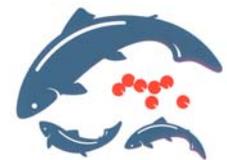


LOWER SNAKE RIVER COMPENSATION PLAN:
Summer Steelhead Creel Surveys on the
Grande Ronde, Wallowa, and Imnaha
Rivers for the 2003-04 Run Year

Oregon Department of Fish and Wildlife
Fish Research and Development, NE Region



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LOWER SNAKE RIVER
COMPENSATION PLAN

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Front cover photo of Gary Vonderohe at "Red Rock "on the Wallowa River in March 2005.

ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT
OREGON

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Grande Ronde, Wallowa, and Imnaha
Rivers for the 2003-04 Run Year

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the Lower Snake River Compensation Plan.

PREFACE

This report is for the funding period 1 April 2004 to 31 March 2005. The sampling period was from 1 September 2003 to 15 April 2004. The report summarizes statistical angler surveys conducted during the summer steelhead angling season in major fishing areas on the Grande Ronde, Wallowa, and Imnaha rivers. Hatchery adult steelhead harvested during the 2003-2004 run year were primarily from the 2000 and 2001 brood years. Results of creel surveys conducted prior to fall 2003 are reported in previous Lower Snake River Compensation Plan evaluation annual reports (Carmichael et al. 1986, 1987, 1988, 1989, 1990; Flesher et al. 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1999, 2000, 2001, 2004a, 2004b, and 2005). The steelhead angling season surveyed in this report, during which only adipose fin-clipped fish could be harvested, was open from 1 September 2003 to 15 April 2004 in the Grande Ronde and Imnaha River basins.

ACKNOWLEDGMENTS

We would like to thank Colleen Fagan for review of this report, Mary Buckman for the statistical design and analysis of the data, and Travis Schultz and Russell Peterson for their dedication in conducting the surveys. We would also like to thank Joe Bumgarner (Washington Department of Fish and Wildlife) for coordinating and John Johnston for conducting the Lower Grande Ronde survey during spring 2004. This project was financed as a cooperative agreement between the Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Service under the Lower Snake River Compensation Plan.

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SUMMARY

Angler effort during the 2003-04 run year was lower than the previous run year on the lower Grande Ronde River and higher on the Imnaha River. Harvest was higher on the lower Grande Ronde River and similar on the Imnaha River when compared to the previous run year. Catch rates this season were higher in all Grande Ronde and Imnaha basin fisheries than the previous run year. The catch rate index was three, five, six, and seven hours per fish at Rondowa, Imnaha, lower Grande Ronde, and Wallowa fisheries, respectively. Hatchery summer steelhead dominated the catch in six of eight months during the fishery on the lower Grande Ronde, in one of three months surveyed at Rondowa, and in all three months on the Wallowa River. Releases of large numbers of unmarked hatchery steelhead in the Imnaha Basin make the contribution of hatchery adults to the fishery difficult to assess. Anglers harvested more one-ocean than to two-ocean hatchery steelhead, and similar numbers of males and females in Grande Ronde and Imnaha basin fisheries. The percentage of local resident anglers (from Union or Wallowa counties) participating in summer steelhead fisheries increased in the Grande Ronde Basin and decreased in the Imnaha Basin compared to the previous run year. However, the percentage of local resident anglers in the Grande Ronde and Imnaha basin fisheries overall has decreased over time. We sampled adipose and left ventral fin-clipped and coded-wire tagged (AdLV+CWT) summer steelhead in both the Grande Ronde and Imnaha basin fisheries. Expanded estimates for the Wallowa and Rondowa fisheries will not be determined until statewide angler harvest tag summaries become available, however harvest, catch, and angler effort for the 2002-03 run year are reported in the appendices. Adult steelhead recycled back into the Wallowa River fishery from the Big Canyon Facility provided additional harvest opportunities for anglers and reduced the number of surplus fish at the Big Canyon Facility.

INTRODUCTION

Summer steelhead (*Oncorhynchus mykiss*) fisheries in the Grande Ronde and Imnaha River basins were closed in 1974. This closure was prompted by declining adult returns, as indicated by adult counts at Ice Harbor Dam on the Snake River (U.S. Army Corps of Engineers 1996), and low steelhead redd counts on index streams in the Grande Ronde and Imnaha River basins (Oregon Department of Fish and Wildlife District Annual Reports 1949-1974). The Lower Snake River Compensation Plan (LSRCP), initiated by Congress in 1976, was developed to compensate for losses of anadromous salmonids in the Snake River Basin from construction of the four lower Snake River Dams built between 1962 and 1976. Thus, the focus of the LSRCP is the Snake River above Lower Granite Dam (Rkm 173), the uppermost of these four dams. One of the primary objectives of the LSRCP in Oregon is to restore historic recreational and tribal fisheries for summer steelhead in the Grande Ronde and Imnaha River basins (Carmichael 1989). Approximately 1.68 M steelhead smolts were targeted for release in Oregon each year during April and May in the Grande Ronde and Imnaha River basins between 1984 and 1999. Beginning in 2000, we reduced releases to approximately 1.2 M smolts in response to the National Marine Fisheries Service's recommendation to help reduce straying of Wallowa hatchery stock steelhead, primarily into the Deschutes

River (mid-Columbia tributary). These fish provide hatchery adult returns that contribute to recreational fisheries and may supplement natural spawning populations in northeast Oregon. Consumptive recreational fisheries for summer steelhead re-opened in 1986, in part as a result of increases in hatchery adult returns.

We began creel surveys for summer steelhead during the fall of 1985 in both the Grande Ronde and Imnaha River basins. The goal of these surveys is to provide annual harvest information needed to assess LSRCP goals (Carmichael and Wagner 1983). In general, the number of summer steelhead in the recreational fishery has been restored to historic values, but the fishery is concentrated at different times and places (Fletcher et al. 1994). This report summarizes results of creel surveys conducted during the fall of 2003 and the spring of 2004 in the Grande Ronde and Imnaha River basins. In addition, this report contains estimates of total effort, catch, and harvest for all fisheries in the Grande Ronde and Imnaha River basins not reported in the previous annual report for the 2002-03 run year. The Grande Ronde and Imnaha River basins encompass the major steelhead fisheries that occur in Oregon tributaries to the Snake River upstream of Lower Granite Dam.

STUDY AREA

Creel surveys on the Grande Ronde River were conducted on a lower 24 km section from the Oregon-Washington state line (Rkm 62) upstream to Wildcat Creek (Rkm 86, Figure 1). Surveys on the Wallowa River were conducted on a 6 km section from its confluence with the Grande Ronde River at Rondowa (mouth of the Wallowa River) upstream to Howard Creek (Rkm 6) and a 50 km section from Minam State Park (Rkm 13) upstream to the mouth of Trout Creek (Rkm 63) near Enterprise. Anglers who parked their vehicles at Minam State Park to fish just below the park were included in the Wallowa survey. Because vehicle access into Rondowa was limited, anglers parked their vehicles at Palmer Junction, located 5.6 km upstream of Rondowa on the Grande Ronde River, and on Smith Mountain Road at the Forest Capital Partners gate, located on Smith Mountain which is approximately 16 km by road to Rondowa. Thus, for the Rondowa survey, we interviewed anglers leaving the parking areas at Palmer Junction and at the gate on Smith Mountain Road when they were encountered. The survey on the Imnaha River was conducted on the lower 32 km from its confluence with the Snake River (Rkm 0) upstream to the mouth of Big Sheep Creek (Rkm 32) near the town of Imnaha (Figure 1).

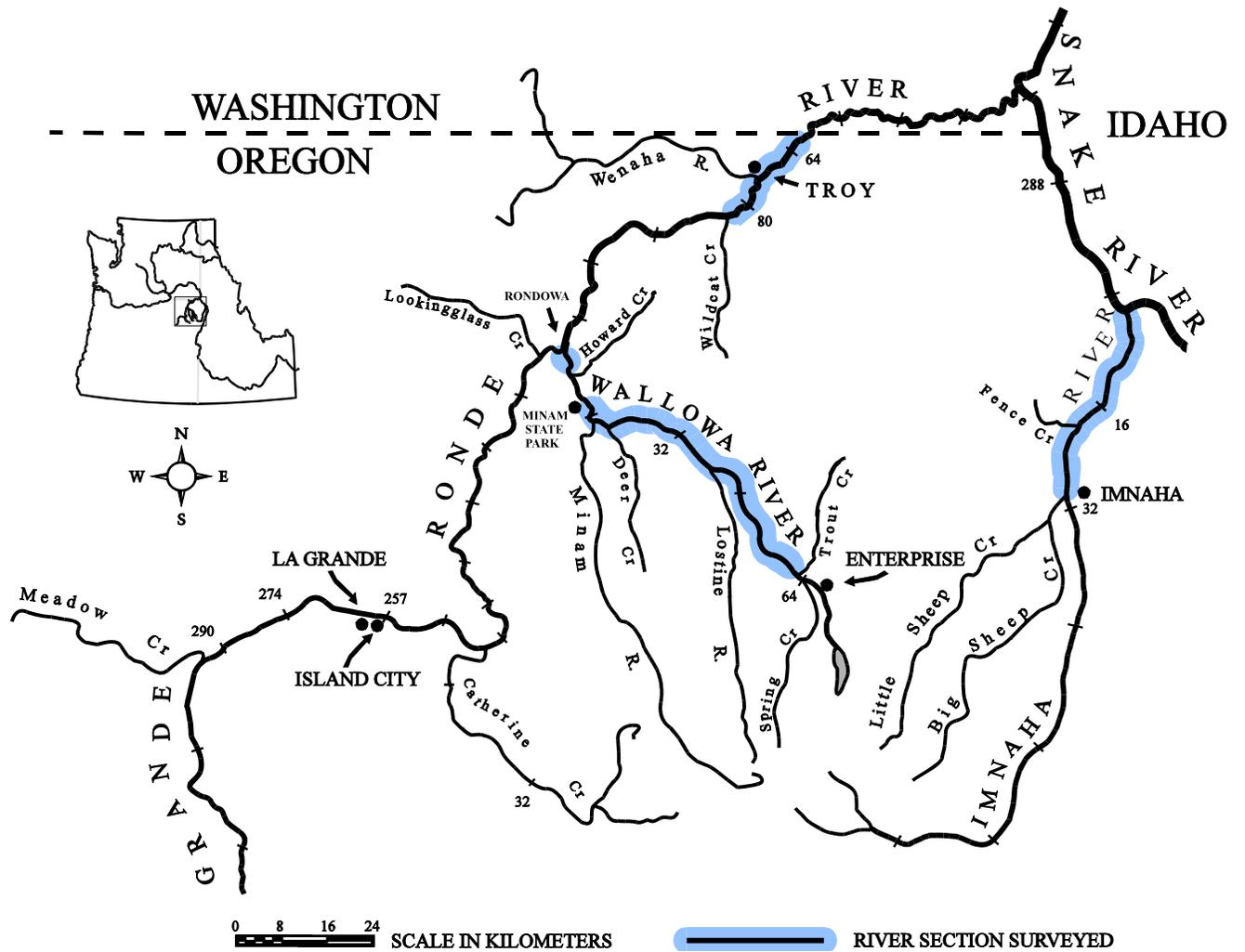


Figure 1. Map of northeastern Oregon showing where summer steelhead creel surveys were conducted in the Grande Ronde and Imnaha River basins during the 2003-04 run year.

METHODS

For the lower Grande Ronde River survey, we used the methodology described by Carmichael et al. (1988). The survey on the lower Grande Ronde River was conducted from 1 September 2003 through 15 April 2004. Our goal was to sample 50% of the weekends (Saturday and Sunday) and holidays and 30% of the weekdays (Monday through Friday) during each month of each survey. Initially, sample days were chosen randomly in two-day blocks. They were then adjusted to equally represent the two strata (weekend days and holidays, and weekdays). Each sample day, beginning at a randomly selected start time, the creel surveyor conducted a pressure count by tallying all anglers and vehicles every three hours while driving a vehicle along the entire survey route. Between pressure counts, the surveyor interviewed anglers by recording a description of each angler and their vehicle, their residence, the number of hours they had fished, and the number and species of fish caught. The surveyor also sampled all harvested fish by recording fork length (mm), sex, fin clips, and any external tags. If the fish was coded-wire-tagged (CWT), as indicated by adipose and left ventral fin-clips (AdLV), the surveyor asked permission from the angler to collect the snout, then excised the snout behind the eye and placed it with an identification number in a plastic bag for later processing.

Surveys on the Imnaha River were conducted from 1 February through 15 April 2004. For the Imnaha River survey, we used a check station for the area below Fence Creek (Rkm 23) and a roving survey in the area above Fence Creek. We selected sample days using the same methodology described for the lower Grande Ronde River survey. Our goal was to survey 50% of the weekends and 30% of the weekdays during each month of each survey. For the check station, we used the methodology described by Carmichael et al. (1988). The check station was designed so that anglers leaving the lower river area during a sample day would stop voluntarily and the surveyor would interview each angler and sample all harvested fish. At the end of the second sample day, the surveyor would drive to Cow Creek (Rkm 7) and interview all anglers encountered that fished during the two-day period and did not exit through the check station. For the roving survey, we followed the same procedures as on the lower Grande Ronde River survey except that the surveyor interviewed anglers during pressure counts. For each pressure count, the surveyor closed the check station, interviewed and enumerated all anglers from Fence Creek to the town of Imnaha, and returned. Time spent away from the check station was recorded, and catch and harvest data was expanded to account for the unsampled time.

For the Wallowa River and Rondowa survey areas, one surveyor conducted angler interviews from 1 February to 15 April 2004. We randomly selected the area to survey first and both areas were surveyed each sample day. Each sample day, the surveyor drove the survey route, stopped to interview anglers, then drove to the next area and repeated this sequence. For Rondowa, the surveyor checked the Palmer Junction and Smith Mountain parking areas that anglers used to access Rondowa. If sufficient time was available, the surveyor returned to interview anglers in the first area surveyed that

sample day. All harvested fish observed were sampled. From 1 February to 1 March, we surveyed five days each week (Sunday – Saturday) from 0800-1700. From 2 March to 15 April, we surveyed four days each week from 0700-1800.

For the lower Grande Ronde River creel surveys, we estimated angler effort in hours and days, total catch, harvest, catch rate, percent hatchery fish in the catch, and the number of AdLV+CWT marked fish harvested (see Carmichael et al. 1988). Similar statistics were estimated for the Imnaha River surveys, except the percent of marked fish was substituted for percent of hatchery fish, since unmarked hatchery steelhead were not distinguishable from wild adults. For the Wallowa and Rondowa survey areas, we estimated catch rate and percent hatchery fish in the catch. In addition, we determined age and sex composition and mean fork length of harvested fish in all survey areas. Catch rate was expressed as an index, hours per fish, in which lower values indicate better angling success and higher values indicate poorer angling success.

We estimated total harvest by month for previous spring fisheries in the Grande Ronde Basin that do not have a statistical creel survey in place (2002-03 run year) by using the angler harvest card estimates of harvest and a regression between angler harvest card harvest and creel survey harvest for specific reaches within the Grande Ronde and Imnaha basins for previous years. The regression is updated annually with lower Grande Ronde and Imnaha fishery harvest estimates from angler harvest tag returns and from the statistical surveys that were conducted. However, there is usually a one or two-year delay in obtaining final angler harvest tag estimates of total harvest. To estimate total catch, we multiplied total harvest estimates by the ratio of sampled catch to sampled harvest from creel surveys. To estimate total angler effort in hours, we used total catch divided by the sample catch rate (fish per hour) reported in Flesher et al. (2005).

In spring 2003 and 2004, we recycled hatchery adult returns from the Big Canyon Facility back into the Wallowa River fishery. On 13 and 20 March 2003 and weekly during March 2004, up to 100 Ad-marked adults trapped at the Big Canyon Facility (located at the mouth of Deer Creek) were transported and released into the Wallowa River either above (6.4 Rkm) or below (1.6 Rkm) the mouth of Deer Creek. We uniquely marked fish using opercle punches to differentiate day of release and release location. Recaptures at the Big Canyon Facility were enumerated by opercle punch and euthanized. The creel surveyor checked for opercle punches on all harvested fish that were sampled after the first recycled groups were released. In addition, on one sample day per week for a total of six sample days in both 2003 and 2004, the surveyor asked each angler if they had fished the previous day and if they had been interviewed by the surveyor. If they had been interviewed, the surveyor recorded how many fish the angler had harvested after being interviewed. We estimated the proportion of unsampled fish harvested per angler as the sum of fish harvested after anglers were interviewed divided by the total number of anglers that fished and were interviewed the previous day. We expanded the proportion of unsampled fish per angler by the total number of anglers interviewed the previous day to estimate the number of unsampled fish

harvested on these six sample days. Total harvest for the six sample days was estimated as sampled plus unsampled fish. We divided total harvest by sampled harvest to estimate number of fish harvested per sampled fish. We estimated total harvest of recycled fish by multiplying the number of recycled fish sampled in the entire fishery by three expansions: 1) the number of fish harvested per sampled fish, 2) an expansion for unsampled anglers (one divided by the proportion of anglers interviewed on the sample days that were interviewed the previous day), and 3) an expansion for unsampled days (number of unsampled days following first release of recycled fish divided by sampled days).

ACCOMPLISHMENTS AND FINDINGS

On the lower Grande Ronde River from 1 September 2003 to 15 April 2004, we sampled 52.1% of the weekends and holidays (37 days) and 29.9% of the weekdays (47 days) for a total of 84 sample days. On the Wallowa River and at Rondowa (mouth of the Wallowa River) from 1 February to 15 April 2004, we sampled 72.7% of the weekends and holidays (16 days) and 41.5% of the weekdays (22 days) for a total of 38 sample days. On the Imnaha River from 1 February to 15 April 2004, we sampled 50.0% of the weekends and holidays (11 days) and 30.2% of the weekdays (16 days) for a total of 27 sample days.

We estimated that 3,111 anglers fished for 17,204 hours on the lower Grande Ronde River during the 2003-04 season. They caught and released 1,052 wild and 756 hatchery steelhead, and harvested 1,172 hatchery steelhead for a catch rate index of 6 hours per fish (Figures 2-6, Appendix A-1). The percent of steelhead caught that were hatchery origin ranged from 8% in March 2004 to 76% in November 2003 (Figure 7, Appendix B). Age composition of harvested hatchery steelhead was 71% 1:1 (one year spent in freshwater: one year spent in saltwater), and 29% 1:2 (one year spent in freshwater: two years spent in saltwater). Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 594 (± 6) mm for age 1:1, and 701 (± 17) mm for age 1:2 (Table 1). Sex composition was 44% male and 56% female (Table 1). Seventy percent of the anglers were local Oregon resident anglers, 16% were non-local Oregon resident anglers, 5% were Washington State residents and 9% resided outside the states of Oregon and Washington (Table 2). On the lower Grande Ronde River, anglers harvested an estimated 78 AdLV+CWT marked steelhead from our hatchery releases and an estimated 8 AdLV+CWT marked steelhead that were strays from Washington Department of Fish and Wildlife releases on the Grande Ronde River at the Cottonwood Conditioning Pond, Washington (Table 3).

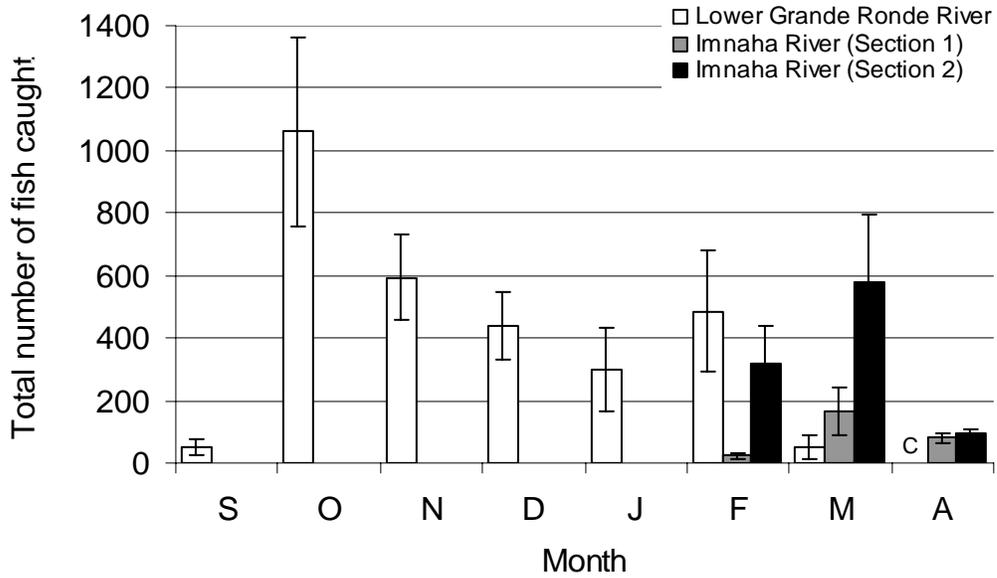


Figure 2. Estimated total catch of summer steelhead (\pm 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2003-04 run year. "C" indicates no catch. Surveys were conducted from 1 September 2003 to 15 April 2004 on the lower Grande Ronde River, and from 1 February to 15 April 2004 on the Imnaha River.

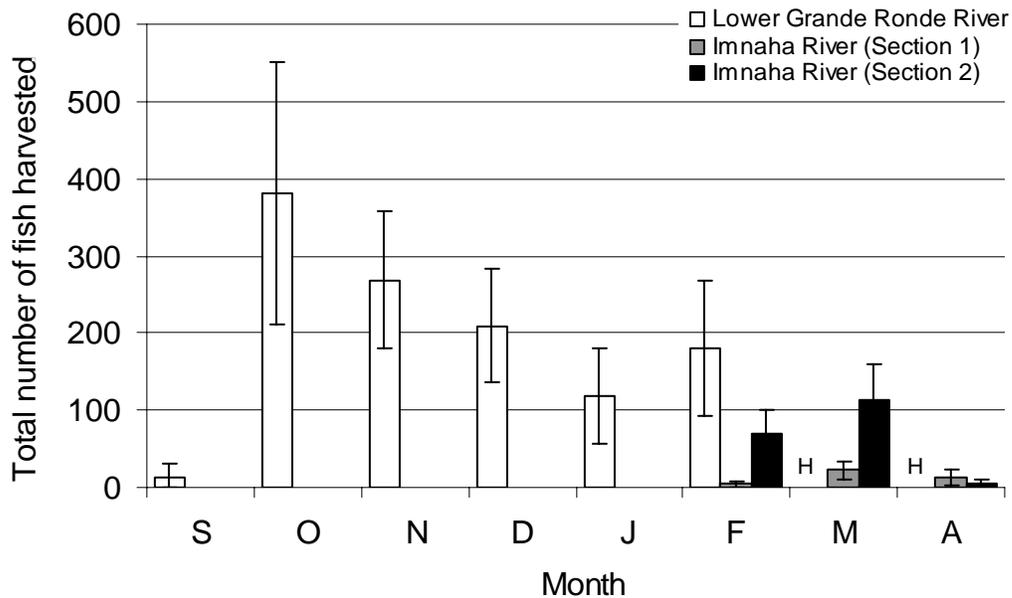


Figure 3. Estimated total harvest of summer steelhead (\pm 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2003-04 run year. "H" indicates no harvest. Surveys were conducted from 1 September 2003 to 15 April 2004 on the lower Grande Ronde River, and from 1 February to 15 April 2004 on the Imnaha River.

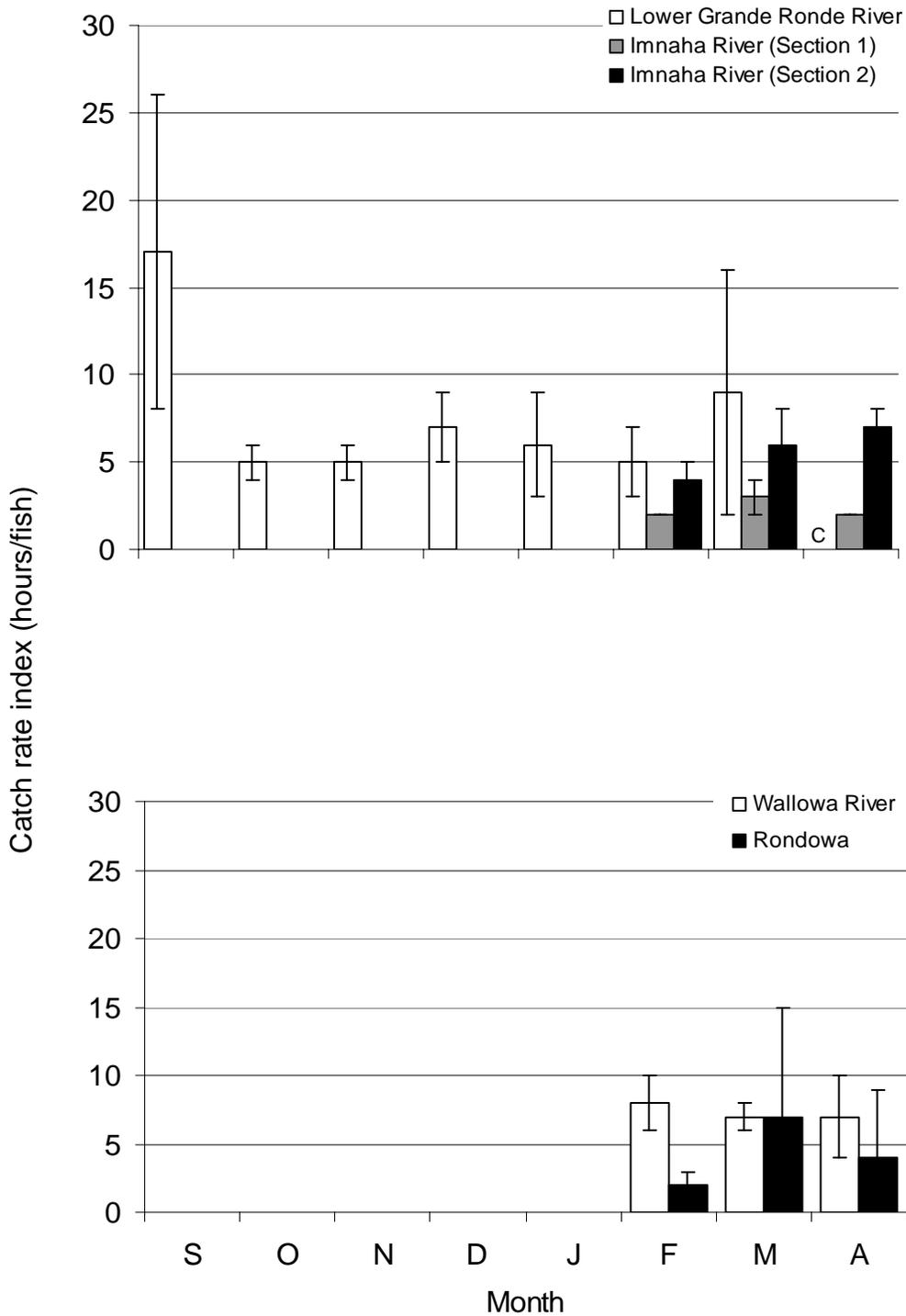


Figure 4. Estimated catch rate index (hours/fish) for summer steelhead (\pm 95% confidence intervals) in the Grande Ronde and Imnaha River basins during the 2003-04 run year. "C" indicates no catch. Survey areas and times include the lower Grande Ronde River (1 September 2003 - 15 April 2004), and Rondowa, Wallowa River, and two sections of the Imnaha River (1 February - 15 April 2004). Note: A lower catch rate index implies better angling success.

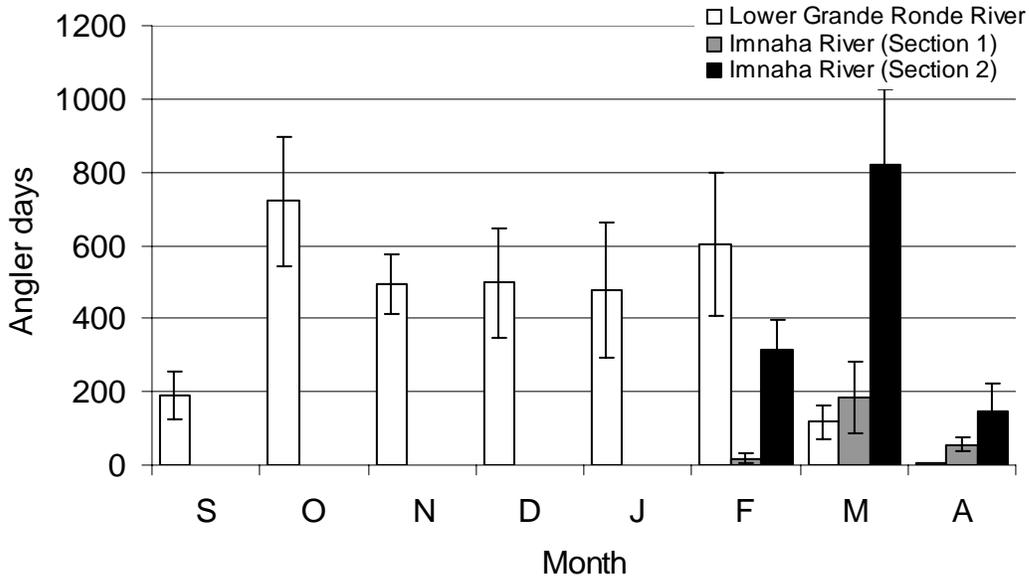


Figure 5. Estimated number of angler days for summer steelhead (\pm 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2003-04 run year. Surveys were conducted from 1 September 2003 to 15 April 2004 on the lower Grande Ronde River, and from 1 February to 15 April 2004 on the Imnaha River.

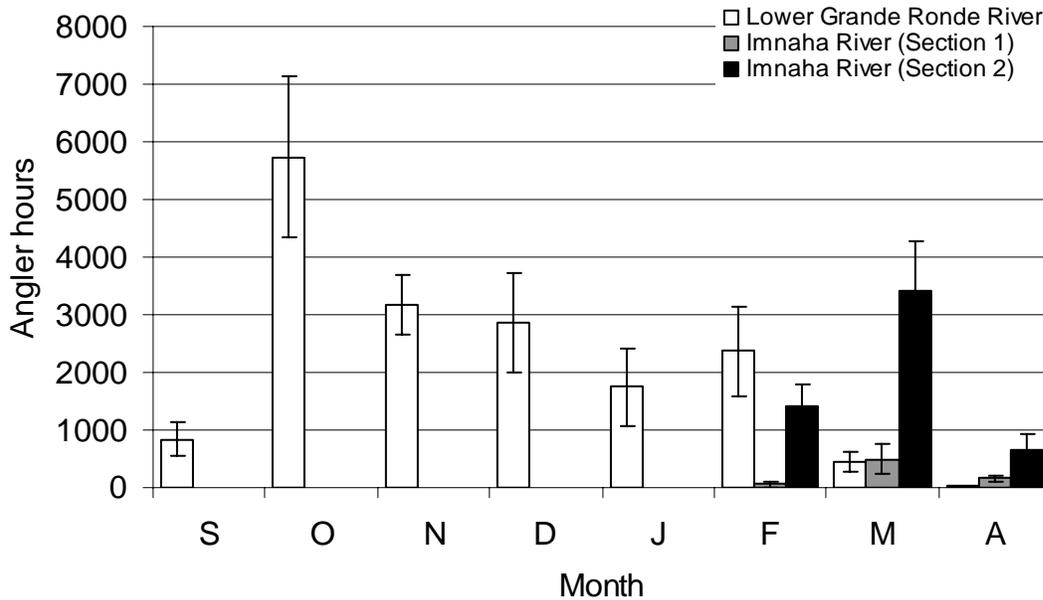


Figure 6. Estimated number of angler hours for summer steelhead (\pm 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2003-04 run year. Surveys were conducted from 1 September 2003 to 15 April 2004 on the lower Grande Ronde River, and from 1 February to 15 April 2004 on the Imnaha River.

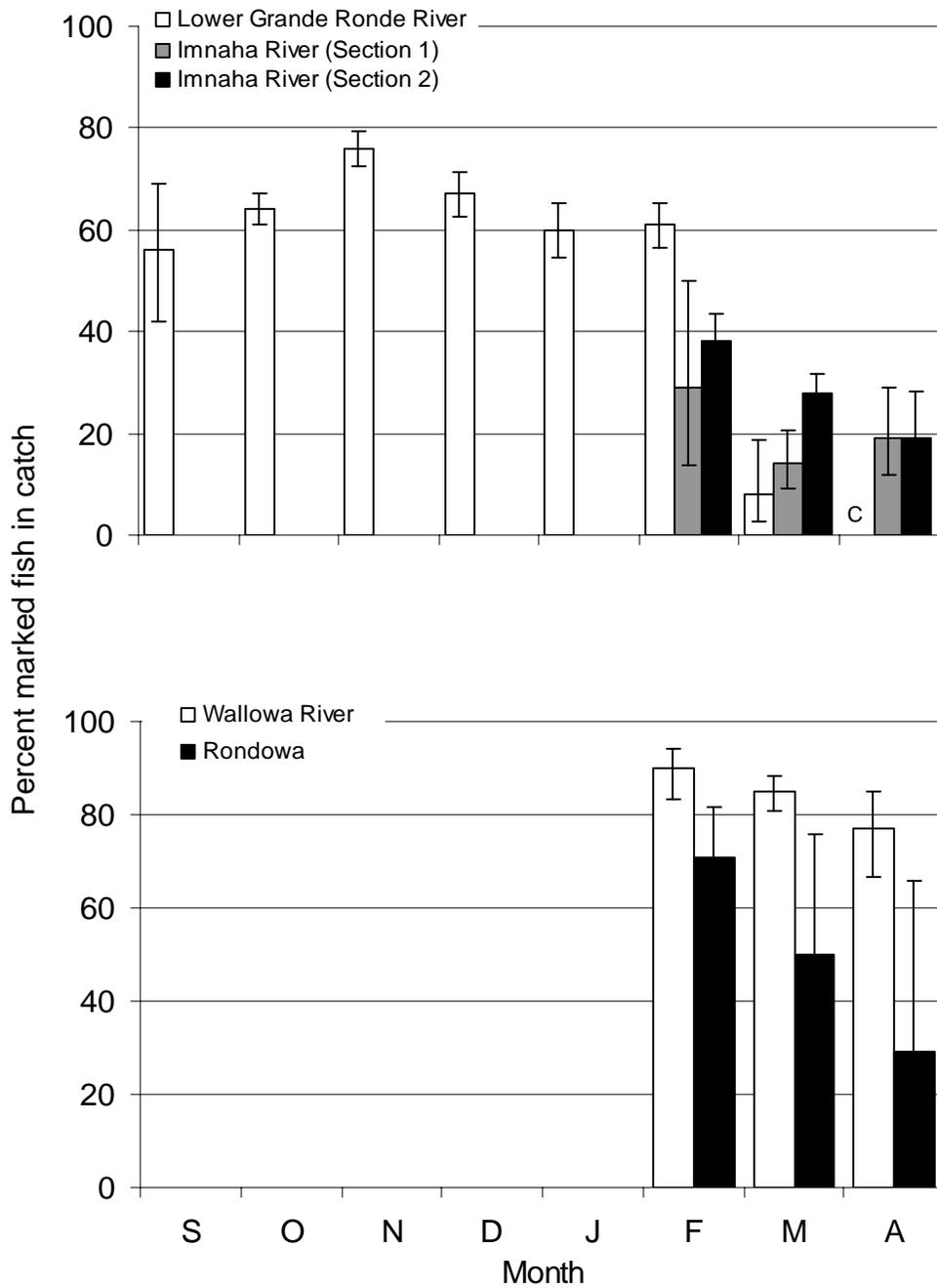


Figure 7. Estimated percent of summer steelhead caught (\pm 95% confidence intervals; using a binomial distribution) in the Grande Ronde and Imnaha River basins during the 2003-04 run year that were marked. In the Grande Ronde Basin all unmarked fish were wild, whereas in the Imnaha Basin unmarked fish were of both wild and hatchery origin. "C" indicates no catch. Survey areas and times include the lower Grande Ronde River (1 September 2003 - 15 April 2004), and Rondowa, Wallowa River, and two sections of the Imnaha River (1 February-15 April 2004).

Table 1. Percent age composition and mean fork length (\pm 95% confidence intervals) of hatchery summer steelhead sampled in creel surveys in the Grande Ronde and Imnaha River basins during the 2003-04 run year. Age composition and mean fork length by age are estimated from fork lengths of harvested fish and age-length keys developed from hatchery returns to Wallowa Hatchery in 2004 and Little Sheep Creek Facility (for the Imnaha River survey area) in 2003 and 2004. Age is expressed as years spent in freshwater prior to ocean migration:years spent in the ocean prior to spawning migration.

Creel survey area, sex	N	Age composition (%)			Mean fork length (mm)		
		1:1	1:2	2:1	1:1	1:2	2:1
Lower GR River							
Males	100	82	18	0	595 \pm 9	659 \pm 32	-
Females	128	62	37	1	594 \pm 7	717 \pm 18	655
Total	228	71	29	0	594 \pm 6	701 \pm 17	655
Rondowa							
Males	12	67	33	0	593 \pm 40	650 \pm 76	-
Females	10	30	70	0	563 \pm 50	712 \pm 14	-
Total	22	50	50	0	584 \pm 28	696 \pm 37	-
Wallowa River							
Males	142	82	18	0	591 \pm 5	665 \pm 32	-
Females	145	80	19	1	585 \pm 5	718 \pm 11	655
Total	287	81	18	0	588 \pm 4	693 \pm 17	655
Imnaha River							
Males	40	85	15	0	588 \pm 11	703 \pm 76	-
Females	46	63	37	0	575 \pm 7	697 \pm 25	-
Total	86	63	23	0	582 \pm 7	698 \pm 23	-

Table 2. Residence of summer steelhead anglers interviewed during creel surveys in the Grande Ronde and Imnaha River basins during the 2003-04 run year. Local Oregon resident anglers were from Union and Wallowa counties.

Creel survey area	Number of anglers	Percent			
		Local Oregon resident anglers	Non-local Oregon resident anglers	Washington resident anglers	Other out-of-state anglers
Lower GR River	846	70	16	5	9
Rondowa	53	77	23	0	0
Wallowa River	1140	68	28	1	3
Imnaha River	582	76	15	2	7

Table 3. Number of AdLV+CWT marked summer steelhead recovered during creel surveys in the Grande Ronde and Imnaha River basins during the 2003-04 run year. Recoveries were expanded for the entire fishery.

Creel survey area	Tag code	Release site	Experimental group ^a	Brood year	Number recovered	
					Observed	Expanded ^b
Lower Grande Ronde River	09 34 04	Spring Cr.	Prod./April	2001	1	7
	09 34 05	Spring Cr.	Forced/May	2001	3	15
	09 34 06	Spring Cr.	Volitional/May	2001	1	2
	09 34 07	Deer Cr.	Prod./April	2001	2	11
	09 34 08	Deer Cr.	Forced/May	2001	3	15
	09 34 09	Deer Cr.	Volitional/May	2001	4	28
	63 02 81	-	WDFW ^c	2000	1	2
	63 11 78	-	WDFW ^c	2001	1	6
Wallowa River	09 34 04	Spring Cr.	Prod./April	2001	3	ND
	09 34 05	Spring Cr.	Forced/May	2001	4	ND
	09 34 06	Spring Cr.	Volitional/May	2001	3	ND
	09 34 07	Deer Cr.	Prod./April	2001	4	ND
	09 34 08	Deer Cr.	Forced/May	2001	7	ND
	09 34 09	Deer Cr.	Volitional/May	2001	5	ND
Rondowa	09 32 12	Spring Cr.	Prod./April	2000	1	ND
	09 34 07	Deer Cr.	Prod./April	2001	1	ND
Imnaha River	09 01 25	B. Sheep Cr.	Direct Stream	2001	9	26
	09 32 11	L. Sheep Cr.	Prod./May	2000	2	5
	09 34 02	L. Sheep Cr.	Prod./April	2001	1	3
	09 34 03	L. Sheep Cr.	Prod./May	2001	7	22

^a Prod. indicates production releases.

^b ND indicates expansions not determined until statewide annual harvest card data become available.

^c Steelhead with tag code 63 02 81 and 63 11 78 were Wallowa stock released by Washington Department of Fish and Wildlife (WDFW) in the lower Grande Ronde River at the Cottonwood Conditioning Pond, Washington, on 1 April 2001 and 1 April 2002, respectively.

At Rondowa, the catch rate index averaged 3 hours per fish (Figure 4, Appendix A-2). The percent of steelhead caught that were hatchery origin ranged from 29% in April to 71% in February (Figure 7, Appendix B). Age composition of harvested hatchery steelhead was 50% 1:1 and 50% 1:2. Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 584 (± 28) mm for age 1:1 and 696 (± 37) mm for age 1:2 (Table 1). Sex composition was 55% male and 45% female (Table 1). Seventy-seven percent of the anglers were local Oregon resident anglers and 23% were non-local Oregon resident anglers (Table 2). At Rondowa, anglers harvested 2 AdLV+CWT marked steelhead from our hatchery releases, however, expanded estimates for the entire fishery will not be determined until angler harvest tag data become available (Table 3).

On the Wallowa River, the catch rate index averaged 7 hours per fish (Figure 4, Appendix A-3). The percent of steelhead caught that were hatchery origin ranged from 77% in April to 90% in February (Figure 7, Appendix B). Age composition of harvested hatchery steelhead was 81% 1:1, and 18% 1:2. Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 588 (± 4) mm for age 1:1, and 693 (± 17) mm for age 1:2 (Table 1). Sex composition was 49% male and 51% female (Table 1). Sixty-eight percent of the anglers were local Oregon residents, 28% were non-local Oregon residents, 1% were Washington State residents and 3% resided outside the states of Oregon and Washington (Table 2). On the Wallowa River, anglers harvested 26 AdLV+CWT marked steelhead from our hatchery releases, however, expanded estimates for the entire fishery will not be determined until state harvest tag data become available (Table 3).

On the Imnaha River, we estimated that 1,544 anglers fished for 6,194 hours. They caught and released 921 unmarked (wild and hatchery) and 120 hatchery steelhead, and harvested 228 hatchery steelhead for a catch rate index of 5 hours per fish (Figures 2-6, Appendices A-4 and A-5). The percent of steelhead caught that were known hatchery origin ranged from 14% in March in Section 1 to 38% in February in Section 2 (Figure 7, Appendix B). Age composition of harvested hatchery steelhead was 63% 1:1, and 23% 1:2. Mean fork length ($\pm 95\%$ confidence interval) of harvested hatchery steelhead was 582 (± 7) mm for age 1:1, and 698 (± 23) mm for age 1:2 (Table 1). Sex composition was 53% male and 47% female (Table 1). Seventy-six percent of the anglers were local Oregon residents, 15% were non-local Oregon residents, 2% were Washington State residents and 7% resided outside the states of Oregon and Washington (Table 2). On the Imnaha River, anglers harvested an estimated 56 AdLV+CWT marked steelhead from our hatchery releases (Table 3).

Angler effort (Figure 8) was lower on the lower Grande Ronde River and higher on the Imnaha River than the previous run year. Harvest (Figure 9), however, was higher than the previous run year on the lower Grande Ronde and similar on the Imnaha River. Catch rates in the Grande Ronde and Imnaha basins were higher than the previous run year and higher than the average since surveys began (Table 4).

The percent of local resident anglers participating in summer steelhead fisheries increased in the Grande Ronde Basin and decreased in the Imnaha Basin compared to the previous run year (Table 2). However, the percent of local resident anglers in the Grande Ronde and Imnaha basin fisheries has significantly decreased since surveys began (Figure 10). The fishery at Rondowa (mouth of the Wallowa River) had the highest percent of local resident anglers (77%), and the Wallowa River fishery had the highest percentage (28%) of non-local Oregon resident anglers, while the lower Grande Ronde River fishery had the highest percent (14%) of out-of-state anglers.

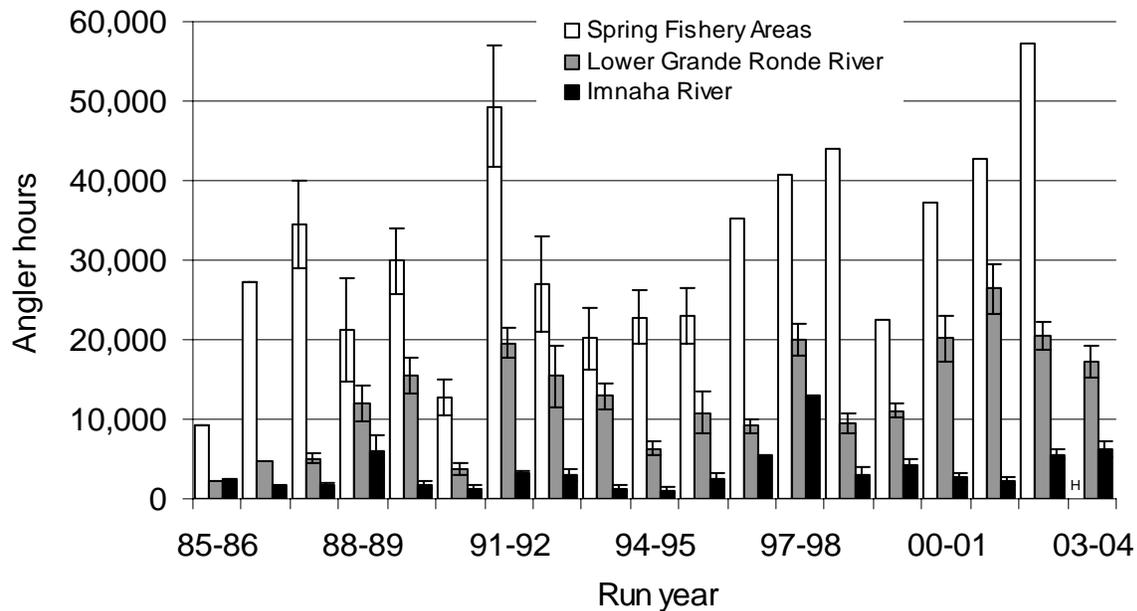


Figure 8. Angler effort for summer steelhead ($\pm 95\%$ confidence intervals) in spring fishery areas (upper Grande Ronde River, Wallowa River, Catherine Creek, and Rondowa), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 2003-04 run years. "H" indicates this value must be estimated from harvest card data, which was not available when this report was submitted. Confidence intervals not available for the 85-86 and 86-87 run years, the Imnaha fishery for the 96-97 and 97-98 run years, and for spring fishery areas beginning with the 96-97 run year.

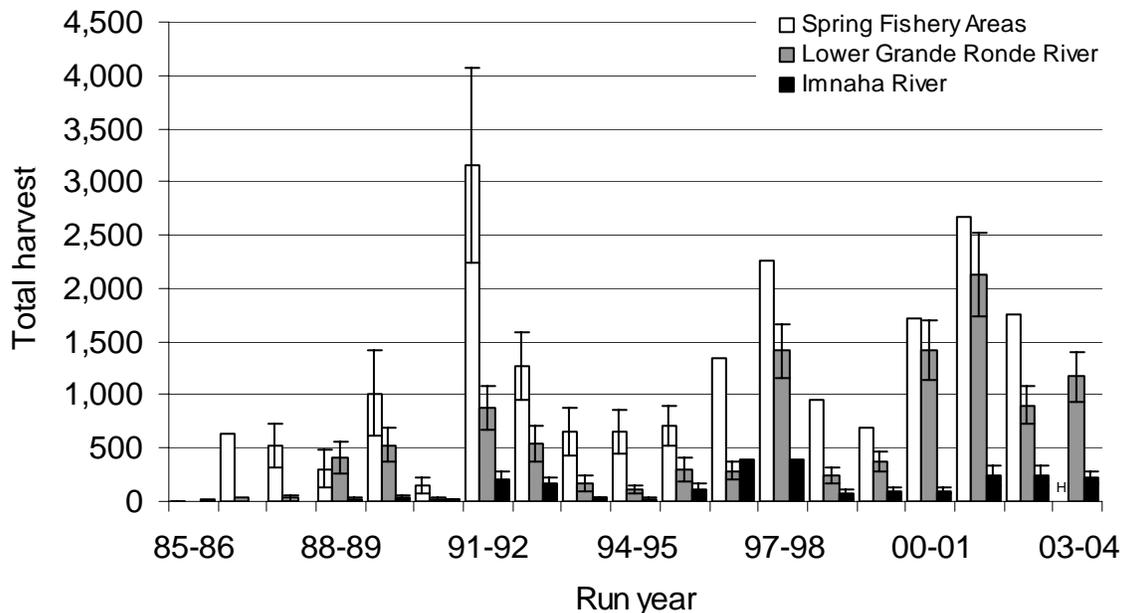


Figure 9. Number of hatchery summer steelhead harvested ($\pm 95\%$ confidence intervals) by recreational anglers in spring fishery areas (upper Grande Ronde River, Wallowa River, Catherine Creek, and Rondowa), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 2003-04 run years. H indicates this value estimated using harvest card data, which was not yet available. Confidence intervals not available for the 85-86 and 86-87 run years, the Imnaha fishery for the 96-97 and 97-98 run years, and for spring fishery areas beginning with the 96-97 run year.

Table 4. Catch rate index (hours/fish \pm 95% confidence intervals) in summer steelhead fisheries creel survey areas in the Grande Ronde and Imnaha River basins for the 1985-86 to 2003-04 run years. Note that a lower catch rate index implies greater angling success. "-" indicates not sampled or undefined.

Run year	Catch rate index (hours/fish)					
	Lower GR River	Upper GR River	Catherine Creek	Rondowa	Wallowa River	Imnaha River
85-86	8 \pm 7	-	-	-	7 \pm 7	15 \pm 7
86-87	9 \pm 3	-	-	-	11 \pm 3	9 \pm 8
87-88	10 \pm 4	-	-	11 \pm 9	16 \pm 3	24 \pm 9
88-89	14 \pm 4	40 \pm 55	-	-	43 \pm 21	18 \pm 11
89-90	14 \pm 4	14 \pm 8	-	34 \pm 27	17 \pm 5	20 \pm 8
90-91	19 \pm 8	24 \pm 11	-	-	6 \pm 2	13 \pm 6
91-92	11 \pm 3	10 \pm 3	3 \pm 3	6 \pm 1	10 \pm 2	4 \pm 1
92-93	9 \pm 2	14 \pm 4	49 \pm 49	-	11 \pm 2	8 \pm 1
93-94	18 \pm 5	31 \pm 17	-	12 \pm 4	17 \pm 3	13 \pm 3
94-95	21 \pm 6	25 \pm 13	-	15 \pm 5	17 \pm 3	17 \pm 8
95-96	11 \pm 2	15 \pm 4	-	-	21 \pm 4	7 \pm 2
96-97	14 \pm 4	18 \pm 9	33 \pm 69	-	13 \pm 3	6 \pm 2
97-98	7 \pm 1	13 \pm 9	7 \pm 10	11 \pm 6	10 \pm 1	18 \pm 9
98-99	17 \pm 4	19 \pm 9	14 \pm 20	-	18 \pm 4	20 \pm 7
99-2000	11 \pm 2	25 \pm 19	-	8 \pm 7	17 \pm 4	12 \pm 3
2000-01	6 \pm 1	18 \pm 17	-	6 \pm 4	11 \pm 2	6 \pm 1
2001-02	5 \pm 1	11 \pm 17	-	7 \pm 4	7 \pm 1	3 \pm 1
2002-03	8 \pm 1	-	-	8 \pm 6	12 \pm 2	6 \pm 2
2003-04	6 \pm 1	-	-	3 \pm 2	7 \pm 1	5 \pm 1
Average	12 \pm 2	20 \pm 5	21 \pm 18	11 \pm 5	14 \pm 4	12 \pm 3

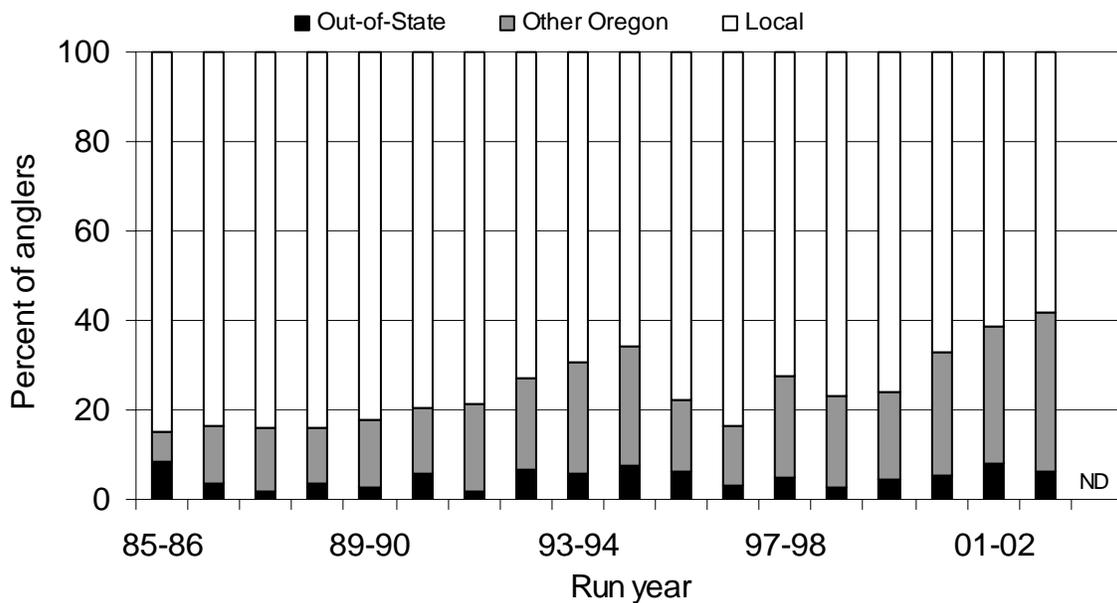


Figure 10. Percent of local resident anglers (Union or Wallowa county residents), non-local Oregon resident anglers, and out-of-state anglers that fished in summer steelhead fisheries in the Grande Ronde and Imnaha River basins for the 1985-86 to 2002-03 run years. ND indicates not determined until statewide annual harvest card data become available.

There was a significant linear relationship between angler harvest tag harvest estimates and creel harvest estimates for summer steelhead fisheries in the Grande Ronde and Imnaha River basins (Figure 11). Total harvest estimates for spring steelhead fisheries in the 2002-03 run year were 10 fish in the upper Grande Ronde River, 4 fish in Catherine Creek, 687 fish at Rondowa, 861 fish in the Wallowa River, and 188 fish in the middle Grande Ronde River, for a total harvest estimate of 1,750 fish in the Grande Ronde Basin, excluding the lower Grande Ronde River (Figure 9, Appendix C-1). We estimated 13 coded-wire tagged fish were harvested at Rondowa, and 122 coded-wire tagged fish were harvested in the Wallowa River in the 2002-03 run year. Total catch estimates for spring steelhead fisheries in the 2002-03 run year were 26 fish in the upper Grande Ronde River, 6 fish in Catherine Creek, 3,719 fish at Rondowa, 1,667 fish in the Wallowa River, and 338 fish in the middle Grande Ronde River, for a total catch estimate of 5,756 fish in the Grande Ronde Basin, excluding the lower Grande Ronde River (Appendix C-2). Angler effort for the 2002-03 run year was estimated to be 350 hours in the upper Grande Ronde River, 79 hours in Catherine Creek, 32,193 hours at Rondowa, 20,441 hours in the Wallowa River, and 4,150 hours in the middle Grande Ronde River, for a total effort estimate of 57,213 hours in the Grande Ronde Basin, excluding the lower Grande Ronde River (Figure 8, Appendix C-3).

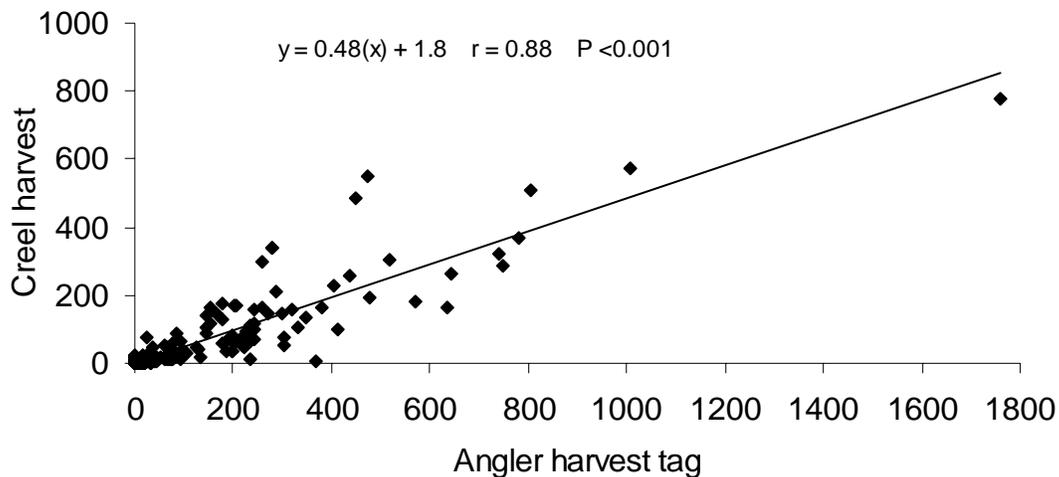


Figure 11. Relationship of angler harvest tag (punch card) and creel survey harvest for summer steelhead fisheries in the Grande Ronde and Imnaha River basins for years when harvest estimates for specific reaches were available (1993-1996 for the upper Grande Ronde, Wallowa, and Rondowa, 1992-1993 for Catherine Creek, 1993-spring 2003 for the lower Grande Ronde, and 1986-2003 for the Imnaha fishery areas).

We recycled 200 summer steelhead to the Wallowa River fishery in 2003 and recycled 306 in 2004. Fifty-three (27%) summer steelhead were recaptured at Big Canyon in 2003 and 131 (43%) were recaptured in 2004. In 2003, 16 recycled steelhead were sampled in 18 days of creel surveys, for a total harvest estimate of 88 recycled steelhead (44%, Appendix D-1). In 2004, 8 recycled steelhead were sampled in 19 days of creel surveys. Estimated total harvest of recycled steelhead in the Wallowa River fishery was 102 fish (33%) during the 2003-04 run year (Appendix D-2).

MANAGEMENT IMPLICATIONS AND RECOMMENDATIONS

Although angler effort was lower than the previous run year on the lower Grande Ronde River, effort the last three years has been the highest recorded since surveys began in 1985. On the Imnaha River, angler effort was higher than the previous run year, and the second highest recorded since surveys began. Harvest was higher on the lower Grande Ronde River and similar on the Imnaha River to the previous run year. Similarly, catch rates in all Grande Ronde and Imnaha basin steelhead fisheries were some of the highest reported since we began surveys. Hatchery fish dominated the catch in six of eight months during the fishery on the lower Grande Ronde, in one of three months surveyed at Rondowa, and in all three months on the Wallowa River. Also, unmarked hatchery fish, which are indistinguishable from natural fish, and marked hatchery fish contributed substantially during all three months to the Imnaha River fishery. Statistics for the Wallowa and Rondowa fisheries for the 2003-04 run year will be reported in the 2004-05 annual report. These fishery statistics illustrate the importance of current hatchery programs to the success of recreational summer steelhead fisheries in both the Grande Ronde and Imnaha River basins.

Recycling adult steelhead returning to the Big Canyon Facility back into the Wallowa River for the recreational fishery in 2003 and 2004 provided additional harvest opportunities for anglers and reduced the number of surplus adults at the facility. Expansions used to estimate total harvest of recycled steelhead for unsampled fish and unsampled anglers were based on six days of sampling information for each run year. Because total harvest is estimated based on expansions for unsampled fish kept by sampled anglers, unsampled anglers on sample days, and unsampled days, we recommend that additional sampling occur during the fishery to better refine harvest estimates of recycled fish. Therefore, we recommend continuing recycling of adipose-only marked steelhead back into the Wallowa River with additional sampling of the fishery to estimate total harvest of recycled fish.

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APPENDIX A

Fishery Statistics for the 2003-04 run year

Appendix Table A-1. Fishery statistics for summer steelhead on the lower Grande Ronde River during the 2003-04 run year. Statistics include mean estimates $\pm 95\%$ confidence intervals. Only adipose fin-clipped fish were harvested. "-" indicates not sampled or undefined. "h" indicates hour.

Month, day type	Sample size		Total Hours	Total Catch	Total harvest	Catch rate		Angler days
	Days	Anglers				fish/h	h/fish	
September:								
Weekday	6	17	440 \pm 229	50 \pm 26	14 \pm 18	0.113 \pm 0.058	9 \pm 5	76 \pm 40
Weekend	5	29	403 \pm 173	0	0	-	-	115 \pm 49
Total	11	46	843 \pm 287	50 \pm 26	14 \pm 18	0.059 \pm 0.030	17 \pm 9	191 \pm 65
October:								
Weekday	7	100	3640 \pm 972	768 \pm 247	276 \pm 15 3	0.211 \pm 0.068	5 \pm 2	471 \pm 126
Weekend	4	57	2089 \pm 1000	292 \pm 179	105 \pm 73	0.140 \pm 0.086	7 \pm 4	250 \pm 120
Total	11	157	5729 \pm 1395	1060 \pm 305	381 \pm 17 0	0.185 \pm 0.053	5 \pm 1	721 \pm 176
November:								
Weekday	5	50	1482 \pm 461	198 \pm 84	62 \pm 48	0.133 \pm 0.057	8 \pm 3	207 \pm 64
Weekend	6	102	1689 \pm 233	397 \pm 104	208 \pm 75	0.235 \pm 0.062	4 \pm 1	289 \pm 40
Total	11	152	3171 \pm 516	595 \pm 134	270 \pm 89	0.188 \pm 0.042	5 \pm 1	496 \pm 81
December:								
Weekday	7	62	1618 \pm 718	253 \pm 92	90 \pm 59	0.156 \pm 0.057	6 \pm 2	313 \pm 139
Weekend	5	82	1247 \pm 460	186 \pm 54	119 \pm 42	0.149 \pm 0.043	7 \pm 2	185 \pm 68
Total	12	144	2865 \pm 852	439 \pm 107	209 \pm 73	0.153 \pm 0.037	7 \pm 2	498 \pm 148
January:								
Weekday	6	60	1317 \pm 667	203 \pm 126	73 \pm 56	0.154 \pm 0.096	6 \pm 4	376 \pm 190
Weekend	6	49	431 \pm 60	97 \pm 40	45 \pm 25	0.224 \pm 0.093	4 \pm 2	102 \pm 14
Total	12	109	1748 \pm 670	300 \pm 132	118 \pm 61	0.172 \pm 0.076	6 \pm 3	478 \pm 183
February:								
Weekday	6	88	1461 \pm 733	359 \pm 182	135 \pm 81	0.246 \pm 0.125	4 \pm 2	382 \pm 192
Weekend	5	114	906 \pm 227	127 \pm 63	45 \pm 32	0.140 \pm 0.070	7 \pm 4	220 \pm 55
Total	11	202	2367 \pm 767	486 \pm 193	180 \pm 87	0.205 \pm 0.082	5 \pm 2	602 \pm 195
March:								
Weekday	7	24	381 \pm 172	45 \pm 34	0	0.118 \pm 0.090	8 \pm 6	88 \pm 40
Weekend	4	10	72 \pm 20	5 \pm 13	0	0.066 \pm 0.177	15 \pm 40	30 \pm 8
Total	11	34	453 \pm 173	50 \pm 37	0	0.110 \pm 0.081	9 \pm 7	118 \pm 45
April:								
Weekday	3	1	16	0	-	-	-	4
Weekend	2	0	12	-	-	-	-	3
Total	5	1	28	0	-	-	-	7
Grand total	84	845	17204 \pm 2022	2980 \pm 423	1172 \pm 23	0.173 \pm 0.025	6 \pm 1	3111 \pm 366

Appendix Table A-2. Catch rate ($\pm 95\%$ confidence intervals) for summer steelhead at Rondowa during the 2003-04 run year. Only adipose fin-clipped fish were harvested. "-" indicates not sampled or undefined. "h" indicates hour.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	12	1	1.558	1
Weekend	5	10	0.529 \pm 0.419	2 \pm 2
Total	17	11	0.618 \pm 0.422	2 \pm 1
March:				
Weekday	8	7	0.185 \pm 0.252	5 \pm 7
Weekend	8	4	0.079 \pm 0.251	13 \pm 40
Total	16	11	0.139 \pm 0.145	7 \pm 8
April:				
Weekday	2	0	-	-
Weekend	3	4	0.226 \pm 0.349	4 \pm 7
Total	5	4	0.226 \pm 0.258	4 \pm 5
Grand total	38	26	0.358 \pm 0.199	3 \pm 2

Appendix Table A-3. Catch rate ($\pm 95\%$ confidence intervals) for summer steelhead on the Wallowa River during the 2003-04 run year. Only adipose fin-clipped fish were harvested. "h" indicates hour.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	12	194	0.120 \pm 0.036	8 \pm 3
Weekend	5	147	0.124 \pm 0.039	8 \pm 3
Total	17	341	0.122 \pm 0.026	8 \pm 2
March:				
Weekday	8	257	0.154 \pm 0.038	7 \pm 2
Weekend	8	382	0.147 \pm 0.031	7 \pm 1
Total	16	639	0.149 \pm 0.024	7 \pm 1
April:				
Weekday	2	59	0.179 \pm 0.117	6 \pm 4
Weekend	3	101	0.111 \pm 0.040	9 \pm 3
Total	5	160	0.135 \pm 0.048	7 \pm 3
Grand total	38	1140	0.140 \pm 0.017	7 \pm 1

Appendix Table A-4. Fishery statistics for summer steelhead in Section 1 (Fence Creek to town of Imnaha) of the Imnaha River during the 2003-04 run year. Statistics include mean estimates $\pm 95\%$ confidence intervals. Only adipose fin-clipped fish were harvested. "h" indicates hour.

Month, day type	Sample size		Total hours	Total catch	Total harvest	Catch rate		Angler days
	Days	Anglers				fish/h	h/fish	
February:								
Weekday	6	7	25 \pm 36	17 \pm 7	0	0.667 \pm 0.077	2 \pm 0	11 \pm 16
Weekend	5	15	30 \pm 27	7 \pm 8	4 \pm 4	0.241 \pm 0.135	4 \pm 2	8 \pm 7
Total	11	22	55 \pm 45	24 \pm 10	4 \pm 4	0.435 \pm 0.081	2 \pm 0	19 \pm 16
March:								
Weekday	6	34	290 \pm 258	84 \pm 72	8 \pm 10	0.291 \pm 0.212	3 \pm 2	131 \pm 117
Weekend	4	36	202 \pm 40	82 \pm 17	14 \pm 6	0.406 \pm 0.060	2 \pm 0	54 \pm 11
Total	10	70	492 \pm 261	166 \pm 74	22 \pm 11	0.338 \pm 0.127	3 \pm 1	185 \pm 98
April:								
Weekday	4	4	45 \pm 43	11 \pm 16	5 \pm 6	0.242 \pm 0.055	4 \pm 1	19 \pm 18
Weekend	2	24	121 \pm 26	70 \pm 15	8 \pm 9	0.578 \pm 0.086	2 \pm 0	38 \pm 8
Total	6	28	166 \pm 50	81 \pm 16	13 \pm 10	0.486 \pm 0.064	2 \pm 0	57 \pm 17
Grand total	27	120	713 \pm 270	271 \pm 76	39 \pm 16	0.380 \pm 0.089	3 \pm 1	261 \pm 99

Appendix Table A-5. Fishery statistics for summer steelhead in Section 2 (mouth to Fence Creek) of the Imnaha River during the 2003-04 run year. Statistics include mean estimates $\pm 95\%$ confidence intervals. Only adipose fin-clipped fish were harvested. "h" indicates hour.

Month, day type	Sample size		Total hours	Total catch	Total harvest	Catch rate		Angler days
	Days	Anglers				fish/h	h/fish	
February:								
Weekday	6	61	955 \pm 340	200 \pm 93	47 \pm 25	0.209 \pm 0.081	5 \pm 2	214 \pm 76
Weekend	5	56	465 \pm 142	119 \pm 75	23 \pm 17	0.256 \pm 0.107	4 \pm 2	100 \pm 31
Total	11	117	1420 \pm 368	319 \pm 119	70 \pm 30	0.225 \pm 0.065	4 \pm 1	314 \pm 81
March:								
Weekday	6	146	2420 \pm 817	414 \pm 203	73 \pm 42	0.171 \pm 0.072	6 \pm 3	554 \pm 187
Weekend	4	134	1001 \pm 262	168 \pm 72	40 \pm 19	0.168 \pm 0.051	6 \pm 2	266 \pm 70
Total	10	280	3421 \pm 858	582 \pm 215	113 \pm 46	0.170 \pm 0.053	6 \pm 2	820 \pm 206
April:								
Weekday	4	25	285 \pm 245	47 \pm 10	0	0.164 \pm 0.027	6 \pm 1	69 \pm 59
Weekend	2	40	355 \pm 183	50 \pm 9	6 \pm 5	0.141 \pm 0.017	7 \pm 1	80 \pm 41
Total	6	65	640 \pm 306	97 \pm 13	6 \pm 5	0.151 \pm 0.015	7 \pm 1	149 \pm 71
Grand total	27	462	5481 \pm 983	998 \pm 246	189 \pm 55	0.182 \pm 0.037	5 \pm 1	1283 \pm 230

APPENDIX B

Percent of Marked Hatchery Steelhead Caught in 2003-04 Run Year

Percent of marked hatchery summer steelhead caught during each survey month in the Grande Ronde and Imnaha River basins during the 2003-04 run year. For the Imnaha River, percentages include catch of marked hatchery fish only. Total catch for the Lower Grande Ronde and Imnaha rivers and sampled catch for the Upper Grande Ronde and Wallowa rivers and Rondowa are shown in parentheses. On the Imnaha River, Section 1 is from Fence Creek upstream to the town of Imnaha, and Section 2 is from the mouth upstream to Fence Creek. "-" indicates not sampled or undefined.

Creel survey area	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Lower GR River	56(50)	64(1060)	76(595)	67(439)	60(300)	61(486)	8(50)	-(0)
Rondowa	-	-	-	-	-	71(55)	50(12)	29(7)
Wallowa River	-	-	-	-	-	90(120)	85(330)	77(86)
Imnaha River (Section 1)	-	-	-	-	-	29(24)	14(166)	19(81)
Imnaha River (Section 2)	-	-	-	-	-	38(319)	28(582)	19(97)

APPENDIX C

Fishery Statistics for Spring Fisheries for the 2002-03 Run Year

Appendix Table C-1. Estimated harvest of summer steelhead, and observed and expanded harvest of AdLV+CWT marked steelhead in spring fisheries in the Grande Ronde Basin for the 2002-03 run year. Total harvest = 0.483 (harvest card) + 1.804. Sample rate expansion = total harvest/sampled fish. A sample rate expansion of 25 or greater was considered unreliable, therefore expanded equals observed. Harvest estimates made only for months when steelhead angling season was open (Sept - April) and angler harvest card data was greater than zero. Does not include the lower Grande Ronde (location code 231) fishery. "-" indicates not sampled or undefined.

Fishery, location code, statistics, tag code	Fishery statistics and number of tags recovered by month									Expanded tags
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	
Upper Grande Ronde (233)										
Angler harvest cards	0	0	0	0	0	0	8	4		
Total harvest	-	-	-	-	-	-	6	4	10	
Catherine Creek (120)										
Angler harvest cards	0	0	0	0	0	4	0	0		
Total harvest	-	-	-	-	-	4	-	-	4	
Rondowa (234)										
Angler harvest cards	0	16	12	16	95	891	319	43		
Sampled fish	0	0	0	0	0	0	2	2		
Total harvest	-	10	8	10	48	432	156	23	687	
Sample rate expansion	-	-	-	-	-	-	78.0	11.5		
092934						0	0	1	1	12
093215						0	1	0	1	1
Wallowa (235)										
Angler harvest cards	4	4	12	43	91	639	792	166		
Sampled fish	0	0	0	0	0	78	121	16		
Total harvest	4	4	8	23	46	310	384	82	861	
Sample rate expansion	-	-	-	-	-	4.0	3.2	5.1		
092930						2.3	0	0	2.3	9
092931						2.3	1	0	3.3	12
092932						2.3	0	0	2.3	9
092933						0	1	0	1	3
092934						1.2	4	0	5.2	18
092935						2.3	3	0	5.3	19
092936						1.2	2	0	3.2	11
092937						0	2	0	2	6
093212						1.2	1	0	2.2	8
093215						0	2	0	2	6
093216						1.2	0	2	3.2	15
093217						0	2	0	2	6
Wenaha (184)										
Angler harvest cards	0	0	0	0	0	0	0	0		
Total harvest	-	-	-	-	-	-	-	-	0	
Middle Grande Ronde (232)										
Angler harvest cards	0	16	28	24	55	162	71	8		
Total harvest	-	10	15	13	28	80	36	6	188	
Total Grande Ronde harvest (excluding lower Grande Ronde)									1,750	

Appendix Table C-2. Estimated catch of summer steelhead in spring fisheries in the Grande Ronde Basin for the 2002-03 run year. Total catch = (sampled catch/sample harvest) x total harvest. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "-" indicates not sampled or undefined.

Fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	-	-	-	-	-	6	4	10
Total catch	-	-	-	-	-	-	12	14	26
Catherine Creek									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	-	-	-	-	4	-	-	4
Total catch	-	-	-	-	-	6	-	-	6
Rondowa									
Sampled harvest	-	-	-	-	-	0	2	2	4
Sampled catch	-	-	-	-	-	0	8	15	23
Total harvest	-	10	8	10	48	432	156	23	687
Total catch	-	58	46	58	276	2484	624	173	3719
Wallowa									
Sampled harvest	-	-	-	-	-	78	121	16	215
Sampled catch	-	-	-	-	-	117	237	56	410
Total harvest	4	4	8	23	46	310	384	82	861
Total catch	8	8	15	44	88	465	752	287	1667
Wenaha									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	-	-	-	-	-	-	-	0
Total catch	-	-	-	-	-	-	-	-	0
Middle Grande Ronde									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	10	15	13	28	80	36	6	188
Total catch	-	19	29	25	53	120	71	21	338
Total Grande Ronde catch (excluding lower Grande Ronde)									5756

^a Wallowa data were used for the upper Grande Ronde, middle Grande Ronde, and Catherine Creek; lower Grande Ronde data, in Flesher et al. 2005, were used for the Wenaha.

Appendix Table C-3. Estimated angler effort (hours) for summer steelhead in spring fisheries in the Grande Ronde Basin for the 2002-03 run year. Angler effort in hours = Total catch/sampled catch rate in fish per hour. For months with little or no sampling, the average proportion was used. For areas with little or no sampling, data from the survey in closest proximity was used. Does not include the lower Grande Ronde fishery. "-" indicates not sampled or undefined.

Fishery ^a , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	-	-	-	-	-	12	14	26
Angler effort	-	-	-	-	-	-	124	226	350
Catherine Creek									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	-	-	-	-	6	-	-	6
Angler effort	-	-	-	-	-	79	-	-	79
Rondowa									
Catch rate	-	-	-	-	-	-	0.082	0.170	0.124
Total catch	-	58	46	58	276	2484	624	173	3719
Angler effort	-	468	371	468	2226	20032	7610	1018	32193
Wallowa									
Catch rate	-	-	-	-	-	0.076	0.097	0.062	0.084
Total catch	8	8	15	44	88	465	752	287	1667
Angler effort	95	95	179	524	1048	6118	7753	4629	20441
Wenaha									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	-	-	-	-	-	-	-	0
Angler effort	-	-	-	-	-	-	-	-	0
Middle Grande Ronde									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	19	29	25	53	120	71	21	338
Angler effort	-	226	345	298	631	1579	732	339	4150
Total Grande Ronde angler effort (excluding lower Grande Ronde)									57213

^a Wallowa data were used for the upper Grande Ronde, middle Grande Ronde, and Catherine Creek; lower Grande Ronde data, in Flesher et al. 2005, were used for the Wenaha.

APPENDIX D

Summary of Recycled Steelhead for the 2002-03 and 2003-04 Run Years

Appendix Table D-1. Summary of adult steelhead recycled back to the Wallowa River fishery from the Big Canyon Facility for the 2002-03 run year.

Date of release, Percent of of release	Location and number of fish ^a						Total	Percent of Release
	Upstream		Downstream		Subtotal			
	M	F	M	F	M	F		
Released								
13 March 2003	17	33	20	30	37	63	100	
20 March 2003	21	29	18	32	39	61	100	
Subtotal	38	62	38	62				
Total	100		100		76	124	200	
Recaptured at Big Canyon ^b								
13 March 2003	9	10	5	7	14	17	21	31%
20 March 2003	7	5	6	4	13	9	22	22%
Subtotal	16	15	11	11				
Total	31		22		27	26	53	27%
% of release	31%		22%		36%	21%		
Observed and estimated harvest ^c								
13 March 2003	2(11)	3(16)	3(16)	1(6)	5(27)	4(22)	9(49)	49%
20 March 2003	0	1(6)	4(22)	2(11)	4(22)	3(17)	7(39)	39%
Subtotal	2(11)	4(22)	7(38)	3(17)				
Total	6(33)		10(55)		9(49)	7(39)	16(88)	44%
% of release	33%		55%		64%	31%		
Total recovered (Big Canyon + estimated harvest)								
13 March 2003	20	26	21	13	41	39	80	80%
20 March 2003	7	11	28	15	35	26	61	61%
Subtotal	27	37	49	28				
Total	64		77		76	65	141	71%
% of release	64%		77%		100%	52%		

^a Release sites 6.4 km upstream and 1.6 km downstream of Deer Creek (Rkm 18) on the Wallowa River.

^b Recaptures of recycled fish were euthanized.

^c Expanded for unsampled fish kept by sampled anglers, unsampled anglers on sample days, and unsampled days.

Appendix Table D-2. Summary of adult steelhead recycled back to the Wallowa River fishery from the Big Canyon Facility for the 2003-04 run year. “-“ indicates not sampled or undefined.

Date of release, Percent of of release	Location and number of fish ^a						Total	Percent of Release
	Upstream		Downstream		Subtotal			
	M	F	M	F	M	F		
Released								
5 March 2004	0	0	5	1	5	1	6	
12 March 2004	35	15	37	13	72	28	100	
19 March 2004	29	21	31	19	60	40	100	
26 March 2004	25	25	29	21	54	46	100	
Subtotal	89	61	102	54				
Total	150		156		191	115	306	
Recaptured at Big Canyon ^b								
5 March 2004	-	-	3	0	3	0	3	50%
12 March 2004	11	5	20	6	31	11	42	42%
19 March 2004	10	8	14	5	24	13	37	37%
26 March 2004	14	11	14	10	28	21	49	49%
Subtotal	35	24	51	21				
Total	59		72		86	45	131	43%
% of release	39%		46%		45%	39%		
Observed and estimated harvest ^c								
5 March 2004	-	-	0	0	0	0	0	0%
12 March 2004	1(13)	0	2(25)	1(13)	3(38)	1(13)	4(51)	51%
19 March 2004	0	0	2(25)	1(13)	2(25)	1(13)	3(38)	38%
26 March 2004	0	0	0	1(13)	0	1(13)	1(13)	13%
Subtotal	1(13)	0	4(50)	3(39)				
Total	1(13)		7(89)		5(63)	3(39)	8(102)	33%
% of release	9%		57%		33%	34%		
Total recovered (Big Canyon + estimated harvest)								
5 March 2004	-	-	3	0	3	0	3	50%
12 March 2004	24	5	45	19	69	24	93	93%
19 March 2004	10	8	39	18	49	26	75	75%
26 March 2004	14	11	14	23	28	34	62	62%
Subtotal	48	24	101	60				
Total	72		161		149	84	233	76%
% of release	48%		103%		78%	73%		

^a Release sites 6.4 km upstream and 1.6 km downstream of Deer Creek (Rkm 18) on the Wallowa River.

^b Recaptures of recycled fish were euthanized.

^c Expanded for unsampled fish kept by sampled anglers, unsampled anglers on sample days and unsampled days.