

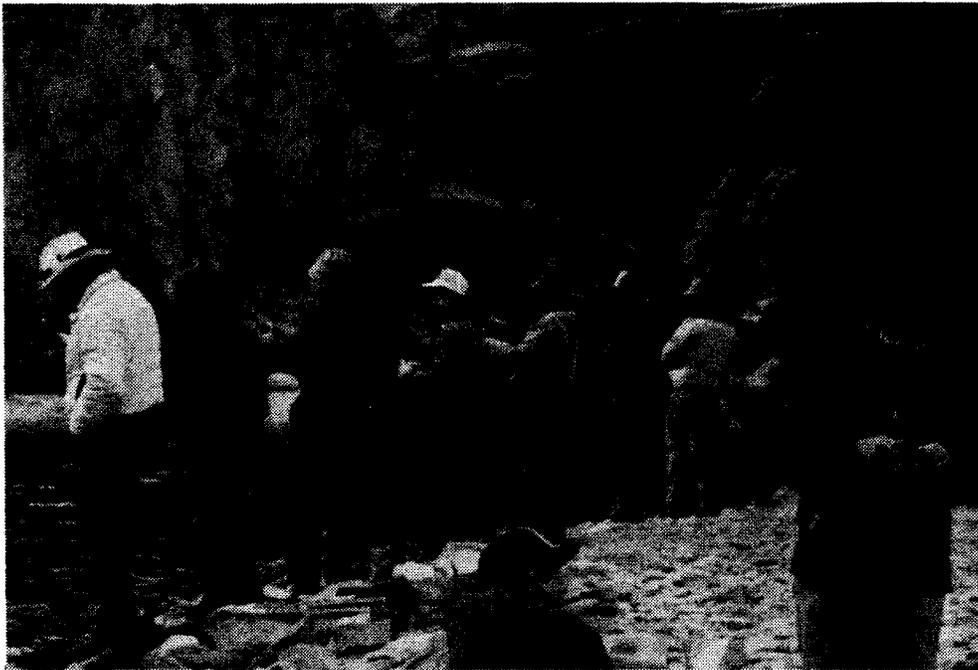
FISHERY RESEARCH



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. 14-16-001-87501 (RWG)

Period Covered: October 1, 1986 to December 1987



By  
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December 1989

## TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT .....	1
INTRODUCTION .....	2
OBJECTIVES .....	3
RECOMMENDATIONS .....	3
DESCRIPTION OF STUDY AREA .....	6
METHODS .....	6
Creel Survey .....	6
Interview Schedule .....	7
Salmon River .....	7
Data Analysis .....	8
RESULTS .....	8
DISCUSSION .....	31
Harvest of Sawtooth Hatchery Releases .....	31
Harvest of East Fork Salmon River Releases .....	32
Harvest of Little Salmon River Releases .....	32
Sources of Error .....	33
Straying .....	34
ACKNOWLEDGMENTS .....	35
LITERATURE CITED .....	36
APPENDICES .....	37

## LIST OF TABLES

	<u>Page</u>
Table 1. River location codes for Idaho's anadromous fisheries .....	4
Table 2. Steelhead fishery interview data (unexpanded) from lower Snake River ( 0 1 ) , September 1986 - March 1987 .....	9
Table 3. Steelhead fishery interview data (unexpanded) from lower Clearwater River (03) and North Fork (05), October 1986 - April 1987 .....	10

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT .....	1
INTRODUCTION .....	2
OBJECTIVES .....	3
RECOMMENDATIONS .....	3
DESCRIPTION OF STUDY AREA .....	6
METHODS .....	6
Creel Survey .....	6
Interview Schedule .....	7
Salmon River .....	7
Data Analysis .....	8
RESULTS .....	8
DISCUSSION .....	31
Harvest of Sawtooth Hatchery Releases .....	31
Harvest of East Fork Salmon River Releases .....	32
Harvest of Little Salmon River Releases .....	32
Sources of Error .....	33
Straying .....	34
ACKNOWLEDGMENTS .....	35
LITERATURE CITED .....	36
APPENDICES .....	37

LIST OF TABLES

	<u>Page</u>
Table 1. River location codes for Idaho's anadromous fisheries .....	4
Table 2. Steelhead fishery interview data (unexpanded) from lower Snake River ( 0 1 ) , September 1986 - March 1987.....	9
Table 3. Steelhead fishery interview data (unexpanded) from lower Clearwater River (03) and North Fork (05), October 1986 - April 1987.....	10

**LIST OF TABLES (Cont.)**

	<u>Page</u>
Table 4. Steelhead fishery interview data (unexpanded) from upper Clearwater River (04) and Middle Fork (06), October 1986 - April 1987 .....	13
Table 5. Steelhead fishery interview data (unexpanded) from South Fork Clearwater River ( 0 7 ) , February - April 1987 .....	14
Table 6. Steelhead fishery interview data (unexpanded) from Salmon River Section 10, September 1986 - February 1987 .....	15
Table 7. Steelhead fishery interview data (unexpanded) from Salmon River Section 1 1 , September 1986 - March 1987 .....	16
Table 8. Steelhead fishery interview data (unexpanded) from Salmon River Section 1 2 , September 1986 - March 1987 .....	17
Table 9. Steelhead fishery interview data (unexpanded) from Salmon River Section 1 3 , September 1986 - March 1987 .....	18
Table 10. Steelhead fishery interview data (unexpanded) from Salmon River Section 1 4 , September 1986 - March 1987 .....	19
Table 11. Steelhead fishery interview data (unexpanded) from Salmon River Section 1 5 , September 1986 - April 1987 .....	20
Table 12. Steelhead fishery interview data (unexpanded) from Salmon River Section 1 6 , September 1986 - April 1987 .....	21
Table 13. Steelhead fishery interview data (unexpanded) from Salmon River Section 17, October 1986 - April 1987 .....	22
Table 14. Steelhead fishery interview data (unexpanded) from Salmon River Section 18, February - April 1987 .....	23
Table 15. Steelhead fishery interview data (unexpanded) from Salmon River Section 19, March - April 1987 .....	24
Table 16. Steelhead fishery interview data (unexpanded) from Salmon River Section 20, February - April 1987 .....	25
Table 17. Proportion of estimated harvest by river section that was examined for marks .....	26

## LIST OF TABLES (Cont.)

	<u>Page</u>
Table 18. Estimated number of hatchery steelhead harvested in the lower Snake, Clearwater, and Salmon rivers during the 1986-87 seasons .....	28
Table 19. Summary of 1986-87 harvest estimates and hatchery returns of steelhead produced by LSRCP hatcheries .....	29

## LIST OF FIGURES

Figure 1. Map of the steelhead harvest area and River location codes in Idaho .....	5
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## APPENDICES

Appendix A. Coded wire tag recoveries and fin clips identified September 1986 - April 1987; harvest estimate by month and river section; and total harvest estimates for the 1986-87 season. (Unidentified tag codes are for steelhead tagged outside Idaho and harvested in Idaho, e.g. NMFS, and Washington.) .....	38
Appendix B. Steelhead groups returning to the Salmon River, 1986-87 .....	79
Appendix C. Steelhead groups returning to the Clearwater River, 1986-87 .....	82

## ABSTRACT

Steelhead trout Oncorhynchus mykiss fisheries in Idaho are monitored to assess hatchery steelhead harvest contribution, distribution, and return rates. Coded wire tags are retrieved from steelhead harvested by anglers, and harvest estimates are made by month and river section.

During the fall of 1986 and spring of 1987 seasons, 39,436 steelhead anglers were interviewed and their catch examined. We inspected 16.7% (7,764 fish) of the total estimated harvest and retrieved 380 coded wire tags from 41 tag groups. The total estimated harvest for the 1986-87 season was 45,698 hatchery fish and 230 wild fish. The total estimated harvest of steelhead reared by the Lower Snake River Compensation Plan (LSRCP) was 13,999 fish, and an additional 2,967 returned to hatcheries and other release sites. In the Salmon River, LSRCP fish supported 48% of the harvest.

Adult harvest rates for LSRCP-raised steelhead released in the Salmon River headwaters were 85.5% for A-strain, and 80.6% for B-strain fish. Adult returns to Idaho of A-strain steelhead raised in LSRCP hatcheries have returned as high as 2.54% of the number released.

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## INTRODUCTION

Chinook salmon Oncorhynchus tshawytscha and steelhead trout O. mykiss are being raised in Idaho hatcheries to mitigate for losses caused by the construction of hydroelectric dams. Adults returning to hatcheries are commingled with each other and with wild stocks. In the Snake River, fish destined for Idaho are also commingled 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 a cursory measure of performance of LSRCP fish. No harvest was allowed on chinook salmon, so this report pertains only to steelhead.

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 have had the adipose fin excised before release. Adults returning can then be identified to be of hatchery origin and selectively harvested.

From 1983 through the spring of 1985, differential harvest of Salmon River steelhead was based on dorsal fin height. In 1985-86, hatchery steelhead with dorsal fins less than 2 1/4 inches in height, or with adipose fin clips, could be legally possessed. In the Snake River, dorsal fin height of two inches was used to differentiate hatchery steelhead until 1985-86 when adipose fin clips were legal. No differential harvest regulations were in effect in the Clearwater River drainage in 1985-86 (Ball 1988).

In the fall of 1986 and spring of 1987 seasons, "only steelhead which have been marked by clipping the adipose fin, as evidenced by a HEALED scar, may be reduced to possession in the Snake, Clearwater, and Salmon River drainages." On the Snake River, steelhead without adipose fin clips, but with dorsal fins less than two inches in height, were also legal. Therefore, in 1986-87, all adult hatchery steelhead returning to Idaho were adipose fin clipped; except fish returning after three ocean-years. Only about 4% of the hatchery steelhead returning to the Clearwater drainage spend three years in the ocean, and these fish were not legal harvest. An insignificant number of three-ocean-year hatchery steelhead returned to the Salmon River.

The consumptive season opened August 30 on the Snake and Salmon rivers, and October 15 on the Clearwater River. Bag limits were 3 per day, 9 in possession, and 20 per season for the Snake and Salmon rivers in the fall and in the spring season. Bag limits for the Clearwater River were 2 per day, 4 in possession, and 10 for the fall season and 3, 9, and 20 for the spring season. The Clearwater River was also open to catch-and-release fishing from August 30 through October 14.

Fall seasons end December 31, and spring seasons begin January 1, so there is no time gap between seasons. Bag limits, season length, and special regulations are adjusted for the spring season to achieve management goals. Water conditions during the spring season are a major factor in the location and number of fish harvested.

The spring season on the Snake and Clearwater rivers closed April 30. On the Salmon River, the spring season closed from the mouth up to Long Tom Creek, near the Middle Fork Salmon River, on March 31, and from there upstream to Redfish Lake Creek on April 30.

The Little Salmon River was open from the mouth up to the Highway 95 bridge, near Smokey Boulder Road, from January 1 through April 30. Limits were the same as the Salmon River.

Representative groups of marked steelhead are included in each major release group. Mark groups are representative in size and time of release and, if possible, in fish health. Coded wire tags are implanted in the snout of the fish, and the left ventral fin is clipped prior to release to allow identification of the fish with coded wire tags. Anglers are interviewed in all major harvest areas to recover these tags from the fishery. Information is collected on timing, straying, exploitation, harvest distribution, and relative abundance for wild and hatchery stocks. Total harvested numbers are generated by a statewide telephone harvest survey, and the composition of the harvest is derived from tag recoveries.

#### **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.

#### **RECOMMENDATIONS**

Initiate a program to estimate the harvest of steelhead released in Idaho that are harvested in downstream fisheries.

Increase the intensity of survey efforts on the lower Snake River to two days each week, in conjunction with Washington Department of Wildlife, to improve documentation of LSRCP fish released in the Tucannon River, and from Lyons Ferry Hatchery.

Release 5,000 Passive Integrated Transponders (PIT) from each hatchery site and in one off-site release area to determine how many steelhead return to the project area.

Table 1. 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
Salmon 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

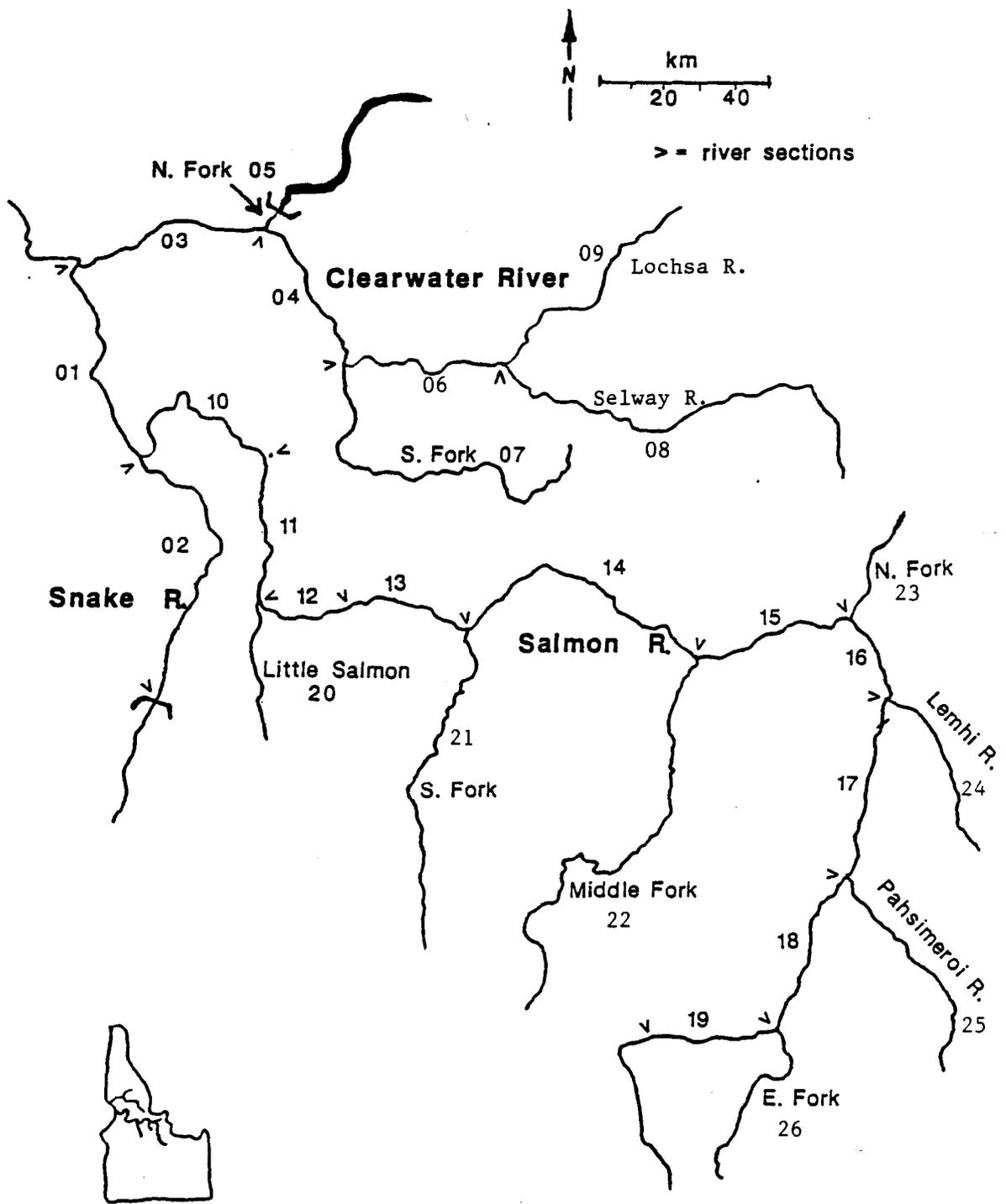


Figure 1. Map of the steelhead harvest area and River Location Codes in Idaho.

Develop a manual for separating age classes of both A-strain and B-strain steelhead in the fishery and in hatchery returns.

Install an adult *counting* weir on the Little Salmon River or Slate Creek to evaluate adult returns and *spawning* escapement.

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

## DESCRIPTION OF STUDY AREA

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

## METHODS

### Creel Survey

Angler interviews were conducted at check stations and from jet boats and roving vehicles. Techniques were tailored to sportsman access and harvest methods, which vary considerably in Idaho. 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 try to sample anglers on the water. Therefore, survey efforts are divided between major boat launch sites. 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 at check stations, from jet boats, and by roving creel clerks.

During angler interviews, data is collected on: number of 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. Each fish observed is inspected for tags and fin clips. Snouts are removed from any fish with an abnormality of the left ventral fin 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, six weekends during the fall and five weekends during the spring season.

Lower Clearwater River and North Fork (03 and 05) - by roving vehicle 2 days each week and by jet boat 2 days each week, for 15 weeks in the fall and 10 weeks in the spring season. Interview from boat ramps for the last six weeks of the spring season.

Upper Clearwater River and South Fork Clearwater River (04 and 07) - by roving vehicle on the Upper Clearwater in the fall and on both rivers in the spring, for two weekends and two weekdays 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 - interview by roving vehicle ten weekends in the fall and eight weekends in the spring season.

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

Section 13 - by jet boat between Vinegar Creek and the South Fork, on six weekends in the fall and five weekends in the spring.

Section 14 - by jet boat for six weekends in the fall and five weekends in the spring season.

Section 15 - by a check station at 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.

## Data Analysis

Harvest estimates for each river section are obtained from Federal Aid in Fish Restoration projects (McArthur 1988, 1989).

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.

Hatchery-wild proportions are reported for fish kept and for total catch, including released fish when their origin could be assessed by anglers. 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 numbers of hatchery fish reported are the summation of monthly statistics. Hatchery fish harvest estimates for months when harvest was minimal, and there were no fish checked, were calculated by using the percent hatchery calculation from the last month that data was available. These estimates were applied during winter, when fish movement is minimal and the proportion of hatchery fish should be constant. Harvest estimates of fish marked with coded wire tags, were calculated by dividing the number of tags recovered by the sampling rate, expressed as a decimal, and then rounded to whole numbers.

Harvest estimates for unmarked groups were made from representative mark groups or companion groups. Hatchery returns were classified by strain (A or B) and ocean-age, using lengths of previous known-age coded wire tag returns. Marked returns to hatchery racks were subtracted from total returns by strain and ocean-age. Performance of unmarked rack returns was assumed to apply to the total harvest of those unmarked groups. Where more than one unmarked group was returning to a release site, the estimates of harvest and hatchery return were calculated on the total of the unmarked fish, and assumed to apply equally to each group. No estimated returns were attempted for the unmarked groups returning to Allison Creek or Slate Creek.

Exploitation rates are the estimated numbers of fish harvested, divided by the sum of the harvest numbers and the number of fish that returned to the hatchery.

## **RESULTS**

During the fall of 1986 and spring of 1987 seasons, 39,436 anglers were contacted (Tables 2-16). Of the 8,728 harvested fish recorded during our interviews, we physically examined 7,764 fish for marks, and removed snouts from marked fish for retrieval of coded wire tags. The proportion of the total fall and spring harvest estimates, reported by McArthur (1988, 1989), that we inspected was 16.7% (Table 17).

Table 2. Steelhead fishery interview data (unexpanded) from lower Snake River (01), September 1986 - March 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
September	244	553	11	0	0	3	14	40	79
October	1,160	4,082	110	2	12	115	239	17	51
November	1,049	4,113	118	1	4	147	270	15	45
December	237	938	36	0	0	16	52	18	69
Fall subtotal	2,690	9,686	275	3	16	281	575		
Average								17	51
January	328	957	27	1	0	33	61	16	44
February	164	469	8	1	0	14	23	20	35
March	15	47	2	0	0	6	8	6	25
Spring subtotal	507	1,473	37	2	0	53	92		
Average								16	40
Total	3,197	11,159	312	5	16	334	667		
Average								17	49

Table 3. Steelhead fishery interview data (unexpanded) from lower Clearwater River (03) and North Fork (05), October 1986 - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
October 11-31									
Boat	1,597	6,449	166	4	9	87	266	24	66
Shore	318	834	8	0	0	6	14	60	57
Total	1,915	7,283	174	4	9	93	280		
Average								26	65
November									
Boat	2,263	9,302	384	3	7	92	486	19	80
Shore	459	1,240	30	0	5	18	53	23	66
Total	2,722	10,542	414	3	12	110	539		
Average								20	79
December									
Boat	1,509	6,361	344	0	25	134	503	13	73
Shore	384	1,464	40	0	5	8	53	28	85
Total	1,893	7,825	384	0	30	142	556		
Average								14	74
Fall subtotal	6,530	25,650	972	7	51	345	1,375		
Average								19	74

10

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Table 3. (continued)

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
January									
Boat	529	2,159	68	0	4	16	88	25	82
Shore	492	1,707	89	0	7	12	108	16	89
Total	1,021	3,866	157	0	11	28	196		
Average								20	86
February									
Boat	141	755	45	0	0	12	57	13	79
Shore	683	3,660	229	4	7	21	261	14	90
Total	824	4,415	274	4	7	33	318		
Average								14	88
March									
Boat	389	2,195	72	0	5	16	93	24	83
Shore	1,294	7,387	327	8	47	70	452	16	83
Total	1,683	9,582	399	8	52	86	545		
Average								18	83

11

Table 3. (continued)

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
April									
Boat	70	402	60	0	0	7	67	6	90
Shore	315	1,543	211	2	9	15	237	7	93
Total	385	1,945	271	2	9	22	304		
Average								6	92
Spring subtotal	3,913	19,808	1,101	14	79	169	1,363		
Average								15	87
Total	10,443	45,458	2,073	21	130	514	2,738		
Average								17	80

12

Table 4. Steelhead fishery interview data (unexpanded) from upper Clearwater River (04) and Middle Fork (06),  
October 1986 - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
October	312	937	40	0	3	19	62	15	69
November	529	1,720	79	0	7	23	109	16	79
December	138	584	30	0	5	6	41	14	85
Fall subtotal	979	3,241	149	0	15	48	212		
Average								15	77
February	634	2,048	110	0	14	23	147	14	84
March	1,108	3,960	206	0	39	41	286	14	86
April	75	282	6	0	0	3	9	31	67
Spring subtotal	1,817	6,290	322	0	53	67	442		
Average								14	85
Total	2,796	9,531	471	0	68	115	654		
Average								15	82

13

Table 5. Steelhead fishery interview data (unexpanded) from South Fork Clearwater River (07), February - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
February	73	151	12	0	0	3	15	10	80
March	646	2,068	109	0	8	6	123	17	95
April	780	4,053	264	0	47	48	359	11	87
Spring total	1,499	6,272	385	0	55	57	497		
Average								13	89

Table 6. Steelhead fishery interview data (unexpanded) from Salmon River section 10, September 1986 - February 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
September	29	101	3	0	0	0	3	34	100
October	499	2,627	77	0	1	70	148	18	53
November	150	639	38	0	1	38	77	8	51
Fall subtotal	678	3,367	118	0	2	108	228		
Average								15	53
February	13	42	2	0	4	2	8	5	75
Spring subtotal	13	42	2	0	4	2	8		
Average								5	75
Total	691	3,409	120	0	6	110	236		
Average								14	53

15

Table 7. Steelhead fishery interview data (unexpanded) from Salmon River section 11, September 1986 - March 1987.

Dates	No. anglers	Total hours fished	<u>Steelhead</u>				Total	Hours/ fish	Percent hatchery (total catch)
			<u>kept</u>	<u>released</u>	Hatchery	Wild			
September	47	210	1	0	0	0	11	210	100
October	330	1,240	20	0	0	9	29	43	68
November	165	621	29	0	0	9	38	16	76
Fall subtotal	542	2,071	50	0	0	18	68		
Average								30	74
February	188	454	8	0	0	1	9	50	89
March	77	257	5	1	0	6	12	21	42
Spring subtotal	265	711	13	1	0	7	21		
Average								34	62
Total	807	2,782	63	1	0	25	89		
Average								31	71

91

Table 8. Steelhead fishery interview data (unexpanded) from Salmon River section 12, September 1986 - March 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
September	86	347	8	0	0	2	10	33	70
October	867	5,771	137	0	9	61	207	28	71
November	745	5,023	147	0	10	42	199	25	79
Fall subtotal	1,698	11,141	292	0	19	105	416		
Average								27	75
February	251	920	27	0	0	13	40	23	68
March	472	2,058	15	1	3	6	25	82	72
Spring subtotal	723	2,978	42	1	3	19	65		
Average								46	69
Total	2,421	14,119	334	1	22	124	481		
Average								29	74

17

Table 9. Steelhead fishery interview data (unexpanded) from Salmon River section 13, September 1986 - March 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
September	27	112	0	0	0	1	1	112	0
October	421	2,862	72	0	4	54	130	22	58
November	332	2,758	97	0	0	49	146	19	66
Fall subtotal	780	5,732	169	0	4	104	277		
Average								21	62
March	252	864	10	0	1	42	53	16	21
Spring subtotal	252	864	10	0	1	42	53		
Average								16	21
Total	1,032	6,596	179	0	5	146	330		
Average								20	56

18

Table 10. Steelhead fishery interview data (unexpanded) from Salmon River section 14, September 1986 - March 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
September	80	807	7	0	0	6	13	62	54
October	827	7,743	211	0	9	150	370	21	59
November	566	5,553	391	0	33	120	544	10	78
Fall subtotal	1,473	14,103	609	0	42	276	927		
Average								15	70
February	190	1,902	200	0	28	91	319	6	71
March	380	4,536	147	0	23	215	385	12	44
Spring subtotal	570	6,438	347	0	51	306	658		
Average								9	57
Total	2,043	20,541	956	0	93	582	1,631		
Average								13	64

19

Table 11. Steelhead fishery interview data (unexpanded) from Salmon River section 15, September 1986 - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
September	271	1,987	35	1	1	10	47	42	77
October	2,090	21,397	709	3	63	163	938	23	82
November	1,838	22,960	1,070	0	101	220	1,391	17	84
Fall subtotal	4,199	46,344	1,814	4	165	393	2,376		
Average								20	83
February	632	3,929	164	1	15	45	225	17	80
March	2,031	19,450	630	1	112	134	877	22	85
April	37	246	0	0	0	0	0	0	0
Spring subtotal	2,700	23,625	794	2	127	179	1,102		
Average								21	84
Total	6,899	69,969	2,608	6	292	572	3,478		
Average								20	83

20

Table 12. Steelhead fishery interview data (unexpanded) from Salmon River section 16, September 1986 - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept			Steelhead released		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild				
September	2	6	1	0	0	0	1	6	100	
October	580	2,594	146	1	1	26	174	15	84	
November	327	1,254	72	0	2	10	84	15	88	
Fall subtotal	909	3,854	219	1	3	36	259			
Average								15	86	
February	282	1,183	36	0	0	10	46	26	78	
March	389	1,764	42	0	3	11	56	32	80	
April	19	58	0	0	0	0	0	0	0	
Spring subtotal	720	3,019	90	0	3	21	114			
Average								26	82	
Total	1,629	6,873	309	1	6	57	373			
Average								18	84	

21

Table 13. Steelhead fishery interview data (unexpanded) from Salmon River section 17, October 1986 - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
October	41	65	2	0	0	1	3	22	67
November	13	25	1	0	0	0	1	25	100
Fall subtotal	54	90	3	0	0	1	4		
Average								23	75
February	456	1,751	23	0	0	5	28	63	82
March	1,753	8,892	214	0	14	17	245	36	93
April	510	2,640	77	0	24	10	111	24	91
Spring subtotal	2,719	13,283	314	0	38	32	384		
Average								35	92
Total	2,773	13,373	317	0	38	33	388		
Average								35	92

22

Table 14. Steelhead fishery interview data (unexpanded) from Salmon River section 18, February - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
February	66	119	1	0	0	0	1	119	100
March	616	2,719	89	0	7	11	107	25	90
April	410	1,206	21	1	0	1	23	52	91
Spring subtotal	1,092	4,004	111	1	7	12	131		
Average								31	90

Table 15. Steelhead fishery interview data (unexpanded) from Salmon River section 19, March - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/ fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
March	661	2,184	121	0	4	4	129	17	97
April	876	1,911	93	0	6	6	105	18	89
Spring subtotal	1,537	4,095	214	0	10	10	234		
Average								18	96

Table 16. Steelhead fishery interview data (unexpanded) from Salmon River section 20, February - April 1987.

Dates	No. anglers	Total hours fished	Steelhead kept		Steelhead released		Total	Hours/fish	Percent hatchery (total catch)
			Hatchery	Wild	Hatchery	Wild			
February	81	206	4	0	0	0	4	52	100
March	284	864	165	0	1	4	170	5	98
April	212	580	71	0	2	5	78	7	94
Spring subtotal	577	1,650	240	0	3	9	252		
Average								7	96

Table 17. Proportion of estimated harvest by river section that was examined for marks.

River section	No. fish checked	Estimated harvest	Sample rate
01	290	3,049	9.5
03 & 05	1,828	12,635	14.5
04	322	2,487	12.9
07	314	696	45.1
10	108	2,589	4.2
11	59	1,636	3.6
12	308	1,537	20.0
13	164	599	27.4
14	852	3,316	25.7
15	2,495	9,492	26.3
16	207	2,167	9.6
17	289	2,661	10.9
18	96	615	15.6
19	206	1,573	13.1
20	<u>226</u>	<u>876</u>	<u>25.8</u>
Total	7,764	45,928	
Average			16.7



Estimates of the hatchery fish harvest, by month and river sections (except 02 and 28), are consolidated by season in Table 18. Total harvest for all river sections was 45,928 steelhead, of which only 230 (0.5%) were of wild origin.

From 546 snouts that were excised, we recovered 380 coded wire tags. The proportion of tags recovered from the number of fish checked for marks was 4.9%. Coded wire tags were recovered from 41 tags groups. The number of tags recovered, the estimated harvest by month and river section, and the total estimated harvest for the season are listed in Appendix A.

Coded wire tags were recovered from all marked groups of A-strain fish released in Idaho. There were two marked groups of B-strain fish returning to the East Fork Salmon River, after one ocean-year, that did not yield a tag, and ten (nine from the Clearwater River and one from the East Fork Salmon River) returning after three ocean-years, from which no tags were recovered (Appendices B and C).

Coded wire tags were also recovered from Washington tag groups released in the Grand Ronde River (62/16/27 and 62/16/28); the Tucannon River (62/16/29, 62/16/30 and 63/32/14); and Lyons Ferry Hatchery (62/16/44). In addition to the National Marine Fisheries Service marked groups released from the Clearwater River drainage, we recovered tags from two marked groups transported to Bonneville Dam (23/18/11 and 23/18/12) and four groups (23/16/44, 23/16/46, 23/16/51 and 23/16/52) that were marked at Lower Granite Dam and released at Beacon Rock on the Columbia River (Johnson 1988).

Estimates of total returns of LSRCP-reared fish are summarized in Table 19. All Idaho returns from the LSRCP program, that returned in 1986-87, were from releases in the Salmon River. However, they were also recovered in the Snake and Clearwater rivers. The total estimated return of adult steelhead in 1986-87 from fish reared by the LSRCP is 16,966, of which 13,999 (82.5%) were harvested, and 2,967 were estimated to return to the release sites. Contribution of the LSRCP to Idaho's total hatchery steelhead harvest (except Sections 02 and 28) in 1986-87 was 30.6%. In the Salmon River, LSRCP-reared fish sustained about 48% of the total hatchery harvest. LSRCP-reared fish sustained a very high exploitation rate. Returns of A-strain steelhead released from Sawtooth Hatchery in the headwaters of the Salmon River were exploited at the rate of 85.5%. Returns of B-strain fish to the East Fork Salmon River were exploited at 80.6%. The exploitation rate on returns to the Little Salmon River is not quantified but was estimated at 50%.

Two coded wire tags were recovered from fish that apparently reared for an additional year after release. Both of these fish were recovered from the Lower Clearwater River. One individual was tagged with 23/16/04, by National Marine Fisheries Service personnel, and released in 1982 from the Clearwater River. This was a B-strain fish and would have spent four years in the ocean. The second individual was an A-strain fish from the 1983 release at Sawtooth Hatchery, and marked with 5/13/33, that would have spent three years in the ocean.

Table 18. Estimated number of hatchery steelhead harvested in the lower Snake, Clearwater and Salmon rivers during the 1986-87 seasons.

River and section	Fall season - 1986			Spring season - 1987			Total harvest
	Estimated harvest <sup>a</sup>	Percent hatchery	No. hatchery fish	Estimated harvest <sup>a</sup>	Percent hatchery	No. hatchery fish	No. hatchery fish
Lower Snake River	2,560	99	2,534	489	95	464	2,998
Lower Clearwater R. and North Fork	7,348	99	7,275	5,287	99	5,221	12,496
Upper Clearwater R.	819	100	819	1,668	100	1,668	2,487
S. Fork Clearwater R.	17	ND	17 <sup>b</sup>	679	100	679	696
Total Clearwater R.	8,184		8,111	7,634		7,568	15,679
Average		99			99		
Salmon River							
10	2,151	100	2,151	438	100	438	2,589
11	1,310	100	1,310	326	93	303	1,613
12	944	100	944	593	98	581	1,525
13	565	100	565	34	100	34	599
14	2,388	100	2,388	928	100	928	3,316
15	6,577	100	6,577	2,915	100	2,915	9,492
16	1,470	100	1,470	697	100	697	2,167
17	444	100	444	2,217	100	2,217	2,661
18	65	ND	65 <sup>b</sup>	550	99	545	610
19	60	ND	60 <sup>b</sup>	1,513	100	1,513	1,573
20	--	--	--	876	100	876	876
Total Salmon River	15,974		15,974	11,087		11,047	27,021
Average		100			99.6		
Total	26,718		26,619	19,210		19,079	45,698

<sup>a</sup> From statewide surveys.

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

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Table 19. Summary of 1986-87 harvest estimates and hatchery returns of steelhead produced by LSRCP hatcheries.

Release year	Strain & ocean-age	No. of fish released	Release site	Hatchery		Estimated number of fish		
				rearing	Marks	Harvested	Hatchery Return <sup>a</sup>	Total
1985	A-I	745,711	Decker Flat	HNFH <sup>b</sup>	None	9,488	1,609	11,097
1985	A-I	40,475	Decker Flat	HNFH	CWT 10/26/30	186	52	238
1985	A-I	268,928	Little Salmon R.	HNFH	None	432	432	864
1985	A-I	39,175	Little Salmon R.	HNFH	CWT 10/26/32	63	63 <sup>o</sup>	126
Subtotal		1,094,289				10,169	2,156	12,325
1984	A-II	39,763	Decker Flat	HNFH	CWT 5/10/28	38	1	39
1984	A-II	40,322	Decker Flat	HNFH	CWT 5/10/29	108	3	111
1984	A-II	397,079	Decker Flat	HNFH	None	1,751	297	2,048
1984	A-II	204,150	Decker Flat	MVSH <sup>d</sup>	None	896	152	1,048
1984	A-II	96,425	Little Salmon R.	HNFH	CWT 5/13/36	98	98 <sup>c</sup>	196
Subtotal		777,739				2,891	551	3,442
1985	B-I	127,607	E. Fk. Salmon R.	HNFH	None	--	--	--
1985	B-I	39,375	E. Fk. Salmon R.	HNFH	CWT 10/26/31	52	11	63
1985	B-I	35,225	E. Fk. Salmon R.	HNFH	CWT 10/26/36	11	5	16
1985	B-I	17,425	E. Fk. Salmon R.	HNFH	CWT 10/25/55	--	--	--
1985	B-I	8,100	E. Fk. Salmon R.	HNFH	CWT 10/28/02	3	--	3
1985	B-I	16,950	E. Fk. Salmon R.	HNFH	CWT 10/28/03	--	--	--
1985	B-I	25,525	E. Fk. Salmon R.	HNFH	CWT 10/28/54	13	3	16
Subtotal		270,207				79	19	98
1984	B-II	393,452	E. Fk. Salmon R.	HNFH	None	775	155	930
1984	B-II	95,624	Little Salmon R.	HNFH	CWT 10/28/06	50	51 <sup>c,e</sup>	101
					CWT 10/28/07	35	35 <sup>c</sup>	70
1984	B-II	31,920	Slate Creek	MVSH	None	--	--	--
1984	B-II	10,764	Allison Creek	MVSH	None	--	--	--
Subtotal		531,760				860	241	1,101

29

Table 19. (continued)

Release near	Strain & ocean-age	No. of fish released	Release site	Hatchery		Estimated number of fish		
				rearing	Marks	Harvested	Hatchery return <sup>a</sup>	Total
1983	B-III	26,173	Decker Flat	HNFH	RV fin clip	--	--	--
1983	B-III	38,864	E. Fk. Salmon R.	HNFH	CWT 10/24/60	--	--	--
1983	B-III	49,140	E. Fk. Salmon R.	MVSH	None	--	--	--
1983	B-III	162,723	E. Fk. Salmon R.	HNFH	None	--	--	--
1983	B-III	11,340	Allison Creek	MVSH	None	--	--	--
1983	B-III	32,200	Slate Creek	MVSH	None	--	--	--
Subtotal		320,440				--	--	--

<sup>a</sup> Includes off-site escapement.

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

<sup>c</sup> Estimated escapement after the the 1986-87 fishery.

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

<sup>e</sup> 1 fish return to Dworshak National Fish Hatchery.

## DISCUSSION

Adult returns from steelhead juveniles released by the LSRCP program are contributing a significant portion of the harvest in Idaho, as well as in other fisheries downstream. As the program increases, major increases in fish numbers are anticipated. In order to maintain or increase exploitation rates, releases should be carefully planned to distribute the fishery in time and space. Some major harvest areas may be reaching the point where effective harvest rates are already near their maximum limit. If so, increased angler densities will not produce much additional harvest, and as run size increases, exploitation rates could decrease.

### Harvest of Sawtooth Hatchery Releases

Returns of fish released from Sawtooth Hatchery in 1984 are now complete. From a total release of 681,314 smolts, an estimated 17,325 adults returned to Idaho and were either harvested by Idaho fishermen or returned to their release sites. Total return rate for this group is 2.54%, which is exceptional for Idaho steelhead. The proportion that returned after one ocean-year (80.7%) is higher than most Salmon River A-strain groups in recent years (Ball 1988). The excellent rate of return is the result of good water conditions during their outmigration in 1984, but is also a reflection of large smolt size and their quality when released. A major portion of the 1984 release (204,150) were fish raised at the site of the Magic Valley Steelhead Hatchery to test the water supply for rearing steelhead. Unfortunately, these fish were not marked and cannot be separated from the groups raised at Hagerman National Fish Hatchery. Both groups were of above average size and quality (approximately 265 mm average size).

In 1985, a total of 786,186 smolts were released at Sawtooth Hatchery, and after one ocean-year, 11,097 (1.44%) have returned to Idaho (Table 19). This is less than the one-ocean return rate of 2.05% that returned from the 1984 release (Ball 1988) but still exceptional.

Returns of steelhead from Sawtooth Hatchery releases are a major contribution to Idaho's harvest in numbers, exploitation, and harvest distribution. The excellent return rates are producing large numbers of returning adults, of which 80% or more are being harvested. Steelhead reared at Hagerman National Fish Hatchery and Magic Valley Steelhead Hatchery, and released at Sawtooth Hatchery in the headwaters of the Salmon River, are the only steelhead in Idaho that have reached Idaho's 80% exploitation goal for hatchery-raised steelhead. The high exploitation rate is a result of the additional harvest opportunity during the spring season in the Upper Salmon River, where water conditions allow additional harvest later in the spring season. During the spring 1987 fishery, McArthur (1988) reported estimates of 2,389 steelhead caught from Salmon River Sections 18 and 19. The majority of these fish were adults returning to Sawtooth Hatchery.

### Harvest of East Fork Salmon River Releases

The East Fork of The Salmon River has been stocked primarily with B-strain fish that originated from Dworshak National Fish Hatchery on the Clearwater River. Before being transplanted in the East Fork, this run was reared at Niagara Springs Fish Hatchery or Hagerman National Fish Hatchery and released into the Pahsimeroi River. Adults returning from these releases were spawned at the adult facility on the Pahsimeroi River and the eggs shipped to Hagerman National Fish Hatchery for rearing. Therefore, the fish spent one rearing cycle in the Salmon River program before they were transferred to the East Fork of the Salmon River.

Harvest and hatchery return estimates for East Fork steelhead are limited by the absence of marked fish in the 1984 release group. The dominant age group of B-strain fish is two-ocean, and without a marked group, estimates are quite subjective. However, there were sufficient returns of marked groups returning after one ocean-year to calculate an exploitation rate of 80.6%. Unmarked returns to the hatchery rack, coupled with the exploitation rate of one-ocean fish, produced an estimated return of 930 two-ocean fish to Idaho from 393,452 smolts released in 1984 (Table 19). This release group also produced an estimated 620 fish after one ocean-year (Ball, 1988). Therefore, the total return through two ocean-years is 1,550, and the return rate is 0.39%. Returns of the 1984 release will be complete after the three ocean-year returns in 1987-88. The proportion of the total returns to date from the 1984 release, that returned after one ocean-year, is unusually high (40%) for B-strain fish. This could be due to some mixing with A-strain fish in previous generations or error in calculating returns without adequate mark groups.

There were 142,600 marked fish released in six mark groups in 1985. Returns from these mark groups will offer the first opportunity for a good analysis of return rates to the East Fork.

### Harvest of Little Salmon River Releases

In 1986-87, adults returned to the Little Salmon River after two ocean-years from 96,425 A-strain fish and 95,624 B-strain fish, both of which were marked (Appendix B). Returns of the A-strain group are complete. After one ocean-year, an estimated 1,501 adults returned (Ball, 1988), and after the second ocean-year, another 196 fish returned to Idaho (Table 19). The total return is 1,697 fish, and the return rate is 1.76%. Of the total return, only about 2.4% were harvested from the Snake River in Sections 01 and 3.2% from the Little Salmon River during the short season there. The remainder of the harvest (94.4%) was taken from the mainstem Salmon River in Sections 10 through 13 (Appendix A; Ball, 1988).

B-strain returns are complete except for a very small *number* that may return after three ocean-years. An estimated 180 fish (0.19%) have returned to Idaho

to date. Of these one and two-ocean returns, 95% returned after two ocean-years (Ball, 1988; Table 19). About 7% of the harvest came from Sections 01 on the Snake River, 79% from Sections 11 through 13 on the Salmon River, and 12% from the Little Salmon River. Returns of B-strain fish were quite disappointing. The A-strain mark group returned nine times as many adults as the B-strain group.

### Sources of Error

The primary sources of error involved in the harvest estimates were discussed by Ball (1986). During the 1986-87 seasons, all hatchery fish harvested, except B-strain fish returning after three ocean-years, were marked with adipose clips. Since only a small proportion of B-strain fish return after three ocean-years, and none returned from the LSRCP program, no attempt was made to estimate returns.

A source of error that could affect the identification of hatchery fish is the number of adipose fins that were either missed during clipping, were only partially clipped so anglers could not recognize the clip, or adipose fin regeneration. Adipose clips have been used to identify the presence of coded wire tags for about ten years on Idaho steelhead. We have not observed any regeneration of adipose clips during that time. Adipose fins appear to have fewer anomalies than paired fins, and occasionally, there may be a question of differentiating between a partial clip on a hatchery fish and an anomaly. Even though the numbers of fish being adipose clipped is very large, preliminary indications are that the quality control of adipose clips has been acceptable. A quantitative check will be incorporated in the hatchery program to monitor the clipping quality control.

Left ventral fin clips that identify the presence of coded wire tag fish do regenerate, but the fin is deformed. There is also a high proportion of hatchery fish with deformed ventral fins. Whenever a fish is inspected that has any abnormality of the left ventral fin, we attempt to take the snout. We take a large number of snouts with these methods, and only about half of them have coded wire tags. But the number of coded wire tags missed with these methods is very small, if any.

In order to adequately quantify returns of any releases, it's imperative that a coded wire tag group is included in the release or included in a companion group of fish identified by managers as representative. Marked fish should be representative in size and time of release and fish health. No return estimates have been made on LSRCP releases in Slate and Allison creeks because of the absence of marked groups. Releases made in reasonably close geographical locations can be evaluated by marking one group and applying the results to the other(s).

As the LSRCP increases, larger numbers of smolts are being allocated to release sites in the Lower Salmon River. Historically, about 60% of the Salmon River harvest came from Sections 10 through 13. Since hatchery fish behave differently than the original wild steelhead, the proportion of harvest from

these lower river sections has declined to about 20%. Releasing hatchery fish lower in the drainage is an attempt to improve harvest distribution. Harvest of marked fish from these lower releases is determined with the same methods as all other marked fish. The problem is the absence of a hatchery rack anywhere in the lower Salmon River where escapement past the fishery can be ascertained. If the escapement and exploitation rate was determined at one site, the results could be applied to the other return groups. A weir constructed on one of the Lower Salmon River tributaries would allow escapement estimates to be made on all of the releases in this river reach.

Another void in evaluating the return of LSRCP steelhead is survival rate from Lower Granite Dam to Idaho's fishery and hatchery racks. In order to determine the success of the LSRCP program, it's necessary to know how many fish returned "to the project area;" i.e. Lower Granite Dam. Passive Integrated Transponders (PIT tags) are the key to determining how many LSRCP fish pass Lower Granite Dam. Adult detection equipment is already installed at the dam. A representative group of fish from each hatchery should be marked with PIT tags prior to release. Adult detection of PIT tags at Lower Granite Dam and at hatcheries, combined with CWT detection in the fishery and at hatcheries, will produce known numbers of LSRCP fish to the project area.

### Straying

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's not unusual for these wandering fish to spend time in several rivers that are not their natural drainage. Adults observed or harvested during the wandering phase should not be considered strays.

In 1986-87, there were large numbers of marked Clearwater River steelhead returning from National Marine Fisheries Service homing research (Harmon and Slatick, 1987). We recovered six coded wire tags from three tag groups and estimated that 19 of these fish were harvested from the Salmon River (Appendix A).

At the hatchery racks in 1987, 277 coded wire tags were retrieved. From Idaho marked fish, only three returned to sites other than where they were released. One A-strain fish released at Sawtooth (10/26/30) returned to the East Fork rack, and one B-strain fish from the East Fork (10/26/31) returned to Sawtooth Hatchery. One A-strain fish released in the Little Salmon River (10/28/06) returned to Dworshak National Fish Hatchery on the Clearwater River.

Adults from the LSRCP program in Washington returning to Idaho hatcheries include two from the Grand Ronde River (62/16/27 and 62/16/28) that returned to the Pahsimeroi Hatchery, four from Lyons Ferry (62/16/44) that returned to Dworshak Hatchery, and six fish from the Tucannon River (62/16/29, 63/32/12, 63/32/14, and 63/32/15) that returned to Dworshak Hatchery.

The straying rate of the returns of Idaho fish (not including the strays from Washington) is 1.13%. This is a slightly higher rate than the less than 0.5% reported for the previous two years (Ball, 1986 and 1988).

#### **ACKNOWLEDGMENTS**

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**APPENDICES**





Appendix A. (continued).

TAG CODE - 05/13/33                      RELEASE SITE - Decker Flat                      NUMBER RELEASED - 40,573

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										1	0.294	3
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

40

River Section	January			February			March			April			1986-87	
	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	3
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest													3	

Appendix A. (continued).

TAG CODE - 05/13/35

RELEASE SITE - Clearwater R.

NUMBER RELEASED - 39,525

No.	Sample Est.	No.	Sample Est.	No.	Sample Est.	No.	Sample Est.		
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.
01									
03/05							1	0.294	3
04/06									
07									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

41

January		February			March			April			1986-87 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	Harv.			
01														
03/05				1	0.188	5	4	0.151	26	5	0.114	44	11	78
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

7B

Appendix A. (continued).

TAG CODE - 05/13/36                      RELEASE SITE - Little Salmon R.                      NUMBER RELEASED - 90,925

River Section	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												
04/06												
07												
10				1	0.062	16						
11												
12				3	0.311	10	7	0.340	21			
13							1	0.469	2			
14												
15												
16												
17												
18												
19												
20												

42

No.	River Section	January			February			March			April			1986-87	
		Sample Tags	Est. Rate	No. Harv.	Sample Tags	Est. Rate	No. Harv.	Sample Tags	Est. Rate	No. Harv.	Sample Tags	Est. Rate	No. Harv.	No. Tags	Est. Harv.
01															
03/05															
04/06															
07															
10													1	16	
11					1	0.036	28						1	28	
12					1	0.200	5						11	36	
13													1	2	
14															
15															
16															
17															
18															
19															
20								7	0.786	9	1	0.137	7	8	16
Total estimated harvest														98	

Appendix A. (continued).

TAG CODE - 05/13/50		RELEASE SITE - North Fork Clearwater River						NUMBER RELEASED - 30 000				
River	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							1	0.332		3		
15												
16												
17												
18												
19												
20												

43

River	January			February			March			April			1986-87	
	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														
04/06														
07														
10														
11														
12														
13														
14													1	3
15														
16														
17														
18														
19														
20														
Total estimated														3



Appendix A. (continued).

TAG CODE - 10/25/17                      RELEASE SITE - Clearwater R.                      NUMBER RELEASED - 37,325

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				1	0.077	13						
03/05							13	0.167	78	3	0.294	10
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

45

River Section	January			February			March			April			1986-87	
	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													1	13
03/05	3	0.214	14	5	0.188	27	1	0.151	7				25	136
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total estimated harvest

149

Appendix A. (continued).

TAG CODE - 10/25/19	RELEASE SITE - Pahsimeroi												NUMBER RELEASED -
	September			October			November			December			
	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	No. Tags	Sample Est.	Harv.	
River Section													
01							1	0.130	8				
03/05													
04/06													
07													
10													
11													
12													
13							1	0.469	2				
14				3	0.171	18	1	0.332	3				
15				5	0.169	30	4	0.466	9				
16				1	0.088	11	1	0.141	7				
17													
18													
19													
20													

46

River Section	January			February			March			April			1986-87	
	No. Tags	Sample Est.	Harv.	No. Est										
01													1	8
03/05														
04/06														
07														
10														
11														
12														
13													1	2
14										4			4	21
15							1	0.349	3	10			10	42
16										2			2	18
17				1	0.103	10				1			1	10
18														
19														
20														
Total estimated													101	

Appendix A. (continued).

TAG CODE - 10/25/21  
45 800

RELEASE SITE - Breuno's Bridge

NUMBER RELEASED -

No.	Sample Est. No.	Sample Est. No.	Sample Est. No.	Sample Est. No.
River Section	Tags	Rate	Harv.	Tags
01				
03/05				
04/06				
07				
10				
11				
12				
13				
14			3 0.332	9
15	3	0.169	18	5 0.466 11
16				
17				
18				
19				
20				

47

	January	February	March	April	1986-87 Total
No.	Sample Est. No.	Sample Est. No.	Sample Est. No.	Sample Est. No.	Est. No.
River Section	Tags	Rate	Harv.	Tags	Rate
01					
03/05					
04/06					
07					
10					
11					
12		1 0.200	5		1 5
13					
14			1 0.360	3	4 12
15			3 0.349	9	11 38
16			1 0.080	13	1 13
17			2 0.148	14	1 0.110 9 3 23
18					
19					
20					
Total estimated harvest					91

Appendix A. (continued).

TAG CODE - 10/26/30                      RELEASE SITE - Decker Flat                      NUMBER RELEASED - 40,475

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
01											
03/05											
04/06											
07											
10				1	0.062	16					
11				1	0.027	37					
12				1	0.311	3					
13				1	0.184	5	1	0.469	2		
14				2	0.171	12	2	0.332	6		
15				3	0.169	18	9	0.466	19		
16											
17											
18											
19											
20											

48

River Section	January			February			March			April			1986-87 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														
04/06														
07														
10													1	16
11													1	37
12													1	3
13													2	7
14				1	0.442	2	3	0.360	8				8	28
15				3	0.194	15	4	0.349	11				19	63
16				1	0.188	5							1	5
17							1	0.148	7				1	7
18							2	0.204	10				2	10
19							2	0.203	10				2	10
20														
Total estimated harvest														186



Appendix A. (continued).

TAG CODE - 10/26/32                      RELEASE SITE - Little Salmon R.                      NUMBER RELEASED - 39,175

River Section	September			October			November			December		
	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.	No.	Sample Est.	Harv.
01							1	0.130				
03/05												
04/06												
07												
10				1	0.062	16	1	0.061				
11												
12				1	0.311	3	2	0.340				
13												
14												
15												
16												
17												
18												
19												
20												

50

No.	River Section	January			February			March			April			1986-87 Total	
		Sample Est.	Harv.	Tags	Est. Tags	Harv.									
	01													1	8
	03/05														
	04/06														
	07														
	10													2	32
	11														
	12				2	0.200	10							5	19
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20							3	0.786	4				3	4
	Total estimated harvest														63

Appendix A. (continued).

TAG CODE - 10/26/36                      RELEASE SITE - East Fork Salmon River      NUMBER RELEASED -  
2E 22E

No.	Sample Est.	No.	Sample Est.	No.	Sample Est.	No.	Sample Est.
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags
01							
03/05							
04/06							
07							
10							
11							
12				1	0.340	3	
13							
14							
15				1	0.466	2	
16							
17							
18							
19							
20							

51

January	February	March	April	1986-87 Total
No.	Sample Est.	No.	Sample Est.	No.
River Section	Tags	Rate	Harv.	Tags
01				
03/05				
04/06				
07				
10				
11				
12				1
13				3
14				
15				2
16				0.349
17				6
18				
19				
20				
Total estimated harvest				11



Appendix A. (continued).

TAG CODE - 10/27/45                      RELEASE SITE - Pahsimeroi R.                      NUMBER RELEASED - 40,122

-----  
 -----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							1	0.063		16	
12											
13											
14				2	0.171	12					
15				4	0.169	24	4	0.466		9	
16											
17											
18											
19											
20											

53

-----January-----February-----March-----April-----1986-87 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										1	16
12											
13											
14										2	12
15				2	0.194	10				10	4
16											
17				2	0.103	19				2	19
18											
19											
20											
Total estimated harvest											90

Appendix A. (continued).

TAG CODE - 10/27/46                      RELEASE SITE - Pahsimeroi R.                      NUMBER RELEASED - 41,019

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.
03/05												
04/06												
07												
10												
11				1	0.027	3						
12				1	0.311	3						
13												
14				2	0.171	12	4	0.332				
15				6	0.169	3	2	0.466				
16												
17												
18												
19												
20												

54

River Section	January			February			March			April			1986-87 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														
04/06														
07														
10														
11													1	37
12													1	3
13														
14				1	0.442	2	1	0.360	3				8	29
15				1	0.194	5	1	0.349	3				10	48
16														
17							3	0.148	20	1	0.110	9	4	29
18														
19														
20														
Total estimated harvest														146

Appendix A. (continued).

TAG CODE - 10/28/02  
 8 100

RELEASE SITE - East Fork Salmon River MIIBER RELEASED -

River Section	January			February			March			April			1986-87	
	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.	Tags	Est. Harv.
01														
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15							1	0.349	3				1	3
16														
17														
18														
19														
20														
Total estimated harvest													3	

Appendix A. (continued).

TAG CODE - 10/28/06                      RELEASE SITE - Little Salmon                      NUMBER RELEASED - 56,906

River Section	September		October		November		December	
	No. Sample	Est. Harv.						
							011	0.130 8

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

1 0.311 3                      1 0.063 16  
3 0.340 9  
1 0.469 2

56

River Section	January		February		March		April		1986-87 Total	
	No. Sample	Est. Harv.	No.	Est.						
									1	8
					1	0.116 9			5	21
									1	2
					2	0.786 3			2	3
Total estimated harvest										50

01  
03/0  
04/06  
07  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20

1 8  
5 21  
1 2  
2 3  
50



Appendix A. (continued).

TAG CODE - 10/28/51                      RELEASE SITE - Panther Creek                      NUMBER RELEASED -  
 23 900

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

58

River Section	January			February			March			April			1986-87	
	No.	Sample Est.	No. Sample Est.	No.	Sample Est.	No. Sample Est.	No.	Sample Est.	No. Sample Est.	No.	Sample Est.	No. Sample Est.	No.	Est.
01														
03/05														
04/06														
07														
10														
11														
12														
13							1	0.471	2				1	2
14														
15							2	0.349	6				2	6
16														
17														
18														
19														
20														
Total estimated harvest														8

Appendix A. (continued).

TAG CODE - 10/28/52  
24 600

RELEASE SITE - Panther Creek

NUMBER RELEASED -

No.	Sample Est.			Sample Est.			Sample Est.			Sample Est.			
	River Section	Tags	Rate Harv.	Tags	Rate Harv.	Tags	Rate Harv.	Tags	Rate Harv.	Tags	Rate Harv.		
01													
03/05													
04/06													
07													
10													
11													
12				1	0.311	3							
13							1	0.469	2				
14				1	0.171	6	3	0.332	9				
15													
16													
17													
18													
19													
20													
	January			February			March			April		1986-87 Total	
No.	River Section	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													
12												1	3
13												1	2
14				1	0.442	2	1	0.360	3			6	20
15							4	0.349	11			4	11
16													
17													
18													
19													
20													
	Total estimated harvest											36	

59

Appendix A. (continued).

TAG CODE - 10/28/53                      RELEASE SITE - Pahsimeroi R.                      NUMBER RELEASED -  
22 100

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							1	0.466		2		
16												
17												
18												
19												
20												

60

River Section	January			February			March			April			1986-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														
04/06														
07														
10														
11														
12														
13														
14														
15													1	2
16														
17														
18														
19														
20														
Total estimated harvest														2

Appendix A. (continued).

TAG CODE - 10/28/54  
25,525

RELEASE SITE - East Fork Salmon River NUMBER RELEASED -

No.	September			October			November			December		
	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												

61

No.	January			February			March			April			1986-87 Total	
	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							1	0.080	13				1	13
17														
18														
19														
20														
Total estimated harvest														13

Appendix A. (continued).

TAG CODE - 23/16/04		RELEASE SITE -				NUMBER RELEASED -						
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										1	0.294	3
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

62

River Section	January			February			March			April			1986-87	
	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.	Est. Tags
01														
03/05													1	3
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest														3

Appendix A. (Continued).

TAG CODE - 23/16/16                      RELEASE SITE - Clearwater R.                      NUMBER RELEASED - 32,236

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												

63

River Section	January			February			March			April			1986-87	
	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	0.188	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 - 23/16/44		RELEASE SITE -						NUMBER RELEASED -				
		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. Sam	Est. Harv.	
01												
03/05				2	0.05	40						
04/06					0							
07												
10												
11												
12												
							1	0.466	2			

65

		January			February			March			April			1986-87	
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.	No. Tags	Est. Harv.	
01															
03/05				1	0.188	5							3	45	
04/06															
07															
10															
11															
12															
13															
14															
15													1	2	
16															
17															
18															
19															
20															
Total estimated harvest														47	

Appendix A. (continued).

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												

99

River Section	January			February			March			April			1986-87	
	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				2	0.188	11	1	0.151	7				3	18
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest													18	

Appendix A. (continued).

TAG CODE - 23/16/46			RELEASE SITE -						NUMBER RELEASED -						
-----															
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															
03/05							1	0.167	6				3	0.294	10
04/06															
07															
10															
11															
12															
13															
14															
15							1	0.466	2						
16															
17															
18															
19															
20															

67

January			February			March			April			1987-88		
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	Harv.
01														
03/0	1	0.214	5	1	0.188	5							6	26
04/06														
07														
10														
11														
12														
13														
14														
15													1	2
16														
17														
18														
19														
20														
Total estimated														28

Appendix A. (continued).

TAG CODE - 23/16/51		RELEASE SITE -						NUMBER RELEASED -			
		September		October		November		December			
No.	River Section	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Sample
		Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Harv.
01											
03/05								3	0.294	10	
04/06											
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

89

January		February			March		April		1986-87		
No.	River Section	Sample	Est.	No.	Sample	Est.	No.	Sample	Est.	No.	Est.
		Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags
01											
03/05				2	0.188	11				5	21
04/06		1	0.207	5		1	0.202	5		2	10
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Total estimated harvest										31	

Appendix A. (continued).

TAG CODE - 23/16/52		RELEASE SITE -									NUMBER RELEASED -		
River	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				2	0.050	40	2	0.167	12	1	0.294	3	
04/06													
07													
10													
11													
12													
13													
14				1	0.171	6							
15							1	0.466	2				
16													
17													
18													
19													
20													

River	January			February			March			April		1986-87
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Sample Est.	No. Est	
01												
03/05							1	0.151	7			62
04/06												
07										2	1.169	2
10												
11												
12												
13												
14												6
15												2
16												
17										1	0.110	9
18												
19												
20												
Total estimated harvest											81	

69

Appendix A. (continued).

TAG CODE - 23/18/11                      RELEASE SITE -                      NUMBER RELEASED -

No.	Sample Est.	No.	Sample Est.	No.	Sample Est.	No.	Sample Est.		
River Section	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									

70

No.	Sample Est.	No.	Sample Est.	No.	Sample Est.	No.	Sample Est.	No.	Sample Est.
January		February		March		April		1986-87	
River Section	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.
01									
03/05									
04/06									
07									
10									
11									
12									
13									
14									
15				1	0.349	3			1 3
16									
17									
18									
19									
20									
Total estimated harvest									3



Appendix A. (continued).

TAG CODE - 23/18/13	RELEASE SITE -						NUMBER RELEASED -					
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												

72

River Section	January			February			March			April			1986-87	
	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														
04/06														
07														
10														
11														
12														
13														
14														
15							1	0.349	3				1	3
16														
17														
18														
19														
20														
Total estimated harvest														3

Appendix A. (continued).

TAG CODE - 62/16/27		RELEASE SITE -						NUMBER RELEASED -				
		September		October		November		December				
No.	River Section	Sample Tags	Est. Rate	No. Harv.	Sample Tags	Est. Rate	No. Harv.	Sample Tags	Est. Rate	No. Harv.	Sample Tags	Est. Rate
01				3	0.077	39	1	0.130		8		
03/05												
04/06												
07												
10				1	0.062	16						
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
		January		February		March		April		1986-87	Total	
No.	Tags	Sample Rate	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Est. Tags
01												4
03/05												47
04/06												
07												
10												1
11												16
12												
13												
14												
15												
16												
17												
18												
19												
20												
Total estimated harvest												63

73

Appendix A. (continued).

TAG CODE - 62/16/28		RELEASE SITE -						NUMBER RELEASED					
		September			October			November			December		
River Section	Tags	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					1	0.077	13	2	0.130	15			
03/05													
04/06													
07													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

74

River Section		January			February			March			April			1986-87 Total		
Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Rate	Harv.	Tags	Est.
01															3	28
03/05															1	5
04/06																
07																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Total estimated harvest

33

Appendix A. (continued).

TAG CODE - -----	RELEASE SITE -								NUMBER RELEASED -		
	September			October			November		December		
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Est.	No. Tags	Sample Rate	Est. Harv.
River Section											
01							1	0.130	8		
03/05										1	0.294
04/06											3
07											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

75

River Section	January			February			March			April			1986-87 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. Est	Est
01													1	8
03/05													1	3
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest														11

Appendix A. (continued).

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										1	0.130
03/05				1	0.050	20						
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

76

River Section	January			February			March			April			1986-87	
	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													1	8
03/05													1	20
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest														28

Appendix A. (continued).

River Section	TAG CODE - 62/16/44									RELEASE SITE -									NUMBER RELEASED -								
	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.	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																											

77

River Section	January			February			March			April			1986-87	
	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	0.214	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 - 63/32/14		RELEASE SITE -						NUMBER RELEASED -				
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												

78

River Section	January			February			March			April			1986-87 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	1	0.074	14										1	14
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
Total estimated harvest													14	

Appendix B. Steelhead groups returning to the Salmon River, 1986-87.

Strain	Ocean age	No. of fish released	Release site	Hatchery rearing	Marks	Purpose Comments
A	I	39,175	Little Salmon R.	HNfHa	CWT 10/26/32	
A	I	268,928	Little Salmon R.	HNfH	None	
A	I	23,900	Panther Creek	NSPRb	CWT 10/28/51	
A	I	24,600	Panther Creek	NSPR	CWT 10/28/52	
A	I	189,409	Panther Creek	NSPR	None	
A	I	23,400	Pahsimeroi	NSPR	CWT 10/28/53	
A	I	855,130	Pahsimeroi	NSPR	None	
A	I	45,800	Bruno's Bridge	NSPR	CWT 10/25/21	
A	I	110,942	Bruno's Bridge	NSPR	None	
A	I	40,475	Decker Flat	HNfH	CWT 10/26/30	
A	I	745,711	Decker Flat	HNfH	None, F.B. R.D. Y-1 (35,125)	
	Subtotal	2,367,470				
A	II	90,925	Little Salmon R.	HNfH	CWT 5/13/36	
A	II	5,500	Little Salmon R.	HNfH	LV clip, no CWT	
A	II	40,919	Pahsimeroi	NSPR	CWT 10/25/19	
A	II	39,749	Pahsimeroi	NSPR	CWT 10/27/44	
A	II	40,122	Pahsimeroi	NSPR	CWT 10/27/45	

Appendix B. (continued).

Ocean Strain	age	No. of released	Release site	Hatchery rearing	Marks	Purpose Comments
A	II	41,019	Pahsimeroi	NSPR	CWT 10/27/46	
A	II	592,195	Pahsimeroi	NSPR	None	
A	II	39,763	Decker Flat	HNFH	CWT 5/10/28	
A	II	40,322	Decker Flat	HNFH	CWT 5/10/29	
A	II	397,079	Decker Flat	HNFH	None	
A	II	204,150	Decker Flat	MVSHc	None	
Subtotal		1,531,743				
B	I	39,375	East Fork	HNFH	CWT 10/26/31	
B	I	35,225	East Fork	HNFH	CWT 10/26/36	
B	I	17,425	East Fork	HNFH	CWT 10/26/55	
B	I	8,100	East Fork	HNFH	CWT 10/28/02	
B	I	16,950	East Fork	HNFH	CWT 10/28/03	
B	I	25,525	East Fork	HNFH	CWT 10/28/54	
B	I	127,607	East Fork	HNFH	None, F.B. R.D. Y-3 (31,775)	
Subtotal		270,207				

08

Appendix B. (continued).

Strain	Ocean age	No. of fish released	Release site	Hatchery rearing	Marks	Purpose Comments
B	II	56,906	Little Salmon R.	HNFH	CWT 10/28/06	
B	II	38,718	Little Salmon R.	HNFH	CWT 10/28/07	
B	II	31,920	Slate Creek	MVSH	None	
B	II	10,764	Allison Creek	MVSH	None	
B	II	393,452	East Fork	HNFH	None	
	Subtotal	531,760				
B	III	32,200	Slate Creek	MVSH	None	
B	III	11,340	Allison Creek	MVSH	None	
B	III	26,173	Decker Flat	HNFH	RV clip	
B	III	38,864	East Fork	HNFH	CWT 10/24/60	
B	III	162,723	East Fork	HNFH	None	
B	III	46,250	East Fork	NSPR	None	
B	III	49,140	East Fork	MVSH	None	
	Subtotal	366,690				

a HNFH=Hagerman National Fish Hatchery.  
 b NSPR=Niagara Springs Fish Hatchery.  
 c MVSH=Magic Valley Steelhead Hatchery.

Appendix C. Steelhead groups returning to the Clearwater River, 1986-87.

train	Ocean age	No. of fish released	Release site	Hatchery rearing	Marks
B	I	1,035,573	Clearwater R.	DNFHa	None
B	I	145,206	Clear Creek	DNFH	None
B	I	95,286	Newsome Creek	DNFH	None
B	I	42,235	Crooked River	DNFH	None
B	I	162,111	American River	DNFH	None
B	I		Eldorado Creek	DNFH	None
		Subtotal			1,601,695
B	II	40,325	Clearwater R.	DNFH	CWT 10/25/16
B	II	37,325	Clearwater R.	DNFH	CWT 10/25/17
B	II	39,525	Clearwater R.	DNFH	CWT 05/13/35
B	II	1,088,781	Clearwater R.	DNFH	None
B	II	2,363	Clearwater R.	DNFH	LV clip, no CWT
B	II	506,930	South Fork	DNFH	None
B	II	246,123	South Fork	DNFH	None
		Subtotal			1,961,372
B	III	33,178	Clearwater R.	DNFH	CWT 23/16/38
B	III	32,236	Clearwater R.	DNFH	CWT 23/16/16
		APPC.WP			

Appendix C. (continued).

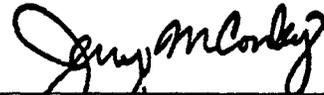
Strain	Ocean age	No. of fish released	Release site	Hatchery rearing	Marks
B	III	30,751	Clearwater R.	DNFH	CWT 23/16/20
B	III	8,460	Clearwater R.	DNFH	None
B	III	24,575	North Fork	DNFH	CWT 05/13/49
B	III	30,000	North Fork	DNFH	CWT 05/13/50
B	III	29,825	North Fork	DNFH	CWT 05/13/51
B	III	32,550	North Fork	DNFH	CWT 05/13/52
B	III	31,956	North Fork	DNFH	CWT 23/16/19
B	III	1,012,593	North Fork	DNFH	None
B	III	3,260	North Fork	DNFH	LV clip, no CWT
B	III	250,488	Clear Creek	DNFH	None
B	III	496,471	South Fork	DNFH	None
B	III	28,658	Columbia River	DNFH	CWT 23/16/39
B	III	30,341	Columbia River	DNFH	CWT 23/16/40
B	III	32,456	Columbia River	DNFH	CWT 23/16/17
B	III	31,906	Columbia River	DNFH	CWT 23/16/18
B	III	5,243	Columbia River	DNFH	None
		Subtotal 2,144,947			

a DNFH=Dworshak National Fish Hatchery.

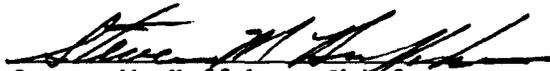
Submitted by:

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