

ANNUAL PROGRESS REPORT

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OREGON

PROJECT TITLE: Summer Steelhead Creel Surveys on the
Grande Ronde, Wallowa, and Imnaha
Rivers for the 1989-90 Run Year

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SUMMARY

Objectives in FY 1990

1. Estimate angler effort in hours and angler days for summer steelhead fisheries on the Grande Ronde, Wallowa, and Imnaha rivers.
2. Estimate total catch, catch rate, and number of fish harvested in summer steelhead fisheries on the Grande Ronde, Wallowa, and Imnaha rivers.
3. Estimate the proportion of hatchery fish in the total catch.
4. Determine length frequency, age composition, and sex composition of catch.
5. Estimate, by tag code, the number of adipose-left ventral clipped plus coded-wire-tagged steelhead harvested.

Accomplishments in FY 1990

We accomplished all of our objectives.

Findings in FY 1990

We estimated that 2,939 anglers fished 15,491 hours and caught and released 512 wild and 60 hatchery steelhead and kept 530 hatchery steelhead, during the periods 1 September through 31 December 1989 and 1 February through 15 April 1990 on the lower Grande Ronde River. Angler effort, catch, and harvest have increased each year in both the fall and spring since 1986. On the upper Grande Ronde River, 1,499 anglers fished 4,078 hours from 1 March

through 15 April 1990. They caught and released 64 wild and 56 hatchery steelhead and kept 176 hatchery steelhead.

On the lower Wallowa River, 294 anglers fished 1,980 hours from 17 March through 31 March 1990. They caught and released 20 wild steelhead and kept 38 hatchery steelhead. On the upper Wallowa River, 4,959 anglers fished 23,840 hours from 1 February through 15 April 1990. They caught and released 239 wild and 376 hatchery steelhead and kept 798 hatchery steelhead.

On the Imnaha River, 483 anglers fished 1,753 hours from 1 March through 15 April 1990. They caught and released 43 wild and 9 hatchery steelhead and kept 37 hatchery steelhead.

Hatchery fish composed a high proportion of the catch in all fisheries in the Grande Ronde river basin. In the 1989-90 run year, the catch rate goal of 10 hours per fish was not met in any of the fisheries.

Management Implications and Recommendations

1. Catch rate objectives of 10 hours per fish will not be achieved in most years in the Grande Ronde river basin fisheries unless abundance and availability of hatchery fish is increased. To improve angler catch rates and hatchery fish contribution to total catch, we should (1) use hatchery and wild fish that return to the Grande Ronde River in the fall as broodstock for smolts released in the lower Grande Ronde and Wallowa Rivers. This should provide an increase in the number of fish available for harvest during the fall on the lower Grande Ronde River. (2) Construct acclimation facilities on the upper and lower Grande Ronde River and Catherine Creek and acclimate smolts prior to release. Acclimation

will localize the distribution of returning adults and concentrate fish in specific areas for harvest. (3) Increase the number of fish that are acclimated and released at the Big Canyon Creek facility which will increase the number of fish available for harvest in the Wallowa River below the Big Canyon Creek facility.

2. If catch composition represents natural spawner composition, then the high percentage of hatchery fish in the catch on the upper Grande Ronde River is of considerable concern because of the genetic risk associated with interbreeding between hatchery fish and wild fish. Non-local origin hatchery fish should not compose more than 10% of the natural spawning population, according to the guidelines in Oregon's Wild Fish Management Policy (OAR 635-07-525 through 529). Management options to reduce the genetic risk include: construction of acclimation and recapture facilities to allow for removal of hatchery fish from the natural spawning population; discontinue use of Wallowa stock and use local stocks; and reduce the number of smolts released in the upper Grande Ronde River.

INTRODUCTION

One of the primary objectives of the Lower Snake River Compensation Plan (LSRCP) in Oregon is to restore historic recreational and tribal fisheries for summer steelhead *Oncorhynchus mykiss* in the Grande Ronde and Imnaha river basins. The goal of the creel surveys is to provide annual harvest information needed to assess achievement of LSRCP objectives and mitigation goals (Carmichael and Wagner 1983). This report summarizes results of creel surveys conducted during fall 1989 and spring 1990 on the Grande Ronde, Wallowa, and Imnaha rivers. Results of creel surveys conducted prior to fall

1989 are reported in previous LSRCP evaluation annual reports (Carmichael et al. 1986, 1987, 1988, and 1989). The steelhead angling season for fall 1989 through spring 1990 was open from 1 September to 15 April, and only adipose-clipped fish could be kept.

STUDY AREA

Creel surveys on the lower Grande Ronde River were conducted on a 14.6 mile section from the Oregon-Washington state line (RM 38.7) to Wildcat Creek (RM 53.3) and on a 24.4 mile section of the upper Grande Ronde River from Highway 82 bridge at Island City (RM 158.8) to Meadow Creek (RM 183.2), as shown in Figure 1. Surveys on the Wallowa River were conducted on a 3.4 mile section on the lower river from its confluence with the Grande Ronde River at Rondowa (RM 0) to Howard Creek (RM 3.4) and an upper 17.8 mile section from Minam State Park (RM 8.2) to the Lostine River (RM 26.0). Anglers who parked their vehicles at Minam State Park and hiked below to fish were included in the upper survey. The survey on the Imnaha River was conducted on the lower 23.0 miles from its confluence with the Snake River (RM 0) to the town of Imnaha (RM 23.0). The study area is shown in Figure 1.

METHODS

We followed methods described by Carmichael et al. (1988) except for minor variations in starting and ending dates.

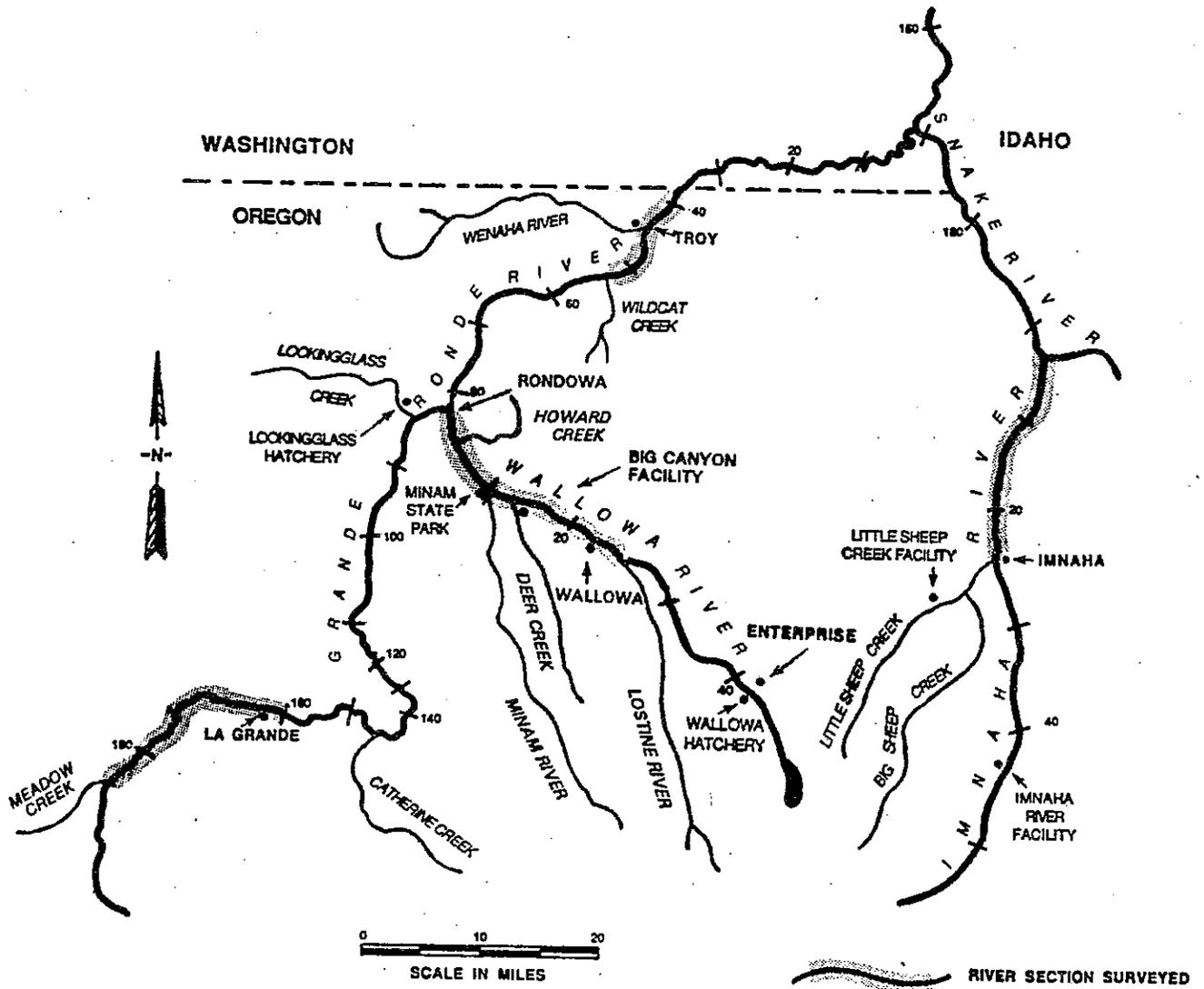


Figure 1. Map of northeastern Oregon showing where summer steelhead creel surveys were conducted in the Grande Ronde and Imnaha river basins during the 1989-90 run year.

RESULTS

Catch statistics for summer steelhead fisheries on the lower Grande Ronde River are presented in Table 1, for the upper Grande Ronde River in Table 2, for the lower Wallowa River in Table 3, for the upper Wallowa River in Table 4, and for the Imnaha River in Table 5. Percentage of the total fish caught that were hatchery fish is presented in Table 6. Age composition of catch is presented in Table 7. Recovery information for adipose-left ventral clipped plus coded-wire-tagged fish is presented in Table 8. A summary of angler residence is presented in Table 9.

Table 1. Catch statistics for summer steelhead on the lower Grande Ronde River from the Oregon-Washington border (RM 38.7) to Wildcat Creek (RM 53.3) from the periods 1 September to 31 December 1989 and 1 February to 15 April 1990. Number caught and number harvested includes $\pm 95\%$ confidence interval. Only adipose-marked fish were harvested.

Month, day type	Number sampled		Hours fished	Number caught	Number harvested	Catch rate (hr/fish)	Angler days
	days	anglers					
September:							
Weekday	6	18	346	18 \pm 34	0	19.2	77
Weekend	5	101	1,162	50 \pm 19	5 \pm 6	23.2	187
Total	11	119	1,508	68 \pm 39	5 \pm 6	22.2	264
October:							
Weekday	7	109	2,103	158 \pm 65	53 \pm 32	13.3	369
Weekend	5	135	1,573	82 \pm 30	34 \pm 18	19.2	246
Total	12	244	3,676	240 \pm 71	87 \pm 37	15.3	615
November:							
Weekday	7	82	1,106	103 \pm 41	54 \pm 28	10.7	221
Weekend	4	98	1,205	79 \pm 38	31 \pm 21	15.3	215
Total	11	180	2,311	182 \pm 55	85 \pm 35	12.7	436
December:							
Weekday	6	45	672	25 \pm 25	21 \pm 22	26.9	132
Weekend	4	75	899	96 \pm 56	46 \pm 31	9.4	152
Total	10	120	1,571	121 \pm 61	67 \pm 39	13.0	284
February:							
Weekday	6	160	3,184	199 \pm 177	122 \pm 112	16.0	549
Weekend	4	144	1,834	104 \pm 55	68 \pm 40	17.6	311
Total	10	304	5,018	303 \pm 185	190 \pm 119	16.6	860
March:							
Weekday	8	30	702	171 \pm 158	81 \pm 89	4.1	206
Weekend	5	40	286	6 \pm 6	4 \pm 5	47.7	114
Total	13	70	988	177 \pm 158	85 \pm 89	5.6	320
April:							
Weekday	4	6	107	0	0	--	49
Weekend	3	31	312	11 \pm 33	11 \pm 33	28.4	111
Total	7	37	419	11 \pm 33	11 \pm 33	38.1	160
Grand total	74	1,074	15,491	1,102 \pm 272	530 \pm 165	14.1	2,939

Table 2. Catch statistics for summer steelhead on the upper Grande Ronde River from Island City (RM 158.8) to Meadow Creek (RM 183.2) from 1 March to 15 April 1990. Number caught and number harvested includes $\pm 95\%$ confidence interval. Only adipose-marked fish were harvested.

Month, day type	Number sampled		Hours fished	Number caught	Number harvested	Catch rate (hr/fish)	Angler days
	days	anglers					
March:							
Weekday	7	95	1,690	173 \pm 139	109 \pm 94	9.8	735
Weekend	4	48	536	56 \pm 54	31 \pm 33	9.6	191
Total	11	143	2,226	229 \pm 149	140 \pm 100	9.7	926
April:							
Weekday	3	48	976	40 \pm 48	25 \pm 33	24.4	271
Weekend	2	56	876	27 \pm 44	11 \pm 19	32.4	302
Total	5	104	1,852	67 \pm 65	36 \pm 38	27.6	573
Grand total	16	247	4,078	296 \pm 162	176 \pm 107	13.8	1,499

Table 3. Catch statistics for summer steelhead on the lower Wallowa River from its confluence with the Grande Ronde River at Rondowa (RM 0) to Howard Creek (RM 3.4) from 17 March to 31 March 1990. Number caught and number harvested includes $\pm 95\%$ confidence interval. Only adipose-marked fish were harvested.

Month, day type	Number sampled		Hours fished	Number caught	Number harvested	Catch rate (hr/fish)	Angler days
	days	anglers					
March:							
Weekday	2	32	1,047	25 \pm 45	10 \pm 19	41.9	161
Weekend	2	53	933	33 \pm 12	28 \pm 12	28.3	133
Total	4	85	1,980	58 \pm 46	38 \pm 22	34.1	294

Table 4. Catch statistics for summer steelhead on the upper Wallowa River from Minam State Park (RM 8.2) to the Lostine River (RM 26.0) from 1 February to 15 April 1990. Number caught and number harvested includes $\pm 95\%$ confidence interval. Only adipose-marked fish were harvested.

Month, day type	Number sampled		Hours fished	Number caught	Number harvested	Catch rate (hr/fish)	Angler days
	days	anglers					
February:							
Weekday	6	60	1,224	17 \pm 34	17 \pm 34	72.0	350
Weekend	4	143	1,886	92 \pm 103	40 \pm 49	20.5	650
Total	10	203	3,110	109 \pm 108	57 \pm 60	28.5	1,000
March:							
Weekday	7	370	7,676	526 \pm 382	318 \pm 236	14.6	1,706
Weekend	5	466	5,760	288 \pm 128	178 \pm 84	20.0	1,067
Total	12	836	13,436	814 \pm 403	496 \pm 251	16.5	2,773
April:							
Weekday	3	176	4,028	240 \pm 135	133 \pm 82	16.8	719
Weekend	2	155	3,266	250 \pm 68	112 \pm 46	13.1	467
Total	5	331	7,294	490 \pm 151	245 \pm 94	14.9	1,186
Grand total	27	1,370	23,840	1,413 \pm 444	798 \pm 274	16.9	4,959

Table 5. Catch statistics for summer steelhead on the Imnaha River from its confluence with the Snake River (RM 0) to the town of Imnaha (RM 23.0) from 1 March to 15 April 1990. Number caught and number harvested includes $\pm 95\%$ confidence interval. Only adipose-marked fish were harvested.

Month, day type	Number sampled		Hours fished	Number caught	Number harvested	Catch rate (hr/fish)	Angler days
	days	anglers					
March:							
Weekday	7	74	816	35 \pm 16	19 \pm 13	23.3	233
Weekend	5	100	794	54 \pm 31	18 \pm 14	14.7	180
Total	12	174	1,610	89 \pm 34	37 \pm 19	18.1	413
April:							
Weekday	3	9	53	0	0	--	29
Weekend	3	24	90	0	0	--	41
Total	6	33	143	0	0	--	70
Grand total	18	207	1,753	89 \pm 34	37 \pm 19	19.7	483

Table 6. Percentage of the total number of summer steelhead caught that were hatchery fish in the Grande Ronde and Imnaha river basins during the 1989-90 run year. Sample sizes are listed in Tables 1-5.

Creel survey area	Sept	Oct	Nov	Dec	Feb	Mar	Apr
Lower Grande Ronde	16.2	48.3	52.2	65.3	63.7	48.0	100.0
Upper Grande Ronde	--	--	--	--	--	79.9	73.1
Lower Wallowa	--	--	--	--	--	65.5	--
Upper Wallowa	--	--	--	--	52.3	85.6	85.7
Imnaha	--	--	--	--	--	18.0	--

Table 7. Percentage age composition and mean fork length (mm) of summer steelhead sampled in creel surveys in the Grande Ronde and Imnaha river basins during the 1989-90 run year. Standard deviation is shown in parenthesis. Age is expressed as years spent in freshwater prior to ocean migration:years spent in the ocean prior to spawning migration.

Creel survey area, age	Age composition			Fork length	
	N	Males	Females	Males	Females
Lower Grande Ronde:					
1:1	80	36.8	22.0	604(31)	593(38)
2:1	9	2.9	3.7	656(23)	642(41)
1:2	47	10.3	24.3	725(48)	688(43)
Upper Grande Ronde:					
1:1	13	36.8	31.6	619(32)	593(23)
1:2	6	0	31.6	--	721(26)
Upper and lower Wallowa:					
1:1	104	31.3	24.9	602(29)	593(29)
2:1	12	2.7	3.8	646(23)	636(39)
1:2	67	10.3	26.0	757(36)	715(35)
2:2	1	0.5	0	760	--
1:3	1	0.5	0	830	--
Imnaha:					
1:1	18	65.0	25.0	599(39)	587(23)
2:1	1	0	5.0	--	650
1:2	1	0	5.0	--	724

Table 8. Recoveries of coded-wire tagged summer steelhead sampled in creel surveys in the Grande Ronde and Imnaha river basins during the 1989-90 run year. No adipose-left ventral clipped plus coded-wire-tagged steelhead were recovered on the upper Grande Ronde or lower Wallowa rivers. Codes with an R1 or R2 refer to tag code replicate. Tag recoveries were expanded for the entire fishery.

Creel survey area	Tag code	Number recovered	
		Observed	Expanded
Lower Grande Ronde	07 40 26	2	8
	07 40 27	2	6
	07 40 28	2	6
	07 40 29	1	4
	07 41 25R1	1	4
	07 41 26R1	1	3
	63 38 42	1	3
Upper Wallowa	07 40 25	1	3
	07 40 27	1	4
	07 40 28	2	7
	07 40 29	2	14
	07 40 32	1	6
	07 41 25R2	1	5
	07 41 26R1	1	9
	07 41 28R2	1	6
Imnaha	07 40 34	3	8

Table 9. Percentage by residence of anglers that were interviewed during summer steelhead creel surveys in the Grande Ronde and Imnaha river basins during the 1989-90 run year.

Creel survey area	Number of anglers	Wallowa and Union counties	Other Oregon residents	Out-of-state
Lower Grande Ronde	1,074	83	12	5
Upper Grande Ronde	247	97	3	0
Lower Wallowa	85	88	12	0
Upper Wallowa	1,370	76	22	2
Imnaha	207	90	8	2

DISCUSSION

We estimated that angler effort, catch, and harvest of summer steelhead in the Grande Ronde basin during the 1989-90 run year was the highest since fisheries reopened in 1986. Most of the increase from the previous year occurred on the upper Wallowa River between Minam State Park and the Lostine River. On the Imnaha River, angler effort and catch was the second lowest since 1986. Although catch was low, more adipose-clipped hatchery steelhead were harvested than in previous years. Season and monthly catch rates were below the Oregon Department of Fish and Wildlife's (ODFW) management goal of 10 hours per fish except during March on the upper and lower Grande Ronde River.

Since 1986, the sport fishery for summer steelhead has steadily increased in both the fall and spring on the lower Grande Ronde River. We observed a small increase in catch and harvest from the previous year. Historically, most of the fish were caught in the lower Grande Ronde River during the fall (Carmichael et al. 1988). However, angler effort and catch in the Grande Ronde basin has been greater in the spring since the fisheries reopened in 1986. Hatchery fish have contributed poorly to the fishery in the fall because they enter the Grande Ronde River primarily in the winter and spring (Carmichael et al. 1990). As in previous years, hatchery fish composed an increasingly higher proportion of the catch from September through December. The potential to increase catch rate and harvest during the fall exists if we can shift run timing so that more hatchery fish enter the Grande Ronde River earlier in the fall.

In the spring fishery on the upper Grande Ronde River, angler effort increased 218% and catch increased 825% from the previous year. Harvest of hatchery fish increased from 8 fish in 1989 to 176 fish in 1990. Effort, catch, and harvest in this fishery may increase in the future as more anglers become familiar with access points and migration patterns of the fish. The high percentage of hatchery fish in the catch is of concern. Under the guidelines of Oregon's Wild Fish Management Policy (OAR 635-07-525 through 529), non-local hatchery fish such as Wallowa stock (Carmichael 1989), should not compose more than 10% of the natural spawning population. Further investigation is needed to determine if ratios observed in the fishery represent ratios in the natural spawning population. If the proportion of hatchery fish in the catch reflects the proportion in the natural spawning population, then we should pursue options that will reduce the potential for hatchery fish interbreeding with wild fish. These options include: (1) construct acclimation and recapture facilities that will localize distribution of returning adults and will provide the ability to remove adults from the river; (2) develop local broodstock from the natural fish to increase the allowable proportion of hatchery fish in the naturally spawning population from 10% to 50%; (3) reduce the number of Wallowa stock steelhead released in the upper Grande Ronde River.

On the Wallowa River, angler effort increased 29%, catch increased 215%, and harvest increased 171% from the previous year. On the Imnaha River, angler effort dropped 71%, catch dropped 73%, and harvest increased 95% from the previous year. Most of the decrease in effort and catch from the previous year occurred in April. Since the season reopened in 1986, angler effort on the Imnaha River has remained relatively stable at a low level.

The emergency season extension from 15 April to 30 April that was implemented in 1989 in the Grande Ronde and Imnaha river basins did not substantially increase catch and effort (Carmichael et al. 1989). However, from 1985-90 in the Imnaha River, an average of 45.3% of the hatchery adults that returned to the Little Sheep Creek facility, which is located five miles upstream of the sport fishery boundary, arrived after 15 April. A considerable number of hatchery fish are likely passing through this fishery after the season closes. Therefore, a season extension may provide an increase in angler effort and harvest.

Catch and catch rates must increase in both the Grande Ronde and Imnaha river basins if we are going to reach management objectives for summer steelhead recreational fisheries under the Lower Snake River Compensation Plan.

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