECTIVES

Identify in the Idaho sport fishery the number and proportion of the harvest that is produced by LSRCP hatcheries.

Determine the spawning escapement of LSRCP stocks in Idaho.

8990LSRCP

Table 1. Steelhead season dates, bag limits<sup>1</sup> and special restrictio for the Clearwater, Salmon and Snake rivers, 1989-90.

River and Sections	Fall Season Dates	Bag Limits	Special Restrictions
Clearwater River (03 - 07)	Oct 15 - Dec 31	2, 4, 10	
Salmon River (10 - 18)	Sept 1 - Dec 31		Only steel-head 31" or under with a healed adipose fin clip may be kept.
Salmon River (19 - 20)			
Snake River (01)			

River and Sections	Spring Season Dates	Bag Limits	Special Restrictions
Clearwater River (03 - 07)	Jan 1 - Apr 30	3, 6, 20	
Salmon River (10 - 14)	Jan 1 - Mar 31	2, 4, 10	Only steel-head 31" or under with a healed adipose fin clip may be kept.
Salmon River (15 - 17)	Jan 1 - Apr 30		
Salmon River (18)			
Salmon River (19)			
Salmon River (20)		3, 6, 20	
Snake River (01)		2, 4, 20	

<sup>1</sup> Limits denote daily, possession, and season totals.

## DESCRIPTION OF STUDY AREA

There are three major river systems in Idaho where steelhead are harvested: the Snake, Clearwater, and Salmon rivers (Figure 1, Table 2). All of Idaho's steelhead harvest areas are included in this study, except the upper Snake River (Section 02) and the Boise River (Section 28). These two sections are excluded because no steelhead produced by the LSRCF are harvested there. Steelhead are blocked from reaching the Boise River by dams on the Snake River. However, a portion of the fish returning to Hells Canyon Dam are transplanted and released there for harvest through Idaho Power Company's mitigation program.

## METHODS

### Creel Survey

#### **Steelhead**

Angler interviews were conducted at check stations and from jet boats and roving vehicles. Angler interview schedules and *intensity* were designed to observe maximum numbers of harvested fish. Techniques were tailored to sportsmen's access and harvest methods. For example, on the Clearwater River, a major portion of the fall and winter harvest is taken by boat fishermen, so survey efforts concentrate on interviewing boat anglers. In late spring, the density of boats in a small area is so high it is prohibitive to sample anglers on the water; therefore, survey efforts are divided between major boat ramps. In the roadless area of the Salmon River, almost all of the angler access is by boat, but most of the fishing effort is from shore. Anglers are contacted by census clerks in jet boats or at check stations located at major egress points.

During angler interviews, data are collected on the number of anglers and hours fished, number of fish kept or released, wild or hatchery origin of fish kept or released, total length of fish kept, and date and river section where fish were caught. Observed fish are inspected for tags and fin clips. Snouts are removed from all fish with abnormalities of their left ventral fins for coded wire tag retrieval, except when anglers desire to keep their fish intact.

Water conditions during the fall season are usually conducive to harvest, and the interview schedule can be followed. During the spring season, high turbid flows can reduce harvest to near zero. Anglers are not interviewed during periods of very low harvest.

#### **Interview Schedule**

**Lower Snake River (01)** - by jet boat with *Washington* Department of Wildlife personnel and at boat ramps on **alternating** weekends for ten weekends during the fall and six weekends during the spring season.

8990LSRCF

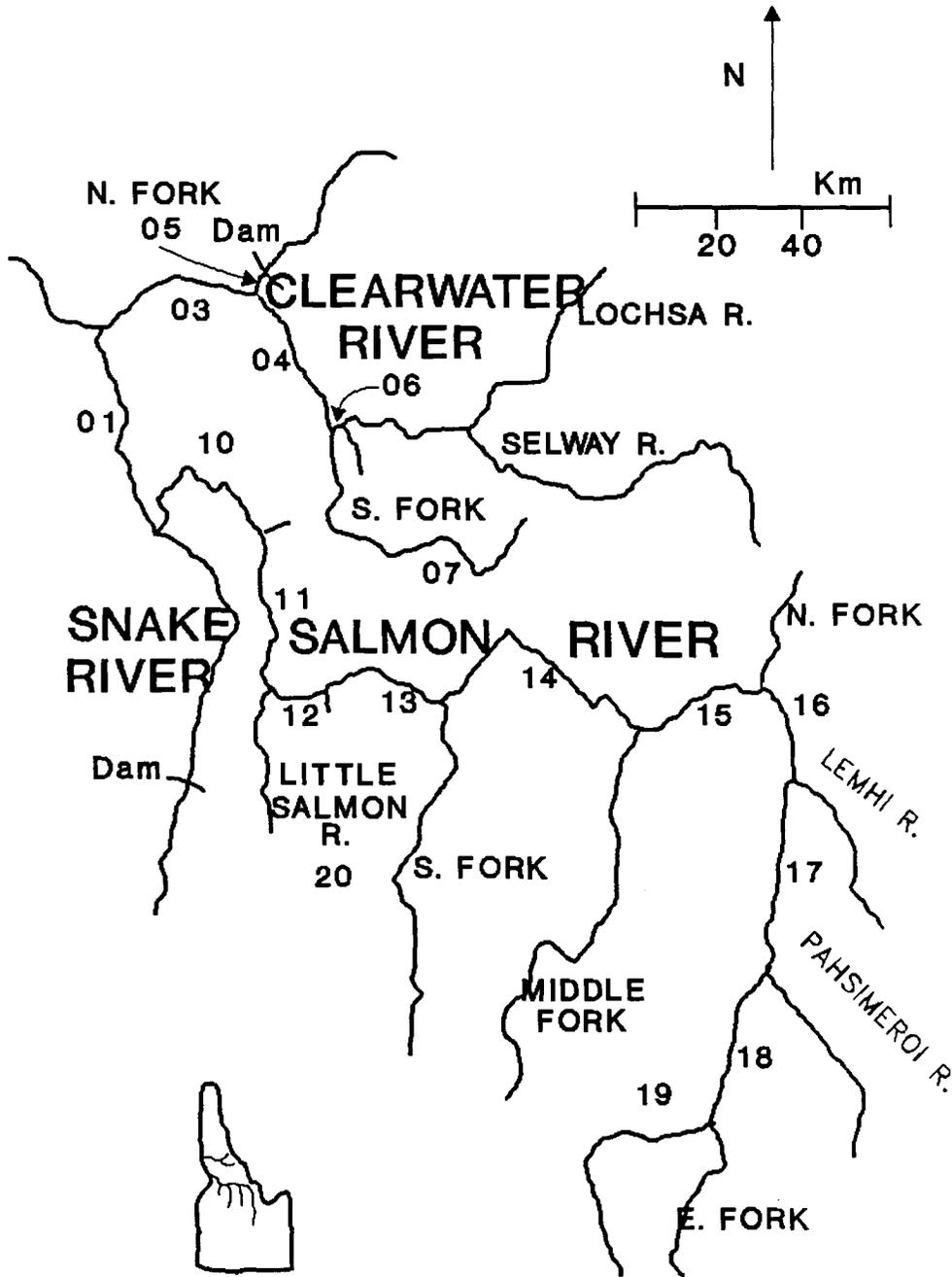


Figure 1. Map of steelhead harvest areas in Idaho.

Table 2. River location codes for Idaho's anadromous fisheries.

River Section	Location Code
Snake River, below Salmon River	01
Snake River, above Salmon River	02
Clearwater River, below Orofino Bridge	03
Clearwater River, above Orofino Bridge	04
North Fork Clearwater River	05
Middle Fork Clearwater River	06
South Fork Clearwater River	07
Selway River	08
Lochsa River	09
Salmon River, below Whitebird Creek	10
Salmon River, Whitebird Creek to Little Salmon	11
Salmon River, Little Salmon to Vinegar Creek	12
Salmon River, Vinegar Creek to South Fork	13
<b>Salmon</b> River, South Fork to Middle Fork	14
Salmon River, Middle Fork to North Fork	15
Salmon River, North Fork to Lemhi River	16
Salmon River, Lemhi River to Pahsimeroi River	17
Salmon River, Pahsimeroi River to East Fork	18
Salmon River, above East Fork	19
Little Salmon River	20
South Fork Salmon River	21
Middle Fork Salmon River	22
North Fork Salmon River	23
Lemhi River	24
Pahsimeroi River	25
East Fork Salmon River	26
Snake River, Oxbow	27
Boise River	28

**Lower Clearwater River and North Fork (03 and 05)** - by roving vehicle one day each week and by jet boat three days each week for 15 weeks in the fall and ten weeks in the spring season. Interview from boat ramps for the last six weeks of the spring season.

**Upper Clearwater, Middle Fork, and South Fork Clearwater River (04, 06, and 07)** - by roving vehicle on the Upper and Middle Fork Clearwater in the fall and on all three rivers in the spring, two weekend days per week, for eight weeks in the fall and ten weeks in the spring.

### **Salmon River**

Section 10 - by jet boat **six** weekends in the fall and five weekends in the spring season.

Section 11 - by roving vehicle two weekdays and two weekend days for ten weeks in the fall and eight weeks in the spring season.

Sections 12 and 13 - by a check station at the old lumber mill site near Riggins for ten weekends in the fall and eight weekends in the spring season.

Sections 14 and 15 - by a check station near North Fork for ten weekends in the fall and eight weekends in the spring season.

Section 16 - by roving vehicle for **six** weekends in the fall and six weekends in the spring season.

Section 17 - by roving vehicle for six weekends in the fall and six weekends in the spring season.

Section 18 - by roving vehicle for six weekends in the spring season.

Section 19 - by roving vehicle for six weekends in the spring season.

Section 20 - by roving vehicle for six weekends in the spring season.

### **Chinook Salmon**

We operated two checking stations on all harvest days to inspect all fish caught as required under mandatory regulations. These stations were located at Peck and Ahsahka and were manned by personnel from 0600 through 2230 on each day the fishery was open.

All salmon inspected at the check stations were measured, sexed, and key scales removed from the fish diagonally below the rear of the dorsal fin and above the lateral line. Snouts were excised from all fish with adipose clips for subsequent coded wire tag retrieval.

Scales were mounted in acetate and read on a microfiche. Analysis of the circuli patterns was used to differentiate fish of hatchery origin. All scales were read twice by two different individuals. Scale readers attempted to determine hatchery or natural origin of fish by comparing circuli patterns of harvested fish with scales from known hatchery adults.

8990LSRCP

## Data Analysis

Harvest estimates for each river section were obtained from statewide telephone survey results (McArthur 1991). Estimated harvest reported from Section 03 in September was shifted to Section 01. The statewide harvest survey erroneously reported harvest in Section 03 during September, when this river section was only open to catch-and-release. By definition, the mouth of the Clearwater River upstream to Memorial Bridge was included in Section 01 in the 1989-90 steelhead regulations and was open for steelhead harvest. Section 03 remained catch-and-release until the consumptive season opened October 15.

The number of fish checked for marks from each river section, divided by the harvest estimate, yields the sampling rate for each river section by month. Harvested fish that were not seen during the interviews were not included when expressing the proportion of the estimated harvest that was marked.

During angler interviews, hatchery-wild proportions were recorded for fish kept and for total catch, including released fish when their origin could be determined. The harvest of hatchery fish is the product of the hatchery proportion observed in anglers' creels and the estimated harvest from statewide surveys by month. Seasonal estimates of reported hatchery fish harvest are the summation of monthly estimates. Hatchery harvest estimates for months when harvest was low and no fish were checked were calculated using the hatchery proportion calculated from the last month that data were available. These methods were applied during winter when fish movement was minimal and the proportion of hatchery fish in the harvest was constant. Harvest estimates of various coded wire tag groups were calculated by dividing the number of tags recovered by the sampling rate expressed as a decimal and then rounded to whole numbers. Tag group harvest rates were calculated by dividing the estimated harvest of the group by the release group size. Harvest estimates for unmarked groups were calculated using harvest rates from representative mark groups or companion groups.

Hatchery returns were classified by strain (A or B) and ocean-age using length frequencies of previous known-age coded wire tag returns. Marked returns to hatchery racks were subtracted from total returns by strain and ocean-age. Total harvest of unmarked groups was assumed to parallel the performance of unmarked hatchery rack returns. Where more than one unmarked group returned to a release site, the estimates of harvest and hatchery returns were calculated on the total of the unmarked fish and assumed to apply equally to each group. Due to very small numbers, no attempt was made to estimate returns of unmarked B-strain fish from the East Fork Salmon River returning after three ocean-years.

Unmarked returns to the Yankee Fork were estimated from unmarked returns to Sawtooth. Unmarked returns to Panther Creek were estimated from marked returns released at Shoup Bridge. Unmarked returns to French Creek, Hammer Creek, and Deer Creek were estimated from marked returns to the Little Salmon River. Exploitation rates of unmarked releases were calculated to be the same as comparison groups.

Exploitation rates are the harvest estimates divided by the sum of the harvest estimates and the number of fish that returned to the hatchery. No attempts were made to include mortality from causes other than angler harvest or contribution to natural reproduction.

8990LSRCP

## RESULTS

### Steelhead

During the fall 1989 and spring 1990 seasons, we interviewed 39,687 anglers that had harvested 8,347 hatchery and 4 wild fish (Tables 3-17). We physically examined 7,829 hatchery fish for marks and removed 512 snouts from fish with clipped left ventral fins for retrieval of coded wire tags (Table 18).

The composition of the hatchery steelhead harvest by river section and season is compiled in Table 19. All river sections are included except 02 and 28 (Table 2). Total harvest for river sections listed was 46,376 steelhead, of which an estimated 19 fish were of wild-natural origin and were illegally possessed.

From anglers' creels we recovered 358 coded wire tags. The overall proportion of tags recovered from the number of fish checked for marks was 4.6% (Table 18). Coded wire tags were recovered from 66 mark groups. The number of tags recovered, the estimated harvest of tag code groups by month and river section, and the total estimated harvest of tag code groups for the fall and spring seasons are listed in Appendix A. Of the 66 tag groups that yielded coded wire tags, 34 were from releases in Idaho (Appendices A, B and C).

Coded wire tags were also recovered from 11 Oregon tag groups, 15 Washington tag groups, and 5 National Marine Fisheries Service (NMFS) groups marked at Lower Granite Dam. One of the Oregon tag groups was released at Little Sheep Creek and ten from Wallowa Hatchery. Three of the Washington tag groups were released in the Grand Ronde River, eight groups at Lyons Ferry Hatchery, two from the Touchet River, and two from the Tucannon River (Appendices A and D).

Estimates of total returns of LSRCP-reared fish are summarized in Table 20. All Idaho returns from the LSRCP program that returned in 1989-90 were from releases in the Salmon River drainage. However, they were also recovered from the fishery in the Snake and Clearwater rivers. The total estimated return of adult steelhead to Idaho in 1989-90 from the LSRCP program, which includes harvest by Idaho anglers, hatchery returns, and off-site escapement, was 9,502. Contribution to Idaho's total hatchery steelhead harvest (except Sections 02 and 28) in 1989-90 was 20.5%. In the Salmon River, LSRCP-reared fish supported about 65% of the estimated harvest.

Adult steelhead returning to Sawtooth Hatchery and the Yankee Fork were exploited at 76-84%. East Fork Salmon River returns were exploited at 63-75%. In the Little Salmon River, and for off-site releases at Deer Creek, French Creek, and Hammer Creek, exploitation is not quantified, but is assumed to be near 50% (Table 20).

### Chinook Salmon

We interviewed 743 anglers and checked in 369 chinook salmon at the mandatory check stations. Only 46 of the anglers were checked at Peck; 701 at Ahsahka. Anglers averaged 11 hours per fish caught, but not all unsuccessful anglers stopped at the check stations.

8990LSRCP

Table 3. Steelhead fishery interview data (unexpanded) from lower Snake River (01), September 1989-March 1990.

Dates	No. Antlers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/	Fish
			Hatchery	Wild	Hatchery	Wild			
September	218	953	18	0	0	11	29	33	62
October	1,117	4,804	144	0	4	29	177	27	84
November	1,264	5,790	184	0	14	60	258	22	77
December	754	2,700	94	0	2	29	125	22	77
Fall total	3,353	14,247	440	0	20	129	589		
Average								24	78
January	145	520	22	0	11	11	44	12	75
February	76	249	12	0	3	4	19	13	79
March	4	12	1	0	0	1	2	6	50
Spring total	225	781	35	0	14	16	65		
Average								12	75
Total	3,578	15,028	475	0	34	145	654		
Average								23	78

10

Table 4. Steelhead fishery interview data (unexpanded) from lower Clearwater River (03) and North Fork Clearwater River (05), October 1989-April 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	3,048	12,818	677	0	96	163	936	14	83
November	4,633	18,611	1,122	0	30	<b>144</b>	1,296	14	89
December	2,840	10,881	661	0	38	84	783	14	89
Fall total	10,521	42,310	2,460	0	164	391	3,015		
Average								14	87
January	2,175	9,546	787	0	78	99	964	10	90
February	2,495	11,330	462	0	32	78	572	20	86
March	3,164	15,601	638	0	61	73	772	20	91
April	317	1,638	62	0	1	2	65	25	97
Spring total	8,151	38,115	1,949	0	172	252	2,373		
Average								16	89
Total	18,672	80,425	4,409	0	336	643	5,388		
Average								15	88

Table 5. Steelhead fishery interview data (unexpanded) from upper Clearwater River (04) and Middle Fork (06), October 1989-April 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/	Percent Fish
			Hatchery	Wild	Hatchery	Wild			
October	191	765	26	0	1	13	40	19	68
November	315	1,469	208	0	9	7	224	7	97
December	44	164	8	0	0	2	10	16	80
Fall total	550	2,398	242	0	10	22	274		
Average								9	92
January	55	131	12	0	1	2	15	9	87
February	352	1,018	31	0	6	11	48	21	77
March	554	2,518	94	0	15	45	154	16	71
April	2	4	0	0	0	0	0	0	0
Spring total	963	3,671	137	0	22	58	217		
Average								17	73
Total	1,513	6,069	379	0	32	80	491		
Average								12	<b>84</b>

Table 6. Steelhead fishery interview data (unexpanded) from South Fork Clearwater River (07), November 1989-April 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
November	2	1	0	0	0	0	0	0	0
Fall total	2	1	0	0	0	0			
Average							0	0	
January	2	2	0	0	0	0	0	0	0
February	43	102	1	0	0	2	3	34	33
March	388	1,490	39	0	0	6	45	33	87
April	262	981	36	0	9	10	55	18	82
Spring total	695	2,575	76	0	9	18	103		
Average								25	83
Total	697	2,576	76	0	9	18	103		
Average								25	83

Table 7. Steelhead fishery interview data (unexpanded) from Salmon River Section 10, September 1989-March 1990.

Dates	No. Antlers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
September	2	6	0	0	0	0	0	0	0
October	329	1,430	51	0	15	38	104	14	63
November	190	620	26	0	2	15	43	14	65
December	7	22	1	0	0	0	1	22	100
Fall total	528	2,078	78	0	17	53	148		
Average								14	64
February	32	88	6	0	6	4	16	6	75
March	14	67	3	0	0	3	6	11	50
Spring total	46	155	9	0	6	7	22		
Average								7	68
Total	574	2,233	87	0	23	60	170		
Average								13	65

Table 8. Steelhead fishery interview data (unexpanded) from Salmon River Section 11, September 1989-March 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
September	5	28	1	0	0	0	1	28	100
October	648	2,542	68	0	26	47	141	18	67
November	729	2,959	133	0	15	104	252	12	59
December	85	357	12	0	2	8	22	16	64
Fall total	1,467	5,886	214	0	43	159	416		
Average								14	62
January	25	82	3	0	1	3	7	12	57
February	112	363	8	0	3	8	19	19	58
March	90	231	10	0	2	8	20	12	60
Spring total	227	676	21	0	6	19	46		
Average								15	59
Total	1,694	6,562	235	0	49	178	462		
Average								14	61

15

Table 9. Steelhead fishery interview data (unexpanded) from Salmon River Section 12, October 1989-March 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	395	3,452	101	0	17	92	210	16	56
November	570	3,879	97	0	22	81	200	19	60
December	90	503	11	0	2	4	17	30	76
Fall total	1,055	7,834	209	0	41	177	427		
Average								18	59
January	15	32	1	0	0	1	2	16	50
February	130	471	10	0	1	6	17	28	65
March	329	1,474	24	0	5	21	50	29	58
Spring total	474	1,977	35	0	6	28	69		
Average								29	59
Total	1,529	9,811	244	0	47	205	496		
Average								20	59

Table 10. Steelhead fishery interview data (unexpanded) from Salmon River Section 13, October 1989-March 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	287	2,254	56	0	8	99	163	14	39
November	120	1,942	48	0	10	59	117	17	50
Fall total	407	4,196	104	0	18	158	280		
Average								15	44
March	93	1,809	22	0	23	91	136	13	33
Spring total	93	1,809	22	0	23	91	136		
Average								13	33
Total	500	6,005	126	0	41	249	416		
Average								14	40

Table 11. Steelhead fishery interview data (unexpanded) from Salmon River Section 14, September 1989-April 1990.

Dates	No. Antlers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
September	1	7	0	0	0	1	1	7	0
October	325	5,234	100	0	56	305	461	11	34
November	254	5,009	156	1	50	281	488	10	42
Fall total	580	10,250	256	1	106	587	950		
Average								11	38
January	6	13	1	0	0	1	2	7	50
February	60	620	14	0	7	21	42	15	50
March	347	4,929	101	0	21	227	349	14	35
April	14	495	6	0	8	42	56	9	25
Spring total	427	6,057	122	0	36	291	449		
Average								13	35
Total	1,007	16,307	378	1	142	878	1,399		
Average								12	37

Table 12. Steelhead fishery interview data (unexpanded) from Salmon River Section 15, September 1989-April 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/Percent Fish Hatchery	
			Hatchery	Wild	Hatchery	Wild		Fish	Hatchery
September	48	224	3	0	0	10	13	17	23
October	1,600	17,729	319	0	53	331	703	25	53
November	1,259	15,318	363	1	79	203	646	24	68
Fall total	2,907	33,271	685	1	132	544	1,362		
Average								24	60
January	26	91	4	0	0	0	4	23	100
February	374	2,553	67	0	23	34	124	21	73
March	2,106	20,186	529	1	232	228	990	20	77
April	137	799	50	0	15	27	92	9	71
Spring total	2,643	23,629	650	1	270	289	1,210		
Average								20	76
Total	5,550	56,900	1,335	2	402	833	2,572		
Average								22	68

Table 13. Steelhead fishery interview data (unexpanded) from Salmon River Section 16, October 1989-  
April 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	377	1,342	36	0	11	34	81	17	58
November	299	1,041	25	0	0	22	47	22	53
Fall total	676	2,383	61	0	11	56	128		
Average								19	56
February	107	457	20	0	3	6	29	16	79
March	700	2,801	63	1	9	40	113	25	64
April	67	327	7	0	2	3	12	27	75
Spring total	874	3,585	90	1	14	49	154		
Average								23	68
Total	1,550	5,968	151	1	25	105	282		
Average								21	62

Table 14. Steelhead fishery interview data (unexpanded) from Salmon River Section 17, October 1989-  
April 1990.

Dates	No. Anqlers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	11	19	0	0	0	0	0	0	0
November	61	144	2	0	1	3	6	24	50
Fall total	72	163	2	0	1	3	6		
Average								27	50
February	93	227	3	0	1	2	6	38	67
March	706	2,820	27	0	9	10	46	61	78
April	237	943	5	0	1	3	9	105	67
Spring total	1,036	3,990	35	0	11	15	61		
Average								65	75
Total	1,108	4,153	37	0	12	18	67		
Average								62	73

Table 15. Steelhead fishery interview data (unexpanded) from Salmon River Section 18, March-April 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
March	174	767	9	0	3	5	17	45	71
April	161	1,063	14	0	17	12	43	25	72
Spring total	335	1,830	23	0	20	17	60		
Average								31	72

Table 16. Steelhead fishery interview data (unexpanded) from Salmon River Section 19, March-April 1990.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
March	101	299	6	0	2	2	10	30	80
April	484	2,500	38	0	24	54	116	22	53
Spring total	585	2,799	44	0	26	56	126		
Average								22	56

Table 17. Steelhead fishery interview data (unexpanded) from Salmon River Section 20, January-April 1990.

Dates	No. Anglers	Total Hour Fishes	Steelhead		Steelhead		Total	Hours/ Fish	Percent Hatchery
			Kept Hatchery	Wild	Released Hatchery	Wild			
January	7	12	1	0	2	0	3	4	100
February	16	28	2	0	1	0	3	9	100
March	390	1,428	127	0	37	5	169	8	97
April	382	1,767	215	0	95	15	325	5	95
Spring total	795	3,235	345	0	135	20	500		
Average								6	96

Table 18. Proportion of estimated harvest by river section that was examined for marks, 1989-90.

River Section	No. Fish Checked	Estimated Harvest <sup>a</sup>	Sample Rate %
01	455	3,636	12.5
03 & 05	4,384	25,208	17.4
04 & 06	217	2,438	8.9
07	75	307	24.4
10	76	1,552	4.9
11	182	1,511	12.0
12	235	477	49.3
13	116	504	23.0
14	348	1,630	21.3
15	1,220	4,833	25.2
16	129	1,266	10.2
17	33	616	5.4
18	19	269	7.1
19	43	430	10.0
20	297	1,720	17.3
Total	7,829	46,397	
Average			16.9

<sup>a</sup>Data from statewide telephone survey (McArthur 1990).

Table 19. Estimated number of hatchery steelhead harvested in the lower Snake, Clearwater and Salmon rivers during the 1989-90 seasons.

River Section	Fall Season - 1989			Spring Season - 1990			Total Harvest <sup>1</sup> From
	Estimated Harvest <sup>1</sup>	Percent Hatchery	No. Hatchery Fish	Estimated Harvest	Percent Hatchery	No. Hatchery Fish	No. Hatchery m Fish
Snake 01	3,172	100	3,172	464	100	464	3,636
<u>Clearwater River</u>							
04 & 05	14,823	100	14,823	10,385	100	10,385	25,208
04 & 06	1,079	100	1,079	1,359	100	1,359	2,438
07	51	-- <sup>2</sup>	51	256	100	256	307
Clearwater Total	15,953		15,953	12,000		12,000	27,953
Average		100			100		
<u>Salmon River</u>							
10	1,232	100	1,232	320	100	320	1,552
11	1,231	100	1,231	280	100	280	1,511
12	277	100	277	200	100	200	477
13	288	100	288	216	100	216	504
14	1,198	99.6	1,193	432	100	432	1,625
15	2,947	99.9	2,944	1,886	99.8	1,882	4,826
16	451	100	451	815	98.9	806	1,257
17	184	100	184	432	100	432	616
18	21	2	21	248	100	248	269
19	62	2	62	368	100	368	430
20	82	2	82	1,638	100	1,638	1,720
Salmon Total	7,973		7,965	6,835		6,822	14,787
Average		99.9			99.8		
1989-90 Total	27,098		27,09	19,299		19,286	46,376

statewide surveys.

<sup>2</sup>Assumed to be of hatchery origin.

TABLES

Table 20. Summary of 1989-90 harvest estimates and hatchery returns of steelhead produced by LSRCP hatcheries.

Release Year	Strain and Ocean-Age	No. of Fish		Hatchery		Estimated Number of Fish		
						Harvested	Hatchery Return	Total
Year	Ocean-Age	Released	Release Site	Rearing	Marks			
1988	A-I	51,919	Sawtooth	HNFH <sup>1</sup>	CWT 10/29/39	34	11	45
1988	A-I	1,263,371	Sawtooth	HNFH	None	2,660	840	3,500
1988	A-I	176,000	Yankee Fork	MVSH <sup>2</sup>	None	371	117 <sup>3</sup>	488
1988	A-I	162,800	Panther Creek	MVSH	None	116	126 <sup>3</sup>	237
1988	A-I	100,000	French Creek	MVSH	None	126	110 <sup>3</sup>	252
1988	A-I	87,200	Hammer Creek	MVSH	None	110	66 <sup>3</sup>	220
1988	A-I	52,300	Little Salmon River	MVSH	CWT 10/40/49	66	819 <sup>3</sup>	132
1988	A-I	649,000	Little Salmon River	MVSH	None	819		1,638
1988	A-I	50,055	Slate Creek	HNFH	CWT 10/40/50	37	37 <sup>3</sup>	74
1988	A-I	667	Slate Creek	HNFH	None	1	1 <sup>3</sup>	2
1988	A-I	346,100	Slate Creek	MVSH	None	256	256 <sup>3</sup>	512
	Subtotal	2,939,412				4,596	2,504	7,100
1987	A-II	662,700	Sawtooth	HNFH	None	630	120	750
1987	A-II	24,950	Sawtooth	HNFH	CWT 10/29/48	21	4	25
1987	A-II	248,875	Little Salmon River	HNFH	None	89	89 <sup>3</sup>	178
1987	A-II	50,250	Little Salmon River	HNFH	CWT 10/29/25	18		36
1987	A-II	13,801	Deer Creek	HNFH	None	5		10
	Subtotal	986,775				763	236	999
1988	B-I	251,832	EF Salmon River	HNFH	None	210	70	280
1988	B-I	51,732	EF Salmon River	HNFH	CWT 10/29/38	6	2	8
	Subtotal	303,564				216	72	288
1987	B-II	40,500	Slate Creek	HNFH	CWT 10/29/26	61	61 <sup>3</sup> 14 <sup>3</sup>	122
1987	B-II	9,250	Slate Creek	HNFH	None	14		28
1987	B-II	24,150	EF Salmon River	HNFH	CWT 10/29/49	12	7	19
1987	B-II	460,950	EF Salmon River	HNFH	None	596	350	946
	Subtotal	534,850				683	432	1,115
1986	B-III	499,991	EF Salmon River	HNFH	None	0	0	0
1986	B-III	25,325	EF Salmon River	HNFH	CWT 10/28/20	0	0	0
	Subtotal	525,316				0	0	0

HNFH = Hagerman National Steelhead Hatchery.

<sup>2</sup>MVSH = Magic Valley Steelhead Hatchery.<sup>3</sup>Includes off-site escapement.

More than 87% of the fish checked were caught from the North Fork Clearwater River. We checked 323 fish that were caught from the North Fork (05) and only 46 from the lower Clearwater (03). An additional 51 fish were caught and released.

The sex composition of harvested chinook salmon was 185 females and 184 males, of which only 2 were jacks. Anglers were releasing jacks in favor of larger adults.

We recovered 42 coded wire tags from 47 snouts removed (Table 21). All of these tags were from fish released into the North Fork Clearwater River (Appendix E).

Both scale readers identified scales from 336 of 369 fish (91%) as being hatchery origin both times they read the scales. The remaining 33 scales (9%) were not consistently identified as hatchery fish; however, 3 were hatchery fish that had coded wire tags. Based on 336 of the scales being consistently identified as hatchery fish and 3 containing coded wire tags, we concluded at least 92% (339 of 369) of the harvest was hatchery origin. The origin of the remaining 8% was unknown.

## **DISCUSSION**

Adult steelhead returning up the Snake River in 1989-90 negotiated McNary Reservoir with much better success than the previous two low flow years. Only 5.1% of the adults counted past McNary Dam were unaccounted for at Ice Harbor and Priest Rapids dams (Table 22). The proportion of fish accounted for was substantially better than in 1987 and 1988 (Ball 1989; 1990).

### **Harvest of Sawtooth Hatchery Releases**

Returns of steelhead released from Sawtooth Hatchery in 1987 are now complete. From a total release of 687,650 smolts, we calculated a return of 1,429 adults after one ocean-year and a return of 775 after two ocean-years. The total return was 2,204 (0.32%), and 75.3% were harvested (Ball 1989) (Table 20). The low rate of return was primarily a function of very low flows during the outmigration year and also poor upstream river conditions in 1988 (Ball 1990).

Adult returns from 1988 smolt releases have returned after their first ocean-year. From 1,315,290 smolts released, 3,545 (0.27%) returned to the fishery and Sawtooth Hatchery (Table 20). These returns were also impacted by flow conditions during outmigration and adult return years (Ball 1990).

The exploitation rate of adults from steelhead released at Sawtooth Hatchery has equaled or approached 80% during the last four return years (Ball 1988; 1989; 1990). This is the highest exploitation rate measured in Idaho and is equal to the state's goal for hatchery steelhead. The harvest primarily occurs in 385 miles of the Salmon River, but a portion also occurs in the Snake River.

Table 21. Spring chinook salmon coded wire tag recoveries from the Clearwater River, June 1990.

Data code	Recovery Site and (River Section)	No. of Tags Recovered
05/17/51	Lower Clearwater (03)	1
05/17/51	North Fork Clearwater (05)	2
10/28/13	North Fork Clearwater (05)	3
10/28/14	North Fork Clearwater (05)	3
10/29/34	North Fork Clearwater (05)	1
10/40/55	Lower Clearwater (03)	1
10/40/55	North Fork Clearwater (05)	3
10/40/56	Lower Clearwater (03)	1
10/40/56	North Fork Clearwater (05)	9
10/40/57	Lower Clearwater (03)	2
10/40/57	North Fork Clearwater (05)	6
	Total	42

Table 22. Difference between the number of steelhead passing McNary Dam that can be accounted for upriver at Ice Harbor and Priest Rapids dams, 1983-89<sup>a</sup>.

Year	No. of Fish (000's)				Difference
	McNary Dam	Ice Harbor Dam	Priest Rapids Dam	Ice Harbor + Priest Rapids Total	
1983	125.2	88.5	31.1	119.6	5.6 (4.5%
<b>1984</b>	135.5	94.0	26.0	120.0	15.5 (11.4%
<b>1985</b>	188.2	128.8	34.5	163.3	24.9 (13.2%
<b>1986</b>	193.5	144.3	22.4	166.7	26.8 (13.9%
1987	148.8	74.5	14.0	88.5	60.3 (40.5%
1988	151.8	99.7	10.2	109.9	41.9 (27.6%
<b>1989</b>	170.5	151.1	10.7	161.8	8.7 (5.1%

<sup>a</sup>Totals from Corps of Engineers annual fish passage reports.

### Harvest of East Fork Salmon River Releases

Adult returns of 525,316 smolts released in 1986 are now complete. We estimated that 748 returned (0.14%) after two ocean-years and *none* returned after three ocean-years. The overall return rate was affected by the low stream flows during outmigration and return.

In 1987, 485,100 smolts were released into the East Fork. There were 88 returning adults after one ocean-year and 965 after two ocean-years. Total return is 1,053 (0.22%), and this group was severely impacted by poor flows during outmigration.

There were 303,564 smolts released into the East Fork in 1988, and an estimated 288 returned after one ocean-year (Table 20).

### Harvest of Slate Creek Releases

The first marked releases in Slate Creek were stocked in 1987. Of the total release of 49,750 B-strain fish, 40,500 were marked with coded wire tags (Appendix B). No tagged fish were recovered after one ocean-year, but we estimated 150 (0.30%) adults returned after two ocean-years. The exploitation rate was estimated to be similar (i.e. 50%) to the Little Salmon River.

### Harvest of Deer Creek, French Creek, and Hammer Creek Releases

Off-site releases (smolt releases into the river or in tributaries without means or attempts to collect spawning adults) is a technique employed to distribute the harvest and put more hatchery fish into anglers' creels. Lower Salmon River harvest areas are corridors for all fish destined upriver, but are unable to sustain a viable fishery after upriver fish have passed. Deer Creek and Hammer Creek are near the upstream boundary of Section 10, and French Creek is near the upstream boundary of Section 12 (Figure 1, Table 2). All of these release sites have roadside access and should be viable harvest areas if fish released at these sites return and mill around in that vicinity.

Off-site releases need to be evaluated to ascertain return rates, contribution to the sport fishery, and distribution over time. Evaluation of off-site releases at Shoup Bridge and North Fork is in progress. However, a coded wire tag group in one of the downriver off-site release groups would improve our efforts to evaluate all off-site releases.

### Sources of Error

The primary sources of error involved in the harvest estimates were discussed by Ball (1986), and the quality control of adipose clipping was discussed by Ball (1989).

Left ventral fin clips, which are used to identify the presence of coded wire tags, regenerate but leave the fin deformed. Since there is a high

8990LSRCP

proportion of hatchery fish with deformed fins from their life in the hatchery, we attempt to take snouts from all fish with deformed left ventral fins. Although we take additional snouts with these methods, we should not be missing very many coded wire tags. Spot checks at hatcheries with portable coded wire tag detectors confirm that our methods are detecting greater than 98% of the coded wire tags.

## **Chinook Salmon**

The chinook salmon season on the Clearwater River was the first since 1974, and the first attempt to selectively harvest one hatchery stock while minimizing harvest of other stocks. It appears that few individuals from stocks other than Dworshak National Fish Hatchery were harvested during the early June 1990 fishery. The high catch rate in the North Fork Clearwater River shows that they can be successfully harvested there in a limited space. However, flows in the North Fork Clearwater, where most harvest occurred, were relatively low. Higher flows may significantly reduce fishing success.

Scale pattern analysis is a useful technique in assessing hatchery origin in most fish after they are caught. However, if selective hatchery harvest is a long-term goal, a method of marking hatchery chinook salmon externally needs to be implemented. Any mark used should be readily recognizable by the anglers, and if a selective harvest program is implemented, mortality of released fish should be assessed.

## **Straying**

### **Steelhead**

Adult steelhead returning to Idaho rivers in the fall are several months away from spawning and commonly wander into streams other than where they were released. It is not unusual for these wandering fish to spend time in one or more rivers that are not their natal drainage. Adults observed or harvested during the wandering phase should not be considered strays. The majority of them would eventually return to their natal stream, hatchery, or release site.

In 1990, there were 669 coded wire tags recovered from hatchery steelhead at hatchery racks in Idaho. Smolts are marked by NMFS personnel during outmigration and are from throughout the Snake River drainage. However, 55 (96.5%) of the 57 adults with NMFS coded wire tags were recovered at Dworshak National Fish Hatchery. One tag was recovered at Sawtooth Fish Hatchery and one tag at Pahsimeroi Fish Hatchery. These adult recoveries indicate that the majority of the fish that are being handled and marked by NMFS are from the Clearwater drainage.

Of particular interest to the LSRCP program were the 16 recoveries of Lyons Ferry steelhead with coded wire tags that were recovered at Dworshak National Fish Hatchery. These fish were strays from Washington releases in the Tucannon and Touchet rivers and from Lyons Ferry Hatchery. Recoveries of Tucannon River releases were tag codes 63/49/41 (1); 63/49/44 (3); 63/38/44 (1); and 63/39/03 (1). From the Touchet River releases, recoveries were from tag code 63/49/47

8990LSRCP

(3). There was one fish from each of seven tag codes released at Lyons Ferry Hatchery; 63/37/03, 63/39/13, 63/39/14, 63/50/13, 63/50/14, 63/50/16, and 63/50/19.

From the remaining 596 recoveries of coded wire tags from Idaho mark groups, 114 were released either at Kooskia National Fish Hatchery or in the South Fork Clearwater River drainage and were recovered at Dworshak National Fish Hatchery. In the pure sense, these fish could be considered strays from their release sites. In reality, they were trapped because of the very close proximity of the adult trap to the main Clearwater River (Ball 1986).

If the remaining 482 fish are considered to be a good indicator of straying, then they were very successful in returning to their respective release sites. Only three fish (0.6%) were recovered elsewhere. Two fish were from off-site releases: one fish released in Panther Creek (10/29/52) and one released at Shoup Bridge on the Salmon River returned to the Pahsimeroi Hatchery. Only a single fish (0.2%) released from a hatchery rack (Sawtooth) returned to another hatchery rack (Pahsimeroi). Therefore, depending on if off-site releases are included (except when released in the upper Clearwater River drainage), the true straying rate of Idaho hatchery steelhead is 0.2 to 0.6%. This agrees very closely with straying rates observed since 1985 (Ball 1986; 1988; 1989; 1990). Furthermore, there is very little variation between years and no change over time in the years we have been calculating straying rates.

#### **RECOMMENDATIONS**

Continue to include coded wire tags in each major smolt release that are representative in size, time of release, and fish health.

Install an adult counting weir on the Little Salmon River to evaluate adult returns and improve accuracy of adult return estimates of Lower Salmon River releases.

Analyze scales from adult returns to the East Fork Salmon River trap for size distribution at each ocean age.

Evaluate rate of return, contribution to the sport fishery, and distribution of adults returning from off-site releases.

#### **ACKNOWLEDGEMENTS**

Marsha White assisted with data compilation and word processing. Steve Elam and Vicky Feucht provided data from coded wire tags. Ralph Roseberg assisted with data from Dworshak National Fish Hatchery. Tom McArthur provided statewide harvest estimates. Mark Schuck and Art Viola, Washington Department of Wildlife, cooperated with data collection and compilation for the Snake River. Steve Yundt edited the report.

## LITERATURE CITED

- Ball, K. 1986. Evaluation of hatchery-wild steelhead harvest, December 1, 1984 to September 30, 1985. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Contract No. 14-16-0001-85607 (RWG). Idaho Department of Fish and Game, Boise.
- Ball, K. 1988. Evaluation of hatchery-wild steelhead harvest, October 1, 1985 to December 31, 1986. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Contract No. 14-16-0001-85068 (RWG). Idaho Department of Fish and Game, Boise.
- Ball, K. 1989. Evaluation of hatchery-wild steelhead harvest, October 1, 1986 to December 31, 1987. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Contract No. 14-16-0001-87501 (RWG). Idaho Department of Fish and Game, Boise.
- Ball, K. 1990a. Evaluation of hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1987 to December 31, 1988. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Contract No. 14-16-0001-88501 (RWG). Idaho Department of Fish and Game, Boise.
- Ball, K. 1990b. Evaluation of hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1988 to December 31, 1989. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Contract No. 14-16-0001-89501 (RWG). Idaho Department of Fish and Game, Boise.
- Johnson, K. and J. Longwill. 1990. Pacific salmonid coded wire tag releases through 1990. Region Mark Processing Center, Pacific Marine Fisheries Commission.
- Koski, C.H., S.W. Pettit, and J.L. McKern. 1989. Fish Transportation Oversight Team Annual Report - FY 1988 Transport Operations on the Snake and Columbia rivers. NOAA Technical Memorandum NMFS F/NWR-25.
- McArthur, T.J. 1991. Technical Assistance and Modeling. 1989-90 steelhead season harvest and effort (telephone survey). Job Performance Report, Project F-73-R-13, Subproject 1, Study 1, Job 2. Idaho Department of Fish and Game, Boise.
- U.S. Army Corps of Engineers, North Pacific Division. 1990. Annual Fish Passage Report, Columbia and Snake rivers for salmon, steelhead, and shad. U.S. Army Engineer Districts, Portland and Walla.

**A P E N D I C E S**

899OLSRCP

Appendix A. Coded wire tag recoveries and fin clips identified September 1989 - April 1990; harvest estimates by month and river section; and total harvest estimates for the 1989-90 season.

TAG CODE - 05/17/12		RELEASE SITE - Clearwater River								NUMBER RELEASED - 15,539			
		September			October			November		December			
River	Section	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.
-----01													
	03/05												
	04/06												
	07												
	10												
	11												
	12												
	13												
	14												
	15												
	16												
	17												
	18												
	19												
	20												
-----													
River	Section	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.
	03/05	1	0.199	5							1		5
	04/06												
	07												
	10												
	11												
	12												
	13												
	14												
	15												
	16												
	17												
	18												
	19												
	20												

Total estimated harvest

5

Appendix A. Continued.

TAG CODE - 05/17/13			RELEASE SITE - Clearwater River			NUMBER RELEASED - 15,424				
River Section	September		October		November		December			
	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.		
01										
03/05			1	0.159						
04/06					6					
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
River Section	January		February		March		April		1989-90 Total	
	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Est. Rate Harv.
01										
03/05					1	0.232			2	10
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
Total estimated harvest										10

38

Appendix A. Continued.

TAG CODE - 05/17/14			RELEASE SITE - Clearwater River						NUMBER RELEASED - 12,948					
River Section	September			October			November			December				
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.			
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.		
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
River Section	January			February			March			April		1989-90 Total		
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01														
03/05							1	0.232	4				1	4
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest														4

39

Appendix A. Continued.

TAG CODE - 05/17/29

RELEASE SITE - S. Fork Clearwater R.

NUMBER RELEASED - 49,675

River Section	September			October			November			December		
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.

01												
03/05									1	0.179		6
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

River Section	January			February			March			April			1989-90 Total	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.

01														
03/05	1	0.199	5										2	11
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

11

Appendix A. Continued.

PMFC book lists this as a "Lower Elwha River" release in '86 of 1,923 steelhead  
by Fish and Wildlife. 9/20/90 mw

TAG CODE - 05/17/30		RELEASE SITE -				NUMBER RELEASED -				
River Section	September		October		November		December			
	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.		
01										
03/05			1	0.159	6					
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
River Section	January		February		March		April		1989-90 Total	
	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Sample Est. Rate Harv.	No. Tags	Est. Rate Harv.
01										
03/05									1	6
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
Total estimated harvest										6



Appendix A. Continued.

TAG CODE - 05/18/34			RELEASE SITE - Clear Creek						NUMBER RELEASED -21,025					
River Section	September			October			November			December				
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.		
01														
03/05				4	0.159	25	6	0.165	36	5	0.179	28		
04/06							1	0.108	9					
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
River Section	January			February			March			April		1989-90 Total		
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Est. Harv.
03/05	3	0.199	15	3	0.146	21	3	0.232	13				24	138
04/06							1	0.134	7				2	16
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest														154

Appendix A. Continued.

TAG CODE - 05/18/35				RELEASE SITE - Clear Creek				NUMBER RELEASED - 19,425					
River Section	September			October			November			December			
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Est. Harv.		
01													
03/05				1	0.159	6	2	0.165	12	3	0.179	17	
04/06							1	0.108	9				
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
River Section	January			February			March			April		1989-90 Total	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	
01	1	0.138	7									1	7
03/05		1	0.199	5			2	0.232	9			9	49
04/06							2	0.134	15			3	24
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
Total estimated harvest													80

Appendix A. Continued.

TAG CODE - 05/18/36		RELEASE SITE - Clearwater River						NUMBER RELEASED - 19,675						
River Section	September			October			November			December				
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.		
01							5	0.108	46					
03/05				1	0.159	6	1	0.165	6	1	0.179	6		
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
River Section	January			February			March			April			1989-90 Total	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.
03/05				2	0.146	14	6	0.232	26				5	46
04/06													11	58
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

45

Appendix A. Continued.

TAG CODE - 05/18/46

RELEASE SITE - Clearwater River

NUMBER RELEASED - 14,333

River Section	September			October			November			December				
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Est. Harv.			
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
River Section	January			February			March			April		1989-90 Total		
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Est. Harv.
01														
03/05							1	0.232		4			1	4
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

4

Appendix A. Continued.

TAG CODE - 05/18/49

RELEASE SITE - Clearwater River

NUMBER RELEASED - 16,604

River Section	September			October			November		December	
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	No. Tags	Sample Est.
--01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

47

River Section	January			February			March			April		1989-90 Total	
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	No. Tags	Harv.
---01													
03/05										1	0.108	9	
04/06												1	9
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Total estimated harvest

9

Appendix A. Continued.

TAG CODE - 05/18/50		RELEASE SITE - Clearwater River								NUMBER RELEASED - 19,796				
		-----September			October			November		December				
River Section		No. Sample Est.			No. Sample Est.			No. Sample Est.		No. Sample Est.				
Tags Rate Harv.		Tags Rate Harv.			Tags Rate Harv.			Tags Rate Harv.		Tags Rate Harv.				
								-----01		1 0.172 6				
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
		January			February			March			April		1989-90 Total	
River Section		No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.		No. Est.	
Tags Rate Harv.		Tags Rate Harv.			Tags Rate Harv.			Tags Rate Harv.			Tags Rate Harv.		Tags Harv.	
											-----01		1	
03/05					2 0.146 14								6	
04/06													2 14	
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest													20	

Appendix A. Continued.

TAG CODE - 05/18/51

RELEASE SITE - Clearwater River

NUMBER RELEASED - 19,873

River Section	September			October			November			December	
	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags
--01											
03/05				1	0.159		6				
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

49

River Section	January			February			March			April			1989-90 Total	
	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags
---01														
03/05														
04/06													1	6
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

6



Appendix A. Continued.

TAG CODE - 05/18/53		RELEASE SITE - Clearwater River						NUMBER RELEASED - 18,835						
River Section	September			October			November			December				
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.			
							01	1	0.172		6			
03/05				10.159		6								
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
River Section	January			February			March			April		1989-90 Total		
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Est. Harv.
01													1	6
03/05													1	6
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest														12

51

Appendix A. Continued.

TAG CODE - 07/40/25

RELEASE SITE - Wallowa Hatchery

NUMBER RELEASED - 25,374

River Section	September			October			November			December	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Est. Harv.
01											
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
River Section	January			February			March			1989-90 Total	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Est. Harv.
01											
03/05				1	0.146	7				1	7
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Total estimated harvest											7

Appendix A. Continued.

TAG CODE - 07/40/26		RELEASE SITE - Wallowa Hatchery								NUMBER RELEASED - 26,136		
River Section	Tags	September		October		November		December		1989-90 Total	Tags	Harv.
		No. Sample Est.	Tags Rate Harv.	No. Sample Est.	Tags Rate Harv.	No. Sample Est.	Tags Rate Harv.	No. Sample Est.	Tags Rate Harv.			
01						1	0.108		9			
03/05												
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
River Section	Tags	January		February		March		April		1989-90 Total		
		No. Sample Est.	Tags Rate Harv.	No. Sample Est.	Tags Rate Harv.	No. Sample Est.	Tags Rate Harv.	No. Sample Est.	Tags Rate Harv.	No. Tags	Est. Harv.	
01										1	9	
03/05												
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

53

Total estimated harvest

Appendix A. Continued.

TAG CODE - 07/40/27				RELEASE SITE - Wallowa Hatchery				NUMBER RELEASED - 26,986									
September				October				November				December					
No. Sample Est.				No. Sample Est.				No. Sample Est.				No. Sample Est.					
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.		
01				2	0.142	14	3	0.108	28								
03/05																	
04/06																	
07																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
January				February				March				April				1989-90 Total	
No. Sample Est.				No. Sample Est.				No. Sample Est.				No. Sample Est.				No.	Est.
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01																5	42
03/05																	
04/06																	
07																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
Total estimated harvest																	42

Appendix A. Continued.

TAG CODE - 07/40/28		RELEASE SITE - Wallowa Hatchery								NUMBER RELEASED - 27,442							
River Section	September				October				November				December				
	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.		
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.		
01				1	0.142	7			1	0.108	9						
03/05																	
04/06																	
07																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
River Section	January				February				March				April		1989-90 Total		
	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01																2	16
03/05																	
04/06																	
07																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Total estimated harvest

55



Appendix A. Continued.

TAG CODE - 07/40/31		RELEASE SITE - Wallowa Hatchery				NUMBER RELEASED - 25,436					
		September		October		November		December			
No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.					
River Section	Tags Rate Harv.	Tags Rate	Harv.	Tags Rate	Harv.	Tags Rate	Harv.				
		01		1	0.108	9					
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
		January		February		March		April		1989-90 Total	
No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No.	Est.
River Section	Tags Rate Harv.	Tags Rate	Harv.	Tags Rate	Harv.	Tags Rate	Harv.	Tags Rate	Harv.	Tags	Harv.
										1	9
01											
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Total estimated harvest											9

57

Appendix A. Continued.

TAG CODE - 07/40/32		RELEASE SITE - Wallowa Hatchery								NUMBER RELEASED - 25,425	
		September		October		November		December			
		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.			
River Section		Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	
						01		1 0.172		6	
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
		January		February		March		April		1989-90 Total	
		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No.	Est.
River Section		Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags Harv.
01										1 6	
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Total estimated harvest										6	



Appendix A. Continued.

TAG CODE - 07/41/25

RELEASE SITE - Wallowa Hatchery

NUMBER RELEASED - 46,571

River Section	September			October			November			December		
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.

---01  
 03/05  
 04/06  
 07  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20

1 0.179 6

River Section	January		February		March		April		1989-90 Total	
	No. Tags	Sample Est. Harv.	No. Tags	Est. Harv.						

01  
 03/05  
 04/06  
 07  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20

1 6

Total estimated harvest

6

09

Appendix A. Continued.

TAG CODE - 07/41/26

RELEASE SITE - Wallowa Hatchery

NUMBER RELEASED - 50,019

River Section	September			October			November			December	
	No. Tags	Sample Est. Rate	Harv.	No. Tags	Sample Est. Rate	Harv.	No. Tags	Sample Est. Rate	Harv.	No. Tags	Sample Est. Rate
03/05	0.142			7	1	0.108	9	1	0.172	6	
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
										01	1

61

River Section	January			February			March			April			1989-90 Total	
	No. Tags	Sample Est. Rate	Harv.	No. Tags	Sample Est. Rate	Harv.	No. Tags	Sample Est. Rate	Harv.	No. Tags	Sample Est. Rate	Harv.	No. Tags	Est. Harv.
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
													01	3 22

Total estimated harvest

22

Appendix A. Continued.

TAG CODE - 07/41/28		RELEASE SITE - Wallowa Hatchery								NUMBER RELEASED - 50,385					
River Section	September				October				November				December		
	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.
Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags
01				1	0.142			7							
03/05															
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

River Section	January				February				March				April		1989-90 Total	
	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.	No.	Sample	Est.	Harv.
Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01	1	0.138													2	14
03/05																
04/06																
07																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Total estimated harvest

62

Appendix A. Continued.

TAG CODE - 10/28/19

RELEASE SITE - Shoup Bridge, Salmon R. NUMBER RELEASED - 28,700

River Section	September			October			November			December	
	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags
---	01										
03/05											
04/06											
07											
10											
11											
12							1	0.814		1	
13											
14											
15				2	0.188		11		1	0.255	4
16											
17											
18											
19											
20											

River Section	January			February			March			April			1989-90 Total	
	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags
01														
03/05														
04/06														
07														
10														
11														
12													1	1
13														
14														
15									1	0.420		2	4	17
16														
17														
18														
19														
20														
Total estimated harvest														18

Appendix A. Continued.

TAG CODE - 10/29/25

RELEASE SITE - Little Salmon River

NUMBER RELEASED - 50,250

River Section	September			October			November			December	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.

01											
03/05											
04/06											
07											
10											
11							2	0.203		10	
12				1	0.858	1					
13							1	0.351		3	
14											
15											
16											
17											
18											
19											
20											

River Section	January			February			March			April		1989-90 Total	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	Tags

01														
03/05														
04/06														
07														
10														
11													2	10
12													1	1
13													1	3
14														
15														
16														
17														
18														
19														
20										1	0.246		4	
Total estimated harvest													1	18



Appendix A. Continued.

TAG CODE - 10/29/27

RELEASE SITE - Shoup Bridge, Salmon R. NUMBER RELEASED - 9,200

River Section	September			October			November			December			1989-90 Total	
	No. Sample Est.		Harv.	No.	Est.									
	Tags	Rate		Tags	Rate		Tags	Rate		Tags	Rate		Tags	Harv.
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14								1	0.379	3			1	3
15								1	0.420	2			1	2
16								1	0.255	4			1	4
17														
18														
19														
20														
Total estimated harvest														9

Appendix A. Continued.

TAG CODE - 10/29/29		RELEASE SITE - Clearwater River								NUMBER RELEASED - 8,020	
		September		October		November		December			
		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.			
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate
---	01										
03/05								1	0.179	6	
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
		January		February		March		April		1989-90 Total	
		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Est.	
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
----	01										
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

67

Total estimated harvest





Appendix A. Continued.

TAG CODE - 10/29/33		RELEASE SITE - Clearwater River						NUMBER RELEASED - 19,050					
River Section	Tags	September			October			November			December		
		No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	
01				1	0.142	7					2	0.172	12
03/05					3	0.159	19	9	0.165	55	2	0.179	11
04/06													
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

River Section	Tags	January			February			March			April			1989-90 Total	
		No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.
01														3	19
03/05		14	0.199	70	3	0.146	21	1	<b>0.232</b>	4				32	180
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

Total estimated harvest

199



Appendix A. Continued.

TAG CODE - 10/29/39		RELEASE SITE - Sawtooth Hatchery				NUMBER RELEASED - 51,925								
River Section	September			October			November			December				
	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.		
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.		
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14							1	0.167		6				
15							1	0.255		4				
16														
17														
18														
19														
20														
River Section	January			February			March			April		1989-90 Total		
	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Est.
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14							1	0.379		3			2	9
15							3	0.420		7			4	11
16							1	0.255		4			1	4
17							1	0.098		10			1	10
18														
19														
20														
Total estimated harvest														34

Appendix A. Continued.

TAG CODE - 10/29/40

RELEASE SITE - Crooked River

NUMBER RELEASED - 26,125

River Section	September			October			November			December		
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	
---01												
03/05				3	0.159	19	10	0.165	61	4	0.179	22
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

73

River Section	January			February			March			April			1989-90 Total	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.
03/05	5	0.199	25	2	0.146	14	2	0.232	9	0	0.000	0	26	150
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

150

Appendix A. Continued.

TAG CODE - 10/29/41

RELEASE SITE - Crooked River

NUMBER RELEASED - 24,025

River Section	September				October				November				December									
	No. Tags	Sample Est.	Harv. Rate	Tags	No. Tags	Sample Est.	Harv. Rate	Tags	No. Tags	Sample Est.	Harv. Rate	Tags	Harv. Rate	Tags								
--01																						
03/05																						
04/06																						
07																						
10																						
11																						
12																						
13																						
14																						
15																						
16																						
17																						
18																						
19																						
20																						
					January				February				March				April		1989-90 Total			
					No. Tags	Sample Est.	Harv. Rate	Tags	No. Tags	Sample Est.	Harv. Rate	Tags	No. Tags	Sample Est.	Harv. Rate	Tags	No. Tags	Sample Est.	Harv. Rate	Tags	No. Tags	Harv. Rate
01																						
03/05	1	0.199		5													1	0.108		9	2	14
04/06																						
07																						
10																						
11																						
12																						
13																						
14																						
15																						
16																						
17																						
18																						
19																						
20																						
Total estimated harvest																						14

Appendix A. Continued.

TAG CODE - 10/29/48

RELEASE SITE - Sawtooth Hatchery

NUMBER RELEASED - 24,950

-----  
 September                      October                      November                      December  
 No. Sample Est.      No. Sample Est.      No. Sample Est.      No. Sample Est.  
 River Section Tags Rate Harv. Tags Rate Harv. Tags Rate Harv. Tags Rate Harv.

-----  
 ---01  
 03/05  
 04/06  
 07  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20

2 0.167    12

-----  
 January                      February                      March                      April                      1989-90 Total  
 No. Sample Est.      No. Sample Est.      No. Sample Est.      No. Sample Est.      No.      Est.  
 River Section Tags Rate Harv. Tags Rate Harv. Tags Rate Harv. Tags Rate Harv.      Tags Harv.

-----  
 ----01  
 03/05  
 04/06  
 07  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20

1    0.420    2

1 0.136    7      1      7

Total estimated harvest

21

75

Appendix A. Continued.

TAG CODE - 10/29/49

RELEASE SITE - East Fork Salmon River NUMBER RELEASED - 24,150

River Section	September			October			November			December				
	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.		
Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15				1	0.188	5								
16														
17														
18														
19														
20														

River Section	January			February			March			April			1989-90 Total	
	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Est.
Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15									3	0.420	7			4 12
16														
17														
18														
19														
20														

Total estimated harvest

12

Appendix A. Continued.

TAG CODE - 10/29/50		RELEASE SITE - Pahsimeroi Hatchery						NUMBER RELEASED - 25,200			
		September		October		November		December			
River Section		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.			
		Tags	Rate	Tags	Rate	Tags	Rate	Tags	Rate		
01											
03/05								1	0.179		
04/06									6		
07											
10											
11											
12											
13											
14						1	0.167		6		
15				4	0.188	21		2	0.255		
16											
17											
18											
19											
20											
River Section		January		February		March		April		1989-90 Total	
		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No.	Est.
		Tags	Rate	Tags	Rate	Tags	Rate	Tags	Rate	Tags	Harv.
01											
03/05											
04/06										1	6
07											
10											
11											
12											
13											
14										1	6
15				2	0.188	11		2	0.420	5	
16										10	45
17											
18											
19											
20											
Total estimated harvest											57

77

Appendix A. Continued.

TAG CODE - 10/29/52		RELEASE SITE - Panther Creek								NUMBER RELEASED - 40,750				
		September			October			November			December			
		No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.			
River Section	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.			
---	01													
	03/05													
	04/06													
	07													
	10													
	11							1	0.203	5				
	12													
	13													
	14							1	0.167	6				
	15													
	16													
	17													
	18													
	19													
	20													
		January			February			March			April		1989-90 Total	
		No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.		No.	Est.
River Section	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.
	01													
	03/05													
	04/06													
	07													
	10													
	11												1	5
	12													
	13													
	14												1	6
	15				1	0.188	5		2	0.420	5		3	10
	16													
	17													
	18													
	19													
	20													
	Total estimated harvest													21

Appendix A. Continued.

TAG CODE - 10/29/54

RELEASE SITE - Hells Canyon

NUMBER RELEASED - 39,950

River Section	September			October			November			December	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.
---	01										
	03/05										
	04/06										
	07										
	10										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										

79

River Section	January			February			March			April			1989-90 Total	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.
	01													
	<b>03/05</b>													
	<b>04/06</b>													
	<b>07</b>													
	10													
	11													
	12													
	13													
	14													
	15							1	0.420	2			1	2
	16													
	17													
	18													
	19													
	20													
	Total estimated harvest													2



Appendix A. Continued.

TAG CODE - 10/29/60

RELEASE SITE - Pahsimeroi Hatchery

NUMBER RELEASED - 9,625

River Section	September			October			November			December	
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.
--01											
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15				2	0.188	11	1	0.255	4		
16											
17											
18											
19											
20											

18

River Section	January			February			March			April		1989-90 Total	
	No. Tags	Sample Est.	Harv.										
01													
03/05													
04/06													
07													
10													
11													
12													
13													
14													
15				1	0.188	5						4	20
16													
17													
18													
19													
20													
Total estimated harvest												20	



Appendix A. Continued.

TAG CODE - 10/40/50		RELEASE SITE - Slate Creek								NUMBER RELEASED - 50,050	
		September				October		November	December		
		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.			
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
-----01											
	03/05										
	04/06										
	07										
	10			2	0.074	27					
	11						2	0.203	10		
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										
-----01											
		January		February		March		April		1989-90 Total	
		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No.	Est.
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
-----01											
	03/05										
	04/06										
	07									2	27
	10										
	11									2	10
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										

Total estimated harvest

37



Appendix A. Continued.

TAG CODE - 23/19/44		RELEASE SITE - Lower Granite Dam								NUMBER RELEASED - 3,829	
		September		October		November		December			
		No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.		
River Section		Tags	Rate	Tags	Rate	Tags	Rate	Tags	Rate	Harv.	
01											
03/05								1	0.179	6	
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
		January		February		March		April		1989-90 Total	
		No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No.	Est.
River Section		Tags	Rate	Tags	Rate	Tags	Rate	Tags	Rate	Tags	Harv.
01											
03/05		1	0.199	5		1	0.146	7		4	22
04/06											
07											
10											
11											
12											
13											
14											
15						1	0.420	2		1	2
16											
17											
18						1	0.087	11		1	11
19											
20											
Total estimated harvest										35	







Appendix A. Continued.

TAG CODE - 63/37/03		RELEASE SITE - Lyons Ferry Hatchery								NUMBER RELEASED - 25,355	
		September		October		November		December			
		No. Sample	Est.	No. Sample	Est.	No. Sample	Est.	No. Sample	Est.		
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.		
01										1	0 172 6
	03/05										
	04/06										
	07										
	10										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										
		January		February		March		April		1989-90 Total	
		No. Sample	Est.	No. Sample	Est.	No. Sample	Est.	No. Sample	Est.	No.	Est.
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01										1	6
	03/05										
	04/06										
	07										
	10										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										
Total estimated harvest										1	6

Appendix A. Continued.

TAG CODE - 63/38/40				RELEASE SITE - Grande Ronde River				NUMBER RELEASED - 19,986				
River Section	September			October			November			December		
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.
01							2	0.108	19	1	0.172	6
03/05				1	0.159	6						
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

River Section	January			February			March			April			1989-90 Total	
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01													3	25
03/05													1	6
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

96



Appendix A. Continued.

TAG CODE - 63/38/42		RELEASE SITE - Grande Ronde River				NUMBER RELEASED - 19,998					
		September		October		November		December			
No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.			
River Section	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.		
			-01	2	0.108	19	1	0.172	6		
03/05											
04/06											
07											
10		1	0.074	14							
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
		January		February		March		April		1989-90 Total	
No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No. Sample Est.		No.	Est.
River Section	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags Rate Harv.	Tags	Harv.
01										3	25
03/05											
04/06											
07											
10										1	14
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Total estimated harvest											39



Appendix A. Continued.

TAG CODE - 63/39/14		RELEASE SITE - Lyons Ferry Hatchery						NUMBER RELEASED - 25,281						
River Section	September			October			November			December				
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.			
Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.			
---	01													
03/05			2	0.159	13	1	0.165	6						
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
River Section	January			February			March			April		1989-90 Total		
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Est.
Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.	
01														
03/05													3	19
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest													3	19

Appendix A. Continued.

TAG CODE - 63/39/15		RELEASE SITE - Lyons Ferry Hatchery								NUMBER RELEASED - 25,308	
River Section	September			October			November			December	
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.
01											
03/05				2	0.159	13	1	0.165	6		
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

River Section	January			February			March			April		1989-90 Total	
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Tags	Harv.
03/05												3	19
04/06													
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

95

Total estimated harvest

Appendix A. Continued.

TAG CODE - 63/49/41                      RELEASE SITE - Tucannon River                      NUMBER RELEASED - 19,960

River Section	September			October			November			December		
	No. Sample Est.			<i>No.</i> Sample Est.			No. Sample Est.			No. Sample Est.		
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.
01												
03/05												
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

River Section	January			February			March			April			1989-90 Total		
	No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.			No.	Est.	
	Tags	Rate	Harv.	Tags	Harv.										
01															
03/05								1	0.232		4			1	4
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

Total estimated harvest

Appendix A. Continued.

TAG CODE - 63/49/44

RELEASE SITE - Tucannon River

NUMBER RELEASED - 20,000

River Section	September			October			November			December	
	Tags	Rate	Harv. Est.	Tags	Rate	Harv. Est.	Tags	Rate	Harv. Est.	Tags	Harv. Est.
01											
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

River Section	January			February			March			April		1989-90 Total		
	Tags	Rate	Harv. Est.	Tags	Rate	Harv. Est.	Tags	Rate	Harv. Est.	Tags	Rate	Harv. Est.	Tags	Harv. Est.
01	1	0.138	7										1	7
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

7

Appendix A. Continued.

TAG CODE - 63/49/49		RELEASE SITE - Touchet River								NUMBER RELEASED - 19,563			
River Section	September			October			November			December			
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Est.		
01				1	0.142	7							
03/05													
04/06													
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
River Section	January			February			March			April		1989-90 Total	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Est.	No. Tags	Est. Harv.
01												1	7
03/05													
04/06													
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
Total estimated harvest													7

Appendix A. Continued.

TAG CODE - 63/50/13

RELEASE SITE - Lyons Ferry Hatchery

NUMBER RELEASED - 24,947

River Section	September			October			November			December		
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Harv.	
--01												
03/05				1	0.165		6			1	0.179	6
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

66

River Section	January			February			March			April			1989-90 Total	
	No. Tags	Sample Est.	Harv.	No. Tags	Est. Harv.									
---01														
03/05													2	12
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

12



Appendix A. Continued.

TAG CODE - 63/50/16		RELEASE SITE - Lyons Ferry Hatchery								NUMBER RELEASED - 25,190					
		September			October			November			December				
		No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.				
River	Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.		
-	01										2	0.172	12		
	03/05				1	0.159	6								
	04/06														
	07														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
		January			February			March			April		1989-90 Total		
		No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.		No.	Est.	
River	Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
	01													2	12
	03/05													1	6
	04/06														
	07														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														

101

Total estimated harvest



Appendix A. Continued.

TAG CODE - 63/50/28

RELEASE SITE - Touchet River

NUMBER RELEASED - 19,952

River Section	September			October			November			December	
	No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.	
	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Harv.
01							1	0	108	9	
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

River Section	January			February			March			April		1989-90 Total		
	No. Sample Est.			No. Sample Est.			No. Sample Est.			No. Sample Est.		No.	Est.	
	Tags	Rate	Harv.	Tags	Harv.									
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

9

Appendix B. Steelhead groups returning to the Salmon River, 1989-90.

Strain	Acre	No. of Fish	Release Site	Hatchery Rearing	Marks
A	I	51,919	Sawtooth	HNFH <sup>1</sup>	CWT 10/29/39
A	I	1,143,826	Sawtooth	HNFH	None
A	I	176,000	Yankee Fork	MVSH <sup>2</sup>	None
A	I	630,800	Pahsimeroi	NSPR <sup>3</sup>	None
A	I	35,000	Pahsimeroi	NSPR	CWT 10/29/55
A	I	28,700	Shoup Bridge	NSPR	CWT 10/28/19
A	I	65,600	Shoup Bridge	NSPR	None
A	I	9,200	Shoup Bridge	NSPR	CWT 10/29/27
A	I	147,500	Shoup Bridge	MVSH	None
A	I	253,100	North Fork	MVSH	None
A	I	102,800	Panther Creek	NSPR	None
A	I	162,800	Panther Creek	MVSH	None
A	I	100,000	French Creek	MVSH	None
A	I	87,200	Hammer Creek	MVSH	None
A	I	649,000	Little Salmon R.	MVSH	None
A	I	52,300	Little Salmon R.	MVSH	CWT 10/40/49
A	I	667	Slate Creek	HNFH	None
A	I	50,055	Slate Creek	HNFH	CWT 10/40/50
A	I	346,100	Slate Creek	MVSH	None
Total		4,092,567			
A	II	248,875	Little Salmon R.	HNFH	None
A	II	50,250	Little Salmon R.	HNFH	CWT 10/29/25
A	II	13,801	Deer Creek	HNFH	None
A	II	662,700	Sawtooth	HNFH	None

APPB

Appendix B. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
A	II	24,950	Sawtooth	HNFH	CWT 10/29/48
A	II	677,375	Pahsimeroi	NSPR	None
A	II	25,200	Pahsimeroi	NSPR	CWT 10/29/50
A	II	9,625	Pahsimeroi	NSPR	CWT 10/29/60
A	II	40,750	Panther Creek	NSPR	CWT 10/29/52
A	II	258,950	Panther Creek	NSPR	None
	Total	2,012,476			
B	I	251,832	East Fork	HNFH	None
B	I	51,732	East Fork	HNFH	CWT 10/29/38
	Total	303,564			
B	II	40,500	Slate Creek	HNFH	CWT 10/29/26
B	II	9,250	Slate Creek	HNFH	None
B	II	24,150	East Fork	HNFH	CWT 10/29/49
B	II	460,950	East Fork	HNFH	None
	Total	534,850			
B	III	25,325	East Fork	HNFH	CWT 10/28/20
B	III	499,991	East Fork	HNFH	None
	Total	525,316			

<sup>1</sup> HNFH = Hagerman National Fish Hatchery.

<sup>2</sup> MVSH = Magic Valley Steelhead Hatchery.

<sup>3</sup> NSPR = Niagara Springs Fish Hatchery.

Appendix C. Steelhead groups returning to the Clearwater River, 1989-90.

Strain	Aqe	No. of Fish	Release Site	Hatchery Rearing	Marks
B	I	1,210,73	North Fork	DNFH <sup>1</sup>	None
B	I	15,425	North Fork	DNFH	CWT 05/17/11
B	I	15,550	North Fork	DNFH	CWT 05/17/12
B	I	15,425	North Fork	DNFH	CWT 05/17/13
B	I	12,950	North Fork	DNFH	CWT 05/17/14
B	I	12,900	North Fork	DNFH	CWT 05/17/39
B	I	14,325	North Fork	DNFH	CWT 05/18/46
B	I	16,600	North Fork	DNFH	CWT 05/18/49
B	I	19,800	North Fork	DNFH	CWT 05/18/50
B	I	19,875	North Fork	DNFH	CWT 05/18/51
B	I	19,850	North Fork	DNFH	CWT 05/18/52
B	I	18,850	North Fork	DNFH	CWT 05/18/53
B	I	21,050	North Fork	DNFH	CWT 05/18/54
B	I	8,150	North Fork	DNFH	CWT 10/29/28
B	I	8,025	North Fork	DNFH	CWT 10/29/29
B	I	56,885	American River	DNFH	None
B	I	201,325	Crooked River	DNFH	None
B	I	190,708	Newsome Creek	DNFH	None
B	I	165,055	South Fork	DNFH	None
B	I	254,898	Clear Creek	DNFH	None
B	I	200,425	Lolo Creek	DNFH	None
B	I	200,806	Eldorado Creek	DNFH	None
Total		2,699,61			
B	II	41,527	American River	DNFH	None
B	II	21,025	Clear Creek	DNFH	CWT 05/18/34
B	II	19,425	Clear Creek	DNFH	CWT 05/18/35
B	II	116,100	Clear Creek	DNFH	None
B	II	19,675	Clearwater River	DNFH	CWT 05/18/36

APPC

Appendix C. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
B	II	18,825	Clearwater River	DNFH	CWT 10/29/31
B	II	20,625	Clearwater River	DNFH	CWT 10/29/32
B	II	19,050	Clearwater River	DNFH	CWT 10/29/33
B	II	1,128,425	Clearwater River	DNFH	None
B	II	26,125	Crooked River	DNFH	CWT 10/29/40
B	II	24,025	Crooked River	DNFH	CWT 10/29/41
B	II	150,025	Crooked River	DNFH	None
B	II	202,857	Newsome Creek	DNFH	None
B	II	298,070	South Fork	DNFH	None
	Total	2,105,779			
B	III	165,483	Clear Creek	DNFH	None
B	III	24,275	Clearwater River	DNFH	CWT 05/17/53
B	III	24,000	Clearwater River	DNFH	CWT 05/17/54
B	III	23,350	Clearwater River	DNFH	CWT 10/28/56
B	III	1,178,071	Clearwater River	DNFH	None
B	III	204,662	Eldorado Creek	DNFH	None
B	III	49,675	South Fork	DNFH	CWT 05/17/29
B	III	1,306,516	South Fork	DNFH	None
	Total	2,976,032			

DNFH = Dworshak National Fish Hatchery.

Appendix D. Miscellaneous coded wire tag steelhead groups that were recovered by Idaho anglers in 1989-90.

Strain	Age	No. of Fish	Release Site	Agency	Marks
A	I	26,986	Wallowa Hatchery	ODFW <sup>1</sup>	CWT 07/40/27
A	I	27,442	Wallowa Hatchery	ODFW	CWT 07/40/28
A	I	27,110	Wallowa Hatchery	ODFW	CWT 07/40/29
A	I	25,436	Wallowa Hatchery	ODFW	CWT 07/40/31
A	I	25,425	Wallowa Hatchery	ODFW	CWT 07/40/32
A	I	27,545	Little Sheep Creek	ODFW	CWT 07/40/34
A	I	19,960	Tucannon River	WDW <sup>2</sup>	CWT 63/49/41
A	I	20,000	Tucannon River	WDW	CWT 63/49/44
A	I	19,563	Touchet River	WDW	CWT 63/49/49
A	I	24,947	Lyons Ferry Hatchery	WDW	CWT 63/50/13
A	I	25,162	Lyons Ferry Hatchery	WDW	CWT 63/50/14
A	I	25,190	Lyons Ferry Hatchery	WDW	CWT 63/50/16
A	I	24,797	Lyons Ferry Hatchery	WDW	CWT 63/50/19
A	I	19,952	Lyons Ferry Hatchery	WDW	CWT 63/50/28
A	II	25,374	Wallowa Hatchery	ODFW	CWT 07/40/25
A	II	26,136	Wallowa Hatchery	ODFW	CWT 07/40/26
A	II	46,571	Wallowa Hatchery	ODFW	CWT 07/41/25
A	II	50,019	Wallowa Hatchery	ODFW	CWT 07/41/26
A	II	50,385	Wallowa Hatchery	ODFW	CWT 07/41/28
A	II	39,950	Hells Canyon	IDFG <sup>3</sup>	CWT 10/29/54
A	II	25,355	Lyons Ferry Hatchery	WDW	CWT 63/37/03
A	II	19,986	Grande Ronde River	WDW	CWT 63/38/40
A	II	19,882	Grande Ronde River	WDW	CWT 63/38/41

APPD

Appendix D. Continued.

Strain	Age	No. of Fish	Release Site	Agency	Marks
A	II	19,998	Grande Ronde River	WDW	CWT 63/38/42
A	II	25,348	Lyons Ferry Hatchery	WDW	CWT 63/39/13
A	II	25,281	Lyons Ferry Hatchery	WDW	CWT 63/39/14
A	II	25,308	Lyons Ferry Hatchery	WDW	CWT 63/39/15
B	II	3,869	Lower Granite Dam	NMFS <sup>4</sup>	CWT 23/19/43
B	II	3,829	Lower Granite Dam	NMFS	CWT 23/19/44
B	II	4,168	Lower Granite Dam	NMFS	CWT 23/19/45
B	II	4,298	Lower Granite Dam	NMFS	CWT 23/19/47
B	II	4,275	Lower Granite Dam	NMFS	CWT 23/19/48

<sup>1</sup>ODFW = Oregon Department of Fish and Wildlife.

<sup>2</sup>WDW = Washington Department of Wildlife.

<sup>3</sup>IDFG = Idaho Department of Fish and Game. <sup>4</sup>

<sup>4</sup>NMFS = National Marine Fisheries Service.

Appendix E. Spring chinook salmon groups returning to the Clearwater River, 1990.

Acre	No. of Fish	Release Site	Hatchery Rearing	Marks
3+	199,690	Crooked River	DNFH <sup>1</sup>	None
3+	209,950	Eldorado Creek	KNFH <sup>2</sup>	None
3+	384,235	Clear Creek	KNFH	None
3+	63,555	Clearwater River	DNFH	CWT 05/40/13
3+	66,380	Clearwater River	DNFH	CWT 05/40/14
3+	66,947	Clearwater River	DNFH	CWT 05/40/15
3+	61,613	N. Fork Clearwater R.	DNFH	CWT 05/40/16
3+	66,107	N. Fork Clearwater R.	DNFH	CWT 05/40/17
3+	67,946	N. Fork Clearwater R.	DNFH	CWT 05/40/18
3+	1,066,834	N. Fork Clearwater R.	DNFH	None
3+	54,371	Red River	Red R. <sup>3</sup>	CWT 10/40/02
3+	236,825	Red River	Red R.	None
3+	137,929	Powell	DNFH	None
3+	21,609	Powell	DNFH	CWT 05/19/42
3+	21,148	Powell	DNFH	CWT 05/19/43
3+	19,953	Powell	DNFH	CWT 05/19/44
3+	102,660	Powell	KNFH	None
Subtotal	2,847,756			
4+	63,775	N. Fork Clearwater R.	DNFH	CWT 05/40/10
4+	63,975	N. Fork Clearwater R.	DNFH	CWT 05/40/11
4+	64,075	N. Fork Clearwater R.	DNFH	CWT 05/40/12
4+	62,700	N. Fork Clearwater R.	DNFH	CWT 10/40/52
4+	62,175	N. Fork Clearwater R.	DNFH	CWT 10/40/53
4+	62,825	N. Fork Clearwater R.	DNFH	CWT 10/40/54
4+	62,350	N. Fork Clearwater R.	DNFH	CWT 10/40/55
4+	60,950	N. Fork Clearwater R.	DNFH	CWT 10/40/56
4+	64,025	N. Fork Clearwater R.	DNFH	CWT 10/40/57

APPE

Appendix E. Continued.

Age	No. of Fish	Release Site	Hatchery Rearing	Marks
4+	979,989	N. Fork Clearwater R.	DNFH	None
4+	46,100	Red River	Red R.	CWT 10/40/01
4+	187,000	Red River	Red R.	None
4+	778,407	Clear Creek	KNFH	None
4+	200,105	Powell	DNFH	None
Subtotal	2,758,676			
5+	9,625	Powell	Sawtooth <sup>4</sup>	CWT 10/29/61
5+	39,700	Powell	Sawtooth	CWT 10/29/56
5+	643,995	Powell	Sawtooth	None
5+	53,675	N. Fork Clearwater R.	DNFH	CWT 05/17/51
5+	30,125	N. Fork Clearwater R.	DNFH	CWT 10/28/13
5+	31,975	N. Fork Clearwater R.	DNFH	CWT 10/28/14
5+	9,800	N. Fork Clearwater R.	DNFH	CWT 10/29/30
5+	53,850	N. Fork Clearwater R.	DNFH	CWT 10/29/34
5+	49,750	N. Fork Clearwater R.	DNFH	CWT 10/29/36
5+	10,725	N. Fork Clearwater R.	DNFH	CWT 10/29/43
5+	1,470,817	N. Fork Clearwater R.	DNFH	None
5+	30,100	Red River	Sawtooth	CWT 10/29/57
5+	19,200	Red River	Sawtooth	CWT 10/29/62
5+	145,900	Red River	Sawtooth	None
5+	763,900	Clear Creek	KNFH	None
5+	778,800	Crooked River	Sawtooth	None
Subtotal	4,142,112			

<sup>1</sup>DNFH = Dworshak National Fish Hatchery.

<sup>2</sup>KNFH = Kooskia National Fish Hatchery.

<sup>3</sup>Red R. = Red River Rearing Pond.

<sup>4</sup>Sawtooth = Sawtooth Fish Hatchery.

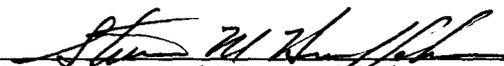
Submitted by:

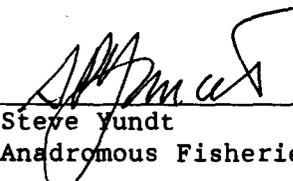
Kent Ball  
Senior Fisheries Research Biologist

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

  
\_\_\_\_\_  
Jerry M. Conley, Director

  
\_\_\_\_\_  
Steven M. Huffaker, Chief  
Bureau of Fisheries

  
\_\_\_\_\_  
Steve Yundt  
Anadromous Fisheries Coordinator