

*file Silver Creek*

SILVER CREEK FISHERY INVESTIGATIONS - 1966

THE NATURE CONSERVANCY  
P. O. BOX 165  
SUN VALLEY, ID 83353

ABSTRACT

Growth of aquatic vegetation in the upper reaches of Silver Creek was good in 1966 but was very sparse in the lower sections of the stream.

A steady rise in the mean daily water temperature was generally noted from the upper stream sections downstream.

Very little migration was noted of tagged catchable rainbow in Silver Creek. Over 96 percent of the tagged fish were caught within two miles of their respective release sites. Ninety-nine tags were recovered for a tag return of 9.9 percent of the 1,000 catchables tagged. The estimated total number of catchables harvested was 31.7 percent.

Fish population surveys made in 1966 indicated good populations of trout and whitefish in the upper three miles of the creek with the profuse aquatic vegetation. The lower, sparsely vegetated stream sections had small game fish populations and heavy rough fish populations.

Years of low catch rates appear to be caused largely by a combination of low water flows, poor natural reproduction and lesser number of catchables planted. Planting dates and distribution may also have a large effect on the return of catchable trout planted. The catch rate of fly fishermen was better than that of bait fishermen on Silver Creek in 1966. Numbers of fly fishermen increased as the summer progressed and the aquatic vegetation built up in the stream.

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*SC Fish Studies  
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## JOB COMPLETION REPORT

State of Idaho Name Tests for Increasing the Returns of Hatchery Trout  
Project No. F 32-R-9 Title Silver Creek Fishery Investi-  
Job No. 11 gations  
Period Covered: May 1, 1966 to October 31, 1966

### RECOMMENDATIONS:

That a close check be kept in future years on the effect of special regulations on the catch, growth rate and size of both catchable and wild trout in Silver Creek.

That plantings of catchable rainbow be limited mainly to the lower sections of the stream — from the Kilpatrick bridge on downstream.

That plantings of catchables be heavier during years of poor aquatic vegetation growth especially in the lower reaches of the stream.

That experimental plantings of suitable fast-growing species such as golden willow be made along the stream edges on Fish and Game Department property in an attempt to improve bank cover.

That private landowners be encouraged to fence off a strip of land along the streambanks to keep out livestock and promote growth of bank cover.

### FINDINGS:

#### Stream Ecology

#### Vegetation:

As mentioned in previous reports by Gebhards and Irving, the abundance of vegetation in Silver Creek may vary greatly from year to year. The abundance of vegetation in the stream is closely associated with stream flows. In years of low flows aquatic vegetation in the stream has been noted to be sparse while in years of heavy flows, it may be very profuse.

It has been noted in the past that the amount of aquatic vegetation present in Silver Creek governs, in part, the water level of the stream. Heavy concentrations of aquatic plants act as barriers which raise the water level.

The aquatic vegetation affords the principal fish food organism habitat in Silver Creek due to the predominantly sand-silt bottom in the stream. Fish growth and populations are associated closely with the condition of the aquatic vegetation in the stream.

Aquatic vegetation growth in Silver Creek characteristically builds up as the summer progresses usually reaching its peak in August or early September. Some years scouring of aquatic vegetation occurs in the stream. This happens when the vegetation becomes very thick and water pressure up-roots the plants.

Growth of aquatic vegetation during the summer of 1966 was fairly good in the upper reaches of Silver Creek (down to the upper Highway 23 bridge), but poor on the lower sections of the stream. Stream flows were considerably lower in 1966 than 1965. Aquatic vegetation on approximately two stream miles of Silver Creek on the Fish and Game property was very sparse in 1966. The same stream section when surveyed in 1965 had extremely profuse aquatic vegetation.

#### Water Temperature:

Stream temperatures were recorded with maximum-minimum thermometers at four separate stations covering a stream distance of approximately 12 miles as shown in Figure 1. Station 1 was located just below the mouth of Loving Creek, with Station 2 roughly three miles downstream. Station 3 was located directly below the Point of Rocks or about three miles downstream from Station 2. The last temperature station, 4, was located below the Susie "Q" Ranch about six miles downstream from Station 3.

A steady rise in the mean daily water temperatures was generally noted at each successive downstream station as shown in Table 1. The average rise in the mean daily water temperature from Station 1 to Station 4 was 3.8° F. from June 26 to September 14. Between July 22 and August 22 the rise averaged 5.5° F.

Table 2 compares the stream temperatures of 1962 and 1966 on Silver Creek at the Point of Rocks from June 22 to September 14. The average daily mean temperature for the period was about a degree higher in 1966 (63.4° F.) than in 1962 (62.5° F.). Daily maximum temperatures for the periods were also slightly higher in 1966 than in 1962. The highest daily maximum temperature in 1966 was 76° F. and occurred between August 1 and August 7.

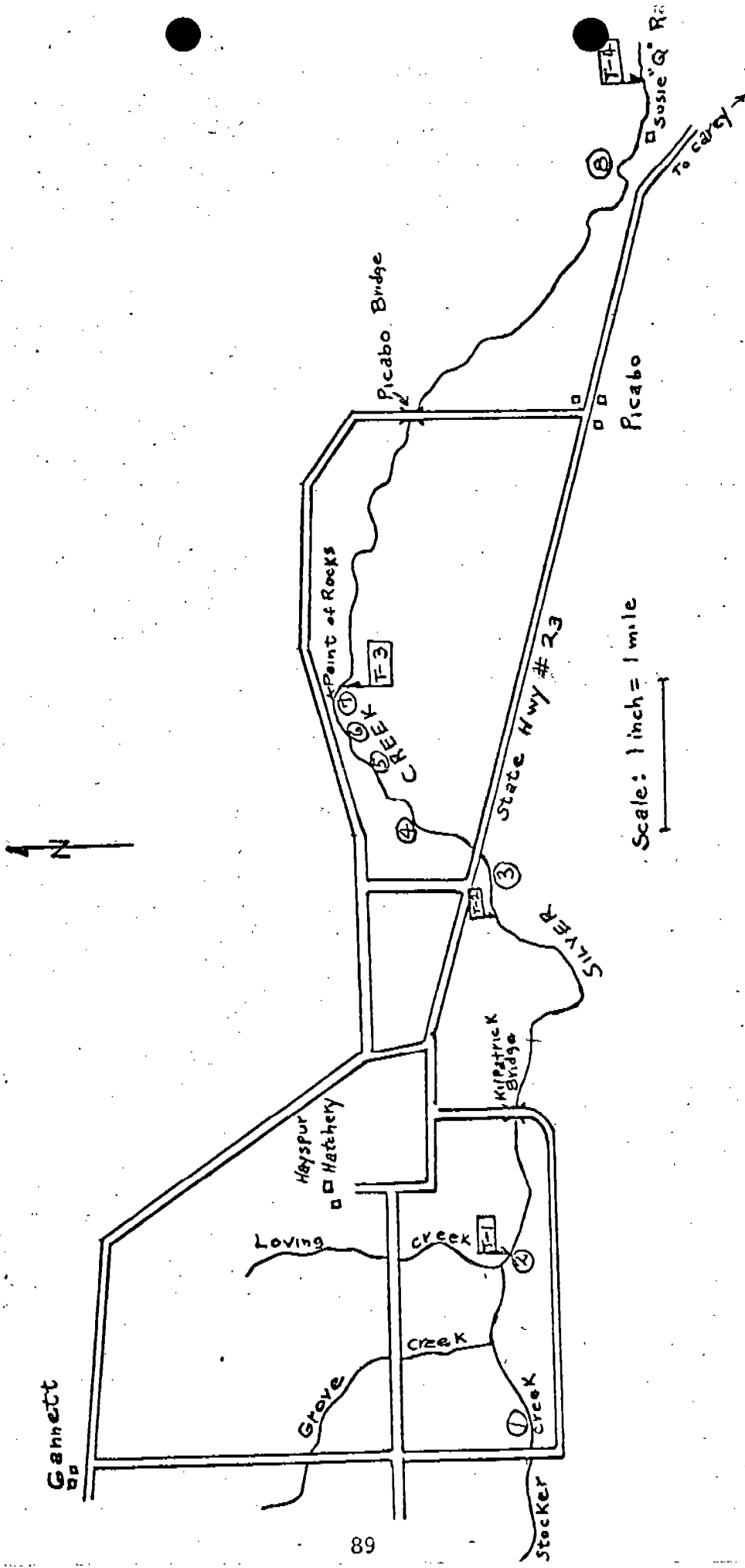
SCUBA observations showed significantly larger numbers of non-game fish in the lower portions of Silver Creek indicating the influence of the warmer stream temperatures.

The more desirable aquatic plant species such as chara and watercress were notably more scarce in the lower sections of the stream also indicating the influence of the higher water temperatures.

#### Tagging Studies

A total of 1,000 catchable-size rainbow were jaw tagged and 200 each released in the five respective study sites on Silver Creek on May 27, 1966. The fish averaged three to the pound and 8 to 9 inches in length when planted. Ninety-nine tags were recovered for a 9.9 per cent return. The tag recoveries are summarized in Table 3.

Figure 1. Stream sections on Silver Creek surveyed with SCUBA gear and temperature recording stations used, Summer 1966.



Temperature recording stations - T-1

Table 1. Stream Temperatures Taken on Silver Creek at Four Separate Stations\* June 26 to September 15, 1966

Period	Daily mean (°F)				Temp rise or loss Stat. from Stat. 1 (°F)				Daily mean Range (°F)				Max for Period (°F)			
	Station				1				Station				Station			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
6/26-6/30	59.6	60.7	64.0	64.5	59.6	1.1	4.4	4.9	7.0	6.0	5.5	6.0	70	68	72	74
7/1-7/7	61.6	60.3	60.3	63.9	61.6	-1.7	2.0	2.3	5.5	5.5	3.9	6.0	71	66	72	74
7/8-7/14	64.2	62.6	65.1	66.2	64.2	-1.3	0.7	2.0	2.5	3.0	1.5	2.5	60	66	72	73
7/15-7/21	64.1	61.9	65.3	66.3	64.1	-2.2	1.2	2.2	4.5	1.5	0.5	4.0	68	65	72	73
7/22-7/31	60.5	62.5	65.6	66.5	60.5	2.0	5.1	6.0	8.0	3.5	2.5	3.0	68	68	73	74
8/1-8/7	60.8	63.8	66.5	67.8	60.8	3.0	5.7	6.8	4.5	3.0	5.5	4.0	70	68	76	74
8/8-8/14	60.0	62.5	64.5	65.2	60.0	2.5	4.5	5.2	2.5	3.0	3.0	1.0	68	68	72	70
8/15-8/21	59.6	62.2	63.3	63.6	59.6	2.6	3.7	4.0	3.0	3.0	1.0	2.0	66	68	72	68
8/22-8/31	57.6	58.8	61.0	60.8	57.6	1.2	3.4	3.2	1.0	0.5	0.0	1.5	64	64	70	64
9/1-9/7	57.0	58.0	60.0	60.3	57.0	1.0	3.0	3.3	4.0	4.0	4.0	6.0	66	64	68	64
9/8-9/14	57.0	57.5	59.3	58.5	57.0	0.5	2.3	1.5	0.0	2.0	2.5	5.0	64	63	68	64

- \*Station 1. Above Kilpatrick Bridge - just below Loving Creek
- Station 2. Kilpatrick Bridge - Highway 23 - across from substation
- Station 3. Highway 23 Bridge - Picabo Bridge - directly below Point of Rocks
- Station 4. Picabo Bridge - Highway 23 - below Susie "Q" Ranch

Table 2. Comparison of 1962 and 1966 Stream Temperatures on Silver Creek at Point of Rocks, June 22 to September 14, 1966

Period	Daily Mean (°F)		Daily Mean Range		Max. for Period (°F)	
	1962	1966	1962	1966	1962	1966
6/22-6/30	64.5	64.0	7.1	5.5	70	72
7/1-7/7	63.0	62.3	8.0	3.9	69	72
7/8-7/14	67.4	65.1	7.0	1.5	72	72
7/15-7/21	63.3	65.3	8.0	0.5	69	72
7/22-7/31	65.5	65.6	7.5	2.5	72	73
8/1-8/7	61.7	66.5	7.3	5.5	69	76
8/8-8/14	64.7	64.5	9.1	3.0	70	72
8/15-8/21	63.1	63.3	7.6	1.0	70	72
8/22-8/31	59.3	61.0	7.4	0.0	65	70
9/1-9/7	59.1	60.0	8.0	4.0	64	68
9/8-9/14	56.1	59.3	5.8	2.5	61	68

Table 3. Tag recoveries by release site group, Silver Creek, June and July, 1966.

Release Site Groups	Number Recovered	Per Cent
Kilpatrick Bridge upstream	36	36.4
Kilpatrick Bridge-Highway 23	6	6.0
Highway 23-Picabo Bridge	20	20.2
Picabo Bridge-Highway 23	16	16.2
Highway 23-Silver Falls	21	21.2
<b>Totals</b>	<b>99</b>	<b>100.0</b>

Very little migration was noted of the tagged fish. Of the 99 tags recovered, catch locations were obtained for 90 of the fish and all but three of the trout were caught in the general area of their respective release sites. Two trout had moved on downstream about 12 miles and one downstream about 6 miles.

Catch dates were obtained on 77 of the tags recovered. Of these, 63.6 per cent were from trout caught on opening weekend. All but two of the tag returns were obtained from trout caught between June 4 and July 17. A 10-inch tagged rainbow was caught on October 25 close to its release site near the Picabo Bridge. An 11-inch tagged rainbow was caught below Silver Falls on March 21, 1967. The tag recoveries by catch period are listed in Table 4.

Table 4. Catch period of 77 tags recovered on Silver Creek between June 4, 1966 and March 21, 1967.

Catch Period	Number Tags	Per Cent
June 4-5	49	63.6
June 6-15	11	14.3
June 16-30	6	7.8
July 1-15	6	7.8
July 15-31	3	3.9
October 25	1	1.3
March 21, 1967	1	1.3
<b>Totals</b>	<b>77</b>	<b>100.0</b>

Comparison of tag returns with actual calculated harvest made by Gebhards on Mackay Reservoir in 1960 and 1961 showed a conversion factor of 3.2 times the per cent of tag return equaled the calculated harvest. Assuming the return on Silver Creek would be similar and based on the 9.9 per cent tag recovery obtained, the estimated total number of catchables harvested would be 317 fish or 31.7 per cent.

## Fish Populations

Fish species composition data was collected during August on different sections of Silver Creek and a tributary stream using SCUBA gear. Wet suits, face masks, and snorkel tubes were used in the survey work.

On August 12, two 500-foot test sections were snorkled — one on Stocker Creek and one on main Silver Creek below the mouth of Loving Creek. On August 12, six additional sections of Silver Creek were snorkled working downstream from a short distance above the uppermost Highway 23 bridge to a section just above the Susie "Q" Ranch. Three 500-foot stream sections and three 1,000-foot stream sections were snorkled on this date.

Table 5 summarizes the findings of the respective surveys and illustrates a marked decrease in the number of trout and a marked increase in rough fish in the lower stream sections surveyed. Stream sections one through three contained a profuse growth of desirable aquatic plants while aquatic vegetation in the lower reaches of the stream was relatively sparse.

It was noted in the SCUBA surveys that larger fish (two to five pounds in weight) were much more plentiful in Stocker Creek and the upper reaches of Silver Creek from the uppermost Highway 23 bridge upstream. Thirteen rainbow ranging from three to approximately five pounds in weight were observed in the 1,500 feet of stream surveyed above the upper highway 23 bridge while only eight rainbow in the same poundage range were observed in 4,000 feet of stream surveyed downstream from the bridge. Broken down into stream survey sections the large rainbow were sighted as follows: 10 in sections one and two; 3 in section three, and a total of 8 in survey section four through eight.

A SCUBA survey was made during October of 1965 of stream sections four through seven and trout populations were very good. However, 1965 was a high flow year and growth of aquatic vegetation through the area was excellent.

## Fishermen Success

Table 6 summarizes fishermen success on Silver Creek for the past fourteen years (1952-1966) with a larger portion of the data being collected on opening weekend. Catch rates have remained relatively stable during the past four years (1962-1966) averaging approximately 1.63 trout per hour.

Low success years such as 1962 (0.87 trout/hr.) and 1960 (0.86 trout/hr.) appear to possibly be caused by a combination of factors, mainly low water flows, poor reproduction and survival of wild trout and lower numbers of catchable rainbow planted. Table 6 indicates an increase in the percentages of wild trout caught from 1964 to 1966 despite higher plantings of catchables made during these years. Distribution and time of planting of catchables may also be affecting their return to the creel. Reproduction and survival of wild trout appears to have been good during these years. In 1962 only 11.4 per cent of the trout checked were wild fish despite the fact that a relatively low number (5,300) of catchables was planted in 1962.



Table 5. Observations made with SCUBA gear on Stocker Creek and Silver Creek during August, 1966.

Date	Stream Section	Length (feet)	WRB	wrb	HRB	EB	WF	Sucker	Shiner	Dace
Aug 2	1 Stocker Creek	500	79	28	4	3	10	49		
	2 Below mouth of Loving Creek	500	105	71	11		39	8		
Aug 12	3 Above upper Highway 23 Bridge	500	48		40		20	91		
	4 From public access bridge down-stream	1,000	(153)	(71)	(51)		(59)	=	334 game fish (84.8%) game fish	
	5 Above Point of Rocks 3,000 ft.	1,000	4	1	1	1	1	211		250
	6 Directly above Point of Rocks	1,000	15	10	1	1	2	629	22	250
	7 At Point of Rocks	500	2	3	11	20	25	473	510	6
	8 Above Susie "Q" Ranch	500	(33)	(11)	(9)	(2)	(5)	=	60 game fish (15.2%)	
								27	959	30
	Totals	5,500	265	110	64	5	74	1,786	1,491	536

Table 7 compares the type of gear used by fishermen in 1963 and 1966. As the table illustrates, there is a marked increase in the per cent of fly fishermen and a decline in bait fishermen as the summer progresses and the aquatic vegetation builds up. As the vegetation density increases, flies become a more efficient means of fishing the stream. Relatively little use of lures by fishermen has been noted on the stream. The catch rate of fly fishermen on Silver Creek was better than that of the bait fishermen in 1966.

Eastern brook trout made up 6.5 per cent of the creel in 1966 and 2.8 per cent in 1965. In previous years they have been found to comprise less than 2 per cent of the catch during the season.

Table 6. Fishermen success on Silver Creek from 1952-1966.

Year	Trout/ pole	Trout/ hour	Per cent Hatchery Rainbow	Number Catchable Rainbow Planted
1966	4.0	1.65	54.9	16,226
1965	3.9	1.56	63.6	10,000
1964	4.5	1.70	58.1	10,475
1963	6.0	1.64	73.8	6,000
1962	3.5	0.87	88.6	5,300
1961	5.6	1.59	81.5	8,000
1960	3.2	0.86	72.5	5,000
1959	6.3			8,900
1958	5.5			11,000
1957	6.0			5,300
1956	4.4	1.40		10,500
1955	6.4			10,500
1954	2.7			8,600
1953	3.3	0.87		9,800
1952	4.6	1.10		15,700

Table 7. Comparison of types of fishing gear used on Silver Creek by fishermen check or observance during June, July and August, 1963 and 1966.\*

Month	BAIT		FLY		LURES	
	1963	1966	1963	1966	1963	1966
June	88.0	89.4	10.9	10.6	1.1	0
July	72.2	42.9	22.2	56.1	5.6	0.1
August	59.9	52.6	40.0	47.4	0.1	0

\*455 fishermen checked or observed during 1966.

Table 8. Length frequencies (total length) of 63 wild rainbow trout in Silver Creek from June 25 to September 8, 1966.

Month	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22
June*		22.2**						
July	21.7	17.4	20.4	4.3	26.1			
August		40.0	53.3	6.6				
September		6.3	56.3	31.3		6.3		

\*Small sample, only 9 trout.

\*\*Per cent

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