PROGRESS REPORTS

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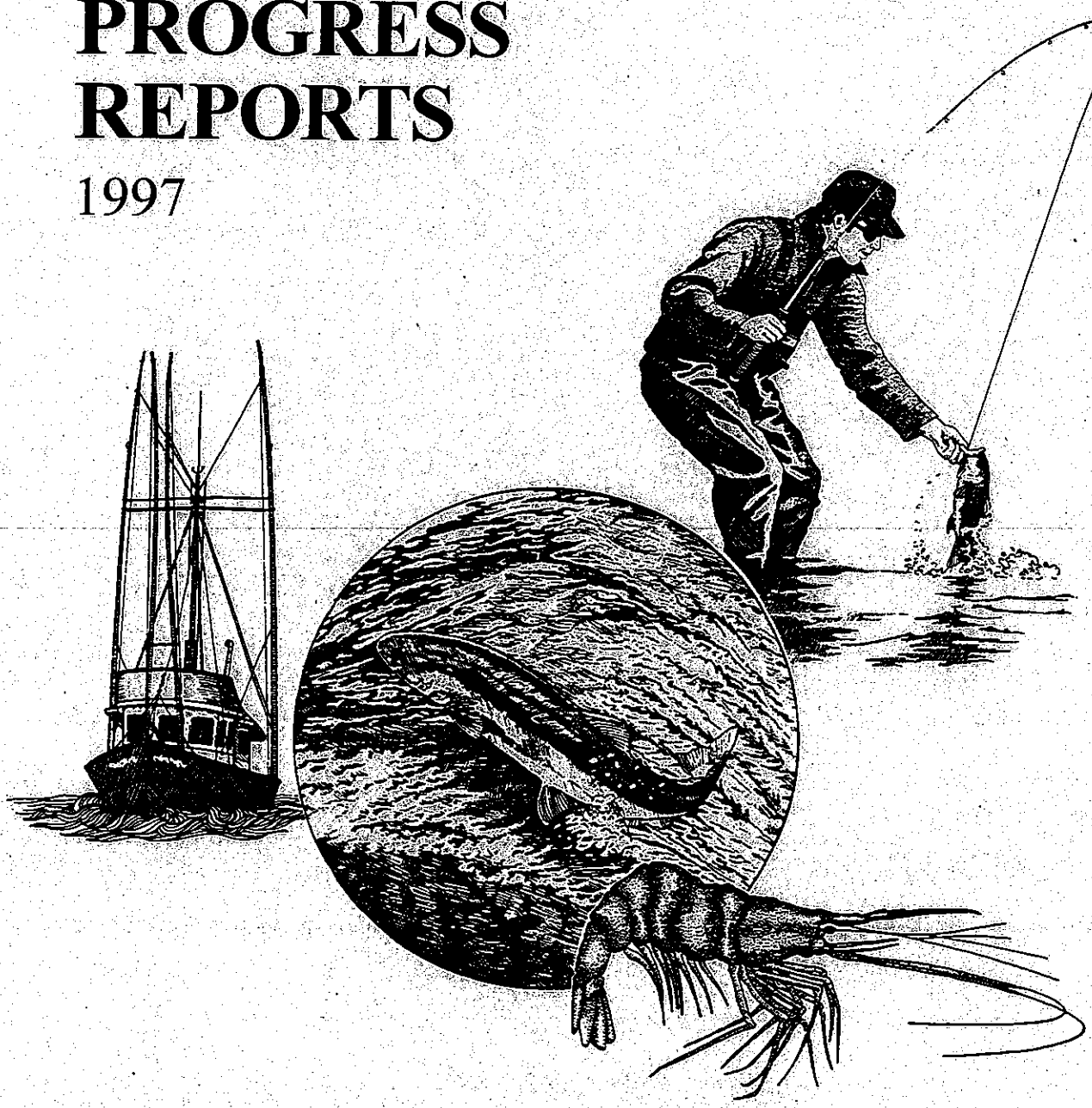
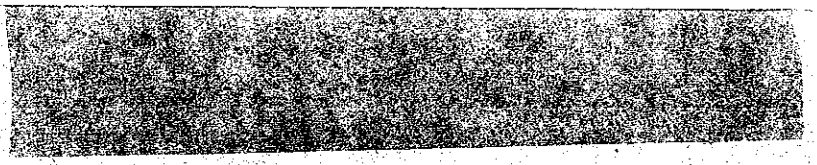


FISH DIVISION

Oregon Department of Fish and Wildlife

Summer Steelhead Creel Surveys on the Grande Ronde, Wallowa, and Imnaha Rivers for the 1996-97 Run Year



ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT
OREGON

PROJECT TITLE: Summer Steelhead Creel Surveys on the Grande Ronde, Wallowa, and Imnaha Rivers for the 1996-97 Run Year

AGREEMENT NUMBER: 1448-14110-975-J039

PROJECT PERIOD: 1 April 1997 to 31 March 1998

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This project was financed by the U.S. Fish and Wildlife Service under the Lower Snake River Compensation Plan.

PREFACE

This report is for the funding period 1 April 1997 to 31 March 1998. The sampling period was from 1 September 1996 to 15 April 1997. 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 adults harvested during the 1996-97 run year are primarily from the 1993 and 1994 brood years. Results of creel surveys conducted prior to fall 1996 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). The steelhead angling season surveyed in this report, during which only adipose-clipped fish could be kept, was open from 1 September 1996 to 15 April 1997 in the Grande Ronde and Imnaha basins.

ACKNOWLEDGMENTS

We would like to thank Dan Herrig for his review of the report, Mary Buckman for the statistical design and analysis of the data, Amy Wilson, C. Mark Mathews, and Troy Rohweder for their dedication in conducting the surveys. Also, from the Washington Department of Fish and Wildlife, we would like to thank Art Viola for coordinating and John Johnston for conducting the lower Grande Ronde survey during the spring. This project was financed by the U.S. Fish and Wildlife Service under the Lower Snake River Compensation Plan, as a cooperative agreement with the Oregon Department of Fish and Wildlife.

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Objectives

1. Estimate angler effort in hours and days for summer steelhead fisheries in the Grande Ronde and Imnaha basins.

2. Estimate total catch, catch rate, and number of fish harvested in summer steelhead fisheries in the Grande Ronde and Imnaha basins.

3. Estimate, by month, the percent of hatchery summer steelhead in the total catch.

4. Determine the length frequency, sex, and age-composition of fish that were caught.

5. Estimate, by tag code, the number of adipose-left ventral clipped plus coded-wire-tagged (AdLV+CWT) marked summer steelhead harvested.

6. Determine residence of anglers in summer steelhead fisheries in the Grande Ronde and Imnaha basins.

Accomplishments and Findings

Angler effort, catch, harvest, and catch rate from the lower Grande Ronde River and catch rates from spring fisheries on the upper Grande Ronde, Wallowa, and Imnaha rivers, and Catherine Creek are included in this report. Also included is the percent hatchery fish in the catch, length frequency, sex and age composition of harvested fish, and angler residence for each fishery. Subsequent annual reports will include these same catch statistics for the current run-year, angler effort, catch, and harvest from the previous run year for the upper Grande Ronde, Wallowa, and Imnaha rivers, and Catherine Creek, and the number of AdLV+CWT marked fish harvested for each fishery from the previous run year.

On the lower Grande Ronde River, we estimated that 1,461 anglers fished for 9,137 hours from 1 September 1996 through 15 April 1997. They caught and released an estimated 193 wild and 179 hatchery steelhead and kept an estimated 286 hatchery steelhead. The catch rate index averaged 14 hours per fish. The percent of steelhead caught that were hatchery fish ranged from 65% in November 1996 to 100% in April 1997. Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 594 (± 6) mm for age 3 fish and 697 (± 20) mm for age 4 fish. Age composition (based on fork lengths and scales) of harvested hatchery steelhead was 61% 1:1's, 34% 1:2's and 5% 2:1's. Sex composition was 52% male and 48% female. Seventy-nine percent of the anglers were from Union or Wallowa counties, 7% were from other Oregon counties, 8% were Washington residents, and 6% resided outside the states of Oregon and Washington.

On the upper Grande Ronde River, the catch rate index averaged 18 hours per fish. The percent of steelhead caught that were hatchery fish ranged from 0% in February to 100% in March. Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 586 (±26) mm for age 3 fish and 667 (±94) mm for age 4 fish. Age composition of harvested hatchery steelhead was 62% 1:1's and 38% 1:2's. Sex composition was 50% male and 50% female. Ninety-three percent of the anglers were from Union or Wallowa counties, 6% were from other Oregon counties, 1% were Washington residents, and 0% resided outside the states of Oregon and Washington.

On Catherine Creek, the catch rate index averaged 33 hours per fish. One harvested fish was sampled. It was a 660 mm, age 4 (1:2) female. One-hundred percent of the anglers were from Union or Wallowa counties.

On the Wallowa River, the catch rate index averaged 13 hours per fish. The percent of steelhead caught that were hatchery fish ranged from 85% in March to 95% in February. Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 599 (±6) mm for age 3 fish and 701 (±13) mm for age 4 fish. Age composition of harvested hatchery steelhead was 62% 1:1's, 33% 1:2's and 5% 2:1's. Sex composition was 40% male and 60% female. Eighty percent of the anglers were from Union or Wallowa counties, 18% were from other Oregon counties, 2% were Washington residents, and 0% resided outside the states of Oregon and Washington.

On the Imnaha River, the catch rate index averaged 6 hours per fish. The percent of steelhead caught that were hatchery fish ranged from 57% in April to 85% in March. Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 579 (±9) mm for age 3 fish and 668 (±18) mm for age 4 and age 5 fish. Age composition of harvested hatchery steelhead was 44% 1:1's, 43% 1:2's, 2% 1:3's, and 11% 2:1's. Sex composition was 32% male and 68% female. Eighty-seven percent of the anglers were from Union or Wallowa counties, 12% were from other Oregon counties, 1% were Washington residents, and 0% resided outside the states of Oregon and Washington.

The percent of anglers from other Oregon counties have increased while the percent of local (Union or Wallowa counties) anglers have decreased since 1985.

Recently, catch rate indexes have been best on the Imnaha River and poorest on the upper Grande Ronde River and Catherine Creek.

Management Implications and Recommendations

1. Given reduced funding, reduced sampling effort, and new sampling protocols for spring fisheries on the Wallowa, upper Grande Ronde, and Imnaha rivers and Catherine Creek, managers will have to wait for the following years' report to have complete information on angler effort, catch, and harvest for the current year.

2. Because angling is best on the Imnaha River, we should continue to promote this fishery. Since angling is poorest on the upper Grande Ronde River and Catherine Creek, we should explore methods to improve catch rates. These may include increases in smolt releases to provide greater adult returns, better access for anglers on streams open to angling, and improvements in the condition of these stream reaches, including water quality, and diversity of instream habitat types; all of which may enhance angling opportunities.

3. Since all fisheries tend to be based largely on hatchery adult returns, we need to maintain hatchery programs if we want to have substantial fisheries in the future.

INTRODUCTION

Summer steelhead (*Oncorhynchus mykiss*) fisheries in the Grande Ronde and Imnaha 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 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 above Lower Granite Dam (Rkm 173), the uppermost of the four lower dams on the Snake River. 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 basins (Carmichael 1989). Approximately 1.68 M steelhead smolts are released in Oregon each year during April and May in the Grande Ronde and Imnaha basins. These fish provide hatchery adult returns which 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 basins. The goal of the surveys is to provide annual harvest information needed to assess LSRCP compensation goals (Carmichael and Wagner 1983). In general, the number of summer steelhead in the recreational fishery has been restored, but the fishery is concentrated in different times and places (Flesher et al. 1994). This report summarizes results of creel surveys conducted during the fall of 1996 and the spring of 1997 in the Grande Ronde and Imnaha basins. The Grande Ronde and Imnaha basins encompass the major steelhead fisheries in Oregon that occur in streams which drain into the Snake River upstream of Lower Granite Dam.

STUDY AREA

Creel surveys on the Grande Ronde River were conducted on a 24 km section on the lower river from the Oregon-Washington state line (Rkm 62) to Wildcat Creek (Rkm 86) and an upper 39 km section from Highway 82 bridge at Island City (Rkm 256) to Meadow Creek (Rkm 295). The

survey on Catherine Creek was conducted on a 22 km section from the Highway 203 bridge below the town of Union (Rkm 24) to the Highway 203 bridge above Catherine Creek State Park (Rkm 46). The survey on the Wallowa River was conducted on a 50 km section from Minam State Park (Rkm 13) 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 survey. The survey on the Imnaha River was conducted on the lower 32 km from its confluence with the Snake River (Rkm 0) to the mouth of Big Sheep Creek (Rkm 32) near the town of Imnaha. These areas are shown in Figure 1.

METHODS

Generally, we followed the methods described by Carmichael et al. (1988) for the lower Grande Ronde River survey. We sampled 50% of the weekends/holidays and 30% of the weekdays during each month of each survey. Initially, sample days were chosen randomly. They were then adjusted so that, as much as possible, weekend days and holidays were represented equally and weekdays were represented equally. Each sample day, beginning with a randomly selected start time, the creel surveyor conducted a pressure count which involved driving a vehicle along the entire survey route while tallying all anglers and vehicles every three hours. Between pressure counts, the surveyor interviewed anglers by recording a description of each angler or their vehicle and their residence, the number of hours they had fished, and the number and species caught. The surveyor also sampled all harvested fish recording fork length, sex, fin clip, and any external tags. If the fish was coded-wire-tagged, as indicated by an adipose fin-clip and left ventral fin-clip (AdLV+CWT), the surveyor excised the head behind the eye and placed it with an identification number in a plastic bag for later processing.

One surveyor conducted angler interviews in the Wallowa, upper Grande Ronde, Catherine Creek, and Imnaha creel survey areas from 1 February to 15 April 1997. No surveys were conducted at Rondowa due to limited vehicle access. The Wallowa area was surveyed each sample day and other areas were surveyed a minimum of once each weekday and every other weekend. A minimum of two areas were surveyed each sample day, and if time allowed, additional areas were surveyed in the following order of priority: Imnaha River, upper Grande Ronde River, and Catherine Creek. Throughout the season, the surveyor alternated between morning and afternoon interviews in each area. Each sample day, the surveyor drove the survey route, stopped to interview anglers, then drove to the next area and repeated this sequence. If sufficient time was available, the surveyor drove to and interviewed anglers in a third area. All harvested fish observed were sampled. We sampled 80% of the weekends (one randomly selected weekend off each month except in April) and 40-60% of the weekdays (two or three days off each week depending on the schedule). Between 1 February and 1 March, we surveyed 5 days per week from 0800-1700. Between 2 March and 15 April, we surveyed 4 days per week from 0700-1800.

From the lower Grande Ronde River creel survey, we estimated angler effort in hours and days, total catch, harvest, catch rate, the percent of hatchery fish in the catch, and the number of AdLV+CWT marked fish harvested (*see* Carmichael et al. 1988). In all other areas, we

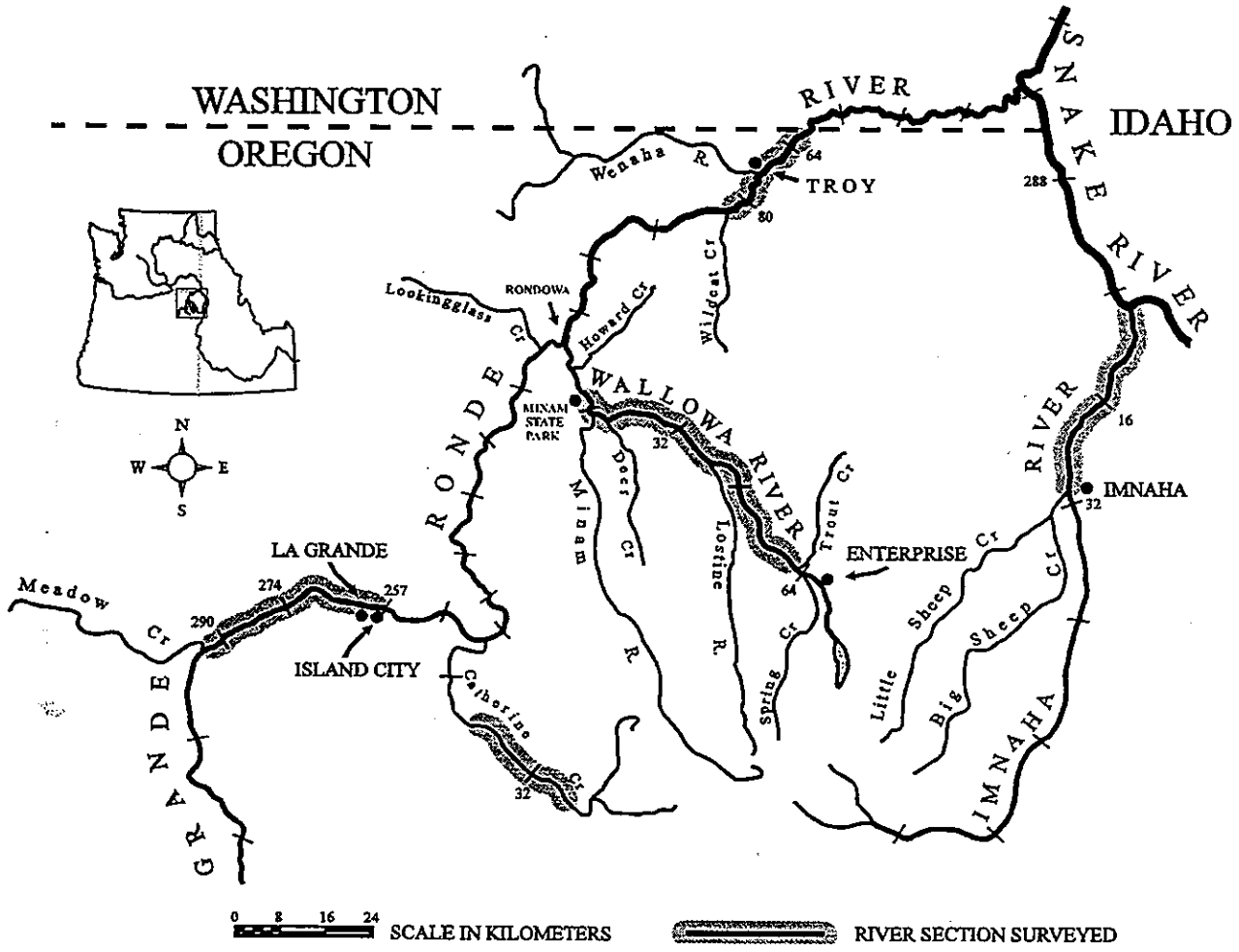

Figure 1. Map of northeastern Oregon showing where summer steelhead creel surveys were conducted in the Grande Ronde and Imnaha basins during the 1996-97 run year.

estimated catch rate and the percent of hatchery fish in the catch. However, when 1997 punch card data become available in 1998 (from our state-wide database), we will estimate angler effort, total catch, harvest, and the number of AdLV+CWT marked fish harvested for those areas, based on punch card data. Catch rate is an index, expressed as hours per fish, which results in lower catch rates reflecting better angling success. In addition, we determined the age and sex composition and mean fork length of harvested fish in all survey areas. The survey on the lower Grande Ronde River was from 1 September 1996 to 15 April 1997. Surveys on the upper Grande Ronde, Wallowa, and Imnaha rivers, and Catherine Creek were from 1 February to 15 April 1997.

RESULTS

On the lower Grande Ronde River, we sampled an average of 52.1% of the weekends/holidays and 31.8% of the weekdays during each month of each survey for a total of 87 sample days. On the Wallowa River, we sampled 78.3% of the weekends/holidays and 49.0% of the weekdays during each month of each survey for a total of 43 sample days. On the upper Grande Ronde River, we sampled 34.8% of the weekends/holidays and 29.4% of the weekdays during each month of each survey for a total of 23 sample days. On Catherine Creek, we sampled 30.4% of the weekends/holidays and 19.6% of the weekdays during each month of each survey for a total of 17 sample days. On the Imnaha River, we sampled 34.8% of the weekends/holidays and 25.5% of the weekdays during each month of each survey for a total of 21 sample days.

We estimated that 1,461 anglers fished for 9,137 hours on the lower Grande Ronde River. They caught and released 193 wild and 179 hatchery steelhead and kept 286 hatchery steelhead for a catch rate index of 14 hours per fish (Figures 2-6, Appendix A-1). The percent of steelhead caught that were hatchery fish ranged from 65% in November 1996 to 100% in April 1997 (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead ranged from 591 (±10) mm for age 3 females to 700 (±29) mm for age 4 females (Table 1). Age composition of harvested hatchery steelhead was 61% 1:1's, 34% 1:2's and 5% 2:1's. Sex composition was 52% male and 48% female (Table 1). Seventy-nine percent of the anglers were from Union or Wallowa counties, 7% were from other Oregon counties, 8% were Washington residents and 6% resided outside the states of Oregon and Washington (Table 2).

On the upper Grande Ronde River, the catch rate index averaged 18 hours per fish (Figure 4, Appendix A-2). The percent of steelhead caught that were hatchery fish ranged from 0% in February to 100% in March (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead ranged from 580 (±25) mm for age 3 females to 675 (± 445) mm for age 4 males (Table 1). Age composition of harvested hatchery steelhead was 62% 1:1's and 38% 1:2's. Sex composition was 50% male and 50% female (Table 1). Ninety-three percent of the anglers were from Union or Wallowa counties, 6% were from other Oregon counties, 1% were Washington residents and 0% resided outside the states of Oregon and Washington (Table 2).

On Catherine Creek, the catch rate index averaged 33 hours per fish (Figure 4, Appendix A-3). One harvested fish was sampled. It was a 660 mm, age 4 (1:2) female (Figure 7, Table 1,

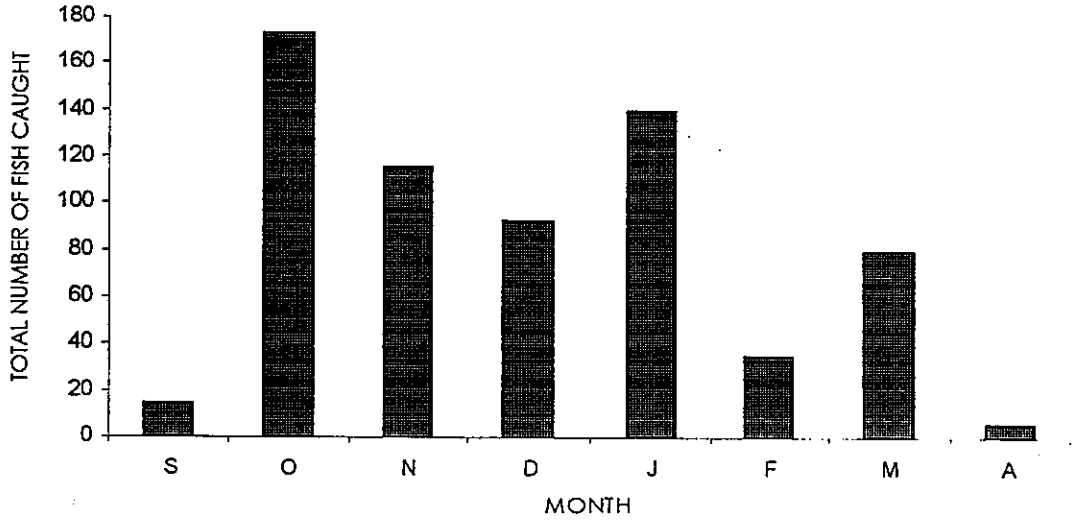

Figure 2. Estimated total catch of summer steelhead on the lower Grande Ronde River during the 1996-97 run year. The survey was conducted from 1 September 1996 to 15 April 1997.

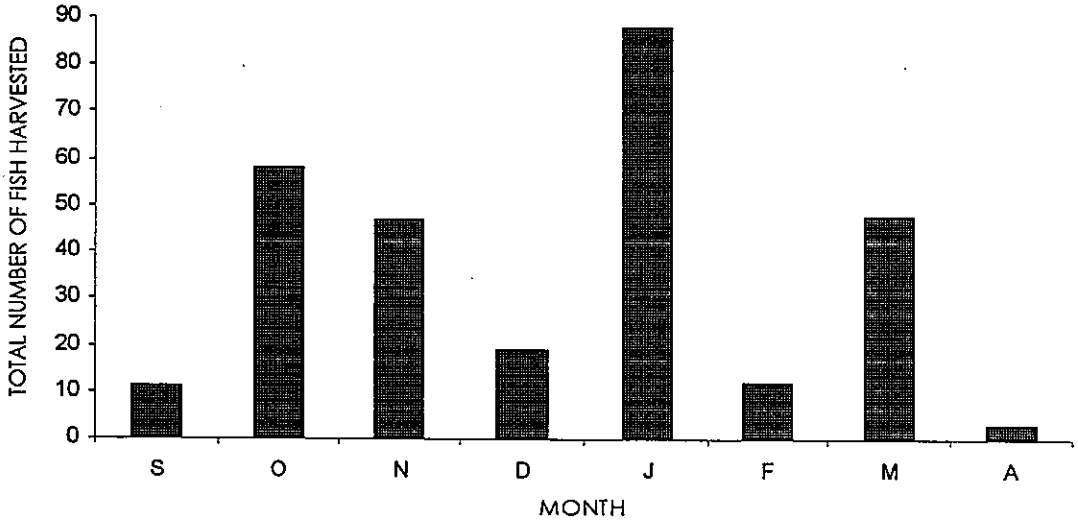

Figure 3. Estimated total harvest of summer steelhead on the lower Grande Ronde River during the 1996-97 run year. The survey was conducted from 1 September 1996 to 15 April 1997.

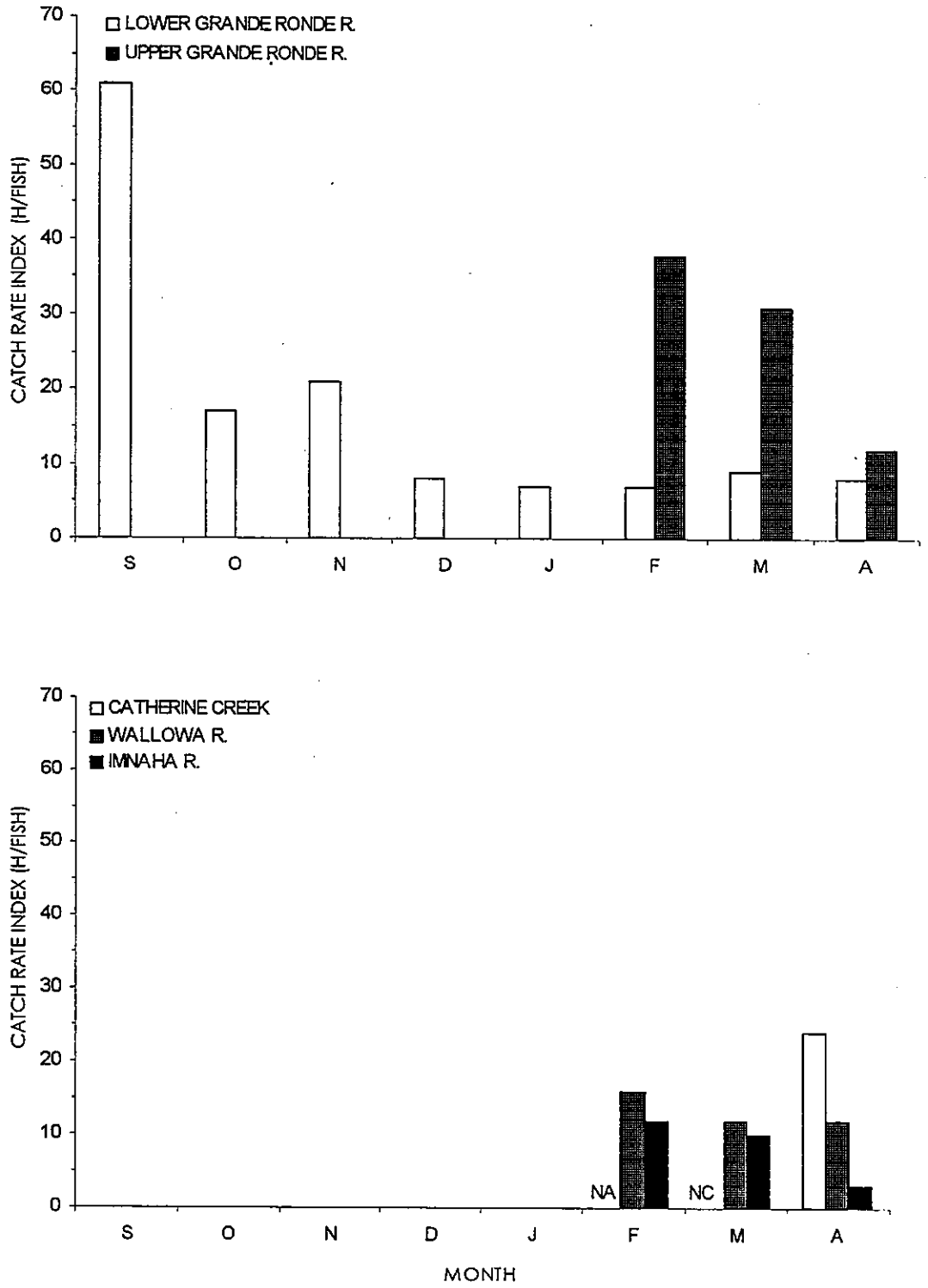

Figure 4. Estimated catch rate index (h/fish) for summer steelhead in the Grande Ronde and Imnaha basins during the 1996-97 run year. NA and NC indicate no anglers and no catch, respectively. Survey areas and times include the lower Grande Ronde River (1 September-to 15 April), upper Grande Ronde River, Catherine Creek, Wallowa River, and the Imnaha River (1 February-15 April). Note: A lower catch rate index implies better angling success.

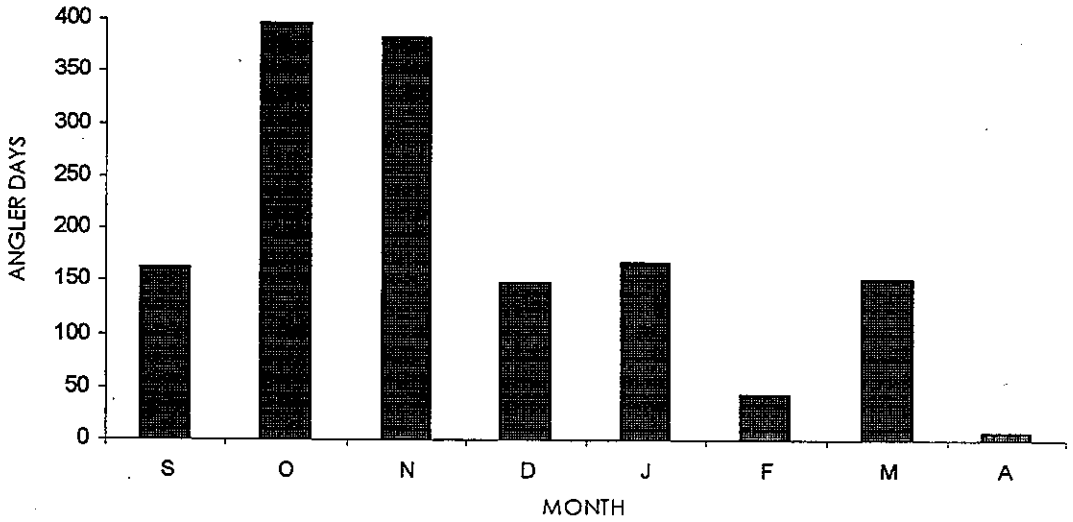

Figure 5. Estimated number of angler days for summer steelhead on the lower Grande Ronde River during the 1996-97 run year. The survey was conducted from 1 September 1996 to 15 April 1997.

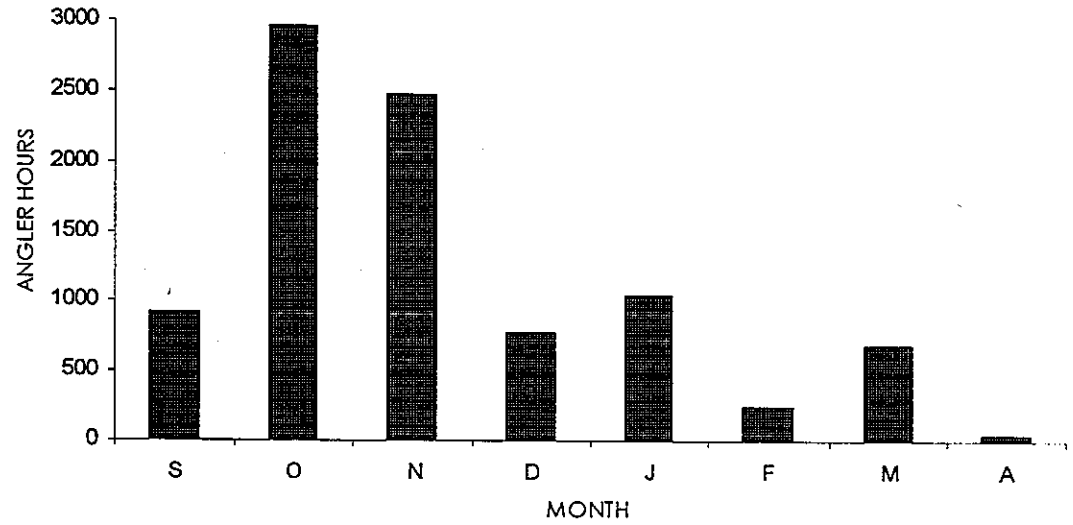

Figure 6. Estimated number of angler hours for summer steelhead on the lower Grande Ronde River during the 1996-97 run year. The survey was conducted from 1 September 1996 to 15 April 1997.

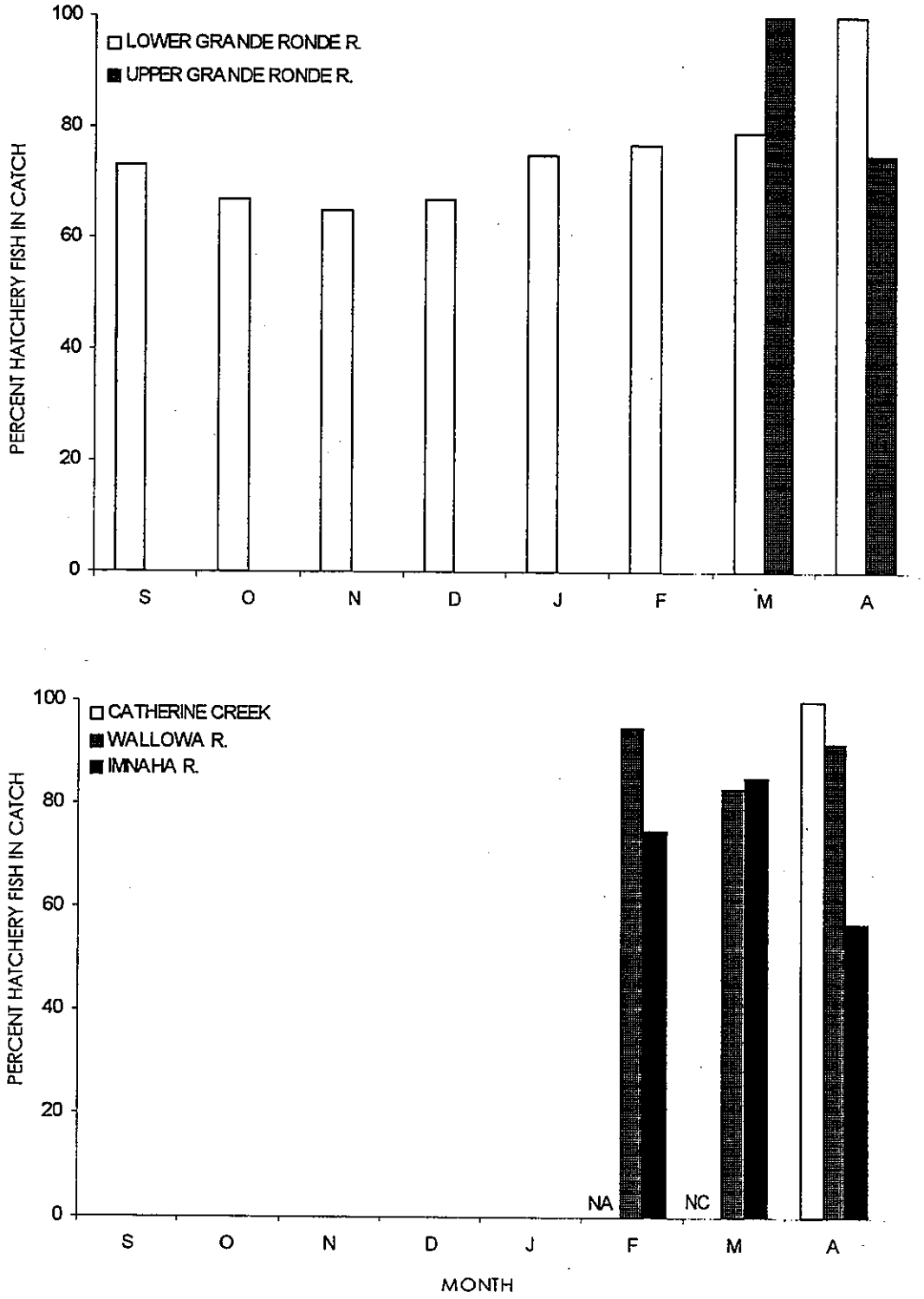

Figure 7. Estimated percent of summer steelhead caught in the Grande Ronde and Imnaha basins during the 1996-97 run year that were hatchery fish. NA and NC indicate no anglers and no catch, respectively. Survey areas and times include the lower Grande Ronde River (1 September-to 15 April), upper Grande Ronde River, Catherine Creek, Wallowa River, and the Imnaha River (1 February-15 April).

Table 1. Percent age composition and mean fork length of hatchery summer steelhead sampled in creel surveys in the Grande Ronde and Imnaha basins during the 1996-97 run year. Age estimated from length frequencies of a subsample (N=124) of hatchery adults at Wallowa Hatchery in 1996. Age 3 fish are 1:1 (years spent in freshwater prior to ocean migration:years spent in the ocean prior to spawning migration). Age 4 fish are either 1:2 or 2:1 and age 5 fish are 1:3. Mean fork length includes ±95% confidence interval.

Creel survey	Age composition (%)					Mean fork length (mm)			
area, sex	*N*	1:1	1:2	2:1	1:3	*N*	Age 3	*N*	Age 4 + Age 5
Lower Grande Ronde									
Males	45	58	38	4	0	26	599±8	19	694±30
Females	42	62	33	5	0	26	591±10	16	700±29
Unknown	2	100	0	0	0	2	575±127	--	--
Total	89	61	34	5	0	54	594±6	35	697±20
Upper Grande Ronde									
Males	4	50	50	0	0	2	595±318	2	675±445
Females	4	75	25	0	0	3	580±25	1	650
Total	8	62	38	0	0	5	586±26	3	667±94
Catherine Cr.									
Females	1	0	100	0	0	1	--	1	660
Wallowa									
Males	44	73	25	2	0	32	604±7	12	683±27
Females	67	55	39	6	0	37	594±10	30	708±15
Total	111	62	33	5	0	69	599±6	42	701±13
Imnaha									
Males	18	50	39	11	0	9	589±18	9	664±7
Females	38	42	45	10	3	16	573±11	22	669±20
Total	56	44	43	11	2	25	579±9	31	668±18

Table 2. Residence of summer steelhead anglers interviewed during creel surveys in the Grande Ronde and Imnaha basins during the 1996-97 run year.

Creel survey area	Number of anglers	Percent			
		Union or Wallowa counties	Other Oregon counties	Washington	Other states
Lower Grande Ronde	668	79	7	8	6
Upper Grande Ronde	152	93	6	1	0
Catherine Creek	15	100	0	0	0
Wallowa	984	80	18	2	0
Imnaha	209	87	12	1	0

Appendix B). One-hundred percent of the anglers were from Union or Wallowa counties (Table 2).

On the Wallowa River, the catch rate index averaged 13 hours per fish (Figure 4, Appendix A-4). The percent of steelhead caught that were hatchery fish ranged from 81% in March to 95% in February (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead ranged from 594 (±10) mm for age 3 females to 708 (±15) mm for age 4 males (Table 1). Age composition of harvested hatchery steelhead was 62% 1:1's, 33% 1:2's and 5% 2:1's. Sex composition was 40% male and 60% female (Table 1). Eighty percent of the anglers were from Union or Wallowa counties, 18% were from other Oregon counties, 2% were Washington residents and 0% resided outside the states of Oregon and Washington (Table 2).

On the Imnaha River, the catch rate index averaged 6 hours per fish (Figure 4, Appendix A-5). The percent of steelhead caught that were hatchery fish ranged from 57% in April to 85% in March (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead ranged from 573 (±11) mm for age 3 females to 669 (±20) mm for age 4 and age 5 females (Table 1). Age composition of harvested hatchery steelhead was 44% 1:1's, 43% 1:2's, 11% 2:1's and 2% for 1:3's. Sex composition was 32% male and 68% female (Table 1). Eighty-seven percent of the anglers were from Union or Wallowa counties, 12% were from other Oregon counties, 1% were Washington residents and 0% resided outside the states of Oregon and Washington (Table 2).

Angler effort (Figure 8) and harvest (Figure 9) for the 1996-97 run year decreased 16% and 5%, respectively on the lower Grande Ronde River compared to the previous year.

The percent of anglers from Oregon counties other than local (Union and Wallowa) in summer steelhead fisheries in the Grande Ronde and Imnaha basins have increased while the percent of local (Union or Wallowa counties) anglers have decreased since 1985 (Figure 10).

Recently, catch rate indexes have been best on the Imnaha River and poorest on the upper Grande Ronde River and Catherine Creek (Table 3).

DISCUSSION

The summer steelhead fishery on the lower Grande Ronde River and catch rates on the upper Grande Ronde, Wallowa, and Imnaha rivers, and Catherine Creek during the 1996-97 run year were similar when compared to the last two years. The relative success of the these fisheries is due, in part, to hatchery adult returns from LSRCP hatchery programs in both basins.

Recently, the best catch rates observed have been on the Imnaha River and the poorest have been on the upper Grande Ronde River and Catherine Creek. On the Imnaha River, we should continue to promote this fishery. However, for areas, such as the upper Grande Ronde River and Catherine Creek, we should explore methods to improve catch rates to better utilize adult hatchery returns in the future. These methods may include increases in smolt releases to increase

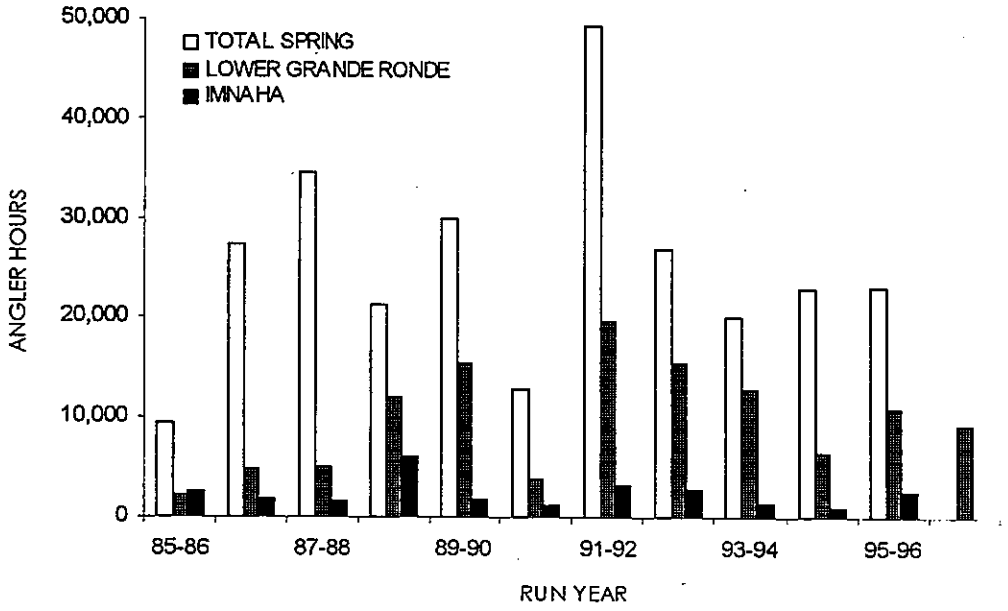

Figure 8. Angler effort for summer steelhead in spring fishery areas (upper Grande Ronde, Wallowa, Rondowa, and Catherine Creek) in the Grande Ronde basin and the Imnaha basin for the 1985-86 to 1995-96 run years and on the lower Grande Ronde River for the 1985-86 to 1996-67 run years.

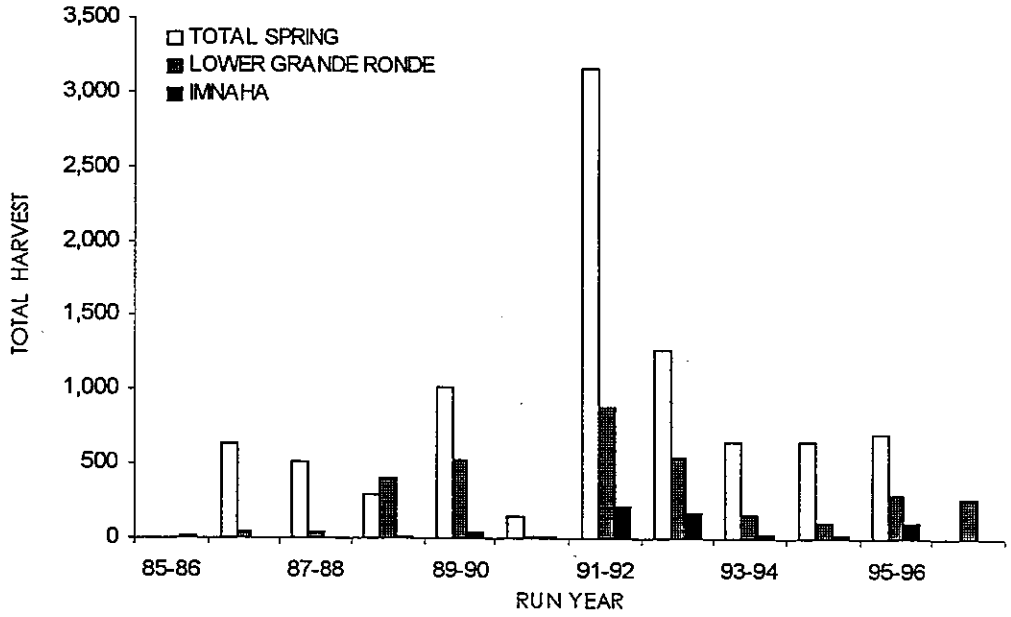

Figure 9. Number of hatchery summer steelhead harvested by recreational anglers in spring fishery areas (upper Grande Ronde, Wallowa, Rondowa, and Catherine Creek) in the Grande Ronde basin and the Imnaha basin for the 1985-86 to 1995-96 run years and on the lower Grande Ronde River for the 1985-86 to 1996-67 run years.

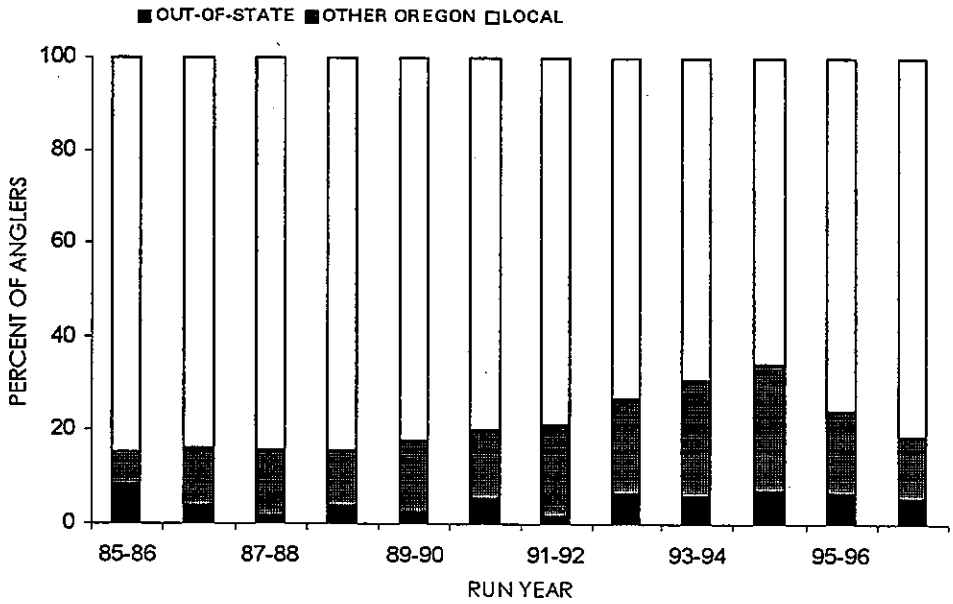

Figure 10. Percent of local (Union or Wallowa county), other Oregon county, and out-of-state anglers that fished in summer steelhead fisheries in the Grande Ronde and Imnaha basins for the 1985-86 to 1996-97 run years.

Table 3. Catch rate index (h/fish) in summer steelhead fisheries in creel survey areas in the Grande Ronde and Imnaha basins for the 1985-86 to 1996-97 run years. Note: a lower catch rate index implies better angling success.

	Catch rate index (h/fish)				
Run year	Lower GR	Upper GR	Wallowa	Catherine Cr.	Imnaha
85-86	8		7		15
86-87	9		11		9
87-88	10		15		24
88-89	14	40	43		18
89-90	14	14	18		20
90-91	19	24	6		13
91-92	11	10	9	3	4
92-93	9	14	11	49	8
93-94	18	31	16		13
94-95	21	25	17		17
95-96	11	15	21		7
96-97	14	18	13	33	6

adult returns, develop better angler access over wide areas allowing anglers to move to where angling is most productive, and improve stream conditions including water quality and instream habitat diversity enhancing angling opportunities.

Because punch card harvest data (Oregon Department of Fish and Wildlife Salmon and Steelhead Catch Data 1953-95) for the 1996-97 run year is not yet available and estimates of angler effort, total catch and harvest of steelhead for spring fisheries will be based on punch card data (Flesher et al. 1996), managers will have to wait for the 1997-98 annual report to have complete information for this years' spring fisheries.

Subsequent annual reports will include angler effort, catch, harvest, and catch rate index for the lower Grande Ronde River and catch rate indexes for spring fisheries on the upper Grande Ronde, Wallowa, and Imnaha rivers, and Catherine Creek. Also included will be the percent hatchery fish in the catch, length frequency, sex and age composition of harvested fish, and angler residence for each fishery. Lastly, the report will include angler effort, catch, and harvest from the previous run year for the upper Grande Ronde, Wallowa, and Imnaha rivers, and Catherine Creek, and observed and expanded numbers of AdLV+CWT marked steelhead for each fishery from the previous run year.

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Appendix A-1. Fishery statistics for summer steelhead on the lower Grande Ronde River during the 1996-97 run year. Statistics include ±95% confidence interval except for catch rate when expressed as h/fish. Only adipose-marked fish were harvested.

Month, day type	Sample size		Total hours	Total catch	Total harvest	Catch rate		Angler days
	Days	Anglers				fish/h	(h/fish)	
September:								
Weekday	7	29	455±290	11±13	11	0.025±0.028	(41)	65±41
Weekend	5	46	462±197	4±17	0	0.009±0.037	(116)	97±41
Total	12	75	917±351	15±22	11	0.017±0.023	(61)	162±62
October:								
Weekday	7	76	1576±344	77±33	23±19	0.049±0.021	(20)	222±48
Weekend	5	102	1380±184	96±23	35±18	0.069±0.017	(14)	174±23
Total	12	178	2956±390	173±40	58±26	0.058±0.014	(17)	396±52
November:								
Weekday	6	62	1241±166	40±25	13±11	0.033±0.020	(31)	193±26
Weekend	6	109	1229±212	76±29	34±20	0.062±024	(16)	190±33
Total	12	171	2470±269	116±38	47±23	0.047±0.016	(21)	383±42
December:								
Weekday	6	21	326±289	42±120	11±32	0.128±0.358	(8)	49±43
Weekend	5	49	448±132	51±33	8±8	0.114±0.073	(9)	100±29
Total	11	70	774±318	93±125	19±33	0.120±0.157	(8)	149±61
January:								
Weekday	7	29	587±428	82±72	60±55	0.140±0.122	(7)	90±66
Weekend	5	44	457±342	58±44	28±25	0.125±0.097	(8)	78±58
Total	12	73	1044±548	140±84	88±60	0.134±0.081	(7)	168±88
February:								
Weekday	6	16	193±123	29±29	9±11	0.152±0.143	(7)	32±20
Weekend	5	25	49	6±10	3±5	0.123±0.213	(8)	11
Total	11	41	242±111	35±30	12±12	0.146±0.122	(7)	43±20
March:								
Weekday	6	19	321±205	57±27	35±25	0.178±0.084	(6)	54±34
Weekend	5	36	369±260	23±29	13	0.063±0.077	(16)	98±69
Total	11	55	690±331	80±40	48±25	0.116±0.057	(9)	152±73
April:								
Weekday	4	3	27	6	3	0.206±0.746	(5)	4
Weekend	2	2	18	0	–	--(--	)	4
Total	6	5	45	6	3	0.123±0.445	(8)	8
Grand total	87	668	9137±933	658±169	286±82	0.072±0.018	(14)	1461±149

Appendix A-2. Sample catch rate for summer steelhead on the upper Grande Ronde River during the 1996-97 run year. Only adipose-marked fish were harvested.

Month, day type	Sample size		Catch rate
	Days	Anglers	fish/h (h/fish)
February:			
Weekday	7	16	0.000 (0)
Weekend	3	6	0.137 (7)
Total	10	22	0.027 (38)
March:			
Weekday	6	31	0.000 (0)
Weekend	2	31	0.059 (17)
Total	8	62	0.032 (31)
April:			
Weekday	2	13	0.079 (13)
Weekend	3	55	0.080 (12)
Total	5	68	0.080 (12)
Grand total	23	152	0.057 (18)

Appendix A-3. Sample catch rate for summer steelhead on Catherine Creek during the 1996-97 run year. Only adipose-marked fish were harvested.

Month, day type	Sample size		Catch rate
	Days	Anglers	fish/h (h/fish)
February:			
Weekday	7	0	–(–)
Weekend	3	0	–(–)
Total	10	0	–(–)
March:			
Weekday	6	2	0.000 (0)
Weekend	4	4	0.000 (0)
Total	10	6	0.000 (0)
April:			
Weekday	1	0	–(–)
Weekend	3	9	0.042 (24)
Total	4	9	0.042 (24)
Grand total	24	15	0.030 (33)

Appendix A-4. Sample catch rate for summer steelhead on the Wallowa River during the 1996-97 run year. Only adipose-marked fish were harvested.

Month, day type	Sample size		Catch rate
	Days	Anglers	fish/h (h/fish)
February:			
Weekday	9	95	0.082 (12)
Weekend	6	156	0.004 (19)
Total	15	251	0.061 (16)
March:			
Weekday	11	217	0.084 (12)
Weekend	8	285	0.080 (13)
Total	19	502	0.082 (12)
April:			
Weekday	5	88	0.082 (12)
Weekend	4	143	0.082 (12)
Total	9	231	0.082 (12)
Grand total	43	984	0.076 (13)

Appendix A-5. Sample catch rate for summer steelhead on the Imnaha River during the 1996-97 run year. Only adipose-marked fish were harvested.

Month, day type	Sample size		Catch rate
	Days	Anglers	fish/h (h/fish)
February:			
Weekday	5	12	0.152 (7)
Weekend	3	34	0.054 (18)
Total	8	46	0.080 (12)
March:			
Weekday	4	33	0.064 (16)
Weekend	4	70	0.118 (9)
Total	8	103	0.104 (10)
April:			
Weekday	4	42	0.281 (4)
Weekend	1	18	0.316 (3)
Total	5	60	0.291 (3)
Grand total	21	209	0.155 (6)

Appendix B. The percent of summer steelhead caught by month in the Grande Ronde and Imnaha basins during the 1996-97 run year that were hatchery fish. Total catch for Lower Grande Ronde River and sampled total catch for the Upper Grande Ronde, Wallowa and Imnaha rivers are shown in parentheses.

Creel survey area	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Lower Grande Ronde	73(15)	67(173)	65(116)	67(93)	75(140)	77(35)	79(80)	100(6)
Upper Grande Ronde	–(–)	–(–)	–(–)	–(–)	–(–)	0(1)	100(3)	75(12)
Catherine Creek	–(–)	–(–)	–(–)	–(–)	–(–)	–(–)	–(–)	100(1)
Wallowa	–(–)	–(–)	–(–)	–(–)	–(–)	95(41)	83(100)	92(59)
Imnaha	–(–)	–(–)	–(–)	–(–)	–(–)	75(12)	85(33)	57(58)

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