

# IDAHO DEPARTMENT OF FISH & GAME

Jerry M. Conley, Director

FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Performance Report

Project F-73-R-2



SUBPROJECT IV: RIVER AND STREAM INVESTIGATIONS

Study III: Lochsa River Fisheries Investigations

Period Covered: 1 March 1979 - 29 February 1980

by

Stephen W. Pettit  
Senior Fishery Research Biologist

September, 1980

## TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT .....	1
RECOMMENDATIONS .....	3
OBJECTIVES .....	3
TECHNIQUES USED .....	3
Angler Creel Census .....	3
Angler Residency, Methods and Opinions .....	5
Releases of Hatchery Rainbow in Lochsa River.....	5
Snorkeling .....	5
FINDINGS .....	7
Angler Effort and Harvest .....	7
Total River.....	7
Lower Sections (Catch-and-keep) .....	7
Upper Sections .....	10
Species Composition .....	10
Catch Rate .....	14
Length Frequencies .....	14
Angler Residency.....	18
Angler Methods and Opinions .....	18
Snorkeling .....	21
DISCUSSION .....	21
LITERATURE CITED .....	23

## LIST OF TABLES

Table 1. Releases of hatchery rainbow catchables in the Lochsa River between 1976 and 1979. 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, 1977, 1978 and 1979. Upper sections (catch-and-release) are treated separately after 1976 .....	8
Table 3. 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, 1977, 1978 and 1979 .....	12

LIST OF TABLES (Continued)

	<u>Page</u>
Table 4. Percent of hatchery catchable rainbow harvested from the Lochsa River, 1976 through 1979.....	13
Table 5. Comparison of catch rates by anglers on the Lochsa River and lower eight miles of Crooked Fork Creek by 2-week intervals, 1976 through 1979. Catch rates include fish released after 1976 .....	15
Table 6. Angling methods and angler opinion information collected on the Lochsa River, 1976 through 1979.....	19
Table 7. Densities of salmonids (fish/100 m) in snorkel sections in the Lochsa River, 1975-76-77-78-79 (Graham 1977 and Mabbott 1978, 1979) .....	20

LIST OF FIGURES

Figure 1. Stream sections used in conducting the creel census and angler interviews on the Lochsa River, 1979 .....	4
Figure 2. The estimated fishing effort (hours x 1000) on the Lochsa River above and below Boulder Creek, 1976-1979 .....	9
Figure 3. Comparison of species composition from angler's catch on the Lochsa River above and below Boulder Creek, 1976-1979 .....	11
Figure 4. Length frequencies of cutthroat trout measured from angler's creels on the Lochsa River below Boulder Creek, 1976-1979 .....	16
Figure 5. Percentage of nonresident fishermen interviewed on the Lochsa River above and below Boulder Creek, 1976-1979 .....	17

APPENDIX

Table A. Estimated hours fished and harvest by anglers on the Lochsa River (Section 1 - mouth to Split Creek) by 2-week intervals, 26 May - 14 September 1979. . . .	27
Table B. Estimated hours fished and harvest by anglers on the Lochsa River (Section 2 - Split Creek to Fish Creek) by 2-week intervals, 26 May - 14 September 1979 .....	28

APPENDIX (Continued)

	<u>Page</u>
Table C. Estimated hours fished and harvest by anglers on the Lochsa River (Section 3 - Fish Creek to Boulder Creek) by 2-week intervals, 26 May - 14 September, 1979.....	29
Table D. Estimated hours fished and species caught and released by anglers on the Lochsa River (Section 4 - Boulder Creek to Warmspring Creek) by 2-week intervals, 26 May - 30 September 1979 .....	30
Table E. Estimated hours fished and species caught by anglers on the Lochsa River (Section 5 - Warmspring Creek to Crooked Fork) by 2-week intervals, 26 May - 30 September 1979 .....	31
Table F. Estimated hours fished and species caught by anglers on Crooked Fork Creek (Section 6 - mouth to Highway 12 Bridge) by 2-week intervals 26 May - 30 September 1979 .....	32
Table G. Comparison of percent composition of catch by stream section in the Lochsa River, 1976 through 1979 .....	33

## JOB PERFORMANCE REPORT

State of Idaho Name: RIVER AND STREAM INVESTIGATIONS  
Project No. F-73-R-2 Title: Lochsa River Fisheries  
Subproject IV Investigations  
Study III  
Period Covered: 1 March 1979 to 29 February 1980

### ABSTRACT

Fisheries personnel conducted an intensive angler count-interview type creel census on the Lochsa River and lower 12.9 km (3 mi) of Crooked Fork Creek in order to evaluate the response of the cutthroat population to the third year catch-and-release regulations in the Lochsa River above Boulder Creek and to monitor changes in angling pressure and harvest of game fish. Census techniques and stream sections were the same as those used in 1977.

From 26 May to 30 September 1979, anglers fished an estimated 5,878 hours on the Lochsa River below Boulder Creek to catch and keep an estimated 4,090 wild rainbow-steelhead (58.0%), 2,087 hatchery catchable rainbow (29.6%), 467 cutthroat trout (6.6%), 224 Dolly Varden (3.2%) and 193 whitefish (2.7%). Anglers fishing below Boulder Creek released 40% of their catch. Anglers fished 1,369 additional hours above Boulder Creek to catch-and-release 3,206 wild rainbow-steelhead (69.1%) and 1,269 cutthroat trout (27.3%).

On the Lochsa River upstream from Boulder Creek (catch-and-release), angler effort (1,360 hours) remained identical to the previous estimate in 1978. The percentage of nonresidents decreased 55% from the angler population interviewed above Boulder Creek. The number of cutthroat caught-and-released decreased 47% from 2,377 in 1978 to 1,269 in 1979. Catch rates for cutthroat dropped from 1.75 per hour in 1978 to 0.93 per hour in 1979. The average size of cutthroat measured from anglers' creels below Boulder Creek continued to increase in 1979.

In the Lochsa River downstream from Boulder Creek, which has been catch-and-keep each year, angler effort decreased by 19% in 1979 but catch rates increased from 0.92 fish per hour in 1978 to 1.20 per hour in 1979.

Author:

Stephen W. Pettit  
Senior Fishery Research Biologist

## 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.

## 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 distribution and abundance in the Lochsa River and selected tributaries.

To collect life history data on cutthroat trout 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

### Angler Creel Census

From 26 May through 30 September 1979, fisheries personnel conducted an intensive angler count interview-type creel census on the Lochsa River and the lower 12.9 km (8 mi) of Crooked Fork Creek. Census sections and techniques used in 1978 were identical to those of 1977. Sections 4, 5 and 6 were regulated on a catch-and-release basis for trout in 1977-79, while all sections were catch-and-keep during 1976. Census sections for all years were (Fig. 1):

- 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)

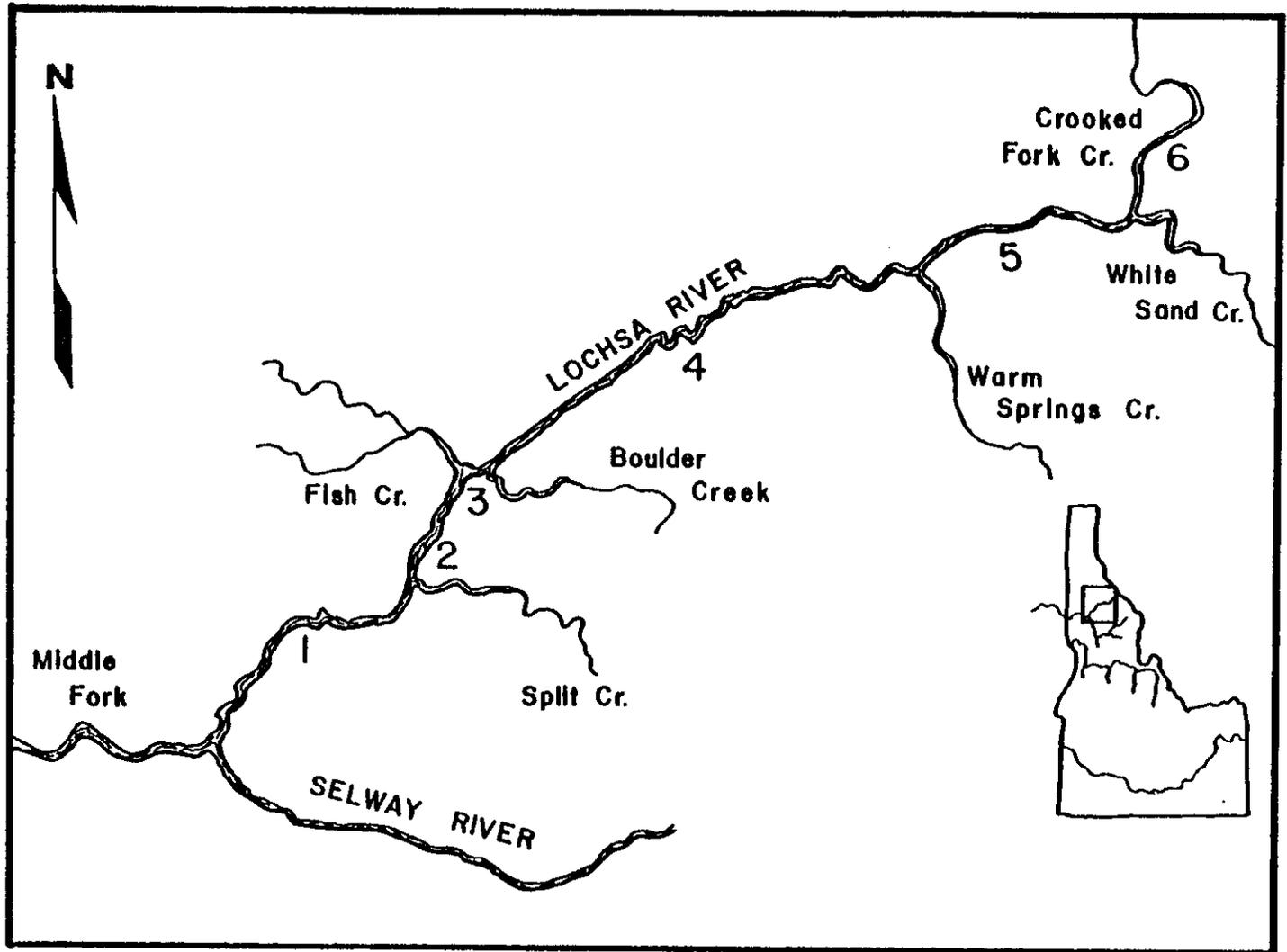


Figure 1. Stream sections used in conducting the creel census and angler interviews on the Lochsa River, 1979.

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 two 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 the 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, numbers 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 angler 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

Hatchery personnel released a total of 7,980 hatchery catchable rainbow trout into the Lochsa River during 1979. As in 1978, all releases were made in the catch-and-keep area below Boulder Creek. There were 1,830 fewer catchables released in 1979 than 1978 and 3,800 fewer than in 1977 (Table 1).

#### Snorkeling

A major indicator of increases in cutthroat and juvenile steelhead population in the Lochsa River will be numbers of fish counted in the snorkel transects which have been established since 1973 (see Appendix for transect locations). Since the Clearwater National Forest was conducting a study which involved snorkeling transects in the Lochsa during 1979, we used their counts to avoid duplication of effort.

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 (103-195 mm), Age I (75-125 mm) and trout fry (75 mm).

Table 1. Releases of hatchery rainbow catchables in the Lochsa River between 1976 and 1979. 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
		<u>12,640</u>	
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
		<u>11,785</u>	
1978	7/12	3,120	3.9
	7/18	4,100	4.1
	7/25	2,590	3.7
		<u>9,810</u>	
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 <sup>a</sup>	5.2
		<u>9,020</u>	

<sup>a</sup>Planted after season closed.

Trout fry could not be separated as to rainbow, steelhead or cutthroat, but most fry in the sections were believed to be steelhead. Rainbow-steelhead were classified as resident rainbow trout. Juvenile chinook densities included young-of-the-year and yearlings (Graham 1977).

## FINDINGS

### Angler Effort and Harvest

#### Total River

Between 26 May and 30 September 1979 we estimated anglers fished 7,250 hours on the Lochsa River and the lower 13 km (8 mi) of Crooked Fork Creek. They caught 7,300 wild rainbow-steelhead (62.4%), 2,100 hatchery catchables (17.9%), 1,740 cutthroat trout (14.9%), 330 Dolly Varden (2.8%) and 235 mountain whitefish (2.0%). Totals include fish released by anglers in both the upper, non-consumptive sections, and those released by sportsmen in the lower catch-and-keep sections. Anglers caught fish at an overall rate of 1.6 fish per hour during 1979. Wild rainbow-juvenile steelhead were caught at a rate of 1.0 fish per hour, hatchery rainbow 0.29, cutthroat trout 0.24, Dolly Varden 0.04 and whitefish at 0.03 fish per hour.

During the 1978 season, anglers fished an estimated 8,640 hours to catch 5,390 wild rainbow-juvenile steelhead (46.6%), 2,920 hatchery rainbow (24.8%), 2,890 cutthroat trout (25.0%), 165 Dolly Varden (1.4%), 211 mountain whitefish (1.8%). Overall catch rates based on fish kept and released was 1.3 fish per hour on the entire Lochsa and lower Crooked Fork (Lindland 1979).

In 1977, anglers fished an estimated 9,770 hours to catch 8,770 fish from the Lochsa River for an overall catch rate of 0.90 fish per hour. Anglers caught 3,595 wild rainbow-juvenile steelhead (41.0%), 4,020 hatchery rainbow (45.8%), 750 cutthroat trout (8.6%), 22 Dolly Varden (0.2%) and 380 mountain whitefish (4.3%).

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 lower 12.9 km (8 mi) of Crooked Fork Creek to catch and keep 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)

In the catch-and-keep area below Boulder Creek, we noted a 19% decrease in angler effort from 1978 to 1979. Effort has dropped steadily since 1977 in the lower sections (Fig. 2). The observed reduction in 1979 could be explained partially, if not completely, by the increased cost of gasoline and its negative effect on tourism in the Clearwater National Forest. River conditions and flows remained excellent throughout the season during 1979 and should not have been a factor in the decrease in fishing pressure. Effort in 1979 below Boulder Creek approximated the fishing effort during the 1976 season when the entire river remained open to catch-and-keep regulations (Fig. 2).

∞

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, 1977, 1978 and 1979. Upper sections (catch-and-release) are treated separately after 1976.

Year	Estimated Hours Fished		Species Caught											
			WRB		HRB		CT		DV		WF		Total	
	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
1976	13,679		11,170		2,557		654		195		717		15,293	
Percent of total			73.0		16.7		4.3		1.3		4.7		-	
Fish/hour			.816		.187		.048		.014		.052		1.12	
1977	984	8,785	1,853	1,742 <sup>a</sup>	0	4,021	541	210	0	22	28	351	2,422	6,346
Percent 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
Percent 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
Percent 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

<sup>a</sup>Estimates, catch rates and percentages are based on total fish caught.

The estimated catch of cutthroat below Boulder Creek dropped somewhat in 1979 from 1978, but then so did the fishing effort. The catch rate remained nearly identical in both years (Table 2). Since the estimated cutthroat catch remained greater than pre-regulations levels, we theorize that the upper, protected stream sections are "seeding" the lower sections with catchable sized cutthroat.

Harvest of wild rainbow-juvenile steelhead increased by 46% in 1979 and their percentage of the catch jumped from 43% to 58% (Table 2). Wild rainbow checked by project personnel were for the most part exclusively juvenile steelhead. The nearly three-fold increase in the catch of juvenile steelhead indicates that Age II+ individuals are increasing in abundance and perhaps enjoying similar protection in the upper sections as are cutthroat. Approximately 40% of the 4,100 rainbow-steelhead caught in the catch-and-keep sections were immediately released by fishermen (Appendix, Tables A, B, C).

The total harvest of hatchery rainbow catchables decreased for the third consecutive year (Table 2). The estimated catch dropped 29% from 1978, but still remained greater than pre-regulation catches in 1976 when hatchery catchables were planted above Boulder Creek. The steady decline in catchable rainbows since 1977 may also reflect the decrease in hatchery plants occurring since 1976 (Table 1).

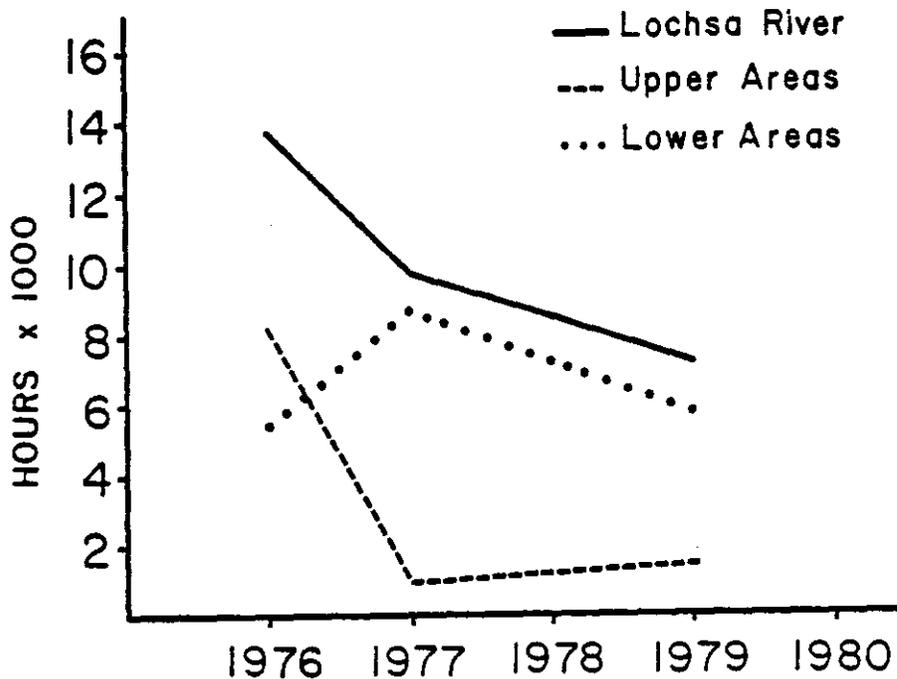


Figure 2. The estimated fishing effort (hours x 1,000) on the Lochsa River above and below Boulder Creek, 1976-1979.

## Upper Sections (Catch-and-release)

Estimated effort in the catch-and-release area above Boulder Creek remained identical to the previous year, 1978. However, 1979 estimates remained 16% less than the 1976 effort when the upper section was catch-and-keep (Fig. 2).

The number of wild rainbow-juvenile steelhead caught-and-released also remained nearly identical in 1979 as we estimated in 1978 (Table 2). However, the rainbow-steelhead percentage of total catch increased from 57% in 1978 to 69% in 1979.

The most significant change in our estimated catch above Boulder Creek was the nearly two-fold decrease in the cutthroat released (Table 2). Their percent-age of the total catch dropped from 44% in 1978 to 30% in 1979. Since the catch of cutthroat remained nearly identical for the same period in the lower sections, one would have expected to see the same response or increased cutthroat abundance in the catch-and-release areas.

As in previous years since the regulation change took effect, the catch of hatchery rainbow remained below 1% of the total catch. The number of Dolly Varden caught-and-released by anglers in the upper areas increased significantly in 1979.

## Species Composition

The percentage of cutthroat released in the catch-and-release area increased during the 1977 and 1978 seasons. However, we observed a decrease in cutthroat percentage in 1979. We estimated that cutthroat provided 27.3% of the catch in the catch-and-release area, down from 43% in 1978 (Fig. 3). Even with the approximate two-fold decrease in the catch, cutthroat percentage remained six times greater than pre-regulation levels. Below Boulder Creek, the percent of cutthroat in the catch decreased from 7.9% in 1978, to 6.6% in 1979. A break-down by census section shows that percent of cutthroat in the catch decreased in all but one of the six sections (Appendix, Table G). The most significant in-creases occurred in sections 4 and 6.

With the decrease in numbers of cutthroat catch-and-released above Boulder Creek, we found the percent of wild rainbow-steelhead increased from 57% in 1978 to 69% in 1979 (Fig. 3). In 1976 and 1977, rainbow-steelhead provided approximately 74% of the catch above Boulder Creek. Below Boulder Creek, wild rainbow-juvenile steelhead comprised 58% of the catch in 1979 compared to 43% in 1978. Their abundance has increased steadily in angler's catches below Boulder Creek since the special regulations took effect. However, as previously mentioned, anglers released nearly 40% of the wild rainbows caught in the catch-and-keep sections. Anglers preferred filling their limits with the larger sized, hatchery rainbows and only kept the smaller wild fish as a last resort. A reduced plant of hatchery rainbows and increased recruitment of Age II juvenile steelhead would account for the increased importance of wild rainbow-steelhead in the harvest. Overall, the percentage of wild rainbow increased from 49.3% in 1978 to 62.2% in 1979 on the entire Lochsa River (Table 3).

The percentage of hatchery rainbows in the catch below Boulder Creek continued to decline in 1979. Catchable rainbows comprised 29.6% of anglers catch in 1979 compared to 63% and 43% in 1977 and 1978 respectively (Fig. 3). A continued reduction in the number of catchable rainbow plants most likely played a role in reducing their importance in the lower river catch (Table 4).

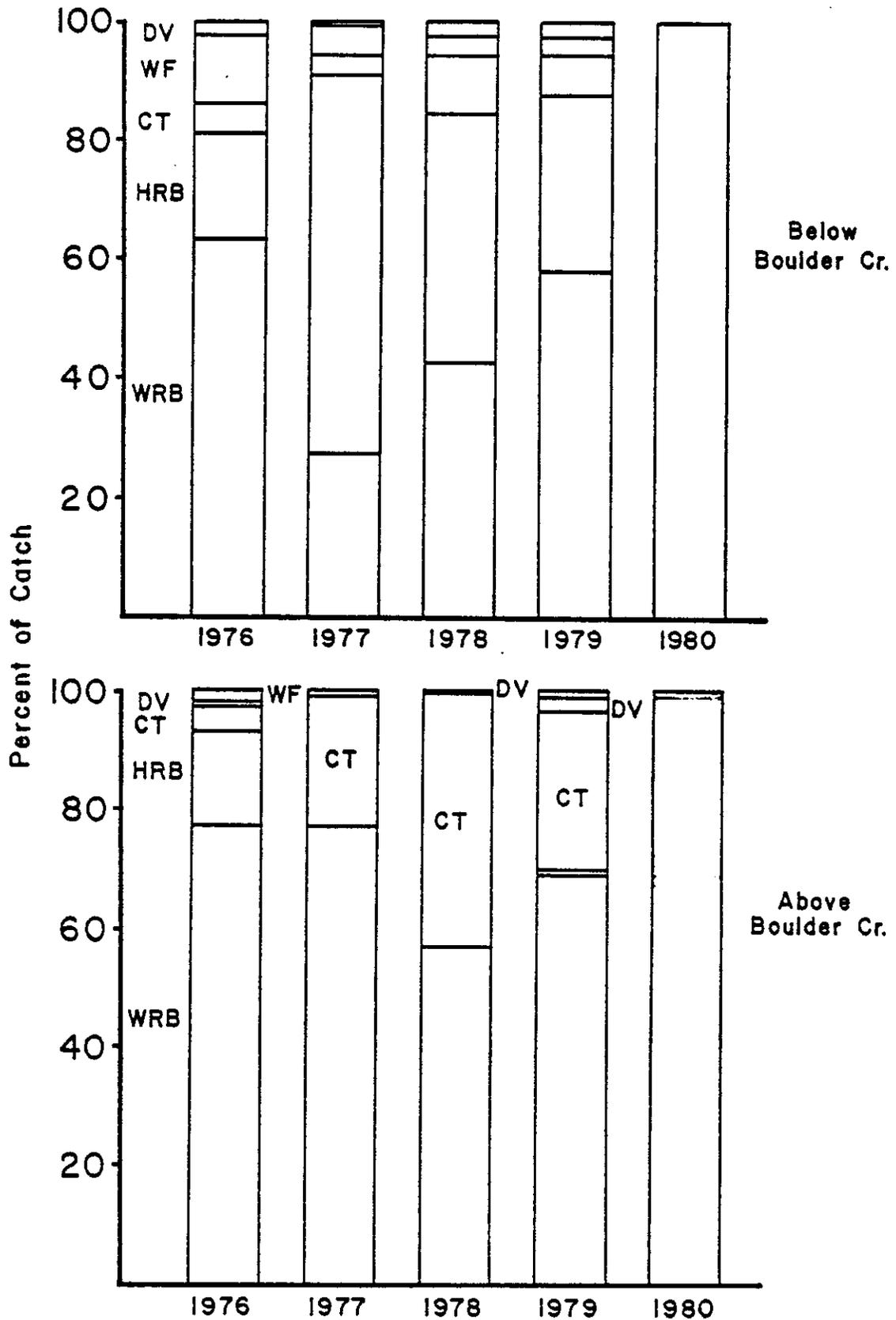


Figure 3. Comparison of species composition from angler's catch on the Lochsa River above and below Boulder Creek, 1976-1979.

Table 3. 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, 1977, 1978 and 1979.

Stream Section	Year	Estimated hours fished	Species caught					Total
			WRB	HRB	CT	DV	WF	
1	1976 <sup>a</sup>	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
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
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
4 <sup>b</sup>	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
5 <sup>b</sup>	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
6 <sup>b</sup>	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
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	6,071	2,919	2,919	165	234	12,308
	1979	7,247	7,296	2,127	1,736	332	234	11,725

<sup>a</sup>All hatchery rainbow catchables were planted above Boulder Creek (Sections 4, 5 and 6) prior to 1977. Since 1977, catchables were planted below Boulder Creek in Section 1, 2 and 3.

<sup>b</sup>Sections 4, 5 and 6 were regulated under catch-and-release regulations from 1977 through 1979.

Table 4. Percent of hatchery catchable rainbow harvested from the Lochsa River, 1976 through 1979.

Year	Number of fish released	Number of fish harvested	Percent harvested
1976 <sup>a</sup>	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

<sup>a</sup>All planting of hatchery catchables occurred above Boulder Creek in 1976. Those made in subsequent years occurred below Boulder Creek.

We estimated that anglers harvested 27% of the 7,930 catchables planted during the 1979 season.

Dolly Varden and mountain whitefish made up less than 5% of the catch above and below Boulder Creek in 1979. The comparison of species composition by stream section appears in the Appendix (Table G).

### Catch Rates

The overall catch rate for cutthroat trout on the Lochsa River increased for the fourth straight year (Table 5). Anglers are now catching cutthroat approximately 7 times faster than they did in 1976. Above Boulder Creek fishermen caught an average of .93 cutthroat per hour in 1979 compared to 1.75 in 1978, and .55 per hour in 1977. In 1976, prior to catch-and-release regulations, anglers managed only .06 cutthroat per hour (Table 2). The catch rate also improved for cutthroat below Boulder Creek. The 1979 and 1978 success rates were nearly identical (.08 and .07) and remain nearly twice as successful as pre-regulation levels.

The catch rate for wild rainbow-juvenile steelhead also increased from .70 per hour in 1978 to .79 in 1979 (Table 5). The 1979 success level still remained less than the overall success rate recorded in 1976 when anglers caught .82 wild rainbow per hour. Above Boulder Creek catch rates appear to have leveled off for wild rainbow-steelhead. In 1979, success was identical to 1978 at 2.34 hours per fish (Table 2). Below Boulder Creek, the catch rate was higher in 1979 than any previous year at .70 fish per hour.

Hatchery catchable rainbow catch rates in the sections below Boulder Creek dropped somewhat in 1979. In 1978 we estimated anglers caught .40 hatchery rainbows per hour and we found 1979 success at .36 fish per hour (Table 2). In 1979, we found hatchery catchables in the catch of anglers fishing above Boulder Creek for the first time since planting stopped in the upper river. However, catchables only appeared in section 4, immediately above Boulder Creek. The over-all catch rate for hatchery rainbow on the Lochsa was .26 fish per hour (Table 5). This was the poorest success since the special regulations went into effect but still remained higher than 1976 levels.

The combined catch rates on the Lochsa for all species reached 1.80 fish per hour in 1979, the highest success rate since the project began (Table 5). As in previous years, anglers enjoyed higher levels of success later in the summer as river conditions improved.

### Length Frequencies

We measured a total of 73 cutthroat from the lower sections of the Lochsa River in 1979. They ranged in total length from 185 to 404 mm (7.3 to 15.9 in) and averaged 288 mm (11.3 in) total length. Cutthroat are now averaging 33 mm (1.3 in) larger than those sampled in 1976 (Fig. 4). In 1976, workers measured 61 cutthroat which averaged 254 mm (10.0 in), while 26 cutthroat measured in 1977 averaged 266 mm (10.5 in). In 1979, 81% of the cutthroat measured were over 254 mm (10.0 in) compared to 65% in 1978, 42% in 1977 and 38% in 1976.

Table 5. Comparison of catch rates by anglers on the Lochsa River and lower eight miles of Crooked Fork Creek by 2-week intervals, 1976 through 1979. Catch rates include fish released after 1976.

Interval	Year	Catch per hour by species					Total
		WRB	HRB	CT	DV	WF	
I	1976	.155	.052	.041	.041	.124	.414
	1977	.162	.405	.012	.012	.012	.601
	1978	.181	.164	.176	.095	.039	.654
	1979	.187	.021	.197	.081	.104	.591
II	1976	.268	.062	.000	.082	.227	.680
	1977	.126	.434	.056	.000	.322	.951
	1978	.180	.000	.165	.015	.066	.425
	1979	.230	.400	.285	.340	.080	1.33
III	1976	.232	.043	.009	.017	.133	.433
	1977	.286	.346	.047	.007	.013	.698
	1978	.524	.000	.154	.023	.018	.719
	1979	.510	.290	.080	.036	.064	.934
IV	1976	.679	.245	.085	.019	.085	1.11
	1977	.274	.548	.151	.000	.000	.973
	1978	.406	.025	.797	.043	.104	1.38
	1979	.884	.364	.171	.008	.015	1.33
V	1976	1.18	.178	.056	.015	.020	1.47
	1977	.150	.289	.043	.000	.011	.492
	1978	.672	.304	.364	.008	.000	1.35
	1979	1.24	.323	.162	.000	.030	1.75
VI	1976	.982	.216	.047	.007	.018	1.27
	1977	.690	.483	.129	.000	.017	1.32
	1978	.686	.561	.143	.000	.009	1.40
	1979	1.75	.482	.510	.000	.008	2.80
VII	1976	1.02	.305	.050	.027	.004	1.41
	1977	.803	.438	.175	.015	.029	1.46
	1978	1.01	.330	.403	.012	.024	1.79
	1979	1.34	.292	.120	.000	.000	1.74
VIII	1976	1.02	.261	.071	.005	.076	1.43
	1977	1.05	.556	.224	.000	.039	1.87
	1978	.982	.576	.317	.005	.017	1.90
	1979	1.00	.190	.250	.040	.032	1.51
IX	1979	2.30	.000	1.60	.040	.140	4.02
Totals	1976	.817	.187	.048	.014	.052	1.12
	1977	.450	.430	.101	.004	.046	1.03
	1978	.703	.338	.338	.019	.027	1.42
	1979	.793	.262	.375	.060	.052	1.80

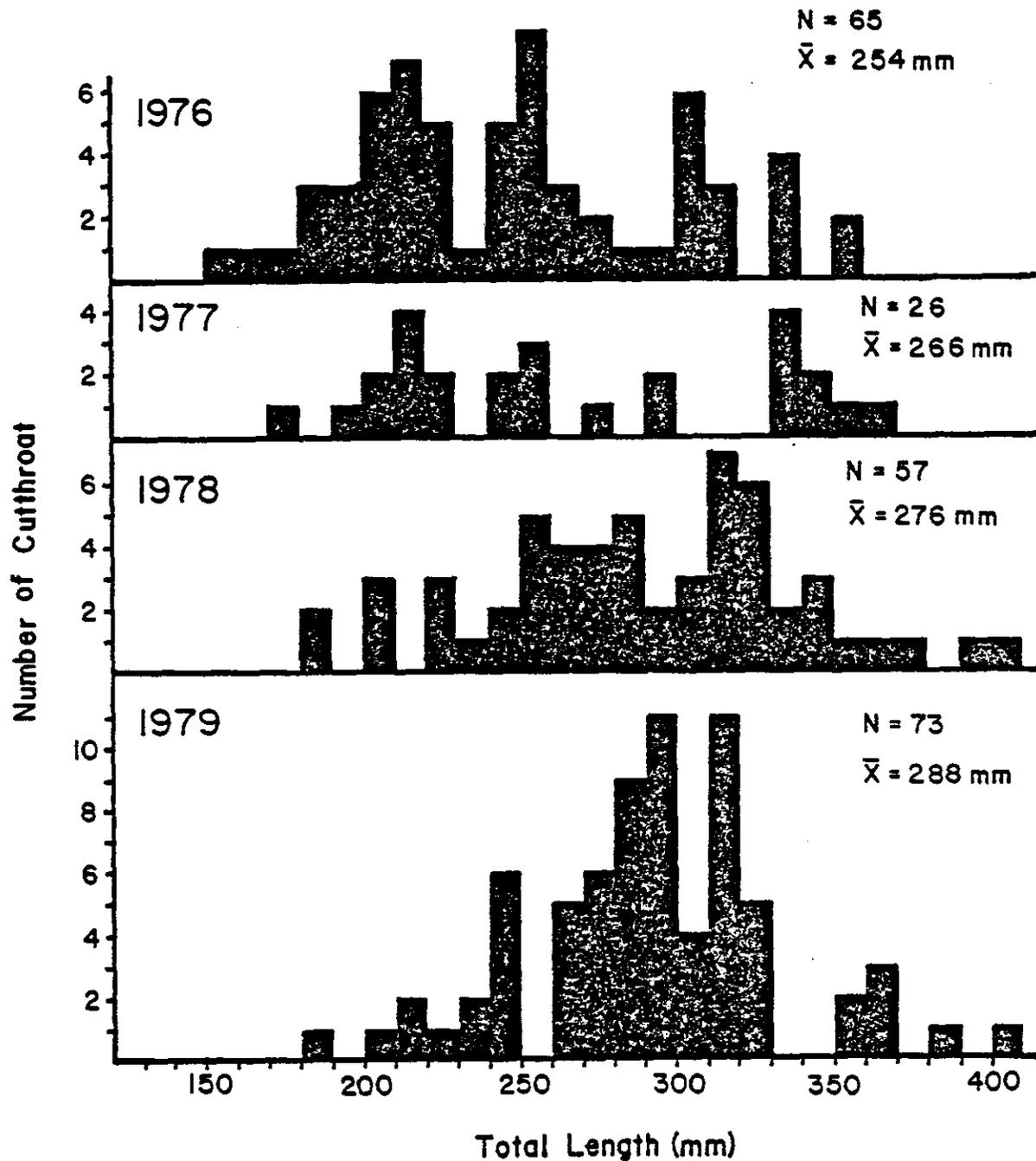


Figure 4. Length frequencies of cutthroat trout measured from angler's creels on the Lochsa River below Boulder Creek, 1976-1979.

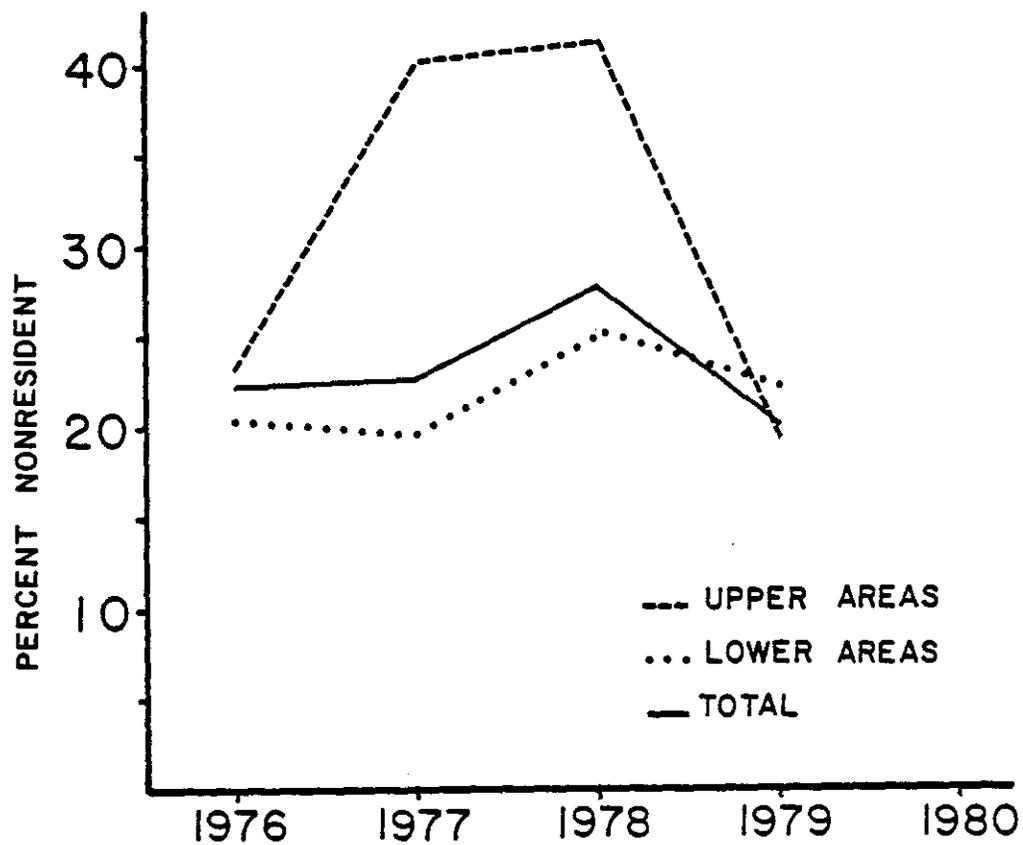


Figure 5. Percentage of nonresident fishermen interviewed on the Lochsa River above and below Boulder Creek, 1976-1979.

The 254 wild rainbow-juvenile steelhead measured from angler's creels in the lower catch-and-keep areas averaged 199 mm (7.8 in) total length during 1979. We found only 13% measured greater than 254 mm (10.0 in), identical to those found larger in 1978. In 1978 we measured 216 wild rainbow-steelhead which averaged 204 mm (8.0 in), 174 fish in 1977 which averaged 196 mm (7.7 in) and 887 were measured in 1976 averaging 198 mm (7.8 in).

### Angler Residency

We interviewed a total of 583 anglers (121 above Boulder Creek) on the Lochsa River during 1979. Of these, 78% were residents compared to 72% residents in 1978, 77% in 1977 and 78% in 1976. Nonresident anglers have ranged between 28% and 22% during the investigation (Fig. 5). The percent of nonresident anglers increased sharply in the catch-and-release sections immediately after the special regulations went into effect, but dropped off just as dramatically in 1979 (Fig. 5). I attribute the sharp decline seen in 1979 to the gasoline shortages experienced in the Northwest. Below Boulder Creek, which has remained catch-and-keep all 4 years, the percentage of nonresidents dropped slightly in 1979.

### Angler Methods and Opinions

The 1979 survey of angling methods revealed that a greater percentage of fly fishermen fished below Boulder Creek than had in the previous 3 years since the special regulations went into effect. We found that anglers using fly-fishing gear increased from 18.3% in 1978 to 27.3% in 1979 (Table 6). Anglers using bait decreased from 49.5% to 39.3% below Boulder Creek. Lure fishermen provided approximately one third of the interviews in 1979, identical to the previous year. In 1977, 61.2% used bait, 22.3% artificial lures and 16.5% flies. In 1976 prior to the special regulations, we found 46% of those fishing below Boulder Creek used bait, 27.4% lures and 29.3% fly gear (Table 6).

In the catch-and-release sections above Boulder Creek, 71.9% of those interviewed used fly gear and 23.1% artificial lures. Bait was used illegally 5% of the time. There has been a steady decline in the percentage of flyfishermen on the upper sections since 1977. In 1977 we found 93.3% of those fishing above Boulder Creek used flies and that dropped to 80% in 1978.

When asked to rate fishing in the Lochsa River during 1979, only 15.3% said it was good below Boulder, while 44.2% rated it good above Boulder Creek (Table 6). As Lindland reported (1979), it is difficult to explain why 60% of the anglers interviewed above Boulder Creek rated the fishing good in 1977, while only 24% and 44% in 1978 and 1979 respectively. Catch statistics indicated that fishing success had increased significantly during 1978 and 1979.

When asked if they were in favor of the catch-and-release regulations as a means of increasing the cutthroat populations in the Lochsa River, 52.4% answered "yes" below Boulder Creek compared to 52.6% in 1978, 32.4% in 1977 and 53.3% in 1976.

Above Boulder Creek the percentage of anglers in favor of the restrictive regulations remained unchanged during 1979. In all 3 years, 87% of those interviewed supported the zero bag limit regulations (Table 6).

Table 6. Angling methods and angler opinion information collected on the Lochsa River, 1976 through 1979.

		1976	Below Boulder Creek			Above Boulder Creek		
			1977	1978	1979	1977	1978	1979
Method:	Bait	46.0%	61.2%	49.5%	39.3%	6.7% <sup>a</sup>	3.3% <sup>a</sup>	5.0%
	Lure	27.4%	22.3%	32.2%	33.4%	0.0%	16.7%	23.1%
	Flies	29.3%	16.5%	18.3%	27.3%	93.3%	80.0%	71.9%
Rate fishing:	Good	23.4%	15.5%	12.3%	15.3%	60.0%	24.1%	44.2%
	Fair	40.8%	48.5%	24.6%	41.1%	40.0%	39.7%	36.3%
	Poor	35.8%	36.0%	63.1%	43.6%	0.0%	34.2%	19.5%
Restrictive regulations to restore cutthroat:	Yes	53.3%	32.4%	52.6%	52.4%	87.6%	86.7%	86.1%
	No	26.4%	39.2%	31.9%	30.2%	0.0%	6.7%	8.2%
	No opinion	20.3%	28.4%	15.5%	17.4%	13.3%	6.6%	5.7%

<sup>a</sup>Illegal

Table 7. Densities of salmonids (fish/100 m) in snorkel sections in the Lochsa River, 1975-76-77-78-79 (Graham 1977 and Mabbott 1978, 1979).

Stream section	Year	Rainbow	Juvenile steelhead		Trout fry	Juvenile chinook	Cut-throat
			II & older	I			
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
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
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
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

## Snorkeling

Mabbott (personal communication) found a slight decrease in numbers of cut-throat per 100 m in the Lochsa River from 1978 to 1979. In snorkel transects from Boulder Creek to Lake Creek, cutthroat dropped from 1.17 fish/100 m in 1978 to only 0.41/100 m in 1979. In the upper areas between Lake Creek and Crooked Fork there was an increase in cutthroat numbers from 2.20/100 m to 3.04/100 m in 1979. The number of cutthroat observed remained nearly identical in the lower transects located between the mouth and Boulder Creek (Table 7).

## DISCUSSION

The data collected on the Lochsa River in 1979 would appear less encouraging than 1978 when evaluating the response of the cutthroat population to special regulations. Catch of cutthroat trout decreased 40% on the study sections and 47% above Boulder Creek. Cutthroat catch rates dropped from 1.75 fish per hour during 1978 to 0.93 fish per hour in 1979 above Boulder Creek. Percent cutthroat in the angler's catch from the catch-and-release sections also dropped from 43% to 27%. However, I believe that several factors acted to reduce cutthroat abundance in the upper sections during 1979. Exceptionally low flows and unusually high water temperatures may have acted to force cutthroat upstream into the higher elevation tributaries until cooler temperatures occurred during September. During September I was able to spend considerable time fishing the upper sections and found cutthroat very abundant. In fact, both catch rates and the number of larger cutthroat I caught compared favorably with my experience on Kelly Creek in 1979. It appears impossible to relate what effect angler skill levels may have had on cutthroat catch rates above Boulder Creek. However it is my opinion that most dedicated and skillful trout fishermen in northcentral Idaho had "written off" the Lochsa as a cutthroat stream capable of producing a quality angling experience. The results of a coordinated Department publicity program on Lochsa cutthroat catch statistics would be interesting, and should be evaluated by regional fisheries workers.

We observed a 27% increase in the catch of wild rainbow-juvenile steelhead on the Lochsa River in 1979. Their contribution to the total catch above Boulder Creek increased from 57% during 1978 to 69% in 1979. Below Boulder Creek wild rainbow-steelhead provided 58% of the total catch in 1979 compared to 43% in 1978. Such an increase was certainly predictable since natural and artificial reproduction has jumped significantly since the disastrous levels we observed in the middle decade. Steelhead fry plants in Lochsa tributaries totalled 270,000 in 1977, 1.7 million in 1978, and approximately 841,000 in 1979. It would be safe to assume that Age II steelhead from the 1977 releases would have entered the fishery in 1979 and contributed to the significant increase in the rainbow-steelhead catch. The aggressive nature of juvenile steelhead may have also contributed to the decreased catch of cutthroat observed in 1979.

The decrease in total effort on the Lochsa during 1979 deserves comment. Fishing effort dropped an estimated 16% on the entire Lochsa in 1979. Since stream conditions and weather patterns remained excellent during 1979, the reduced effort most likely occurred as a result of higher fuel cost and periodic shortages. The unpredictable nature of the northwest fuel supplies resulted in significantly fewer visitor days on most National Forests and Parks.

The Powell District on the Clearwater Forest reported visitor use along Highway 12 campgrounds down between 10% and 15% during 1979 (John Twiss, personal communication). The decrease in camping tourists was also responsible for the decrease in nonresident anglers. Nonresident angler use on the upper catch-and-release sections dropped from 42% in 1978 to 19% in 1979. It should be interesting to compare nonresident participation during 1980 with 1979 usage. Although gas prices will be higher during the coming year, predictions are indicating no shortages. If tourists are confident that fuel will be available in 1980, then angler use may increase on the Lochsa irregardless of the fuel costs.

Cutthroat size has increased on the lower catch-and-keep sections during the 3 years that the special regulations have been utilized, but no information exists on cutthroat size above Boulder Creek. Since fish must be immediately released in the catch-and-release areas, anglers have not been able to provide the necessary length information. During 1980, project personnel will collect, and measure a significant sample of cutthroat above Boulder Creek. This should enable us to compare cutthroat population responses after 4 years of catch-and-release regulations with other streams such as the St. Joe River and Kelly Creek.

## LITERATURE CITED

- Graham, Patrick J. 1977. Juvenile steelhead trout densities in the Lochsa and Selway River drainages. MS Thesis, University of Idaho. 91 pp.
- Lindland, Ronald L. 1979. Lochsa River fisheries investigations, Job Performance Report, Idaho Department of Fish and Game. 32 pp.
- Mabbott, Brent L. 1980. Density, habitat and introduction of juvenile steelhead trout in the Lochsa River drainage, Idaho. MS Thesis, University of Idaho.
- Pettit, S. W. and R. L. Lindland. 1979. Clearwater steelhead investigations, Job Performance Report, Idaho. 70 pp.
- Twiss, John. 1979. Personal communication.

A P P E N D I X

Table A. Estimated hours fished and harvest by anglers on the Lochsa River (Section 1 - mouth to split Creek) by 2-week intervals, 26 May - 14 September 1979.

Interval starting date	Estimated hours fished	Species caught					Total
		WRB	HRB	CT	DV	WF	
26 May	402	89	11	78	33	45	256
9 June	289	23	156	23 (8) <sup>a</sup>	47	23 (16)	272 (24)
23 June	607	148 (165)	206	47	18 (6)	6	425 (171)
7 July	352	119 (170)	203	42 (8)	0	0	364 (178)
21 July	458	179 (76)	202	6	0	25	403 (76)
4 August	365	146 (179)	270	40	0	7	463 (179)
18 August	522	167 (282)	178	42	0	0	387 (282)
1 September	732	241 (432)	190 (22)	37 (15)	0	7 (7)	475 (476)
<b>Totals</b>	<b>3,727</b>	<b>1,103 (1,304)</b>	<b>1,416 (22)</b>	<b>315 (31)</b>	<b>98 (6)</b>	<b>113 (23)</b>	<b>3,045 (1,386)</b>
Percent of total		54.3	32.4	7.8	2.3	3.1	
Fish/hour		.65	.39	.09	.03	.04	1.19

<sup>a</sup>Fish released by anglers shown in parentheses

Table B. Estimated hours fished and harvest by anglers on the Lochsa River (Section 2 - Split Creek to Fish Creek) by 2-week intervals, 26 May - 14 September 1979.

Interval starting date	Estimated hours fished	Species caught					Total
		WRB	HRB	CT	DV	WF	
26 May	57	4 (4) <sup>a</sup>	0	15	9	0	28 (4)
9 June	123	0	0	8	22	8	38
23 June	125	22	0	0	0	22	44
7 July	162	28 (73)	6	11 (17)	0 (6)	0 (11)	45 (107)
21 July	127	64 (111)	0	0	0	0	64 (111)
4 August	168	54 (54)	25	25	0	0	104 (54)
18 August	305	165 (244)	79	12	0	0	256 (244)
1 September	189	60 (208)	10	6	0	6 (6)	82 (214)
Totals	1,256	397 (694)	120	77	31 (6)	36 (17)	661 (734)
Percent of total		78.2	8.6	6.8	2.6	3.8	
Fish/hour		.65	.10	.06	.03	.04	1.11

<sup>a</sup>Fish released by anglers shown in parentheses

Table G. Estimated hours fished and harvest by anglers on the Lochsa River (Section 3 - Fish Creek to Boulder Creek) by 2-week intervals, 26 May - 14 September 1979.

Interval starting date	Estimated hours fished	Species caught					Total
		WRB	HRB	CT	DV	WF	
26 May	39	0	0	0	0	0	0
9 June	119	79	79	0	79	0	237
23 June	118	28 (7) <sup>a</sup>	63 (7)	11	4	0	106 (14)
7 July	123	36	64	9	0	0	109
21 July	126	34 (60)	81	4	0	0	119 (60)
4 August	102	31 (70)	143	10	0	0	184 (71)
18 August	137	92 (36)	77	10	0	0	179 (36)
1 September	131	55 (63)	37	0	0	4	96 (63)
Totals	895	355 (237)	544 (7)	44	83	4	1,030 (244)
Percent of total		46.5	43.2	3.4	6.5	.31	
Fish/hour		.661	.616	.050	.093	.004	1.42

<sup>a</sup>Fish released by anglers shown in parentheses

Table D. Estimated hours fished and species caught and released by anglers on the Lochsa River (Section 4 - Boulder Creek to Warm Spring Creek) by 2-week intervals, 26 May - 30 September 1979.

Interval starting date	Estimated hours fished	Species released					Total released
		WRB	HRB	CT	DV	WF	
26 May	16	0	0	9	0	0 (9)	9 (9)
9 June	20	8	0	24 (1) <sup>a</sup>	0	0	32 (1)
23 June	59	94	0	0	0	0	94
7 July	93	157	0	40 (1)	0	0	197 (1)
21 July	128	520	0	107	0	0	627
4 August	204	530	0	286	0	0	816
18 August	116	367	0	51	0	0	418
1 September	225	243	18	212	5	14	492
15 September	90	302	0	50	5	18	375
Totals	951	2,221	18	779 (2)	10	32 (9)	3,060 (11)
Percent of total		72.3	.60	24.4	.33	1.34	
Fish/hour		2.33	.020	.821	.010	.043	3.23

<sup>a</sup>Illegal harvests are shown in parentheses.

Table E. Estimated hours fished and species caught by anglers on the Lochsa River (Section 5 - Warmspring Creek to Crooked Fork) by 2-week intervals, 26 May - 30 September 1979.

Interval starting date	Estimated hours fished	Species caught					Total
		WRB	HRB	CT	DV	WF	
26 May	4	0	0	0	0	0	0
9 June	39	26	0	104	52	0	182
23 June	16	24	0	16	0	0	40
7 July	0	No anglers counted or interviewed					
21 July	37	45	0	25	0	0	70
4 August 55	572	0	99	0	0	671	
18 August	49	147	0	0	0	0	147
1 September	46	14	0	46	46	0	106
15 September	36	0	0	144	0	0	144
Totals	282	828	0	434	98	0	1,360
Percent of total		60.9	0.0	32.0	7.2	0.0	
Fish/hour		2.94	.000	1.540	.350	0	4.82

Table F. Estimated hours fished and species caught by anglers on Crooked Fork Creek (Section 6 - mouth to Highway 12 Bridge) by 2-week intervals, 26 May - 30 September 1979.

Interval starting date	Estimated hours fished	Species caught					Total
		WRB	HRB	CT	DV	WF	
26 May	0	No anglers counted or interviewed					
9 June	0	No anglers counted or interviewed					
23 June	32	0	0	0	0	0	0
7 July	20	80	0	0	0	0	80
21 July	0	No anglers counted or interviewed					
4 August	15 (0)	No anglers interviewed					
18 August	14	28	0	18	0	0	46
1 September	49	49	0	24	0	0	73
15 September	6	0	0	12	0	0	12
Totals	136	157	0	54	0	0	211
Percent of total		74.4	0.0	25.6	0.0	0.0	
Fish/hour		1.2	.00	.40	.00	.00	1.60

Table G. Comparison of percent composition of catch by stream section in the Lochsa River, 1976 through 1979.

Stream section	Year	Percent of catch by species				
		WRB	HRB	CT	DV	WF
1	1976 <sup>a</sup>	49.0	28.5	8.7	0.9	12.9
	1977 <sup>b</sup>	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
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
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
4 <sup>c</sup>	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
5 <sup>c</sup>	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
6 <sup>c</sup>	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
Totals	1976	73.0	16.7	4.3	1.3	4.7
	1977	27.5	63.4	3.3	0.3	5.5
	1978	49.3	23.7	23.7	1.3	2.0
	1979	62.2	18.2	14.8	2.8	2.0

<sup>a</sup>All hatchery catchable rainbow were released above Boulder Creek in 1976.

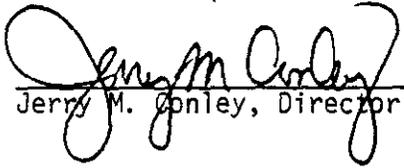
<sup>b</sup>All hatchery catchable rainbow were released below Boulder Creek in 1977 and 1978.

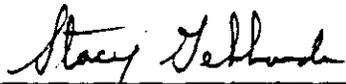
<sup>c</sup>These sections were regulated on a catch-and-release basis after 1976 and percentages are for fish caught and released.

Submitted by:

Stephen W. Pettit  
Senior Fishery Research Biologist

Approved by:

  
Jerry M. Conley, Director

  
Stacy Gebhards, Chief  
Bureau of Fisheries

  
Jerry Mallet  
Fishery Research Supervisor  
Bureau of Fisheries