IDAHO
DEPARTMENT OF FISH & GAME

Joseph C. Greenley, Director

FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Completion Report

Project F-66-R

RIVER AND STREAM INVESTIGATIONS

Job No. III Silver Creek Fisheries Investigations
Job No. III-a. Angler Opinions, Preferences and/or Attitudes
Job No. III-b. Fish Distribution and Abundance Survey
Job No. III-c. Angler Use and Harvest Survey

Period Covered: 1 March 1976 to 28 February 1978

by

Russ Thurow
Fisheries Research Biologist

December, 1978

- Wild rainbow trout caught in Silver Creek - circa 1925.

ACKNOWLEDGEMENTS

The late Harry Gibson helped design the Silver Creek Fisheries Investigations project and supervised the project from 1 March 1976 to 4 July 1977. Gibson died in an airplane crash on 4 July 1977 while engaged in making angler counts on Silver Creek.

Biological aides Bruce Reininger, Rich Uberuaga, Terry Powell, Steve Elle and Jerry Baltazor contributed their skills and energies to the project.

Conservation Officer Lee Frost assisted in securing tag recovery information.

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JOB COMPLETION REPORT

State of Idaho Name: River and Stream Investigations

Project No. F-66-R Title: Silver Creek Fisheries Investi-

Job No. III gations

Period Covered: 1 March 1975 to 28 February 1978

ABSTRACT

In 1975 the Idaho Department of Fish and Game initiated an intensive fishery investigation on Silver Creek designed to aid the development of a management plan for the drainage. To assess the status of the fish stocks in Silver Creek we collected information on the relative abundance, density, distribution, species composition, movement, sizes and age and growth of fish. During 1977 we collected information characterizing the Silver Creek fishery, estimated total angler effort and harvest and assessed angler opinions regarding the fishery.

Silver Creek currently supports an abundant population of self sustaining wild rainbow trout, particularly within the upper sections and tributaries. This population is comprised of predominantly two and three year-old trout; large (>400 mm) and old age (>IV+) trout are uncommon.

Since the early 1900's a variety of rainbow trout stocks have been introduced into Silver Creek forming a complex gene-pool. As a result, Silver Creek supports spring-spawning and fall-spawning races of rainbow trout. Although most wild rainbow trout sustained a limited home range, a portion of the population exhibited upstream and downstream migrations in the spring and fall related to spawning.

The primary tributaries (Stalker, Grove, Wilson and Loving creeks) function as important spawning and rearing areas for wild rainbow trout.

Hatchery catchable rainbow trout planted in Silver Creek moved considerable distances from the planting site into sections of Silver Creek where no hatchery trout were planted.

Trout sampled in Silver Creek in 1976 and 1977 grew slower than trout sampled in 1952. However, a disproportionate number of trout sampled in 1952 consisted of old age fish. Growth of wild rainbow trout in Silver Creek in 1976 and 1977 was comparable to growth rates of trout in the South Fork Boise River.

Preliminary results indicate that the catch and release regulations currently in effect on Section 1 are increasing the abundance of large trout within that section.

Anglers expended an estimated 32,033 hours of effort and captured 32,112 game fish in Silver Creek and tributaries in 1977. Wild rainbow trout comprised a majority of the catch from all sections except 3 and 4 where large numbers of hatchery catchable rainbow trout were planted. The catch consisted of predominantly 2- and 3-year old trout with few trout over 4-years old.

A majority of the anglers who fished Silver Creek caught at least one game fish per trip (79% successful trips). The catch rate exceeded or approached one fish per hour in four stream sections. The catch rate for wild rainbow trout was largest in sections 1 and 2.

Although anglers were allowed to keep fish on Sections 2 through 5 and Grove and Loving creeks, approximately 50% of the wild trout caught were subsequently released. Anglers released over 14,705 wild rainbow trout from a total catch of 20,683 wild rainbow in 1977. Fly fishermen released a majority (94%) of all wild rainbow released in 1977.

Fly fishermen comprised a majority of the anglers who fished Silver Creek in 1977. Anglers using flies were also the most successful fishermen on Silver Creek and they caught a disproportionate amount of the catch of wild rainbow trout for the effort expended.

Most anglers who fish Silver Creek considered the fishing good or fair, were satisfied with the species composition in the stream and preferred to catch wild rainbow trout. Anglers opposed plants of hatchery catchable rainbow trout in the upper sections of the stream and they supported the catch and release regulations in effect on Section 1.

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INTRODUCTION

The Silver Creek drainage historically supported a high-quality rainbow trout fishery which was recognized as one of the premier trout streams in North America. Numerous popular articles have been published about this highly touted trout stream and its crystal water, difficult to catch trout and scenic beauty (Schwiebert 1976, 1977). As recently as September, 1977 Bauer (1977) described the stream as one of the top ten trout streams in North America.

Since the 1940's anglers and fishery biologists have observed an apparent decline in the number and size of rainbow trout harvested from Silver Creek. Hauck (1947) recognized that fishing success in Silver Creek had declined during the previous decade but he did not identify the cause. Following Hauck's preliminary work, additional studies have been conducted to assess the status of the fish population and evaluate management programs (Bell 1966, Gebhards 1963, Irving 1952, 1953, 1956, 1958).

In 1975 the Idaho Department of Fish and Game initiated an intensive fishery investigation on Silver Creek designed to aide the development of a management plan for the drainage. During 1975, project personnel conducted a preliminary creel census (Mallet 1975). In 1976, Department personnel assessed fish distribution and abundance, food availability and utilization and physical stream parameters. In 1977 we conducted a creel census to determine total angler effort and catch and angler preferences.

This report is intended to serve as a completion report for Job III (Silver Creek Fisheries Investigations) as well as an annual job performance report for: Job III-a of F-66-R-3 (Angler Opinions, Preferences and/or Attitudes on Silver Creek); Job III-b of F-66-R-2 (Fish Distribution and Abundance Survey on Silver Creek); and Job III-c of F-66-R-3 (Angler Use and Harvest Survey on Silver Creek). The annual performance report for Job III-d of F-66-R-2 (Food Availability and Utilization by Trout in Silver Creek) will be reported separately.

OBJECTIVES

To determine fish distribution and abundance in Silver Creek.

To compare the fish population of the "fly-fishing-only" section with that of the non-regulated section.

To evaluate the effect of catchable trout releases on the wild trout population.

To survey angler use and harvest in Silver Creek.

To monitor angler opinions, preferences and/or attitudes on Silver Creek.

RECOMMENDATIONS

Formulate a specific management plan with specific management goals for

the Silver Creek fishery.

Limit plantings of hatchery catchable rainbow trout to the lower, accessible sections of Silver Creek (Sections 3 and 4) and discontinue catchable plants in the tributaries.

Isolate a wild strain of late-maturing rainbow trout which exhibit rapid growth rates and experimentally introduce the strain into upper Silver Creek.

Prevent additional removal of stream bank vegetation and promote techniques of bank cover restoration.

Monitor the effect of the special regulations in Section 1 on the size and growth rate of wild trout.

DESCRIPTION OF STUDY AREA

The Silver Creek drainage is located in south central Blaine County (Fig. 1). Silver Creek originates from springs surfacing south of Gannett and flows southeast through a gap between the Pioneer Mountains and the Timmerman Hills. The main stem of Silver Creek begins at the confluence of Grove and Stalker creeks and flows southeast 39 km (24 mi) to its confluence with the Little Wood River. The watershed encompasses 18,100 ha (44,707 acres) and drops in elevation from 1,509 m (4,951 ft) at the headwaters to 1,448 m (4,751 ft) at the confluence with the Little Wood River.

Peak stream discharge occurs in March and April as a result of snowmelt. Local ranchers begin diverting irrigation water from Silver Creek in early June and low flows occur from late June through July or August. Most of the land is irrigated by sub-irrigation methods, but ranchers began applying sprinkler irrigation techniques in 1976. Flows increase in August as a result of irrigation return water recharging the aquifer (Castelin and Chapman 1972). Local annual rainfall averages 35.6 cm (14 in). Additional hydrological data will be available upon publication of the Silver Creek Aquifer Recharge Study by the Idaho Department of Water Resources.

The geology of the drainage has been described in detail by Schmidt and Mackin (1962) and Castelin and Chapman (1972) provide a summary of the geologic framework. During the early Paleozoic Era the region was covered by a succession of seas which accumulated sediments and formed the underlying basement rock in the drainage. In the Tertiary Period extrusion of the Challis Volcanics modified the area. During the Quaternary Period a succession of basalt flows in the valley altered the Big Wood River channel which formerly flowed in the present Silver Creek drainage. A basalt flow also impounded the river forming a lake filled with fine-grained sediments which were later deposited throughout the valley. Late in the Quaternary Period alpine glaciers began to recede and substantially increase the flow of the Big Wood River systems and its load-carrying capacity. A succession of alternating layers of clay, sand, silt and gravel were later deposited in the valley.

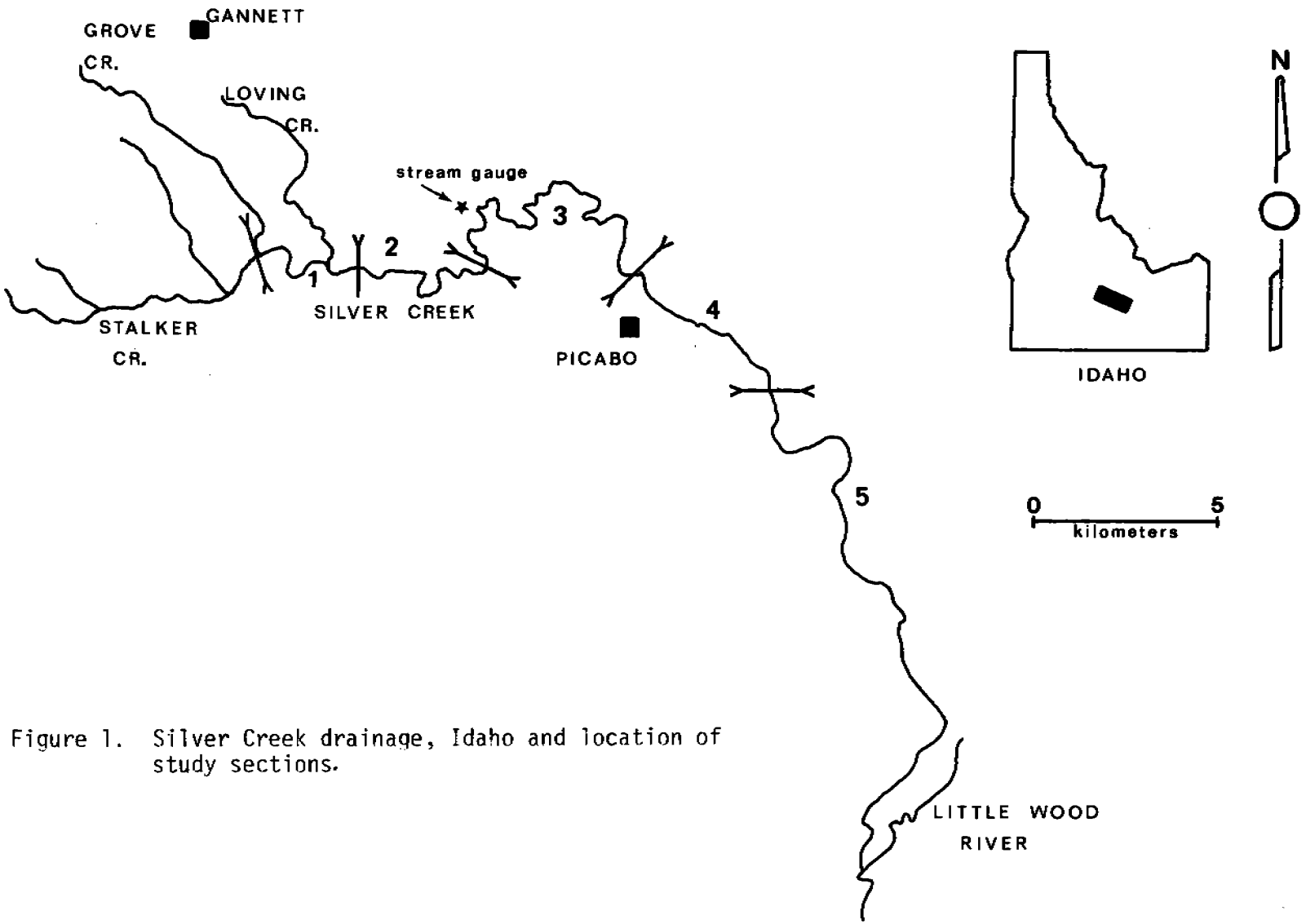

Figure 1. Silver Creek drainage, Idaho and location of study sections.

LOCATION AND DESCRIPTION OF STUDY SITES

In 1975 Idaho Department of Fish and Game research personnel surveyed Silver Creek and selected five study sections based primarily on physical characteristics, fishing regulations and the presence of hatchery reared trout (Fig. 1) (Mallet 1976).

The study sites included a variety of habitat types and I recorded substrate and channel characteristics and accessibility for each site (Table 1). Section 1 is suitable for wading due to its slight gradient and shallow mean depth. The only unwadeable area is formed by an irrigigation dam which impounds 1.4 km (0.9 mi) of stream beginning 0.6 km (0.4 mi) below Section 1. In Sections 2 through 4 the Silver Creek channel becomes narrower and deeper than in Section 1 and the gradient also increases. Substrate in Sections 1 through 4 consists of gravel and silt in varying proportions. Within Section 5, the stream channel is narrower and deeper and the gradient steeper than in the other sections. Section 5 also contains a larger proportion of exposed gravel substrate and rubble than the other stream sections.

The primary tributaries, Loving, Grove and Stalker creeks exhibit moderate gradients and varying proportions of silt and gravel. Loving Creek contains a large proportion of silt. Stalker and Grove creeks also contain occasional silted areas, but these two streams also contain a large proportion of exposed gravel substrate which functions as primary spawning area for rainbow trout and whitefish.

Stream discharge in Silver Creek varied considerably during the 3 years of research (Fig. 2). An extremely high-flow year occurred in 1975 while 1977 was an extremely low-flow year. In 1977 no peak spring discharge occurred. Mid-summer flows averaged approximately 280 cfs in 1975, 180 cfs in 1976 and 80 cfs in 1977.

Within Section 1 the temperature regime of Silver Creek remained stable. Francis (1977) installed a thermograph below the confluence of Grove and Stalker creeks and recorded water temperatures from 13 June to 24 October. Daily maximum water temperatures ranged from 10 C (50 F) in October to 22 C (72 F) in June with a mean of 17.1 C (62.8 F). Daily minimum water temperatures ranged from 4.5 C (40 F) in October to 13.5 C (56.3 F) in August with a mean of 9.8 C (49.6 F).

Comparisons of temperature data between Sections 1, 3 and 5 illustrate variations in water temperature between sections. The lower sections of the stream are colder in the winter and warmer in the summer than the upper sections (Table 2) (Clark 1976).

Chemical analysis of water samples indicates that Silver Creek is composed of productive waters which contain relatively large concentrations of various ions (Table 3) (Clark 1976).

Table 1. Description of Silver Creek study sections.

Section	Length (km)	Location	Fishing regulations	Access	Substrate	Channel characteristics
1	3.4	Confluence of Stalker and Grove creeks to Kilpatrick Bridge	Catch and release, fly fishing only	Open to public	Gravel-silt, silt increases in impoundment	Mean depth 1 m except in impoundment
2	2.7	Kilpatrick Bridge to Hwy. 68	General regulations	Private land, inaccessible except by private membership or float tubing	Gravel-silt	Channel narrower and deeper than Section 1, pools up to 1.5 m
3	5.8	Hwy. 68 to Picabo Bridge	General regulations, hatchery rainbow trout plants	Numerous access points through public access and landowner consent	Gravel-silt	Similar to Section 2
4	5.2	Picabo Bridge to lower Hwy. 68 Bridge	General regulations, hatchery rainbow trout plant-	Private land, inaccessible except at Picabo and Lower 68 bridges	Gravel-silt	Similar to Section 2
5	9.7	Lower Hwy. 68 Bridge to Little Wood River	General regulations	Access point at Priest Campground	Gravel-silt	Numerous pools and riffles, steeper gradient than Sections 1 through 4

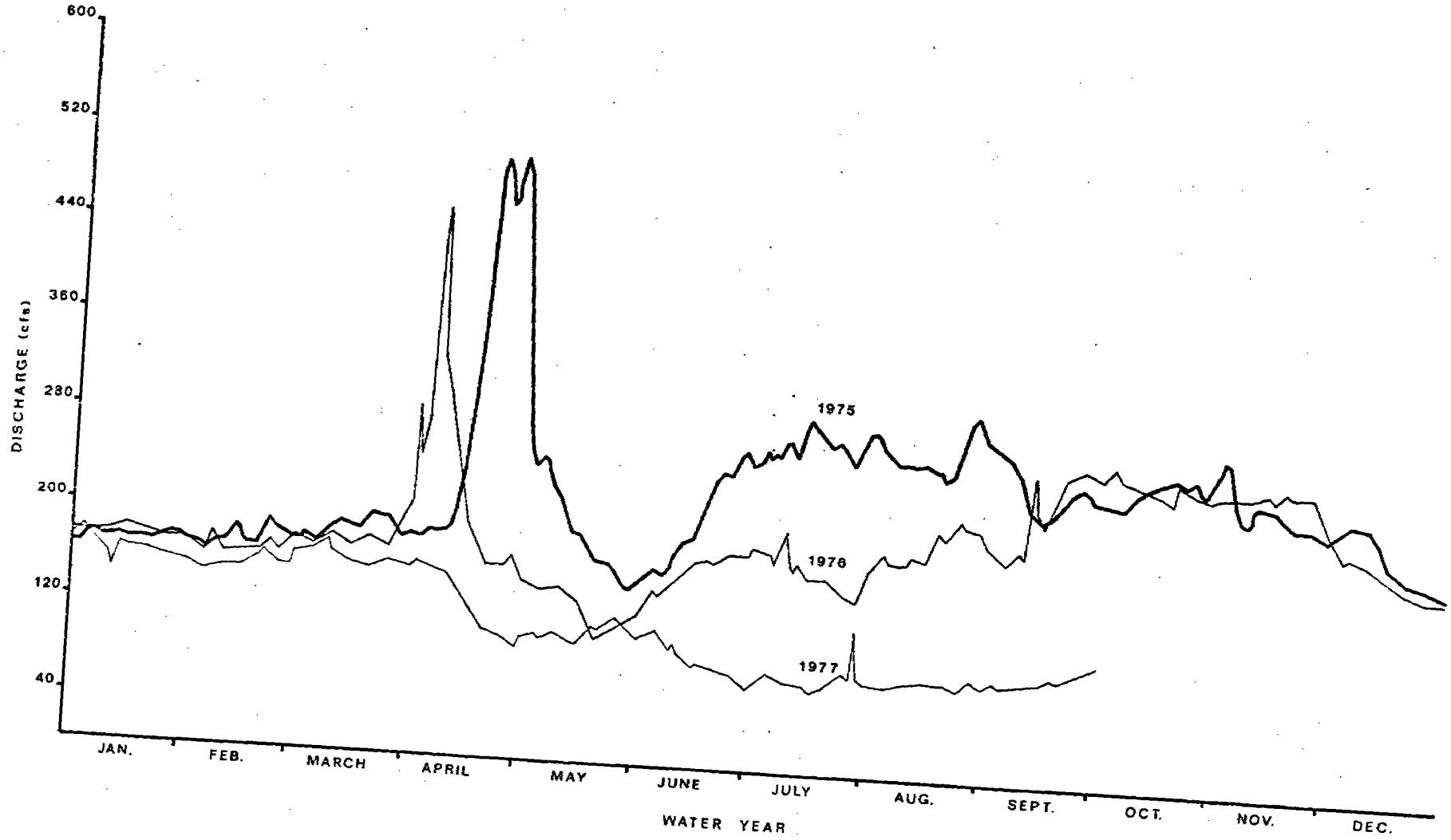

Figure 2. Daily discharge (c.f.s.) of Silver Creek at Sportsman Access-Section 3, during 1975, 1976 and 1977.

Table 2. Water temperatures recorded in Silver Creek in Sections 1, 3 and 5; February, 1975 to February, 1976 (Idaho Department of Health and Welfare).

Date	Section 1 Temperature °C.	Section 3 Temperature °C.	Section 5 Temperature °C.
2-19-75	4.0	4.0	3.5
4-19-75	8.0	7.0	7.0
5-20-75	9.0	8.0	7.5
6-12-75	16.0	15.0	17.0
7-17-75	13.0	15.0	17.0
8-6-75	14.0	15.0	18.0
9-16-75	12.0	13.0	14.0
10-9-75	6.0	7.5	7.5
11-28-75	3.0	3.0	3.0
2-25-76	3.0	3.0	4.0

Table 3. Water quality parameters sampled in Silver Creek February, 1975 to February, 1976 (Idaho Department of Health and Welfare)

Parameter	Range (mg/l)
Specific conductance (umhos/cm.)	190 - 493
Total alkalinity ($CaCO_3$)	108 - 228
Total solids	216 - 340
Nitrate (NO_3)	0.85 - 3.44
Nitrite (NO_2)	.001 - .017
Ortho phosphate (PO_4)	.01 - .90
Calcium (Ca++)	11.0 - 80.0
Sulfate (SO4)	12.0 - 17.5
Sodium (NA+)	4.1 - 6.1
Potassium (K+)	0.8 - 2.7

Dense growths of aquatic macrophytes including Chara, Veronica, Potamogeton, Elodea, Ranunculus, Myriophyllum and others occur in Silver Creek (Francis 1977). Aquatic invertebrate production and fish production are apparently closely associated with the condition of the aquatic vegetation (Bell 1967; Gebhards 1963).

Section 1, Grove, Stalker and Loving creeks are sparsely shaded by occasional stands of aspens, cottonwoods and willows. Within sections 2-4 permanent bank cover is scant, consisting of occasional stretches of willows. In Section 5, Silver Creek meanders through a sagebrush desert and occasional stands of willows, aspen, and cottonwoods occur. Grasses and sedges comprise additional bank cover on all stream sections.

Silver Creek is accessible to anglers through public access points in Section 1, 3 and 5 (Table 1). Within Section 2 and 4, a majority of the adjacent land is privately owned and access is by permission only. Crop production and cattle grazing are prevalent land-use forms on Sections 2 through 5 of Silver Creek. The access surrounding Section 1 is currently owned by the Nature Conservancy and limited crop production and no cattle grazing currently occur there.

Biological Characteristics

Rainbow trout from several stocks have been introduced into Silver Creek forming a complex gene pool. The original rainbow trout introductions were of McCloud River, California trout in the nineteenth century. In 1907 the State of Idaho constructed Hayspur fish hatchery on Loving Creek (tributary to Silver Creek) (Batchelder 1975). Since 1907 rainbow trout from several sources have been reared at Hayspur Hatchery and introduced to Silver Creek. Sources include Neosho, Mo.; Soap Lake, Wash.; Hat Creek, Calif.; Henrys Fork Snake River, Idaho; Williams Lake, Idaho;

and Roaring River, Oregon. In addition, between 1955 and 1970 Idaho Department of Fish and Game personnel annually salvaged fish from Richfield Canal and planted them in Silver Creek. Richfield Canal introductions included trout from the original Big Wood River stock and trout from stocks reared in Hayspur Hatchery and introduced into Richfield Canal. Hayspur Hatchery currently maintains its own brood stock and these fish exhibit considerable variation in external characteristics due to their complex genetic makeup. Hayspur Hatchery personnel stocked catchable sized rainbow trout in Loving Creek and Section 3 and 4 of Silver Creek during this research from 1975 to 1977 (Table 4).

Table 4. Silver Creek fish planting record for hatchery catchable rainbow trout, 1975 to 1977.

Date	Location	Number of fish
5/23/75 to 9/1/75	Silver Creek-Sections 3 & 4	13,600
5/23/75 to 8/29/75	Loving Creek	5,000
5/19/76 to 11/5/76	Silver Creek-Sections 3 & 4	14,900
5/23/76 to 7/30/76	Loving Creek	2,770
4/11/77 to 8/3/77	Silver Creek-Sections 3 & 4	7,948
5/23/77 to 7/30/77	Loving Creek	2,500

A variety of other game and non-game fish species are present in the Silver Creek drainage (Table 5).

Table 5. Game and non-game fish species present in Silver Creek and tributaries.

Common name	Scientific name
Game Species	
Rainbow trout	*Salmo gairdneri*
Brown trout	*Salmo trutta*
Brook trout	*Salvelinus fontinalis*
Mountain whitefish	*Prosopium williamsoni*
Non-Game Species	
Bridgelip sucker	*Catostomus columbianus*
Redside shiner	*Richardsonius balteatus*
Longnose dace	*Rhinichthys cataractae*
Wood River sculpin	*Cottus leiopomus*
Utah chub	*Gila atraria*

TECHNIQUES USED

Fish Populations

To assess the status of the fish stocks in the Silver Creek drainage we collected information on the relative abundance, density, distribution, species composition, movements, sizes and age and growth of fish. We used electrofishing and snorkeling techniques to sample the fish and jaw tags to monitor movements.

Fish Distribution and Abundance

In 1976 Gibson established electrofishing transects in the Silver Creek study area (Table 6). Between April, 1976 and March, 1977 he increased the number of transects to 48. Transects consisted of a length of stream which was representative of the habitat in the respective sections. Recognizable landmarks designated transect boundaries.

Using a canoe and fiberglass boat, Gibson floated downstream through each transect and collected fish during a recorded time period.

Gibson captured the fish with a D.C. variable voltage pulsator powered by a portable generator. He enumerated all collected fish by species and measured them. He also weighed, tagged and collected scales from a sample of the trout.

In 1977 we established five transects each in Sections 1, 2 and 3 and utilized portions of the transects Gibson sampled in 1976. We utilized identical gear in 1977 but made three passes through each transect in an attempt to collect a larger sample. We enumerated species, measured each fish, collected scales and tagged a sample of trout.

To further evaluate fish distribution and abundance, I made underwater counts of fish in established transects in Sections 1 and 2. I snorkeled the transects which Department personnel had surveyed previously (Bell 1967 and Gebhards 1963). Using a wetsuit and snorkle, I floated each transect and counted the total number of fish per transect (by species) and estimated the size of large fish with the aide of a clipboard length scale. Due to the width of the stream and the fair to marginal visibility, I did not attempt to estimate the total number of fish within the transects.

Rainbow Trout Movements

To assess movements of rainbow trout, we tagged wild rainbow captured by electrofishing, catchable-size rainbow trout reared at Hayspur Hatchery and planted into Silver Creek and rainbow trout salvaged from Richfield Canal and introduced into Silver Creek (Table 7). From 1975 to 1977 project personnel tagged and released approximately 3,456 wild rainbow, 16,873 hatchery rainbow and 2,927 Richfield rainbow trout in Silver Creek and tributaries. In 1976 and 1977 we also tagged 195 brook trout and 124 brown trout. We attached numbered monel-metal tags to the mandible of each trout and recorded species, total length, tag number and date and location of release.

Table 6. Number of electrofishing transects in Silver Creek, 1976 and 1977.

Stream Sections	Number of sites electrofished, by dates				
	21 April-11 May 1976	7-23 July 1976	25 Oct.-12 Nov. 1976	24 Feb.-31 March 1977	8-17 Nov. 1977
Silver Cr. -1	3	4	4	5	5
Silver Cr. -2	2	2	2	4	5
Silver Cr. -3	4	6	7	7	5
Silver Cr. -4	3	4	4	3	-
Silver Cr. -5	5	5	8	9	-
Stalker Cr.	4	4	6	7	-
Grove Cr.	2	2	3	4	-
Wilson Cr.	2	4	4	3	-
Loving Cr.	4	3	4	6	-
Totals	29	34	42	48	15

Table 7. Numbers and stocks of trout tagged and released in Silver Creek and tributaries from 1975 to 1977.

Year	Wild Rainbow tagged		Hatchery RB tagged		Richfield RB tagged		Brook trout tagged		Brown trout tagged	
	Silver Cr.	Tribs.	Silver Cr.	Tribs.	Silver Cr.	Tribs.	Silver Cr.	Tribs.	Silver Cr.	Tribs.
1975	---	---	11,504	5,202	---	---	---	---	---	---
1976	1,542	903	107	10	2,065	592	99	81	81	---
1977	735	276	46	4	180	90	11	4	43	---
Total 1975-1977	2,277	1,179	11,657	5,216	2,245	682	110	85	124	

Project personnel collected a majority of the recaptured trout while electrofishing in Silver Creek and tributaries. We also obtained tag recovery information from anglers we contacted on Silver Creek. To stimulate more anglers to return tags, we posted signs along Silver Creek which provided information on where to send or deposit tag recovery information.

Age and Growth

We analyzed 196 scales collected from wild rainbow trout in Sections 1, 2 and 3 in Silver Creek in 1976 and 1977. We collected the scales from the caudal peduncle above the lateral line, mounted them on glass slides in a water medium and examined them on a microprojector. After recording the total number of annuli, we measured the distances from the center focus to each annuli along the median anterior radius.

The regression equation ($L=a+cS$) fit the body-scale relationship of rainbow trout from Silver Creek. We employed this formula to back-calculate mean lengths at each annulus for each age class.

Creel Census

In 1975, department personnel conducted a preliminary creel census on Silver Creek in preparation for more intensive studies in 1977 (Mallet 1976). During 1977 we collected information characterizing the Silver Creek fishery, estimated total angler effort and harvest and assessed angler opinions regarding the fishery.

Angler Effort

We conducted angler counts on Silver Creek between 28 May and 30 November 1977. Personnel conducted an aerial census between 28 May and 4 July. We employed ground counts for the duration of the census. Utilizing the study sections designated in 1975, we regularly censused Sections 1 through 5, Stalker, Grove and Lovings creeks and enumerated all anglers during each count.

Gibson designed the census and selected 14-day intervals. He employed cluster sampling as outlined by Cochran (1953). We used each day as a cluster and made four counts daily. We selected the count days at random and the counts during each day systematically. During each 14-day interval we selected 2-weekend days and 2 weekdays. The study period included twelve 14-day intervals and one final 20-day interval.

I estimated the total hours of angler effort by stream section and angler type (shore, boat, float tube) for each interval as follows:
$\overline{X}WD(H) + \overline{X}_1WE(H)$

Where: $\overline{X}$ = mean number of anglers counted for all weekdays during an interval, computed by:

$$\frac{\text{Anglers Counted}}{\text{Number of Counts}}$$

$\overline{X}_1$ = mean number of anglers counted for all weekend days and holidays during an interval, computed by:

$$\frac{\text{Anglers Counted}}{\text{Number of Counts}}$$

WD = total number of weekdays per interval

WE = total number of weekend days and holidays per interval

(H) = mean daylight hours per interval

I estimated total angler use for each stream section by combining the total estimated hours fished during each interval.

Harvest

Project personnel interviewed anglers to assess residence, stream section fished, fishing method, catch composition and catch per hour. When possible, personnel measured all creeled fish and recorded data by species.

I estimated the catch per interval by the product of the estimated total angler hours per interval multiplied by the mean catch per angler hour during that interval for each section. The mean catch rates were based upon catch records obtained during personal interviews. We recorded catch per hour by species caught and angling method (fly, lure, bait). I calculated total harvest for each stream section by combining the estimated catch during each interval.

Angler Opinions

We also interviewed anglers on Silver Creek to assess their opinions on present management programs and their preferences for future management of the fishery.

Fish Distribution and Abundance

Electrofishing

Wild rainbow trout comprised a majority of the game fish captured in all study sections (Table 8). Gibson captured the largest numbers of wild rainbow trout in Section 1 and the tributaries (Table 9). Juvenile rainbow trout were also most abundant in Section 1 and the tributaries, particularly Grove and Wilson Creeks. Large rainbow trout (>356 mm) were most abundant in Sections 1 and 2.

Calculated relative fish densities, fish per 1,000 linear meters (1,094 yd) (Table 9) provided a poor indicator of actual fish densities. A comparison with fish per 1,000 m (1,094 yd) by snorkeling (Table 11) and the estimated catch per 1,000 m (1,094 yd) (Table 20) indicates that electrofishing underestimated the actual numbers of fish present. Apparently a single pass during the electrofishing was not effective in capturing a large percentage of the fish. Although gear efficiency may have varied between sections, particularly in the smaller tributary areas, electrofishing did provide an indicator of relative fish abundance.

A majority of the wild rainbow trout captured in 1976 and 1977 were age II+ fish 220 to 300 mm (7.9 - 11.8 in), in all sections except Section I in 1977 (Fig. 3, 4, 5). With Section 1, young-of-year trout were the most abundant age class.

We captured a larger percentage of small, <200 mm (<7.9 in), trout in 1977 than Gibson did in 1976 in all stream sections (Fig. 3, 4, 5). I believe the three electrofishing passes we completed in each section in 1977 were more effective in capturing small trout than the single pass Gibson completed in 1976. Gibson's single pass was down the center of the stream while our procedure was composed of one pass down the center of the stream and one near each stream bank. Due to the variable effectiveness of the sampling trips, I calculated the percentage of large rainbow captured on the basis of fish exceeding 200 mm (7.9 in) total length. In 1976 Gibson captured the largest percentage of trout exceeding 300 mm (11.8 in) in Section 2 and the largest percentage of trout exceeding 400 mm (15.7 in) in Section 3. In 1977 we captured the largest percentage of trout exceeding 300 mm (11.8 in) and 400 mm (15.7 in) in Section 1. Within Sections 2 and 3 the percentage of large trout (>300 mm and > 400 mm) declined between 1976 and 1977. In contrast, within Section 1 the percentage of large trout, >300 mm (>11.8 in) increased from 1976 to 1977. Trout exceeding 450 mm (17.7 in) total length were uncommon in all stream sections in 1976 and 1977.

The relative abundance of large rainbow trout captured varied between seasonal electrofishing samples (Table 10). Within the sections, the percentage of captured rainbow exceeding 300 mm (11.8 in) and 400 mm (15.7 in) increased between July and March in Sections 1 and 2 and increased from July to October in Section 3. A plausible explanation for the increased percentage of large fish is that large, mature trout migrated out of deep water areas (as Kilpatrick Pond) into upstream areas to spawn in the fall and spring. Electrofishing gear would have been more effective in sampling these large fish in the shallower water areas.

Table 8. Species composition and numbers of fish captured per hour by electrofishing in Silver Creek and tributaries during April-May, July-August, and October-November, 1976.

	STREAM SECTIONS																	
	Silver Cr. 1		Silver Cr. 2		Silver Cr. 3		Silver Cr. 4		Silver Cr. 5		Stalker		Grove		Wilson		Loving	
Game Fish	% comp	Fish/ hour	% comp	Fish/ hour	% comp	Fish/ hour	% comp	Fish/ hour	% comp	Fish/ hour	% comp	Fish/ hour	% comp	Fish/ hour	% comp	Fish/ hour	% comp	Fish/ hour
Wild RBT	47	55	27	30	16	15	26	30	13	18	53	82	83	250	43	92	49	84
Hatchery RBT	0.8	0.9	2	3	7	7	4	5	0	0	0.1	0.2	0.1	0.3	0	0	0.6	1
Brook trout	2	2	1	1	0.6	0.6	0.5	0.5	0	0	8	12	12	36	46	98	0.2	0.4
Brown trout	0	0	0	0	0	0	0.5	0.5	7	10	0	0	0	0	0	0	0	0
Whitefish	32	37	4	4	1	1	0.1	0.2	0.1	0.1	12	19	3	9	0	0	0.6	1
Non-Game Fish																		
Sucker	15	18	60	67	49	46	43	48	33	46	11	18	0.5	2	1	2	35	61
Dace	3	4	3	4	19	18	18	20	11	16	14	22	0.1	0.3	0.5	1.1	15	26
Sculpin	.2	.2	0	0	0	0	0	0	0	0	1	1	1	4	10	21	0.1	0.1
Shiner	0	0	3	3	7	6	8	9	35	49	0	0	0	0	0	0	0	0
Chub	0	0	0	0	0.1	0.1	0	0	0.2	0.2	0	0	0	0	0	0	0	0

Table 9. Species of game fish captured per 1,000 m (1,094 yd) of stream by electrofishing in Silver Creek and tributaries during April-May July-August and October-November 1976.

Species	Length (mm)	Silver Cr-1	Silver Cr-2	Silver Cr-3	Silver Cr-4	Silver Cr-5	Stalker Cr.	Grove Cr.	Wilson Cr.	Loving Cr.
Wild Rbt	150	4	2	1	1	1	18	318	200	36
	150	18	9	4	9	5	64	109	28	46
	356	4	2	0.3	1	0.2	7	4	2	9
	Total	26	13	5.3	11	6.2	89	431	220	91
Hatchery Rbt	150	0	0	0	0	--	0	0	--	0
	150	1	3	3	0.2	--	0.3	1	--	2
	356	0	0	0.3	0	--	0.3	0	--	0.4
	Total	1	3	3.3	0.2	0	0.6	1	0	2.4
Brook trout	150	0	0	0	--	--	0.3	27	109	--
	150	1	0.5	0.1	--	--	2	18	55	--
	356	0	0	0	--	--	0	0	0	--
	Total	1	0.5	0.1	0	0	2.3	45	164	0
Brown trout	150	--	--	--	0	0.5	--	--	--	--
	150	--	--	--	0.5	5	--	--	--	--
	356	--	--	--	0.5	4	--	--	--	--
	Total	0	0	0	1.0	9.5	0	0	0	0
White fish	150	0	0	0.3	--	--	1	9	--	1
	150	9	1	0	--	--	9	9	--	0.4
	356	9	0.5	0	--	--	4	3	--	0
	Total	18	1.5	.3	0	0	14	21	0	1.4
Total game fish		46	18	8.9	12.2	15.7	105.9	498	384	94.8

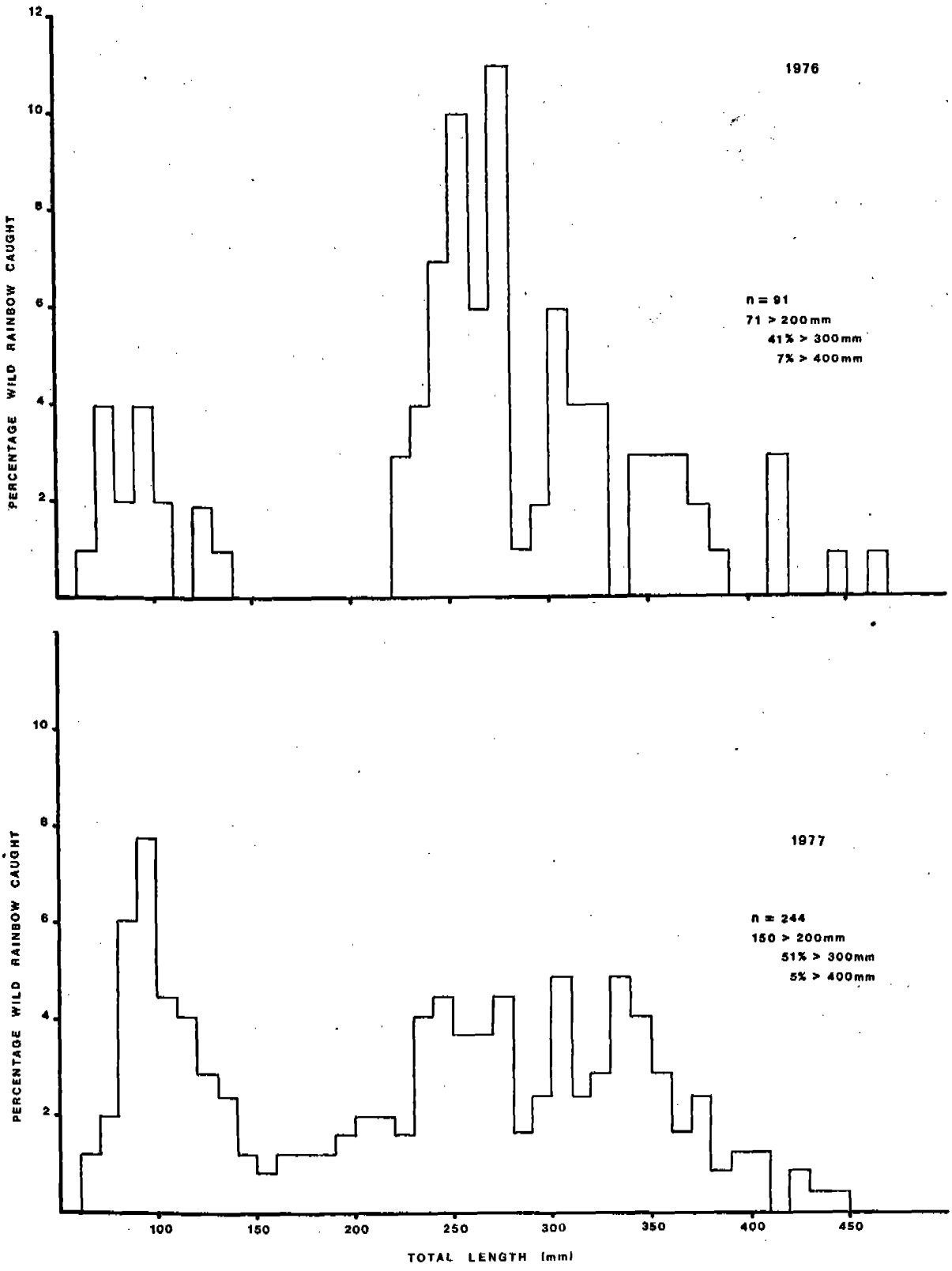

Figure 3. Length frequencies of wild rainbow trout captured by electrofishing in Silver Creek - Section 1, November, 1976 and 1977.

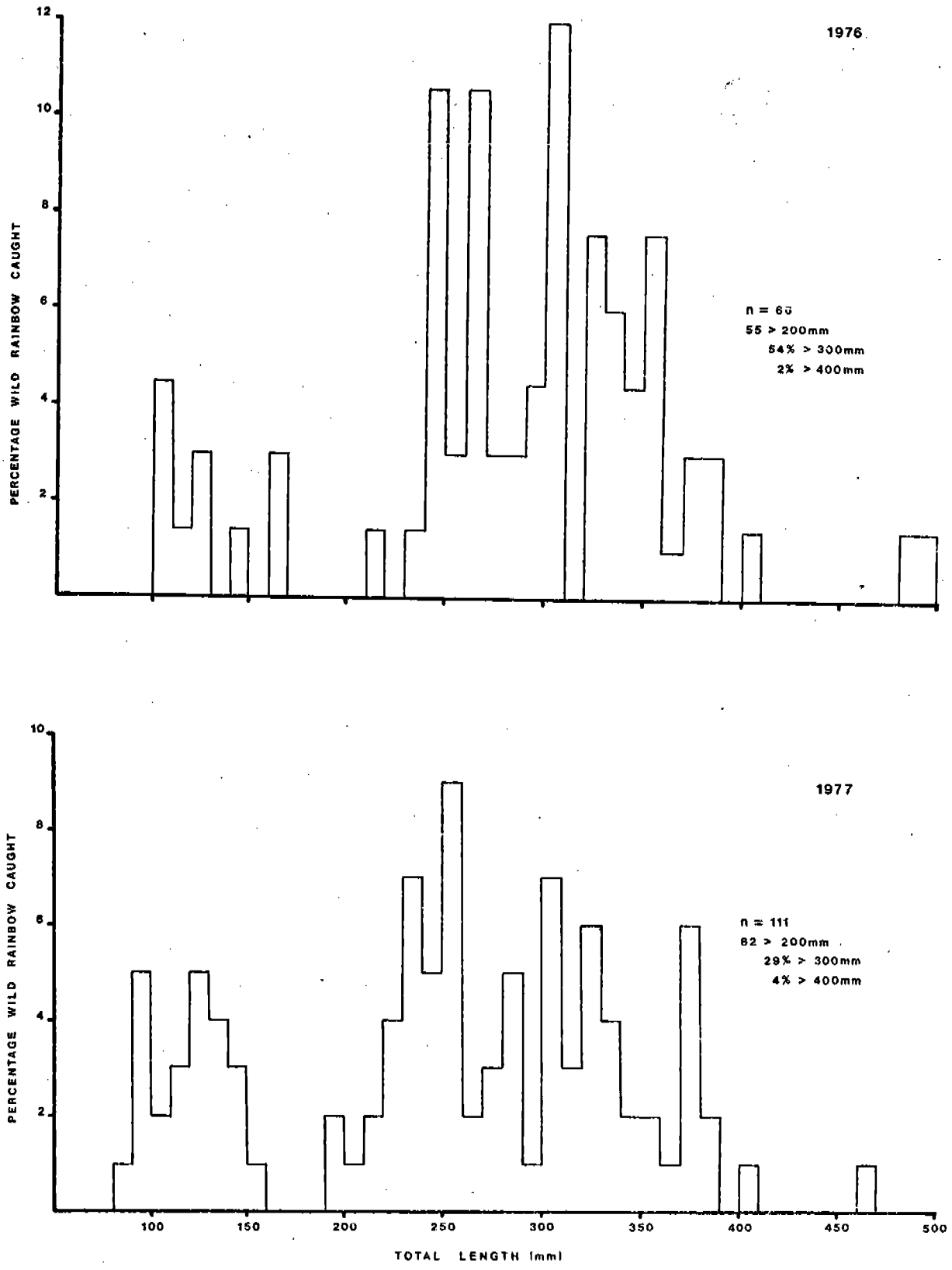

Figure 4. Length frequencies of wild rainbow trout captured by electrofishing in Silver Creek - Section 2, November, 1976 and 1977.

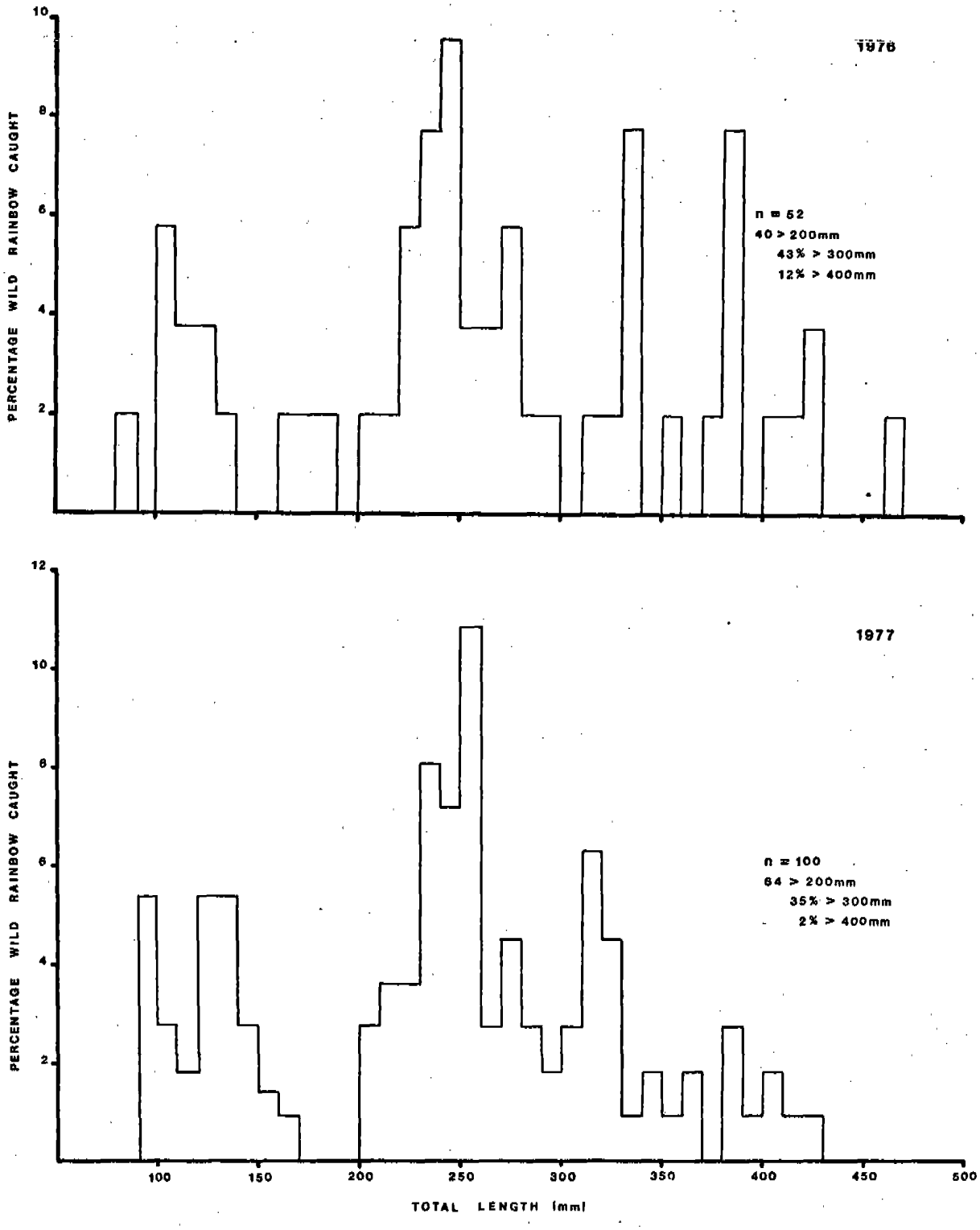

Figure 5. Length frequencies of wild rainbow trout captured by electrofishing in Silver Creek - Section 3, November, 1976 and 1977.

Table 10. The percentage of wild rainbow trout captured by electrofishing in Silver Creek which exceeded specified total lengths, 1976 and 1977.

Stream section	Date	Percentage of trout exceeding 300 mm	Percentage of trout exceeding 400 mm	Sample size
Silver Creek - 1	July, 1976	24	1	170
	Oct., 1976	33	5	91
	March, 1977	74	13	92
Silver Creek - 2	July, 1976	20	3	100
	Oct., 1976	45	2	66
	March, 1977	55	4	117
Silver Creek - 3	July, 1976	19	2	43
	Oct., 1976	33	10	52
	March, 1977	25	2	168

Hatchery reared rainbow trout moved into unplanted stream sections. Although hatchery rainbow trout were stocked only in Sections 3, 4, and Loving Creek, Gibson captured them in all stream sections except Section 5 and Wilson Creek (Tables 2, 8, 9).

Brown trout apparently moved farther up Silver Creek between 1976 and 1977 (Table 8, 9). In 1976 Gibson collected brown trout in Sections 4 and 5 while in 1977 we also collected brown trout in Section 2 below the irrigation dam. A small population of brown trout is also present in Loving Creek below Hayspur Hatchery. Brook trout were most abundant in Grove and Wilson creeks. Mountain whitefish were present in all areas except Wilson Creek and were most abundant in Section 1 and the tributaries.

Bridgelip suckers were the most common non-game species in Silver Creek and they were more abundant than trout in Sections 2 through 5 (Table 8). Schools of suckers were most prevalent in deep pool areas. Gibson collected redside shiners from Section 2 downstream and Utah chubs from Section 3 downstream. Sculpin were most common in the tributaries and Section 1.

Underwater Observations

Within Section 1, I observed approximately 1,000 wild rainbow trout, 290 mountain whitefish and 40 brook trout per 1,000 m (1,094 yd) of stream (Table 11). I observed large numbers of young-of-the-year rainbow trout, <150 mm (<5.9 in), and juvenile and adult whitefish in the upper portion of Section 1. Numbers of wild rainbow trout decreased as I approached the mouth of Loving Creek.

I observed small numbers of large, > 450 mm (>17.7 in), rainbow trout in the transects in 1977 (Table 11). Within the six transects 41 rainbow trout exceeded 400 mm and 5 rainbow trout exceeded 450 mm (0.9-1.4 kg, 2-3 lb). Gebhards (1963) observed 5 rainbow trout below Loving Creek ranging from 1.8 to 2.3 kg (4-5 lb) and Bell (1966) observed 10 rainbow trout in Stalker Creek and below the mouth of Loving Creek ranging from 1.4 to 2.3 kg (3-5 lb). I observed only 42 brook trout and 29% of them exceeded 300 mm in total length.

Within Section 2 I observed fewer wild rainbow trout than I had in Section 1 (Table 11). I observed approximately 480 wild rainbow trout and 100 mountain whitefish per 1,000 meters of stream. Young-of-the-year rainbow trout were uncommon. Although large (0.9 to 1.4 kg) trout were also uncommon in Section 2, a larger percentage of the trout observed exceeded 400 mm and 450 mm than in Section 1.

Table 11. Snorkeling observations on Stalker Creek and Silver Creek Sections 1 and 2, September and October, 1977

Date	Upper boundary of stream section	Approximate length (m)	Species observed: Wild rainbow trout Total	Wild rainbow trout No. <150mm	Wild rainbow trout No. >400 mm	Wild rainbow trout No. > 450 mm	Brook trout Total	Brook trout No. > 310mm	Whitefish Tot.	Whitefish Juv.
28 Sept. 1977	Stalker Cr. Bridge	220	180	90	80	1	9	1	12	0
	Confluence of Stalker and Grove Cr.	220	350	140	12	2	15	5	150	100
	Foot Bridge at Hunting Lodge	165	130	65	4	0	6	2	22	10
	2nd Foot Bridge	165	180	50	10	2	10	4	32	10
	300 yards above Loving Creek	110	75	25	2	0	0	0	50	10
	Loving Creek mouth	165	130	0	5	0	2	0	40	0
	Totals	1045	1045	370	41	5	42	12	306	130
5 Oct. 1977	Purdy Dam to First Bridge	90	95	30	9	2	0	0	44	0
	Duck Blind above Purdy's House	220	73	5	6	2	0	0	1	0
	Purdy's House to Hwy. 68	165	60	0	5	1	0	0	1	0
	Totals	475	228	35	20	5	0	0	46	0

Migration and Movement

Seasonal Migration

Returns of trout tagged and released in Silver Creek indicated that most wild rainbow trout remained within 1.6 km (1 mi) of the original tagging location (Table 12). We recaptured a majority (56 to 79%) of the trout recovered within 1.6 km (1 mi) of the release site for all seasons tagged.

Approximately 28% of the wild rainbow trout tagged and released in Silver Creek were recovered after migrating more than 1.6 km (1 mi) upstream or downstream (Table 12). A majority of these trout moved downstream.

Wild rainbow trout which migrated in Silver Creek, moved upstream and downstream in spring and fall. Of 14 tagged trout which moved upstream, 8 (57%) were tagged in spring and summer and moved upstream by fall and winter, 3 (21%) were tagged in fall and winter and recovered upstream in spring, and 2 (14%) were tagged in spring and summer and recovered upstream in the spring of the following year. Only one trout had moved upstream by summer. Of 26 tagged trout which moved downstream, 9 (35%) were tagged in spring and summer and recovered downstream in fall and winter, 5 (19%) were tagged in spring and summer and moved downstream in spring, 5 (19%) were tagged in spring and summer and moved downstream in summer, and 3 (12%) were tagged in fall and winter and recovered downstream in the spring.

I believe the seasonal upstream and downstream movements of wild rainbow trout in Silver Creek were migrations of spring and fall spawning races of trout. Due to the variable proportions of trout spawning between March and November, we did not observe a distinct spawning migration.

Movements of Planted Rainbow Trout

Rainbow trout salvaged from Richfield Canal and introduced into Silver Creek moved both upstream and downstream from the release site (Table 12). Of 13 recaptured Richfield trout introduced in summer, only one remained within 1.6 km (1 mi) of the release site. A majority (79%) of the recaptured Richfield trout which were introduced in fall remained within 1.6 km (1 mi) of the release site.

A large proportion of the hatchery catchable rainbow trout planted in Silver Creek moved upstream and downstream in Silver Creek (Table 12). Fifty percent (197 trout) of the recaptured hatchery trout planted in spring, summer and fall moved upstream and downstream more than 1.6 km (1 mi) from the release site. A majority of these trout moved downstream.

Anglers captured a majority of the hatchery catchable rainbow trout within the same season in which they were released. Approximately 71% of the recaptured hatchery trout tagged in spring, 82% of the recaptured trout tagged in summer and 79% of the recaptured trout tagged in fall were recaptured during the same month in which they were planted. This indicates that anglers rapidly exploited hatchery catchable trout, particularly in the vicinity of Martin Bridge and Picabo Bridge.

Table 12. Numbers and percentages (in parenthesis) of wild, Richfield and hatchery rainbow trout tagged in Silver Creek and recovered at various distances from tagging locations, by season, 1975 to 1977.

Season tagged	No. trout recaptured	Movement in miles				
		5+ Upstream	1-5 Upstream	Within 1	1-5 Downstream	5+ Downstream
Wild rainbow trout						
Spring	46	3 (7)	1 (2)	33 (72)	8 (17)	1 (2)
Summer	60	1 (2)	6 (10)	43 (72)	6 (10)	4 (7)
Fall	29	1 (3)	1 (3)	23 (79)	3 (10)	1 (3)
Winter	9	--	1 (11)	5 (56)	3 (33)	--
Totals	144	5 (3)	9 (6)	104 (72)	20 (14)	6 (4)
Richfield rainbow trout						
Spring	1				1 (100)	
Summer	13		4 (31)	1 (10)	8 (62)	
Fall	183	5 (3)	13 (7)	144 (79)	9 (5)	12 (7)
Totals	197	5 (3)	17 (9)	145 (74)	18 (9)	12 (7)
Hatchery rainbow trout						
Spring	101	2 (2)	25 (25)	59 (58)	5 (5)	10 (10)
Summer	257		43 (17)	123 (48)	74 (29)	17 (7)
Fall	39	1 (3)	1 (3)	18 (46)	18 (46)	1 (3)
Totals	397	3 (1)	69 (17)	200 (50)	97 (24)	28 (7)

Tributary Movements

Returns of wild rainbow trout tagged and released in tributaries indicate that trout in tributaries exhibited more movement than trout in Silver Creek (Table 13). Only 14% of the recaptured wild trout remained within 1.6 km (1 mi) of the original tagging location. Approximately equal numbers of wild trout moved upstream and downstream from the tagging location.

Wild rainbow trout in tributaries to Silver Creek migrated upstream and downstream in spring and fall (Table 13). We recaptured 44 trout which migrated upstream and 23 (52%) were tagged in spring and summer and moved upstream by fall and winter, 10 (23%) were tagged in spring and summer and recovered upstream in spring of the following year, and 7 (16%) were tagged in fall and winter and recovered upstream in spring. Of 48 trout which migrated downstream,13 (27%) were tagged in spring and summer and recovered in spring of the following year, 12 (25%) were tagged in spring and summer and recovered downstream in summer of the same year, and 10 (21%) were tagged in spring and summer and recovered downstream in fall and winter.

I believe the movements of wild rainbow trout in the tributaries were also migrations of spring and fall spawning races of trout which utilized the four major tributaries as spawning areas. Gibson collected ripe and spawning rainbow trout in Stalker, Grove, Wilson and Loving creeks in spring and in fall, 1976.

A small percentage of the wild rainbow trout tagged in tributaries and later recaptured, had migrated down the tributaries into Silver Creek. Ten trout (9% of wild trout recaptured) migrated from Stalker, Grove, Wilson and Loving creeks into Silver Creek. Four trout migrated from Silver Creek into Stalker, Grove and Loving creeks and five trout migrated from Stalker and Grove creeks into Stalker, Grove and Loving creeks.

The major tributaries provide rearing areas for juvenile rainbow trout as well as spawning grounds. During his electrofishing trips in 1976 and 1977 Gibson found large numbers of young-of-the-year fry and fingerlings in the tributaries. He observed fewer numbers of juvenile rainbow trout in main Silver Creek, particularly below Kilpatrick Bridge. Hauck (1947) also observed that the tributaries provided spawning and rearing areas for rainbow trout. Unfortunately, a majority of the trout which Gibson tagged were large, >300 mm (>11.8 in) so we are unable to determine whether a substantial number of juvenile rainbow trout eventually migrate into Silver Creek.

Electrofishing conducted by Francis (1977) indicates that many juvenile trout entered main Silver Creek in July. Presumably these were fish which reared in the tributaries.

Richfield Canal rainbow trout that had been introduced into tributaries exhibited random movements (Table 13). A majority moved downstream while approximately equal numbers moved upstream or remained at the original point of stocking.

Table 13. Numbers and percentages of wild, Richfield and hatchery rainbow trout tagged in tributaries to Silver Creek and recovered at various distances from tagging locations, 1975 to 1977.

Location	No. trout recaptured	Movement		
		Upstream	within 1.6 km (1 mi)	Downstream
Wild rainbow trout				
Stalker Cr.	39	20 (51)	7 (18)	12 (31)
Grove Cr.	25	4 (16)	5 (20)	16 (64)
Wilson Cr.	2	1 (50)	--	1 (50)
Loving Cr.	41	19 (46)	3 (7)	19 (46)
TOTALS	107	44 (41)	15 (14)	48 (45)
Richfield rainbow trout				
Stalker Cr.	45	14 (31)	14 (31)	17 (38)
Grove Cr.	35	8 (23)	2 (6)	25 (71)
Loving Cr.	9	1 (11)	6 (67)	2 (22)
Totals	89	23 (26)	22 (25)	44 (49)
Hatchery rainbow trout				
Stalker Cr.	2	2 (100)	--	--
Grove Cr.	1	1 (100)	--	--
Loving Cr.	124	15 (12)	18 (15)	91 (73)
Totals	127	18 (14)	18 (14)	91 (73)

Table 14. Numbers and percentages (in parenthesis) of wild, Richfield and hatchery rainbow trout which moved between study sections of Silver Creek, 1975 to 1977.

Species	No. fish moved between sections	Movement into sections					Movement out of sections				
		1	2	3	4	5	1	2	3	4	5
Wild rainbow trout	20	3 (15)	6 (30)	9 (45)	1 (5)	1 (5)	9 (45)	5 (25)	2 (10)	1 (5)	3 (15)
Richfield Canal rainbow trout	47	8 (17)	11 (23)	14 (30)	--	14 (30)	5 (11)	8 (17)	15 (32)	19 (40)	--
Hatchery rainbow trout	159	6 (4)	2 (1)	72 (45)	68 (43)	11 (7)	26 (16)	--	68 (43)	65 (41)	--

Hatchery rainbow trout exhibited considerable downstream movement in the tributaries (Table 13). Seventy-two percent of the hatchery catchable trout planted in the tributaries moved downstream more than 1.6 km (1 mi). Approximately equal numbers of hatchery trout moved upstream or remained at the original point of planting.

Hatchery rainbow trout also migrated down the tributaries into main Silver Creek. Seventeen percent of the hatchery fish tagged and released in Loving Creek and subsequently recaptured were recaptured in Silver Creek.

Movements Between Sections

Relatively few wild rainbow trout moved from one study section of Silver Creek to another (Table 14). Of 144 wild trout recaptured, 20 (14%) moved between sections. A majority of these trout moved out of Sections 1 and 2, and into Sections 2 and 3. Densities of trout were largest in Section 1 (Table 8) and this factor may have effected the numbers of trout migrating out of the section.

Rainbow trout from Richfield Canal also migrated between sections (Table 14). A majority of the Richfield rainbow were introduced into Sections 3 and 4. Consequently, a majority of these fish migrated out of Sections 3 and 4 and into Sections 3 and 5.

Large numbers of hatchery rainbow trout moved between sections in Silver Creek (Table 14). Forty percent of the hatchery rainbow recaptured had moved between sections. A majority of the hatchery trout were planted in Section 3 and 4 and most of them moved between these two sections. However, hatchery rainbow trout also moved from lower sections of Silver Creek into Sections 1 and 2.

Other species also migrated within Silver Creek. Two brook trout moved from Section 4 to Sections 3 and 2 and one brown trout moved from Section 5 to Section 3. We also observed large numbers of mountain whitefish which entered Grove and Wilson creeks to spawn in November, 1976 and 1977.

Age and Growth

Calculated growth rates and scale radius measurements of rainbow trout varied between Sections 1, 2 and 3 (Tables 15, 16, 17). Rainbow trout in Section 3 grew at a faster rate during the first year of life than trout in Sections 1 and 2. However, trout in Sections 1 and 2 grew at a faster rate during the second growing season than trout in Section 3.

Several factors may contribute to the variable growth rate between sections: 1) earlier fry emergence in Section 3, 2) warmer water temperatures in Section 3 during the growing season, 3) the impact of tributary rearing on trout growth rates, and 4) variable proportions of spring and fall spawning races of trout within stream sections. Warmer water temperatures in lower river areas could result in early fry emergence and more rapid growth than in upper river areas (Table 2). Rainbow trout spawners utilize four main tributaries (Stalker, Grove, Wilson, Loving creeks) which enter Section 1 (Figure 1). If progeny of these spawners rear in tributaries for 1 or 2 years, they may exhibit slower initial growth rates. In 1976 and 1977 Gibson observed rainbow trout spawning in Silver Creek and tributaries in spring and fall.

Although the original Silver Creek introductions were of spring-spawning races, subsequent hatchery plants have also established fall spawning races of rainbow trout. Since I could not identify spring and fall spawned trout on the basis of scale analysis, this factor may have introduced considerable variation into the age and growth data.

Rainbow trout collected from Silver Creek in 1976 and 1977 grew at a much slower rate during their second, third and fourth years of life than trout collected in 1952 (Table 18). Calculated total lengths at annulus 3 in 1952 exceeded calculated lengths at annulus 4 in all sections in 1976 and 1977. Further, the trout sampled in 1952 attained a mean total length of 477 mm (18.8 in) at annulus 4 and none of the trout we sampled in 1976 and 1977 exceeded 380 mm (15.0 in) at annulus 4. I believe, however, that the actual differences in growth rates between fish in Silver Creek in 1952 and 1976-1977 may be of less magnitude. In 1952, a disproportionate amount of the fish sampled were large trout. In 1976-1977, 12% of the trout sampled were IV+ and in 1952, 72% of the trout sampled were IV+ or older (Tables 15, 16, 17, 18). Further, in 1952 department personnel analyzed only one fish less than 400 mm (15.7 in) total length. In 1976 and 1977 only 9% of the trout we analyzed exceeded 400 mm (15.7 in) total length. A majority of the trout sampled in 1952 consisted of large, old age (>IV+), fast-growing individuals. In 1976 and 1977 comparable large, old age individuals were not present in the population.

Calculated growth rates and total lengths at each annulus for rainbow trout in Silver Creek in 1976 and 1977 were similar to those found by Mate (1978) in the South Fork Boise River (Table 18). Growth increments for years one through four were nearly identical, particularly when compared to Silver Creek - Section 3. If the data is comparable in the older age classes, a 5-year old trout in Silver Creek could be expected to exceed 414 mm (16.3 in) total length.

Table 15. Calculated total lengths and increments of growth for rainbow trout collected in 1976 and 1977 from Silver Creek - Section 1.

	Age class	No. fish	Mean total length at capture (mm)	Calc. total length at each annulus (mm) 1	2	3	4
1976	I	4	155	96			
	II	13	250	98	195		
	III	6	331	93	197	287	
	IV	4	382	95	176	239	307
		No. of fish		(27)	(23)	(10)	(4)
		Weighted grand average		96	192	268	307
		Mean growth increment		96	96	75	40
1977	I	9	177	113			
	II	14	262	132	234		
	III	18	347	117	205	277	
	IV	9	414	118	212	298	367
		No. of fish		(50)	(41)	(27)	(9)
		Weighted grand average		121	216	284	367
		Mean growth increment		121	96	68	83
$\bar{X}$ 1976-1977		No. of fish		(77)	(64)	(37)	(13)
		Weighted grand average		112	208	280	349
		Mean growth increment		112	96	72	69

Table 16. Calculated total lengths and increments of growth for rainbow trout collected in 1976 and 1977 from Silver Creek - Section 2

	Age class	No. fish	Mean total length at capture(mm)	Calc. total length at each annulus (mm) 1	2	3	4
1976	I	4	123	97			
	II	20	266	121	215		
	III	12	358	116	211	299	
	IV	1	372	121	182	230	286
		No. of fish		(37)	(33)	(13)	(1)
		Weighted grand average		117	212	293	286
		Mean growth increment		117	95	81	7
1977	I	5	215	136			
	II	15	254	124	198		
	III	8	366	126	220	300	
	IV	2	419	143	232	292	355
		No. of fish		(30)	(25)	(10)	(2)
		Weighted grand average		128	208	298	355
		Mean growth increment		128	80	90	57
$\bar{X}$ 1976-1977		No. of fish		(67)	(58)	(23)	(3)
		Weighted grand average		122	211	296	332
		Mean growth increment		122	90	84	37

Table 17. Calculated total lengths and increments of growth for rainbow trout collected in 1976 and 1977 from Silver Creek - Section 3.

	Age class	No. fish	Mean total length at capture(mm)	Calc. total length at each annulus (mm) 1	2	3	4
1976	I	5	172	141			
	II	6	210	121	194		
	III	2	327	131	205	287	
	IV	5	432	141	217	291	350
		No. of fish		(18)	(13)	(7)	(5)
		Weighted grand average		133	204	290	350
		Mean growth increment		133	71	86	60
1977	I	4	221	160			
	II	20	262	138	213		
	III	7	352	141	213	295	
	IV	3	414	155	240	321	379
		No. of fish		(34)	(30)	(10)	(3)
		Weighted grand average		143	215	303	379
		Mean growth increment		143	73	87	76
$\bar{X}$ 1976-1977		No. of fish		(52)	(43)	(17)	(8)
		Weighted grand average		139	212	297	361
		Mean growth increment		139	73	85	64

Table 18. Calculated total lengths and increments of growth for rainbow trout collected in 1952 from Silver Creek and 1977 from South Fork Boise River.

Age class	No. fish	Mean total length at capture (mm)	Calculated total length at each annulus (mm) 1	2	3	4	5	6
I	1	244	132					
II	0							
III	2	468	147	272	379			
IV	6	513	132	274	389	475		
V	1	572	94	191	356	450	528	
VI	1	638	132	348	432	526	569	615
		No. of fish	11	10	10	8	2	1
		Weighted grand average	132	274	386	478	549	615
		Mean growth increment	132	142	114	89	61	46
South Fork Boise River (Mate 1978)								
		No. of fish	126	117	91	44	17	
		Weighted grand average	135	210	300	357	414	
		Mean growth increment	135	75	90	57	58	

Coefficient of Condition

We calculated the condition factors $\left(K = \frac{\text{Weight (gm)}}{\text{Length}^3\text{(mm)}}\right)$ for 298 wild rainbow trout captured in Sections 1, 2 and 3. We collected the trout in June-July, 1976; October-November, 1976 and March, 1977.

Small trout, <200 mm (<7.9 in), were in better condition in early summer and fall than in early spring (Table 19). Presumably food was more available from April through November than it was from November through March. Large trout, >300 mm (>11.8 in), had the largest coefficient of condition in fall and their condition declined during the winter and was smallest in early summer. As previously noted, food was most available from early summer through fall resulting in maximum body condition in fall. In addition, mature trout would be expected to attain their maximum coefficient of condition just prior to spawning in fall through spring. Further, trout which spawned between fall and spring would exhibit their lowest coefficient of condition in early summer, just after spawning and prior to the summer growing season.

Although trout densities varied between Sections 1, 2 and 3 (Table 19), the calculated coefficients of condition within the same season were comparable in Sections 1, 2 and 3. Therefore, larger trout densities within Section 1 apparently did not effect the condition of the trout present.

Anglers and project personnel observed that a large proportion of the fish exceeding 300 mm (11.8 in) in Silver Creek exhibited a low coefficient of condition during the 1977 angling season. The poor condition of these large trout was presumably due to the loss of body condition following spawning and overwintering rather than to reduced food potential for large fish in the stream.

Creel Census

Angler Effort and Catch

Anglers expended an estimated 32,033 hours of effort on Silver Creek and tributaries during the 1977 fishing season (Table 20). Angler effort was largest in Section 3 (37%) followed by Section 1 (24%) (Fig. 6, 7). Within Section 4 and the tributaries angler effort declined considerably during October and November.

Anglers captured an estimated 32,112 game fish from Silver Creek and tributaries in 1977 (Table 20). Anglers captured the largest number of fish in Section 3 followed closely by Section 1 (Fig. 6). Wild rainbow trout comprised a majority of the catch from all sections except 3 and 4 where hatchery rainbow trout were the predominant species captured (55% and 46% respectively). The final plant of hatchery trout occurred on 3 August and anglers captured a few hatchery trout after 15 August (Table 4). Brown trout comprised 21% of the catch from Section 5 and brook trout comprised 18% of the catch from Stalker and Grove creeks. The composition of the catch substantiated the distribution and abundance information collected by electrofishing (Table 8).

Table 19. Calculated seasonal coefficients of condition for wild rainbow trout from Silver Creek, Sections 1, 2 and 3, 1976.

	Section 1				Section 2				Section 3			
Season	Size class (mm)	Sample size	Mean total length (mm)	Mean condition factor	Size class (mm)	Sample size	Mean total length (mm)	Mean condition factor	Size class (mm)	Sample size	Mean total length (mm)	Mean condition factor
June - July 1976	<200	5	179.80	1.068	<200	25	174.96	1.032	<200	17	168.06	1.019
	200-299	23	243.70	.968	200-299	26	240.35	.938	200-299	8	233.63	.876
	300-380	11	341.36	.969	300-380	11	338.09	.872	300-380	4	343.25	.798
	>380	5	403.40	.872	>380	2	399.50	.900	>380	3	443.33	.769
October-November 1976	<200	5	138.20	1.000	<200	9	115.22	1.110	<200	6	128.50	1.283
	200-299	15	250.93	.992	200-299	14	263.43	1.073	200-299	6	239.17	1.059
	300-380	13	332.69	1.009	300-380	19	334.63	1.012	300-380	2	327.00	.927
	>380	4	396.25	1.010	>380	2	394.50	1.051	>380	6	427.83	1.017
March 1977	<200	1	161.00	.886	<200	1	184.00	.851	<200	2	158.50	.907
	200-299	4	268.00	1.030	200-299	6	288.33	.971	200-299	13	264.31	.974
	300-380	4	336.50	.956	300-380	12	342.42	.956	300-380	8	338.25	1.057
	>380	2	443.50	.943	>380	2	395.50	1.024	>380	2	393.50	1.050

Table 20. Harvest information collected on Silver Creek and tributaries from 28 May to 30 November 1977

Stream section	Estimated effort (hrs.)	Estimated no. game fish harvested	Fish per km	Fish per hour	Species Composition (%) W-Rbt	H-Rbt	Bk	Anglers interviewed
Silver Cr. 1	7,772	9,365	2,754	1.20	94	<1	2	551
Silver Cr. 2	4,627	5,300	1,963	1.15	91	3	1	303
Silver Cr. 3	11,963	10,166	1,753	.85	28	55	3	662
Silver Cr. 4	1,630	1,908	367	1.17	32	46	<1	100
Silver Cr. 5	2,227	2,206	227	.99	73	2	21	146
Stalker Cr.	510	397	--	.78	83	0	17	29
Grove Cr.	911	885	--	.98	73	0	19	63
Loving Cr.	2,393	1,885	--	.79	50	33	<1	140
	32,033	32,112						1,994

W-Rbt -Wild rainbow
H-Rbt -Hatchery rainbow
Bk -Brook trout
Brn -Brown trout

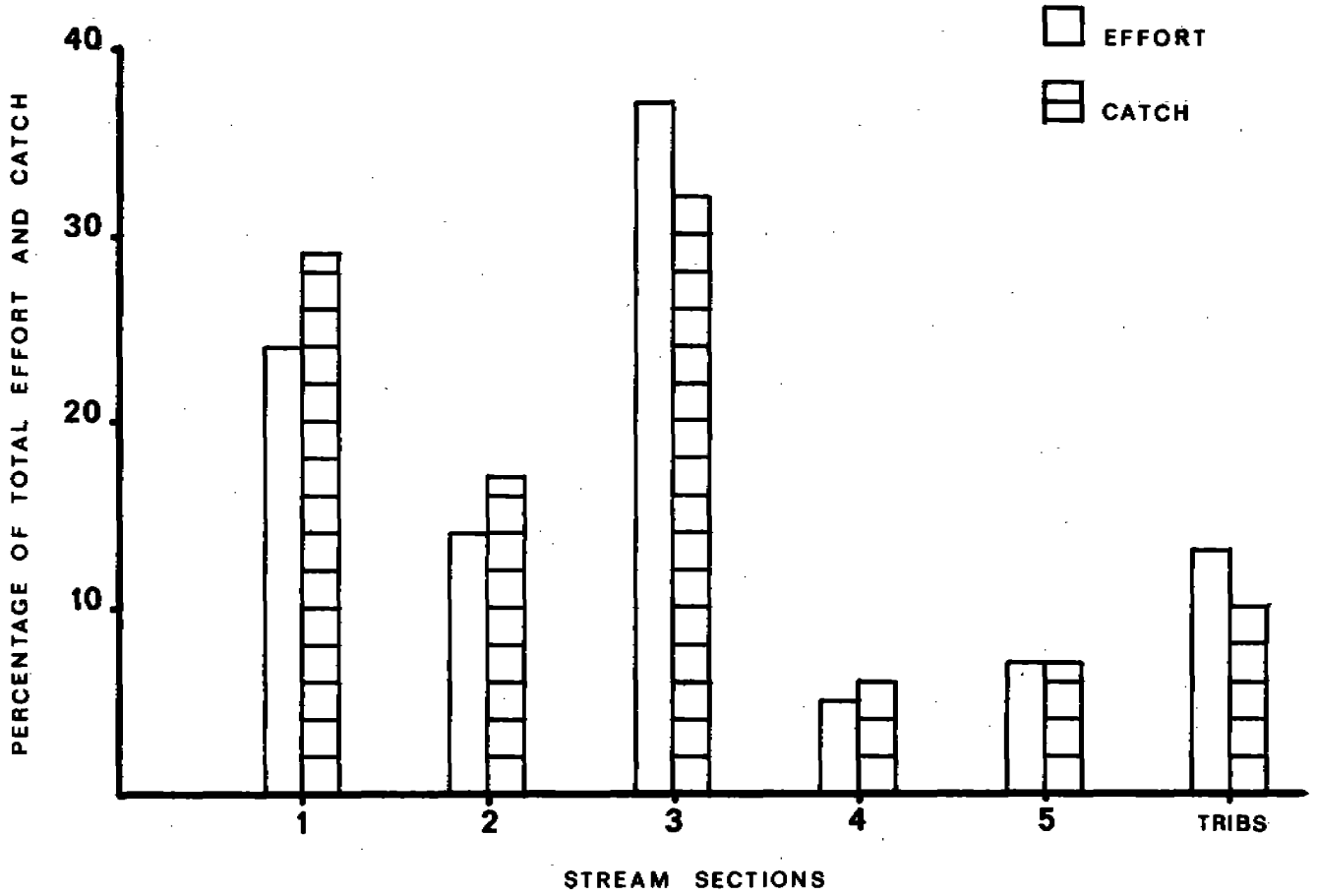

Figure 6. Percentages of total angler effort and catch on Silver Creek, by sections in 1977.

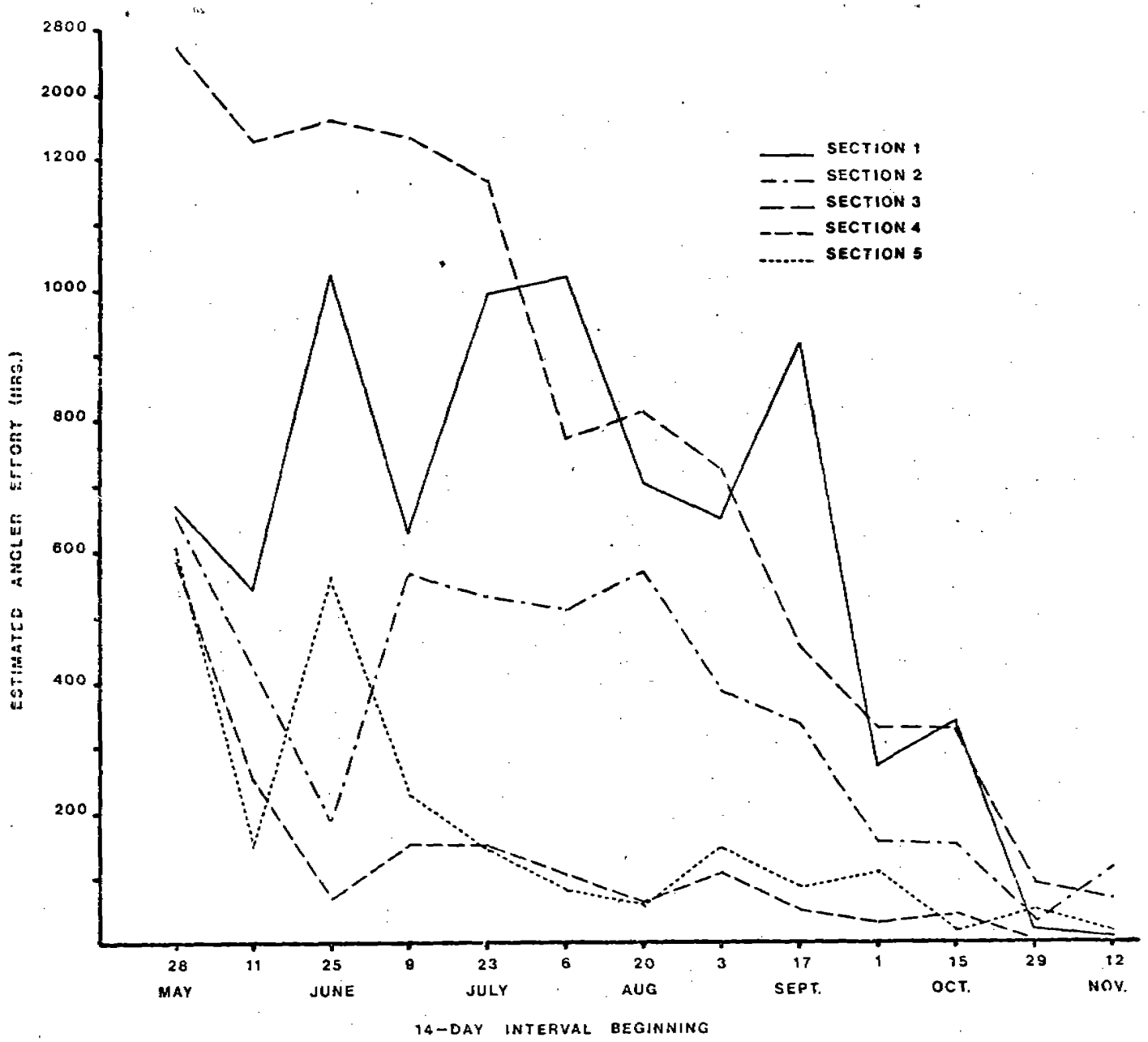

Figure 7. Distribution of angler effort in Silver Creek, by sections in 1977.

Angling effort and the catch of wild rainbow trout followed similar trends throughout the fishing season (Fig. 8). Angler effort and catch were largest during the initial week of the season and thereafter fishing pressure and catch declined. During the third interval, which included Independence Day, there was an increase in angler effort. The catch of wild rainbow increased during intervals 4, 5, 6 and 9 but never approached the peak catch during the initial week of the season. In addition to angler effort expended, a combination of factors including: weather condition, the emergence of aquatic insects and the expertise of the anglers influenced the catch of wild rainbow trout.

Catch Characteristics

Size

Wild rainbow trout captured by anglers varied in size between stream sections (Table 21). The mean total length of trout captured ranged from 219 mm (8.6 in) in Stalker Creek to 346 mm (13.6 in) in Loving Creek and averaged 289 mm (11.4 in) for the entire stream.

The mean total length of rainbow trout captured by anglers was comparable to the mean total length of trout $\geq$ 150 mm ($\geq$ 5.9 in) captured by electrofishing in 1977 (Fig. 9, 10, 11). I used actual fish measurements in computing the mean length of trout captured and the percentage exceeding specified lengths in all areas except Section 1. Since all fish captured in Section 1 were released, the lengths were based upon angler recall. However, Figure 9 indicates that angler recall was fairly accurate in estimating the size of fish captured. Within Section 2, anglers released 71% of the catch (Table 24). Since anglers released the smaller fish and kept the larger fish the mean total length of trout captured and measured was larger than the mean length of trout captured by electrofishing (Fig. 10). Rainbow trout captured by anglers in Section 3 were comparable in size to trout captured by electrofishing although anglers captured and creeled a smaller proportion of fish $<$ 250 mm ($<$ 9.8 in) than the electrofishing indicated were present (Fig. 11). This may have been a result of anglers creeling the larger fish as they did in Section 2.

Anglers captured relatively few large rainbow trout in Silver Creek in 1977 (Table 21). Ten percent of the trout captured exceeded 400 mm (15.7 in) total length and 1% exceeded 500 mm (19.7 in) total length.

Anglers captured a majority of the large rainbow trout in Section 1 and the tributaries (Table 21). Of 156 trout exceeding 400 mm (15.7 in), 75 were captured in Section 1. Project personnel checked only four creeled trout exceeding 500 mm (19.7 in) during 1977, and anglers captured them in Stalker (1), Grove (1) and Loving (2) creeks. Anglers in Section 1 captured five trout exceeding 500 mm (19.7 in) during 1977. Project personnel did not capture any wild rainbow trout exceeding 500 mm (19.7 in) by electrofishing in Sections 1, 2 and 3 in 1976 or 1977.

Age Structure

An abundant group of 2-year old rainbow trout dominated the 1977 catch of wild rainbow trout (Fig. 12). These fish comprised a majority of the harvestable-sized trout in the population (Fig. 3, 4, 5) and they comprised 42% of the catch of wild rainbow trout in all sections of Silver Creek. Age zero and 1-year old

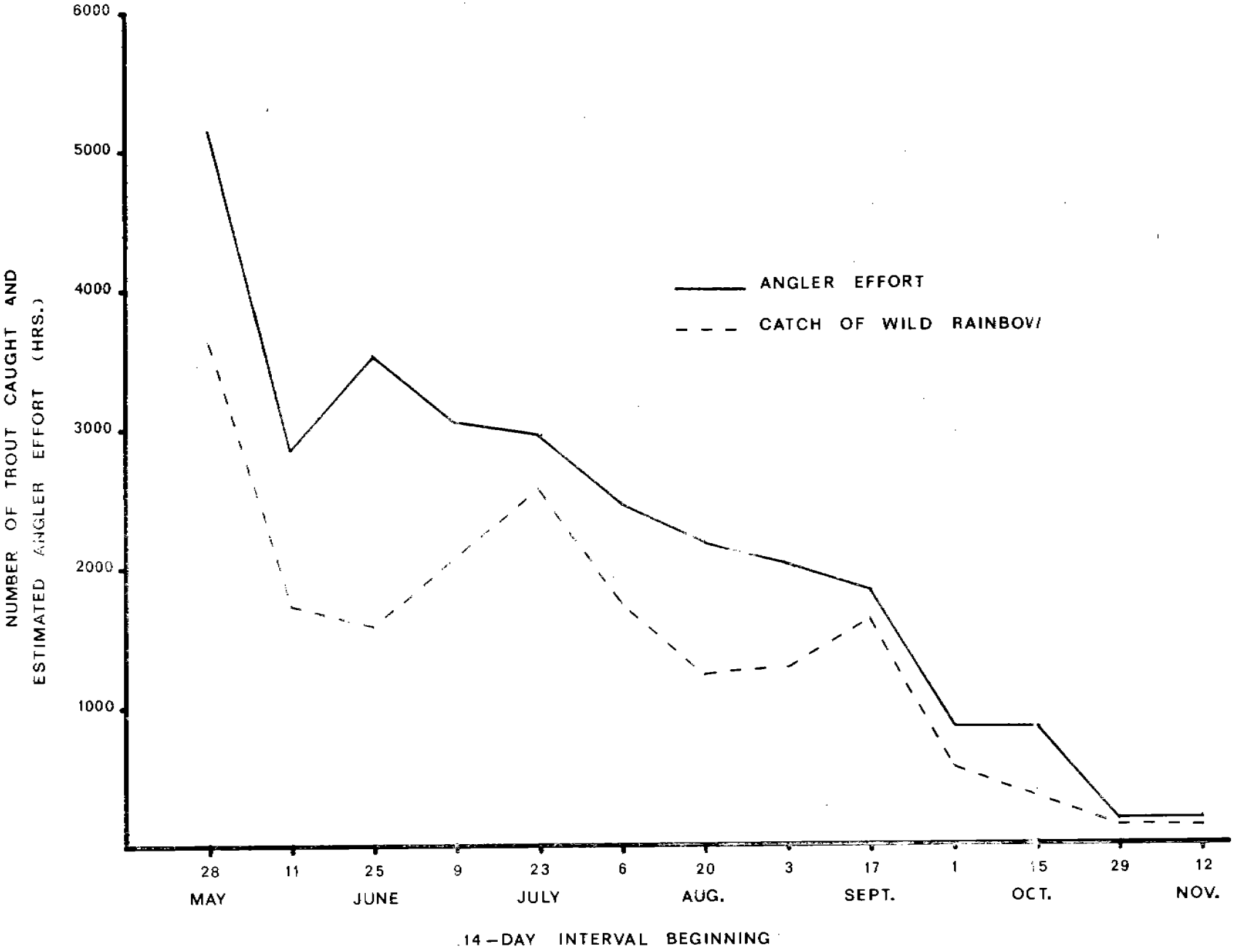

Figure 8. Distribution of angler effort and catch of wild rainbow trout on all sections of Silver Creek, 1977.

Table 21. Mean total length of wild rainbow trout captured by anglers and the percentage of catch exceeding specified lengths in Silver Creek and tributaries, 28 May to 30 November 1977.

Section	Mean total length mm	(in)	Percentage of catch exceeding 300 mm	400 mm	500 mm	Fish in sample
Silver Cr.-1	285	11.2	37	8	1	898
Silver Cr.-2	336	13.2	71	23	0	171
Silver Cr.-3	280	11.0	44	8	0	146
Silver Cr.-4	285	11.2	54	8	0	26
Silver Cr.-5	266	10.5	27	2	0	122
Stalker Cr.	219	8.6	13	5	3	38
Grove Cr.	283	11.1	48	3	3	33
Loving Cr.	346	13.6	67	38	3	58
Stream average	289	11.4	42	10	1	1,492

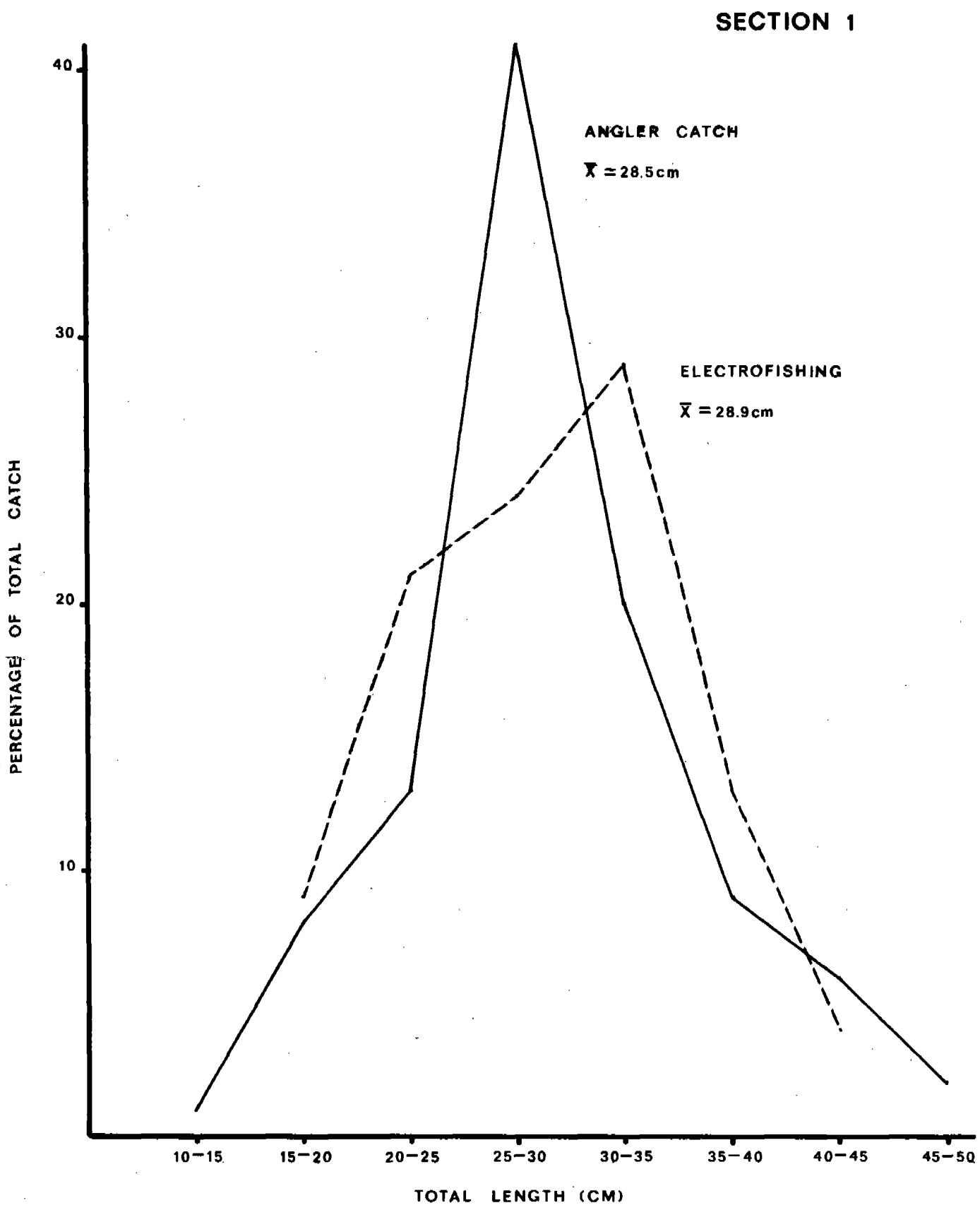

Figure 9. Length frequencies of wild rainbow trout captured by electrofishing and by anglers in Silver Creek - Section 1, 1977

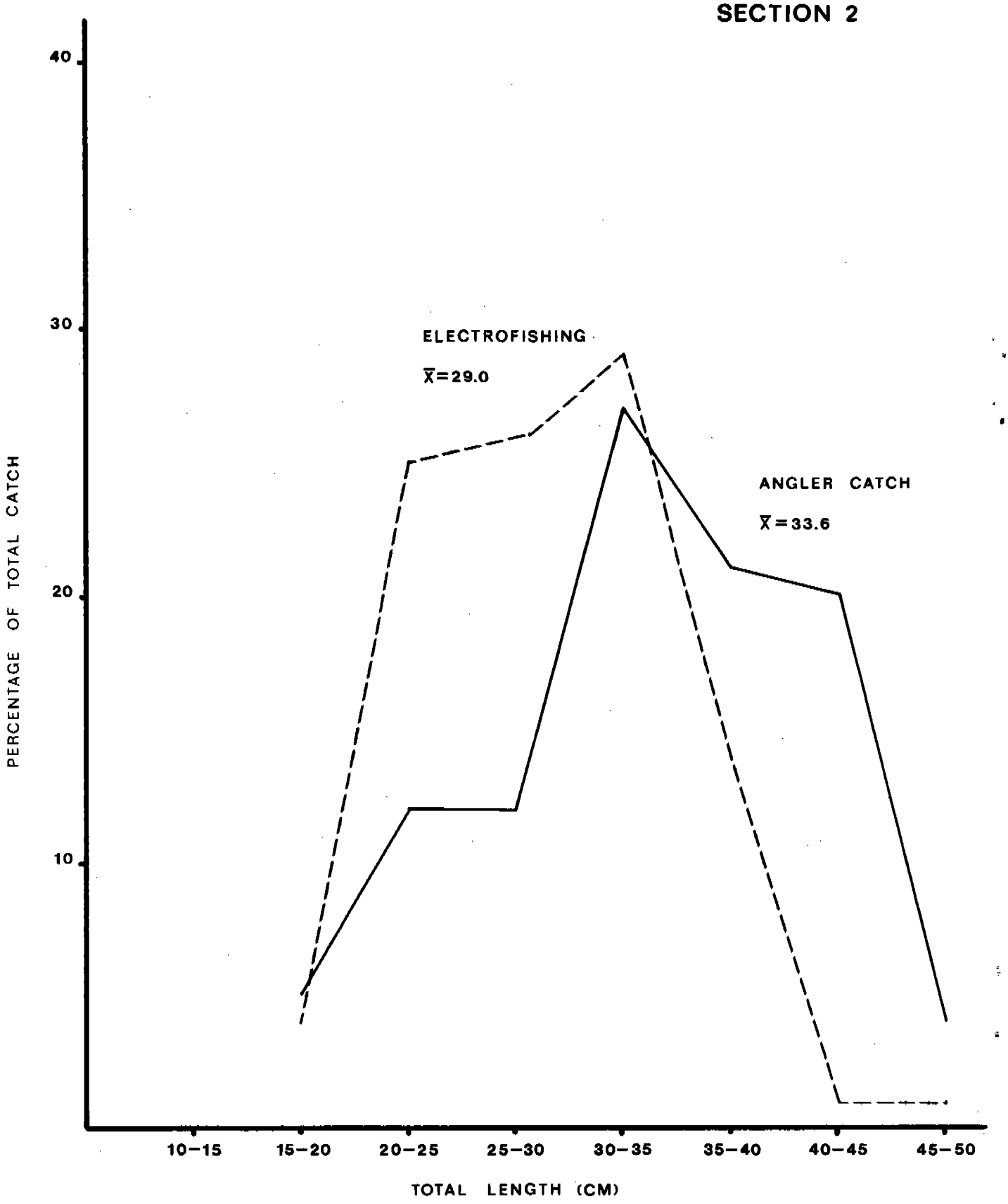

Figure 10. Length frequencies of wild rainbow trout captured by electrofishing and by anglers in Silver Creek - Section 2, 1977.

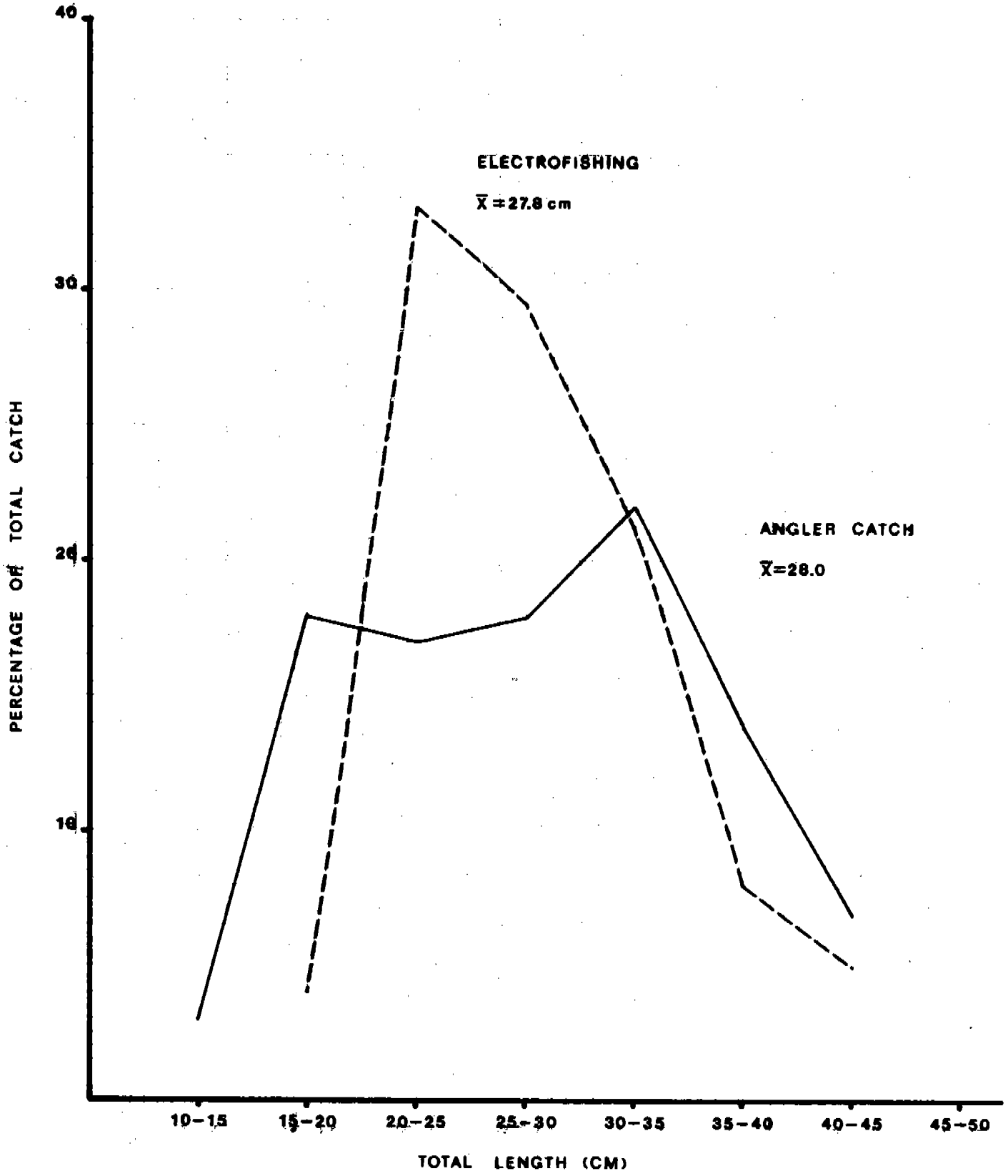

Figure 11. Length frequencies of wild rainbow trout captured by electrofishing and by anglers in Silver Creek - Section 3, 1977.

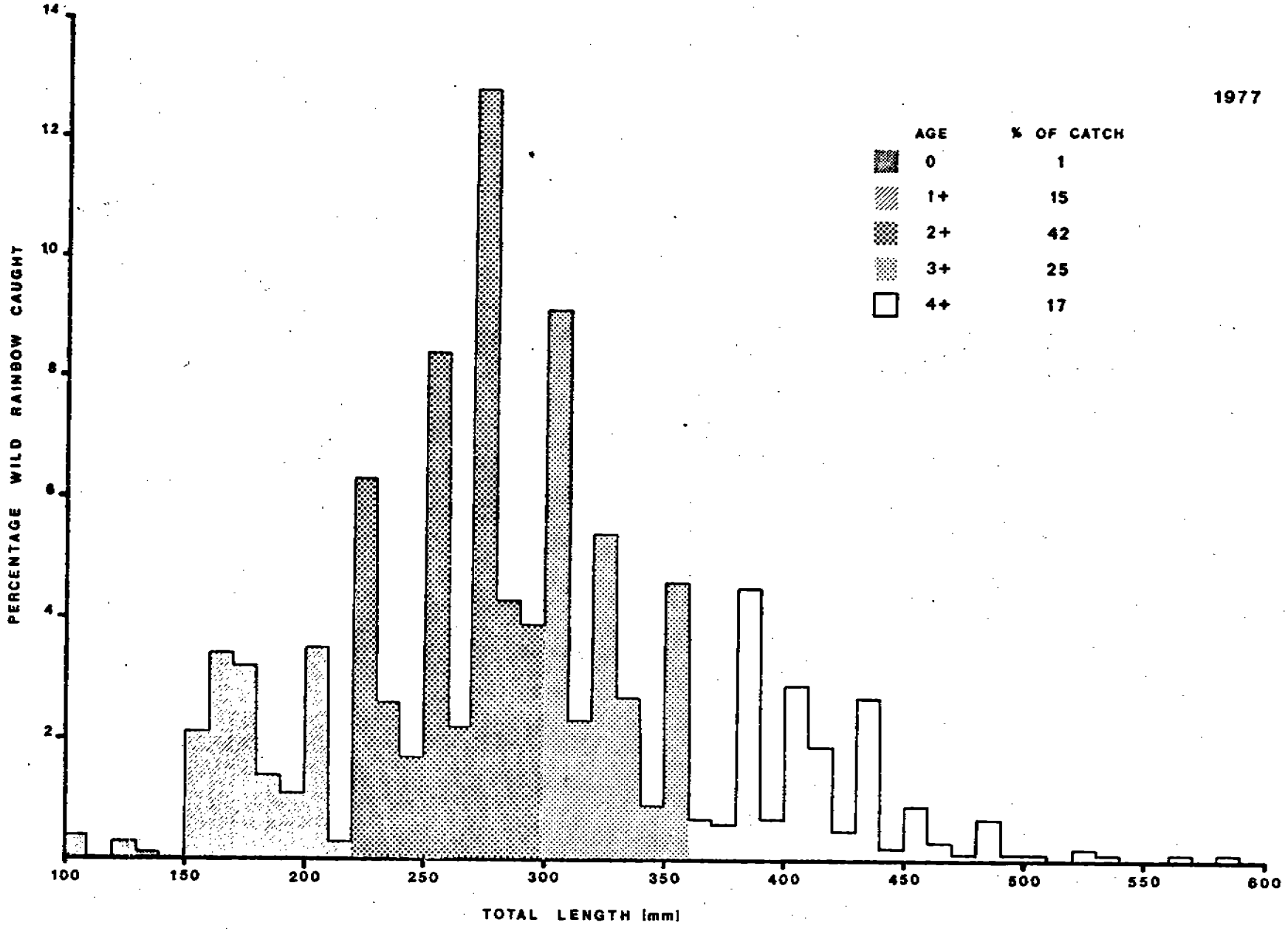

Figure 12. Length frequencies of wild rainbow trout captured by anglers in all sections of Silver Creek, 28 May to 30 November 1977 and the percentage of the catch in various age classes.

Table 22. The percentage of wild rainbow trout captured in Silver Creek by anglers which exceeded specified total lengths by stream section and period, 1977.

Stream Section	I. 28 May to 22 July Percentage of catch exceeding		II. 23 July to 16 Sept. Percentage of catch exceeding		III. 17 Sept. to 30 Nov. Percentage of catch exceeding	
	300 mm	400 mm	300 mm	400 mm	300 mm	400 mm
Silver Creek - 1	39	8	34	7	53	16
Silver Creek - 2	84	29	64	23	56	7
Silver Creek - 3	47	13	41	5	45	0

trout comprised only 16% of the catch. Old-age rainbow trout (IV+) comprised 17% of the catch.

Within Sections 2 and 3, rapid exploitation of larger rainbow trout caused the incidence of large trout in the catch to decline (Table 22). In Section 2 anglers rapidly depleted the supply of trout larger than 300 mm (11.8 in) and 400 mm (15.7 in). In Section 3 the percentage of trout creeled which exceeded 400 mm (15.7 in) declined from 13% during Period I to 0% during Period III. In contrast, within Section 1 the percentage of large rainbow in the catch increased during the same periods. Optimum angling conditions, and an upstream migration of mature trout in the fall may have accounted for the larger incidence of large trout in the catch in Section I during Period III and the smaller number of large trout caught in Section 2 and 3.

Angling Characteristics

Angling Success

A majority of the anglers who fished Silver Creek caught at least one game fish per trip (Table 23). The percentage of successful trips ranged from 68% to 82% with a mean of 79%.

Table 23. Percentage of successful trips on Silver Creek during 1977.

Stream section								Stream
1	2	3	4	5	Stalker Cr.	Grove Cr.	Loving Cr.	average
80	81	78	70	79	68	73	82	79

Anglers captured the largest numbers of game fish per hour in Section I (1.20 fish per hour) followed by Sections 2 and 4 (Table 20). The catch rate in four stream sections approached or exceeded one fish per hour. (Fig. 13). Anglers also captured the largest numbers of game fish per kilometer of stream in Section 1.

The catch rate for wild rainbow trout was largest in Sections 1 and 2 (Table 20). Anglers captured 1.14 rainbow per hour in Section 1 and 1.05 rainbow per hour in Section 2.

Anglers released a large percentage of the wild rainbow trout caught and a large number of these fish were captured more than once during the angling season (Table 24). Within Section 1 (mandatory catch and release) anglers released all captured trout. Although anglers were allowed to keep fish on the remaining stream sections, approximately 50% of the wild rainbow caught were subsequently released. Anglers released over 14,705 wild rainbow trout from a total catch of 20,683 wild rainbow trout in Silver Creek in 1977. Fly fishermen released a majority (94%) of all wild rainbow released in 1977.

Some of the captured fish sustained minor injuries prior to release and we recorded the incidence of hook scars on the trout we captured while electrofishing in 1977. We observed the largest incidence of hook scars on trout in

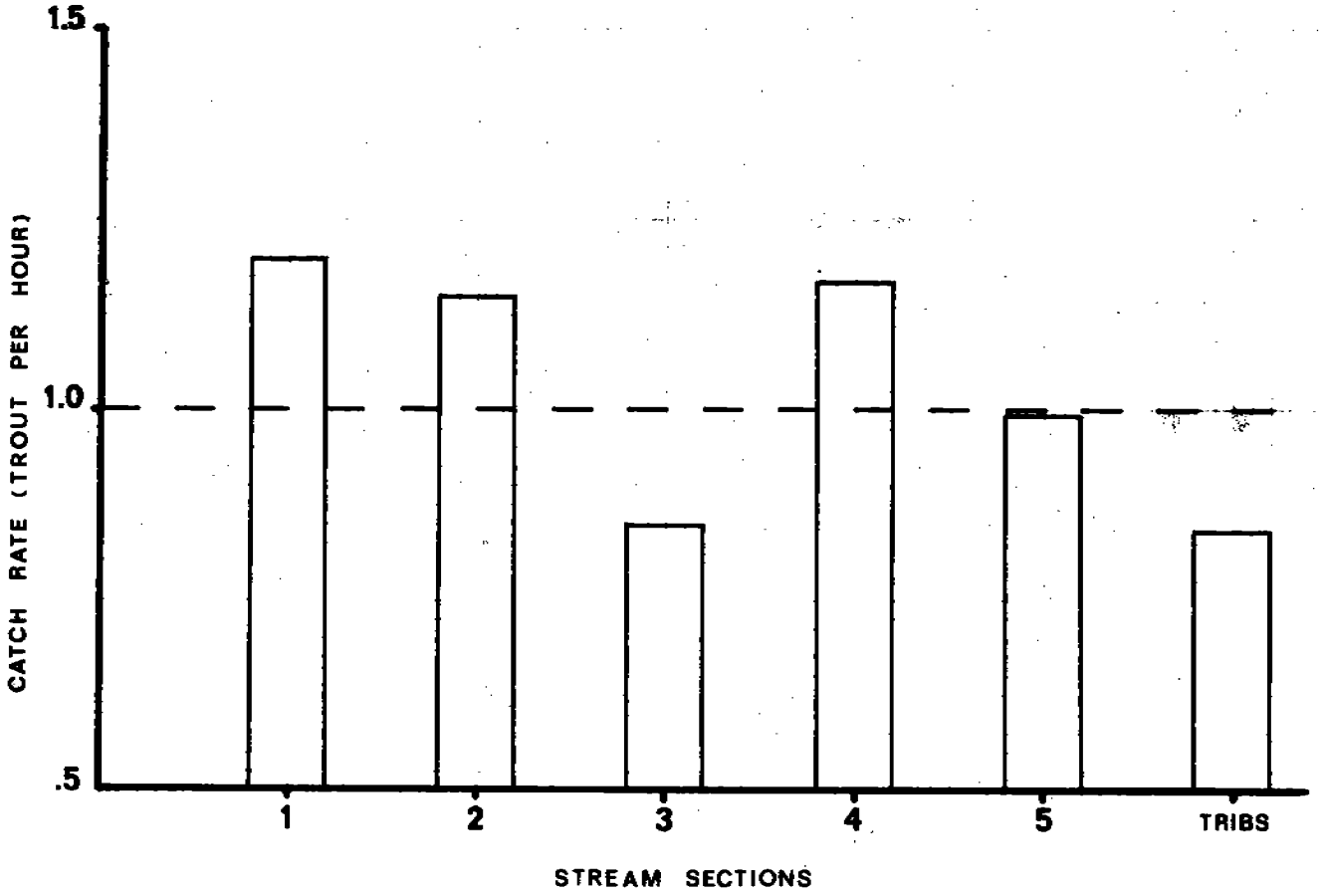

Figure 13. Catch of game fish per hour from Silver Creek by stream section, 1977.

Table 24. Wild rainbow trout released by anglers in 1977; and the percentage of rainbow trout released by anglers using various methods.

Stream section	Wild rainbow trout released		Percentage of wild rainbow trout released, by method		
	Estimated No.	% of Catch	Fly	Bait	Lure
Silver Creek - 1	8,843	100	100	0	0
Silver Creek - 2	3,423	71	98	2	0
Silver Creek - 3	922	32	84	11	5
Silver Creek - 4	104	17	91	0	9
Silver Creek - 5	629	39	93	4	3
Stalker Creek	308	93	100	0	0
Grove Creek	232	36	93	7	0
Loving Creek	244	26	100	0	0
Totals excluding Section 1	5,862	50	94	4	2

Section 1 where 15% of all trout over 250 mm (9.8 in) long exhibited scars. In Section 2, 5% of the trout over 250 mm (9.8 in) and in Section 3, 5% of the trout over 200 mm (7.9 in) long exhibited hook scars. Hook scars consisted of torn mandibles and maxillaries on the fish and I believe they constituted minor injuries in most cases.

Angling Methods

Within all sections of Silver Creek, a majority of the anglers waded the stream or fished from shore (Table 25). Relatively few anglers utilized float tubes or boats. We observed the largest incidence of float tubers in Section 2 (38%). Section 2 is predominantly private land and due to the depth of the stream, float tubes are the only means to fish most of the section.

Bank anglers in Section 2 were more successful than anglers fishing from float tubes. Bank anglers (n=182) averaged 1.16 wild rainbow trout per hour and float tubers (n=119) averaged .88 wild rainbow trout per hour.

A majority of the anglers we interviewed on Silver Creek utilized flies (60%) followed by bait and lures (Table 25). However, when separated by stream sections a majority of the anglers in Sections 3-5, Grove and Loving Creeks utilized bait.

Fly fishermen were more successful than bait or lure anglers in capturing wild rainbow trout (Table 26). Within all stream sections except Section 4, fly anglers exhibited the largest catch per hour. Further, fly fishermen took a disproportionate amount of the catch of wild rainbow trout from Silver Creek (Table 27). Within Section 2 fly fishermen captured 93% of the catch of wild rainbow trout on 82% of the trips. Within Sections 3-5 fly fishermen captured a mean of 59% of the catch of wild rainbow trout on 35% of the trips.

In contrast, bait and lure anglers were more successful than fly fishermen in capturing hatchery catchable rainbow trout in Sections 3 and 4 (Table 26). Within Sections 3 and 4 bait anglers captured 75% of the catch of hatchery rainbow trout on 59% of the trips (Table 27). Two explanations could account for the disparity between the success rates of bait and fly anglers for hatchery trout. Either hatchery trout are more readily caught with bait, or bait anglers actively sought hatchery trout while fly anglers avoided them.

Angler Residence

Resident anglers comprised a majority (68%) of the anglers we interviewed on Silver Creek (Table 28). However, a majority of the anglers we interviewed on Section 1 were non-residents. In contrast, in 1975 non-resident anglers were prevalent only in areas where hatchery catchables were stocked (Mallet 1976). The percentage of resident and non-resident anglers remained similar during Period I (28 May to 22 July),Period II (23 July to 16 Sept.), and Period III (17 Sept. to 30 Nov.). Most resident anglers were locals (within a 97-km, 60-mi, radius) or they lived in Boise or other southern Idaho locations. Californians comprised a majority of the non-resident anglers followed by residents of Oregon and Washington. Anglers from a variety of states and a few foreign countries fished Silver Creek in 1977. During Period II, anglers from 23 states fished Section 1 of Silver Creek.

Table 25. Fishing locations and methods utilized by anglers on Silver Creek and tributaries, 28 May to 30 November 1977.

Stream Section	Angling location (%)			No. sampled	Method used (%)			No. sampled
	Shore	Tube	Boat		Fly	Lure	Bait	
Silver Cr. - 1	100	--	--	537	100	--	--	537
Silver Cr. - 2	61	38	1	301	82	2	16	301
Silver Cr. - 3	96	3	1	659	38	6	56	659
Silver Cr. - 4	90	10	--	104	20	5	75	104
Silver Cr. - 5	95	5	--	154	31	12	57	146
Stalker Cr.	89	--	11	28	86	--	14	28
Grove Cr.	100	--	--	63	32	7	61	66
Loving Cr.	100	--	--	141	34	3	63	143
Totals	92	7	1	1,987	60	4	36	1,984

Table 26. Computed catch rates for trout captured by anglers utilizing various methods on Silver Creek from 28 May to 30 November 1977.

Section	Wild rainbow trout			Hatchery rainbow trout			Anglers interviewed			Total anglers interviewed
	Fly	Lures	Bait	Fly	Lures	Bait	Fly	Lures	Bait	
Silver Cr. - 1	1.14	--	--	--	--	--	551	--	--	551
Silver Cr. - 2	1.18	.25	.69	--	--	--	245	6	47	298
Silver Cr. - 3	.42	.29	.12	.18	.73	.45	241	41	377	659
Silver Cr. - 4	.38	.64	.14	.07	.21	.56	23	4	60	87
Silver Cr. - 5	1.02	.18	.65	.27*	.23*	.18*	50	22	74	146

* Brown trout captured per hour.

Table 27. Percentage of total trips and percentage of total catch by angling method in Silver Creek, 1977.

Stream section	Method	Percent of trips	Wild rainbow trout percent of catch	Hatchery rainbow trout percent of catch	
Silver Creek - 1	Fly	100	100	--	
Silver Creek - 2	Fly	82	93	--	
	Lure	2	1	--	
	Bait	16	7	--	
Silver Creek - 3	Fly	38	65	18	
	Lure	6	6	10	
	Bait	56	29	72	
Silver Creek - 4	Fly	20	41	4	
	Lure	5	8	1	
	Bait	75	51	95	
Silver Creek - 5	Fly	31	52	56*	
	Lure	12	3	12*	
	Bait	57	45	42*	
Totals Sections 3, 4, 5	Fly	35	59	16	Sections 3, 4
	Lure	7	5	9	
	Bait	58	36	75	

* Percent of catch of brown trout

Table 28. Residence of anglers interviewed on Silver Creek, 28 May to 30 November 1977.

Stream section	Total		
	Idaho residents (%)	Non-residents (%)	Anglers interviewed
Silver Cr. - 1	40	60	466
Silver Cr. - 2	74	26	258
Silver Cr. - 3	77	23	622
Silver Cr. - 4	64	36	87
Silver Cr. - 5	89	11	132
Stalker Creek	75	25	28
Grove Creek	75	25	53
Loving Creek	89	11	120
Totals	68	32	1,766

Angler Opinions

A majority of the anglers we interviewed on Silver Creek and tributaries, considered the fishing good or fair, were satisfied with the species composition in the stream, and preferred to catch wild rainbow trout. Anglers within Sections 1, 2 and Stalker Creek opposed hatchery catchable releases (74% negative). In contrast, a majority (85%) of the anglers in the other stream sections favored hatchery catchable releases.

Anglers interviewed on all sections of Silver Creek except Section 5 and Grove Creek supported the catch and release regulations currently in effect on Section 1. Excluding responses from Section 1, 66% of the remaining 361 anglers we interviewed, supported the catch and release regulations.

A majority of the anglers we interviewed did not favor the use of boats on Silver Creek. Over 70% of the anglers did not favor the use of float tubes in the Conservancy Section. Approximately 84% of the anglers interviewed while fishing on the Conservancy did not favor the use of float tubes in that section. Most anglers believed more access is not needed on Silver Creek. A majority of the anglers who believed more access was needed suggested additional access be developed in Section 5 below Highway 68. Ninety-four percent of the anglers we interviewed were satisfied with the current six fish - 14 inch general regulation.

Angler responses to questions in 1977 were consistent with responses obtained during the preliminary survey in 1975 (Mallet 1976).

ANGLER OPINION SURVEY

The specific questions posed to anglers and their responses (as percentages)follow:

1. QUESTION: Do you consider fishing on Silver Creek good, fair, or poor?

Response:	Good	Fair	Poor	N.
Section 1	56	35	9	189
Section 2	45	44	11	96
Section 3	44	50	6	144
Section 4	36	61	3	36
Section 5	41	47	12	32
Stalker Cr.	50	50	-0-	12
Grove Cr.	24	76	-0-	21
Loving Cr.	56	37	7	27
Total	47	45	08	557

2. QUESTION: Is the current species composition satisfactory?

Response:	Yes	No	N
Section 1	95	5	149
Section 2	94	6	79
Section 3	96	4	140
Section 4	100	-0-	33
Section 5	85	15	26
Stalker Cr.	100	-0-	12
Grove Cr.	95	5	20
Loving Cr.	100	-0-	26
Total	.95	.05	485

3. QUESTION: What species do you prefer to catch?

Response:	Wild rainbow	Rainbow or brook	Brown	N
Section 1	95	2	3	112
Section 2	98	-0-	2	65
Section 3	87	11	2	99
Section 4	87	10	3	31
Section 5	62	27	11	26
Stalker Cr.	50	34	16	12
Grove Cr.	90	5	5	20
Loving Cr.	89	11	-0-	28
Total	89	09	02	393

4. QUESTION: Do you favor hatchery catchable releases?

Response:	Yes	No	N
Section 1	20	80	174
Section 2	37	63	89
Section 3	85	15	147
Section 4	71	29	35
Section 5	90	10	29
Stalker Cr.	33	67	12
Grove Cr.	81	19	21
Loving Cr.	96	4	27
Total	54	46	534
Section 1, 2 Stalker:	26	74	
Remainder:	85	15	

5. QUESTION: Do you support the catch and release regulation currently in effect on the Conservancy?

Response:	Yes	No	N
Section 1	79	21	140
Section 2	78	22	85
Section 3	67	33	150
Section 4	67	33	36
Section 5	47	53	30
Stalker Cr.	92	8	12
Grove Cr.	36	64	22
Loving Cr.	58	42	26
Total	70	30	501

6. QUESTION: Do you favor the use of boats on Silver Creek?

Response:	Yes	No	N
Section 1	6	94	131
Section 2	7	93	82
Section 3	18	82	139
Section 4	35	65	37
Section 5	18	82	28
Stalker Cr.	25	75	12
Grove Cr.	5	95	21
Loving Cr.	4	96	26
Total	13	87	476

7. QUESTION: Do you favor the use of float tubes in the Conservancy Section of Silver Creek?

Response:	Yes	No	N
Section 1	16	84	135
Section 2	58	42	90
Section 3	27	73	142
Section 4	63	37	35
Section 5	21	79	29
Stalker Cr.	17	83	12
Grove Cr.	24	76	21
Loving Cr.	11	89	27
Total	29	71	491

8. QUESTION: Is more access needed on Silver Creek?

Response:	Yes	No	N
Section 1	9	91	173
Section 2	9	91	87
Section 3	22	78	143
Section 4	6	94	32
Section 5	17	83	30
Stalker Cr.	-0-	100	12
Grove Cr.	38	62	21
Loving Cr.	15	85	26
Total	14	86	524

9. QUESTION: Is the current six fish- 14 inch limit acceptable?

Response:	Yes	No	N
Section 1	97	3	154
Section 2	89	11	88
Section 3	95	5	148
Section 4	94	6	35
Section 5	90	10	31
Stalker Cr.	92	8	12
Grove Cr.	100	-0-	20
Loving Cr.	85	15	27
Total	94	06	515

SUMMARY AND CONCLUSIONS

Population Status

Silver Creek currently supports an abundant population of self-sustaining wild rainbow trout. Results of trout distribution and abundance surveys indicate that wild rainbow trout are most abundant in the upper two sections and tributaries of Silver Creek.

The wild rainbow trout population is comprised of predominantly 2- and 3-year-old trout. Large, >400 mm (>15.7 in), and old age (>IV+) trout are uncommon. Sections 1 and 2 and the tributaries contain the largest proportion of large trout.

Since the early 1900's a variety of rainbow trout stocks have been introduced into Silver Creek forming a complex gene-pool. As a result, Silver Creek supports spring-spawning and fall-spawning strains of rainbow trout. Although most wild rainbow trout sustained a limited home range, a portion of the population exhibited upstream and downstream migrations in the spring and fall which were related to spawning.

The upper tributaries function as important spawning areas for adult rainbow and rearing areas for juvenile trout. Electrofishing data indicates that juvenile trout from the tributaries enter main Silver Creek.

A small percentage of the wild trout in Silver Creek migrated considerable distances (>15 km) although most (72%) remained within 1.6 km (1 mi) of the release site. A majority of the trout which migrated between study sections moved out of the upper sections into lower sections. These movements may have been related to spawning and/or displacement out of upper areas with large trout densities.

A large portion (50%) of the hatchery rainbow trout released in Silver Creek moved considerable distances from the planting site. Catchable trout moved into areas in which no hatchery trout were planted.

Trout sampled in 1976 and 1977 grew slower than trout sampled in 1952. However a disproportionate number of the trout sampled in 1952 consisted of old age fish. Growth of wild rainbow in Silver Creek in 1976 and 1977 was comparable to growth rates of trout in the South Fork Boise River (Mate 1978).

Large trout densities in Section 1 apparently did not affect the growth and condition of the trout present. The poor condition of large-size trout, >300 mm (>11.8 in) was presumably due to the loss of body condition after spawning and over wintering rather than to reduced food availability.

Status of Fishery

Silver Creek supports a very significant fishery which sustains one of the largest levels of angler effort in Region 4. Angler effort estimates are comparable to other high quality trout streams in Idaho as the Henrys Fork Snake River (Coon 1977) and the South Fork Boise River (Mate 1978).

Indices of angling quality indicate that Silver Creek sustains a high quality of wild trout fishery. Catch rates exceeding one fish per hour and a successful trip ratio of nearly 80% are indicative of a quality trout stream. However, the lack of large, > 400 mm (>15.7 in), "trophy" trout may detract from the angling experience. The catch consists of predominantly 2- and 3-year old trout with relatively few trout over 4-years old.

Silver Creek is an extremely popular stream with fly fishermen. Fly fishermen comprised a majority of the anglers who fished Silver Creek in 1977. Anglers utilizing flies were also the most successful fishermen on Silver Creek and they creeled a disproportionate amount of the catch of wild rainbow trout for the effort expended.

Fly anglers also released a large percentage of the wild rainbow trout they captured. The release of trout in all stream sections probably helped to distribute the catch among more anglers and to sustain the relatively large catch rates throughout the angling season.

Although resident anglers comprised a majority of the anglers who fished Silver Creek in 1977, non-resident anglers outnumbered resident anglers on the catch and release section. Silver Creek attracted anglers from numerous states and a few foreign countries in 1977.

Most anglers who fished Silver Creek considered the fishing good or fair, were satisfied with the species composition in the stream, and preferred to catch wild rainbow trout. Anglers opposed plants of hatchery catchable rainbow trout in the upper sections of the creek and they supported the catch and release regulation in effect on Section 1.

DISCUSSION

Management Goals

Optimum management of the Silver Creek drainage is contingent upon the formulation of specific management goals which will sustain the desired population structure. As Mate (1977) observed, definite management goals outlining the desired percentage of the fish population exceeding a specific size, catch rates, and numbers of fish harvested are necessary before regulation options can be formulated. Fishery managers face a number of options in managing Silver Creek. These options range from sustaining a large harvest of small, young-aged trout to severely restricting harvest in an attempt to establish a fishery for large trout. Different regulations may also be applied to separate stream sections as in 1977. Once specific management goals are established, the information obtained during the fisheries investigations conducted from 1975 to 1977 can be utilized to implement management programs in the Silver Creek drainage.

Silver Creek currently supports an abundant population of wild rainbow trout comprised of predominantly 2- and 3-year old trout. The relatively high productivity of the creek indicates that it may be capable of producing much larger trout.

Historically, Silver Creek did support a high quality fishery for large trout. Anglers who fished Silver Creek since the 1920's reported catching

numerous 1.4 to 2.3 k (3 - 5 lb) trout with larger trout ranging to 4.6 kg (10 lb) (Fig. 14). In the 1940's and early 1950's reports of 1.4 to 2.3 kg trout were also common and Irving (1952) reported catch rates of one fish per hour with "many" 1.8 to 2.3 kg(4 to 5 lb) trout captured on opening day in 1952. Photographs I obtained indicate anglers captured trout up to 3.6 kg(8 lb) in Silver Creek as recently as 1962. Although large rainbow trout captured since 1955 could have been transplanted Richfield Canal trout, trout captured earlier were definitely produced in Silver Creek. Today, trout exceeding 1.4 kg(3 lb) are uncommon in Silver Creek.

Restoration of Silver Creek to its former status as a producer of large trout will necessitate defining the factors which contributed to the decline of large trout in the stream. Once these factors are identified fishery managers may attempt to alleviate them. Plausible reasons for the decline of large trout in Silver Creek include dilution of the genetic stock, a decline in stream productivity and angler overharvest of trout.

Stock Dilution

Random introductions of several races of rainbow trout have altered the genetic makeup of the original Silver Creek stock. The original trout were spring-spawners and trout currently spawn in spring and fall. It is possible that introductions of inbred hatchery stocks have produced a shorter lived trout which matures at an early age. In 1976 Gibson collected ripe female trout to 235 mm (9.3 in) and ripe males to 197 mm (7.6 in) (age II+). These trout would be incapable of utilizing the food production in Silver Creek to attain a large size over a number of growing seasons.

Future introductions of hatchery-reared trout, particularly those from inbred populations of hatchery stock, should be carefully scrutinized. Studies of fall and spring spawning populations of rainbow trout in Wyoming demonstrated that inbreeding equivalent to one generation of full sibling mating produced significant reduction in growth rate, survival, and food conversion efficiency and also increased frequencies of crippled fry (Kincaid 1976). The reduced growth rate and food efficiency was maintained through the first year and the author believed "probably through the entire life cycle". Reisenbichler and McIntyre (1977) also observed that hatchery reared steelhead trout were genetically different from wild fish and when they inbred with wild fish reduced the number of smolts produced.

Any future plantings of hatchery reared rainbow trout should be limited to Sections 3 and 4 of Silver Creek. For the following reasons, hatchery catchable plants should be curtailed in Sections 1, 2, 5 and the tributaries:

1) A large percentage of the hatchery trout planted in Silver Creek, particularly those planted in Loving Creek, moved from the

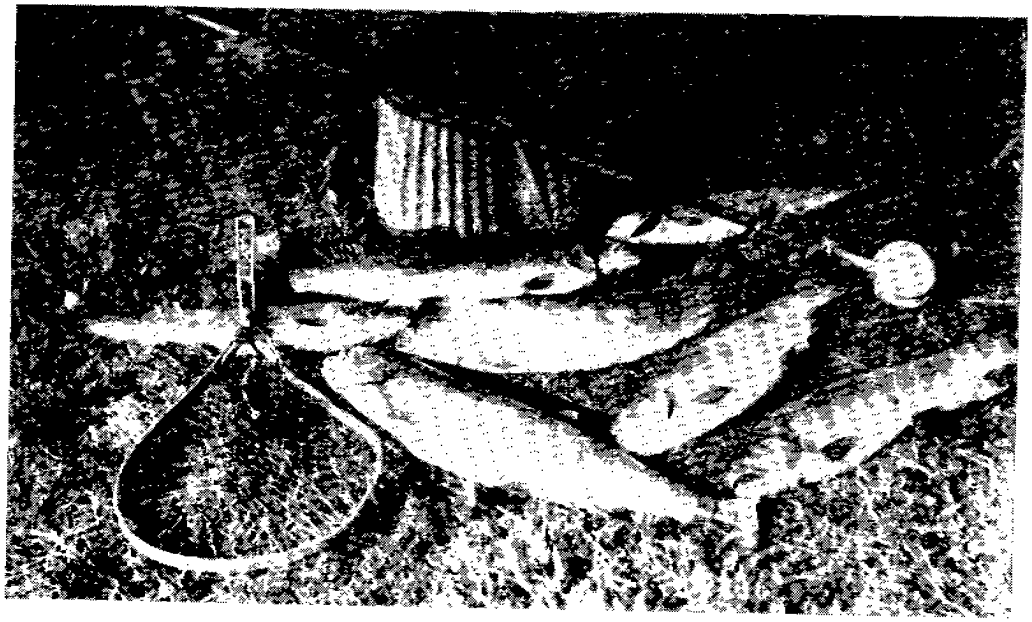

Figure 14. Photos of large rainbow trout captured in Silver Creek - circa 1925, from the collection of Mrs. Claude High.

planting site into areas of the stream where they were not accessible to anglers or not desirable.

2) Anglers who fish Silver Creek prefer to catch wild rainbow trout and anglers on Sections 1, 2 and Stalker Creek oppose plantings of hatchery catchable trout. Hatchery trout planted above Section 3 will eventually enter Sections 1 and 2.

3) Tributaries provide spawning areas for wild rainbow trout. Introduction of large numbers of hatchery catchable trout may adversely impact adult spawning and juvenile rearing.

4) Hatchery catchable plants should be confined to stream sections exhibiting public access and large angler effort in order to accrue maximum public benefit.

Only Section 3 and Section 4 at Picabo bridge meet these criteria. A majority of the anglers who fish these sections also support hatchery catchable plants.

In the future, fishery managers may chose to curtail all hatchery catchable plants and attempt to sustain a wild trout fishery. Currently Silver Creek sustains a large wild trout population, particularly in the upper sections and tributaries. Wild trout comprise a majority of the catch in all areas except Sections 3 and 4 where large numbers of hatchery catchables are planted. It is possible to alter the catch composition in Sections 3 and 4 from primarily hatchery catchable rainbow to wild rainbow trout through implementation of alternative angling regulations and termination of hatchery catchable plants. Mate (1977) reported more large trout and higher catch rates in the South Fork Boise River where such a management procedure was implemented in 1976.

If the gene pool of trout in Silver Creek has been altered to the detriment of the population, measures may also be taken to restore a desirable race of trout. The optimum rainbow trout stock for Silver Creek would exhibit rapid growth rates and late maturity. These trout would be capable of attaining a large size after a number of growing seasons in a productive environment. Fishery managers could experimentally rear and introduce a wild stock of fast growing, late maturing trout into Silver Creek. The brood stock should be replaced periodically to reduce the incidence of inbreeding.

Altered Productivity

During the past 30 years much of the land adjacent to Silver Creek has been coverted from natural vegetation and pastureland into wheat and barley production. Wind erosion and runoff from the cultivated lands have undoubtedly introduced quantities of silt into Silver Creek and tributaries. During the winter months, Hayspur Hatchery personnel reported approximately 365 tons of silt entering the hatchery per month through its intake in Loving Creek.

It is feasible that the influx of silt has reduced the available trout spawning areas and the aquatic vegetation with a subsequent decline in recruitment and fish food production. The magnitude of this siltation is difficult to discern since no past data is available.

Some silt appears to be essential since it functions as the substrate for Chara and Potamogeton beds which support much of Silver Creek's invertebrate population (Francis 1977). However, trout sampled in 1952 grew faster than trout sampled in Silver Creek in 1976 and 1977 and it is possible that the decline in growth was due to decreased production since 1952. It is also likely that the actual differences in growth rates would have been much less if a larger 1952 sample were available.

At the present time I have no basis to conclude that habitat degredation has caused a decline in the productivity of Silver Creek and its ability to produce large trout. In 1978 Idaho State University will begin a study to evaluate the levels of silt entering Silver Creek so additional data is forthcoming. Irregardless of future studies, proper stream management dictates that we prevent additional removal of stream bank vegetation and promote techniques of bank cover restoration in areas where cattle grazing and land clearing have denuded it. This is particularly applicable on the upper tributaries of Silver Creek.

Angler Overharvest

Anglers may have over-harvested the rainbow trout in Silver Creek, removing the larger faster growing individuals and shifting the population to its present status of smaller, younger-aged trout.

Due to its accessibility and reputation as a producer of large trout, anglers have exerted a large amount of effort on Silver Creek since the 1940's. As early as 1957 Irving (1958) estimated that Silver Creek provided 25,000 man days of angling. During the same period, anglers enjoyed liberal catch regulations until the late 1970's. Daily bag limits allowed anglers to keep 25 trout up to 1945, 20 trout up to 1952, 15 trout up to 1972, and 10 trout up to 1977. Angling regulations on Silver Creek varied considerably during its history and special regulations including no boating, headwater stream closures, and fly fishing only sections have been utilized periodically.

If overharvest has caused the decline of large trout in Silver Creek, special regulations as the catch and release (C&R) regulation instituted in 1977 would be expected to increase the abundance of large trout through decreased angling mortality. Although the regulation has only been in effect one angling season, we observed some changes in the population structure in the C&R section as compared to the other sections. Between 1976 and 1977 the abundance of large trout in Sections 2 and 3, as assessed by electrofishing, declined. In contrast, within the C&R section the abundance of large trout increased between 1976 and 1977. Further, during the 1977 angling season we observed a rapid depletion in the percentage of large fish creeled in Sections 2 through 4 between the initial months of the angling season and the close of the season. In contrast, within Section 1 anglers caught more large fish during the latter part of the season than during the initial part. During 1977 trout densities were also larger in Section 1 than any section except the tributaries and more fish moved out of the section than any other area of Silver Creek.

During 1978 and in the ensuing seasons we should continue to

monitor the effects of the catch and release regulation on the size, age structure, and growth rates of wild trout in Silver Creek. If trophy-sized trout are a product of the restrictive regulations, fishery managers may utilize this technique to restore Silver Creek to its former status as a producer of large trout.

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IDAHO
DEPARTMENT OF FISH & GAME

Joseph C. Greenley, Director

FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Performance Report

Project F-66-R-1

RIVER AND STREAM INVESTIGATIONS

Job No. III. Silver Creek Fisheries Investigations

Period Covered: 1 March 1975 to 29 February 1976

by

Jerry Mallet
Fishery Research Supervisor

May, 1976

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State of Idaho Name: RIVER AND STREAM INVESTIGATIONS

Project No. F-66-R-1 Title: Silver Creek Fisheries Investigations

Job No. III

Period Covered: 1 March 1975 to 29 February 1976

ABSTRACT

Silver Creek has been a stream of national renown for many years. Because of the importance of Silver Creek as a trout fishery, an intensive fishery investigation has been programmed. During 1975 a limited effort was made to collect information that will assist in preparation for more intensive studies to be conducted in 1976 and 1977.

Fishing in Silver Creek during 1975 was relatively good as indicated by catch rates from 0.8 to 2.6 in various stream sections. Over half (59%) of the anglers listed fishing as good and only 6% listed it as poor.

Anglers kept fewer trout (9%) in section 1 ("fly-only") and anglers fishing section 3 ("hatchery rainbows") kept most fish (97%).

Approximately 93% of the anglers interviewed did not favor the use of boats for fishing on Silver Creek. About 84% did not favor the use of float tubes in the "fly-fishing-only" section of Silver Creek.

The 14-in regulation on Silver Creek and tributaries was satisfactory to 88% of the anglers.

Forty percent of the anglers on Silver Creek fished with flies, 13% with lures and 47% with bait. However, bait was used by over 50% of the anglers utilizing those stream sections where they had a choice.

Idaho residents composed 55% of the anglers interviewed on Silver Creek during 1975. Nonresident anglers were in the majority only in areas in which hatchery catchable rainbows were stocked.

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RECOMMENDATIONS

Conduct detailed studies on Silver Creek to include fish distribution and abundance, food availability and utilization, physical habitat evaluation, total harvest and use estimates and angler preference work.

OBJECTIVES

To monitor angler opinions, preferences, and/or attitudes on Silver Creek.

To ascertain catch rates for anglers fishing the "fly-fishing-only" section and the nonregulated section of Silver Creek.

INTRODUCTION

Silver Creek has been a stream of national renown for many years. As early as 1947 there was concern for declining fishing success and reduced fish size (Hauck 1947).

Silver Creek is a stream with relatively high productivity, stable stream flows, good water clarity and abundant aquatic vegetation. Bell (1967), Gebhards (1963) and others tie much of the productivity of this stream to the aquatic vegetation.

During 1957 Irving indicated that Silver Creek provided approximately 25,000 fishermen days of excellent trout angling annually (Bell 1967). Angler use and harvest have probably increased significantly since 1957.

Regulations on Silver Creek have undergone many changes over the years with current regulations limiting harvest to five trout, no more than one of which may exceed 14 inches in total length. A "fly-fishing-only" regulation is in force for Stocker Creek and for Silver Creek from the Kilpatrick bridge upstream. Fishing from boats or rafts is not permitted in Silver Creek. Use of float tubes is limited to those areas other than "fly-only" areas. Season length is from 29 May to 30 November (the general season).

Because of the importance of Silver Creek as a trout fishery, an intensive fishery investigation has been programmed. Fish distribution and abundance, food availability and utilization and physical habitat work will be undertaken in 1976. Creel census to determine total harvest, use and angler preferences will be conducted during 1977. The work accomplished during 1975 was initiated in order to obtain information that would assist in the finite planning for the 2 years of intensive study.

TECHNIQUES USED

The work undertaken during 1975 was in preparation for more intensive studies to be conducted during 1976 and 1977.

For the purposes of our study we divided Silver Creek into five sections (Fig. 1):

Section 1 -- Stocker Creek to Kilpatrick bridge (fly-fishing only).

Section 2 -- Kilpatrick bridge to Highway 68 (General regulations - no hatchery rainbow).

Section 3 -- Highway 68 to Picabo bridge (General regulations - hatchery rainbow).

Section 4 -- Picabo bridge to lower Highway 68 crossing (General regulations - no hatchery rainbow).

Section 5 -- Lower Highway 68 crossing to stream mouth (General regulations - no hatchery rainbow).

These sections were designated because of differences in habitat, fishing regulations and hatchery releases. Grove, Loving and Stocker creeks were considered separately.

Conservation Officer Lee Frost interviewed anglers and separated the information by stream section.

Anglers were interviewed for catch information and preference information. Residence and fishing method was also noted. The sample collected during 1975 was quite small (74 anglers - 163 angler hours). However, this information will supply general insights into the fishery until an intensive creel census can be conducted during 1977.

Catch information included hours fished, fish caught (by species), fish kept, fish released and size of fish.

Angler opinion or preference questions were as follows:

1. Do you consider fishing on Silver Creek good, fair or poor?

2. If you do not consider fishing on Silver Creek good, is the problem fish size, the number of fish, angler congestion or some other item?

3. Do you favor the use of boats on Silver Creek?

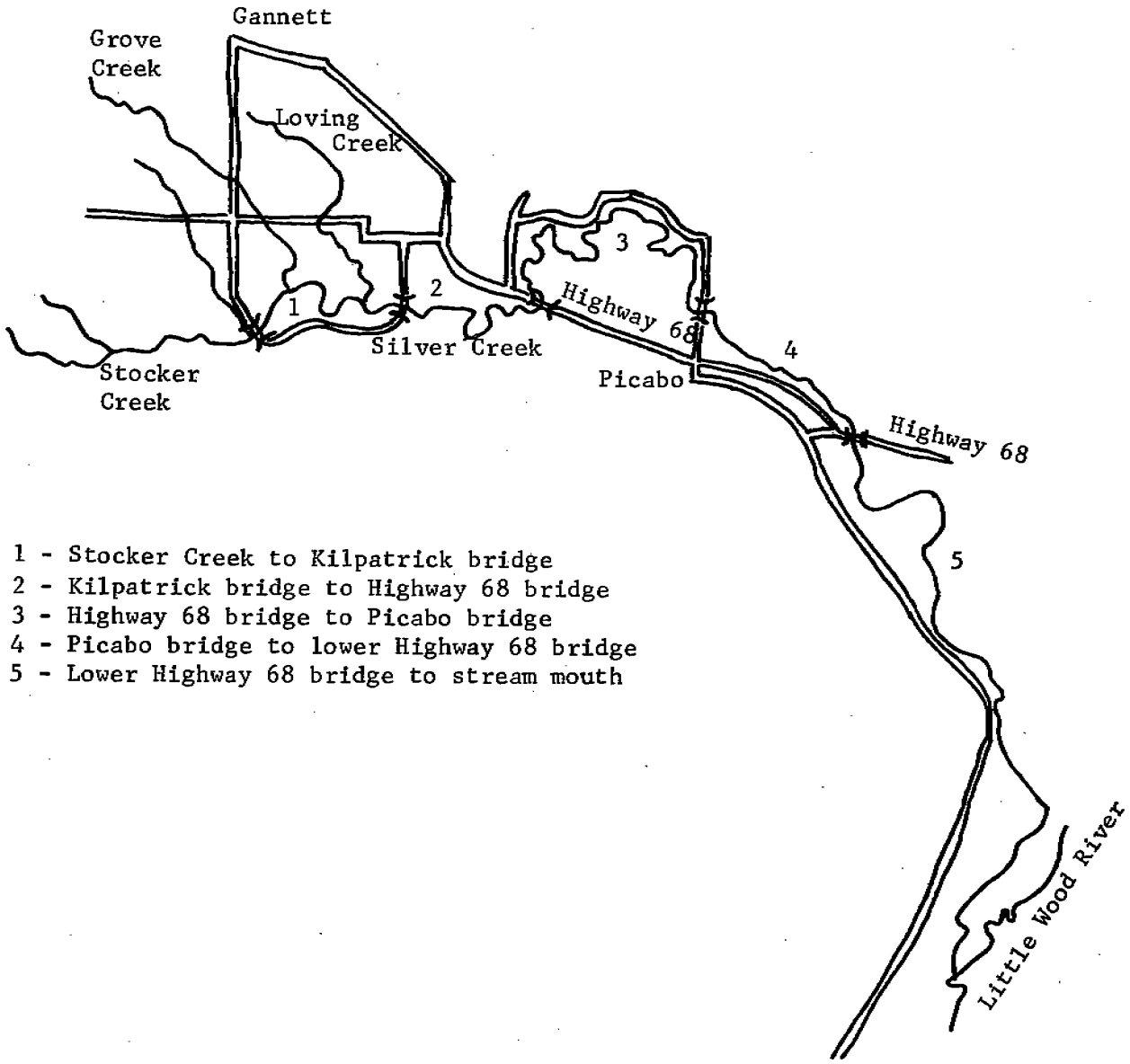
4. Do you favor the use of float tubes in the "fly-fishing" section of Silver Creek?

5. Is the species composition in Silver Creek alright?

6. If the species composition is not alright, what species do you suggest?

7. Do you faovr hatchery catchable releases?

8. Is more access needed on Silver Creek?



Section 1 - Stocker Creek to Kilpatrick bridge
Section 2 - Kilpatrick bridge to Highway 68 bridge
Section 3 - Highway 68 bridge to Picabo bridge
Section 4 - Picabo bridge to lower Highway 68 bridge
Section 5 - Lower Highway 68 bridge to stream mouth

Figure 1. Diagram of Silver Creek with stream sections utilized during 1975.

9. If more access is needed, which areas do you suggest?

10. Is the 14-in regulation satisfactory?

The entire hatchery release in the Silver Creek drainage during 1975 was marked with monel metal jaw tags. These tags will be utilized during 1976 to establish growth rates, overwinter survival and fish movement.

FINDINGS

Fish Harvest

Fishing on Silver Creek during 1975 was relatively good as indicated by catch rates from 0.8 to 2.6 in various stream sections (Table 1). Catch rates were best in the "fly-fishing-only" section (section 1) at 2.3 fish per hour and in the section stocked with hatchery rainbow (section 3) at 2.6 fish per hour.

Anglers kept fewer trout (9%) in section 1 ("fly-only") and anglers fishing section 3 ("hatchery rainbows") kept most fish (97%).

All rainbow caught in section 1 were wild fish while only 25% of the rainbow caught in section 3 were wild fish. Although there were fewer wild rainbow in section 3 than in section 1, the wild fish that were kept in section 3 were larger at 330 mm (13.0 in) than were those kept in section 1 at 297 mm (11.7 in). Approximately the same percentage of the wild rainbow in each of these two sections were over 356 mm (14 in) with section 2 having 38% and section 3 having 39%. Fish averaged significantly smaller in the two tributary streams that were not stocked with hatchery fish; Stocker Creek - 231 mm (9.1 in) and Grove Creek - 241 mm (9.5 in).

Angler Opinions and Preferences

Most anglers interviewed on Silver Creek considered fishing either good or fair (94%). Approximately 59% of the anglers listed fishing as good and only 6% listed it as poor (Table 2).

Of those anglers that did not consider fishing as good on Silver Creek, 33% were disappointed with fish size, 64% with numbers of fish and 3% with angler congestion.

Approximately 93% of the anglers interviewed did not favor the use of boats for fishing on Silver Creek. About 84% of the anglers did not favor the use of float tubes in the "fly-fishing-only" section of Silver Creek.

Some 78% of the anglers considered the species composition in Silver Creek satisfactory. Of the anglers that were not satisfied with the species composition, 88% suggested brown trout, 6% brook trout and 6% rainbow-cutthroat hybrids.

Slightly over half of the interviewed anglers favored hatchery catchalbe releases. However, very few anglers fishing either of the "fly-fishing-only"

Table 1. Harvest information collected at Silver Creek during 1975.

Stream section	Fish per hour	WRb (%)	HRb (%)	Brk (%)	Fish kept (%)	Fish released (%)	$\bar{x}$ size WRb mm (in)	% WRB >356 mm (14 in)
Silver Creek - 1	2.3	91.2	0.0	8.8	8.8	91.2	298 (11.7)	38
Silver Creek - 2	1.9	92.3	7.7	0.0	50.0	50.0	291 (11.5)	16
Silver Creek - 3	2.6	25.0	75.0	0.0	96.7	3.3	331 (13.0)	39
Silver Creek - 4	1.1	83.3	11.1	5.6	100.0	0.0	280 (11.0)	19
Silver Creek - 5	2.0	100.0	0.0	0.0	0.0	100.0	--	--
Stocker Creek	0.8	85.7	0.0	14.3	42.8	57.2	232 (9.1)	--
Grove Creek	1.3	91.3	0.0	8.7	65.2	34.8	241 (9.5)	--
Loving Creek	2.1	--	100.0	0.0	100.0	0.0	--	--

WRb = Wild Rainbow
HRb = Hatchery Rainbow
Brk = Brook Trout

Table 2. Angler opinion and preference information.

Do you consider fishing on Silver Creek good, fair or poor?

	Good	Fair	Poor
Section 1	69%	31%	--
Section 2	54%	46%	--
Section 3	52%	43%	5%
Section 4	60%	--	40%
Section 5	--	100%	--
Stocker Creek	--	100%	--
Grove Creek	67%	22%	11%
Loving Creek	100%	--	--
Total	59%	35%	6%

If you do not consider fishing on Silver Creek good, is the problem fish size, the number of fish, angler congestion, or some other item?

	Size	Number	Congestion
Section 1	80%	--	20%
Section 2	14%	86%	--
Section 3	--	100%	--
Section 4	--	100%	--
Section 5	100%	--	--
Stocker Creek	100%	--	--
Grove Creek	40%	60%	--
Loving Creek	--	--	--
Total	33%	64%	3%

Do you favor the use of boats on Silver Creek?

	Yes	No
Section 1	--	100%
Section 2	22%	78%
Section 3	10%	90%
Section 4	--	100%
Section 5	--	--
Stocker Creek	--	100%
Grove Creek	--	100%
Loving Creek	--	100%
Total	7%	93%

Table 2. Angler opinion and preference information (continued).

Do you favor the use of float tubes in the "fly-fishing-only" section of Silver Creek?

	Yes	No
Section 1	--	100%
Section 2	57%	43%
Section 3	25%	75%
Section 4	--	--
Section 5	--	--
Stocker Creek	--	100%
Grove Creek	--	100%
Loving Creek	--	--
Total	16%	84%

Is the species composition in Silver Creek alright?

	Yes	No
Section 1	62%	38%
Section 2	73%	27%
Section 3	81%	19%
Section 4	100%	--
Section 5	100%	--
Stocker Creek	100%	--
Grove Creek	78%	22%
Loving Creek	100%	--
Total	78%	22%

If the species composition is not alright, what species do you suggest?

	Brown trout	Brook trout	RbxCt hybrid
Section 1	83%	17%	--
Section 2	75%	--	25%
Section 3	100%	--	--
Section 4	--	--	--
Section 5	--	--	--
Stocker Creek	--	--	--
Grove Creek	100%	--	--
Loving Creek	--	--	--
Total	88%	6%	6%

Table 2. Angler opinion and preference information (continued).

Do you favor hatchery catchable releases?

	Yes	No
Section 1	12%	88%
Section 2	60%	40%
Section 3	71%	29%
Section 4	83%	17%
Section 5	100%	--
Stocker Creek	--	100%
Grove Creek	50%	50%
Loving Creek	100%	--
Total	54%	46%

Is more access needed on Silver Creek?

	Yes	No
Section 1	6%	94%
Section 2	--	100%
Section 3	--	100%
Section 4	67%	33%
Section 5	--	100%
Stocker Creek	--	100%
Grove Creek	--	100%
Loving Creek	--	100%
Total	5%	95%

If more access is needed, which areas do you suggest?

The only suggestions for more access were: (1) Lower Silver Creek between access area and Priest, (2) from Picabo down and (3) anywhere to relieve crowding.

Table 2. Angler opinion and preference information (continued).

Is the 14-in regulation satisfactory?

	Yes	No
Section 1	94%	6%
Section 2	100%	--
Section 3	82%	18%
Section 4	--	--
Section 5	--	--
Stocker Creek	100%	--
Grove Creek	67%	33%
Loving Creek	--	--
Total	88%	12%

sections favored releases of hatchery catchable rainbows.

Most anglers did not see a need for added access to Silver Creek. The only suggestions were for additional access in lower Silver Creek or anywhere in order to reduce congestion.

The 14-in regulation on Silver Creek and tributaries was satisfactory to 88% of the anglers.

Fishing Methods

Forty percent of the anglers on Silver Creek fished with flies, 13% with lures and 47% with bait (Table 3). However, bait was used by over 50% of the anglers utilizing those stream sections where they had a choice.

Angler Residence

Idaho residents composed 55% of the anglers interviewed on Silver Creek during 1975 (Table 4). Nonresident anglers were in the majority only in areas in which hatchery catchable rainbow were stocked.

Hatchery Rainbow Releases

Present policy calls for release of 15,000 catchable rainbow trout in Silver Creek annually. An additional 5,000 catchable rainbow were stocked in Loving Creek during 1975 (Table 5). However, the release in Loving Creek may be curtailed in future years if access problems cannot be resolved.

Fish were stocked throughout the entire fishing season at an average size of about 254 mm (10 in). Each of the fish had a metal jaw tag for identification during the 1976 and 1977 portions of the study.

DISCUSSION

Information collected during 1975 can only indicate trends in a general way since the sample is quite small. The creel census conducted during 1977 will cover the same items but have a large sample which should indicate an accurate image of the use, harvest and angler preferences.

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Table 3. Fishing methods utilized on Silver Creek and tributaries during 1975.

	Flies	Lures	Bait
Section 1*	100%	--	--
Section 2	15%	31%	54%
Section 3	25%	5%	70%
Section 4	--	40%	60%
Section 5	--	100%	--
Stocker Creek*	100%	--	--
Grove Creek	33%	11%	56%
Loving Creek	--	--	100%
Total	40%	13%	47%

* Fly-fishing only section.

Table 4. Residence of anglers interviewed on Silver Creek during 1975.

	Idaho resident	Nonresidents
Section 1	50%	50%
Section 2	69%	31%
Section 3	38%	62%
Section 4	100%	0%
Section 5	0%	100%
Stocker Creek	50%	50%
Grove Creek	90%	10%
Loving Creek	0%	100%
Total	55%	45%

Table 5. Hatchery rainbow trout released in Silver Creek and Loving Creek during 1975.

Date	Number	$\bar{x}$ size mm	(in)	Size range mm	(in)
		Silver Creek			
23 May	2,000	251.1	(9.9)	190-330	(7.5-13)
29 May	1,200	254.0	(10)	187-320	(7.4-12.6)
12 June	1,200	252.3	(9.9)	170-325	(6.7-12.8)
20 June	1,200	255.1	(10)	180-315	(7.1-12.4)
27 June	1,200	257.9	(10.2)	194-321	(7.6-12.6)
7 July	800	270.4	(10.6)	220-338	(8.7-13.3)
18 July	600	256.8	(10.1)	190-315	(7.5-12.4)
22 July	600	256.8	(10.1)	190-315	(7.5-12.4)
29 July	1,200	255.2	(10)	182-340	(7.2-13.4)
6 August	1,200	258.5	(10.2)	156-330	(6.1-13)
11 August	1,200	260.1	(10.2)	193-330	(7.6-13)
1 September	1,200	257.3	(10.1)	169-358	(7.6-14.1)
3 October	800	272.9	(10.7)	198-340	(7.8-13.4)
6 October	200	272.9	(10.7)	198-340	(7.8-13.4)
11 November	600	272.9	(10.7)	198-340	(7.8-13.4)
Total	15,200				
		Loving Creek			
23 May	500	251.1	(9.9)	190-330	(7.5-13)
30 May	500	254.0	(10)	187-320	(7.4-12.6)
12 June	500	252.3	(9.9)	170-325	(6.7-12.8)
19 June	500	255.1	(10)	180-315	(7.1-12.4)
26 June	500	257.9	(10.2)	194-321	(7.6-12.6)
17 July	500	270.4	(10.6)	220-338	(8.7-13.3)
25 July	500	256.8	(10.1)	190-315	(7.5-12.4)
30 July	500	256.8	(10.1)	190-315	(7.5-12.4)
11 August	500	260.1	(10.2)	193-330	(7.6-13)
29 August	500	257.3	(10.1)	169-358	(6.7-14.1)
Total	5,000				

Submitted by:

Jerry Mallet
Fishery Research Supervisor

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Joseph C. Greenley, Director

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