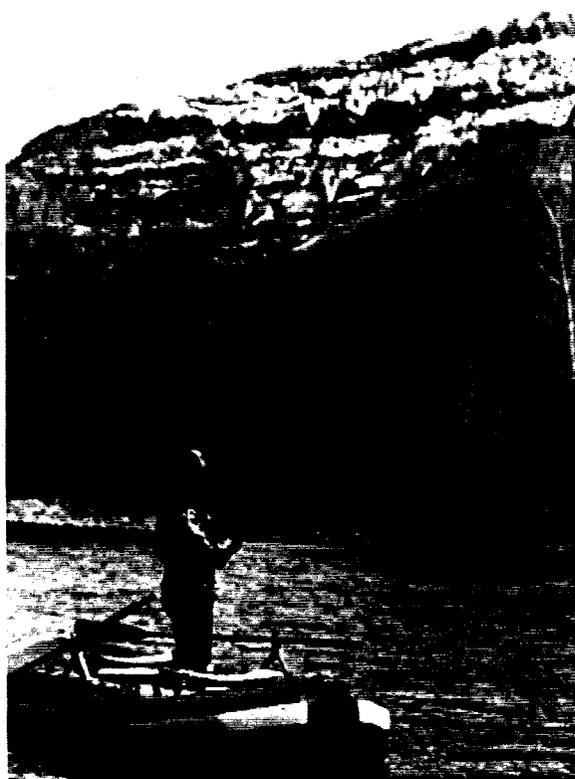


FISHERY RESEARCH



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

Performed for U.S. Fish and Wildlife Service
Lower Snake River Fish and Wildlife Compensation Plan
Contract No. 14-16-0001-89501 (RWG)
Period Covered: October 1, 1988 to December 31, 1989



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ABSTRACT

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

During the fall 1988 and spring 1989 seasons, 21,578 anglers were interviewed and 3,094 adult steelhead examined, which was 13.8% of the total estimated harvest. We retrieved 124 coded wire tags from 31 different tag groups. The total estimated harvest for the 1988-1989 season was 22,409 hatchery and 48 wild/natural fish. The total estimated harvest of steelhead reared by the Lower Snake River Compensation Plan (LSRCP) was 5,900, and an additional 1,506 returned to hatcheries and other release sites. In the Salmon River, LSRCP fish supported about 60% of the hatchery harvest.

The estimated return of adults from 699,715 smolts released at Sawtooth Hatchery in 1986 was 6,208 (0.89%). Adults returning in 1987 were significantly reduced by low flows during the upstream migration. Adults returning from releases at Sawtooth Hatchery were exploited at 80%.

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INTRODUCTION

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

The main purpose of this project is to determine the composition of the anadromous fish harvest in the Idaho fishery and to estimate the adult harvest contribution from juveniles produced in Lower Snake River Compensation Plan (LSRCP) hatcheries. Contribution to the Idaho fishery is one of the measures of performance of LSRCP fish. No harvest was allowed on chinook salmon, so this report pertains only to steelhead.

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

In the fall 1988 and spring 1989 seasons, all age groups of hatchery steelhead returning to Idaho were marked by fin clips, and regulations stated that "only steelhead with a missing adipose fin (as evidenced by a healed scar) may be kept." Consequently, the harvest of any wild (unmarked) steelhead was illegal. Table 1 lists the fall and spring regulations.

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

OBJECTIVES

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

Determine the spawning escapement of LSRCP stocks in Idaho.

Table 1. Steelhead season dates, bag limits^a and special restrictions for the Clearwater, Salmon and Snake rivers, 1988-89.

| River (sections) | Fall Season Dates | Bag Limits | Special Restrictions |
|-------------------------------|-------------------|------------|----------------------|
| Clearwater River (03 - 07) | Oct 15 - Dec 31 | 2, 4, 6 | |
| Salmon River (10, 11, and 20) | Sept 1 - Dec 31 | | |
| Salmon River (12 - 19) | | | |
| Snake River (01) | | 2, 4, 10 | |

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

^aLimits denote daily, possession and season totals.

VTABLES

DESCRIPTION OF STUDY AREA

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

METHODS

Creel Survey

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

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

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

Interview Schedule

Lower Snake River (01) - by jet boat with Washington Department of Wildlife personnel and at boat ramps on alternating weekends for 10 weekends during the fall and 6 weekends during the spring season.

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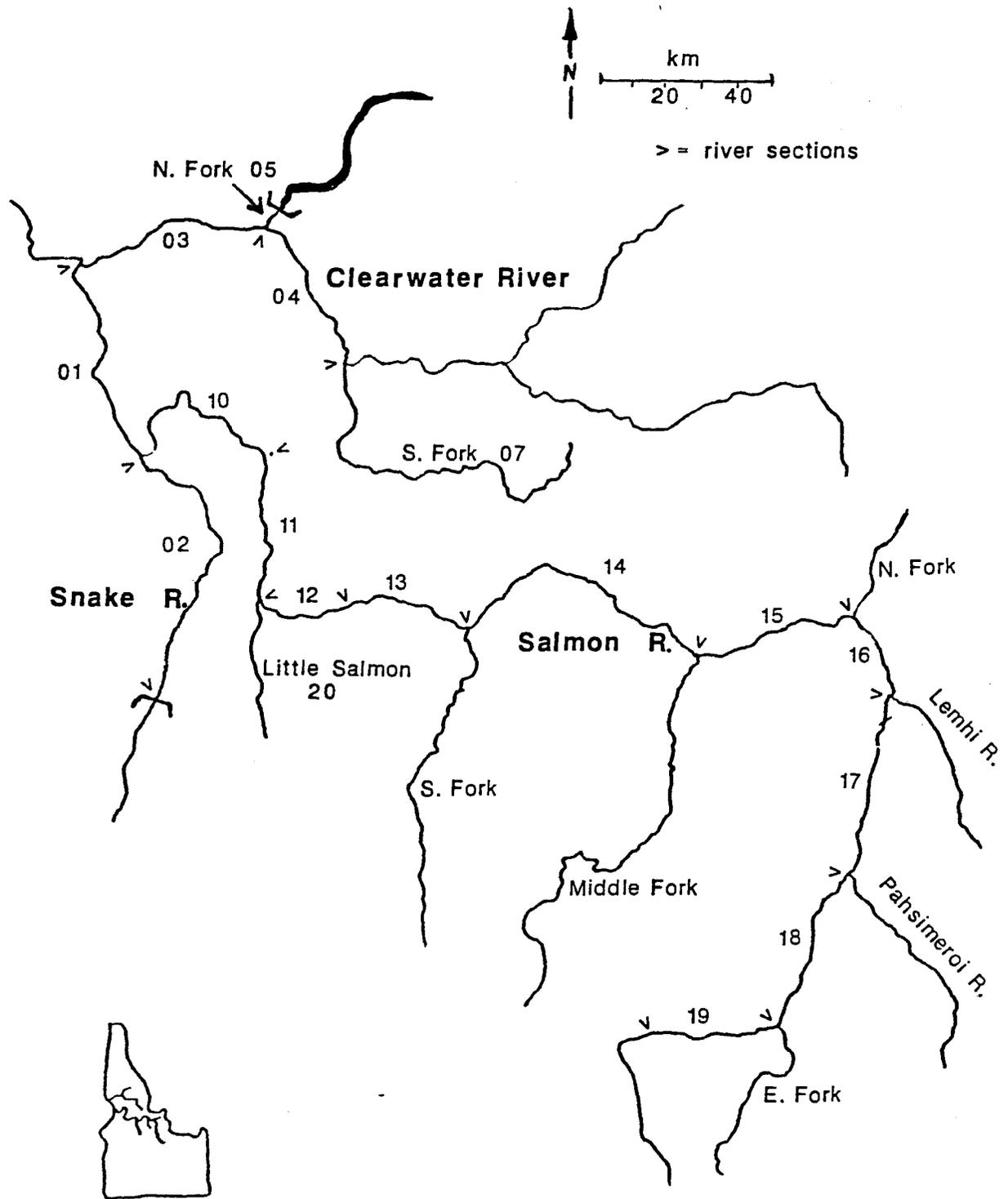


Figure 1. Map of the steelhead harvest area in Idaho.

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

| Location river section | 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 |

Lower Clearwater River and North Fork (03 and 05) - by roving vehicle 1 day each week and by jet boat 3 days each week for 15 weeks in the fall and 10 weeks in the spring season. Interview from boat ramps for the last 6 weeks of the spring season.

Upper Clearwater, Middle Fork, and South Fork Clearwater River (04, 06, and 07) - by roving vehicle on the Upper and Middle Fork Clearwater in the fall and on all three rivers in the spring, 2 weekend days per week, for 8 weeks in the fall and 10 weeks in the spring.

Salmon River

Section 10 - by jet boat 6 weekends in the fall and 5 weekends in the spring season.

Section 11 - by roving vehicle 2 weekdays and 2 weekend days for 10 weeks in the fall and 8 weeks in the spring season.

Sections 12 and 13 - by a check station at the old lumber mill site near Riggins for 10 weekends in the fall and 8 weekends in the spring season.

Sections 14 and 15 - by a check station near North Fork for 10 weekends in the fall and 8 weekends in the spring season.

Section 16 - by roving vehicle for 6 weekends in the fall and 6 weekends in the spring season.

Section 17 - by roving vehicle for 6 weekends in the fall and 6 weekends in the spring season.

Section 18 - by roving vehicle for 6 weekends in the spring season.

Section 19 - by roving vehicle for 6 weekends in the spring season.

Section 20 - by roving vehicle for 6 weekends in the spring season.

Data Analysis

Harvest estimates for each river section were obtained from statewide telephone survey results (McArthur 1990). Estimated harvest reported from Section 03 in September was shifted to Section 01. The statewide harvest survey erroneously reported harvest in Section 03 during September when this river section was only open to catch-and-release. By definition, the mouth of the Clearwater River upstream to Memorial Bridge was included in Section 01 in the 1988-1990 steelhead regulations and was open for steelhead harvest. Section 03 remained catch-and-release until the consumptive season opened October 15.

The number of fish checked for marks from each river section, divided by the harvest estimate, yields the sampling rate for each river section by month.

Harvested fish that were not seen during the interviews were not included when expressing the proportion of the estimated harvest that was marked.

During angler interviews, hatchery-wild proportions were recorded for fish kept and for total catch, including released fish when their origin could be determined. The harvest of hatchery fish is the product of the hatchery proportion observed in anglers' creels and the estimated harvest from statewide surveys by month. Seasonal estimates of reported hatchery fish harvest are the summation of monthly estimates. Hatchery harvest estimates for months when harvest was low and no fish were checked were calculated using the hatchery proportion calculated from the last month that data were available. These methods were applied during winter when fish movement was minimal and the proportion of hatchery fish in the harvest was constant. Harvest estimates of various 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 mark 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 returns to hatchery racks were subtracted from total returns by strain and ocean-age. Total harvest of unmarked groups was assumed to parallel the performance of unmarked hatchery rack returns. Where more than one unmarked group returned to a release site, the estimates of harvest and hatchery returns were calculated on the total of the unmarked fish and assumed to apply equally to each group. Due to very small numbers, no attempt was made to estimate returns of unmarked B strain fish from the East Fork Salmon River returning after three ocean-years.

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

RESULTS

During the fall 1988 and spring 1989 seasons, we interviewed 21,578 anglers that had harvested 3,213 hatchery and 5 wild fish (Tables 3-17). We physically examined 3,094 hatchery fish for marks and removed 139 snouts from fish with clipped left ventral fins for retrieval of CWTs (Table 18).

The composition of the hatchery steelhead harvest by river section and season is compiled in Table 19. All river sections are included except 02 and 28 (Table 2). Total harvest for river sections listed was 22,457 steelhead, of which an estimated 48 fish were of wild/natural origin and were illegally possessed.

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Table 3. Steelhead fishery interview data (unexpanded) from lower Snake River (01), October 1988-March 1989.

| Dates | No. angler | Total hour fishe | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatche |
|-------------|------------|------------------|----------------|------|--------------------|------|-------|-------------|----------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 625 | 2,366 | 45 | 0 | 5 | 8 | 58 | 41 | 86 |
| November | 286 | 1,153 | 105 | 1 | 7 | 8 | 121 | 10 | 93 |
| December | 370 | 1,626 | 84 | 0 | 3 | 19 | 106 | 15 | 82 |
| Fall Sum. | 1,281 | 5,145 | 234 | 1 | 15 | 35 | 285 | | |
| Average | | | | | | | | 18 | 87 |
| January | 73 | 182 | 0 | 0 | 0 | 6 | 6 | 30 | 0 |
| February | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| March | 23 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spring Sum. | 96 | 251 | 0 | 0 | 0 | 6 | 6 | | |
| Average | | | | | | | | 42 | 0 |
| Total | 1,377 | 5,396 | 234 | 1 | 15 | 41 | 291 | | |
| Average | | | | | | | | 19 | 86 |

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Table 4. Steelhead fishery interview data (unexpanded) from lower Clearwater River (03) and North Fork (05), October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 1,034 | 3,638 | 139 | 0 | 8 | 27 | 174 | 21 | 84 |
| November | 982 | 4,234 | 133 | 0 | 7 | 27 | 167 | 25 | 84 |
| December | 790 | 2,961 | 102 | 1 | 3 | 16 | 122 | 24 | 86 |
| Fall Sum. | 2,806 | 10,833 | 374 | 1 | 18 | 70 | 463 | | |
| Average | | | | | | | | 23 | 85 |
| January | 936 | 2,258 | 152 | 0 | 8 | 30 | 190 | 12 | 84 |
| February | 1,139 | 4,706 | 150 | 0 | 15 | 24 | 189 | 25 | 87 |
| March | 2,804 | 13,538 | 564 | 0 | 47 | 31 | 642 | 21 | 95 |
| April | 1,184 | 7,153 | 275 | 0 | 26 | 3 | 304 | 24 | 99 |
| Spring Sum. | 6,063 | 27,655 | 1,141 | 0 | 96 | 88 | 1,325 | | |
| Average | | | | | | | | 21 | 93 |
| Total | 8,869 | 38,488 | 1,515 | 1 | 114 | 158 | 1,788 | | |
| Average | | | | | | | | 22 | 91 |

01

Table 5. Steelhead fishery interview data (unexpanded) from upper Clearwater River (04) and middle Fork (06), October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 99 | 300 | 13 | 1 | 14 | 15 | 43 | 7 | 63 |
| November | 248 | 1,027 | 29 | 0 | 4 | 18 | 51 | 20 | 65 |
| December | 8 | 14 | 0 | 0 | 0 | 1 | 1 | 14 | 0 |
| Fall Sum. | 355 | 1,341 | 42 | 1 | 18 | 34 | 95 | | |
| Average | | | | | | | | 14 | 63 |
| March | 205 | 644 | 28 | 0 | 0 | 10 | 38 | 17 | 74 |
| April | 35 | 111 | 7 | 0 | 1 | 0 | 8 | 14 | 88 |
| Spring Sum. | 240 | 755 | 35 | 0 | 1 | 10 | 46 | | |
| Average | | | | | | | | 16 | 78 |
| Total | 595 | 2,096 | 77 | 1 | 19 | 44 | 141 | | |
| Average | | | | | | | | 15 | 68 |

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

| Dates | No. anglers | Total hours fished | <u>Steelhead kept</u> | | <u>Steelhead released</u> | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|-----------------------|------|---------------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| March | 111 | 413 | 27 | 0 | 4 | 3 | 34 | 12 | 91 |
| April | 289 | 1,138 | 63 | 0 | 4 | 2 | 69 | 16 | 97 |
| Spring Sum. | 400 | 1,551 | 90 | 0 | 8 | 5 | 103 | | |
| Average | | | | | | | | 15 | 95 |

Table 7. Steelhead fishery interview data (unexpanded) from Salmon River Section 10, October 1988-March 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 231 | 855 | 34 | 0 | 2 | 25 | 61 | 14 | 59 |
| November | 125 | 568 | 16 | 0 | 0 | 12 | 28 | 20 | 57 |
| Fall Sum. | 356 | 1,423 | 50 | 0 | 2 | 37 | 89 | | |
| Average | | | | | | | | 16 | 58 |
| March | 3 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spring Sum. | 3 | 11 | 0 | 0 | 0 | 0 | 0 | | |
| Average | | | | | | | | 0 | 0 |
| Total | 359 | 1,434 | 50 | 0 | 2 | 37 | 89 | | |
| Average | | | | | | | | 16 | 58 |

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Table 8. Steelhead fishery interview data (unexpanded) from Salmon River Section 11, October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 408 | 1,499 | 21 | 0 | 0 | 10 | 31 | 48 | 68 |
| November | 327 | 1,138 | 25 | 0 | 2 | 29 | 56 | 20 | 48 |
| Fall Sum. | 735 | 2,637 | 46 | 0 | 2 | 39 | 87 | | |
| Average | | | | | | | | 30 | 55 |
| February | 28 | 69 | 2 | 0 | 0 | 3 | 5 | 14 | 40 |
| March | 173 | 411 | 6 | 0 | 0 | 2 | 8 | 51 | 75 |
| April | 15 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spring Sum. | 216 | 533 | 8 | 0 | 0 | 5 | 13 | | |
| Average | | | | | | | | 41 | 62 |
| Total | 951 | 3,170 | 54 | 0 | 2 | 44 | 100 | | |
| Average | | | | | | | | 32 | 56 |

Table 9. Steelhead fishery interview data (unexpanded) from Salmon River Section 12, October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 233 | 1,724 | 37 | 0 | 1 | 21 | 59 | 29 | 64 |
| November | 243 | 1,974 | 24 | 0 | 3 | 16 | 43 | 46 | 63 |
| Fall Sum. | 476 | 3,698 | 61 | 0 | 4 | 37 | 102 | | |
| Average | | | | | | | | 36 | 64 |
| February | 30 | 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| March | 520 | 2,485 | 7 | 0 | 3 | 22 | 32 | 78 | 31 |
| April | 44 | 234 | 1 | 0 | 0 | 7 | 8 | 29 | 13 |
| Spring Sum. | 594 | 2,874 | 8 | 0 | 3 | 29 | 40 | | |
| Average | 72 | 28 | | | | | | | |
| Total | 1,070 | 6,572 | 69 | 0 | 7 | 66 | 142 | | |
| Average | | | | | | | | 46 | 54 |

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Table 10. Steelhead fishery interview data (unexpanded) from Salmon River Section 13, October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 97 | 1,589 | 26 | 0 | 0 | 45 | 71 | 22 | 37 |
| November | 82 | 1,306 | 23 | 0 | 2 | 23 | 48 | 27 | 52 |
| Fall Sum. | 179 | 2,895 | 49 | 0 | 2 | 68 | 119 | | |
| Average | | | | | | | | 24 | 43 |
| March | 9 | 206 | 2 | 0 | 0 | 26 | 28 | 7 | 7 |
| April | 8 | 76 | 0 | 0 | 0 | 1 | 1 | 76 | 0 |
| Spring Sum. | 17 | 282 | 2 | 0 | 0 | 27 | 29 | | |
| Average | | | | | | | | 10 | 7 |
| Total | 196 | 3,177 | 51 | 0 | 2 | 95 | 148 | | |
| Average | | | | | | | | 21 | 36 |

15

Table 11. Steelhead fishery interview data (unexpanded) from Salmon River Section 14, October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|-------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild. | Hatchery | Wild | | | |
| October | 186 | 2,931 | 61 | 0 | 13 | 149 | 223 | 13 | 33 |
| November | 233 | 4,143 | 59 | 0 | 42 | 147 | 248 | 17 | 41 |
| Fall Sum. | 419 | 7,074 | 120 | 0 | 55 | 296 | 471 | | |
| Average | | | | | | | | 15 | 37 |
| February | 2 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| March | 158 | 2,776 | 28 | 0 | 19 | 111 | 158 | 18 | 30 |
| April | 47 | 745 | 2 | 0 | 1 | 24 | 27 | 28 | 11 |
| Spring Sum. | 207 | 3,549 | 30 | 0 | 20 | 135 | 185 | | |
| Average | | | | | | | | 19 | 27 |
| Total | 626 | 10,623 | 150 | 0 | 75 | 431 | 656 | | |
| Average | | | | | | | | 16 | 34 |

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Table 12. Steelhead fishery interview data (unexpanded) from Salmon River Section 15, October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 1,313 | 12,420 | 291 | 0 | 64 | 290 | 645 | 19 | 55 |
| November | 1,008 | 10,551 | 189 | 0 | 62 | 124 | 375 | 28 | 67 |
| Fall Sum. | 2,321 | 22,971 | 480 | 0 | 126 | 414 | 1,020 | | |
| Average | | | | | | | | 23 | 59 |
| February | 24 | 176 | 1 | 0 | 0 | 0 | 1 | 176 | 100 |
| March | 1,062 | 9,645 | 165 | 1 | 73 | 109 | 348 | 28 | 68 |
| April | 471 | 4,147 | 47 | 0 | 47 | 53 | 147 | 28 | 64 |
| Spring Sum. | 1,557 | 13,968 | 213 | 1 | 120 | 162 | 496 | | |
| Average | | | | | | | | 28 | 67 |
| Total | 3,878 | 36,939 | 693 | 1 | 246 | 576 | 1,516 | | |
| Average | | | | | | | | 24 | 62 |

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Table 13. Steelhead fishery interview data (unexpanded) from Salmon River Section 16, October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 186 | 771 | 22 | 0 | 2 | 13 | 37 | 21 | 65 |
| November | 236 | 827 | 25 | 0 | 2 | 16 | 43 | 19 | 63 |
| Fall Sum. | 422 | 1,598 | 47 | 0 | 4 | 29 | 80 | | |
| Average | | | | | | | | 20 | 64 |
| March | 232 | 919 | 13 | 0 | 3 | 13 | 29 | 32 | 55 |
| April | 53 | 159 | 3 | 0 | 0 | 4 | 7 | 23 | 43 |
| Spring Sum. | 285 | 1,078 | 16 | 0 | 3 | 17 | 36 | | |
| Average | | | | | | | | 30 | 53 |
| Total | 707 | 2,676 | 63 | 0 | 7 | 46 | 116 | | |
| Average | | | | | | | | 23 | 60 |

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Table 14. Steelhead fishery interview data (unexpanded) from Salmon River Section 17, October 1988-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| October | 7 | 12 | 1 | 0 | 0 | 0 | 1 | 12 | 100 |
| November | 19 | 50 | 1 | 0 | 0 | 1 | 2 | 25 | 50 |
| Fall Sum. | 26 | 62 | 2 | 0 | 0 | 1 | 3 | | |
| Average | | | | | | | | 21 | 67 |
| March | 842 | 3,114 | 47 | 0 | 9 | 12 | 68 | 46 | 82 |
| April | 183 | 997 | 7 | 0 | 2 | 4 | 13 | 77 | 69 |
| Spring Sum. | 1,025 | 4,111 | 54 | 0 | 11 | 16 | 81 | | |
| Average | | | | | | | | 51 | 80 |
| Total | 1,051 | 4,173 | 56 | 0 | 11 | 17 | 84 | | |
| Average | | | | | | | | 50 | 80 |

20

Table 15. Steelhead fishery interview data (unexpanded) from Salmon River Section 18, March-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery, |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|-------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| March | 137 | 426 | 4 | 0 | 0 | 3 | 7 | 61 | 57 |
| April | 254 | 852 | 6 | 0 | 16 | 4 | 26 | 33 | 85 |
| Spring Sum. | 391 | 1,278 | 10 | 0 | 16 | 7 | 33 | | |
| Average | | | | | | | | 39 | 79 |

Table 16. Steelhead fishery interview data (unexpanded) from Salmon River Section 19, March-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| March | 31 | 63 | 2 | 0 | 0 | 0 | 2 | 32 | 100 |
| April | 761 | 3,000 | 67 | 1 | 20 | 40 | 128 | 23 | 68 |
| Spring Sum. | 792 | 3,063 | 69 | 1 | 20 | 40 | 130 | | |
| Average | | | | | | | | 24 | 68 |

Table 17. Steelhead fishery interview data (unexpanded) from Salmon River Section 20, February-April 1989.

| Dates | No. anglers | Total hours fished | Steelhead kept | | Steelhead released | | Total | Hours/ fish | Percent hatchery |
|-------------|-------------|--------------------|----------------|------|--------------------|------|-------|-------------|------------------|
| | | | Hatchery | Wild | Hatchery | Wild | | | |
| February | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| March | 110 | 259 | 5 | 0 | 0 | 0 | 5 | 52 | 100 |
| April | 204 | 633 | 27 | 0 | 5 | 4 | 36 | 18 | 89 |
| Spring Sum. | 316 | 893 | 32 | 0 | 5 | 4 | 41 | | |
| Average | | | | | | | | 22 | 90 |

Table 18. Proportion of estimated harvest by river section that was examined for marks, 1988-89.

| River section | No. fish checked | Estimated harvest ^a | Sample rate % |
|---------------|------------------|--------------------------------|---------------|
| 01 | 284 | 2,148 | 13.6 |
| 03 & 05 | 1,475 | 9,594 | 15.4 |
| 04 & 06 | 52 | 1,075 | 4.8 |
| 07 | 86 | 693 | 12.4 |
| 10 | 43 | 798 | 5.4 |
| 11 | 48 | 688 | 7.0 |
| 12 | 67 | 556 | 12.1 |
| 13 | 48 | 174 | 27.6 |
| 14 | 132 | 1,172 | 11.3 |
| 15 | 644 | 3,061 | 21.0 |
| 16 | 57 | 632 | 9.2 |
| 17 | 49 | 810 | 6.0 |
| 18 | 9 | 320 | 2.8 |
| 19 | 68 | 512 | 13.3 |
| 20 | 32 | 224 | 14.3 |
| Total | 3,094 | 22,457 | |
| Average | | | 13.8 |

^aData from telephone survey (McArthur 1990).

Table 19. Estimated number of hatchery steelhead harvested in the lower Snake, Clearwater and Salmon rivers during the 1988-89 seasons.

| River section | Fall season - 1988 | | | Spring season - 1989 | | | Total |
|------------------|--------------------------------|----------------|-------------------|--------------------------------|-----------------|-------------------|-------------------|
| | Estimated harvest ^a | % hatchery | No. hatchery fish | Estimated harvest ^a | % hatchery | No. hatchery fish | No. hatchery fish |
| Snake 01 | 1,807 | 99.6 | 1,800 | 341 | -- ^b | 341 | 2,141 |
| Clearwater R. | | | | | | | |
| 03 & 05 | 5,477 | 99.7 | 5,461 | 4,117 | 100 | 4,117 | 9,578 |
| 04 & 06 | 588 | 97.7 | 574 | 487 | 100 | 487 | 1,061 |
| 07 | 0 | -- | 0 | 693 | 100 | 693 | 693 |
| Clearwater Total | 6,065 | | 6,035 | 5,297 | | 5,297 | 11,332 |
| Average | | 99.5 | | | 100 | | |
| Salmon River | | | | | | | |
| 10 | 508 | 100 | 508 | 290 | N D | 290 | 798 |
| 11 | 543 | 100 | 543 | 145 | 100 | 145 | 688 |
| 12 | 443 | 100 | 443 | 113 | 100 | 113 | 556 |
| 13 | 153 | 100 | 153 | 21 | 100 | 21 | 174 |
| 14 | 852 | 100 | 852 | 320 | 100 | 320 | 1,172 |
| 15 | 2,286 | 100 | 2,286 | 775 | 99.5 | 771 | 3,057 |
| 16 | 290 | 100 | 290 | 342 | 100 | 342 | 632 |
| 17 | 45 | 100 | 45 | 765 | 100 | 765 | 810 |
| 18 | 0 | -- | 0 | 320 | 100 | 320 | 320 |
| 19 | 27 | — ^b | 27 | 485 | 98.6 | 478 | 505 |
| 20 | 27 | — ^b | 27 | 197 | 100 | 197 | 224 |
| Salmon Total | 5,174 | | 5,174 | 3,773 | | 3,762 | 8,936 |
| Average | | 100 | | | 99.7 | | |
| 1988-89 Total | 13,046 | | 13,009 | 9,411 | | 9,400 | 22,409 |

^aFrom statewide surveys.

^bAssumed to be of hatchery origin.

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From anglers' creels, we recovered 124 CWTs. The overall proportion of tags recovered from the number of fish checked for marks was 13.8% (Table 18). CWTs were recovered from 31 mark groups. The number of tags recovered, the estimated harvest of tag code groups by month and river section, and the total estimated harvest of tag code groups for the fall and spring seasons are listed in Appendix A. Of the 31 tag groups that yielded CWTs, 19 were from releases in Idaho (Appendices A, B and C).

CWTs were also recovered from seven Oregon tag groups and five Washington tag groups. One of the Oregon tag groups was released at Little Sheep Creek and six from Wallowa Hatchery. Three of the Washington tag groups were released in the Grand Ronde River and two groups at Lyons Ferry Hatchery (Appendices A and D).

Estimates of total returns of LSRCP-reared fish are summarized in Table 20. All Idaho returns from the LSRCP program that returned in 1988-1989 were from releases in the Salmon River drainage. However, they were also recovered from the fishery in the Snake and Clearwater rivers. The total estimated return of adult steelhead to Idaho in 1988-1989 from the LSRCP program, which includes harvest by Idaho anglers, hatchery returns and off-site escapement was 7,406. Contribution to Idaho's total hatchery steelhead harvest (except Sections 02 and 28) in 1988-1989 was 26.3%. In the Salmon River, LSRCP-reared fish supported about 60% of the estimated harvest.

Adult steelhead returning to Sawtooth Hatchery and East Fork Salmon River trap were exploited at 86% and 40%, respectively. In the Little Salmon River, exploitation is not quantified, but is assumed to be near 50% (Table 20).

Included in the Salmon River CWT recoveries is a fish that apparently reared an additional year in fresh water before migrating. This fish was tagged with 10/26/32 and released into the Little Salmon River in 1985 (Appendix A).

DISCUSSION

Steelhead returning in 1988-1989 after one ocean-year of life were adversely affected by abnormally low flows during outmigration in 1987 (Koski et al. 1988). These fish were then impacted again by low streamflows in the Snake River during their upstream migration as adults in 1988.

Snake River flows at the onset of the adult migration were 54% of the 1961-1985 average (Koski et al. 1989). The ability of steelhead to negotiate McNary Reservoir appears to be a function of flow as well as temperature in the river system. No attempt was made here to quantify the effects of these environmental parameters. However, unusually high losses in the river system need to be recognized when evaluating return rates.

After passing McNary Dam, the majority of adult steelhead either pass Priest Rapids Dam on the Columbia River or Ice Harbor Dam on the Snake River. In 1988, 41,900 fewer fish were counted **at** the two upstream facilities than were

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Table 20. Summary of 1988-89 harvest estimates and hatchery returns of steelhead produced by LSRCP hatcheries.

| Release Year | Strain and Ocean-Age | No. of Fish Released | Release Site | Hatchery | | Estimated Number of Fish | | |
|--------------|----------------------|----------------------|------------------|-------------------|--------------|--------------------------|------------------------------|-------|
| | | | | Rearing | Marks | Harvest | Hatchery Return ^a | Total |
| 1987 | A-I | 24,950 | Sawtooth | HNFH ^b | CWT 10/29/48 | 24 | 10 | 34 |
| 1987 | A-I | 662,700 | Sawtooth | HNFH | None | 985 | 410 | 1,395 |
| 1987 | A-I | 50,250 | Little Salmon R. | HNFH | CWT 10/29/25 | 5 | 5 | 10 |
| 1987 | A-I | 248,875 | Little Salmon R. | HNFH | None | 25 | 25 | 50 |
| | Subtotal | 986,775 | | | | 1,039 | 450 | 1,489 |
| 1986 | A-II | 39,125 | Sawtooth | HNFH | CWT 10/28/44 | 166 | 18 | 184 |
| 198 | A-II | 9,450 | Sawtooth | HNFH | CWT 10/28/01 | 11 | 2 | 13 |
| 1986 | A-II | 651,140 | Sawtooth | HNFH | None | 4,248 | 480 | 4,728 |
| 1986 | A-II | 8,650 | Little Salmon R. | HNFH | CWT 10/28/05 | 13 | 13 | 26 |
| 1986 | A-II | 35,475 | Little Salmon R. | HNFH | CWT 10/28/42 | 15 | 15 | 30 |
| 1986 | A-II | 258,178 | Little Salmon R. | HNFH | None | 164 | 164 | 328 |
| | Subtotal | 1,002,018 | | | | 4,617 | 692 | 5,309 |
| 1987 | B-I | 24,150 | E. Fk. Salmon R. | HNFH | CWT 10/29/49 | -- | -- | -- |
| 1987 | B-I | 460,950 | E. Fk. Salmon R. | HNFH | None | 35 | 53 | 88 |
| 1987 | B-I | 40,500 | Slate Creek | HNFH | CWT 10/29/26 | -- | -- | -- |
| 1987 | B-I | 9,250 | Slate Creek | HNFH | None | -- | -- | -- |
| | Subtotal | 534,850 | | | | 35 | 53 | 88 |
| 1986 | B-II | 25,325 | E. Fk. Salmon R. | HNFH | CWT 10/28/20 | 6 | 9 | 15 |
| 1986 | B-II | 499,991 | E. Fk. Salmon R. | HNFH | None | 200 | 300 | 500 |
| | Subtotal | 525,316 | | | | 206 | 309 | 515 |

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Table 20. Continued.

| Release Year | Strain and Ocean-Age | No. of Fish Released | Release Site | Hatchery | | Estimated Number of Fish | | |
|-----------------|----------------------------|-------------------------|------------------|----------|--------------|--------------------------|---------------------|-------|
| | | | | | | Hatchery | | |
| | | | | Rearing | Marks | Harvest | Return ^a | Total |
| 1985 | B-III | 127,607 | E. Fk. Salmon R. | HNFH | None | -- | -- | -- |
| 1985 | B-III | 39,375 | E. Fk. Salmon R. | HNFH | CWT 10/26/31 | -- | -- | -- |
| 1985 | B-III | 35,225 | E. Fk. Salmon R. | HNFH | CWT 10/26/36 | -- | -- | -- |
| 1985 | B-III | 17,425 | E. Fk. Salmon R. | HNFH | CWT 10/28/55 | -- | -- | -- |
| 1985 | B-III | 16,950 | E. Fk. Salmon R. | HNFH | CWT 10/28/03 | 3 | -- | 3 |
| 1985 | B-III | 8,100 | E. Fk. Salmon R. | HNFH | CWT 10/28/02 | -- | -- | -- |
| 1985 | B-III | 25,525 | E. Fk. Salmon R. | HNFH | CWT 10/28/54 | -- | 2 | 2 |
| | Subtotal | 270,207 | | | | 3 | 2 | 5 |

^aIncludes off-site escapement.

^bHNFH = Hagerman National Fish Hatchery.

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counted at McNary Dam (Table 21). This was the second highest number in the last six years and represents 27.6% of the total number of steelhead past McNary Dam. Although less than in 1987, the numbers are still significantly higher than the 1985-1986 average of 13.5% (Ball 1990). If the 13.5% average of 1985-1986 is used as an indication of what could realistically have been "expected" in 1988, we would "expect" to be able to account for all but 13.5% of 151,800 steelhead, i.e. 20,500 fish. Since losses were 41,900, and 90.7% of the fish accounted for passed Ice Harbor Dam, I estimate the loss of Snake River fish to be $(21,400 \times 0.907)$ 19,400 fish.

Although CWTs are a valuable tool in identifying harvest composition, they cannot be used to quantify the losses of LSRCP-raised fish that occurred in 1987 and 1988. It is reasonable to assume that an important portion of the adult fish lost in the 1987 and 1988 upriver migrations were produced by the LSRCP hatcheries in Idaho and Washington. Although the numbers cannot be quantified, any conclusions about returns should include qualification of these significant losses.

Passive Integrated Transponders (PIT tags) have been proposed as a tool to quantify the numbers of LSRCP steelhead reaching Lower Granite Dam (Ball 1989). When adult detection equipment is installed at other dams, such as Bonneville and McNary, losses like those that occurred in 1987 can be quantified. PIT tags have distinct advantages over conventional methodology in yielding results from individuals without handling the fish (Prentice et al. 1987).

Harvest of Sawtooth Hatchery Releases

Returns of steelhead released from Sawtooth Hatchery in 1986 are now complete. From a total release of 699,715 smolts, adult returns of 1,283 (.18%) were one-ocean and 4,925 came back after two ocean-years for a total return of 6,208 (0.89%). The unusually low proportion of one-ocean fish was a reflection of in-river losses due to low flows during the adult migration in 1987 (Ball 1990). The total return rate was approximately two-thirds the rate of return observed from the 1985 release (i.e. 1.51%), and was also substantially reduced due to low stream flows.

In 1987, a total of 687,650 smolts were released at Sawtooth Hatchery, and after one ocean-year, an estimated 1,429 (0.21%) adults were either caught or returned to the hatchery (Table 20). This group of fish was also affected by low flow conditions in the river system during outmigration and as returning adults.

The overall exploitation rate of 80% on Sawtooth releases was comparable to what has been measured in all previous years, except 1987-1988 when it was lower (Ball 1988, 1989, 1990). These fish support the highest exploitation rate measured for Idaho's steelhead.

Table 21. Difference between the number of steelhead passing McNary Dam that can be accounted for upriver at Ice Harbor and Priest Rapids dams, 1983-88^a.

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

^aTotals from COE annual fish passage reports.

Harvest of East Fork Salmon River Releases

Adult returns of 270,207 smolts released into the East Fork in 1985 are now complete. The estimated total return was 573 fish (0.21%), of which 74% were harvested (Table 20). This was the first group of fish released from the East Fork with comprehensive mark groups, but unfortunately the returns were reduced by low flows in the river system.

From 525,316 smolts released into the East Fork in 1986, an estimated 748 (0.14%) have returned after two ocean-years. Exploitation of these fish has been reduced to 50% with restrictive regulations. However, the overall return rate has been affected by the low stream flows.

In 1987, 485,100 smolts were released in the East Fork. After one ocean-year, an estimated 88 adults (0.02%) have returned to Idaho (Table 20).

Harvest of Little Salmon River Releases

Returns of 302,303 smolts released in 1986 have returned an estimated 1,244 adults (0.41%) after two ocean-years (Table 20). Escapement is unquantified, but is estimated at 50%; equal to exploitation. About 21% of the harvest was taken from the Little Salmon River in the spring (Appendix A).

In 1987, 299,125 smolts were released into the Little Salmon River, and only 60 adults (0.02%) returned after one ocean-year. This group of fish was adversely affected by abnormally low stream flows during juvenile outmigration and adult return.

Harvest of Slate Creek Releases

The first marked fish were released into Slate Creek in 1987. Of the total release of 49,750 B strain fish, 40,500 were marked with CWTs (Appendix B). No tag recoveries were found after one ocean-year.

Sources of Error

The primary sources of error involved in the harvest estimates were discussed by Ball (1986). The quality control of adipose fin clipping has also been discussed (Ball 1989). Adults returning to hatchery racks in 1988 were inspected to ascertain the proportion of the hatchery fish that did not have adipose fin clips. From the Salmon River hatcheries (which includes the LSRCF releases), only 12 of 1,739 fish checked (0.12%) had intact adipose fins. Considering the large number of fish clipped, the quality control is very good

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and should not be a significant cause of error. However, the adult return should be sampled each year to insure that the quality control is maintained at an acceptable level.

Left ventral fin clips, which are used to identify the presence of CWTs, regenerate but usually leave the fin deformed. Since there is a high proportion of hatchery fish with deformed ventral fins, we attempt to take the snouts from all fish with deformed left ventral fins. Although we take additional snouts with these methods, we don't believe we miss many snouts. In 1988-1989, we recovered CWTs from 89% of the snouts we removed.

Straying

Adult steelhead returning to Idaho rivers in the fall are several months away from spawning and commonly wander into streams other than where they were released. It is not unusual for these wandering fish to spend time in several rivers that are not their natal drainage. Adults observed or harvested during the wandering phase should not be considered strays.

In 1989, there were 371 CWTs recovered from hatchery racks in Idaho. Six tags, representing three National Marine Fisheries Service tag code groups, were recovered at the hatchery racks. These fish were tagged at Lower Granite Dam and released in the Snake River below Little Goose Dam or transported to the Columbia River below Bonneville Dam (Johnson and Longwill 1988). None of these tag codes were recovered in the Idaho fishery.

From the 360 CWT recoveries that were from Idaho marked groups, only 39 fish (10.8%) returned to sites other than where they were released. Thirty-eight fish (CWT 05/17/29, CWT 10/29/40, and CWT 10/29/41) released in the South Fork Clearwater River were collected at Dworshak National Fish Hatchery. One fish released in Panther Creek (CWT 10/28/18) was collected at the Pahsimeroi Hatchery. Because of the close proximity of Dworshak Hatchery to the mouth of the North Fork Clearwater River, it is not uncommon for fish released into the South Fork to be collected at Dworshak Hatchery (Ball 1986). With the exception of these South Fork Clearwater fish, the one remaining fish is only 0.3% of the hatchery returns.

There were five hatchery recoveries of fish carrying CWTs from the LSRCP program in Oregon and Washington. At Dworshak Hatchery, there were recoveries of one fish from each of four tag groups: CWT 63/32/02, CWT 63/39/03, CWT 63/38/45 all released in the Tucannon River in Washington, and CWT 63/38/37 released at Lyons Ferry. One fish from Oregon released in Little Sheep Creek was recovered at Oxbow Hatchery (CWT 07/37/61).

RECOMMENDATIONS

- 1) Sample the adult returns at each hatchery rack to ascertain the quality control of adipose clips.
- 2) Continue to include CWTs in each major smolt release group that are representative in size, time of release, and fish health.
- 3) Install an adult steelhead counting weir on the Little Salmon River to evaluate adult returns and spawning escapement of lower Salmon River smolt releases.
- 4) Estimate the number of steelhead that are rearing an additional year before emigration.
- 5) Analyze scales from adult returns to the East Fork Salmon River trap for size distribution at each ocean-age.
- 6) Develop techniques for estimating angler response bias to queries on the number and origin of fish released.

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APPENDICES

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Appendix A. Continued.

TAG CODE - 05/17/53 RELEASE SITE - Clearwater R. NUMBER RELEASED - 24,275

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|-------|---------|-------------|-------|----------|-------------|-------|----------|-------------|-------|
| | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. |
| 01 | | | | | | | | | | | | |
| 03/05 | | | | | | | 1 | 0.043 | 23 | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|---------|-------------|-------|----------|-------------|-------|-------|-------------|-------|-------|-------------|-------|---------------|------|
| | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Est. |

| | | | | | | | | | | | | | | |
|-------|--|--|--|---|-------|---|---|-------|---|--|--|--|---|----|
| 01 | | | | | | | | | | | | | | |
| 03/05 | | | | 1 | 0.167 | 6 | 1 | 0.309 | 3 | | | | 3 | 32 |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |

Total estimated harvest

32

Dworshak = 39

Appendix A. Continued.

TAG CODE - 05/17/54 RELEASE SITE - Clearwater R. NUMBER RELEASED - 24,000

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. |
| 01 | | | | | | | | | | | | |
| 03/05 | | | | 2 | 0.094 | 21 | 2 | 0.043 | 47 | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|---------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | | |
| 03/05 | 1 | 0.197 | 5 | 1 | 0.167 | 6 | 7 | 0.309 | 23 | | | | 13 | 102 |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |

Total estimated harvest

102
Dworshak = 70

APPA

Appendix A. Continued.

TAG CODE - 05/18/36 RELEASE SITE - Clearwater R. NUMBER RELEASED - 19,675

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

| River Section | January | | February | | March | | April | | 1988-89 Total | | |
|---------------|----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|---------------|------------|---|
| | No. Tags | Sample Est. Harv. | No. Tags | Est. Harv. | |
| 01 | | | | | | | | | | | |
| 03/05 | | | | | | | 1 | 0.391 | 3 | 1 | 3 |
| 04/06 | | | | | | | | | | | |
| 07 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |

Total estimated harvest

³
Dworshak = 7

Appendix A. Continued.

TAG CODE - 07/37/61 RELEASE SITE - Little Sheep Creek NUMBER RELEASED - 27,162

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

| | | | | | | | | | | | | |
|-------|--|--|--|--|--|--|---|-------|---|--|--|--|
| 01 | | | | | | | 1 | 0.197 | 5 | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|---------|--------|-------|----------|--------|-------|-------|--------|-------|-------|--------|-------|---------------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Harv. |

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

Total estimated harvest

5
Oxbow return = 1

Appendix A. Continued.

TAG CODE - 07/37/63 RELEASE SITE - wallowa Hatchery NUMBER RELEASED - 26,908

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

| | | | | | | | | | | | | |
|-------|--|--|--|---|-------|---|--|--|--|--|--|--|
| 01 | | | | 1 | 0.165 | 6 | | | | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|---------|--------|-------|----------|--------|-------|-------|--------|-------|-------|--------|-------|---------------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Harv. |

| | | | | | | | | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|--|--|--|--|--|---|---|
| 01 | | | | | | | | | | | | | 1 | 6 |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 6 |

Appendix A. Continued.

TAG CODE - 07/38/01 RELEASE SITE - wallowa Hatchery NUMBER RELEASED - 26,316

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. |
| 01 | | | | | | | 2 | 0.197 | 10 | 1 | 0.192 | 5 |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|---------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | 3 | 15 |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 15 |

Appendix A. Continued.

TAG CODE - 07/40/25 RELEASE SITE - Wallowa Hatchery NUMBER RELEASED -25,374

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. |
| 01 | | | | | | | 1 | 0.197 | 5 | 1 | 0.192 | 5 |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|---------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | 2 | 10 |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 10 |

Appendix A. Continued.

TAG CODE - 07/41/25 RELEASE SITE - Wallowa Hatchery NUMBER RELEASED - 46,571

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. |
| 01 | | | | | | | 1 | 0.197 | 5 | 1 | 0.192 | 5 |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|---------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | 2 | 10 |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 10 |

Appendix A. Continued.

TAG CODE - 07/41/26 RELEASE SITE - Wallowa Hatchery NUMBER RELEASED - 50,019

--

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|
| | No. Tags | Sample Est. | Harv. | No. Tags | Sample Est. | Harv. | No. Tags | Sample Est. | Harv. | No. Tags | Sample Est. | Harv. |
| 01 | | | | | | | 1 | 0.197 | | 5 | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|---------------|------------|
| | No. Tags | Sample Est. | Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | 1 | 5 |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 5 |

Appendix A. Continued.

TAG CODE - 07/41/28 RELEASE SITE - wallowa Hatchery NUMBER RELEASED - 50,385

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. |
| 01 | | | | | | | 2 | 0.197 | 10 | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|---------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | 2 | 10 |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 10 |

Appendix A. Continued.

TAG CODE - 10/28/03 RELEASE SITE - East Fork Salmon R. NUMBER RELEASED - 16,950

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

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|---------------|------------|
| | No. Tags | Sample Est. | Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | 1 | 0.286 | 3 | | | | 1 | 3 |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 3 |

Appendix A. Continued.

TAG CODE - 10/28/05 RELEASE SITE - Little Salmon R. NUMBER RELEASED - 8,650

| River Section | September | | October | | November | | December | |
|---------------|-----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|
| | No. Tags | Sample Est. Harv. | No. Tags | Sample Est. Harv. | No. Tags | Sample Est. Harv. | No. Tags | Sample Est. Harv. |
| 01 | | | | | 1 | 0.197 | | 5 |
| 03/05 | | | | | | | | |
| 04/06 | | | | | | | | |
| 07 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | 1 | 0.209 | 5 | | | |
| 13 | | | | | 1 | 0.349 | | 3 |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |

| River Section | January | | February | | March | | April | | 1988-89 Total | |
|-------------------------|----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|---------------|------------|
| | No. Tags | Sample Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | 1 | 5 |
| 03/05 | | | | | | | | | | |
| 04/06 | | | | | | | | | | |
| 07 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | 1 | 5 |
| 13 | | | | | | | | | 1 | 3 |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | 13 |

Appendix A. Continued.

TAG CODE - 10/28/42 RELEASE SITE - Little Salmon R. NUMBER RELEASED - 35,475

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|--------|-------|---------|--------|-------|----------|--------|-------|----------|--------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. |
| 01 | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | 1 | 0.209 | 5 | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|---------|--------|-------|----------|--------|-------|-------|--------|-------|-------|--------|-------|---------------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Harv. |
| 01 | | | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | 1 | 5 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | 1 | 0.096 | 10 | | | | 1 | 10 |
| Total estimated harvest | | | | | | | | | | | | | | 15 |

APPA

Appendix A. Continued.

TAG CODE - 10/28/17 RELEASE SITE - Pahsimeroi NUMBER RELEASED - 17,775

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|--------|-------|---------|--------|-------|----------|--------|-------|----------|--------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. |
| 01 | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | 2 | 0.294 | 7 | | | | 3 | 0.143 | 21 |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|---------|--------|-------|----------|--------|-------|-------|--------|-------|-------|--------|-------|---------------|---------------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Harv. |
| 01 | | | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | 1 | 0.296 | 3 | | |
| 16 | | | | | | | | | | | | | 6 | 31 |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | 31 | Pahsimeroi=15 |

Appendix A. Continued.

TAG CODE - 10/28/18 RELEASE SITE - Panther Creek NUMBER RELEASED - 27,575

--

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

--

| | | | | | | | | | | | | |
|-------|--|--|--|---|-------|---|--|--|--|--|--|--|
| 01 | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | 1 | 0.156 | 6 | | | | | | |
| 15 | | | | 1 | 0.294 | 3 | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|----------|-------------|-------|---------------|------|
| | No. Tags | Sample Est. | Harv. | No. Tags | Est. |

--

| | | | | | | | | | | | | | | | |
|-------|--|--|--|--|--|--|---|-------|---|--|--|--|---|---|--|
| 01 | | | | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | 1 | 0.296 | 3 | | | | 1 | 6 | |
| 16 | | | | | | | | | | | | | 2 | 6 | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |

Total estimated harvest

12
Pahsimeroi= 1

Appendix A. Continued.

TAG CODE - 10/28/42 RELEASE SITE - Little Salmon R. NUMBER RELEASED - 35,475

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|-------|---------|-------------|-------|----------|-------------|-------|----------|-------------|-------|
| | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. |
| 01 | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | 1 | 0.209 | 5 | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|---------|-------------|-------|----------|-------------|-------|-------|-------------|-------|-------|-------------|-------|---------------|------|
| | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Est. |
| 01 | | | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | 1 | 5 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | 1 | 0.096 | 10 | | | 1 | 10 |
| Total estimated harvest | | | | | | | | | | | | | | 15 |

APPA

Appendix A. Continued.

TAG CODE - 10/28/44

RELEASE SITE - Sawtooth

NUMBER RELEASED - 39,125

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|-------|---------|-------------|-------|----------|-------------|-------|----------|-------------|-------|
| | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. |
| 01 | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | 1 | 0.294 | 3 | 7 | 0.143 | 49 | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|---------|-------------|-------|----------|-------------|-------|-------|-------------|-------|-------|-------------|-------|---------------|------|
| | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Sample Est. | Harv. | No. | Est. |
| 01 | | | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | 3 | 0.296 | 10 | | | | 11 | 62 |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | 1 | 0.012 | 83 | | | | 1 | 83 |
| 19 | | | | | | | | | | 4 | 0.194 | 21 | 4 | 21 |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | 166 | |
| | | | | | | | | | | | | | Sawtooth = 18 | |

Appendix A. Continued.

TAG CODE - 10/28/56

RELEASE SITE - Clearwater R.

NUMBER RELEASED - 23,350

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. |
| 01 | | | | | | | | | | 1 | 0.192 | 5 |
| 03/05 | | | | | | | 3 | 0.043 | 70 | 1 | 0.080 | 13 |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|---------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | 1 | 5 |
| 03/05 | 1 | 0.197 | 5 | | | | 12 | 0.309 | 39 | 5 | 0.391 | 13 | 22 | 140 |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | 1 | 0.076 | 13 | | | | 1 | 13 |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |

Total estimated harvest

158
Dworshak return = 79

Appendix A. Continued.

TAG CODE - 10/29/25 RELEASE SITE - Little Salmon R. NUMBER RELEASED - 50,250

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

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

1 0.209 5

| River Section | January | | February | | March | | April | | 1988-89 Total | |
|---------------|----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|---------------|-------------------|
| | No. Tags | Sample Est. Harv. | No. Tags | Sample Est. Harv. |

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

1 5

Total estimated harvest

5

Appendix A. Continued.

TAG CODE - 10/29/48

RELEASE SITE - Sawtooth

NUMBER RELEASED - 24,950

| River Section | September | | October | | November | | December | |
|---------------|-----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|
| | No. Tags | Sample Est. Harv. | No. Tags | Sample Est. Harv. | No. Tags | Sample Est. Harv. | No. Tags | Sample Est. Harv. |
| 01 | | | | | | | | |
| 03/05 | | | | | | | | |
| 04/06 | | | | | | | | |
| 07 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | 1 | 0.103 | 10 | |
| 15 | | | | | 2 | 0.143 | 14 | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |

| River Section | January | | February | | March | | April | | 1988-89 Total | |
|---------------|----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|---------------|------------|
| | No. Tags | Sample Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | |
| 03/05 | | | | | | | | | | |
| 04/06 | | | | | | | | | | |
| 07 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | 1 | 10 |
| 15 | | | | | | | | | 2 | 14 |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |

Total estimated harvest

24
Sawtooth return = 10

Appendix A. Continued.

TAG CODE - 10/29/60 RELEASE SITE - Pahsimeroi NUMBER RELEASED - 9,625

--

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|--------|-------|---------|--------|-------|----------|--------|-------|----------|--------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. |
| 01 | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | 2 | 0.294 | 7 | 2 | 0.143 | 14 | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

--

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|---------|--------|-------|----------|--------|-------|-------|--------|-------|-------|--------|-------|---------------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Harv. |
| 01 | | | | | | | | | | | | | | |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | 1 | 0.296 | 3 | | | | 5 | 24 |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |

Total estimated harvest

Pahsimeroi return = 6 24

Appendix A. Continued.

TAG CODE - 63/38/40 RELEASE SITE - Grand Ronde R. NUMBER RELEASED - 19,986

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

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|-------------------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|----------|-------------|------------|---------------|------------|
| | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Sample Rate | Est. Harv. | No. Tags | Est. Harv. |
| 01 | | | | | | | | | | | | | 1 | 6 |
| 03/05 | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 6 |

Appendix A. Continued.

TAG CODE - 63/38/43 RELEASE SITE - Grand Ronde R. NUMBER RELEASED - 20,118

| River Section | September | | | October | | | November | | | December | | |
|---------------|-----------|--------|-------|---------|--------|-------|----------|--------|-------|----------|--------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. |
| 01 | | | | | | | | | | 1 | 0.192 | 5 |
| 03/05 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | |

| River Section | January | | | February | | | March | | | April | | | 1988-89 Total | |
|---------------|---------|--------|-------|----------|--------|-------|-------|--------|-------|-------|--------|-------|---------------|-------|
| | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Sample | Est. | No. | Est. |
| | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Rate | Harv. | Tags | Harv. |

| | | | | | | | | | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|
| 01 | | | | | | | | | | | | | | 1 | 5 |
| 03/05 | | | | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | | |
| 07 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| Total estimated harvest | | | | | | | | | | | | | | 5 | |

Appendix B. Steelhead groups returning to the Salmon River, 1988-89.

| Strain | Ocean age | No. of fish released | Release site | Hatchery rearing | Marks |
|--------|-----------|----------------------|------------------|------------------|--------------|
| A | I | 50,250 | Little Salmon R. | HNFFa | CWT 10/29/25 |
| A | I | 248,875 | Little Salmon R. | HNFFH | None |
| A | I | 13,801 | Deer Creek | HNFFH | None |
| A | I | 25,200 | Pahsimeroi | NSPRb | CWT 10/29/50 |
| A | I | 9,625 | Pahsimeroi | NSPR | CWT 10/29/60 |
| A | I | 677,375 | Pahsimeroi | NSPR | None |
| A | I | 40,750 | Panther Creek | NSPR | CWT 10/29/52 |
| A | I | 258,950 | Panther Creek | NSPR | None |
| A | I | 24,950 | Sawtooth | HNFFH | CWT 10/29/48 |
| A | I | 662,650 | Sawtooth | HNFFH | None |
| | Subtotal | 2,012,426 | | | |
| A | II | 8,650 | Little Salmon R. | HNFFa | CWT 10/28/05 |
| A | II | 35,475 | Little Salmon R. | HNFFH | CWT 10/28/42 |
| A | II | 258,178 | Little Salmon R. | HNFFH | None |
| A | II | 17,200 | Pahsimeroi | NSPRb | CWT 10/28/16 |
| A | II | 17,775 | Pahsimeroi | NSPR | CWT 10/28/17 |
| A | II | 579,063 | Pahsimeroi | NSPR | None |
| A | II | 27,575 | Panther Creek | NSPR | CWT 10/28/18 |
| A | II | 218,745 | Panther Creek | NSPR | None |
| A | II | 9,450 | Sawtooth | HNFFH | CWT 10/28/01 |
| A | II | 39,125 | Sawtooth | HNFFH | CWT 10/28/44 |
| A | II | 651,140 | Sawtooth | HNFFH | None |
| | Subtotal | 1,862,376 | | | |
| B | I | 40,500 | Slate Creek | HNFFH | CWT 10/29/26 |
| B | I | 9,250 | Slate Creek | HNFFH | None |
| B | I | 24,150 | East Fork | HNFFH | CWT 10/29/49 |
| B | I | 460,950 | East Fork | HNFFH | None |
| | Subtotal | 534,850 | | | |

APPB

Appendix B. Continued.

| Strain | Ocean age | No. of fish released | Release site | Hatchery rearing | Marks |
|--------|-----------|----------------------|--------------|------------------|--------------|
| B | II | 25,325 | East Fork | HNFH | CWT 10/28/20 |
| B | II | 499,991 | East Fork | HNFH | None |
| | Subtotal | 525,316 | | | |
| B | III | 39,375 | East Fork | HNFH | CWT 10/26/31 |
| B | III | 35,225 | East Fork | HNFH | CWT 10/26/36 |
| B | III | 8,100 | East Fork | HNFH | CWT 10/28/02 |
| B | III | 16,950 | East Fork | HNFH | CWT 10/28/03 |
| B | III | 25,525 | East Fork | HNFH | CWT 10/28/54 |
| B | III | 17,425 | East Fork | HNFH | CWT 10/28/55 |
| B | III | 127,608 | East Fork | HNFH | None |
| | Subtotal | 270,208 | | | |

Appendix C. Steelhead groups returning to the Clearwater River, 1988-89.

| Strain | Ocean age | No. of fish released | Release site | Hatchery rearing | Marks |
|--------|-----------|----------------------|----------------|------------------|--------------|
| B | I | 19,675 | Clearwater R. | DNFHa | CWT 05/18/36 |
| B | I | 40,100 | Clearwater R. | DNFH | None |
| B | I | 18,825 | Clearwater R. | DNFH | CWT 10/29/31 |
| B | I | 252,375 | Clearwater R. | DNFH | None |
| B | I | 20,625 | Clearwater R. | DNFH | CWT 10/29/32 |
| B | I | 356,250 | Clearwater R. | DNFH | None |
| B | I | 19,050 | Clearwater R. | DNFH | CWT 10/29/33 |
| B | I | 479,700 | Clearwater R. | DNFH | None |
| B | I | 26,125 | Crooked R. | DNFH | CWT 10/29/40 |
| B | I | 150,025 | Crooked R. | DNFH | None |
| B | I | 24,025 | Crooked R. | DNFH | CWT 10/29/41 |
| B | I | 41,527 | American R. | DNFH | None |
| B | I | 202,857 | Newsome Creek | DNFH | None |
| B | I | 298,070 | South Fork | DNFH | None |
| B | I | 21,025 | Clear Creek | DNFH | CWT 05/18/34 |
| B | I | 116,100 | Clear Creek | DNFH | None |
| B | I | 19,425 | Clear Creek | DNFH | CWT 05/18/35 |
| | Subtotal | 2,105,779 | | | |
| B | II | 24,275 | Clearwater R. | DNFH | CWT 05/17/53 |
| B | II | 338,557 | Clearwater R. | DNFH | None |
| B | II | 24,000 | Clearwater R. | DNFH | CWT 05/17/54 |
| B | II | 722,625 | Clearwater R. | DNFH | None |
| B | II | 23,350 | Clearwater R. | DNFH | CWT 10/28/56 |
| B | II | 116,889 | Clearwater R. | DNFH | None |
| B | II | 204,662 | Eldorado Creek | DNFH | None |
| B | II | 165,483 | Clear Creek | DNFH | None |
| B | II | 49,675 | South Fork | DNFH | CWT 05/17/29 |
| B | II | 1,306,516 | South Fork | DNFH | None |
| | Subtotal | 2,976,032 | | | |

APPC

Appendix C. Continued.

| Strain | Ocean ape | No. of fish released | Release site | Hatchery rearing | Marks |
|--------|--------------|-------------------------|----------------|---------------------|-------|
| B | III | 1,035,573 | Clearwater R. | DNFH | None |
| B | III | 145,206 | Clear Creek | DNFH | None |
| B | III | 95,286 | Newsome Creek | DNFH | None |
| B | III | 42,235 | Crooked R. | DNFH | None |
| B | III | 162,111 | American R. | DNFH | None |
| B | III | 121,284 | Eldorado Creek | DNFH | None |
| | Subtotal | 1,601,695 | | | |

Appendix D. Coded wire tag steelhead groups released by Oregon Department of Fish and Wildlife (ODFW), Washington Department of Wildlife (WDW) and National Marine Fisheries Service (NMFS), and recovered by Idaho anglers in 1988-89.

APPD

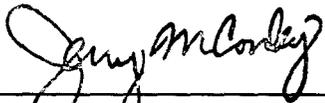
| Strain | Ocean age | No. of fish released | Release site | Agency | Marks |
|--------|-----------|----------------------|----------------------|--------|--------------|
| A | I | 25,374 | Wallowa Hatchery | ODFW | CWT 07/40/25 |
| A | I | 46,571 | Wallowa Hatchery | ODFW | CWT 07/41/25 |
| A | I | 50,019 | Wallowa Hatchery | ODFW | CWT 07/41/26 |
| A | I | 50,385 | Wallowa Hatchery | ODFW | CWT 07/41/28 |
| A | I | 20,099 | Grand Ronde R. | WDW | CWT 63/38/40 |
| A | I | 20,164 | Grand Ronde R. | WDW | CWT 63/38/43 |
| A | I | 20,272 | Tucannon R. | WDW | CWT 63/38/45 |
| A | I | 20,357 | Tucannon R. | WDW | CWT 63/39/03 |
| A | I | 25,384 | Lyons Ferry Hatchery | WDW | CWT 63/39/15 |
| A | II | 27,162 | Little Sheep Creek | ODFW | CWT 07/37/61 |
| A | II | 28,094 | Wallowa Hatchery | ODFW | CWT 07/37/63 |
| A | II | 26,316 | Wallowa Hatchery | ODFW | CWT 07/38/01 |
| A | II | 20,234 | Lyons Ferry Hatchery | WDW | CWT 63/33/04 |
| A | II | 20,234 | Grand Ronde R. | WDW | CWT 63/33/49 |

Submitted by:

Kent Ball
Senior Fishery Research Biologist

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME



Jerry M. Conley, Director



Steven M. Huffaker, Chief
Bureau of Fisheries



Steven P. Yundt
Anadromous Fisheries Coordinator