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DEPARTMENT OF FISH & GAME

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FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Completion Report

Project F-73-R-4

SUBPROJECT IV: RIVER AND STREAM INVESTIGATIONS

STUDY NO. II, JOB NO. I: Lochsa River Fisheries Investigations

Period Covered: 1 March 1981 to 28 February 1982

by

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TABLE OF CONTENTS

Page

ABSTRACT 1

RECOMMENDATIONS 2

OBJECTIVES 2

TECHNIQUES USED 2

Creel Census 2
Angler Residency, Methods, and Opinions 4
Releases of Hatchery Rainbow in Lochsa River 5
Snorkeling 5

FINDINGS 5

Angler Effort and Harvest 5
Lower Sections (Catch-and-Keep) 9
Upper Sections (Catch-and-Release) 14
Species Composition 14
Catch Rates 16
Length Frequencies 16
Angler Residency 20
Angler Methods and Opinions 20
Snorkeling 20

DISCUSSION 24

LITERATURE CITED 26

LIST OF TABLES

Table 1. Releases of hatchery rainbow catchables in the Lochsa River between 1976 and 1981. All catchables prior to 1977 were planted above Boulder Creek. Releases after 1976 took place below Boulder Creek 6

Table 2. Comparison of total estimated angler effort and species caught by anglers in the Lochsa River and Crooked Fork (mouth to Highway 12 Bridge), 1976-1981 7

TABLE OF CONTENTS (Continued)

LIST OF TABLES (Continued) Page

Table 3. Comparison of estimated angler effort and species caught by anglers in upper (catch-and-release) and lower (catch-and-keep) sections of the Lochsa River and Crooked Fork (mouth to Highway 12 Bridge), 1977-1981 8

Table 4. Comparison of total estimated angler effort and fish caught by stream section in the Lochsa River and Crooked Fork (mouth to Highway 12 Bridge), 1976-1981 11

Table 5. Percent of hatchery catchable rainbow harvested from the Lochsa River, 1976 through 1981 13

Table 6. Comparison of catch rates by anglers on the Lochsa River and lower eight miles of Crooked Fork Creek by 2-week intervals, 1976 through 1981. Catch rates include fish released after 1976 17

Table 7. Angling methods and angler opinion information collected on the Lochsa River, 1976 through 1981 22

Table 8. Densities of salmonids (fish/100 m) in snorkel sections in the Lochsa River, 1975-1981 (Graham 1977 and Mabbott 1978, 1979) 23

LIST OF FIGURES

Figure 1. Stream sections used in conducting the creel census and angler interviews on the Lochsa River, 1976-1981 3

Figure 2. The estimated fishing effort (hours x 1,000) on the Lochsa River above and below Boulder Creek, 1976-1981 10

TABLE OF CONTENTS (Continued)

LIST OF FIGURES (Continued)

Page

Figure 3. Comparison of species composition from anglers' catch on the Lochsa River above and below Boulder Creek, 1976-1981 15

Figure 4. Length frequencies of cutthroat trout measured from the Lochsa River, 1976-1981 19

Figure 5. Percentage of nonresident fishermen interviewed on the Lochsa River above and below Boulder Creek, 1976-1981 21

LIST OF APPENDIX

Table A. Estimated hours fished and harvest by anglers on the Lochsa River (Section 1-Mouth to Split Creek) by 2-week intervals, 23 May-10 September 1981 28

Table B. Estimated hours fished and harvest by anglers on the Lochsa River (Section 2-Split Creek to Fish Creek) by 2-week intervals, 23 May-10 September 1981 29

Table C. Estimated hours fished and harvest by anglers on the Lochsa River (Section 3-Fish Creek to Boulder Creek) by 2-week intervals, 23 May-10 September 1981 30

Table D. Estimated hours fished and fish caught and released on the Lochsa River (Section 4-Boulder Creek to Warmsprings Creek) by 2-week intervals, 23 May-10 September 1981 31

Table E. Estimated hours fished and fish caught and released on the Lochsa River (Section 5-Warmsprings Creek to Crooked Fork Creek) by 2-week intervals, 23 May-10 September 1981 32

Table F. Estimated hours fished and fish caught and released on the Crooked Fork Creek (Section 6-mouth to Highway 12 Bridge) by 2-week intervals, 23 May-10 September 1981 33

TABLE OF CONTENTS (Continued)

LIST OF APPENDIX (Continued)

Page

Table G. Comparison of percent composition of catch by stream section in the Lochsa River, 1976 through 1981 34

JOB COMPLETION REPORT

State of Idaho

Name: RIVER AND STREAM INVESTIGATIONS

Project No. F-73-R-4

Title: Lochsa River Fisheries Investigations

Subproject No. IV

Study No. II, Job No. 1

Period Covered: 1 March 1981 to 28 February 1982

ABSTRACT

From 1976 through 1981, fisheries personnel conducted an intensive creel census on the Lochsa River and lower portion of Crooked Fork Creek, to evaluate the response of the cutthroat trout population to catch-and-release regulations on the Lochsa River and to monitor changes in angling pressure and harvest of game fish. In addition to the creel census, we also surveyed cutthroat and juvenile steelhead populations by use of standardized snorkeling techniques in transects established in 1975.

Cutthroat catch rate increased from 0.05 per hour in 1976, to 0.38 per hour in 1981. Cutthroat increased from 4% of the catch in 1976 to 22% in 1981. The average total length of cutthroat measured increased from 254 mm (10.0 in) in 1976, to 306 mm (12.1 in) in 1981. Cutthroat counted in snorkel transects increased from less than 0.1/100 m in 1976, to 4.0/100 m in 1981.

In the catch-and-release section, cutthroat catch rate increased from 0.55 per hour in 1977 to 1.52 per hour in 1981. Contribution of cutthroat to the catch increased from 22% in 1977, to 44% in 1981. Cutthroat counted in snorkel transects increased from 1.2/100 m in 1977, to 6.8/100 m in 1981.

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RECOMMENDATIONS

Continue catch-and-release regulations on the Lochsa River above Boulder Creek (river mile 123) as a means of increasing cutthroat trout populations and protecting wild juvenile steelhead stocks.

Stock all hatchery rainbow trout in the catch-and-keep sections below Boulder Creek. Plants should be spread throughout the lower river.

Encourage census and angler interview assistance from area conservation officers to increase data collected from the upper catch-and-release sections, and allow ongoing monitoring of the fishery and evaluation of the management procedures.

OBJECTIVES

To measure the angling pressure on and harvest of cutthroat trout, juvenile steelhead, and hatchery catchable rainbow trout in the Lochsa River.

To monitor cutthroat trout and juvenile steelhead distribution and abundance in the Lochsa River and selected tributaries.

To collect life history data on cutthroat trout and juvenile steelhead populations in the Lochsa River and selected tributaries.

To collect angler opinions on the acceptability of catch-and-release or other restrictive regulations for the Lochsa River.

To evaluate the effects of catch-and-release or other restrictive regulations on the cutthroat trout and juvenile steelhead populations of the Lochsa River.

TECHNIQUES USED

Creel Census

From 23 May through 10 September 1981, fisheries personnel conducted an intensive angler count and creel census on the Lochsa River and the lower 12.9 km (8 mi) of Crooked Fork Creek. Census sections and techniques used in 1981 were identical to those of previous years (1976-1980) (Fig. 1). Sections 4, 5, and 6 were regulated on a catch-and-release basis for trout in 1977-81, while all sections were catch-and-keep during 1976. Census sections for all years were:

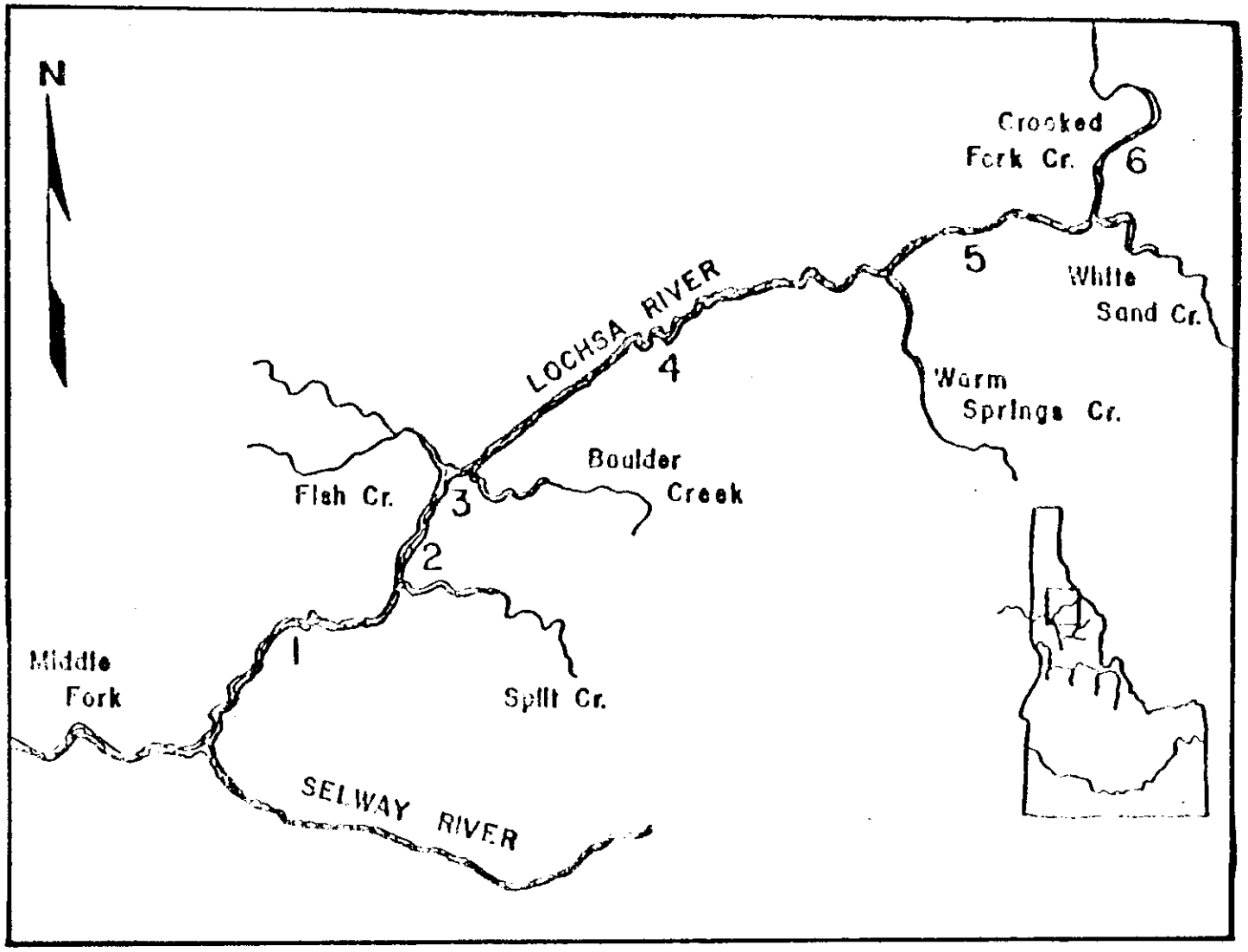

Figure 1. Stream sections used in conducting the creel census and angler interviews on the Lochsa River, 1976-1981.

Section 1 - Mouth of Lochsa (Lowell to Split Creek- 24 km (15 mi).

Section 2 - Split Creek to Fish Creek - 13.6 km (8.5 mi).

Section 3 - Fish Creek to Boulder Creek - 3.2 km (2.0 mi).

Section 4 - Boulder Creek to Warmspring Creek - 45.6 km (28.5 mi).

Section 5 - Warmspring Creek to mouth of Crooked Fork Creek - 20 km (12.5 mi).

Section 6 - Mouth of Crooked Fork Creek to Highway 12 Bridge - 12.8 km (8.0 mi).

To remove error due to seasonal and type-of-day variability, we divided the fishing season into 2-week intervals, and further subdivided these intervals into Saturdays, Sundays, holidays, and weekdays. We counted anglers four times a day on all holidays, 2 weekend days, and 2 randomly selected weekdays per 2-week interval. The average of the counts for each type of day was expanded to obtain an estimate of angling pressure for that type of day during the interval. These totals were added to calculate total pressure for the interval. Counts were conducted by driving along Highway 12, which parallels the entire length of the Lochsa and lower 12.9 km (8 mi) of Crooked Fork Creek. The estimate of angling pressure for a 2-week interval is the product of average angler count, times average daylight hours in that interval, times number of days of each class (weekend, holiday, weekday) in the interval.

We interviewed anglers to obtain information on hours fished, number of each species caught, angler residency, method of angling, and angler opinions. In addition to the angler interviews obtained on count days, we interviewed anglers on all other weekend days as time permitted. Estimates of harvest for an interval are the product of the estimated angling pressure, times the average catch per hour for each species as obtained from the angler interviews.

To obtain length frequencies, we measured all wild rainbow and cutthroat checked in anglers' creels. The majority of hatchery rainbow, Dolly Varden, and whitefish checked were also measured.

Angler Residency, Methods, and Opinions

In addition to the catch rate information obtained from interviews, angler residency and method of angling (bait, lures, flies) were noted. Anglers were also asked if they considered fishing on the Lochsa River good, fair, or poor; and if they were in favor of the catch-and-release regulation to restore cutthroat to the Lochsa River.

Releases of Hatchery Rainbow in Lochsa River

The stocking plan for the Lochsa River is for 10,000 catchable rainbow trout yearly. A total of 10,218 hatchery, catchable rainbow trout were released into the Lochsa River during 1981. As has been the case since 1977, all stocking was done in the catch-and-keep area below Boulder Creek. There were 778 more catchables released into the Lochsa in 1981 than 1980 (Table 1).

Snorkeling

A major indicator of the trend in abundance of cutthroat and juvenile steelhead populations in the Lochsa River will be the numbers of fish counted in the snorkel transects which have been established since 1973.

Project personnel snorkeled established transects in the Lochsa River on 28 July 1981. Transects were snorkeled by floating downstream close to the shoreline and counting out toward midstream. Two floats were made over the same area, and the larger fish count was used. Fish densities are expressed in numbers per 100 m of stream length. Juvenile steelhead were classified by length as Age II and older (130-195 mm), Age I (75-125 mm), and trout fry (75 mm or less).

FINDINGS

Angler Effort and Harvest

From 23 May to 10 September 1981, anglers fishing on the Lochsa River and lower 13 km (8 mi) of Crooked Fork Creek fished an estimated 7,711 hours. They caught an estimated 7,792 wild rainbow-steelhead (59.0%), 2,175 hatchery catchable rainbow (16.5%), 2,940 cutthroat (22.3%), 152 Dolly Varden (1.2%), and 143 whitefish (1.0%). These totals include fish kept by anglers, as well as fish released in both the catch-and-release and catch-and-keep sections of the Lochsa. Anglers fishing the Lochsa River and lower Crooked Fork caught fish at an overall rate of 1.71 per hour. Wild rainbow-steelhead were caught at a rate of 1.01 per hour, hatchery rainbow 0.28, cutthroat trout 0.38, Dolly Varden 0.02, and whitefish 0.02 fish per hour (Table 2).

During the previous four years (1977-1980) in which catch-and-release regulations have been in effect on the Lochsa, estimated angler effort varied from 7,247 to 9,793 hours, and averaged 8,862 hours. Estimated catch of wild rainbow-steelhead has varied from 3,595 to 11,893, and averaged 7,044 per year. Cutthroat catch has ranged from 751 to 2,951, and averaged 2,082. Hatchery rainbow catch has averaged 2,958, Dolly Varden 182, and whitefish 417 per year (Table 3).

Table 1. Releases of hatchery rainbow catchables in the Lochsa River between 1976 and 1981. All catchables prior to 1977 were planted above Boulder Creek. Releases after 1976 took place below Boulder Creek.

Year	Date of release	Number of fish	Fish per pound
1976	6/29	2,280	3.8
	6/30	2,280	3.8
	7/8	2,960	3.7
	7/20	2,560	3.2
	7/21	2,560	3.2
		12,640	
1977	5/24	1,595	2.9
	6/2	2,050	4.1
	6/14	3,440	4.3
	6/27	4,700	4.7
		11,785	
1978	7/12	3,120	3.9
	7/18	4,100	4.1
	7/25	2,590	3.7
		9,810	
1979	6/11	1,500	2.0
	6/20	1,750	3.5
	7/11	2,520	3.6
	7/19	2,210	3.4
	10/2	1,040[a]	5.2
		9,020	
1980	5/29	1,620	3.6
	6/3	2,040	3.4
	6/19	1,750	3.5
	6/25	2,380	3.4
	7/11	1,650	3.3
		9,440	
1981	5/21	2,700	3.0
	6/5	1,170	1.8
	6/25	1,520	3.8
	7/1	1,650	3.3
	7/16	3,178	3.7
		10,218	

[a]Planted after season closed.

Table 2. Comparison of total estimated angler effort and species caught by anglers in the Lochsa River and Crooked Fork (mouth to Highway 12 Bridge), 1976-1981.

Year	Hours Fished	Species Caught					Total
		WRB	HRB	CT	DV	WF	
1976	13,679	11,170	2,557	654	195	717	15,293
% of total		73.0	16.7	4.3	1.3	4.7	
Fish/hour		.816	.187	.048	.014	.052	1.12
1977	9,769	3,595	4,021	751	22	379	8,768
% of total		41.0	45.9	8.6	0.2	4.3	
Fish/hour		.368	.412	.077	.002	.039	.897
1978	8,641	5,391	2,919	2,890	165	211	11,576
% of total		46.6	25.2	25.0	1.4	1.8	
Fish/hour		.624	.338	.334	.019	.024	1.34
1979	7,247	7,296	2,105	1,736	332	234	11,703
% of total		62.2	18.2	14.8	2.8	2.0	
Fish/hour		1.01	.290	.239	.046	.032	1.61
1980	9,793	11,893	2,787	2,951	209	843	18,683
% of total		63.8	14.7	15.8	1.1	4.6	
Fish/hour		1.21	.285	.301	.021	.086	1.91
1981	7,711	7,792	2,175	2,940	152	143	13,202
% of total		59.0	16.5	22.3	1.2	1.0	
Fish/hour		1.01	.282	.381	.020	.019	1.71

Table 3. Comparison of estimated angler effort and species caught by anglers in upper (catch-and-release) and lower (catch-and-keep) sections of the Lochsa River and Crooked Fork (mouth to Highway 12 Bridge), 1977-1981.

	Hours Fished		SPECIES CAUGHT											
			WRB		HRB		CT		DV		WF		Total	
Year	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
1977	984	8,785	1,853	1,742[a]	0	4,021	541	210	0	22	28	351	2,422	6,346
% of Total			76.5	27.5	0.0	63.4	22.3	3.3	0.0	0.3	1.2	5.5	-	-
Fish/hour			1.88	.198	.000	.458	.550	.024	.000	.002	.028	.040	2.46	.722
1978	1,363	7,278	3,183	2,208	0	2,919	2,377	513	13	152	0	211	5,573	6,003
% of Total			57.1	42.8	0.0	43.5	42.7	7.9	0.2	2.3	0.0	3.5	-	-
Fish/hour			2.34	.394	.000	.401	1.75	.073	.010	.021	.000	.032	4.11	.922
1979	1,369	5,878	3,206	4,090	18	2,087	1,269	467	108	224	41	193	4,642	7,061
% of Total			69.1	58.0	0.4	29.6	27.3	6.6	2.3	3.2	0.9	2.7	-	-
Fish/hour			2.34	.700	.013	.360	.930	.079	.079	.038	.030	.033	3.40	1.20
1980	2,491	7,302	4,181	7,712	52	2,735	2,065	886	121	88	253	590	6,672	12,011
% of Total			62.7	64.2	0.7	22.8	21.0	7.4	1.8	0.7	3.8	4.9	-	-
Fish/hour			1.68	1.06	.021	.374	.829	.121	.049	.012	.102	.076	2.68	1.64
1981	1,727	5,984	3,329	4,463	0	2,175	2,623	317	37	115	41	102	6,030	7,172
% of Total			55.2	62.2	0.0	30.3	43.5	4.4	0.6	1.6	0.7	1.5	-	-
Fish/hour			1.93	.746	.000	.363	1.52	.053	.021	.019	.024	.017	3.49	1.20

[a]Estimates, catch rates and percentages are based on total fish caught by section.

In 1976, prior to introduction of the catch-and-release regulation above Boulder Creek, anglers fished an estimated 13,679 hours in the Lochsa River and Crooked Fork to catch 11,170 wild rainbow-steelhead (73.0%), 2,557 hatchery rainbow trout (16.7%), 654 cutthroat trout (4.3%), 195 Dolly Varden (1.3%), and 717 whitefish (4.7%) (Table 2).

Lower Sections (Catch-and-Keep)

Estimated angler effort decreased by 18.0% in the Lochsa below Boulder Creek from 1980 to 1981. The 1981 effort was the second lowest estimated in this section since 1977, and was 18.2% below the previous four-year average effort of 7,311 hours.

The decreased effort combined with decreased catch rates for every species except Dolly Varden resulted in a 9.6% decline in total estimated catch. Comparing 1981 with 1980 estimates shows a 42.2% decrease in wild rainbow-steelhead catch, a 20.5% decrease in hatchery rainbow catch, a 64.3% decrease in cutthroat catch, and an 82.8% decrease in whitefish catch. Extremely hot weather resulting in maximum water temperatures in excess of 24 degrees C (76 degrees F) was probably the major cause of decreased catch rates in the Lochsa below Boulder Creek (Table 3).

Estimated cutthroat harvest below Boulder Creek during 1981 was only 317 fish, which is our lowest estimate since 1977, and is 39% below the previous four-year average of 519 (Table 3). The most dramatic decrease occurred in Section 2 (Split Creek to Boulder Creek), where an estimated 640 cutthroat were harvested in 1980 compared to only 78 in 1981 (Table 4). Approximately 13% of the cutthroat caught by anglers in the catch-and-keep sections during 1981 were released (Appendix Tables A, B, and C).

Estimated catch of wild rainbow-steelhead below Boulder Creek declined from 7,712 in 1980 to 4,463 in 1981 (42% decrease). The 1981 catch, however, was still greater than the previous four-year average of 3,938. The largest decrease in wild rainbow-steelhead catch occurred in sections 1 and 2 from the mouth of the Lochsa to Fish Creek, where water temperatures were highest (24 degrees C during much of August). Approximately 58% of the wild rainbow-steelhead caught by anglers in the catch-and-keep sections during 1981 were released.

Hatchery rainbow catch decreased 20% in 1981 despite an increase in numbers stocked from 9,440 in 1980 to 10,218 in 1981 (Table 1). Again, the major decrease occurred in Section 2, where an estimated 1,016 catchables were harvested in 1980 compared to only 242 in 1981 (Table 4). An estimated 21% of the 10,218 hatchery rainbow stocked in the Lochsa during 1980 were harvested. This represents the lowest return to the creel since 1976 (Table 5).

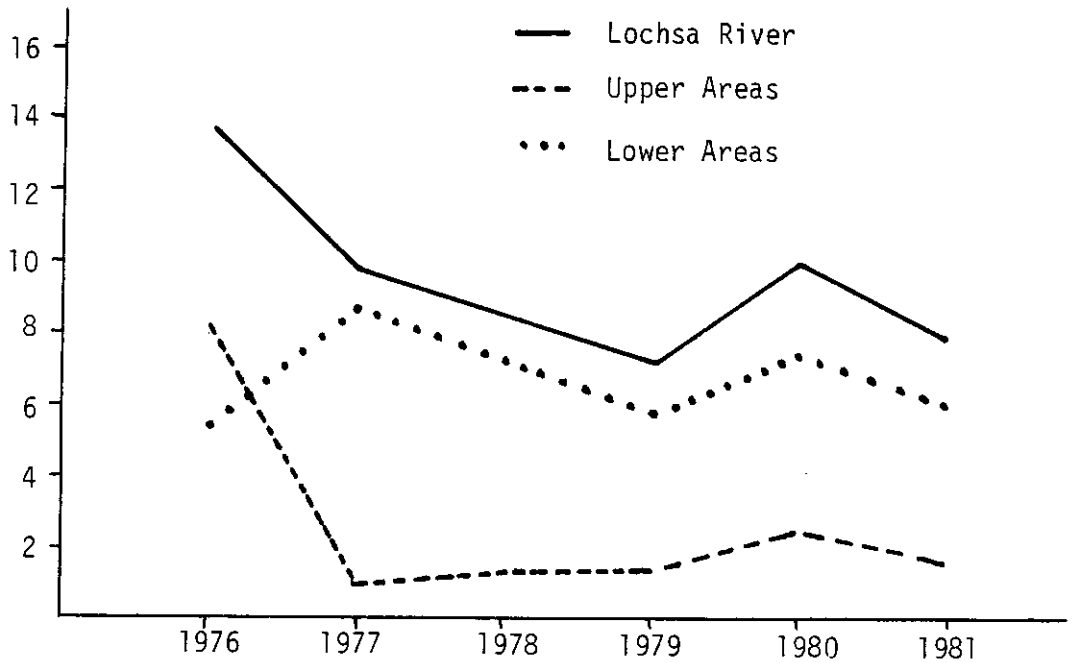

Figure 2. The estimated fishing effort (hours x 1,000) on the Lochsa River above and below Boulder Creek, 1976-1981.

Table 4. Comparison of total estimated angler effort and fish caught by stream section in the Lochsa River and Crooked Fork (mouth to Highway 12 Bridge), 1976-1981.

Stream Section	Year	Estimated hours fished	Species Caught					
			WRB	HRB	CT	DV	WF	Total
1	1976	2,779	657	382	117	12	174	1,342
	1977	4,447	492	1,712	136	17	51	2,408
	1978	4,016	1,455	1,050	306	92	63	2,966
	1979	3,727	2,407	1,438	346	104	136	4,431
	1980	3,997	3,022	714	193	48	79	4,056
	1981	2,828	1,678	603	192	60	54	2,587
2	1976	1,987	1,420	108	54	36	322	1,940
	1977	2,200	856	457	52	5	266	1,636
	1978	2,043	1,006	707	134	23	171	2,041
	1979	1,256	1,091	120	77	37	53	1,378
	1980	2,113	3,380	1,016	640	32	511	5,579
	1981	1,543	1,601	242	78	55	30	2,006
3	1976	841	649	265	34	53	0	1,001
	1977	2,138	394	1,852	22	0	34	2,302
	1978	1,219	410	1,162	92	37	0	1,701
	1979	895	592	551	44	83	4	1,274
	1980	1,192	1,310	953	53	8	0	2,324
	1981	1,613	1,184	1,330	47	0	18	2,579
4	1976	5,228	4,839	1,072	303	46	168	6,428
	1977	552	1,261	0	425	0	28	1,714
	1978	948	1,830	0	1,168	13	0	3,011
	1979	951	2,221	18	781	10	41	3,071
	1980	1,780	3,302	52	1,407	3	75	4,839
	1981	1,074	1,428	0	1,786	28	22	3,264
5	1976	1,690	2,635	292	110	13	53	3,103
	1977	350	548	0	94	0	0	642
	1978	225	748	0	413	0	0	1,161
	1979	282	828	0	434	98	0	1,360
	1980	368	306	0	637	14	137	1,094
	1981	446	550	0	609	9	19	1,187
6	1976	1,154	970	438	36	35	0	1,479
	1977	82	44	0	22	0	0	66
	1978	190	622	0	806	0	0	1,428
	1979	136	157	0	54	0	0	211
	1980	343	573	0	21	104	41	739
	1981	207	1,351	0	228	0	0	1,579

Table 4 (Continued).

Stream section	Year	Estimated hours fished	Species caught					
			WRB	HRB	CT	DV	WF	Total
Total	1976	13,679	11,170	2,557	654	195	717	15,293
	1977	9,769	3,595	4,021	751	22	379	8,768
	1978	8,641	5,391	2,919	2,890	165	211	11,576
	1979	7,247	7,296	2,127	1,736	332	234	11,725
	1980	9,793	11,893	2,735	2,951	209	843	18,631
	1981	7,711	7,792	2,175	2,940	152	143	13,202

Table 5. Percent of hatchery catchable rainbow harvested from the Lochsa River, 1976 through 1981.

Year	Number of fish released	Number of fish harvested	Percent harvested
1976[a]	12,640	2,557	20.2
1977	11,785	4,021	34.1
1978	9,810	2,919	29.8
1979	7,980	2,127	26.6
1980	9,440	2,735	29.0
1981	10,218	2,175	21.3

[a]All planting of hatchery catchables occurred above Boulder Creek in 1976. stocking in subsequent years occurred only below Boulder Creek.

Upper Sections (Catch-and-Release)

Estimated angler effort decreased by 31% in the catch-and-release area above Boulder Creek from 1980 to 1981. Despite the decrease, 1981 effort of 1,727 hours was still greater than the four-year average of 1,552 hours since the catch-and-release regulation was initiated (Table 3).

Numbers of cutthroat caught and released above Boulder Creek increased from 2,065 in 1980 to 2,623 in 1981. The 1981 cutthroat catch is the highest recorded since the catch-and-release regulation was initiated and is 68% greater than the previous four-year average.

Although the catch rate was higher (1.93 fish per hour compared to 1.68), the decreased effort resulted in a decline in estimated catch of wild rainbow-steelhead from 4,181 in 1980 to 3,329 in 1981. Nevertheless, the 1981 catch was still greater than the previous four-year average of 3,106.

Species Composition

Cutthroat trout comprised 43% of the fish caught-and-released above Boulder Creek in 1981. This represents the highest proportion of cutthroat in the catch since special regulations were initiated in 1977 (Table 3). The most significant increase occurred in Section 4 (Boulder Creek to Warmspring Creek), where 55% of the fish caught in 1981 were cutthroat, compared to 29% in 1980, and 24% in 1979 (Appendix Table G). Conversely, only 4% of the fish caught below Boulder Creek in 1981 were cutthroat. This is the smallest contribution of cutthroat since 1977 when they made up 3% of the catch. Below Boulder Creek, cutthroat contributed an average of 7% of the catch from 1977-1980.

With the increase in percentage of cutthroat in the catch above Boulder Creek, the contribution of wild rainbow-steelhead decreased from 63% in 1980 to 55% in 1981. Below Boulder Creek, wild rainbow-steelhead comprised 62% of the catch in 1981, compared to 64% in 1980. The average contribution of wild rainbow-steelhead from 1977-1980 had been 64% above Boulder Creek, and 50% below Boulder Creek (Fig. 3).

Hatchery rainbow contributed 30% of the catch below Boulder Creek in 1981. The percentage of hatchery fish in the catch has decreased from 63 in 1977 to a low of 23 in 1980, with an average of 37.

Dolly Varden and whitefish comprised 3% of the total catch below Boulder Creek, and only 1% above Boulder Creek in 1981. These figures are both below the previous four-year average contributions of 6% and 3%, respectively.

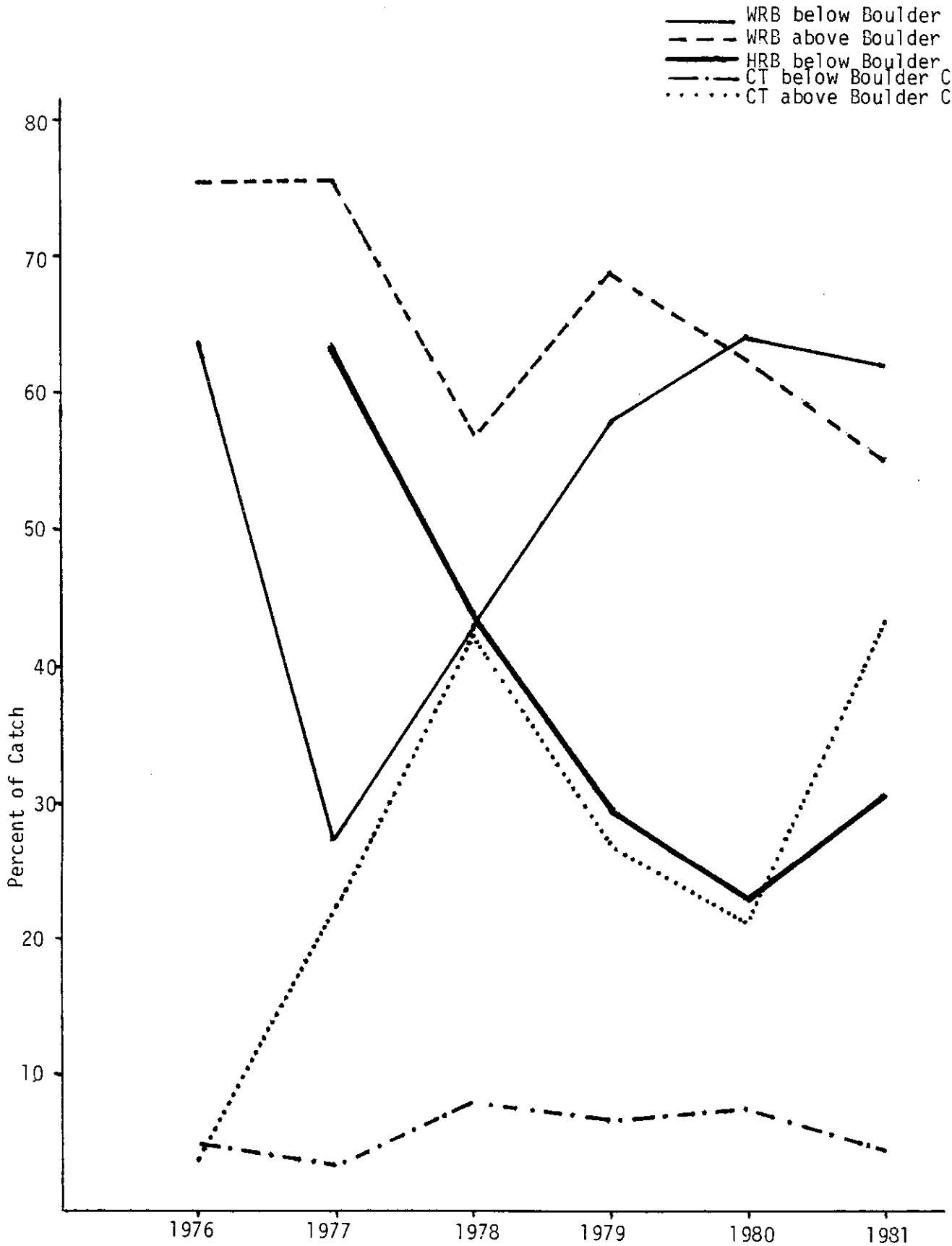

Figure 3. Comparison of species composition from angers' catch on the Lochsa River above and below Boulder Creek, 1976-1981.

Catch Rates

The overall catch rate for cutthroat trout on the Lochsa River increased again in 1981 to a level eight times greater than in 1976 (Table 6). Above Boulder Creek, anglers caught-and-released an average of 1.52 cutthroat per hour in 1981, compared to 0.83 in 1980. Below Boulder Creek, cutthroat catch rate declined to the lowest level since 1977.

Catch rates for wild rainbow-steelhead decreased below Boulder Creek and increased above Boulder Creek in 1981. The 0.75 fish per hour catch rate below Boulder Creek was considerably lower than the 1.1 per hour rate experienced in 1980, but was still the second highest since 1977. Above Boulder Creek, the 1981 catch rate of 1.93 wild rainbow-steelhead per hour was higher than the 1.68 rate of 1980, but lower than 1978 and 1979 rates of 2.34 fish per hour (Table 6).

Hatchery rainbow have been caught at a relatively constant rate of 0.36 fish per hour below Boulder Creek each year since 1979. Angler success on hatchery rainbow peaked at 0.44 fish per hour in mid-July (Table 6).

The overall catch rate on the Lochsa for all species combined was 1.71 fish per hour in 1981. This is the second highest since 1976, exceeded only by the 1.91 fish per hour rate of 1980 (Table 6).

Length Frequencies

Cutthroat measured by Department personnel in the catch-and-release area above Boulder Creek during 1981 ranged from 195 mm (7.7 in) to 400 mm (15.7 in) and averaged 295 mm (11.6 in). Cutthroat measured from angler creels in the catch-and-keep area below Boulder Creek during 1981 ranged from 220 mm (8.7 in) to 400 mm (15.7 in), and averaged 306 mm (12.1 in). Comparatively, in 1980 cutthroat measured above Boulder Creek averaged 277 mm (10.9 in), while those measured below averaged 262 mm (10.3 in). In previous years, cutthroat measured below Boulder Creek averaged 288 mm (11.3 in) in 1979, 276 mm (10.9 in) in 1978, 266 mm (10.5 in) in 1977, and 254 mm (10.0 in) in 1976 (Fig. 4). Percentages of cutthroat over 254 mm (10 in) were 76% in 1981, 66% in 1980, 81% in 1979, 65% in 1978, 42% in 1977, and 38% in 1976 (Fig. 4).

The 168 wild rainbow-steelhead measured from anglers' creels on the Lochsa during 1981 averaged 198 mm (7.8 in) in total length. Comparatively, average total lengths for wild rainbow-steelhead were 189 mm (7.4 in) in 1980, 199 mm (7.8 in) in 1979, 204 mm (8.0 in) in 1978, 196 mm (7.7 in) in 1977, and 198 mm (7.8 in) in 1976.

Table 6. Comparison of catch rates by anglers on the Lochsa River and lower eight miles of Crooked Fork Creek by 2-week intervals, 1976 through 1981. Catch rates include fish released after 1976.

Interval	Year	Catch per hour by species					Total
		WRB	HRB	CT	DV	WF	
I	1976	0.15	0.05	0.04	0.04	0.12	0.41
	1977	0.16	0.40	0.01	0.01	0.01	0.60
	1978	0.18	0.16	0.18	0.09	0.04	0.65
	1979	0.19	0.02	0.20	0.08	0.10	0.59
	1980	0.15	0.03	0.09	0.06	0.04	0.38
	1981	0.44	0.13	0.10	0.10	0.00	0.78
II	1976	0.27	0.06	0.00	0.08	0.23	0.68
	1977	0.13	0.43	0.06	0.00	0.32	0.95
	1978	0.18	0.00	0.16	0.01	0.07	0.42
	1979	0.23	0.40	0.28	0.34	0.08	1.33
	1980	0.29	0.05	0.03	0.06	0.04	0.46
	1981	0.21	0.37	0.18	0.11	0.03	0.91
III	1976	0.23	0.04	0.01	0.02	0.13	0.43
	1977	0.29	0.35	0.05	0.01	0.01	0.67
	1978	0.52	0.00	0.15	0.02	0.02	0.72
	1979	0.51	0.29	0.08	0.04	0.06	0.93
	1980	1.06	0.17	0.17	0.01	0.00	1.41
	1981	0.37	0.24	0.61	0.04	0.01	1.26
IV	1976	0.68	0.24	0.08	0.02	0.08	1.11
	1977	0.27	0.55	0.15	0.00	0.00	0.97
	1978	0.41	0.02	0.80	0.04	0.10	1.38
	1979	0.88	0.36	0.17	0.01	0.01	1.33
	1980	1.31	0.48	0.24	0.00	0.07	2.10
	1981	1.45	0.29	0.43	0.00	0.05	2.23
V	1976	1.18	0.18	0.06	0.02	0.02	1.47
	1977	0.15	0.29	0.04	0.00	0.01	0.49
	1978	0.67	0.30	0.36	0.01	0.00	1.35
	1979	1.24	0.32	0.16	0.00	0.03	1.75
	1980	2.44	0.14	0.37	0.01	0.02	2.98
	1981	0.78	0.44	0.43	0.01	0.00	1.68
VI	1976	0.98	0.22	0.05	0.01	0.02	1.27
	1977	0.69	0.48	0.13	0.00	0.02	1.32
	1978	0.69	0.56	0.14	0.00	0.01	1.40
	1979	1.75	0.48	0.51	0.00	0.01	2.80
	1980	1.39	0.17	0.30	0.00	0.03	1.89
	1981	1.38	0.40	0.30	0.01	0.00	2.09

Table 6. (Cont.)

Interval	Year	Catch per hour by species					Total
		WRB	HRB	CT	DV	WF	
VII	1976	1.02	0.30	0.05	0.03	0.00	1.41
	1977	0.80	0.44	0.17	0.02	0.03	1.46
	1978	1.01	0.33	0.40	0.01	0.02	1.79
	1979	1.34	0.29	0.12	0.00	0.00	1.74
	1980	1.23	0.67	0.60	0.07	0.31	2.88
	1981	1.18	0.19	0.35	0.00	0.03	1.75
VIII	1976	1.02	0.26	0.07	0.01	0.08	1.43
	1977	1.05	0.56	0.22	0.00	0.04	1.87
	1978	0.98	0.58	0.32	0.01	0.02	1.90
	1979	1.00	0.19	0.25	0.04	0.03	1.51
	1980	0.47	0.01	0.21	0.01	0.06	0.76
	1981	1.11	0.06	0.41	0.01	0.04	1.62
IX	1979	2.30	0.00	1.60	0.04	0.14	4.02
	1980	1.79	0.00	0.48	0.00	0.00	2.27
Totals	1976	0.82	0.19	0.05	0.01	0.05	1.12
	1977	0.37	0.41	0.08	0.00	0.04	0.90
	1978	0.62	0.34	0.34	0.02	0.03	1.34
	1979	1.01	0.28	0.24	0.05	0.03	1.61
	1980	1.21	0.29	0.30	0.02	0.09	1.91
	1981	1.01	0.28	0.38	0.02	0.02	1.71

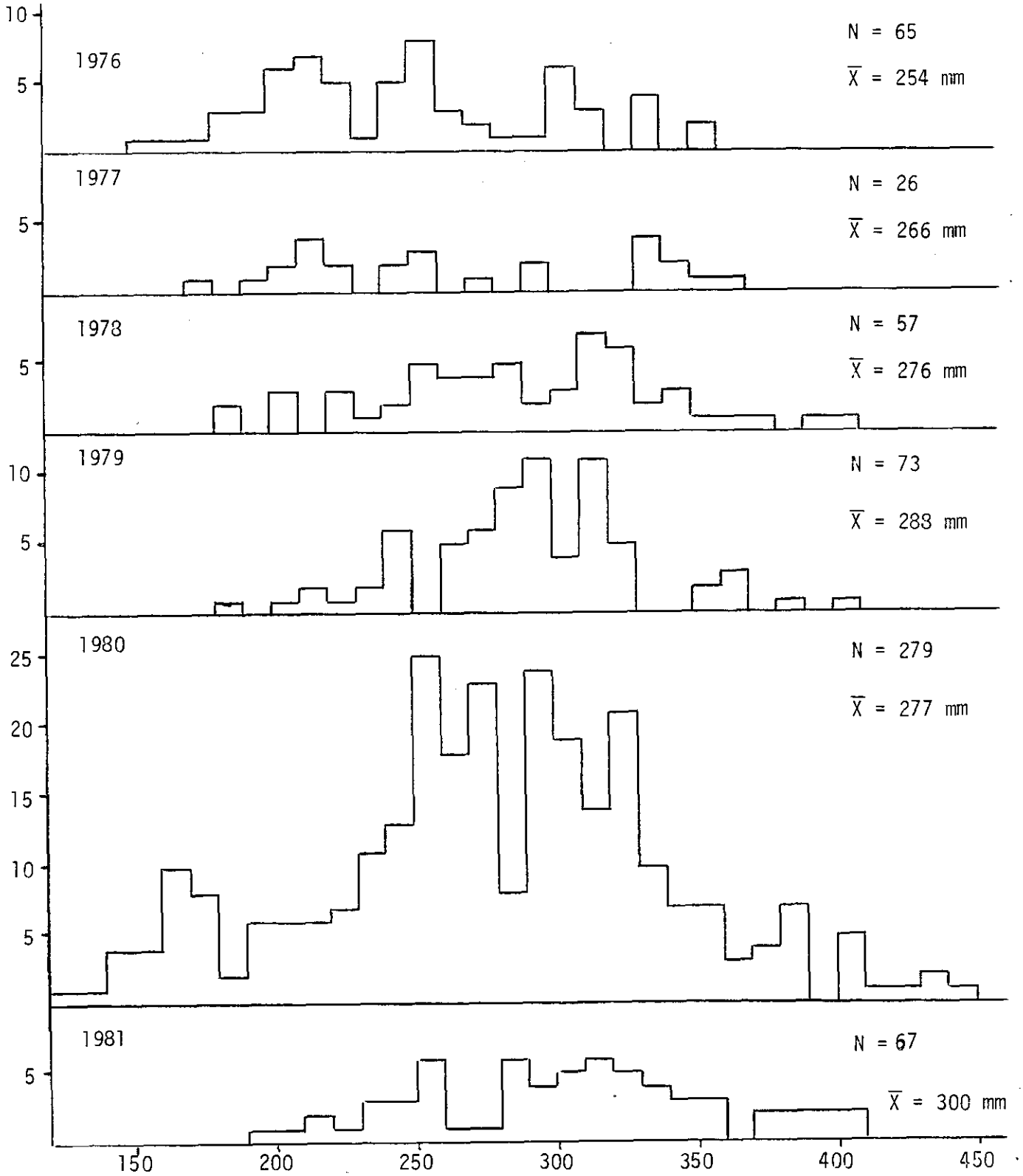

Figure 4. Length frequencies of cutthroat trout measured from the Lochsa River, 1976-1981.

Angler Residency

We interviewed a total of 679 anglers (205 above Boulder Creek) on the Lochsa River during 1981. Of these, 76% were Idaho residents. Comparatively, 77% were residents in 1980, 78% in 1979, 72% in 1978, 77% in 1977, and 78% in 1976 (Fig. 5). Above Boulder Creek, 33% of anglers interviewed during 1981 were nonresidents. Below Boulder Creek, 21% of those interviewed were nonresidents.

Angler Methods and Opinions

The most significant change in angler methods occurring on the Lochsa was the increase in use of bait below Boulder Creek, from 37% in 1980 to 51% in 1981. Illegal use of bait in the catch-and-release area declined to more normal levels in 1981 (4%), after a surprising jump to 14% in 1980 (Table 7).

The results of tabulation of angler responses on whether fishing in the Lochsa is "good," "fair," or "poor" are difficult to interpret. Even though catch rates indicate that angler success has improved significantly, 48% of the anglers interviewed below Boulder Creek in 1981 rated fishing as "poor." Only 18% rated fishing "good." Above Boulder Creek, 57% rated fishing "good," while only 15% rated it "poor." Before the catch-and-release regulation was initiated (1976), 23% of the anglers interviewed rated fishing "good," and 36% "poor" (Table 7).

Anglers fishing the Lochsa above Boulder Creek continue to support the catch-and-release regulation, with 89% in favor. Below Boulder Creek, support for the regulation has ranged between 50 and 60 percent (Table 7).

Snorkeling

Numbers of cutthroat counted in snorkel transects in the Lochsa above Boulder Creek decreased in 1981 compared to 1980, but remained seven-fold greater than in 1977. Cutthroat counted in transects below Boulder Creek increased in 1981 to levels four-fold greater than in 1976 (Table 8).

Increased numbers of juvenile steelhead throughout the Lochsa were the result of fry released in upper tributaries and increased wild adult escapement during 1978 and 1979.

The tremendous increase in numbers of juvenile chinook was probably due to a release of 480,000 chinook fry in the upper drainage during early July.

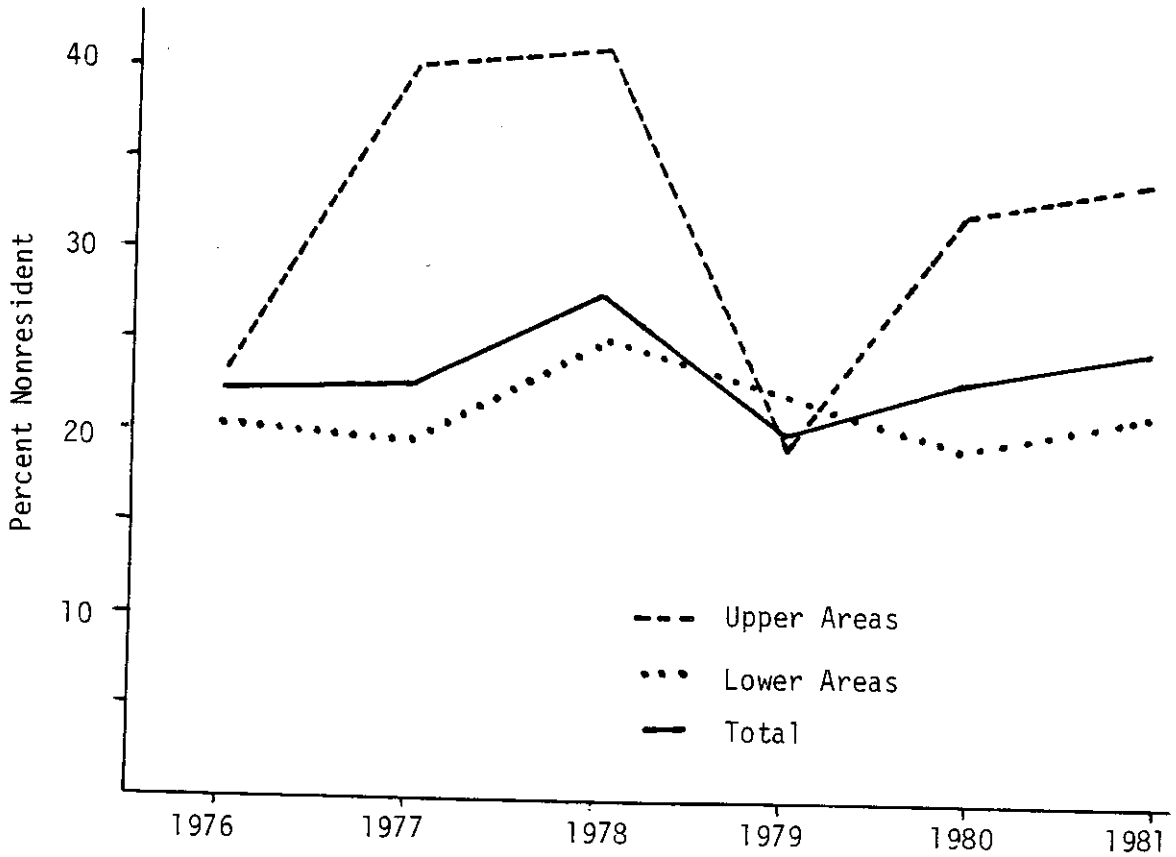

Figure 5. Percentage of nonresident fishermen interviewed on the Lochsa River above and below Boulder Creek, 1976-1981.

Table 7. Angling methods and angler opinion information collected on the Lochsa River, 1976 through 1981.

			Below Boulder Creek					Above Boulder Creek				
		1976	1977	1978	1979	1980	1981	1977	1978	1979	1980	1981
Method:	Bait	46.0%	61.2%	49.5%	39.3%	36.6%	50.7%	6.7%[a]	3.3%[a]	5.0%[a]	14.4%[a]	4.5%[a]
	Lure	27.4%	22.3%	32.2%	33.4%	33.2%	27.8%	0.0%	16.7%	23.1%	21.6%	22.6%
	Flies	29.3%	16.5%	18.3%	27.3%	30.2%	21.5%	93.3%	80.0%	71.9%	64.0%	72.9%
Rate fishing:	Good	23.4%	15.5%	12.3%	15.3%	21.2%	18.2%	60.0%	24.1%	44.2%	25.5%	57.0%
	Fair	40.8%	48.5%	24.6%	41.1%	31.7%	33.6%	40.0%	39.7%	36.3%	47.3%	28.2%
	Poor	35.8%	36.0%	63.1%	43.6%	47.1%	48.2%	0.0%	34.2%	19.5%	27.2%	14.8%
Restrictive regulations to restore cutthroat:	Yes	53.3%	32.4%	52.6%	52.4%	61.0%	56.1%	87.6%	86.7%	86.1%	92.5%	89.0%
	No	26.4%	39.2%	31.9%	30.2%	29.6%	29.0%	0.0%	6.7%	8.2%	6.5%	5.2%
	No opinion	20.3%	28.4%	15.5%	17.4%	9.4%	14.9%	13.3%	6.6%	5.7%	1.0%	5.8%

[a]Illegal

Table 8. Densities of salmonids (fish/100 m) in snorkel sections in the Lochsa River, 1975-1981 (Graham 1977 and Mabbott 1978, 1979).

Stream section	Year	Rainbow	Juvenile steelhead II & older	Juvenile steelhead I	Trout fry	Juvenile chinook	Cutthroat
Mouth of Lochsa to Fish Creek	1975	0.37	0.96	0.00	0.74	0.12	0.00
	1976	0.04	0.29	0.00	0.02	0.33	0.16
	1977	4.23	0.38	0.15	0.00	0.64	0.08
	1978	2.56	0.51	0.11	0.29	1.53	0.11
	1979	4.38	0.38	0.38	0.00	0.13	0.13
	1980	0.66	1.00	0.66	0.00	0.00	0.33
	1981	11.00	4.50	1.00	0.00	4.50	0.50
Fish Creek to Lake Creek	1975	2.50	9.73	2.92	7.32	0.99	0.00
	1976	2.70	5.45	0.11	3.25	2.69	0.07
	1977	7.60	2.90	0.70	0.35	0.70	0.08
	1978	4.46	5.12	2.12	12.58	6.58	1.17
	1979	1.75	2.27	1.86	7.64	1.55	0.41
	1980	11.00	2.00	0.33	0.00	0.00	5.00
	1981	10.25	3.50	1.50	1.75	21.75	3.75
Lake Creek to Crooked Fork Creek	1975	1.14	2.54	2.22	0.16	1.78	0.00
	1976	3.72	3.92	0.23	0.00	3.55	0.00
	1977	0.00	4.28	2.14	2.14	2.80	1.15
	1978	0.00	5.84	2.37	3.47	35.38	2.20
	1979	0.68	4.05	2.70	1.69	0.68	3.04
	1980	0.00	5.33	2.66	0.00	0.00	8.00
	1981	0.00	6.67	4.33	1.67	10.00	6.67
Overall	1975	1.34	4.41	1.71	2.74	0.96	0.00
	1976	2.15	3.21	0.11	1.09	2.16	0.08
	1977	2.60	2.00	0.60	0.38	0.89	0.19
	1978	2.89	3.02	1.20	5.33	8.49	0.82
	1979	2.61	1.80	1.40	3.82	0.87	0.68
	1980	4.67	2.27	0.93	0.00	0.00	3.73
	1981	7.00	4.77	2.33	1.33	14.00	4.00

DISCUSSION

The cutthroat population in the Lochsa River has responded very well to protection afforded by catch-and-release regulations which have been in effect in the main river above Boulder Creek since 1977. Overall, cutthroat catch rates on the Lochsa have improved from 0.05 fish per hour in 1976, to 0.38 per hour in 1981. Considering the catch-and-release section only, catch rate for cutthroat has improved from 0.55 per hour in 1977 to 1.52 per hour in 1981. Comparatively, cutthroat catch rates on Kelly Creek increased from 0.21 per hour in 1969 (Ball, 1971) to 3.6 per hour in 1974 (Johnson and Bjornn, 1975). Bjornn and Thurow (1974) noted an increase in catch rate from 0.82 per hour in 1968 to 4.85 per hour in 1973 on the St. Joe River from Gold Creek to Spruce Tree Campground. Because of easy access from Highway 12 and resultant higher angling pressure, the cutthroat trout population of the Lochsa River was considerably more depressed than those of Kelly Creek on the St. Joe River before restrictive regulations were implemented. Taking these factors into consideration, the Lochsa has recovered significantly.

Mean total length of cutthroat measured from the Lochsa River has increased from 254 mm (10 in) in 1976 to 300 mm (11.8 in) in 1981. Johnson and Bjornn (1978) state that the mean total length of cutthroat in Kelly Creek increased from 220 mm (8.7 in) in 1970 to 265 mm (10.4 in) in 1973. The percentage of cutthroat over 250 mm in the Lochsa catch was 76.2 in 1981. Johnson and Bjornn (1978) report that 91.3% and 35.6% of the cutthroat sampled from Kelly Creek and the St. Joe River, respectively, in 1975 were over 250 mm.

Cutthroat counted in snorkel transects in the Lochsa River increased seven-fold in the catch-and-release area, and four-fold in the catch-and-keep area from 1977 to 1981. Johnson and Bjornn (1978) noted a four-fold increase in cutthroat numbers in Kelly Creek transects from 1970-1974, and a six-fold increase in St. Joe River cutthroat from 1969-1974.

The decline in angler effort in both sections of the Lochsa during 1981 (18% decline in catch-and-keep section, and 30% in catch-and-release section) is difficult to explain. Extremely hot weather and frequent thunderstorms during the month of August could have depressed angler effort somewhat. Continued high prices for gasoline could still be discouraging some people from travelling to the Lochsa area.

Anglers' support for the catch-and-release regulation on the Lochsa River has remained high throughout the course of the study, ranging from 86 to 92 percent in favor among anglers interviewed above Boulder Creek. Johnson and Bjornn (1978) found that 93% of the anglers fishing Kelly Creek and 97% of anglers fishing the St. Joe River were in favor of the special regulations on those streams.

In addition to enabling the cutthroat population to rebuild, the catch-and-release regulation on the Lochsa has also afforded protection for wild juvenile steelhead. Previous to initiation of the catch-and-release regulation, an estimated 30-35 thousand wild juvenile steelhead were harvested annually during the late 1960's, and early 1970's from the Lochsa River above Boulder Creek (Keating 1968). Since catch-and-release was established in 1977, the peak estimated harvest has been 12,000, which results in a saving of 20,000 smolt-size wild steelhead.

In order to allow the cutthroat trout population to expand to its full potential and to afford further protection for the depressed stocks of wild steelhead in the Lochsa River, the catch-and-release regulation should remain in effect for several more years. Response of the cutthroat population should be monitored by snorkeling established transects and by test fishing by Department personnel.

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APPENDIX

Table A. Estimated hours fished and harvest by anglers on the Lochsa River (Section 1 - Mouth to Split Creek) by 2-week intervals, 23 May-10 September 1981.

Interval starting date	Estimated hours fished	Species Caught					
		WRB	HRB	CT	DV	WF	Total
23 May	210	14 (14)	40	22	14	0	90 (14)
6 June	80	7 (3)	0	20 (3)	3 (7)	3 (3)	33 (16)
20 June	333	28 (19)	28	19	28	0 (9)	103 (28)
4 July	461	184 (169)	61	31	0	0 (31)	276 (200)
18 July	543	132 (85)	109	0 (24)	0	0	241 (109)
1 August	676	251 (598)	314	63	0	0	628 (598)
15 August	126	38 (136)	21	10	0	0	69 (136)
29 August	399	0	30	0	8	0 (8)	38 (8)
Totals	2,828	654 (1,024)	603	165 (27)	53 (7)	3 (51)	1,478 (1,109)
Percent of total		64.9	23.3	7.4	2.3	2.1	
Fish/hour		.59	.21	.07	.02	.02	.91

Table B. Estimated hours fished and harvest by anglers on the Lochsa River (Section 2 - Split Creek to Fish Creek) by 2-week intervals, 23 May - 10 September 1981.

Interval starting date	Estimated hours fished	Species caught					
		WRB	HRB	CT	DV	WF	Total
23 May	212	76 (33)	0	11	43	0	130 (33)
6 June	40	6	0	12	12	0	30
20 June	72	0 (5)	27	0	0	0	27 (5)
4 July	208	233 (133)	83	17	0	0 (17)	333 (150)
18 July	245	132 (241)	47	0	0	0	179 (241)
1 August	333	167 (167)	69	14	0	0	250 (167)
15 August	147	51 (82)	16	0 (2)	0	0 (2)	67 (86)
29 August	286	143 (132)	0	11 (11)	0	11	165 (143)
Totals	1,543	808 (793)	242	65 (13)	55	11 (19)	1,181 (825)
Percent of total		79.8	12.1	3.9	2.7	1.5	
Fish/hour		1.04	.16	.05	.04	.02	1.30

Table C. Estimated hours fished and harvest by anglers on the Lochsa River (Section 3 - Fish Creek to Boulder Creek) by 2-week intervals, 23 May-10 September 1981.

Interval starting date	Estimated hours fished	Species caught					
		WRB	HRD	CT	DV	WF	Total
23 May	75	83	33	0	0	0	116
6 June	72	24	72	0	0	0	96
20 June	140	134 (73)	122	0	0	0	256 (73)
4 July	153	60 (51)	144	26	0	0	230 (51)
18 July	367	52 (52)	525	0	0	0	577 (52)
1 August	421	63 (295)	295	21	0	0	379 (295)
15 August	238	0 (190)	95	0	0	0	95 (190)
29 August	147	0 (107)	44	0	0	0 (18)	44 (125)
Totals	1,613	416 (768)	1,330	47	0	0 (18)	1,793 (786)
Percent of total		45.9	51.6	1.8	0.0	0.7	
Fish/hour		.73	.82	.03	.00	.01	1.60

Table D. Estimated hours fished and fish caught and released on the Lochsa River (Section 4 - Boulder Creek to Warmsprings Creek) by 2-week intervals, 23 May-10 September 1981.

Interval starting date	Estimated hours fished	Species caught and released					
		WRB	HRB	CT	DV	WF	Total
23 May	37	24	0	24	0	0	48
6 June	No anglers counted or interviewed						
20 June	116	0	0	310	0	0	310
4 July	59	261	0	143	3	3	410
18 July	153	236	0	301	10	0	547
1 August	179	498	0	365	15	0	878
15 August	161	206	0	167	0	0	373
29 August	369	203	0	476	0	19	698
Totals	1,074	1,428	0	1,786	28	22	3,264
Percent of total		43.8	0.0	54.7	0.9	0.6	
Fish/hour		1.33	.00	1.66	.03	.02	3.04

Table E. Estimated hours fished and fish caught and released on the Lochsa River (Section 5 - Warmsprings Creek to Crooked Fork Creek) by 2-week intervals, 23 May-10 September 1981.

Interval starting date	Estimated hours fished	Species caught and released					
		WRB	HRB	CT	DV	WF	Total
23 May	16	0	0	0	0	0	0
6 June	No anglers counted or interviewed						
20 June	68	0	0	90	0	0	90
4 July	20	40	0	20	0	0	60
18 July	230	276	0	340	7	0	623
1 August	40	93	0	38	0	0	131
15 August	35	131	0	72	2	19	224
29 August	37	10	0	49	0	0	59
Totals	446	550	0	609	9	19	1,187
Percent of Total		46.3	0.0	51.3	0.7	1.7	
Fish/hour		1.23	.00	1.37	.02	.04	2.66

Table F. Estimated hours fished and fish caught and released on the Crooked Fork Creek (Section 6 - mouth to Highway 12 Bridge) by 2-week intervals, 23 May-10 September 1981.

Interval starting date	Estimated hours fished	Species caught and released					
		WRB	HRB	CT	DV	WF	Total
23 May	No anglers counted or interviewed						
6 June	No anglers counted or interviewed						
20 June	20	20	0	40	0	0	60
4 July	75	281	0	188	0	0	469
18 July	No anglers counted or interviewed						
1 August	25	180	0	0	0	0	180
15 August	No anglers counted or interviewed						
29 August	87	870	0	0	0	0	870
Totals	207	1,351	0	228	0	0	1,579
Percent of total		85.6	0.0	14.4	0.0	0.0	
Fish/hour		6.53	.00	1.10	.00	.00	7.63

Table G. Comparison of percent composition of catch by stream section in the Lochsa River, 1976 through 1981.

Stream Section	Year	Percent of catch by species				
		WRB	HRB	CT	DV	WF
1	1976[a]	49.0	28.5	8.7	0.9	12.9
	1977[b]	20.4	71.1	5.7	0.7	2.1
	1978	49.1	35.4	10.3	3.1	2.1
	1979	54.3	32.4	7.8	2.3	3.1
	1980	74.5	17.6	4.8	1.2	1.9
	1981	64.9	23.3	7.4	2.3	2.1
2	1976	73.2	5.6	2.8	1.9	16.5
	1977	52.3	27.9	3.2	0.3	16.3
	1978	49.3	34.6	6.6	1.1	8.4
	1979	78.2	8.6	6.8	2.6	3.8
	1980	60.6	18.2	11.5	0.6	9.1
	1981	79.8	12.1	3.9	2.7	1.5
3	1976	64.8	26.5	3.4	5.3	0.0
	1977	17.1	80.4	1.0	0.0	1.5
	1978	24.0	68.3	5.4	2.3	0.0
	1979	46.5	43.2	3.4	6.5	0.3
	1980	56.4	41.0	2.3	0.3	0.0
	1981	45.9	51.6	1.8	0.0	0.7
4[c]	1976	75.3	16.6	4.7	0.7	2.6
	1977	73.6	0.0	24.8	0.0	1.6
	1978	60.8	0.0	38.8	0.4	0.0
	1979	72.3	0.6	24.4	0.3	1.3
	1980	68.2	1.1	29.1	0.1	1.5
	1981	43.8	0.0	54.7	0.9	0.6
5[c]	1976	84.9	9.4	3.5	0.4	1.8
	1977	85.4	0.0	14.6	0.0	0.0
	1978	64.4	0.0	35.6	0.0	0.0
	1979	60.9	0.0	32.0	7.2	0.0
	1980	28.0	0.0	58.2	1.3	12.5
	1981	46.3	0.0	51.3	0.7	1.7
6[c]	1976	65.6	29.6	2.4	2.4	0.0
	1977	66.7	0.0	33.3	0.0	0.0
	1978	43.6	0.0	56.4	0.0	0.0
	1979	74.4	0.0	25.6	0.0	0.0
	1980	77.5	0.0	2.8	14.1	5.6
	1981	85.6	0.0	14.4	0.0	0.0

Table G. Comparison of percent composition of catch by stream section in the Lochsa River, 1976 through 1981 (continued).

Stream Section	Year	Percent of catch by species				
		WRB	HRB	CT	DV	WF
Totals	1976	73.0	16.7	4.3	1.3	4.7
	1977	41.0	45.9	8.6	0.2	4.3
	1978	46.6	25.2	25.0	1.4	1.8
	1979	62.2	18.2	14.8	2.8	2.0
	1980	63.8	14.7	15.8	1.1	4.6
	1981	59.0	16.5	22.3	1.2	1.0

[a]All hatchery catchable rainbow were released above Boulder Creek in 1976

[b]All hatchery catchable rainbow were released below Boulder Creek in 1977 and 1978.

[c]These sections were regulated on a catch-and-release basis after 1976 and percentages are for fish caught and released.

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