

LOWER SNAKE RIVER COMPENSATION PLAN:  
Summer Steelhead Creel Surveys on the  
Grande Ronde, Wallowa, and Imnaha  
Rivers for the 2005-06 Run Year

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



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Front cover photo of a hatchery steelhead caught on a bobber and jig during October 2007 by Jared Sisemore on the lower Grande Ronde River.

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## PREFACE

This report is for the funding period 1 April 2007 to 31 March 2008. The sampling period was from 1 September 2005 to 15 April 2006. 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 2005-2006 run year were primarily from the 2002 and 2003 brood years. Results of creel surveys conducted prior to fall 2005 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, 2005, 2007, and 2008). The steelhead angling season surveyed in this report, during which only adipose fin-clipped fish could be harvested, was open from 1 September 2005 to 15 April 2006 in the Grande Ronde and Imnaha river basins.

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## SUMMARY

Angler effort was higher than the overall average in Grande Ronde and Imnaha basin recreational summer steelhead fisheries during the 2005-06 run year. Harvest was the highest observed since surveys began in 1985 on the Imnaha River and third highest on the Lower Grande Ronde River. Catch rates were also the highest ever observed in the Imnaha Basin and in the Grande Ronde Basin at Rondowa, and second and third highest observed in the Grande Ronde Basin on the lower Grande Ronde and Wallowa rivers, respectively. Hatchery fish dominated the catch during the fall and winter months on the lower Grande Ronde River and during the spring months on the Wallowa River and at Rondowa, and hatchery fish contributed substantially to the Imnaha River fishery, although many hatchery fish were not clipped and thus were indistinguishable from wild fish. Anglers harvested more two-ocean than one-ocean hatchery steelhead, and more females than males in Grande Ronde and Imnaha basin fisheries. The percent of local resident anglers participating in summer steelhead fisheries increased from the prior year in the Imnaha Basin and in the Grande Ronde Basin on the Wallowa River and at Rondowa (mouth of the Wallowa River), and was similar to the previous run year on the lower Grande Ronde River. 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 2004-05 run year are reported in the appendices. Adult steelhead recycled back into the Wallowa River fishery from the Big Canyon Facility during the spring 2006 provided some additional harvest opportunities for anglers.

## 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 million 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. In 2000, we reduced releases to approximately 1.2 million 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 (Flesher et al. 1994). This report summarizes results of creel surveys conducted during the fall of 2005 and the spring of 2006 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 2004-05 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).

## **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 through 11 December 2005, and 24 December 2005 through 15 April 2006. The survey was not conducted from 12-23 December 2005 because there was no angling effort due to the river freezing over within the survey area. Our goal was to sample 50% of the weekends (Saturday and Sunday) and holidays and 30% of the

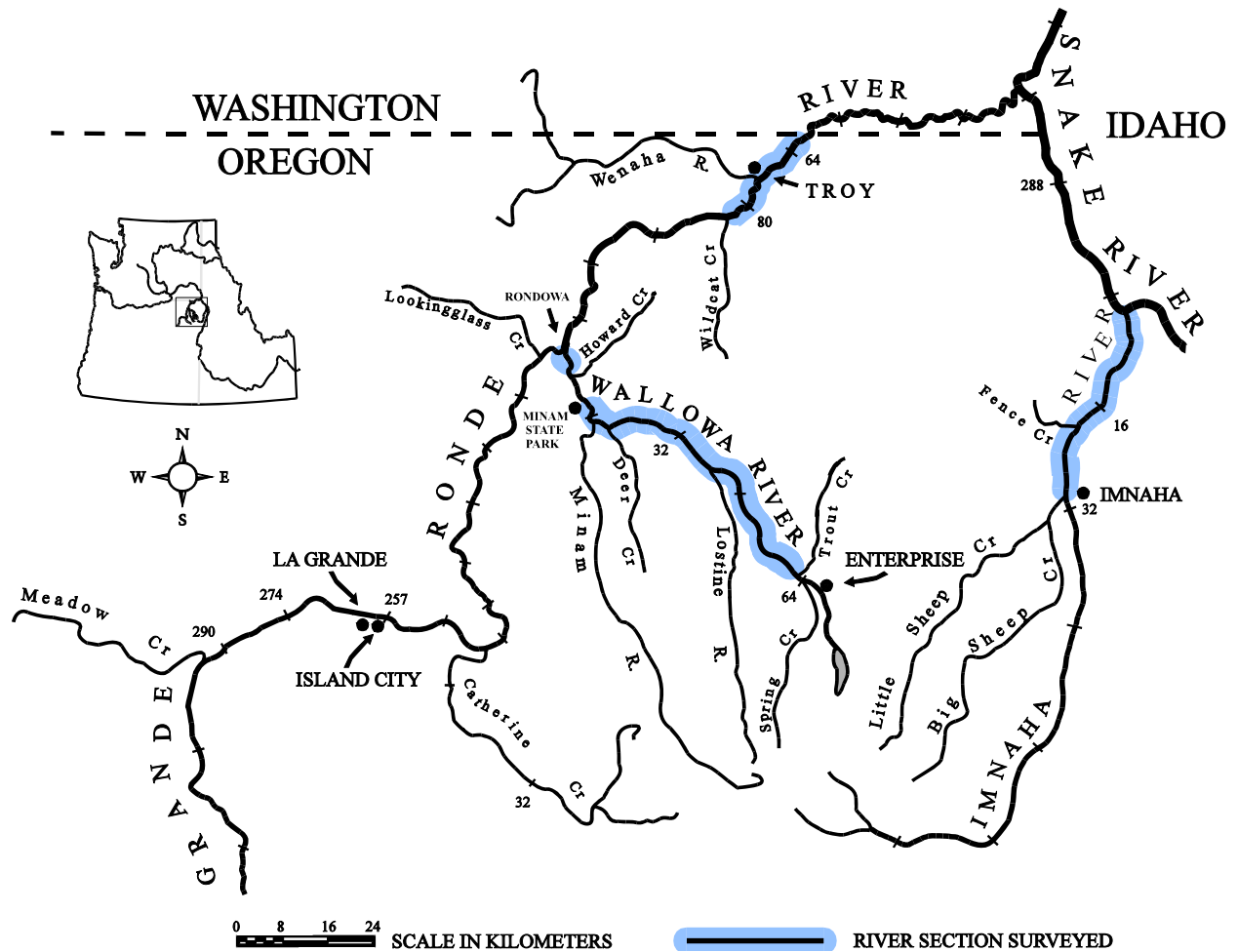


Figure 1. Map of northeastern Oregon showing where summer steelhead creel surveys were conducted in the Grande Ronde and Imnaha river basins during the 2005-06 run year.

weekdays (Monday through Friday) during each month of each survey. Sample days were chosen randomly in two-day blocks, representing two strata (weekend days and holidays, and weekdays). On 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, what species of fish they were angling for, what type of angling gear they were using, 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 2006. 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 2006. We surveyed the Wallowa River area each sample day and surveyed both the Wallowa and Rondowa survey areas every other sample day. For the Wallowa River survey, the surveyor drove the survey route from Trout Creek downstream to Minam State Park, stopped to interview anglers, then waited at the park for approximately one hour and interviewed returning anglers that had hiked below the park to fish, and then repeated this sequence. On alternate sample days, the surveyor drove the survey route from Minam State Park upstream to Trout Creek, stopping to interview anglers along the way, then drove to the Smith Mountain parking area that anglers use to access Rondowa and interviewed anglers returning from Rondowa for approximately one hour, and then repeated the sequence. All harvested fish observed were sampled. From 1 February to 4 March, we surveyed five days each week (Sunday – Saturday) from 0900-1800. From 5 March to 15 April, we surveyed four days each week from 0800-1900.

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 during spring fisheries in the Grande Ronde Basin for the previous year (2004-05 run year) that do not have a statistical creel survey in place, 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 the previous years' annual report (Flesher et al. 2008).

Some figures and tables in this report also include data from creel surveys conducted on the upper Grande Ronde River from 1993 to 1996 and Catherine Creek from 1992 to 1993, and originally reported on in Flesher et al. (1993, 1994, 1995, 1996).

In spring 2006, we recycled hatchery adult returns from the Big Canyon Facility back into the Wallowa River fishery, using methodology described by Flesher et al. (2007). Between 10 March and 7 April, 130 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 1.6 Rkm below or 6.4 Rkm above the mouth of Deer Creek. As in past years, fish were uniquely marked using an opercle punch to identify them as recycled. 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 recycled group was released.

## **ACCOMPLISHMENTS AND FINDINGS**

On the lower Grande Ronde River from 1 September to 11 December 2005 and 24 December 2005 to 15 April 2006, we sampled 51.4% of the weekends and holidays (36 days) and 31.0% of the weekdays (45 days) for a total of 81 sample days. On the

Wallowa River from 1 February to 15 April 2006, we sampled 90.9% of the weekends and holidays (20 days) and 42.3% of the weekdays (22 days) for a total of 42 sample days. During the same time period at Rondowa, we sampled 63.6% of the weekends and holidays (14 days) and 32.7% of the weekdays (17 days) for a total of 31 sample days. On the Imnaha River from 1 February to 15 April 2005, we sampled 54.5% of the weekends and holidays (12 days) and 30.8% of the weekdays (16 days) for a total of 28 sample days.

We estimate that 3,935 anglers fished for 19,909 hours on the lower Grande Ronde River during the 2005-06 season. They caught and released 1,692 wild and 1,008 hatchery steelhead, and harvested 1,462 hatchery steelhead for an average catch rate index of 5 hours per fish (Figures 2-6, Appendix Table A-1). The percent of steelhead caught that were hatchery origin ranged from 11% in September 2005 to 69% in January 2006 (Figure 7, Appendix Table B). Thirty-six percent of harvested hatchery steelhead spent one year in freshwater and one year in saltwater (hereafter designated 1:1), 62% spent one year in freshwater and two years in saltwater (designated 1:2), and 2% spent one year in freshwater and three years in saltwater (designated 1:3; Table 1). Mean fork length ( $\pm 95\%$  confidence interval) of harvested hatchery steelhead was 595 ( $\pm 6$ ) mm for age 1:1, 687 ( $\pm 7$ ) mm for age 1:2, and 827 ( $\pm 57$ ) mm for age 1:3 (Table 1). Gender composition was 34% male and 66% female (Table 1). Sixty-six percent of the anglers were local Oregon resident anglers, 15% were non-local Oregon resident anglers, 6% were Washington State residents and 13% resided outside the states of Oregon and Washington (Table 2). On the lower Grande Ronde River, anglers harvested an estimated 70 AdLV+CWT marked steelhead from our hatchery releases and an estimated 15 AdLV+CWT marked steelhead from Washington Department of Fish and Wildlife releases on the Grande Ronde River at the Cottonwood Conditioning Pond, Washington (Table 3).

At Rondowa, the catch rate index averaged 2 hours per fish (Figure 4, Appendix Table A-2). The percent of steelhead caught that were hatchery origin ranged from 84% in February to 87% in March (Figure 7, Appendix Table B). Age composition of harvested hatchery steelhead was 27% 1:1, 71% 1:2, 1% 2:2, and 1% 1:3 (Table 1). Mean fork length ( $\pm 95\%$  confidence interval) of harvested hatchery steelhead was 591 ( $\pm 9$ ) mm for age 1:1, 692 ( $\pm 9$ ) mm for ages 1:2 and 2:2, and 828 ( $\pm 95$ ) for age 1:3 (Table 1). Sex composition was 29% male and 71% female (Table 1). Seventy-six percent of the anglers were local Oregon resident anglers, 19% were non-local Oregon resident anglers and 5% resided outside the states of Oregon and Washington (Table 2). At Rondowa, anglers harvested 10 AdLV+CWT marked steelhead from our hatchery releases, and 1 AdLV+CWT marked steelhead that was a stray from Washington Department of Fish and Wildlife releases on the Grande Ronde River at the Cottonwood Conditioning Pond, Washington. 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 Table A-3). The percent of steelhead caught that were hatchery origin ranged from 77% in April to 92% in March (Figure 7, Appendix Table B). Age composition of



harvested hatchery steelhead was 35% 1:1, 62% 1:2, 1% 2:2, and 2% 1:3 (Table 1). Mean fork length ( $\pm 95\%$  confidence interval) of harvested hatchery steelhead was 591 ( $\pm 4$ ) mm for age 1:1, 701 ( $\pm 5$ ) mm for ages 1:2 and 2:2, and 800 ( $\pm 9$ ) mm for age 1:3 (Table 1). Gender composition was 46% male and 54% female (Table 1). Seventy-eight percent of the anglers were local Oregon residents, 17% were non-local Oregon residents, 2% were Washington State residents and 3% resided outside the states of Oregon and Washington (Table 2). On the Wallowa River, anglers harvested 48 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 estimate that 1,145 anglers fished for 4,488 hours. They caught and released 972 unmarked (wild and hatchery) and 281 hatchery steelhead, and harvested 338 hatchery steelhead for an average catch rate index of 3 hours per fish (Figures 2-6, Appendix Tables A-4 and A-5). The percent of steelhead caught that were known hatchery origin ranged from 27% in April in Section 1 to 56% in April in Section 2 (Figure 7, Appendix Table B). Age composition of harvested hatchery steelhead was 41% 1:1, and 59% 1:2 (Table 1). Mean fork length ( $\pm 95\%$  confidence interval) of harvested hatchery steelhead was 592 ( $\pm 8$ ) mm for age 1:1, and 696 ( $\pm 8$ ) mm for age 1:2 (Table 1). Gender composition was 33% male and 67% female (Table 1). Eighty-four percent of the anglers were local Oregon residents, 9% were non-local Oregon residents, 2% were Washington State residents and 5% resided outside the states of Oregon and Washington (Table 2). On the Imnaha River, anglers harvested an estimated 76 AdLV+CWT marked steelhead from our hatchery releases (Table 3).

Angler effort on the lower Grande Ronde River was lower than last year but higher than the overall average, and on the Imnaha River it was higher than both last year and the overall average (Figure 8). Harvest on the lower Grande Ronde River was also lower than last year, but overall it was the third highest harvest since surveys began (Figure 9). On the Imnaha River harvest was the highest observed since surveys began. Since surveys began in 1985 on the lower Grande Ronde and Wallowa rivers, catch rates were the second and third highest recorded, respectively. Catch rates were the highest ever observed on the Imnaha River and in the Rondowa fishery area (Table 4). Compared to the previous year, the percent of local resident anglers participating in summer steelhead fisheries increased in the Imnaha Basin, on the Wallowa River and at Rondowa (mouth of the Wallowa River). The percent of local resident anglers was similar to the previous year on the lower Grande Ronde River (Table 2). The Imnaha fishery had the highest percent of local resident anglers (84%), and the fishery at Rondowa had the highest percentage (19%) of non-local Oregon resident anglers, while the lower Grande Ronde River fishery had the highest percent (19%) of out-of-state anglers. However, the percent of local resident anglers in the Grande Ronde and

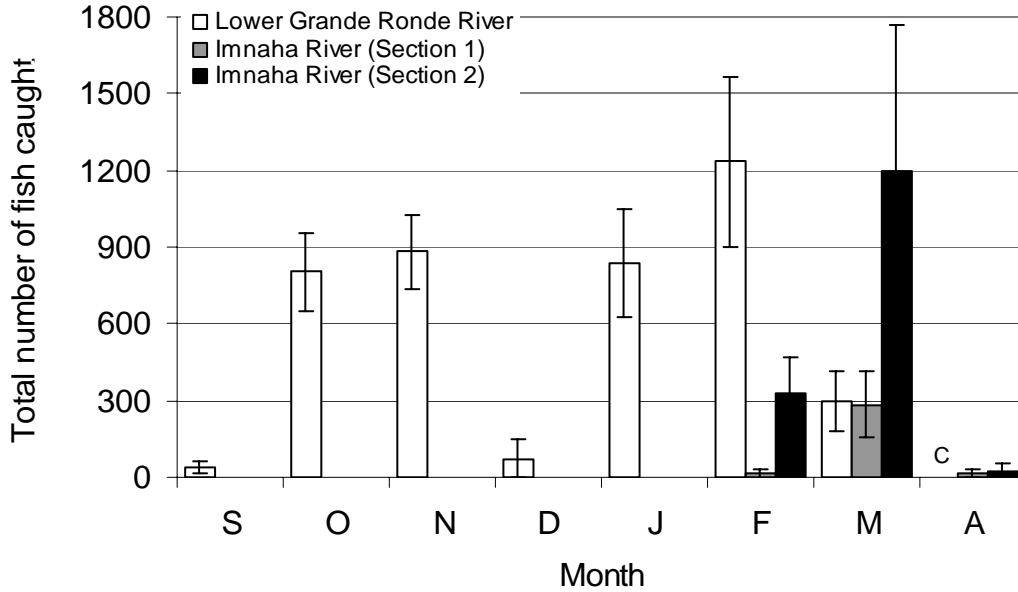


Figure 2. Estimated total catch of summer steelhead (vertical bars show 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2005-06 run year. "C" indicates no catch. Surveys were conducted from 1 September 2005 to 15 April 2006 on the lower Grande Ronde River, and from 1 February to 15 April 2006 on the Imnaha River.

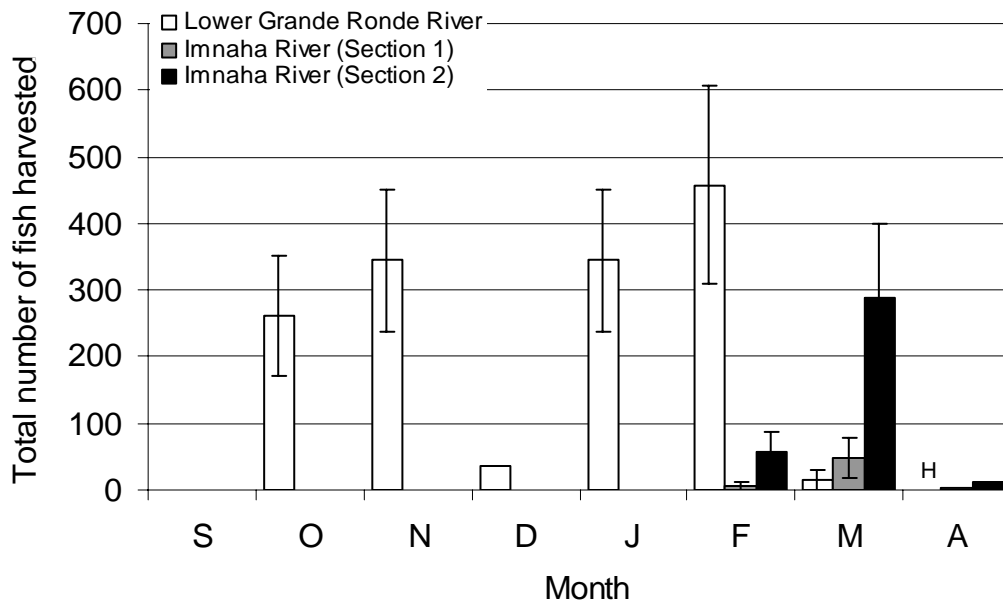


Figure 3. Estimated total harvest of summer steelhead (vertical bars show 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2005-06 run year. "H" indicates no harvest. Surveys were conducted from 1 September 2005 to 15 April 2006 on the lower Grande Ronde River, and from 1 February to 15 April 2006 on the Imnaha River.

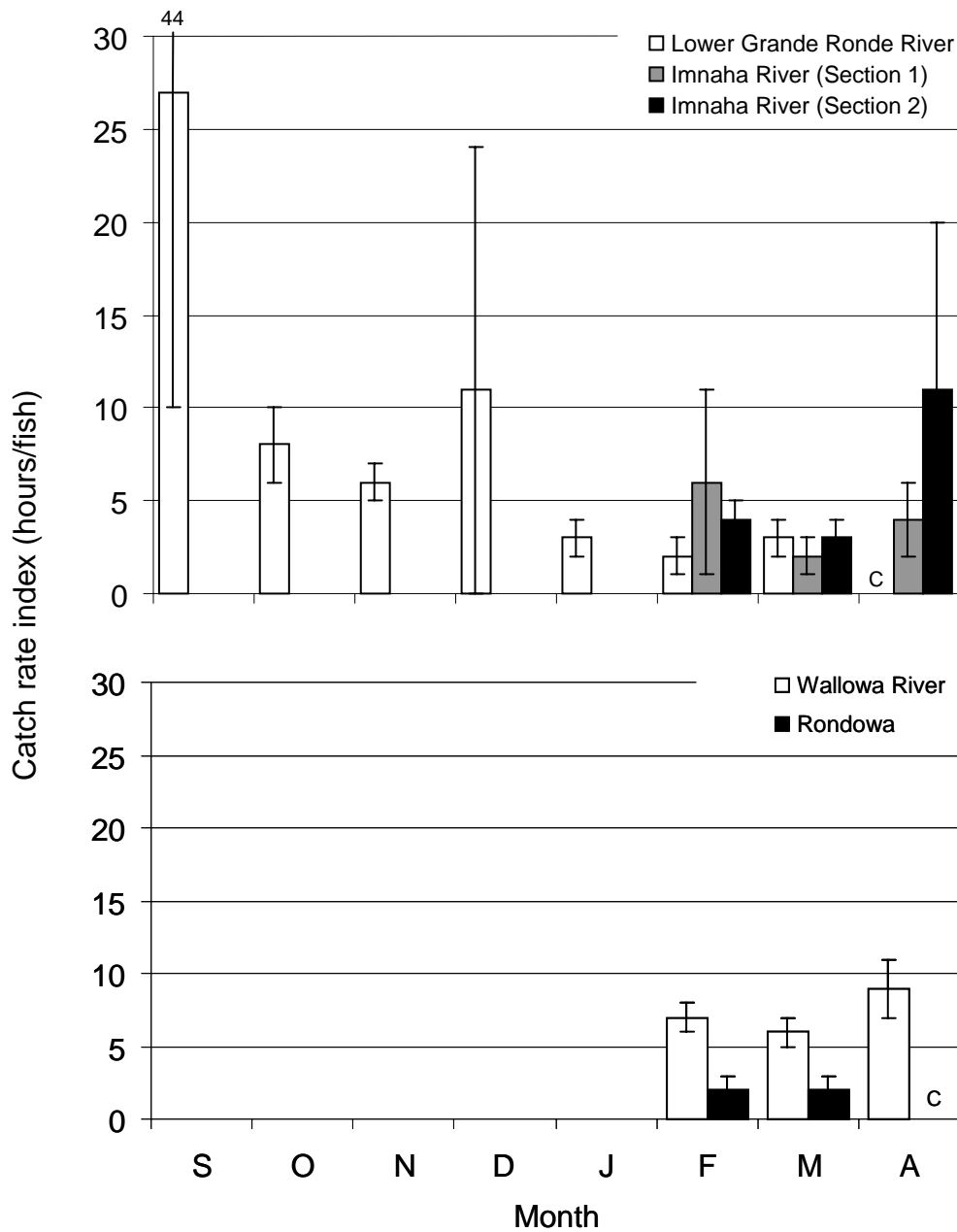


Figure 4. Estimated catch rate index (hours/fish) for summer steelhead (vertical bars show 95% confidence intervals) in the Grande Ronde and Imnaha river basins during the 2005-06 run year. "C" indicates no catch. Survey areas and times include the lower Grande Ronde River (1 September 2005 - 15 April 2006), and Rondowa, Wallowa River, and two sections of the Imnaha River (1 February - 15 April 2006). Note: A lower catch rate index implies better angling success.

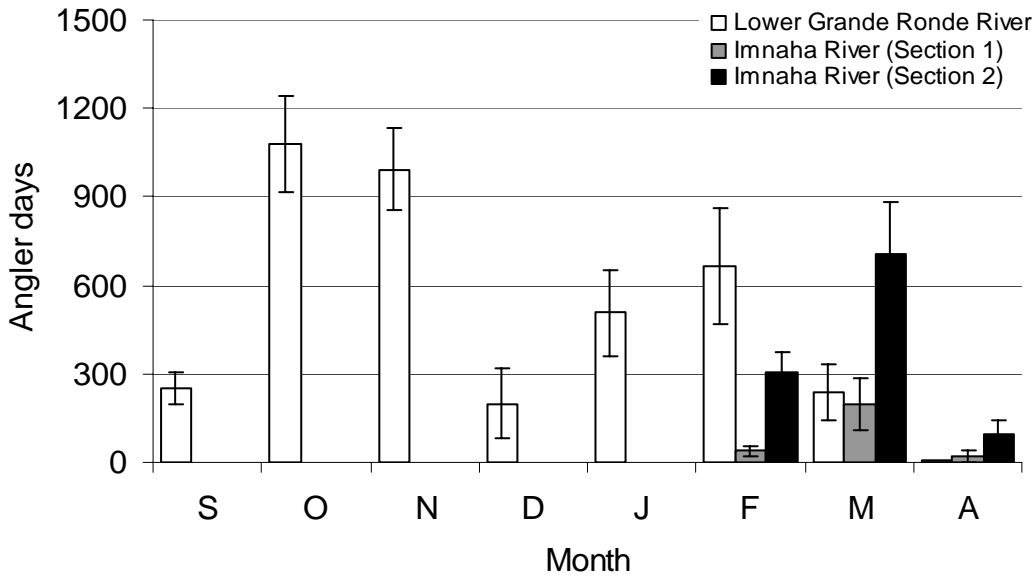


Figure 5. Estimated number of angler days for summer steelhead (vertical bars show 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2005-06 run year. Surveys were conducted from 1 September 2005 to 15 April 2006 on the lower Grande Ronde River, and from 1 February to 15 April 2006 on the Imnaha River.

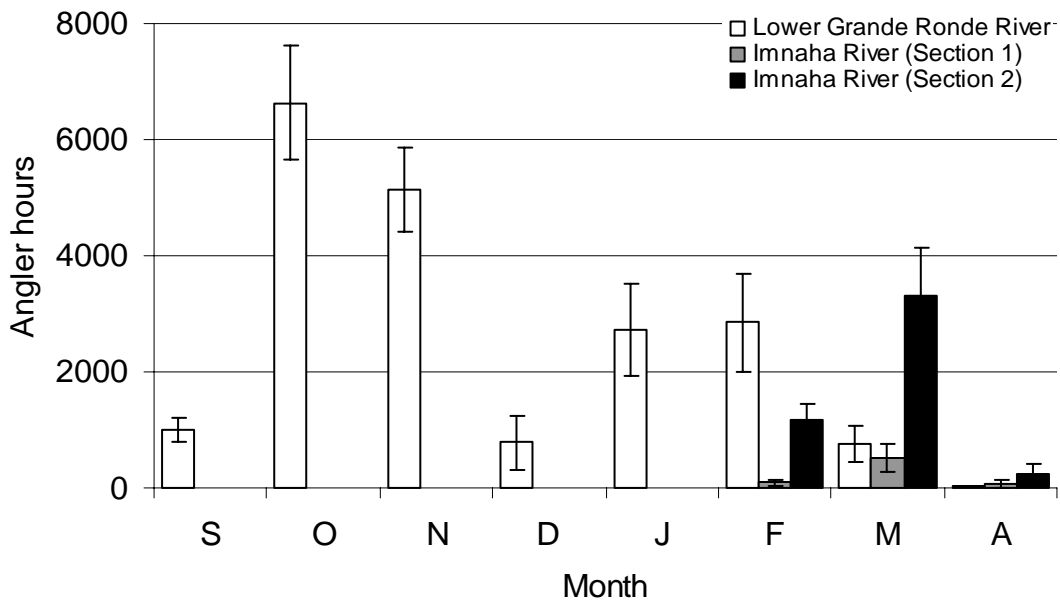


Figure 6. Estimated number of angler hours for summer steelhead (vertical bars show 95% confidence intervals) on the lower Grande Ronde River, and two sections of the Imnaha River during the 2005-06 run year. Surveys were conducted from 1 September 2005 to 15 April 2006 on the lower Grande Ronde River, and from 1 February to 15 April 2006 on the Imnaha River.

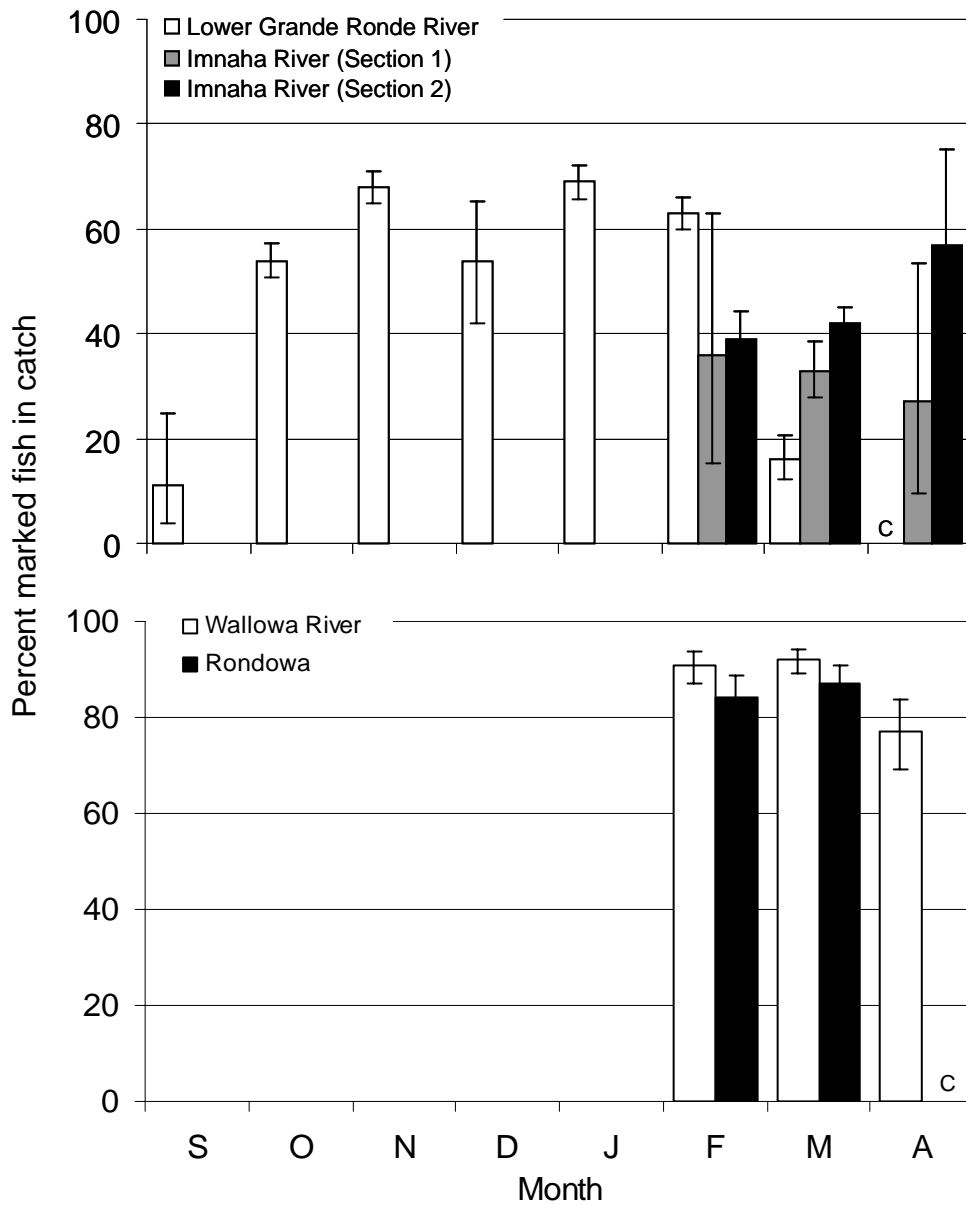


Figure 7. Estimated percent of summer steelhead caught (vertical bars show 95% confidence intervals; using a binomial distribution) in the Grande Ronde and Imnaha river basins during the 2005-06 run year that were marked. In the Grande Ronde Basin all unmarked fish were wild, whereas in the Imnaha Basin 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 2005 - 15 April 2006), and Rondowa, Wallowa River, and two sections of the Imnaha River (1 February-15 April 2006).

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 2005-06 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 and Little Sheep Creek Facility (for the Imnaha River survey area) in 2006. Age is expressed as years spent in freshwater prior to ocean migration: years spent in the ocean prior to spawning migration.

Creel survey area, Gender	Age composition (%)					Mean fork length (mm)					
	N	1:1	1:2	2:2	1:3	N	1:1	N	1:2 & 2:2	N	1:3
Lower GR River											
Males	115	66	30	1	3	67	608 $\pm$ 7	32	722 $\pm$ 14	3	815 $\pm$ 102
Females	219	20	79	0	1	39	573 $\pm$ 7	152	679 $\pm$ 7	2	845 $\pm$ 572
Total	334	36	62	0	2	106	595 $\pm$ 6	184	687 $\pm$ 7	5	827 $\pm$ 57
Rondowa											
Males	40	60	35	2.5	2.5	23	597 $\pm$ 12	14	728 $\pm$ 23	1	835
Females	98	13	86	0	1	11	579 $\pm$ 13	70	685 $\pm$ 9	1	820
Total	138	27	71	1	1	34	591 $\pm$ 9	84	692 $\pm$ 9	2	828 $\pm$ 95
Wallowa River											
Males	240	53	42	2	3	119	598 $\pm$ 5	99	725 $\pm$ 7	8	802 $\pm$ 10
Females	279	20	79	0	1	53	577 $\pm$ 4	211	690 $\pm$ 6	3	793 $\pm$ 38
Total	519	35	62	1	2	172	591 $\pm$ 4	310	701 $\pm$ 5	11	800 $\pm$ 9
Imnaha River											
Males	50	72	28	0	0	34	598 $\pm$ 12	13	727 $\pm$ 24	0	-
Females	100	26	74	0	0	24	582 $\pm$ 9	69	690 $\pm$ 8	0	-
Total	150	41	59	0	0	58	592 $\pm$ 8	82	696 $\pm$ 8	0	-

Table 2. Residence of summer steelhead anglers interviewed during creel surveys in the Grande Ronde and Imnaha river basins during the 2005-06 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	1149	66	15	6	13
Rondowa	123	76	19	0	5
Wallowa River	1801	78	17	2	3
Imnaha River	508	84	9	2	5

Table 3. Number of AdLV+CWT marked summer steelhead recovered during creel surveys in the Grande Ronde and Imnaha river basins during the 2005-06 run year. Recoveries were expanded for the entire fishery.

Creel survey area	Tag code	Release site	Experimental group <sup>a</sup>	Brood Year	Number recovered	
					Observed	Expanded <sup>b</sup>
Lower Grande Ronde River	09 36 30	Spring Cr.	Prod./April	2002	2	7
	09 36 31	Deer Cr.	Prod./April	2002	3	13
	09 36 32	Spring Cr.	Volitional/May	2002	2	11
	09 36 33	Deer Cr.	Volitional/May	2002	4	20
	09 39 14	Spring Cr.	Prod./April	2003	1	3
	09 39 15	Deer Cr.	Prod./April	2003	3	12
	09 39 17	Deer Cr.	Volitional/May	2003	1	4
	63 15 23	-	WDFW <sup>c</sup>	2002	2	6
	63 15 28	-	WDFW <sup>c</sup>	2003	3	9
Wallowa River	09 36 30	Spring Cr.	Prod./April	2002	1	ND
	09 36 31	Deer Cr.	Prod./April	2002	9	ND
	09 36 32	Spring Cr.	Volitional/May	2002	6	ND
	09 36 33	Deer Cr.	Volitional/May	2002	9	ND
	09 39 14	Spring Cr.	Prod./April	2003	6	ND
	09 39 15	Deer Cr.	Prod./April	2003	10	ND
	09 39 16	Spring Cr.	Volitional/May	2003	1	ND
	09 39 17	Deer Cr.	Volitional/May	2003	6	ND
Rondowa	09 36 30	Spring Cr.	Prod./April	2002	2	ND
	09 36 31	Deer Cr.	Prod./April	2002	3	ND
	09 36 32	Spring Cr.	Volitional/May	2002	1	ND
	09 39 14	Spring Cr.	Prod./April	2003	1	ND
	09 39 15	Deer Cr.	Prod./April	2003	2	ND
	09 39 17	Deer Cr.	Volitional/May	2003	1	ND
	63 15 28	-	WDFW <sup>c</sup>	2003	1	ND
Imnaha River	09 36 34	L. Sheep Cr.	Prod./April	2002	1	2
	09 36 35	L. Sheep Cr.	Prod./May	2002	4	8
	09 36 36	B. Sheep Cr.	Direct St./April	2002	7	17
	09 39 11	B. Sheep Cr.	Direct St./April	2003	12	24
	09 39 12	L. Sheep Cr.	Prod./April	2003	9	20
	09 39 13	L. Sheep Cr.	Prod./May	2003	2	5

<sup>a</sup> Prod. indicates production releases that are forced-released over a 24-hour period. Direct St. indicates direct stream releases. The volitional releases in May (usually over a one-week period) are a current management strategy designed to help remove steelhead smolts that may residualize.

<sup>b</sup> ND indicates expansions not determined until statewide annual harvest card data become available.

<sup>c</sup> Steelhead with tag codes 63 15 23 and 63 15 28 were Wallowa stock released by Washington Department of Fish and Wildlife (WDFW) in the lower Grande Ronde River at the Cottonwood Conditioning Pond, Washington, from 15-30 April 2003 and 13-30 April 2004, respectively.

Imnaha basin fisheries as a whole has decreased while the percent of non-local resident anglers has increased since surveys began (Figure 10).

We found a statistically significant linear relationship ( $P < 0.001$ ) 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 2004-05 run year were 50 fish in the upper Grande Ronde River, 1,125 fish at Rondowa, 809 fish in the Wallowa River, and 455 fish in the middle Grande Ronde River, for a total harvest estimate of 2,439 fish in the Grande Ronde Basin, excluding the lower Grande Ronde River (Figure 9, Appendix Table C-1). We estimated 89 coded-wire tagged fish were harvested at Rondowa, and 98 coded-wire-tagged fish were harvested in the Wallowa River in the 2004-05 run year. Total catch estimates for spring steelhead fisheries in the 2004-05 run year were 114 fish in the upper Grande Ronde River, 2,352 fish at Rondowa, 1,929 fish in the Wallowa River, and 1,005 fish in the middle Grande Ronde River, for a total catch estimate of 5,400 fish in the Grande Ronde Basin, excluding the lower Grande Ronde River (Appendix C-2). Angler effort for the 2004-05 run year was estimated to be 676 hours in the upper Grande Ronde River, 11,415 hours at Rondowa, 9,438 hours in the Wallowa River, and 7,214 hours in the middle Grande Ronde River, for a total effort estimate of 28,743 hours in the Grande Ronde Basin, excluding the lower Grande Ronde River (Appendix Table C-3).

We recycled 130 summer steelhead to the Wallowa River fishery in 2006. Sixty-six (51% of release) were recaptured at the Big Canyon Facility and an estimated 7 (5%) recycled fish were harvested in the fishery for a total estimated recovery of 73 (56%) recycled fish (Appendix Table D).

## **MANAGEMENT IMPLICATIONS AND RECOMMENDATIONS**

Angler effort was higher than last year and higher than the overall average on the Imnaha River, and lower than last year but higher than the overall average on the Lower Grande Ronde River. However, harvest was the highest observed on the Imnaha River and the third highest on the lower Grande Ronde River. In addition, catch rates in the steelhead fisheries in the Imnaha Basin and in the Grande Ronde Basin at Rondowa were the best reported since surveys began, and second and third best in the Grande Ronde Basin on the lower Grande Ronde and Wallowa river fishery areas, respectively. Hatchery fish dominated the catch during the fall and winter months on the lower Grande Ronde River and in the spring months on the Wallowa River and at Rondowa. Also, unmarked hatchery fish, which are indistinguishable from natural fish, and marked hatchery fish contributed substantially to the Imnaha River fishery from February through mid-April. These fishery statistics continue to illustrate the importance of current hatchery programs to the success of recreational summer steelhead fisheries in both the Grande Ronde and Imnaha river basins. Statistics for the Wallowa and Rondowa fisheries for the 2005-06 run year will be reported in the 2006-07 annual report.



Recycling adult steelhead returning to the Big Canyon Facility back into the Wallowa River for the recreational fishery in 2006 provided additional harvest and sport opportunities for anglers, and reduced the number of surplus adults at the facility. We estimate that 56% of the fish were accounted for either by returning to the Big Canyon Facility or in the harvest. Although only 5% were estimated to be harvested in this year's fishery, the higher harvest rates reported in prior years provides the rationale for our recommendation to continue recycling of adipose-only marked steelhead back into the Wallowa River.

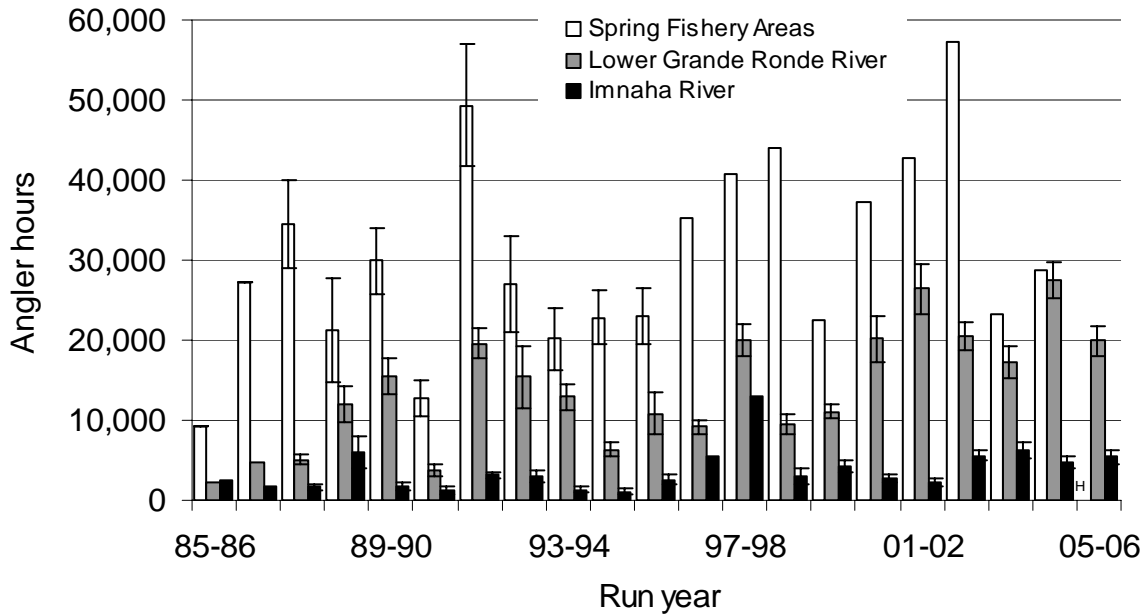


Figure 8. Angler effort for summer steelhead (vertical bars show 95% confidence intervals) in spring fishery areas (upper Grande Ronde River, Wallowa River, Catherine Creek, and Rondowa), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 2005-06 run years. “H” indicates this value must be estimated from harvest tag 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.

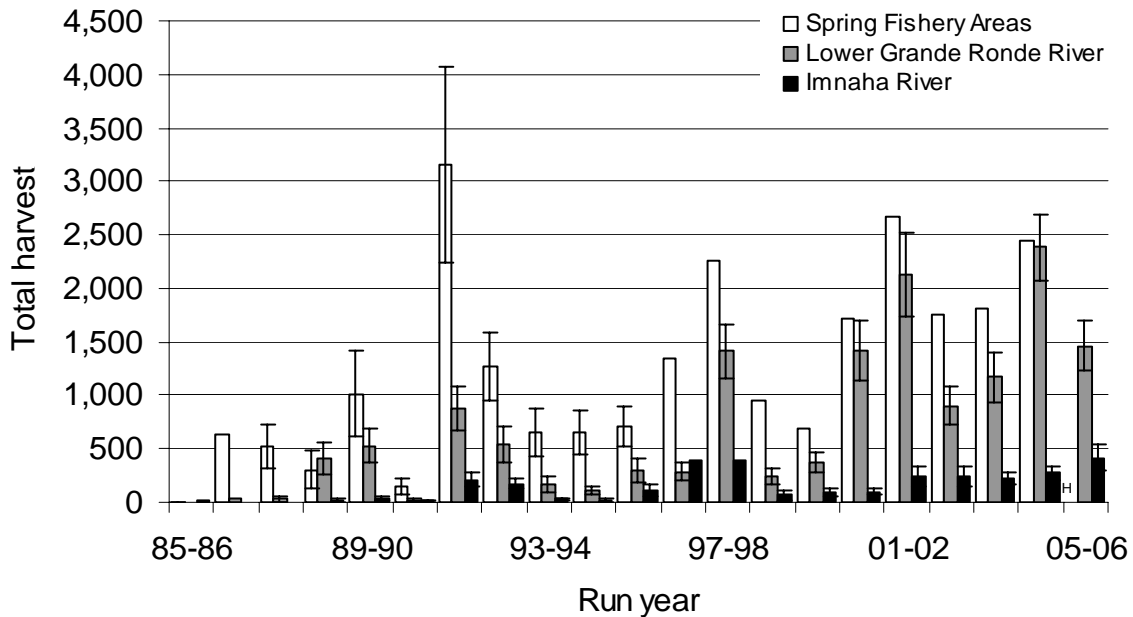


Figure 9. Number of hatchery summer steelhead harvested (vertical bars show 95% confidence intervals) by recreational anglers in spring fishery areas (upper Grande Ronde River, Wallowa River, Catherine Creek, and Rondowa), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 2005-06 run years. H indicates this value must be estimated using harvest tag 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 creel survey areas in the Grande Ronde and Imnaha river basins for the 1985-86 to 2005-06 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
2004-05	4 $\pm$ 0	-	-	5 $\pm$ 1	5 $\pm$ 1	4 $\pm$ 1
2005-06	5 $\pm$ 1	-	-	2 $\pm$ 1	7 $\pm$ 1	3 $\pm$ 1
Average	11 $\pm$ 2	20 $\pm$ 5	21 $\pm$ 18	10 $\pm$ 5	14 $\pm$ 4	11 $\pm$ 3

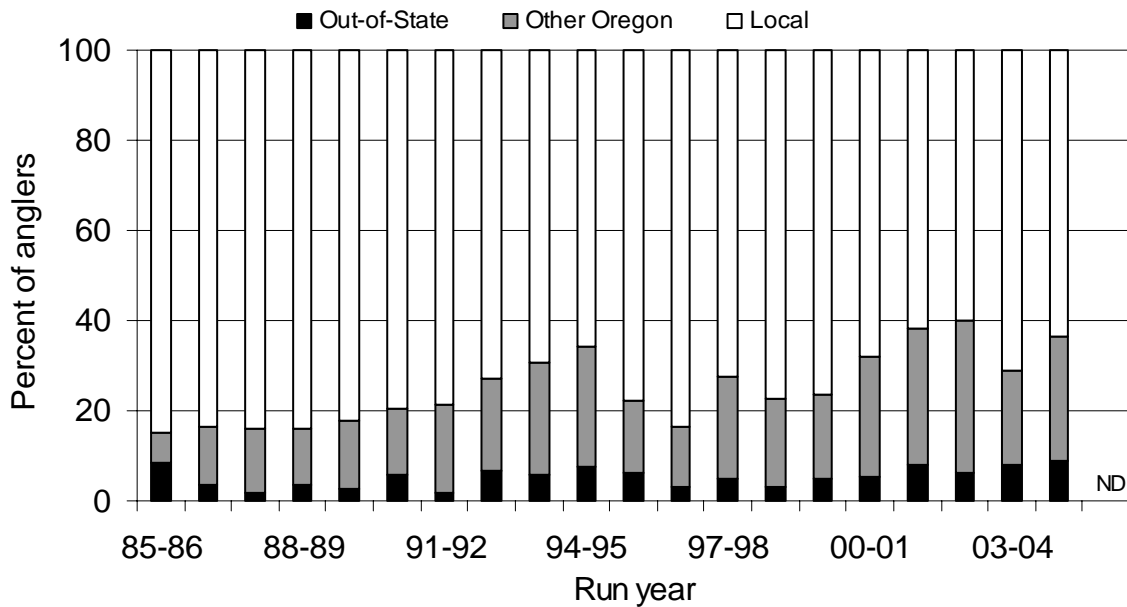


Figure 10. Percent of local resident anglers (Union or Wallowa county residents), non-local Oregon resident anglers, and out-of-state anglers that fished in summer steelhead fisheries in the Grande Ronde and Imnaha river basins for the 1985-86 to 2004-05 run years. ND indicates not determined until statewide annual harvest card data become available.

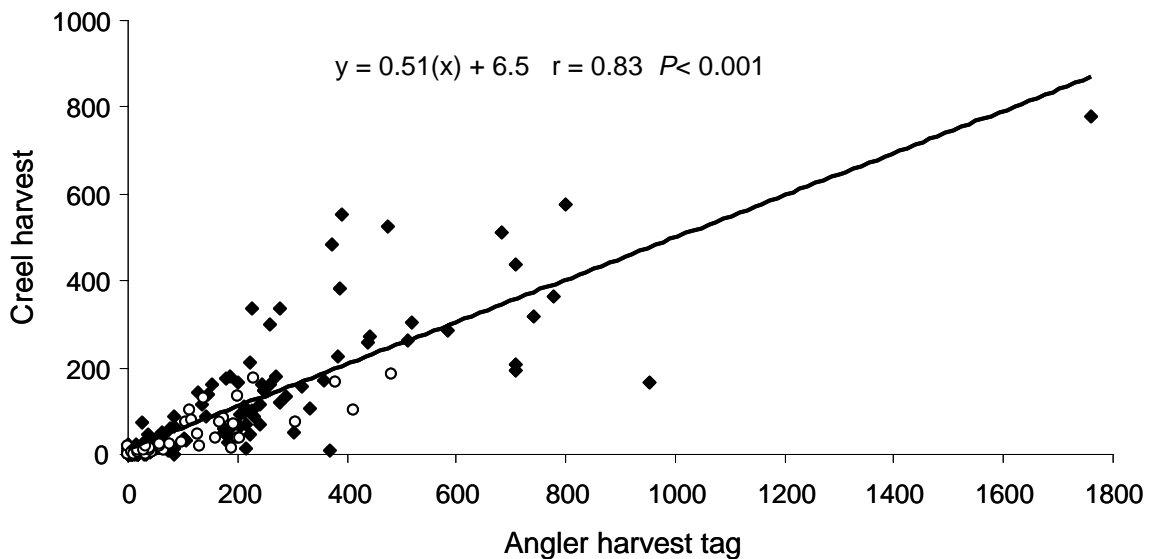


Figure 11. Relation between angler harvest tag (punch card) and creel survey harvest for summer steelhead fisheries in the Grande Ronde (◆) and Imnaha (○) river basins for years when harvest estimates for specific reaches were available (1993-1996 for the upper Grande Ronde, Wallowa, and Rondowa, 1992-1993 for Catherine Creek, 1993-spring 2005 for the lower Grande Ronde, and 1986-2005 for the Imnaha fishery areas).

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## **APPENDIX A**

Fishery Statistics for the 2005-06 run year



Appendix Table A-1. Fishery statistics for summer steelhead on the lower Grande Ronde River during the 2005-06 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	48	755 $\pm$ 207	18 $\pm$ 20	0	0.024 $\pm$ 0.027	42 $\pm$ 47	174 $\pm$ 48
Weekend	6	42	257 $\pm$ 44	19 $\pm$ 12	0	0.075 $\pm$ 0.046	13 $\pm$ 8	78 $\pm$ 13
Total	12	90	1012 $\pm$ 211	37 $\pm$ 24	0	0.037 $\pm$ 0.023	27 $\pm$ 17	252 $\pm$ 53
October:								
Weekday	7	181	3658 $\pm$ 949	419 $\pm$ 102	152 $\pm$ 67	0.115 $\pm$ 0.028	9 $\pm$ 2	674 $\pm$ 175
Weekend	5	137	2977 $\pm$ 281	386 $\pm$ 112	110 $\pm$ 61	0.129 $\pm$ 0.038	8 $\pm$ 2	406 $\pm$ 38
Total	12	318	6635 $\pm$ 990	805 $\pm$ 152	262 $\pm$ 91	0.121 $\pm$ 0.023	8 $\pm$ 2	1080 $\pm$ 161
November:								
Weekday	6	139	3374 $\pm$ 594	692 $\pm$ 134	254 $\pm$ 100	0.205 $\pm$ 0.040	5 $\pm$ 1	611 $\pm$ 108
Weekend	5	136	1758 $\pm$ 416	189 $\pm$ 62	91 $\pm$ 39	0.107 $\pm$ 0.036	9 $\pm$ 3	383 $\pm$ 91
Total	11	275	5132 $\pm$ 725	881 $\pm$ 148	345 $\pm$ 107	0.172 $\pm$ 0.029	6 $\pm$ 1	994 $\pm$ 140
December:								
Weekday	3	25	560 $\pm$ 299	62 $\pm$ 84	31	0.111 $\pm$ 0.150	9 $\pm$ 12	167 $\pm$ 89
Weekend	3	18	220 $\pm$ 360	6	6	0.027	37	32 $\pm$ 52
Total	6	43	780 $\pm$ 468	68 $\pm$ 84	37	0.088 $\pm$ 0.107	11 $\pm$ 13	199 $\pm$ 119
January:								
Weekday	6	58	1076 $\pm$ 755	331 $\pm$ 184	130 $\pm$ 84	0.308 $\pm$ 0.171	3 $\pm$ 2	224 $\pm$ 157
Weekend	6	121	1652 $\pm$ 239	507 $\pm$ 96	214 $\pm$ 65	0.307 $\pm$ 0.058	3 $\pm$ 1	282 $\pm$ 41
Total	12	179	2728 $\pm$ 792	838 $\pm$ 208	344 $\pm$ 106	0.307 $\pm$ 0.076	3 $\pm$ 1	506 $\pm$ 147
February:								
Weekday	6	87	1664 $\pm$ 560	803 $\pm$ 239	270 $\pm$ 99	0.483 $\pm$ 0.143	2 $\pm$ 1	392 $\pm$ 132
Weekend	5	95	1186 $\pm$ 626	430 $\pm$ 230	188 $\pm$ 113	0.362 $\pm$ 0.194	3 $\pm$ 2	275 $\pm$ 145
Total	11	182	2850 $\pm$ 840	1233 $\pm$ 332	458 $\pm$ 150	0.433 $\pm$ 0.116	2 $\pm$ 1	667 $\pm$ 197
March:								
Weekday	7	36	534 $\pm$ 297	199 $\pm$ 112	0	0.373 $\pm$ 0.210	3 $\pm$ 2	164 $\pm$ 91
Weekend	4	26	228 $\pm$ 82	101 $\pm$ 37	16 $\pm$ 15	0.442 $\pm$ 0.161	2 $\pm$ 1	71 $\pm$ 26
Total	11	62	762 $\pm$ 308	300 $\pm$ 118	16 $\pm$ 15	0.393 $\pm$ 0.155	3 $\pm$ 1	235 $\pm$ 95
April:								
Weekday	3	0	10	0	-	-	-	2
Weekend	3	0	0	0	-	-	-	0
Total	6	0	10	0	-	-	-	2
Grand total	81	1149	19909 $\pm$ 1788	4162 $\pm$ 468	1462 $\pm$ 232	0.209 $\pm$ 0.024	5 $\pm$ 1	3935 $\pm$ 353

Appendix Table A-2. Catch rate ( $\pm 95\%$  confidence intervals) for summer steelhead at Rondowa during the 2005-06 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	8	22	0.672 $\pm$ 0.349	2 $\pm$ 1
Weekend	6	28	0.542 $\pm$ 0.362	2 $\pm$ 1
Total	14	50	0.593 $\pm$ 0.250	2 $\pm$ 1
March:				
Weekday	6	39	0.454 $\pm$ 0.141	2 $\pm$ 1
Weekend	5	36	0.422 $\pm$ 0.210	2 $\pm$ 1
Total	11	75	0.438 $\pm$ 0.123	2 $\pm$ 1
April:				
Weekday	3	0	-	-
Weekend	3	2	-	-
Total	6	2	-	-
Grand total	31	127	0.493 $\pm$ 0.121	2 $\pm$ 1

Appendix Table A-3. Catch rate ( $\pm 95\%$  confidence intervals) for summer steelhead on the Wallowa River during the 2005-06 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	10	275	0.170 $\pm$ 0.034	6 $\pm$ 1
Weekend	7	304	0.123 $\pm$ 0.027	8 $\pm$ 2
Total	17	579	0.147 $\pm$ 0.022	7 $\pm$ 1
March:				
Weekday	8	330	0.182 $\pm$ 0.040	6 $\pm$ 1
Weekend	8	553	0.143 $\pm$ 0.030	7 $\pm$ 2
Total	16	883	0.157 $\pm$ 0.024	6 $\pm$ 1
April:				
Weekday	4	116	0.111 $\pm$ 0.040	9 $\pm$ 3
Weekend	5	223	0.111 $\pm$ 0.035	9 $\pm$ 3
Total	9	339	0.111 $\pm$ 0.027	9 $\pm$ 2
Grand total	42	1801	0.145 $\pm$ 0.015	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 2005-06 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	
February:								
Weekday	6	3	38 $\pm$ 41	0	-	-	-	15 $\pm$ 16
Weekend	5	25	53 $\pm$ 19	14 $\pm$ 20	5 $\pm$ 7	0.272 $\pm$ 0.230	4 $\pm$ 3	23 $\pm$ 8
Total	11	28	91 $\pm$ 45	14 $\pm$ 20	5 $\pm$ 7	0.158 $\pm$ 0.133	6 $\pm$ 5	38 $\pm$ 19
March:								
Weekday	7	37	281 $\pm$ 157	138 $\pm$ 115	19 $\pm$ 26	0.490 $\pm$ 0.292	2 $\pm$ 1	124 $\pm$ 69
Weekend	4	45	242 $\pm$ 179	144 $\pm$ 58	30 $\pm$ 14	0.596 $\pm$ 0.169	2 $\pm$ 1	74 $\pm$ 55
Total	11	82	523 $\pm$ 238	282 $\pm$ 129	49 $\pm$ 30	0.539 $\pm$ 0.175	2 $\pm$ 1	198 $\pm$ 90
April:								
Weekday	3	4	16 $\pm$ 15	3 $\pm$ 13	0	0.213 $\pm$ 0.502	5 $\pm$ 12	6 $\pm$ 6
Weekend	3	9	47 $\pm$ 59	12	2	0.249	4	15 $\pm$ 19
Total	6	13	63 $\pm$ 61	15 $\pm$ 13	2	0.240 $\pm$ 0.126	4 $\pm$ 2	21 $\pm$ 20
Grand total	28	123	677 $\pm$ 250	311 $\pm$ 131	56 $\pm$ 30	0.460 $\pm$ 0.137	2 $\pm$ 1	257 $\pm$ 95

Appendix Table A-5. Fishery statistics for summer steelhead in Section 2 (mouth to Fence Creek) of the Imnaha River during the 2005-06 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	32	453 $\pm$ 243	184 $\pm$ 134	26 $\pm$ 28	0.406 $\pm$ 0.247	2 $\pm$ 1	120 $\pm$ 64
Weekend	5	100	721 $\pm$ 108	148 $\pm$ 27	32 $\pm$ 9	0.205 $\pm$ 0.023	5 $\pm$ 1	186 $\pm$ 28
Total	11	132	1174 $\pm$ 266	332 $\pm$ 137	58 $\pm$ 30	0.282 $\pm$ 0.096	4 $\pm$ 1	306 $\pm$ 69
March:								
Weekday	7	116	2112 $\pm$ 772	686 $\pm$ 568	130 $\pm$ 110	0.325 $\pm$ 0.224	3 $\pm$ 2	461 $\pm$ 169
Weekend	4	99	1199 $\pm$ 320	510 $\pm$ 45	157 $\pm$ 27	0.425 $\pm$ 0.027	2 $\pm$ 0	245 $\pm$ 65
Total	11	215	3311 $\pm$ 836	1196 $\pm$ 570	287 $\pm$ 113	0.361 $\pm$ 0.144	3 $\pm$ 1	706 $\pm$ 178
April:								
Weekday	3	6	74 $\pm$ 123	4 $\pm$ 0	0	0.055	18	24 $\pm$ 40
Weekend	3	32	178 $\pm$ 79	19 $\pm$ 28	11	0.107 $\pm$ 0.099	9 $\pm$ 8	68 $\pm$ 30
Total	6	38	252 $\pm$ 146	23 $\pm$ 28	11	0.092 $\pm$ 0.070	11 $\pm$ 8	92 $\pm$ 53
Grand total	28	385	4737 $\pm$ 889	1551 $\pm$ 587	356 $\pm$ 117	0.327 $\pm$ 0.103	3 $\pm$ 1	1104 $\pm$ 207

## APPENDIX B

### Percent of Summer Steelhead That Were Marked Hatchery Fish and Caught in 2005-06 Run Year

Appendix Table B. Percent of marked hatchery summer steelhead caught during each survey month in the Grande Ronde and Imnaha River basins during the 2005-06 run year. For the Imnaha River, percentages include catch of marked hatchery fish only. In parentheses are 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	11(37)	54(805)	68(881)	54(68)	69(838)	63(1233)	16(300)	-(0)
Rondowa	-	-	-	-	-	84(182)	87(208)	-(0)
Wallowa River	-	-	-	-	-	91(290)	92(521)	77(133)
Imnaha River (Section 1)	-	-	-	-	-	36(14)	33(282)	27(15)
Imnaha River (Section 2)	-	-	-	-	-	39(332)	42(1196)	57(23)

## **APPENDIX C**

Fishery Statistics for Spring Fisheries for the 2004-05 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 2004-05 run year. Total harvest = 0.505 (harvest card) + 6.490. 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	17	3	0	4	4	4	0		
Total harvest	-	15	8	-	9	9	9	-	50	
Catherine Creek (120)										
Angler harvest cards	0	0	0	0	0	0	0	0		
Total harvest	-	-	-	-	-	-	-	-	0	
Rondowa (234)										
Angler harvest cards	13	3	27	96	157	495	1253	82		
Sampled fish	0	0	0	0	0	40	50	1		
Total harvest	13	8	20	55	86	256	639	48	1125	
Sample rate expansion	-	-	-	-	-	6.4	12.8	48.0		
093404						1	0	0	1	6
093405						0	2	0	2	26
093407						1	1	0	2	19
093409						1	0	0	1	6
093632						1	0	0	1	6
093633						0	1	0	1	13
631523						0	1	0	1	13
Wallowa (235)										
Angler harvest cards	3	0	3	33	28	64	890	291		
Sampled fish	0	0	0	0	0	46	309	108		
Total harvest	8	-	8	23	21	39	456	254	809	
Sample rate expansion	-	-	-	-	-	0.8	1.5	2.4		
093405						1	1.1	3.2	5.3	11
093406						0	1.1	0	1.1	2
093407						1	3.2	1.1	5.3	9
093408						0	2.1	3.2	5.3	11
093409						0	4.2	1.1	5.3	9
093630						1	1.1	2.1	4.2	8
093631						1	14.9	3.2	19.1	31
093632						1	1.1	1.1	3.1	6
093633						0	4.2	1.1	5.3	9
631178						0	1.1	0	1.1	2
Wenaha (184)										
Angler harvest cards	0	0	0	0	0	0	0	0		
Total harvest	-	-	-	-	-	-	-	-	0	
Middle Grande Ronde (232)										
Angler harvest cards	0	63	76	33	43	335	242	18		
Total harvest	-	38	45	23	28	176	129	16	455	
Total Grande Ronde harvest (excluding lower Grande Ronde)									2,439	

Appendix Table C-2. Estimated catch of summer steelhead in spring fisheries in the Grande Ronde Basin for the 2004-05 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 <sup>a</sup> , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	15	8	-	9	9	9	-	50
Total catch	-	35	19	-	21	18	21	-	114
Catherine Creek									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	-	-	-	-	-	-	-	0
Total catch	-	-	-	-	-	-	-	-	0
Rondowa									
Sampled harvest	-	-	-	-	-	40	50	1	91
Sampled catch	-	-	-	-	-	85	94	5	184
Total harvest	13	8	20	55	86	256	639	48	1125
Total catch	26	16	40	111	174	544	1201	240	2352
Wallowa									
Sampled harvest	-	-	-	-	-	46	309	108	463
Sampled catch	-	-	-	-	-	92	711	281	1084
Total harvest	8	-	8	23	21	39	456	254	809
Total catch	19	-	19	54	49	78	1049	661	1929
Wenaha									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	-	-	-	-	-	-	-	0
Total catch	-	-	-	-	-	-	-	-	0
Middle Grande Ronde									
Sampled harvest	-	-	-	-	-	-	-	-	-
Sampled catch	-	-	-	-	-	-	-	-	-
Total harvest	-	38	45	23	28	176	129	16	455
Total catch	-	89	105	54	66	352	297	42	1005
Total Grande Ronde catch (excluding lower Grande Ronde)									5400

<sup>a</sup> Wallowa data were used for the upper Grande Ronde, middle Grande Ronde, and Catherine Creek; lower Grande Ronde data, in Flesher et al. 2007b, 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 2004-05 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 <sup>a</sup> , statistics	Fishery statistics by month								
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Upper Grande Ronde									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	35	19	-	21	18	21	-	114
Angler effort	-	176	95	-	106	217	82	-	676
Catherine Creek									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	-	-	-	-	-	-	-	0
Angler effort	-	-	-	-	-	-	-	-	0
Rondowa									
Catch rate	-	-	-	-	-	0.201	0.221	0.158	0.209
Total catch	26	16	40	111	174	544	1201	240	2352
Angler effort	124	77	191	531	833	2706	5434	1519	11415
Wallowa									
Catch rate	-	-	-	-	-	0.083	0.256	0.179	0.199
Total catch	19	-	19	54	49	78	1049	661	1929
Angler effort	95	-	95	271	246	490	4098	3693	9438
Wenaha									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	-	-	-	-	-	-	-	0
Angler effort	-	-	-	-	-	-	-	-	0
Middle Grande Ronde									
Catch rate	-	-	-	-	-	-	-	-	-
Total catch	-	89	105	54	66	352	297	42	1005
Angler effort	-	447	528	271	332	4241	1160	235	7214
Total Grande Ronde angler effort (excluding lower Grande Ronde)									28743

<sup>a</sup> Wallowa data were used for the upper Grande Ronde, middle Grande Ronde, and Catherine Creek; lower Grande Ronde data, in Flesher et al. 2007b, were used for the Wenaha.



## APPENDIX D

### Summary of Recycled Steelhead for the 2005-06 Run Year

Appendix Table D. Summary of adult steelhead recycled back to the Wallowa River fishery from the Big Canyon Facility for the 2005-06 run year. "-" indicates not sampled or undefined.

Date of release, Percent of Of release	Location and number of fish <sup>a</sup>							Percent of Release
	Upstream		Downstream		Subtotal		Total	
	M	F	M	F	M	F		
	Released							
10 March 2006	0	0	14	5	14	5	19	
17 March 2006	0	0	4	7	4	7	11	
31 March 2006	8	7	23	12	31	19	50	
7 April 2006	15	0	30	5	45	5	50	
Subtotal	23	7	71	29				
Total	30		100		94	36	130	
	Recaptured at Big Canyon <sup>b</sup>							
10 March 2006	-	-	6	2	6	2	8	42%
17 March 2006	-	-	0	1	0	1	1	9%
31 March 2006	3	3	19	9	22	12	34	68%
7 April 2006	8	0	14	1	22	1	23	46%
Subtotal	11	3	39	13				
Total	14		52		50	16	66	51%
% of release	47%		52%		53%	44%		
	Observed and estimated (in parentheses) harvest <sup>c</sup>							
10 March 2006	-	-	0	1(7)	0	1(7)	1(7)	37%
17 March 2006	-	-	0	0	0	0	0	
31 March 2006	0	0	0	0	0	0	0	
7 April 2006	0	0	0	0	0	0	0	
Subtotal	0	0	0	1(7)				
Total	0		1(7)		0	1(7)	1(7)	5%
% of release	0%		7%		0%	19%		
	Total recovered (Big Canyon + estimated harvest)							
10 March 2006	-	-	6	9	6	9	15	79%
17 March 2006	-	-	0	1	0	1	1	9%
31 March 2006	3	3	19	9	22	12	34	68%
7 April 2006	8	0	14	1	22	1	23	46%
Subtotal	11	3	39	20				
Total	14		59		50	23	73	56%
% of release	47%		59%		53%	64%		

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

<sup>b</sup> Recaptures of recycled fish were euthanized.

<sup>c</sup> Expanded for unsampled fish kept by sampled anglers, unsampled anglers on sample days and unsampled days.