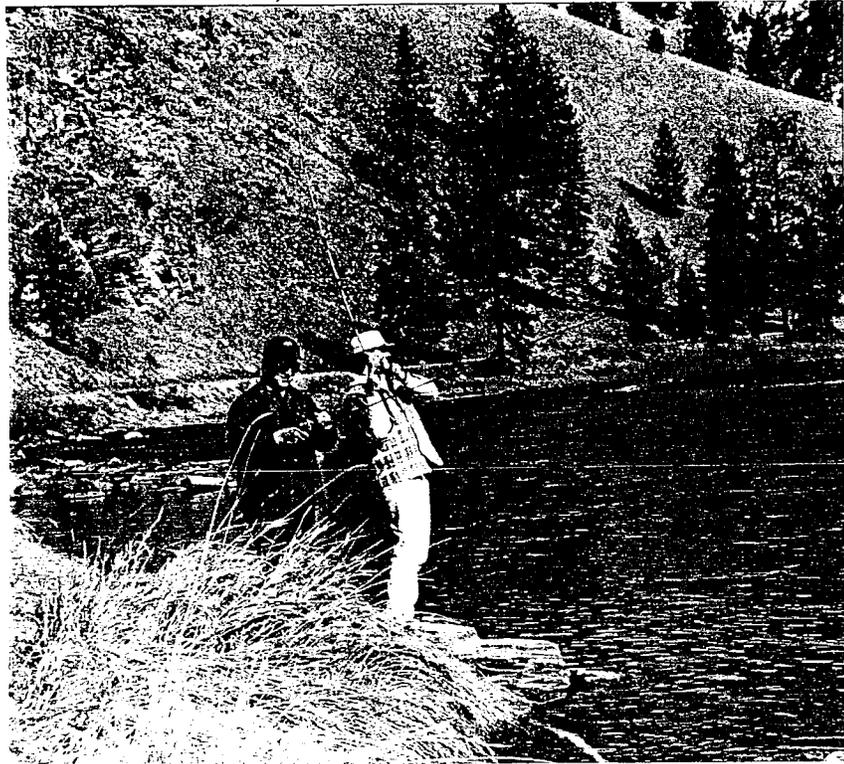




# FISHERY RESEARCH

## EVALUATION; OF HATCHERY-WILD COMPOSITION OF IDAHO SALMON AND STEELHEAD HARVEST

October 1, 1996 to December 31, 1997



Kent Ball, Senior Fishery Research Biologist  
Marsha White, Fisheries Technician

January 2001  
IDFG 00-57

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## 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 (CWTs) are retrieved from fish harvested by anglers, and harvest rates are calculated by month and river section.

During the fall 1996 and spring 1997 steelhead seasons, 17,153 anglers were interviewed and 3,507 adult steelhead were examined, which was 13.5% of the total steelhead harvest. We retrieved 477 CWTs from 88 different mark groups, of which 75 groups (85%) originated in Idaho. The total estimated harvest for the 1996-1997 season in Idaho was 26,034 hatchery steelhead, of which an estimated 8,355 (32%) were produced by the Lower Snake River Compensation Plan (LSRCP). An additional 4,126 LSRCP-reared fish returned to hatchery racks or were estimated to return to off-site release locations. Therefore, we accounted for 12,481 adult steelhead from the LSRCP program, 66.9% of which were harvested.

After seven release years of comparison, progeny of East Fork Salmon River parents have returned 1.9 times as many adults to the Idaho fishery, and 10.2 times as many to the hatchery rack than progeny of Dworshak National Fish Hatchery parents when smolts were released into the East Fork Salmon River.

Authors:

Kent Ball  
Senior Fishery Research Biologist

Marsha White  
Fishery Technician

## INTRODUCTION

Steelhead trout *Oncorhynchus mykiss* and chinook salmon *O. tshawytscha* are raised in Idaho hatcheries to mitigate for losses caused by the construction of hydroelectric dams. Adults returning to 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 Lower Snake River Compensation Plan (LSRCP) hatcheries. The LSRCP mitigates for four federal dams on the lower Snake River. Contribution to the Idaho fishery is one of the measures of performance of LSRCP fish. Idaho Power Company (IPC) and the US Army Corps of Engineers (USACE) also fund hatchery rearing of steelhead as mitigation for other federal and private dams. Although a summary and discussion of the harvest contribution of these fish is not included in this report, they are incorporated in the Appendix B tables and identified by their rearing hatchery, Niagara Springs Fish Hatchery, in Appendix C. For some release groups, coded-wire-tagged (CWT) fish from the IPC program provided the basis for LSRCP evaluation.

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

During the fall 1996 and spring 1997 seasons, all age groups of hatchery steelhead returning to Idaho were marked by adipose fin clips. 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 were marked with coded wire tags (CWTs) prior to release. Anglers were interviewed and fish snouts were retrieved in all major harvest areas to recover these tags from the fishery. Information was collected and used to estimate timing, straying, exploitation, and harvest distribution of hatchery stocks. Total harvested numbers were estimated by a statewide harvest survey, and the harvest contribution for each hatchery program was derived from tag recoveries. Off-site smolt releases are used as a tool for distributing angler effort and harvest, and increasing harvest rates. This report documents some of the behavior and distribution of the returning adults.

In recent years, harvest opportunity for spring and summer chinook salmon has been limited to hatchery stocks. Harvest is allowed only when returning adult numbers exceed hatchery escapement needs. During spring and summer 1997, chinook salmon seasons were held on the mainstem, North Fork, and South Fork Clearwater rivers, the Lochsa River, the Little Salmon River, the South Fork Salmon River, and the Boise River. Chinook salmon produced by LSRCP facilities were harvested on the Clearwater, Lochsa, South Fork Salmon, and Boise rivers. All but the Boise River fishery were summarized in separate publications (Apperson and Wilson, 1998; Barrett, 1998), so this report pertains only to the harvest of LSRCP-produced steelhead in the Clearwater, Snake, and Salmon river drainages.

Table 1. Steelhead season dates, bag limits and special restrictions for the Clearwater, Salmon, and Snake rivers, 1996-1997.

River and Sections	Fall Season Dates	Bag Limits <sup>a</sup>
Snake River (01)	Sept 1 - Dec 31	2, 4, 10
Clearwater River (03) <sup>b</sup>		
Clearwater River (03 - 07) <sup>c</sup>	Oct 15 - Dec 31	
Salmon River (10 - 20)	Sept 1 - Dec 31	

River and Sections	Spring Season Dates	Bag Limits <sup>a</sup>
Snake River (01)	Jan 1 - Apr 30	2, 4, 10
Clearwater River (03 - 07)		
Salmon River (10 - 14)	Jan 1 - Mar 31	
Salmon River (15 - 19)	Jan 1 - Apr 30	
Salmon River (20)		

<sup>a</sup> Bag limits denotes daily, possession, and season totals.

<sup>b</sup> Section 03 includes only that portion from its mouth upstream to Memorial Bridge of Highway 12 at Lewiston. Catch and release only Sept. 1 - Oct. 14, 1996.

<sup>c</sup> Section 03 includes that portion from Memorial Bridge upstream to Clear Creek.

## OBJECTIVES

Identify the number and proportion of steelhead harvested in the Idaho sport fishery that are produced by LSRCP hatcheries.

Determine adult returns of LSRCP steelhead to Idaho hatcheries and off-site release areas.

## 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 (section 02), Selway (08), Lochsa (09), South Fork (21), Middle Fork (22), North Fork (23) and East Fork Salmon (26) rivers, and the Lemhi (24), Pahsimeroi (25), Oxbow (27) and Boise rivers (28). These sections are excluded because either no steelhead produced by the LSRCP are released there or these rivers are not open to steelhead harvest. 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 in the Boise River and Oxbow Reservoir for harvest through the IPC mitigation program.

## METHODS

### Creel Survey

Angler interviews were conducted at check stations, from jet boats, and from roving vehicles. Angler interview schedules and intensity were designed to observe maximum numbers of harvested fish. Techniques were tailored to sportsman access and harvest methods. For example, on the Clearwater River, the majority of fishermen harvested steelhead during the fall and winter months by boat, so survey efforts concentrated on interviewing boat anglers. In late spring, the density of boats in a small area became so high that it was prohibitive to interview anglers on the water. Therefore, survey efforts were divided between major boat ramps. In the roadless areas of the Salmon River, almost all of the angler access was by boat, but most of the fishing effort was from shore. Anglers were contacted by roving census clerks or at check stations located at major egress points.

During angler interviews, data collection included the number of anglers and hours fished, number of fish kept or released, wild or hatchery origin of fish kept or released, fork length of fish kept, and date and river sections where fish were caught. Observed fish were inspected for tags and clipped fin. The snout was removed for CWT retrieval from fish with an abnormality of their left ventral fin or when use of a portable CWT hand wand detector signaled the presence of a CWT. Snouts were not excised from CWTed fish when anglers desired to keep their fish intact.

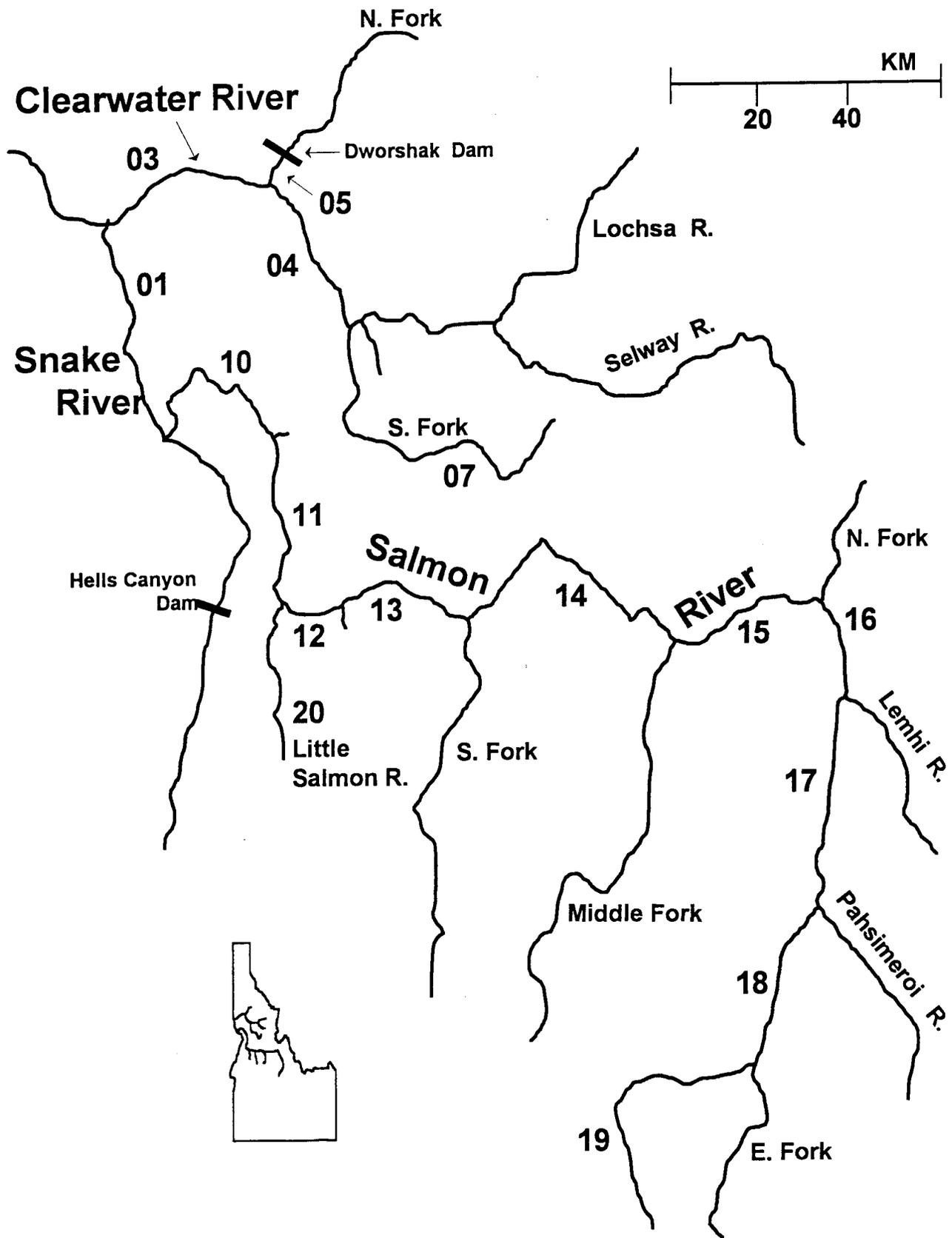


Figure 1. Map of steelhead harvest areas in Idaho.

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
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

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

## **Interview Schedule**

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

**Lower Clearwater and North Fork Clearwater River (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 10 weeks in the spring season. Interviews were conducted from boat ramps for the last six weeks of the spring season.

**Upper Clearwater (including the Middle Fork) 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, two weekend days per week, for six weeks in the fall and eight weeks in the spring.

## **Salmon River**

**Section 10** - by roving vehicle two weekend days for 8 weeks in the fall and four weeks in the spring season (upper roaded portion only).

**Section 11** - by roving vehicle two weekend days for 8 weeks in the fall and four weeks in the spring season.

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

**Sections 14 and 15** - by a check station near North Fork for eight weekends in the fall and five 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 in the bottom one-half of the section and six weekends in the spring season.

**Sections 17 and 18** - by a check station near Challis for three weekends in the spring season.

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

**Section 19** - by roving vehicle for five 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 were obtained from statewide telephone survey results (Appendix A). Beginning with the fall 1990 season, that portion of the Clearwater River up to the Memorial Bridge of Highway 12 at Lewiston was designated river section 03 during the September 1 to October 15 harvest period. Previously, harvest from this section of the Clearwater River had been included with river section 01 (Ball 1992a).

The number of fish checked for marks from each river section, divided by the harvest estimate, yielded the sampling rate for each river section by month. Harvested fish that were not seen during the interviews were not included in this calculation.

During angler interviews, hatchery and naturally-produced proportions were recorded for fish kept and for total catch, including released fish when their origin could be determined. The harvest of hatchery fish was the product of the hatchery proportion observed in anglers' creels and the estimated monthly harvest from statewide surveys. Seasonal estimates of reported hatchery fish harvest were 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 months when fish movement was minimal and the proportion of hatchery fish in the harvest was constant.

Harvest estimates of various CWT 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 CWT groups or companion groups.

Hatchery returns were classified by strain (A or B) and ocean-age using length frequencies of previous known-age CWT returns. Marked (CWT) returns to hatchery racks were subtracted from total returns by strain and ocean-age. Harvest of unmarked groups was assumed to parallel the performance of marked hatchery rack returns. Where more than one unmarked group returned to a release site, the estimates of in-state harvest and hatchery returns were calculated on the total of the unmarked fish and assumed to apply equally to each group.

Returns of marked groups were the summation of in-state harvest estimates and hatchery rack returns. Out-of-state harvest was not calculated. In this report, we define exploitation rates as the harvest estimates divided by the sum of the harvest estimates and the number of fish that could be accounted for, primarily as a hatchery return. No attempt was made to estimate numbers of fish that spawned naturally or died prior to spawning. Therefore, estimated exploitation rates should be considered maximum rates.

## Stock Separation

The USACE publishes counts of adult steelhead taken as fish negotiate fish ladders over the dams on the Columbia and Snake rivers. At Bonneville Dam, a bimodal pattern of steelhead movement has been recognized for many years. The Columbia River Fish Management Plan (Anonymous 1987) defines steelhead that pass Bonneville Dam through August 25 as Group A and

those passing after August 25 as Group B (the date method). For our purposes, we consider Groups A and B to be synonymous with A-strain (A) and B-strain (B), respectively. Early marking and recovery studies identified Group A steelhead to be fish that return to lower elevation streams in the Columbia and Snake river drainages. And, Group B steelhead return to the Clearwater and Salmon rivers in Idaho. Group A fish are smaller in size than Group B and predominately return after one-ocean year. Group B fish are larger in size and predominately return after two-ocean years. A bimodal pattern is not evident at upstream dams, so the date method is not implemented. Furthermore, changes in the bimodal pattern and the run composition in recent years have weakened the date methodology. I developed the fork length methodology to provide a means of stock separation at Lower Granite Dam. After analyzing length frequencies from several known stocks of Group A fish and comparing them to known stocks of Group B fish, I determined that 77.5 cm fork length (FL) was a useful size for stock separation. With some modification, the fork length method is also useful in stock separation at Bonneville Dam.

Each week at Bonneville Dam, Oregon Department of Fish and Wildlife (ODFW) personnel trap steelhead swimming up the ladder. They measure fork length (FL), record the presence or absence of an adipose fin, and take scales from the fish samples. ODFW then supplies Idaho Department of Fish and Game (IDFG) with copies of the data, including scale readings.

National Marine Fisheries Service personnel (NMFS) sample steelhead at Lower Granite Dam each week through the steelhead run. NMFS supplies IDFG with the numbers of fish in each of four categories: naturally-produced steelhead with less than 77.5 cm FL, hatchery steelhead less than 77.5 cm FL, naturally-produced steelhead longer than 77.5 cm FL, and hatchery steelhead longer than 77.5 cm FL.

Using fish counts supplied by USACOE and sample data taken by ODFW and NMFS, we estimate the number of naturally-produced and hatchery steelhead, and the number of A- and B-strain fish in runs passing Bonneville and Lower Granite dams. We construct spreadsheets using the Lotus 1-2-3 Release 5 for Windows computer software program. Dam counts are partitioned into the four groups based on the percent of each of the four groups in the weekly sample size. Weekly counts and estimates are added to show cumulative totals for the season.

Sample weeks ran from Monday through Sunday. Small weekly counts at the beginning and end of the run were added together, and the naturally-produced and hatchery portions, along with the A- and B-strain estimates, were calculated using the first and last week's sample ratios, respectively.

### Overlap

As is expected, the 77.5 cm separation size is not perfect for separating A- from B-strain steelhead. A percentage of A-strain fish are longer than 77.5 cm FL. A somewhat greater percentage of B-strain fish are shorter than the cutoff. We adjusted the original estimates of naturally-produced A- and B-strain steelhead to reflect this overlap of the separation size. The adjusted estimates for naturally-produced A- and B-strain steelhead were added to the Bonneville and Lower Granite dams spreadsheets and were listed immediately below the original estimates.

We estimated the percentage of overlap in naturally-produced fish using fork lengths of wild steelhead caught, measured, and released in the Middle Fork Salmon, South Fork Salmon, and

Selway rivers (P. Hassemer, personal communication). We estimated that 14% of the wild A-strain steelhead were longer than 77.5 cm FL, and 36% of wild B-strain fish were less than 77.5 cm FL. These were the overlap correction factors used with fishery data from Lower Granite Dam.

The overlap correction factors at Bonneville Dam were modified to reflect the influence of many steelhead stocks in Oregon and Washington waters that cross Bonneville Dam, but do not enter Idaho. We estimated that 2% of the naturally produced A-strain sized steelhead crossing Bonneville Dam were longer than 77.5 cm FL. Since B-strain steelhead are unique to Idaho, the estimate of naturally produced B-strain steelhead less than 77.5 cm FL remained at 36%.

The calculations of estimated numbers of naturally-produced A-strain vs. B-strain steelhead adjusted for overlap are as follows:

### Bonneville Dam

Using the percentage overlaps for Bonneville Dam as given above, if:

a = % of A-strain naturally-produced steelhead < 77.5 cm FL (or 98%),  
 b = % of B-strain naturally-produced steelhead < 77.5 cm FL (or 36%),  
 s = total estimated number of naturally-produced fish < 77.5 cm FL,  
 S = total estimated number of naturally-produced fish > 77.5 cm FL,  
 A = total number of naturally-produced A's,  
 B = total number of naturally-produced B's,

Then:

$$aA + bB = s \tag{1}$$

$$(1-a)A + (1-b)B = S$$

or:

$$0.98A + 0.36B = s \tag{2}$$

$$0.02A + 0.64B = S$$

We simultaneously solved these two algebraic expressions to calculate the total numbers of naturally-produced A- and B-strain steelhead:

$$0.98A + 0.36B = s \qquad 0.02A + 0.64B = S \tag{3}$$

$$0.98A + \frac{0.36(S-0.02A)}{0.64} = s \qquad B = \frac{S - 0.02A}{0.64} \tag{4}$$

$$(0.64*0.98)A + 0.36S - (0.36*0.02)A = 0.64s \quad (5)$$

$$(0.64*0.98)A - (0.36*0.02)A = 0.64s - 0.36S \quad (6)$$

$$((0.64*0.98) - (0.36*0.02)) A = 0.64s - 0.36S \quad (7)$$

$$A = (0.64s - 0.36S)/((0.64*0.98) - (0.36*0.02)) \quad (8)$$

### Lower Granite Dam

Using the percentage overlaps for Lower Granite Dam as given above, if:

a = % of naturally-produced A-strain steelhead < 77.5 cm FL (or 86%),

b = % of naturally-produced B-strain steelhead < 77.5 cm FL (or 36%),

s = total estimated number of naturally-produced fish < 77.5 cm FL,

S = total estimated number of naturally-produced fish > 77.5 cm FL,

A = total of naturally-produced A's,

B = total number of naturally-produced B's,

then:

$$aA + bB = s \quad (1)$$

$$(1-a)A + (1-b)B = S$$

or:

$$0.86A + 0.36B = s \quad (2)$$

$$0.14A + 0.64B = S$$

We simultaneously solved these two algebraic expressions to calculate the total numbers of naturally-produced A- and B-strain steelhead:

$$0.86A + 0.36B = s \quad 0.14A + 0.64B = S \quad (3)$$

$$0.86A + \frac{0.36(S-0.14A)}{0.64} = s \quad B = \frac{S - 0.14A}{0.64} \quad (4)$$

$$(0.64*0.86)A + 0.36S - (0.36*0.14)A = 0.64s \quad (5)$$

$$(0.64*0.86)A - (0.36*0.14)A = 0.64s - 0.36S \quad (6)$$

$$((0.64*0.86) - (0.36*0.14)) A = 0.64s - 0.36S \quad (7)$$

$$A = (0.64s - 0.36S)/((0.64*0.86) - (0.36*0.14)) \quad (8)$$

## RESULTS

### Creel Survey

During the fall 1996 and spring 1997 seasons, we interviewed 17,153 anglers that had harvested 3,715 hatchery fish, which represented 14.3% of the total number of hatchery steelhead estimated as harvested (Tables 3-17). We physically examined 3,507 hatchery fish for marks, which represented 13.5% of the total steelhead harvest (Table 18). We removed 559 snouts for CWT retrieval from fish with clipped left ventral fins or from fish that triggered positive detection signals using a portable CWT wand detector.

Total harvest for the river sections listed in Table 19 was 26,043 steelhead, of which 26,034 hatchery fish were kept and another 9 natural-origin steelhead were harvested illegally during the 1996-97 season. The estimated number of hatchery steelhead harvested represented 32.8% of the hatchery steelhead that were counted at Lower Granite Dam.

From anglers' creels, we recovered 477 CWTs from 88 different mark groups. The overall proportion of tags recovered from the number of fish checked for marks was 13.6% (Table 18). 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 also listed in Appendix B. Of the 88 mark groups that yielded CWTs in the fishery, 75 were from releases in Idaho (Appendices B, C, and D). All CWTs recovered at hatchery racks were also recovered in the fishery except for one CWT from tag group 10/50/09.

Coded wire tags were also recovered from five Oregon, six Washington, and six NMFS-tagged wire groups (Appendices B and E). Two Oregon tag groups were from releases on the Imnaha River and three were from releases on the Wallowa River. Washington tag groups were from two releases in the Touchet River, two in the Walla Walla River, and one each in the Tucannon River and at Lyons Ferry Hatchery. The six NMFS-tagged groups were from steelhead smolts tagged at Lower Granite Dam during their downstream migration. These smolts were then transported downriver and released at river mile 141 on the Columbia River below Bonneville Dam.

We estimated that at least 11,049 A-strain and 1,432 B-strain steelhead reared by LSRCP hatcheries returned to Idaho in 1996-97 (Table 20). Adult returns from the LSRCP program, verified by CWT recoveries, were from releases in the Salmon and Clearwater river drainages. However, CWTs from LSRCP releases were also recovered from the fishery in the Snake River bordering Idaho and Oregon. CWT recoveries form the basis of estimating adult returns from the LSRCP program in Idaho. The estimated return of adult steelhead to Idaho in 1996-97 from the LSRCP program was 12,481 fish. The return estimate was comprised of harvest by Idaho anglers, hatchery returns, and off-site escapement which is included with the hatchery return information (Table 20). The LSRCP contribution to Idaho's hatchery steelhead harvest (except sections 02, 08, 09, and 21 through 28) in 1996-97 was 8,355 adult steelhead. This number does not include an estimated harvest of 221 LSRCP-reared fish in Oregon and Washington that were caught by Idaho anglers (Appendix B and E). Additionally, LSRCP-reared fish released in Idaho were caught by Oregon, Washington, tribal anglers and others in the Columbia and Snake River corridors as well as in the

Table 3. Steelhead fishery interview data (unexpanded) from lower Snake River (01), September - December 1996.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
September	48	105	4	0	2	0	6	18	100
October	402	1,706	76	0	12	18	106	16	83
November	350	1,088	42	0	2	7	51	21	86
December	69	151	9	0	2	1	12	13	92
Total	869	3,050	131	0	18	26	175		
Average								17	85

Table 4. Steelhead fishery interview data (unexpanded) from lower Clearwater River (03) and North Fork Clearwater River (05), October 1996 - March 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	589	2,307	104	0	68	44	216	11	80
November	1,569	5,520	160	0	35	50	245	23	80
December	503	1,447	85	0	24	26	135	11	81
Fall total	2,661	9,274	349	0	127	120	596		
Average								16	80
January	240	811	45	0	26	5	76	11	93
February	730	2,890	100	0	16	16	132	22	88
March	301	1,074	30	0	9	5	44	24	89
Spring total	1,271	4,775	175	0	51	26	252		
Average								19	90
Total	3,932	14,049	524	0	178	146	848		
Average								17	83

Table 5. Steelhead fishery interview data (unexpanded) from upper Clearwater River and Middle Fork Clearwater rivers (04), November 1996 - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
November	52	130	3	0	0	0	3	43	100
December	15	34	1	0	0	0	1	34	100
Fall total	67	164	4	0	0	0	4		
Average								41	100
February	188	725	11	0	12	0	23	32	100
March	252	931	30	0	7	9	46	20	80
April	12	44	4	0	1	1	6	7	83
Spring total	452	1,700	45	0	20	10	75		
Average								23	87
Total	519	1,864	49	0	20	10	79		
Average								24	87

Table 6. Steelhead fishery interview data (unexpanded) from South Fork Clearwater River (07), November 1996 - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
November	7	18	0	0	0	0	0	--	--
December	1	2	0	0	0	0	0	--	--
Fall total	8	20	0	0	0	0	0		
Average								--	--
February	16	26	4	0	0	0	4	7	100
March	266	721	30	0	3	3	36	20	92
April	158	493	24	0	11	1	36	14	97
Spring total	440	1,240	58	0	14	4	76		
Average								16	95
Total	448	1,260	58	0	14	4	76		
Average								17	95

Table 7. Steelhead fishery interview data (unexpanded) from Salmon River Section 10, October 1996 - March 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	112	431	19	0	3	4	26	17	85
November	38	131	12	0	2	3	17	8	82
Fall total	150	562	31	0	5	7	43		
Average								13	84
February	28	107	3	0	1	0	4	27	100
March	10	25	0	0	0	0	0	--	--
Spring total	38	132	3	0	1	0	4		
Average								33	100
Total	188	694	34	0	6	7	47		
Average								15	85

Table 8. Steelhead fishery interview data (unexpanded) from Salmon River Section 11, October 1996 - March 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/ Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	318	1,414	53	0	11	11	75	19	85
November	305	1,272	52	0	4	10	66	19	85
Fall total	623	2,686	105	0	15	21	141		
Average								19	85
February	146	422	8	0	3	6	17	25	65
March	156	406	13	0	5	10	28	15	64
Spring total	302	828	21	0	8	16	45		
Average								18	64
Total	925	3,514	126	0	23	37	186		
Average								19	80

Table 9. Steelhead fishery interview data (unexpanded) from Salmon River Section 12, October 1996 - March 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	649	3,223	151	0	41	52	244	13	79
November	988	4,333	109	0	24	21	154	28	86
Fall total	1,637	7,556	260	0	65	73	398		
Average								19	82
February	350	1,435	26	0	6	12	44	33	73
March	380	1,569	32	0	17	13	62	25	79
Spring total	730	3,004	58	0	23	25	106		
Average								28	76
Total	2,367	10,560	318	0	88	98	504		
Average								21	81

Table 10. Steelhead fishery interview data (unexpanded) from Salmon River Section 13, October 1996 - March 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	57	367	52	0	9	25	86	4	71
November	108	464	89	0	9	23	121	4	81
Fall total	165	831	141	0	18	48	207		
Average								4	77
March	38	183	23	0	18	13	54	3	76
Spring total	38	183	23	0	18	13	54		
Average								3	76
Total	203	1,014	164	0	36	61	261		
Average								4	77

Table 11. Steelhead fishery interview data (unexpanded) from Salmon River Section 14, October 1996 - March 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	162	2,159	75	0	22	82	179	12	54
November	233	3,310	145	0	2	39	186	18	79
Fall total	395	5,469	220	0	24	121	365		
Average								15	67
March	132	1,648	118	0	84	46	248	7	81
Spring total	132	1,648	118	0	84	46	248		
Average								7	81
Total	527	7,117	338	0	108	167	613		
Average								12	73

Table 12. Steelhead fishery interview data (unexpanded) from Salmon River Section 15, October 1996 - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	649	7,258	280	1	111	59	451	16	87
November	788	7,803	240	0	107	34	381	20	91
Fall total	1,437	15,061	520	1	218	93	832		
Average								18	89
March	1,090	9,695	480	0	374	55	909	11	94
April	31	181	11	0	12	2	25	7	92
Spring total	1,121	9,876	491	0	386	57	934		
Average								11	94
Total	2,558	24,937	1,011	1	604	150	1,766		
Average								14	91

Table 13. Steelhead fishery interview data (unexpanded) from Salmon River Section 16, October 1996 - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	50	210	14	0	11	2	27	8	93
November	216	882	32	0	6	2	40	22	95
Fall total	266	1,092	46	0	17	4	67		
Average								16	94
February	18	43	0	0	1	0	1	43	100
March	282	1,177	35	0	4	7	46	26	85
April	162	755	58	0	66	3	127	6	98
Spring total	462	1,975	93	0	71	10	174		
Average								11	94
Total	728	3,067	139	0	88	14	241		
Average								13	94

Table 14. Steelhead fishery interview data (unexpanded) from Salmon River Section 17, October 1996 - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	6	23	0	0	0	0	0	--	--
November	26	106	2	0	0	2	53	100	100
Fall total	32	129	2	0	0	2			
Average							65	100	100
March	858	4,496	159	0	89	266	17	93	
April	693	5,240	244	0	268	523	10	98	
Spring total	1,551	9,736	403	0	357	789			
Average							12	96	
Total	1,583	9,865	405	0	357	791			
Average							12	96	

Table 15. Steelhead fishery interview data (unexpanded) from Salmon River Section 18, March - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
March	210	973	36	0	21	5	62	16	92
April	569	2,854	92	0	102	11	205	14	95
Total	779	3,827	128	0	123	16	267		
Average								14	94

Table 16. Steelhead fishery interview data (unexpanded) from Salmon River Section 19, March - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
March	178	651	24	0	14	2	40	16	95
April	401	1,732	84	0	69	8	161	11	95
Total	579	2,383	108	0	83	10	201		
Average								12	95

Table 17. Steelhead fishery interview data (unexpanded) from Salmon River Section 20, October 1996 - April 1997.

Dates	No. Anglers	Total Hours Fished	Steelhead Kept		Steelhead Released		Total Catch	Hours/Fish	Percent Hatchery
			Hatchery	Wild	Hatchery	Wild			
October	16	50	0	0	1	0	1	50	100
Fall total	16	50	0	0	1	0	1		
Average								50	100
February	54	225	10	0	13	2	25	9	92
March	452	1,504	62	1	42	6	111	14	94
April	426	1,419	110	0	55	14	179	8	92
Spring total	932	3,148	182	1	110	22	315		
Average								10	93
Total	948	3,198	182	1	111	22	316		
Average								10	93

Table 18. Proportion of estimated harvest by river section examined for marks, 1996-1997.

River Section	No. Fish Checked	Estimated Harvest <sup>a</sup>	Sample Rate (%)
01	128	2,525	5.1
03 & 05	489	4,301	11.4
04 & 06	49	478	10.3
07	58	150	38.7
10	29	1,403	2.1
11	108	2,698	4.0
12	303	1,762	17.2
13	159	549	29.0
14	320	2,574	12.4
15	949	3,902	24.3
16	132	1,096	12.0
17	387	1,952	19.8
18	121	765	15.8
19	107	880	12.2
20	168	1,008	16.7
Total	3,507	26,043	
Average			13.5

<sup>a</sup> Statewide harvest survey data from Thomas J. McArthur, IDFG, (unpublished).

Table 19. Estimated number of hatchery steelhead harvested in the lower Snake, Clearwater and Salmon rivers during the 1996-1997 seasons.

River and Section	Fall Season - 1996			Spring Season - 1997			Total Harvest No. Hatchery Fish
	Estimated Harvest <sup>a</sup>	Percent Hatchery	No. Hatchery Fish	Estimated Harvest <sup>a</sup>	Percent Hatchery	No. Hatchery Fish	
<u>Snake R.</u>							
01	2,525	100	2,525	0	--	0	2,525
<u>Clearwater R.</u>							
03 & 05	3,266	100	3,266	1,035	100	1,035	4,301
04	358	100	358	120	100	120	478
07	0	--	0	150	100	150	150
Clwtr. Total	3,624		3,624	1,305		1,305	4,929
Average		100			100		
<u>Salmon River</u>							
10	1,073	100	1,073	330	100	330	1,403
11	1,633	100	1,633	1,065	100	1,065	2,698
12	1,327	100	1,327	435	100	435	1,762
13	459	100	459	90	100	90	549
14	2,244	100	2,244	330	100	330	2,574
15	1,938	99.8	1,934	1,964	100	1,964	3,898
16	511	100	511	585	100	585	1,096
17	154	100	154	1,798	100	1,798	1,952
18	0	--	0	765	100	765	765
19	26	--	26 <sup>b</sup>	854	100	854	880
20	78	--	78 <sup>b</sup>	930	99.5	925	1,003
Salmon Total	9,443		9,439	9,146		9,141	18,580
Average		100			100		
1996-97 Total	15,592		15,588	10,451		10,446	26,034

<sup>a</sup> Statewide harvest survey data from Thomas J. McArthur, IDFG, (unpublished).

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



Table 20. Continued.

Release Year	Strain and Ocean-Age	No. of Fish Released	Release Site	Hatchery Rearing	Marks	Estimated Number of Fish		
						Harvest	Hatchery Return <sup>a</sup>	Total
1995	A-I	21,481	Little Salmon R.	HNFH	CWT 10/45/16 <sup>c</sup>	30	30	60
1995	A-I	20,853	Little Salmon R.	HNFH	CWT 10/45/17 <sup>c</sup>	0	0	0
1995	A-I	22,923	Little Salmon R.	HNFH	CWT 10/45/21 <sup>c</sup>	17	17	34
1995	A-I	19,236	Little Salmon R.	HNFH	CWT 10/45/22 <sup>c</sup>	28	28	56
1995	A-I	272,023	Little Salmon R.	HNFH	None <sup>e</sup>	291	290	581
1995	A-I	43,988	Little Salmon R.	HNFH	None <sup>f</sup>	177	177	354
	Subtotal	2,471,158				5,440	2,813	8,253
1994	A-II	60,772	Sawtooth Hatchery	HNFH	CWT 10/46/28 <sup>c</sup>	12	2	14
1994	A-II	60,929	Sawtooth Hatchery	HNFH	CWT 10/46/29 <sup>c</sup>	16	7	23
1994	A-II	651,433	Sawtooth Hatchery	HNFH	None	367	118	485
1994	A-II	61,817	Salmon R. @ Bruno's Bridge	HNFH	CWT 10/49/26 <sup>c</sup>	49	55	104
1994	A-II	120,266	Salmon R. @ Bruno's Bridge	HNFH	None	95	107	202
1994	A-II	21,294	Pahsimeroi Hatchery	MVFFH	CWT 10/47/25	22	18	40
1994	A-II	21,660	Pahsimeroi Hatchery	MVFFH	CWT 10/47/26	31	13	43
1994	A-II	441,486	Pahsimeroi Hatchery	MVFFH	None <sup>c</sup>	981	363	1,344
1994	A-II	21,155	Salmon R. @ Lemhi R.	HNFH	CWT 10/46/03 <sup>c</sup>	28	8	36
1994	A-II	214,633	Salmon R. @ Lemhi R.	HNFH	None	284	80	364
1994	A-II	20,529	Little Salmon R.	HNFH	CWT 10/46/01 <sup>c</sup>	4	4	8
1994	A-II	20,365	Little Salmon R.	HNFH	CWT 10/46/02 <sup>c</sup>	0	0	0
1994	A-II	287,269	Little Salmon R.	HNFH	None	28	28	56
1994	A-II	20,958	Little Salmon R.	MVFFH	CWT 10/47/23	4	4	8
1994	A-II	21,530	Little Salmon R.	MVFFH	CWT 10/47/24	0	0	0
1994	A-II	425,062	Little Salmon R.	MVFFH	None <sup>c</sup>	40	40	80
	Subtotal	2,471,158				1,961	847	2,808

Table 20. Continued.

Release Year	Strain and Ocean-Age	No. of Fish Released	Release Site	Hatchery Rearing	Marks	Estimated Number of Fish		
						Harvest	Hatchery Return <sup>a</sup>	Total
1995	B-I	20,328	Slate Cr.	MVFH	CWT 10/20/01 <sup>c</sup>	0	0	0
1995	B-I	20,983	Slate Cr.	MVFH	CWT 10/20/02 <sup>c</sup>	5	0	5
1995	B-I	20,391	Slate Cr.	MVFH	CWT 10/20/05 <sup>c</sup>	0	0	0
1995	B-I	154,233	Slate Cr.	MVFH	None	13	0	13
1995	B-I	21,337	E. Fork Salmon R.	MVFH	CWT 10/20/03 <sup>c</sup>	1	0	1
1995	B-I	19,328	E. Fork Salmon R.	MVFH	CWT 10/20/04 <sup>c</sup>	0	0	0
1995	B-I	20,414	E. Fork Salmon R.	MVFH	CWT 10/20/12 <sup>c</sup>	0	0	0
1995	B-I	61,767	E. Fork Salmon R.	MVFH	CWT 10/20/24 <sup>c</sup>	8	11	19
1995	B-I	3,233	E. Fork Salmon R.	MVFH	None <sup>g</sup>	1	0	1
1995	B-I	362,626	E. Fork Salmon R.	MVFH	None <sup>h</sup>	9	13	22
1995	B-I	19,430	Little Salmon R.	MVFH	CWT 10/20/06 <sup>c</sup>	0	0	0
1995	B-I	19,546	Little Salmon R.	MVFH	CWT 10/20/13 <sup>c</sup>	0	0	0
1995	B-I	19,998	Little Salmon R.	MVFH	CWT 10/20/14 <sup>c</sup>	10	10	20
1995	B-I	283,706	Little Salmon R.	MVFH	None	49	49	98
1995	B-I	56,573	Clearwater R. @ Clear Cr.	CAFH	CWT 10/20/25 <sup>c</sup>	143	2	145
1995	B-I	62,835	Clearwater R. @ Clear Cr.	CAFH	CWT 10/20/26 <sup>c</sup>	0	1	1
1995	B-I	58,316	Clearwater R. @ Clear Cr.	CAFH	CWT 10/20/27 <sup>c</sup>	0	2	2
1995	B-I	5,988	Clearwater R. @ Clear Cr.	CAFH	None	5	0	5
1995	B-I	22,056	Red R.	CAFH	CWT 10/45/05 <sup>i,k</sup>	0	0	0
1995	B-I	21,585	Red R.	CAFH	CWT 10/45/06 <sup>i,k</sup>	0	0	0
1995	B-I	1,350	Red R.	CAFH	None <sup>j,k</sup>	0	0	0
1995	B-I	4,790	Red R.	CAFH	None <sup>c,j,k</sup>	0	0	0
1995	B-I	42,595	S. Fork Clearwater R.	CAFH	CWT 10/46/21 <sup>c</sup>	0	0	0
1995	B-I	21,242	S. Fork Clearwater R.	CAFH	CWT 10/47/27 <sup>c</sup>	0	0	0
1995	B-I	21,350	S. Fork Clearwater R.	CAFH	CWT 10/47/28 <sup>c</sup>	10	0	10
1995	B-I	319,063	S. Fork Clearwater R.	CAFH	None	37	37	74
Subtotal						291	125	416
						1,685,063		

Table 20. Continued.

Release Year	Strain and Ocean-Age	No. of Fish Released	Release Site	Hatchery Rearing	Marks	Estimated Number of Fish		
						Harvest	Hatchery Return <sup>a</sup>	Total
1994	B-II	62,510	Slate Cr.	MV FH	CWT 10/49/25	28	1	29
1994	B-II	148,845	Slate Cr.	MV FH	None <sup>c</sup>	133	4	137
1994	B-II	21,296	E. Fork Salmon R.	MV FH	CWT 10/47/10 <sup>f</sup>	7	0	7
1994	B-II	20,048	E. Fork Salmon R.	MV FH	CWT 10/47/11 <sup>e</sup>	44	12	56
1994	B-II	21,377	E. Fork Salmon R.	MV FH	CWT 10/47/12 <sup>e</sup>	12	11	23
1994	B-II	21,369	E. Fork Salmon R.	MV FH	CWT 10/47/13 <sup>e</sup>	25	12	37
1994	B-II	20,443	E. Fork Salmon R.	MV FH	CWT 10/47/21 <sup>f</sup>	0	0	0
1994	B-II	20,974	E. Fork Salmon R.	MV FH	CWT 10/47/22 <sup>f</sup>	8	0	8
1994	B-II	226,333	E. Fork Salmon R.	MV FH	None <sup>c,g</sup>	163	70	233
1994	B-II	164,740	E. Fork Salmon R.	MV FH	None <sup>c,h</sup>	12	5	17
1994	B-II	20,891	Little Salmon R.	MV FH	CWT 10/47/14	9	9	18
1994	B-II	21,243	Little Salmon R.	MV FH	CWT 10/47/15	11	11	22
1994	B-II	21,582	Little Salmon R.	MV FH	CWT 10/47/16	6	6	12
1994	B-II	175,009	Little Salmon R.	MV FH	None <sup>c</sup>	72	71	143
1994	B-II	21,507	Clearwater R. @ Clear Cr.	CAF H	CWT 10/47/29	0	2	2
1994	B-II	21,562	Clearwater R. @ Clear Cr.	CAF H	CWT 10/47/30	0	1	1
1994	B-II	20,827	Clearwater R. @ Clear Cr.	CAF H	CWT 10/47/33 <sup>c</sup>	0	0	0
1994	B-II	89,964	Clearwater R. @ Clear Cr.	CAF H	None <sup>c</sup>	0	4	4
1994	B-II	21,779	Crooked R.	CAF H	CWT 10/47/32 <sup>c</sup>	0	0	0
1994	B-II	20,883	Crooked R.	CAF H	CWT 10/47/37 <sup>c</sup>	0	0	0
1994	B-II	61,788	Crooked R.	CAF H	None	0	0	0
1994	B-II	71,566	Crooked R.	CAF H	RV Clip <sup>c,j</sup>	--	--	--
1994	B-II	50,027	S. Fork Red R.	CAF H	None <sup>c,i,k</sup>	--	--	--
1994	B-II	20,424	S. Fork Clearwater R.	CAF H	CWT 10/47/31	10	11	21
1994	B-II	21,086	S. Fork Clearwater R.	CAF H	CWT 10/47/34 <sup>c</sup>	0	1	1
1994	B-II	22,137	S. Fork Clearwater R.	CAF H	CWT 10/47/35 <sup>c</sup>	10	10	20
1994	B-II	21,430	S. Fork Clearwater R.	CAF H	CWT 10/47/36 <sup>c</sup>	9	0	9
1994	B-II	307,988	S. Fork Clearwater R.	CAF H	None <sup>c</sup>	104	111	215
Subtotal						663	352	1,015

Table 20. Continued.

Release Year	Strain and Ocean-Age	No. of Fish Released	Release Site	Hatchery Rearing	Marks	Estimated Number of Fish		
						Harvest	Hatchery Return <sup>a</sup>	Total
1993	B-III	187,100	Slate Cr.	MVFH	None	0	0	0
1993	B-III	16,024	E. Fork Salmon R.	MVFH	CWT 10/50/05	0	0	0
1993	B-III	18,924	E. Fork Salmon R.	MVFH	CWT 10/50/07	0	0	0
1993	B-III	19,128	E. Fork Salmon R.	MVFH	CWT 10/50/09	0	1	1
1993	B-III	87,272	E. Fork Salmon R.	MVFH	None <sup>c,g</sup>	0	0	0
1993	B-III	356,052	E. Fork Salmon R.	MVFH	None <sup>c,h</sup>	0	0	0
1993	B-III	19,358	Little Salmon R.	MVFH	CWT 10/50/04	0	0	0
1993	B-III	19,932	Little Salmon R.	MVFH	CWT 10/50/06	0	0	0
1993	B-III	19,909	Little Salmon R.	MVFH	CWT 10/50/08	0	0	0
1993	B-III	266,101	Little Salmon R.	MVFH	None <sup>c</sup>	0	0	0
1993	B-III	25,673	S. Fork Clearwater R.	CAFH	CWT 10/29/47 <sup>c</sup>	0	0	0
1993	B-III	22,003	S. Fork Clearwater R.	CAFH	CWT 10/49/37 <sup>c</sup>	0	0	0
1993	B-III	21,340	S. Fork Clearwater R.	CAFH	CWT 10/49/38 <sup>c</sup>	0	0	0
1993	B-III	257,284	S. Fork Clearwater R.	CAFH	None <sup>c</sup>	0	0	0
Subtotal						0	1	1

<sup>a</sup> Includes off-site escapement and strays to hatchery racks.  
<sup>b</sup> HNFH = Hagerman National Fish Hatchery.  
<sup>c</sup> Release group includes fish marked with passive integrated transponder (PIT) tags.  
<sup>d</sup> MVFH = Magic Valley Fish Hatchery.  
<sup>e</sup> Hells Canyon stock.  
<sup>f</sup> Pahsimeroi stock.  
<sup>g</sup> East Fork Salmon River stock.  
<sup>h</sup> Dworshak National Fish Hatchery stock.  
<sup>i</sup> CAFH = Clearwater Anadromous Fish Hatchery.  
<sup>j</sup> Fingering release.  
<sup>k</sup> Fall release.

ocean during 1996-97. We queried the computer CWT database of the Pacific States Marine Fisheries Commission (PSMFC) to determine tag recoveries of these LSRCP fish in harvest areas outside Idaho. As of our April 9, 1999 query to PSMFC's CWT database on the Internet, 88 CWTed fish from LSCRCP-reared hatcheries in Idaho were reported caught from fisheries in the lower Columbia River and its tributaries, in the ocean, and in the Zone 6 tribal fishery (Appendix F). The 88 CWT recoveries represent only those tag groups expected to return as adults during 1996-97 (Appendices C and D). Harvest of LSRCP-reared fish from Idaho that occurred downstream of Snake River section 01 was reported by Washington (Schuck et al. 1998) and was not included in the appendix table.

In 1996-97, the maximum exploitation rate for two-ocean adult steelhead returning to Sawtooth Hatchery was 76%. East Fork Salmon River returns after two ocean-years were exploited at a maximum rate of 71%. Off-site releases in 1994 at Bruno's Bridge and Lemhi River were estimated to be exploited at 47% and 78% respectively. In the Little Salmon River, exploitation was not quantified, but was estimated to be 50% (Table 20). Exploitation of steelhead released in the South Fork Clearwater River was 49% after two ocean-years.

All CWT recoveries from steelhead released from hatchery racks in the upper Salmon River were recovered downstream of their release sites until this year. Two B-strain East Fork fish released in 1994 were recovered upstream at a temporary weir near the mouth of Slate Creek, 23.2 km upstream from the mouth of the East Fork Salmon River.

#### Stock Separation

Stock separation for naturally-produced and hatchery steelhead at Bonneville Dam using the fork length methodology is in Appendix G. At Lower Granite Dam, the results of the fork length method for stock separation is in Appendix H.

### **DISCUSSION**

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

Returns of steelhead released from Sawtooth Hatchery in 1994 are now complete. From the release of 733,134 smolts, we estimated a return of 1,989 adults after one ocean-year and 522 after two ocean-years. The total return of 2,511 adults was 0.34% of the number released, and a maximum exploitation rate of 81% of the adult returns were harvested (Ball 1999a; Table 20).

Adult returns from the 1995 Sawtooth Hatchery release have returned after their first ocean-year. From 685,006 smolts released, 3,404 (0.50%) returned to the fishery and Sawtooth Hatchery (Table 20).

## Harvest of East Fork Salmon River Releases

Returns of steelhead released from the East Fork Salmon River in 1993 are now complete. From 497,400 smolts released, we estimated that 53 returned after one ocean-year, 195 returned after two ocean-years and one fish after three ocean-years (Ball 1998, 1999a; Table 20). There were 249 returning adults (0.05%), of which 90% were harvested. B-strain steelhead in the Clearwater drainage commonly return 2-5% of the adults after three ocean-years (Roseberg et al., 1991). In the upper Salmon River drainage, however, the proportion of three-ocean returnees from East Fork B-strain releases is very small. Of the 208 known-age CWT Idaho fishery recoveries of East Fork marked fish, to date only six (2.9%) East Fork CWT fish have been recovered as three-ocean from the fishery. An additional three (1.5%) CWT fish have been recovered at the East Fork trap as three-ocean returns from a total of 202 CWT fish counted at the East Fork trap since steelhead were first released there beginning in 1983.

From 517,180 smolts released in 1994, we estimate that 137 adults returned after one ocean-year, and 381 returned after two ocean-years (Ball 1999a; Table 20). The total return to date is 518 adults (0.1%), of which 375 (72%) were harvested.

The 1995 release of 488,705 smolts into the East Fork returned an estimated 43 adults after one ocean-year. Of these one-ocean returns, 19 (44%) were harvested.

Since 1989, smolts released into the East Fork Salmon River have been from parents that returned to the East Fork trap and from adults from Dworshak National Fish Hatchery on the Clearwater River. Each year since 1989 (except 1993), each of the two stocks has been marked with CWTs to evaluate their performance (Table 21).

Through the 1995 releases, from a total of 304,359 CWTed smolts released as East Fork stock, 76 adults were harvested in Idaho and 92 returned to hatchery racks. From 371,366 CWTed smolts released as Dworshak stock, 41 adults were harvested in the Idaho fishery and 9 returned to hatchery racks (Table 21). From fairly comparable numbers of smolts released, East Fork stock fish have produced 2.3 times as much total harvest as Dworshak progeny. Total harvest includes tags recovered from both downriver and Idaho harvest areas. Tag code recoveries through 1996-97 show that 44% of East Fork and Dworshak stock steelhead harvest occurred downriver of the Idaho harvest areas (Table 21). Downriver harvest included Oregon and Washington sport fisheries, and commercial and Indian gillnet fisheries. These harvest areas extend from the confluence of the Clearwater and Snake rivers downstream to Bonneville Dam on the lower Columbia River. Based on CWT recoveries, comparison of downriver harvest between the two stocks showed a slight difference. For CWT recoveries reported to Idaho through December 1998, downriver harvest accounted for 38% of East Fork stock CWT recoveries, compared to 58% for Dworshak stock CWT recoveries. By the time these stocks returned to Idaho waters, East Fork stock fish produced 1.9 times more CWT recoveries in the fishery than Dworshak stock fish. Likewise, East Fork stock returned 10.2 times as many CWT adults to the hatchery rack as the Dworshak stock.

Table 21. Coded wire tag (CWT) recoveries of East Fork Salmon River steelhead releases - East Fork stock vs. Dworshak stock.

Release Year, Stock, Tag Codes, and No. Of Fish Released	I-Ocean		II-Ocean		III-Ocean		Harvest Downriver <sup>a</sup>	Rack ID. Returns	No. Tags Recovered
	Harvest Downriver <sup>a</sup>	Rack ID.	Returns	Harvest Downriver <sup>a</sup>	Rack ID.	Returns			
<u>1989</u>									
East Fork Stock:									
CWT 10/41/44,									
10/41/45, 10/41/46	1	0	4	16	12	3	0	0	36
n = 44,064									
Dworshak Stock:									
CWT 10/41/32,									
10/41/33, 10/41/34	0	0	1	0	6	1	0	1	9
n = 43,569									
<u>1990</u>									
East Fork Stock:									
CWT 10/42/36,									
10/42/37, 10/42/38	1	4	4	26	22	10	3	1	71
n = 46,403									
Dworshak Stock:									
CWT 10/42/33,									
10/42/34, 10/42/35	2	1	1	15	7	1	3	0	30
n = 44,763									
<u>1991</u>									
East Fork Stock:									
CWT 10/43/20,									
10/43/21, 10/43/22	5	1	7	23	12	3 <sup>b</sup>	3	1	55
n = 66,383									

Table 21. Continued.

Release Year, Stock, Tag Codes, and No. Of Fish Released	I-Ocean		II-Ocean		III-Ocean		Harvest Downriver <sup>a</sup> ID. Returns	Rack ID. Returns	No. Tags Recovered	
	Harvest Downriver <sup>a</sup> ID.									
<u>1991 (Cont.)</u>										
Dworshak Stock:										
CWT 10/43/14, 10/43/15, 10/43/16 n = 61,827	1	2	2	23	12	0	3	1	0	44
<u>1992</u>										
East Fork Stock:										
CWT 10/44/20 n = 20,821	0	2	1	5	1	2	0	0	0	11
Dworshak Stock:										
CWT 10/44/18, 10/44/19 n = 43,339	0	0	0	9	2	1 <sup>c</sup>	0	0	0	12
<u>1993</u>										
East Fork Stock:										
No CWT groups	--	--	--	--	--	--	--	--	--	--
Dworshak Stock:										
CWT 10/50/05, 10/50/07, 10/50/09 n = 54,076	0	1	1	6	4	0	0	0	1	13
<u>1994</u>										
East Fork Stock:										
CWT 10/47/11, 10/47/12, 10/47/13 n = 63,394	2	4	12	18	13	35 <sup>d</sup>	ND <sup>e</sup>	ND	ND	84

Table 21. Continued.

Release Year, Stock, Tag Codes, and No. Of Fish Released	I-Ocean		II-Ocean		III-Ocean		Harvest Downriver <sup>a</sup> ID. Returns	Rack ID. Returns	No. Tags Recovered
	Harvest Downriver <sup>a</sup> ID.	Rack ID.	Harvest Downriver <sup>a</sup>	Returns	Harvest Downriver <sup>a</sup>	Rack ID.			
<u>1994 (Cont.)</u>									
Dworshak Stock:									
CWT 10/47/10, 10/47/21, 10/47/22 n = 62,713	0	0	0	0	4	0	ND	ND	14
<u>1995</u>									
East Fork Stock:									
CWT 10/20/24 n = 61,767	1	3	11	11	ND	ND	ND	ND	15
Dworshak Stock:									
CWT 10/20/03, 10/20/04, 10/20/12 n = 61,079	1	1	0	0	ND	ND	ND	ND	2

<sup>a</sup> Downriver CWT recoveries reported through April 1999 at Idaho Department of Fish and Game CWT lab in Lewiston.

<sup>b</sup> Includes one stray to Pahsimeroi Hatchery.

<sup>c</sup> Includes one stray to Hells Canyon trap.

<sup>d</sup> Includes two strays to Slate Creek temporary weir.

<sup>e</sup> ND = No data.

### Harvest of Little Salmon River Releases

In 1994, both A-strain and B-strain smolts were released into the Little Salmon River. Adult returns after two ocean-years are complete. Based on past performance of B-strain fish returning to the Salmon River, very few three-ocean fish are expected next year. From the 795,713 A-strain smolts released, 256 adults returned after one ocean-year, and 152 returned after two ocean-years.

The total Little Salmon River return was estimated at 408 fish (0.05%), which included an estimated off-site escapement of 50% of the returning adults past the fishery. From the 238,725 B-strain smolts released in 1994, no adults were detected after one ocean-year and 195 estimated adults returned after two ocean-years. The total return of 195 (0.08%) includes an estimated off-site escapement of 50% of the returning adults past the fishery.

In 1994-95, we observed that 23% of the steelhead checked during the fishery in the Little Salmon River were of B-strain size; in 1995-96, we observed a similar proportion (22%) of B-strain sized fish in the fishery. However, in these two run-years, our estimated harvest of B-strain fish, based on CWT recoveries, fell far short of these percentages. Apparently, there must have been a survival problem with the CWTeD fish. In 1996-97, we observed 17% B-sized fish during creel checks in the Little Salmon. When we applied this percentage to the 1996-97 statewide steelhead harvest of 1,008 fish for the Little Salmon River (Appendix A), we expected an estimated harvest of 171 B-strain fish. Expanded CWT recoveries of B-strain fish generated a surprisingly larger harvest estimate of 195 steelhead (Table 20), just the opposite of the two previous run-years.

Including 1994, there have been six years when both A- and B-strain steelhead were released into the Little Salmon River to increase diversity of the fishery. Using CWT return data and harvest estimates, A-strain steelhead releases have returned 2.7 times as many adults to the drainage than B-strain releases (Ball 1989, 1996, 1997, 1998, 1999). Summarizing the completed two-ocean returns for both strains (including the 1994 release), the total estimated return of A-strain steelhead in the Little Salmon River was 6,252 fish (0.22%), while B-strain releases produced a total estimated return of 2,301 adults (0.12%).

### Harvest of Clearwater Anadromous Fish Hatchery Releases

The Clearwater Anadromous Fish Hatchery (CAFH), the newest LSRCP steelhead facility in Idaho, began releasing B-strain smolts in the Clearwater River drainage in 1993. Three CWT groups were included in this first release of 326,300 smolts into the South Fork Clearwater River. Returns are now complete for this release. After three ocean-years, we have not recorded any CWTs in the fishery from 69,016 marked fish. Two fish with CWTs strayed into the trap at Dworshak National Fish Hatchery in spring 1996.

The 1994 release of 393,065 smolts into the South Fork Clearwater River from CAFH fared better than the first release. Although no returning fish were detected as one-ocean in 1995-96, an estimated 266 fish returned after two ocean-years, and 133 (50%) were exploited. Also in 1994, 63,896 CWTeD fish reared at CAFH were released at Kooskia National Fish Hatchery on Clear

Creek. After two ocean-years, no CWTs were recovered in the 1996-97 fishery and seven fish returned to the hatchery rack as two-ocean B's. Previously, the 1995-96 harvest on these fish was greatly reduced due to a catch and release fishery in the fall and high river flooding in the spring (Ball, 1999a). While there may have been adult returns, we did not detect any.

In 1994, CAFH also released 42,662 CWTd smolts in Crooked River. To date, no adult returns have been detected. Another 50,027 unmarked fingerlings reared at CAFH were released in fall 1994 into the South Fork Red River. No attempts were made to estimate adult returns from this release, which was a supplementation research study.

### Off-site Releases

Off-site releases (smolt releases into the river or into 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. However, because these lower river sections have been unable to sustain a viable fishery after upriver fish have passed, off-site releases have been employed there.

In the upper Salmon River -- from North Fork upstream -- off-site releases have been used in recent years to distribute angling opportunity and harvest over more river miles. In 1988, evaluation of upper Salmon River off-site releases began with marked fish releases at Shoup Bridge, about eight km upstream of the city of Salmon. Although there were no marked LSRCP releases in the upper Salmon River that year, estimated returns were derived from a companion group of marked fish from Niagara Springs Fish Hatchery (Ball 1992b). Beginning in 1990, the LSRCP has reared smolts for various off-site releases in the upper Salmon River at Hagerman National Fish Hatchery and Magic Valley Fish Hatchery.

Concerns of potential interactions between steelhead smolts and emergent chinook salmon were raised in 1993. Consequently, the scheduled number of smolts released into the East Fork Salmon River were reduced that year. Slate Creek (23.2 km upstream of the mouth of the East Fork) was stocked with 187,100 B-strain smolts, none of which were CWTed. No attempts were made to document returns since only a small proportion of the B-strain fish return after one ocean-year. The 1994 release of 211,355 smolts into Slate Creek included a CWT mark group. After two ocean-years, 203 (0.10%) adults have returned from this release (Table 20).

In 1994 and 1995, off-site LSRCP releases of A-strain fish were spread over 141 km of the upper Salmon River from North Fork upstream to Challis. Adult returns are now complete for off-site releases in 1990, 1991, and 1993 at North Fork, Lemhi, Shoup Bridge, Ellis Bridge, and Challis. Return rates for these release groups ranged from 0.12% to 0.35%, and averaged 0.18% (Ball 1992b, 1994, 1996, 1997, 1998).

Adult returns from the 1994 off-site releases into the Salmon River at Bruno's Bridge and the Lemhi River showed slightly higher return rates than earlier off-site release groups. From 182,083 smolts released at Bruno's Bridge, an estimated 598 (0.33%) adults returned, and another 902 adults (0.38%) returned from a release of 235,788 smolts at the Lemhi (Table 20).

Releasing steelhead off-site has important management benefits in distributing anglers in space and time. Anglers enjoy the opportunity to catch steelhead later in the spring near these off-site release areas.

### Hatchery Straying

Concerns have been raised about the behavior of unexploited steelhead that return to off-site areas. Based on limited information in this report, an estimated 2,319 LSRCP steelhead may have escaped the fishery to return to off-site areas, which are generally large mainstem sites or near the mouths of tributaries. The fate of these fish, whether they spawned or not, is unknown. It is also unknown whether natural steelhead adults also returned to the same areas.

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 or release 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. Fish released off-site that return to areas without spawning gravel may enter hatchery racks and are included in the number of CWTs recovered there.

In 1997, there were 805 CWTs recovered from hatchery steelhead at hatchery racks in Idaho, excluding Hells Canyon. Additionally, NMFS personnel marked smolts with CWTs during their downriver outmigration. These smolts originated from throughout the Snake River drainage and contributed to the 1997 adult return to Idaho. In 1997, 33 NMFS-tagged fish returned to Idaho hatchery racks, but their site of origin is unknown.

Subtracting these 33 NMFS-tagged fish, a total of 772 CWT returns were recovered at Idaho racks: 318 to DNFH and KNFH on the Clearwater River, and 454 to Pahsimeroi, East Fork, and Sawtooth hatchery traps on the upper Salmon River.

Of the 454 CWTs recovered in the Salmon River drainage, 35 fish (7.7%) strayed to another rack or temporary weir. Only one of these 35 fish strayed from one hatchery rack to another; a one-ocean fish released with CWT 10/45/09 from Sawtooth Hatchery returned to the Pahsimeroi rack. The remaining 34 fish were either off-site released fish returning to hatchery racks, or hatchery rack releases that were recovered at the Slate Creek temporary weir.

Eight A-strain fish, marked with CWTs 10/20/09, 10/20/10, 10/20/11, and 10/49/26, were recovered at the Pahsimeroi rack from an off-site release into the Salmon River at Bruno's Bridge. Two fish, marked with CWT 10/20/17 and 10/20/18, returned to the Pahsimeroi rack from an off-site release into the Salmon River at McNabb's Point near Challis. These two release sites are located 12.6 and 13.9 km respectively upstream from the mouth of the Pahsimeroi River. Twenty CWTed fish released into the Salmon River at Torrey's Hole, carrying tags 10/45/13, 10/45/14, and 10/45/15, strayed upstream 40.7 km to Sawtooth Hatchery. One other fish from tag group 10/45/13 returned to the Slate Creek temporary weir. The Torrey's Hole release site is located 2.1 km above the

mouth of Slate Creek. The last A-strain stray was tagged with 10/45/11 and released from Sawtooth Hatchery. This fish was recovered at the Slate Creek weir. Two B-strain fish, released from the East Fork Salmon River with tag codes 10/47/11 and 10/47/12, also returned to the Slate Creek weir.

This year's straying rate is much higher than the average rate (1.13%) reported since 1985 (Ball 1986a, 1986b, 1988, 1989, 1990, 1991, 1992a, 1992b, 1994, 1996, 1997, 1998, 1999a). There has been very little variation between years and little or no change over time in the years we have been calculating straying rates between hatchery racks.

Straying may be affected by water conditions the fish encounter during their upstream migration. High water temperatures deplete stored fat resources and may cause some fish to spawn before they return to their release site. Therefore, fish returning the longest distance would show a higher rate of straying. This appears to be the situation with adults returning to Sawtooth Hatchery and other headwater release sites.

### **Sources of Error**

The primary sources of error involved in the steelhead harvest estimates have been discussed previously by Ball (1986), as well as the quality control of adipose clipping (Ball 1989).

Left ventral (LV) fin clips, which are used on steelhead to identify the presence of CWTs, may regenerate but nonetheless leave the fin deformed. Since there is a high proportion of hatchery fish with deformed fins from their life in the hatchery, we attempt to take snouts from all fish with deformed LV fins. Although we take additional snouts with these methods, we should not be missing very many CWTs. Spot checks at hatcheries with portable CWT detectors have confirmed that our methods detect greater than 98% of steelhead with CWTs.

Beginning with the spring 1995 releases in the Salmon River, A-strain steelhead implanted with CWTs did not have their LV fins clipped as external CWT indicators. B-strain CWTed fish released in the Salmon and Clearwater rivers continued to be marked externally with LV fin clips. During the 1996-97 fishery, census clerks working on the Salmon River were equipped with portable CWT hand wand detectors manufactured by Northwest Marine Technology, Inc. (NMT). During fall 1996, census clerks working the lower Clearwater and Snake River steelhead sections also used CWT wand detectors to scan fish for CWTs since A- and B-strain fish commingle in the two rivers during the fall and winter. Steelhead were visibly checked for external marks and their snouts scanned with CWT wand detectors to identify the presence of CWTs. In spring 1997, personnel at Pahsimeroi, East Fork, and Sawtooth hatcheries also scanned returning hatchery fish with CWT wand detectors to identify those potentially carrying CWTs. Fish that exhibited deformed LV fins or fish that triggered positive detection signals from the CWT wand detectors had their snouts excised for CWT retrieval when anglers granted permission for snout removal.

A CWT wand efficiency test conducted on both A- and B-strain steelhead snouts found the NMT portable CWT hand wands detected a minimum of 97% of CWTs. Steelhead snouts scanned in the field and at hatchery racks could yield false positives in a number of scenarios. A wand might

give a positive detection signal for a foreign metal object in the snout area when scanned, such as a hook, leader, or broken hook. Likewise, a wand might pick up external metal from the surrounding area, such as a watch, ring, coat zipper, or other metal object, if the snout was scanned too close to any of these metal-bearing surfaces. However, in all cases, false positive detections by the CWT hand wand result in excess snouts taken and very few CWTs should be missed with this method.

The number of CWT marked fish in each release group and the number of groups released each depend on many factors, but generally have been adjusted to produce adequate adult returns under average conditions. Several consecutive low water years and poor migration survival of both juveniles migrating downstream and adults returning upstream have resulted in several poor steelhead runs in the Salmon River. Consequently, the chance of recovering marked fish becomes very low and the accuracy of return information diminishes. Harvest patterns, exploitation rates, age at return, and other reasonably stable statistics have been aberrant.

It is impossible to predict when poor migration conditions will occur in order to mark more fish to compensate for poor survival. The reasoning to mark enough fish with average return expectations is still sound, but may not produce sufficient results in very low return years.

## **RECOMMENDATIONS**

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

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

Install a weir at Slate Creek to trap returning adults from the 1994 and 1995 releases.

Investigate additional areas in Salmon River sections 16, 17, and 18 for off-site smolt releases that do not conflict with federally-listed chinook salmon and steelhead.

Formulate and obtain funding for a marking program for PIT tag evaluation of adult returns to Lower Granite Dam.

## **ACKNOWLEDGMENTS**

Ralph Roseberg provided data from Dworshak National Fish Hatchery. Mark Schuck and Art Viola, Washington Department of Fish and Wildlife, cooperated with data collection and compilation for the Snake River. Marsha White contributed the cover photo

## LITERATURE CITED

- Anonymous 1987. Columbia River Fish Management Plan. (Document produced by Agencies and Tribes in U.S. vs. Oregon negotiations).
- Apperson, K. and G. Wilson, 1998. 1997 Chinook salmon fishery on the South Fork Salmon River, Idaho. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Idaho Department of Fish and Game, Boise.
- Ball, K. 1986a. Evaluation of the hatchery-wild composition of Idaho's steelhead harvest, September-November, 1984. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Contract No. 14-16-0001-84133 (RWG). Idaho Department of Fish and Game, Boise.
- Ball, K. 1986b. Evaluation of the hatchery-wild composition of Idaho salmon and 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 the hatchery-wild composition of Idaho salmon and 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 the hatchery-wild composition of Idaho salmon and 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. 1990. Evaluation of the 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. 1991. Evaluation of the 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.
- Ball, K. 1992a. Evaluation of the hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1989 to December 31, 1990. 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.
- Ball, K. 1992b. Evaluation of the hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1990 to December 31, 1991. 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.

- Ball, K. 1994. Evaluation of the hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1991 to December 31, 1992. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Idaho Department of Fish and Game, Boise.
- Ball, K. 1996. Evaluation of the hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1992 to December 31, 1993. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Idaho Department of Fish and Game, Boise.
- Ball, K. 1997. Evaluation of the hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1993 to December 31, 1994. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Idaho Department of Fish and Game, Boise.
- Ball, K. 1998. Evaluation of the hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1994 to December 31, 1995. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Idaho Department of Fish and Game, Boise.
- Ball, K. 1999. Evaluation of the hatchery-wild composition of Idaho salmon and steelhead harvest, October 1, 1995 to December 31, 1996. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Idaho Department of Fish and Game, Boise.
- Barrett, L. 1998. Clearwater River, Idaho Spring chinook salmon 1997 sport harvest report. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Idaho Department of Fish and Game, Boise.
- Roseberg, R.B., H.L. Burge, W.H. Miller and D. Diggs, 1991. A review of coded-wire tagged fish released from Dworshak, Kooskia, and Hagerman National Fish Hatcheries, 1976-1990. U.S. Fish and Wildlife Service Report. Ahsahka, ID.
- Schuck, M., A. Viola, J. Bumgarner and J. Dedloff, 1998. Lyons Ferry Trout Evaluation Study, 1996-97 Annual Report. U.S. Fish and Wildlife Service Lower Snake River Compensation Plan, Washington Department of Fish and Wildlife, Olympia, WA.



## **APPENDICES**



Appendix A. Total number of steelhead by section and month harvested by resident and nonresident anglers, fall 1996<sup>a</sup> and spring 1997<sup>a</sup>.

<b>Fall 1996 Steelhead Harvest</b>						
<b>River Section</b>	<b>September</b>	<b>October</b>	<b>November</b>	<b>December</b>	<b>Total</b>	
Snake R.						
01	536	714	1,173	102	2,525	
02	77	306	434	77	893	
Subtotal	612	1,020	1,607	179	3,418	
Clearwater R.						
03	255	995	1,403	485	3,138	
04	77	51	179	51	357	
05	0	0	26	102	128	
06	0	0	0	0	0	
07	0	0	0	0	0	
Subtotal	332	1,046	1,607	638	3,622	
Salmon R.						
10	77	434	281	281	1,071	
11	26	459	663	485	1,633	
12	179	612	510	26	1,326	
13	0	153	255	51	459	
14	0	969	1,020	255	2,245	
15	51	816	918	153	1,939	
16	0	102	383	26	510	
17	26	26	102	0	153	
18	0	0	0	0	0	
19	0	0	0	0	0	
20	26	26	26	0	77	
Subtotal	383	3,597	4,183	1,275	9,438	
Oxbow Reservoir	0	77	153	0	230	
Boise R.	0	0	26	0	26	
Payette R.	0	0	0	0	0	
Statewide Total	1,326	5,740	7,576	2,092	16,734	

Appendix A. Continued.

River Section	<u>Spring 1997 Steelhead Harvest</u>				
	January	February	March	April	Total
Snake R.					
01	0	0	0	0	0
02	15	0	0	15	30
Subtotal	15	0	0	15	30
Clearwater R.					
03	210	240	195	0	645
04	15	0	90	15	120
05	180	135	75	0	390
06	0	0	0	0	0
07	0	15	60	75	150
Subtotal	405	390	420	90	1,304
Salmon R.					
10	180	75	60	15	330
11	270	330	330	135	1,064
12	90	285	45	15	435
13	0	60	30	0	90
14	15	195	90	30	330
15	120	570	1,214	60	1,964
16	60	0	150	375	585
17	0	30	749	1,019	1,799
18	0	15	150	600	764
19	45	0	105	704	854
20	15	0	285	630	929
Subtotal	794	1,559	3,208	3,582	9,143
Oxbow Reservoir	0	0	0	0	0
Boise R.	0	0	0	0	0
Payette R.	0	0	0	0	0
Statewide Total	1,214	1,949	3,627	3,687	10,477

<sup>a</sup> Statewide harvest survey data from Thomas J. McArthur, IDFG, (unpublished).

Appendix B. Coded wire tag recoveries and fin clips identified September 1996 - April 1997; harvest estimates by month and river section; and total harvest estimates for the 1996-1997 season.

Tag Code: 05/21/53 Release Site: Clearwater R. Number Released: 19,422

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Sample	Est. Harv.	No. Tags	Sample Rate	No. Sample	Est. Harv.
01								
03/05			1	0.099	10		1	0.141
04/06								7
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Sample	Est. Harv.	No. Tags	Sample Rate	No. Sample	Est. Harv.	No. Tags	Est. Harv.
01										
03/05									2	17
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest 17

Appendix B. Continued.

Tag Code: 05/21/54      Release Site: Clearwater R.      Number Released: 20,451

River Sect.	<u>September</u>			<u>October</u>			<u>November</u>			<u>December</u>					
	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							1	0.141				7			
07															
10															
11															
12															
13															
14															
15															
16															
17															
River Sect.	<u>January</u>			<u>February</u>			<u>March</u>			<u>April</u>			<u>1996-97</u>		
	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															

Total Estimated Harvest

7

Appendix B. Continued.

Tag Code: 05/21/56 Release Site: Clearwater R. Number Released: 19,318

River Sect.	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	0.094	11	2	0.099	20	1	0.141	7
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												

River Sect.	January			February			March			April			1996-97		
	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															

Total Estimated Harvest

38

Appendix B. Continued.

Tag Code: 05/21/60      Release Site: Clearwater R.      Number Released: 21,144

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	Est. Harv. Tags
01								
03/05			1	0.094				
04/06								11
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	Est. Harv. Tags
01										
03/05										
04/06										1
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest 11

Appendix B. Continued.

Tag Code: 05/24/54 Release Site: Clearwater R. @ Button Beach Number Released: 18,951

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate
01								
03/05								
04/06							1	0.141
07								7
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

7

Appendix B. Continued.

Tag Code: 05/24/56

Release Site: Clearwater R.

Number Released: 18,437

River Sect.	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	0.104	10									
03/05												
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												

River Sect.	January			February			March			April			1996-97		
	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													1		10
03/05															
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

Total Estimated Harvest

10

Appendix B. Continued.

Tag Code: 05/31/41 Release Site: Clearwater R. Number Released: 5,148

River Sect.	September		October		November		December		1996-97	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Est. Harv.
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
February										
River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Est. Harv.
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
					1	0.107			1	9

Total Estimated Harvest

9

Appendix B. Continued.

Tag Code: 05/31/43      Release Site: Clearwater R.      Number Released: 22,189

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	Est. Harv.	No. Tags	Sample Rate	No. Tags	Est. Harv.
01										
03/05	1	0.110	9	1	0.264	4			2	13
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

13

Appendix B. Continued.

Tag Code: 05/34/06

Release Site: Clearwater R. @ Clear Cr.

Number Released: 1,149

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

River Sect.	<u>January</u>		<u>February</u>		<u>March</u>		<u>April</u>		<u>1996-97</u>	
	No. Tags	Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Tags	Est. Harv.	
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

4

Appendix B. Continued.

Tag Code: 05/34/07 Release Site: Clearwater R. @ Clear Cr. Number Released: 1,149

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01								
03/05					1	0.099		
04/06								10
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Tags	Est. Harv.						
01										
03/05									1	10
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

13

Appendix B. Continued.

Tag Code: 07/03/21 Release Site: Imnaha R. @ Little Sheep Cr. Number Released: 24,658

River Sect.	September			October			November			December		
	No. Tags	Sample Rate	Est. Harv. Tags	No. Tags	Sample Rate	Est. Harv. Tags	No. Tags	Sample Rate	Est. Harv. Tags	No. Tags	Sample Rate	Est. Harv. Tags
01			1		0.104	10						
03/05												
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												

River Sect.	January			February			March			April			1996-97		
	No. Tags	Sample Rate	Est. Harv. Tags	No. Tags	Sample Rate	Est. Harv. Tags	No. Tags	Sample Rate	Est. Harv. Tags	No. Tags	Sample Rate	Est. Harv. Tags	No. Tags	Sample Rate	Est. Harv. Tags
01													1		10
03/05															
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

Total Estimated Harvest

10

Appendix B. Continued.

Tag Code: 07/03/26 Release Site: Wallowa R. @ Big Canyon Cr. Number Released: 26,960

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01	1	0.104	10					
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Tags	Est. Harv.						
01									1	10
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

10

Appendix B. Continued.

Tag Code: 07/09/20

Release Site: Wallowa R. @ Big Canyon Cr.

Number Released: 50,524

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01	1	0.104	10					
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate								
01									1	10
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

10



Appendix B. Continued.

Tag Code: 07/58/22

Release Site: Wallowa R. @ Spring Cr.

Number Released: 26,336

River Sect.	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	0.104	10									
03/05												
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												

River Sect.	January			February			March			April			1996-97	
	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	10
03/05														
04/06														
07														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Total Estimated Harvest

10

Appendix B. Continued.

Tag Code: 10/15/32

Release Site: Salmon R. @ Hammer Cr.

Number Released: 60,423

River Sect.	September			October			November			December			1996-97						
	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																			
08																			
01																			
03/05																			
04/06																			
07																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
Total Estimated Harvest															1	0.644	2	1	2

Appendix B. Continued.

Tag Code: 10/20/02      Release Site: Slate Cr. (Upper Salmon R.)      Number Released: 20,983

River Sect.	<u>September</u>		<u>October</u>		<u>November</u>		<u>December</u>	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	<u>January</u>		<u>February</u>		<u>March</u>		<u>April</u>		<u>1996-97</u>	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

5

Appendix B. Continued.

Tag Code: 10/20/03 Release Site: East Fork Salmon R. Number Released: 21,337

River Sect.	September		October		November		December		1996-97	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01										
03/05										
04/06										
07										
10										
11										
12										
13					1	0.833	1		1	
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

1

Appendix B. Continued.

Tag Code: 10/20/07 Release Site: Salmon R. @ Lemhi R. Number Released: 20,537

River Sect.	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	0.311	3	1	0.129	8						
16							1	0.239	4						
17															
River Sect.	January			February			March			April			1996-97		
	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							1	1.278	1				2		9
15							3	0.383	8				5		15
16													1	0.144	7
17															7
18															
19															
20															

Total Estimated Harvest

31







Appendix B. Continued.

Tag Code: 10/20/11 Release Site: Salmon R. @ Bruno's Bridge Number Released: 19,159

River Sect.	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				1	0.044	23									
10															
11															
12															
13							3	0.329	9						
14							1	0.129	8						
15				3	0.311	10	1	0.239	4						
16															
17															
River Sect.	January			February			March			April			1996-97		
	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													1		23
11															
12															
13															
14							1	1.278	1						9
15				2	0.383	5	2	0.383	5						9
16															19
17															
18													4	0.224	18
19													1	0.145	7
20															

Total Estimated Harvest

85



Appendix B. Continued.

Tag Code: 10/20/15 Release Site: Salmon R. @ Lemhi R. Number Released: 20,488

River Sect.	September		October		November		December		January		February		March		April		1996-97		
	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				1	0.311		3						2	0.129		16			
16													3	0.239		13			
17																			
01																			
03/05																			
04/06																			
07																			
10																			
11																			
12																			
13																			
14																			
15													2	1.278		2			4
16													3	0.383		8			7
17													1	0.227		4			2
18																			
19																			
20																			

Total Estimated Harvest

53



Appendix B. Continued.

Tag Code: 10/20/17

Release Site: Salmon R. @ McNabb's Point

Number Released: 20,776

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01								
03/05					2	0.208		10
04/06					2	0.329		6
07					2	0.129		16
10					1	0.075		
11					1	0.311		
12								
13								
14					13			
15					3			
16					1	0.239		4
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Tags	Est. Harv.						
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14					2	1.278		2		10
15					3	0.383		8		6
16										31
17					2	0.210		10		15
18					1	0.227		4		32
20								5	0.224	7
								1	0.145	2

Total Estimated Harvest

105





Appendix B. Continued.

Tag Code: 10/20/24      Release Site: East Fork Salmon R.      Number Released: 61,767

River Sect.	September		October		November		December	
	No. Sample	Tags	No. Sample	Tags	No. Sample	Tags	No. Sample	Tags
	Est.	Rate	Est.	Rate	Est.	Rate	Est.	Rate
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15			1	0.239				
16								
17								

River Sect.	January		February		March		April	
	No. Sample	Tags	No. Sample	Tags	No. Sample	Tags	No. Sample	Tags
	Est.	Rate	Est.	Rate	Est.	Rate	Est.	Rate
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15					1	1.278	1	1
16					1	0.383	3	2
17								
18								
19								
20								

Total Estimated Harvest 8

Appendix B. Continued.

Tag Code: 10/20/25

Release Site: Clearwater R. @ Clear Cr.

Number Released: 56,573

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Sample	Harv. Est.	No. Sample	Harv. Est.	No. Sample	Harv. Est.
01	1	0.007						
03/05								143
04/06								
07								
10								
11								
12								
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Sample	Harv. Est.	No. Sample	Harv. Est.	No. Sample	Harv. Est.	No. Tags	Harv. Est.
01									1	143
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest

143



Appendix B. Continued.

Tag Code: 10/30/48

Release Site: Salmon R. @ Hammer Cr.

Number Released: 64,057

River Sect.	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	0.104	10									
03/05												
04/06												
07												
10												
11	1	0.102	10									
12	1	0.234	4	1	0.208	5						
13				1	0.329	3						
14												
15												
16												
17												

River Sect.	January			February			March			April			1996-97		
	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													1		10
03/05															
04/06															
07															
10															
11															
12	1	0.088	11	1	0.644	2							1		10
13													4		22
14													1		3
15															
16															
17															
18															
19															
20															

Total Estimated Harvest

45

Appendix B. Continued.

Tag Code: 10/43/12 Release Site: Pahsimeroi R. Number Released: 20,882

River Sect.	September			October			November			December			1996-97				
	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																	
01																	
03/05																	
04/06																	
07																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
Total Estimated Harvest													1	0.383	3	1	3

Total Estimated Harvest 3

Appendix B. Continued.

Tag Code: 10/45/07 Release Site: Sawtooth Hatchery Number Released: 19,923

River Sect.	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				1	0.234	4						
13												
14												
15												
16												
17												
River Sect.	January			February			March			April		
	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	1.278	1			1
15				4	0.383	10	4	0.383	10			4
16												
17												
18												
19							1	0.219	5			1
20												5

Total Estimated Harvest 20

Appendix B. Continued.

Tag Code: 10/45/08		Release Site: Sawtooth Hatchery										Number Released: 19,689	
River Sect.	No. Tags	September		October		November		December		1996-97			
		Sample Rate	Est. Harv.	Sample Rate	Est. Harv.	Sample Rate	Est. Harv.	Sample Rate	Est. Harv.	No. Tags	Est. Harv.		
01													
03/05													
04/06													
07													
10													
11													
12													
13													
14													
15				2	0.311	6	2	0.239	8				
16				1	0.137	7							
17													
		January		February		March		April		1996-97			
River Sect.	No. Tags	Sample Rate	Est. Harv.	Sample Rate	Est. Harv.	Sample Rate	Est. Harv.	Sample Rate	Est. Harv.	No. Tags	Est. Harv.		
01													
03/05													
04/06													
07													
10													
11													
12				1	0.644	2				1	2		
13													
14				1	1.278	1				1	1		
15				2	0.383	5				6	19		
16				1	0.227	4				2	11		
17				1	0.210	5				1	5		
18													
19				1	0.219	5				1	7		
20										3	25		
Total Estimated Harvest											75		

Appendix B. Continued.

Tag Code: 10/45/09 Release Site: Sawtooth Hatchery Number Released: 19,900

River Sect.	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							2	0.129	16			
15												
16							2	0.078	26			
17												
1996-97												
River Sect.	January			February			March			April		
	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	1.278	1			3
15							3	0.383	8			3
16												2
17												17
18												8
19										1	0.145	7
20							1	0.219	5			1
												5

Total Estimated Harvest

63



Appendix B. Continued.

Tag Code: 10/45/11 Release Site: Sawtooth Hatchery Number Released: 20,331

River Sect.	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	0.311	3	1	0.129	8						
16							2	0.239	8						
17															
89															
River Sect.	January			February			March			April			1996-97		
	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							1	0.644	2				1		2
13															
14															
15							3	0.383	8				1		8
16													6		19
17															
18													1	0.145	7
19													2	0.119	17
20															

Total Estimated Harvest

53

Appendix B. Continued.

Tag Code: 10/45/12		Release Site: Sawtooth Hatchery										Number Released: 20,591	
River Sect.	No. Tags	September		October		November		December		April		1996-97	
		Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Sample Rate	Est. Harv. Tags	No. Tags	Est. Harv. Tags
01													
03/05													
04/06													
07													
10													
11													
12													
13													
14													
15	1	0.311	3	1	0.239	4							
16													
17													
90													
01													
03/05													
04/06													
07													
10													
11													
12													
13													
14													
15	3	0.383	8	5	15								
16													
17													
18													
19	1	0.219	5	1	5								
20													
Total Estimated Harvest												20	

Appendix B. Continued.

Tag Code: 10/45/13      Release Site: Salmon R. @ Torrey's Hole      Number Released: 20,287

River Sect.	<u>September</u>			<u>October</u>			<u>November</u>			<u>December</u>					
	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate			
01															
03/05															
04/06															
07															
10															
11															
12															
13															
14	1	0.075	13	2	0.129	16									
15	1	0.311	3	1	0.239	4									
16				1	0.078	13									
17															
River Sect.	<u>January</u>			<u>February</u>			<u>March</u>			<u>April</u>			<u>1996-97</u>		
	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate
01															
03/05															
04/06															
07															
10															
11															
12															
13															
14													3	29	
15													4	12	
16													1	13	
17															
18															
19													2	0.119	17
20													2		17
Total Estimated Harvest															71





Appendix B. Continued.

Tag Code: 10/45/16 Release Site: Little Salmon R. Number Released: 21,481

River Sect.	September			October			November			December			1996-97										
	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																							
13																							
14																							
15																							
16																							
17																							
19																							
20																							
Total Estimated Harvest																							
															1	0.211	5	1	0.156	6	2	11	30





Appendix B. Continued.

Tag Code: 10/45/19      Release Site: Sawtooth Hatchery      Number Released: 21,995

River Sect.	<u>September</u>			<u>October</u>			<u>November</u>			<u>December</u>					
	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate			
01															
03/05															
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
River Sect.	<u>January</u>			<u>February</u>			<u>March</u>			<u>April</u>			<u>1996-97</u>		
	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	Harv. Rate
01															
03/05															
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
Total Estimated Harvest															38





Appendix B. Continued.

Tag Code: 10/45/22      Release Site: Little Salmon R.      Number Released: 19,236

River Sect.	<u>September</u>			<u>October</u>			<u>November</u>			<u>December</u>						
	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate				
01																
03/05																
04/06																
07																
10																
11				1	0.102	10										
12				1	0.234	4	1	0.208								
13				1	0.327	3										
14																
15																
16																
17																
River Sect.	<u>January</u>			<u>February</u>			<u>March</u>			<u>April</u>						
	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate	No. Sample	Est. Harv.	Tags Rate				
01																
03/05																
04/06																
07																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
Total Estimated Harvest											1	0.156	6	1	6	28

Appendix B. Continued.

Tag Code: 10/46/01      Release Site: Little Salmon R.      Number Released: 20,529

River Sect.	<u>September</u>		<u>October</u>		<u>November</u>		<u>December</u>	
	No. Sample	Harv. Est.	No. Sample	Harv. Est.	No. Sample	Harv. Est.	No. Sample	Harv. Est.
01	Tags Rate	Harv.	Tags Rate	Harv.	Tags Rate	Harv.	Tags Rate	Harv.

03/05								
04/06								
07								
10								
11								
12	1	0.234		4				
13								
14								
15								
16								
17								

River Sect.	<u>January</u>		<u>February</u>		<u>March</u>		<u>April</u>	
	No. Sample	Harv. Est.	No. Sample	Harv. Est.	No. Sample	Harv. Est.	No. Sample	Harv. Est.
01	Tags Rate	Harv.	Tags Rate	Harv.	Tags Rate	Harv.	Tags Rate	Harv.

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

Total Estimated Harvest

4





Appendix B. Continued.

Tag Code: 10/46/29 Release Site: Sawtooth Hatchery Number Released: 60,929

River Sect.	<u>September</u>		<u>October</u>		<u>November</u>		<u>December</u>	
	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14			1	0.129				8
15								
16								
17								
River Sect.	<u>January</u>		<u>February</u>		<u>March</u>		<u>April</u>	
	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15							1	8
16								
17								
18								
19					1	0.119	8	8
20								
Total Estimated Harvest								
								16



Appendix B. Continued.

Tag Code: 10/46/61      Release Site: Salmon R. @ North Fork      Number Released: 30,811

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate	No. Tags	Sample Rate
01								
03/05								
04/06								
07								
10			1	0.044				
11					23			
12			1	0.234				
13			1	0.327	4			
14								
15					3	0.129		23
16								
17					5	0.239		21

River Sect.	January		February		March		April	
	No. Tags	Sample Rate						
01								
03/05								
04/06								
07								
10							1	23
11								
12			2	0.088				
13					23			
14								
15								
16								
17								
18								
19								
20								

1996-97	
No. Tags	Sample Rate
1	23
3	27
1	3
5	25
12	39

Total Estimated Harvest	
	117

Appendix B. Continued.

Tag Code: 10/47/01      Release Site: Pahsimeroi R.      Number Released: 20,098

	<u>September</u>		<u>October</u>		<u>November</u>		<u>December</u>	
River	No. Sample	Est.	No. Sample	Est.	No. Sample	Est.	No. Sample	Est.
Sect.	Tags	Harv.	Tags	Harv.	Tags	Harv.	Tags	Harv.

01								
03/05								
04/06								
07								
10								
11								
12								
13			1		0.329		3	
14								
15								
16								
17								

	<u>January</u>		<u>February</u>		<u>March</u>		<u>April</u>		<u>1996-97</u>	
River	No. Sample	Est.	No. Sample	Est.	No. Sample	Est.	No. Sample	Est.	No. Sample	Est.
Sect.	Tags	Harv.	Tags	Harv.	Tags	Harv.	Tags	Harv.	Tags	Harv.

01										
03/05										
04/06										
07										
10										
11										
12									1	3
13										
14										
15										
16										
17					2	0.224		9	2	9
18										
19										
20										

Total Estimated Harvest      12



Appendix B. Continued.

Tag Code: 10/47/03      Release Site: Salmon R. @ Challis      Number Released: 21,172

		<u>September</u>		<u>October</u>		<u>November</u>		<u>December</u>	
River	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate
01									
03/05									
04/06									
07									
10									
11									
12									
13									
14									
15	1	0.311	3	1	0.239	4			
16									
17									

		<u>January</u>		<u>February</u>		<u>March</u>		<u>April</u>		<u>1996-97</u>	
River	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	Harv. Rate	No. Sample	Est. Tags	No. Sample	Est. Tags	Harv. Rate
01											
03/05											
04/06											
07											
10											
11											
12											
13											
14											
15									2	7	
16											
17							1	0.224	5	1	5
18											
19											
20											

Total Estimated Harvest 12

Appendix B. Continued.

Tag Code: 10/47/04 Release Site: Salmon R. @ North Fork Number Released: 20,357

River Sect.	<u>September</u>		<u>October</u>		<u>November</u>		<u>December</u>	
	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15			1	0.311				3
16								
17								

River Sect.	<u>January</u>		<u>February</u>		<u>March</u>		<u>April</u>		<u>1996-97</u>	
	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.	No. Sample	Est. Harv.
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14										
15					1	0.383			3	12
16									6	7
17									1	1
18										
19										
20										

Total Estimated Harvest 19

Appendix B. Continued.

Tag Code: 10/47/10      Release Site: East Fork Salmon R.      Number Released: 21,296

River Sect.	<u>September</u>			<u>October</u>			<u>November</u>			<u>December</u>					
	No. Sample	Tags Rate	Harv. Est.	No. Sample	Tags Rate	Harv. Est.	No. Sample	Tags Rate	Harv. Est.	No. Sample	Tags Rate	Harv. Est.			
01															
03/05															
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
River Sect.	<u>January</u>			<u>February</u>			<u>March</u>			<u>April</u>					
	No. Sample	Tags Rate	Harv. Est.	No. Sample	Tags Rate	Harv. Est.	No. Sample	Tags Rate	Harv. Est.	No. Sample	Tags Rate	Harv. Est.			
01															
03/05															
04/06															
07															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
Total Estimated Harvest											1	0.145	7	1	7















Appendix B. Continued.

Tag Code: 10/47/22      Release Site: East Fork Salmon R.      Number Released: 20,974

River Sect.	September			October			November			December		
	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.
01												
03/05												
04/06												
07												
10												
11												
12												
13												
14												
15							1	0.239	4			
16												
17												
River Sect.	January			February			March			April		
	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.	Tags	Sample Rate	Est. Harv.
01												
03/05												
04/06												
07												
10												
11												
12												
13							1	0.833	1			1
14												
15							1	0.383	3			7
16												
17												
18												
19												
20												
Total Estimated Harvest												8

Appendix B. Continued.

Tag Code: 10/47/23 Release Site: Little Salmon R. Number Released: 20,958

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

01								
03/05								
04/06								
07								
10								
11								
12			1	0.234				4
13								
14								
15								
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Sample	Est. Harv.								

01										
03/05										
04/06										
07										
10										
11										
12									1	4
13										
14										
15										
16										
17										
18										
19										
20										

Total Estimated Harvest 4

Appendix B. Continued.

Tag Code: 10/47/25      Release Site: Pahsimeroi R.      Number Released: 21,294

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Sample Harv.	Est. Rate	No. Sample Harv.	Est. Rate	No. Sample Harv.	Est. Rate
01								
03/05								
04/06								
07								
10								
11								
12								
13								
14								
15	1	0.311						
16								
17								

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Sample Harv.	Est. Rate	No. Sample Harv.	Est. Rate	No. Sample Harv.	Est. Rate	No. Tags	Est. Harv.
01										
03/05										
04/06										
07										
10										
11										
12										
13										
14					1	1.278			1	1
15					2	0.383			3	8
16										
17										
18										
19										
20										
							3	0.224	13	13

Total Estimated Harvest

22















Appendix B. Continued.

Tag Code: 10/50/17 Release Site: Little Salmon R. Number Released: 20,045

River Sect.	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				1	0.234	4						
13												
14												
15												
16												
17												

River Sect.	January			February			March			April			1996-97		
	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													1		4

Total Estimated Harvest 4







Appendix B. Continued.

Tag Code: 63/54/42      Release Site: Walla Walla R.      Number Released: 25,047

River Sect.	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				3	0.094	32																			
04/06																									
07																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
							January			February			March			April			1996-97						
River Sect.	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.	No. Tags	Sample Rate	Est. Harv.	
01																									
03/05																									
04/06																									
07																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
Total Estimated Harvest																							3	32	

Appendix B. Continued.

Tag Code: 63/54/43      Release Site: Walla Walla R.      Number Released: 24,910

River Sect.	September			October			November			December			1996-97					
	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				1	0.099		10			1	0.141							
04/06																		
07																2	17	
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
River Sect.	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				1	0.099		10			1	0.141							
04/06																		
07																2	17	
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
Total Estimated Harvest																		17

Appendix B. Continued.

Tag Code: 63/57/14 Release Site: Touchet R. Number Released: 20,107

River Sect.	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	0.094	11						
04/06												
07												
10												
11												
12												
13												
14												
15												
16												
17												
1996-97												
River Sect.	January			February			March			April		
	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												
Total Estimated Harvest											11	11





Appendix B. Continued.

Tag Code: 63/57/28      Release Site: Lower Snake R.      Number Released: 39,737

River Sect.	September		October		November		December	
	No. Tags	Sample Rate	No. Sample Harv.	Est. Harv.	No. Sample Tags	Rate Harv.	No. Sample Tags	Rate Harv.
01			1	0.035	29	1	0.088	11

03/05      2      0.094      21

04/06  
07  
10  
11  
12  
13  
14  
15  
16  
17

River Sect.	January		February		March		April		1996-97	
	No. Tags	Sample Rate	No. Sample Harv.	Est. Harv.	No. Sample Tags	Rate Harv.	No. Sample Tags	Rate Harv.	No. Tags	Est. Harv.
01									2	40

03/05      2      0.094      21

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

Total Estimated Harvest      61

Appendix C. Steelhead return groups to the Salmon River, 1996-1997.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
A	I	19,923	Sawtooth Hatchery	HNFB <sup>a</sup>	CWT 10/45/07 <sup>b</sup>
A	I	19,689	Sawtooth Hatchery	HNFB	CWT 10/45/08 <sup>b</sup>
A	I	19,900	Sawtooth Hatchery	HNFB	CWT 10/45/09 <sup>b</sup>
A	I	20,321	Sawtooth Hatchery	HNFB	CWT 10/45/10 <sup>b</sup>
A	I	20,331	Sawtooth Hatchery	HNFB	CWT 10/45/11 <sup>b</sup>
A	I	20,591	Sawtooth Hatchery	HNFB	CWT 10/45/12 <sup>b</sup>
A	I	23,576	Sawtooth Hatchery	HNFB	CWT 10/45/18 <sup>b</sup>
A	I	21,995	Sawtooth Hatchery	HNFB	CWT 10/45/19 <sup>b</sup>
A	I	18,109	Sawtooth Hatchery	HNFB	CWT 10/45/20 <sup>b</sup>
A	I	500,571	Sawtooth Hatchery	HNFB	None
A	I	20,287	Salmon R. @ Torrey's Hole	HNFB	CWT 10/45/13 <sup>b</sup>
A	I	21,887	Salmon R. @ Torrey's Hole	HNFB	CWT 10/45/14 <sup>b</sup>
A	I	19,085	Salmon R. @ Torrey's Hole	HNFB	CWT 10/45/15 <sup>b</sup>
A	I	2,908	Salmon R. @ Torrey's Hole	HNFB	None
A	I	20,625	Salmon R. @ McNabb's Pt.	MVSH <sup>c</sup>	CWT 10/20/16 <sup>b</sup>
A	I	20,776	Salmon R. @ McNabb's Pt.	MVSH	CWT 10/20/17 <sup>b</sup>
A	I	21,144	Salmon R. @ McNabb's Pt.	MVSH	CWT 10/20/18 <sup>b</sup>
A	I	145,300	Salmon R. @ McNabb's Pt.	MVSH	None
A	I	17,501	Salmon R. @ Bruno's Br.	MVSH	CWT 10/20/09 <sup>b</sup>
A	I	17,947	Salmon R. @ Bruno's Br.	MVSH	CWT 10/20/10 <sup>b</sup>
A	I	19,159	Salmon R. @ Bruno's Br.	MVSH	CWT 10/20/11 <sup>b</sup>
A	I	108,263	Salmon R. @ Bruno's Br.	MVSH	None
A	I	64,953	Pahsimeroi R.	NSPR <sup>d</sup>	CWT 10/30/46 <sup>b</sup>
A	I	764,325	Pahsimeroi R.	NSPR	None

Appendix C. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
A	I	20,537	Salmon R. @ Lemhi R.	MVSH	CWT 10/20/07 <sup>b</sup>
A	I	19,340	Salmon R. @ Lemhi R.	MVSH	CWT 10/20/08 <sup>b</sup>
A	I	20,488	Salmon R. @ Lemhi R.	MVSH	CWT 10/20/15 <sup>b</sup>
A	I	137,905	Salmon R. @ Lemhi R.	MVSH	None
A	I	31,186	Salmon R. @ N. Fork	MVSH	CWT 10/46/60 <sup>b</sup>
A	I	30,811	Salmon R. @ N. Fork	MVSH	CWT 10/46/61 <sup>b</sup>
A	I	53,053	Salmon R. @ N. Fork	MVSH	None
A	I	38,390	Little Salmon R.	NSPR	CWT 10/20/19 <sup>b</sup>
A	I	92,767	Little Salmon R.	NSPR	None
A	I	21,481	Little Salmon R.	HNFH	CWT 10/45/16 <sup>b</sup>
A	I	20,853	Little Salmon R.	HNFH	CWT 10/45/17 <sup>b</sup>
A	I	22,923	Little Salmon R.	HNFH	CWT 10/45/21 <sup>b</sup>
A	I	19,236	Little Salmon R.	HNFH	CWT 10/45/22 <sup>b</sup>
A	I	316,011	Little Salmon R.	HNFH	None
A	I	64,057	Salmon R. @ Hammer Cr.	NSPR	CWT 10/30/48 <sup>b</sup>
A	I	33,163	Salmon R. @ Hammer Cr.	NSPR	None
A	I	29,400	Salmon R. @ Pine Bar Rapids	NSPR	None
Total		2,920,766			
A	II	60,772	Sawtooth Hatchery	HNFH	CWT 10/46/28 <sup>b</sup>
A	II	60,929	Sawtooth Hatchery	HNFH	CWT 10/46/29 <sup>b</sup>
A	II	651,433	Sawtooth Hatchery	HNFH	None
A	II	21,172	Salmon R. @ Challis	NSPR	CWT 10/47/03 <sup>b</sup>
A	II	178,790	Salmon R. @ Challis	NSPR	None <sup>b</sup>
A	II	61,817	Salmon R. @ Bruno's Br.	HNFH	CWT 10/49/26 <sup>b</sup>
A	II	120,266	Salmon R. @ Bruno's Br.	HNFH	None

## Appendix C. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
A	II	21,294	Pahsimeroi R.	MVSH	CWT 10/47/25
A	II	21,660	Pahsimeroi R.	MVSH	CWT 10/47/26
A	II	441,486	Pahsimeroi R.	MVSH	None <sup>b</sup>
A	II	20,098	Pahsimeroi R.	NSPR	CWT 10/47/01 <sup>b</sup>
A	II	20,496	Pahsimeroi R.	NSPR	CWT 10/47/02 <sup>b</sup>
A	II	339,354	Pahsimeroi R.	NSPR	None <sup>b</sup>
A	II	21,155	Salmon R. @ Lemhi R.	HNFH	CWT 10/46/03 <sup>b</sup>
A	II	214,633	Salmon R. @ Lemhi R.	HNFH	None
A	II	20,357	Salmon R. @ N. Fork	NSPR	CWT 10/47/04 <sup>b</sup>
A	II	114,622	Salmon R. @ N. Fork	NSPR	None <sup>b</sup>
A	II	20,958	Little Salmon R.	MVSH	CWT 10/47/23
A	II	21,530	Little Salmon R.	MVSH	CWT 10/47/24
A	II	425,062	Little Salmon R.	MVSH	None <sup>b</sup>
A	II	20,529	Little Salmon R.	HNFH	CWT 10/46/01 <sup>b</sup>
A	II	20,365	Little Salmon R.	HNFH	CWT 10/46/02 <sup>b</sup>
A	II	287,269	Little Salmon R.	HNFH	None
A	II	60,423	Salmon R. @ Hammer Cr.	NSPR	CWT 10/15/32
A	II	132,599	Salmon R. @ Hammer Cr.	NSPR	None
A	II	132,599	Salmon R. @ Pine Bar Rapids	NSPR	None
Total		3,400,139			
B	I	20,328	Slate Cr.	MVSH	CWT 10/20/01 <sup>b</sup>
B	I	20,983	Slate Cr.	MVSH	CWT 10/20/02 <sup>b</sup>
B	I	20,391	Slate Cr.	MVSH	CWT 10/20/05 <sup>b</sup>
B	I	154,233	Slate Cr.	MVSH	None
B	I	21,337	E. Fork Salmon R.	MVSH	CWT 10/20/03 <sup>b</sup>

Appendix C. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
B	I	19,328	E. Fork Salmon R.	MVSH	CWT 10/20/04 <sup>b</sup>
B	I	20,414	E. Fork Salmon R.	MVSH	CWT 10/20/12 <sup>b</sup>
B	I	61,767	E. Fork Salmon R.	MVSH	CWT 10/20/24 <sup>b</sup>
B	I	3,233	E. Fork Salmon R.	MVSH	None <sup>e</sup>
B	I	362,626	E. Fork Salmon R.	MVSH	None <sup>f</sup>
B	I	19,430	Little Salmon R.	MVSH	CWT 10/20/06 <sup>b</sup>
B	I	19,546	Little Salmon R.	MVSH	CWT 10/20/13 <sup>b</sup>
B	I	19,998	Little Salmon R.	MVSH	CWT 10/20/14 <sup>b</sup>
B	I	283,706	Little Salmon R.	MVSH	None
Total		1,047,320			
B	II	62,510	Slate Cr.	MVSH	CWT 10/49/25
B	II	148,845	Slate Cr.	MVSH	None <sup>b</sup>
B	II	21,296	E. Fork Salmon R.	MVSH	CWT 10/47/10
B	II	20,048	E. Fork Salmon R.	MVSH	CWT 10/47/11
B	II	21,377	E. Fork Salmon R.	MVSH	CWT 10/47/12
B	II	21,369	E. Fork Salmon R.	MVSH	CWT 10/47/13
B	II	20,443	E. Fork Salmon R.	MVSH	CWT 10/47/21
B	II	20,974	E. Fork Salmon R.	MVSH	CWT 10/47/22
B	II	226,333	E. Fork Salmon R.	MVSH	None <sup>b,e</sup>
B	II	164,740	E. Fork Salmon R.	MVSH	None <sup>f</sup>
B	II	20,891	Little Salmon R.	MVSH	CWT 10/47/14
B	II	21,243	Little Salmon R.	MVSH	CWT 10/47/15
B	II	21,582	Little Salmon R.	MVSH	CWT 10/47/16
B	II	175,009	Little Salmon R.	MVSH	None <sup>b</sup>
Total		967,260			

Appendix C. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
B	III	187,100	Slate Cr.	MVSH	None
B	III	16,024	E. Fork Salmon R.	MVSH	CWT 10/50/05
B	III	18,924	E. Fork Salmon R.	MVSH	CWT 10/50/07
B	III	19,128	E. Fork Salmon R.	MVSH	CWT 10/50/09
B	III	87,272	E. Fork Salmon R.	MVSH	None <sup>b,e</sup>
B	III	356,052	E. Fork Salmon R.	MVSH	None <sup>b,f</sup>
B	III	19,358	Little Salmon R.	MVSH	CWT 10/50/04
B	III	19,932	Little Salmon R.	MVSH	CWT 10/50/06
B	III	19,909	Little Salmon R.	MVSH	CWT 10/50/08
B	III	266,101	Little Salmon R.	MVSH	None <sup>b</sup>
Total		1,009,800			

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

<sup>b</sup> Release group includes fish marked with passive integrated transponder (PIT) tags.

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

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

<sup>e</sup> East Fork Salmon River stock.

<sup>f</sup> Dworshak National Fish Hatchery stock.

Appendix D. Steelhead groups returning to the Clearwater River,  
1996-1997.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
B	I	18,951	Clearwater R. @ Button Beach	DNFH <sup>a</sup>	CWT 05/24/54
B	I	131,795	Clearwater R. @ Button Beach	DNFH	None
B	I	56,573	Clearwater R. @ Clear Cr.	CAFH <sup>b</sup>	CWT 10/20/25 <sup>c</sup>
B	I	62,835	Clearwater R. @ Clear Cr.	CAFH	CWT 10/20/26 <sup>c</sup>
B	I	58,316	Clearwater R. @ Clear Cr.	CAFH	CWT 10/20/27 <sup>c</sup>
B	I	5,988	Clearwater R. @ Clear Cr.	CAFH	None
B	I	19,849	Clearwater R. @ Clear Cr.	DNFH	CWT 05/24/63
B	I	328,269	Clearwater R. @ Clear Cr.	DNFH	None
B	I	19,385	Clearwater R.	DNFH	CWT 05/24/55
B	I	18,437	Clearwater R.	DNFH	CWT 05/24/56
B	I	18,573	Clearwater R.	DNFH	CWT 05/24/57
B	I	20,488	Clearwater R.	DNFH	CWT 05/24/58
B	I	14,763	Clearwater R.	DNFH	CWT 05/24/59
B	I	19,635	Clearwater R.	DNFH	CWT 05/24/60
B	I	20,372	Clearwater R.	DNFH	CWT 05/24/61
B	I	22,297	Clearwater R.	DNFH	CWT 05/24/62
B	I	21,747	Clearwater R.	DNFH	CWT 05/31/48
B	I	1,037,880	Clearwater R.	DNFH	None
B	I	22,056	Red R.	CAFH	CWT 10/45/05 <sup>d,e</sup>
B	I	21,585	Red R.	CAFH	CWT 10/45/06 <sup>d,e</sup>
B	I	1,350	Red R.	CAFH	None <sup>d,e</sup>
B	I	4,790	Red R.	CAFH	None <sup>c,d,e</sup>
B	I	21,326	South Fork Clearwater R.	DNFH	CWT 05/31/47

## Appendix D. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
B	I	18,893	South Fork Clearwater R.	DNFH	CWT 05/33/62
B	I	20,065	South Fork Clearwater R.	DNFH	CWT 05/33/63
B	I	614,457	South Fork Clearwater R.	DNFH	None
B	I	42,595	South Fork Clearwater R.	CAFH	CWT 10/46/21 <sup>c</sup>
B	I	21,242	South Fork Clearwater R.	CAFH	CWT 10/47/27 <sup>c</sup>
B	I	21,350	South Fork Clearwater R.	CAFH	CWT 10/47/28 <sup>c</sup>
B	I	319,063	South Fork Clearwater R.	CAFH	None
Total		3,024,925			
B	II	136,447	Clearwater R. @ Button Beach	DNFH	None
B	II	21,507	Clearwater R. @ Clear Cr.	CAFH	CWT 10/47/29
B	II	21,562	Clearwater R. @ Clear Cr.	CAFH	CWT 10/47/30
B	II	20,827	Clearwater R. @ Clear Cr.	CAFH	CWT 10/47/33 <sup>c</sup>
B	II	89,964	Clearwater R. @ Clear Cr.	CAFH	None <sup>c</sup>
B	II	1,149	Clearwater R. @ Clear Cr.	DNFH	CWT 05/34/06
B	II	2,187	Clearwater R. @ Clear Cr.	DNFH	CWT 05/34/07
B	II	346,297	Clearwater R. @ Clear Cr.	DNFH	None
B	II	19,422	Clearwater R.	DNFH	CWT 05/21/53
B	II	20,451	Clearwater R.	DNFH	CWT 05/21/54
B	II	18,551	Clearwater R.	DNFH	CWT 05/21/55
B	II	19,318	Clearwater R.	DNFH	CWT 05/21/56
B	II	18,264	Clearwater R.	DNFH	CWT 05/30/12
B	II	5,148	Clearwater R.	DNFH	CWT 05/31/41
B	II	9,509	Clearwater R.	DNFH	CWT 05/31/42
B	II	22,189	Clearwater R.	DNFH	CWT 05/31/43

Appendix D. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
B	II	19,769	Clearwater R.	DNFH	CWT 05/34/05
B	II	1,000,796	Clearwater R.	DNFH	None
B	II	21,779	Crooked R.	CAFH	CWT 10/47/32 <sup>c</sup>
B	II	20,883	Crooked R.	CAFH	CWT 10/47/37 <sup>c</sup>
B	II	61,788	Crooked R.	CAFH	None
B	II	71,566	Crooked R.	CAFH	RV Clip <sup>c,d</sup>
B	II	50,027	South Fork Red R.	CAFH	None <sup>c,d,e</sup>
B	II	20,424	South Fork Clearwater R.	CAFH	CWT 10/47/31
B	II	21,086	South Fork Clearwater R.	CAFH	CWT 10/47/34 <sup>c</sup>
B	II	22,137	South Fork Clearwater R.	CAFH	CWT 10/47/35 <sup>c</sup>
B	II	21,430	South Fork Clearwater R.	CAFH	CWT 10/47/36 <sup>c</sup>
B	II	307,988	South Fork Clearwater R.	CAFH	None <sup>c</sup>
B	II	184,380	South Fork Clearwater R.	DNFH	None
Total		2,596,845			
B	III	16,214	Clearwater R.	DNFH	CWT 05/20/50
B	III	20,579	Clearwater R.	DNFH	CWT 05/20/51
B	III	20,779	Clearwater R.	DNFH	CWT 05/20/52
B	III	20,258	Clearwater R.	DNFH	CWT 05/21/57
B	III	20,886	Clearwater R.	DNFH	CWT 05/21/58
B	III	19,800	Clearwater R.	DNFH	CWT 05/21/59
B	III	21,144	Clearwater R.	DNFH	CWT 05/21/60
B	III	20,780	Clearwater R.	DNFH	CWT 05/21/61
B	III	1,168,550	Clearwater R.	DNFH	None
B	III	25,673	South Fork Clearwater R.	CAFH	CWT 10/29/47 <sup>c</sup>

Appendix D. Continued.

Strain	Age	No. of Fish	Release Site	Hatchery Rearing	Marks
B	III	22,003	South Fork Clearwater R.	CAFH	CWT 10/49/37 <sup>c</sup>
B	III	21,340	South Fork Clearwater R.	CAFH	CWT 10/49/38 <sup>c</sup>
B	III	257,284	South Fork Clearwater R.	CAFH	None
B	III	63,803	South Fork Clearwater R.	DNFH	CWT 05/29/37
B	III	675,826	South Fork Clearwater R.	DNFH	None
Total		2,394,919			

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

<sup>b</sup> CAFH = Clearwater Anadromous Fish Hatchery.

<sup>c</sup> Release group includes fish marked with passive integrated transponder (PIT) tags.

<sup>d</sup> Fingerling release.

<sup>e</sup> Fall release.

Appendix E. Miscellaneous coded wire tag steelhead groups that were recovered by Idaho anglers, 1996-1997.

<u>Strain</u>	<u>Age</u>	<u>No. of Fish</u>	<u>Release Site</u>	<u>Tagging Agency</u>	<u>Marks</u>
A	I	50,524	Wallowa R. @ Big Canyon Cr.	ODFW <sup>a</sup>	CWT 07/09/20
A	I	26,630	Imnaha R. @ Little Sheep Cr.	ODFW	CWT 07/58/21
A	I	26,336	Wallowa R. @ Spring Cr.	ODFW	CWT 07/58/22
A	I	25,047	Walla Walla R.	WDFW <sup>b</sup>	CWT 63/54/42
A	I	24,910	Walla Walla R.	WDFW	CWT 63/54/43
A	I	20,107	Touchet R.	WDFW	CWT 63/57/14
A	I	19,967	Touchet R.	WDFW	CWT 63/57/16
A	I	18,112	Touchet R.	WDFW	CWT 63/57/18
A	I	39,737	Lower Snake R.	WDFW	CWT 63/57/28
A	II	24,658	Imnaha R. @ Little Sheep Cr.	ODFW	CWT 07/03/21
A	II	26,960	Wallowa R. @ Big Canyon Cr.	ODFW	CWT 07/03/26
<sup>c</sup>	II	9,678	Columbia R. @ RM 141	NMFS <sup>d</sup>	CWT 23/19/58
<sup>c</sup>	II	9,965	Columbia R. @ RM 141	NMFS	CWT 23/23/56

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

<sup>b</sup> WDFW = Washington Department of Fish and Wildlife.

<sup>c</sup> Mixed hatchery stocks tagged and released in 1994; strain unknown.

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

Appendix F. Coded wire tag recoveries of Idaho's LSRCP<sup>a</sup> steelhead in downriver and ocean fisheries, 1996-1997. Data queried from PSMFC<sup>b</sup> as of April 9, 1999. Sampling rate expansions not available for all harvest areas.

Tag Code	Lower Columbia River											
	Ocean			Sport			Tributary Sport			Zone 6		
	No. Tags	Est. Harv.		No. Tags	Est. Harv.		No. Tags	Est. Harv.		No. Tags	Est. Harv.	
10/20/01				1	1							
10/20/25				1	2							
10/20/27				1	1							
10/29/47										1	1	
10/45/12												
10/45/14	1	1		1	1							
10/46/01										1	5	
10/46/03							1	2		1	2	
10/46/21										1	5	
10/46/28				1	4					2	4	
10/46/29				1	4					2	4	
10/47/10										1	2	
10/47/11									1	5	10	
10/47/12				1	2		2	5		6	15	
10/47/13										4	10	
10/47/14				4	13					3	7	
10/47/15										2	4	
10/47/16										3	4	
10/47/21	1	4		1	7					4	4	
10/47/22										4	11	
10/47/23				1	1		1	1		4	9	
10/47/24				1	4		1	2		1	1	
10/47/25										1	1	
10/47/26										3	6	
10/47/31										2	3	
10/49/25										1	2	
10/49/26				1	1		1	3		13	30	
										2	4	

<sup>a</sup> LSRCP = Lower Snake River Compensation Plan.

<sup>b</sup> PSMFC = Pacific States Marine Fisheries Commission.

Appendix G. Estimated steelhead run composition at Bonneville Dam, April 1 - November 15, 1996.

Week	Dam Count	N	Dam Count %	Dam Count		No. Hatch. <sup>c</sup>		No. Hatch.		Estimated Counts					
				Nat. <sup>a</sup> <77.5 <sup>b</sup>	%	No. Hatch. <77.5	%	Nat. >77.5	%	Nat. <77.5	Hatch. <77.5	Nat. >77.5	Hatch. >77.5		
4/1-6/9	5,625	163	2.9	16	9.8	127	77.9	4	2.5	16	9.8	552	4,383	138	552
6/10-16	1,050	33	3.1	1	3.0	27	81.8	1	3.0	4	12.1	32	859	32	127
6/17-23	1,462	73	5.0	7	9.6	57	78.1	2	2.7	7	9.6	140	1,142	40	140
6/24-30	2,688	83	3.1	9	10.8	61	73.5	2	2.4	11	13.3	291	1,976	65	356
7/1-7	3,246	102	3.1	13	12.7	84	82.4	1	1.0	4	3.9	414	2,673	32	127
7/8-14	5,233	97	1.9	17	17.5	77	79.4	0	0	3	3.1	917	4,154	0	162
7/15-21	7,424	87	1.2	23	26.4	59	67.8	2	2.3	3	3.4	1,963	5,035	171	256
7/22-28	14,753	140	0.9	38	27.1	97	69.3	2	1.4	3	2.1	4,004	10,222	211	316
7/29-8/4	20,540	160	0.8	34	21.3	126	78.8	0	0	0	0	4,365	16,175	0	0
8/5-11	28,042	160	0.6	26	16.3	131	81.9	2	1.3	1	0.6	4,557	22,959	351	175
8/12-18	25,055	180	0.7	19	10.6	159	88.3	0	0	2	1.1	2,645	22,132	0	278
8/19-25	20,644	180	0.9	23	12.8	154	85.6	0	0	3	1.7	2,638	17,662	0	344
8/26-9/1	17,452	200	1.1	17	8.5	171	85.5	2	1.0	10	5.0	1,483	14,921	175	873
9/2-8	17,146	180	1.0	16	8.9	129	71.7	12	6.7	23	12.8	1,524	12,288	1,143	2,191
9/9-15	13,642	90	0.7	5	5.6	58	64.4	3	3.3	24	26.7	758	8,792	455	3,638
9/16-22	8,104	73	0.9	3	4.1	38	52.1	5	6.8	27	37.0	333	4,219	555	2,997
9/23-29	5,493	80	1.5	2	2.5	42	52.5	3	3.8	33	41.3	137	2,884	206	2,266
9/30-10/6	3,273	31	0.9	4	12.9	20	64.5	0	0	7	22.6	422	2,112	0	739
10/7-11/15	3,426	49	1.4	2	4.1	31	63.3	4	8.2	12	24.5	140	2,167	280	839
Total	204,298	2,161		275		1,648		45		193		27,316	156,753	3,852	16,378
%			1.1									13.4	76.7	1.9	8.0
Adjusted Total <sup>d</sup>												25,960		5,207	

<sup>a</sup> Nat. = Naturally-produced.

<sup>b</sup> All fish measured in centimeter fork length.

<sup>c</sup> Hatch. = Hatchery origin.

<sup>d</sup> Counts adjusted for overlap percentages: 2% for the number of naturally-produced fish < 77.5 cm fork length, 36% for the number of naturally-produced fish > 77.5 cm fork length.

Appendix H. Estimated steelhead run composition at Lower Granite Dam, June 1 - December 15, 1996, and March 1 - May 31, 1997.

Week	Dam Count	N	Dam Count %	No. Nat. <sup>a</sup>		No. Hatch. <sup>c</sup>		No. Hatch.		Estimated Counts					
				<77.5 <sup>b</sup>	>77.5	<77.5	>77.5	<77.5	>77.5	<77.5	>77.5				
6/1-9/8	10,572	65	0.6	5	1	59	90.8	1	1.5	0	0	813	9,596	163	0
9/9-15	7,446	75	1.0	4	0	67	89.3	0	0	4	5.3	397	6,652	0	397
9/16-22	11,677	150	1.3	18	3	121	80.7	3	2.0	8	5.3	1,401	9,419	234	623
9/23-29	12,704	200	1.6	16	4	148	74.0	4	2.0	32	16.0	1,016	9,401	254	2,033
9/30-10/6	11,749	200	1.7	6	4	160	80.0	4	2.0	30	15.0	352	9,399	235	1,762
10/7-13	10,898	200	1.8	3	3	145	72.5	6	3.0	46	23.0	163	7,901	327	2,507
10/14-20	8,872	175	2.0	8	4	107	61.1	4	2.3	56	32.0	406	5,425	203	2,839
10/21-27	3,084	176	5.7	13	1	137	77.8	1	0.6	25	14.2	228	2,401	18	438
10/28-11/3	1,966	75	3.8	10	0	49	65.3	0	0	16	21.3	262	1,284	0	419
11/4-10	2,065	75	3.6	0	2	62	82.7	2	2.7	11	14.7	0	1,707	55	303
11/11-17	678	25	3.7	1	4	21	84.0	0	0	3	12.0	27	570	0	81
11/18-12/15	1,553	20	1.3	2	2	17	85.0	0	0	1	5.0	155	1,320	0	78
3/1-16	953	40	4.2	3	3	29	72.5	2	5.0	6	15.0	71	691	48	143
3/17-23	455	40	8.8	4	4	30	75.0	1	2.5	5	12.5	46	341	11	57
3/24-30	548	40	7.3	10	10	21	52.5	1	2.5	8	20.0	137	288	14	110
3/31-5/31	1,678	40	2.4	12	2	16	40.0	2	5.0	10	25.0	503	671	84	420
Total	86,898	1,596		115	31	1,189		261		5,979	67,066	1,644	12,209		
Adjusted Total <sup>d</sup>										6.9	77.2	1.9	14.0		
										6,469		1,154			

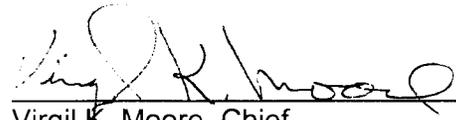
<sup>a</sup> Nat. = Naturally-produced.  
<sup>b</sup> All fish measured in centimeter fork length.  
<sup>c</sup> Hatch. = Hatchery origin.  
<sup>d</sup> Counts adjusted for overlap percentages: 36% for the number of naturally-produced fish < 77.5 cm fork length, 14% for the number of naturally-produced fish > 77.5 cm fork length.

**Submitted by:**

Kent Ball  
Senior Fisheries Research Biologist

Marsha White  
Fisheries Technician

**Approved by:**



Virgil K. Moore, Chief  
Fisheries Bureau



Bill Hutchinson  
State Fishery Manager