

PRELIMINARY OBSERVATIONS ON SILVER CREEK AND ITS HEADWATER TRIBUTARIES
WITH NOTES ON POPULATION STUDIES AND SOME FISHING RESULTS

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INTRODUCTION

For over thirty years Silver Creek has been considered by many sportsmen, from both Idaho and other states, as one of the finest trout streams in the West. Up until a few years ago it has enjoyed the reputation of being one of the most highly productive trout streams in the United States, both for size and number of fish produced. There is little wonder, then, that much conjecture would arise and many complaints be heard when the productivity, or at least the success of fishing, declined. Many reasons for the decline were given and many were the suggested remedies.

From the fisheries management viewpoint there are a number of reasons why the productivity of a stream, or fishing success on that stream, declines, if physical and chemical properties of the stream remain fairly constant. Among these are lack of cover, lack of food, unsuccessful reproduction, and over fishing.

Silver Creek and its headwater streams are different from the usual mountain streams of the West. They have their source from large, constantly flowing springs on the floor of a valley. All of these principal springs arise within an area of less than eight square miles and the two most remote springs are less than six miles apart. The water, for the most part, is "crystal clear" the year around; the exceptions being during the spring thaw and heavy rainstorms when it might become slightly murky. The streams are rather shallow in comparison to their widths even though there are occasional pools. Because of the transparency of the water, fish are very dependent upon cover for protection. During the greater part of the year they are afforded good cover in the form of algae and some emergent angiosperms, most dominant of which is watercress. During the fall months the cress almost "chokes" the smaller streams and there appears to be little space left for fish. At this time the fish spend most of their time in "pockets" of water surrounded on four sides by aquatic plants. These "pockets" are of various sizes and shapes but invariably the bottom is of gravel and the top is free from plant growth. It is only during the late winter and early spring months that this plant cover might be absent—due mostly to the workings of ducks and cattle. At this time the fish must seek cover in the undercut banks and in deeper pools. During the later spring months this aquatic plant life begins to re-appear, at first in the headwater streams and later, on down through Silver Creek. It remains for the cattle and ducks to remove the vegetation during the following winter and spring, something that even the high water during July and August cannot accomplish.

After several successive years of favorable conditions for rapid plant growth some sections of the streambeds become so heavily grown over with aquatic vegetation, particularly in the case of *Nitella Chara* sp., a member of the Characeae family, that the subsequent weight of water backed up by this growth finally loosens the upstream margin of plant life and may sweep the stream bed clean of its aquatic plants. Spawning fish tend to help start this process of loosening.

Lack of food as a contributing factor in the decline of productivity in these streams can be dismissed. Specimens taken from the most heavily populated stretches of these streams showed condition factors and growth-age ratios above normal for streams of this type and temperature. The streambed and the many submerged and emergent plants growing in it were literally alive with food.

The third reason under consideration for decline of productivity—unsuccessful reproduction—may be discounted as of having little importance in the case of Silver Creek and its tributary streams with the possible exceptions of Loving and Stocker Creeks. Portions of these two have been silted in and are no longer used for spawning purposes. The presence of so many fingerling trout in all of the other headwater streams, an account of which follows, would indicate successful reproduction.

A fourth reason for decline of productivity of a stream is over fishing. In the case of Silver Creek it might better be stated as: a further reason for decline of fishing success on a particular stream is the increased number of fishermen making use of that stream. If forty fish over a certain stretch of stream are willing to take the lures of two fishermen today, the resultant twenty fish per creel are certainly indications of good fishing. If those same forty willing fish, however, are confronted by twenty fishermen, the average of two fish per creel which results indicates something entirely different. One of the remedies for over fishing is, of course, to plant more fish. Ordinarily, this is a good remedy, if survival of planted fish is high, provided it is not carried to the point of overpopulation, at which point we find a reduction in size of the fish due to their increased competition for food.

A fifth reason for the decline of fish populations in a stream might be advanced and discussed briefly. This is the actual loss of fish through artificial removal other than by fishing, and the loss of fish through down stream migration.

For several years trapping operations were carried on in Silver Creek and in Loving Creek by department personnel for the purpose of taking spawn. The eggs taken were incubated at the Hayspur state fish hatchery. However, since the spawned fish were returned to the streams in which they were trapped, and the fingerling trout raised from these eggs planted back into the streams, it is doubtful that any actual loss in fish numbers resulted from the trapping operations.

There could be depletion in actual numbers of fish from Silver Creek through down stream migration. The rainbow trout is well known for its inherent tendency to migrate. Since the desire, or instinct, to migrate would have to be very strong, stronger than the desire to live in a very desirable habitat, it is doubtful that there is excessive down stream migration. Further investigation might prove this statement incorrect.

OBSERVATIONS

This past summer preliminary work was carried on, first, to determine the fish populations of the headwater streams of Silver Creek and, second, to lay the groundwork for future investigations in

order to determine, if possible, the real causes for decreased productivity and to suggest means which might remedy that decrease. Other observations noted in this paper were made over a period of the last three years, the first half of which time the writer was stationed at the state fish hatchery near Silver Creek.

There are eight streams tributary to Silver Creek, all of which are important factors in its capacity to produce fish. Of these eight, Grove Creek, because of its size, is the most important. Other streams are Loving, Deep, Osborn, and Stocker Creeks; and "A", "B", and "C" Creeks, so called because their local names could not be learned. Stocker Creek showed the smallest fish population but must be considered important because it connects Silver Creek with at least four of the eight streams. The gradient of all streams is slight, their waters transparent.

Following is a stream to stream account of observations made:

Deep Creek: In fifty minutes, fishing down stream and not exercising great care in approach to stream, there were taken, on a No. 10 renegade dry fly, five brook trout, seven to twelve inches long, and one rainbow trout fourteen inches long. I also had eight other strikes and twelve rises from other trout, mostly brook, in this same stretch of stream. Over a four-hundred yard stretch of stream the following fish were observed: approximately two hundred, two inch trout, species unknown; and eighteen other trout, mostly brook, ranging from six to nine inches long. The aquatic vegetation in Deep Creek was abundant and was composed of some species of filamentous algae and watercress, of which the watercress was emergent and most abundant.

Osburn Creek: A few trout were surface feeding. Three rainbow trout, eight, ten, and fourteen inches long were observed in the pool just below the hill road culvert. In two hundred yards of stream above the road, fishing with a barbless hook, I had sixteen rises and three strikes, all from different fish which ranged in size from five to nine inches. One fourteen inch rainbow came downstream ten yards from its lie and took the fly. Approximately one hundred fifty to two hundred rainbow fingerling, two to three inches long; forty-five fingerling rainbows, three to five inches long; and one brook trout of six inches were observed in a measured (stepped off) one hundred yards of stream. Most of the fish were lying in the previously described "pockets" of cress. The aquatic vegetation on Osburn Creek is abundant, made up of algae and emergent sedges and cress, of which the cress is again most abundant.

"A" Creek: In the first two hundred yards just above the hill road fifty-six trout (rainbow) from five to eight inches were observed. Over two hundred smaller trout, two to three inches were counted. All appeared to be rainbows. Aquatic vegetation abundant with cress fairly clogging the stream.

"B" Creek: In ten feet of stream just above hill road culvert twenty-three two to three inch and one five inch rainbow trout were counted. Fish were almost as numerous in the one hundred yards of stream covered about this point. The fish were found lying in "pockets" and when disturbed they darted under the cress. Aquatic vegetation again abundant with watercress dominant.

Stocker Creek: Three hundred yards of stream below the Stocker Creek bridge were covered. Only three fish were seen: one eight inch whitefish and two eight inch rainbow trout. Aquatic vegetation

is scarce, mostly long, filamentous green algae. The stream bottom is composed of silt and sand with very little gravel in evidence through this area.

Grove Creek: From the Gannett-Punkin Center road bridge many fish were observed surface feeding. Three rainbows of four, five, and seven inches were taken on three casts with a renegade fly. In the following fifteen minutes, fishing from the road, twenty rainbows, ranging from five to ten inches, were caught and released. In one small pocket of about two square feet eight rainbow trout, and the largest about twelve inches, were seen. The stream below the road was literally full of fish.

Just below the hill road bridge five rainbows from eight to fourteen inches were observed in one "pocket". Other, larger rainbows, up to eighteen inches in length were seen feeding just below the west culvert. A mayfly hatch started at nine o'clock that morning and the trout were beginning to surface feed. In one "pocket" covering an area of eight square feet, just below the old water wheel, I counted ten surfacing trout from ten to fourteen inches long. Other nearby riffles were just as heavily populated. The trout were easily frightened and any movement on the part of the observer sent them quickly to cover. The aquatic vegetation in Grove Creek was abundant with watercress dominant.

Loving Creek: A few fish were observed below the reservoir on the Van Atta ranch. The water was murky, due to the activities of ducks feeding in the reservoir. Observations in this area could not be completed. The bottom of the stream was composed of sand and silt. Aquatic vegetation was common to abundant, mostly cress with some green algae present.

Between the hill road and railroad sixteen trout from eight to twenty-four inches were seen. All but three of these were under twelve inches long. Among the sedges in the water just above the railroad trestle hundreds of one inch fry were seen. Species could not be determined but they were not trout. Much of Loving Creek is bordered with cattails, many of which are emergent from the water and form cover for the fish. Other plant life present included sedges, green algae, and cress. Much of the stream bottom is composed of silt, but wherever there is enough current present to form riffles, the stream bottom is of gravel.

"C" Creek: In one hundred yards of stream above the bridge on the Gannett-Punkin Center road, eighteen rainbows, from four to seven inches, were counted. Many (over two hundred) smaller rainbows from two to three inches were observed surface feeding. Below the road a ten inch rainbow was taken from the pool just below the culvert. In one hundred yards of stream below the road, over one hundred and fifty small rainbows, two to three inches, were counted. The same length of stream below the hill road crossing revealed about the same fish population. This stream is wide and quite shallow. Aquatic vegetation is abundant with cress dominant.

Silver Creek: Near the Rod and Gun Club cabin, Silver Creek is about seventy-five feet wide and will average four feet deep, with some pools as deep as eight feet. The evening this section of the stream was observed a fairly good hatch of insects was on and the trout were actively feeding on the surface. The trout observed ranged from six to twenty-four inches in length. Feeding fish were very selective in their choice of foods. They would not rise to nor strike renegade, mosquito, coachman,

or black gnat dry flies. Yet they would take a small, white, living mayfly, of similar size, floating within six inches of the artificial lure.

The rainbows inhabiting Silver Creek are wily trout and in addition have many factors in their favor. They have a plentiful supply of food, good cover most of the year, transparent water with the sky as a background, so that they are quickly aware of the approach of enemies, and the water in which they live has a fairly constant year-around temperature. In addition to having so many factors favorable to their survival, they are intermittent "biters" and can be compared to the cutthroat trout of the Bear River basin which Locke describes as " 'shier biters' than any other species". It is small wonder they are so difficult to take on hook and line.

SUGGESTIVE REMEDIES

Suggestive remedies to improve the fishing on Silver Creek are many but without further investigation might prove to be costly in time, money, and actual results. A brief discussion follows.

HEAVIER PLANTINGS

Heavier plantings of hatchery trout, especially those of legal size, could be made and may improve fishing, though this is doubtful. Over a period of the past eleven years there have been planted in Silver Creek and its headwater streams a total of 1,846,787 fingerling rainbow trout. Most of these were from two to ten inches long with the average well over three. Grading Silver Creek and its headwater streams as above average for pools and very rich in food, conditions not always evident, and computing from Neadham's planting table for trout streams we obtain the following results for recommended planting of three inch fish:

Silver Creek: Average width 60 feet; Length 20 miles; Fish per mile, 4800;
Total recommended: 96,000.

Grove Creek: Average width 30 feet; Length 3 miles; Fish per mile, 2400;
Total recommended: 7200.

All others: Average width 10 feet; Length 25 miles; Fish per mile, 800;
Total recommended: 20,000.

Total recommended plantings of 3 inch fingerling: 123,200.

Average annual plantings for past eleven years: 167,880.

From the approximate percentage of survival (fifty) of planted three inch fingerling trout we should expect a yearly average of 83,940 legal size trout for the fisherman's creel from the previous seasons' plantings! The success of natural reproduction should add materially to these figures.

Observations made during the month of December show a considerable number of fall spawning rainbow trout. This would indicate a good survival of plantings of hatchery-reared trout from Hayspur—where fall-spawning rainbow brood stock is maintained.

From the large numbers of fingerling trout observed in all of the headwater streams of Silver Creek, except Stocker, and the fact that these observations were made prior to any hatchery plantings for that year, the survival of fish from natural reproduction must be considerable.

RESTRICTIVE MEASURES

Among restrictive measures that could be applied to Silver Creek are shorter open season, reduced creel limit, and method of fishing.

SHORTER SEASON

Until 1946 the trout season on Silver Creek conformed with the Idaho general trout season. During the last two years the opening day has been on July first. This later opening would give the aquatic vegetation enough time to reform, the fish would then have adequate cover, and fishing success, in general, would improve. To shorten the season more than this would have little or not benefit, and to close the entire stream would throw a much heavier fishing load on adjacent streams which are all under tremendous fishing pressure already. Any benefit Silver Creek would derive from a closed season would be lost in the following open season when it would be subjected to a heavier than normal fishing load.

REDUCED CREEL LIMIT

A reduced creel limit might help relieve fishing pressure and could increase fishing success. Creel census records for the last four seasons, however, show only an average of 4.2 fish per creel. The greatest objection to a special creel limit on Silver Creek would be from the enforcement angle. The nearby streams abound in rainbow trout.

METHOD OF FISHING

Restricting the method of fishing, as, for example, limiting the use of these waters to fly fishermen, would be followed by many and loud accusations of favoritism and of acquiescence to high pressure groups. The question of legality of such a restriction might also be raised.

REMOVAL OF PRESENT RESTRICTIVE MEASURES

To be considered under restrictive measures is the removal of any presently restrictive measures which would improve fishing success. Opening the areas of the Silver Creek drainage now closed to fishing would, naturally, improve fishing.

For the past twelve years or more, the spring-fed streams which make up Silver Creek have been closed to fishing. This closure was initiated as a conservation measure, inasmuch as it was thought that the closed areas would serve as suitable brood streams for small trout. It was further thought that as the trout increased in size there would be a tendency for them to drift down stream into Silver Creek proper (open to fishing), leaving the headwater streams for the new generation of young trout. The closed waters, therefore, should serve a multiple purpose: (1) brood areas for fry and fingerling trout; (2) spawning areas for large trout during the spawning season, after which they would return to Silver Creek; (3) feeder streams for Silver Creek, insuring a plentiful annual supply of legal size trout for the sportsman.

As a conservation measure, the closure of these headwater streams of Silver Creek has not been entirely successful from a sound fisheries management angle. First, even though these headwater streams are used for spawning purposes by the mature trout, many of them fail to drift back down stream. Second, the closed areas have served their part as brood areas for fry and fingerling trout but these trout have not been free from the predation of large fish which are in evidence. Third, from the sportsmen's viewpoint, these headwater streams have not been too successful in building up and maintaining a constant supply of legal size trout in Silver Creek for the creel.

To open all of these streams to fishing would double the present length of fishing waters of Silver Creek and its tributaries. But to do so might destroy what good, if any, those headwater streams have built up in the past five years as brood areas for fingerling trout. Of all the headwater streams, Grove Creek is the most heavily populated and could stand a heavy fishing load. Opening this stream would improve fishing but would make boundary descriptions, and consequent enforcement, difficult. To open all headwater streams or parts thereof east of the north-south county road that runs from Gannett to the Picabo hills and through Punkin Center junction, would open all of Grove except for its headwaters, all of Loving Creek, an additional mile of Stocker Creek, and a mile and a quarter of "C" Creek. This would roughly add nine miles of fishing water to the present 20 and still leave about 16 miles of the smaller headwater streams closed to continue their function as brood areas. Such an opening would help relieve the fishing pressure on Silver Creek and would improve fishing success in those waters without drastic removal of all brood areas.

STREAM IMPROVEMENT

In the matter of stream improvement work there are possibilities. Parts of Loving and Stocker Creeks have been heavily silted in, but beneath the silt is the original gravel streambed. The proper placement of stream deflectors in these areas would sweep much of this silt downstream,

form new pools, and uncover gravel beds which would be suitable for spawning. Just where the displaced silt would stop and its effect upon existing fauna and flora, is worthy of study before any extensive work of this nature is undertaken.

The placement of diagonal, or cross, underwater log chocks in Silver Creek would tend to form dead water areas immediately above such chocks, in which the regrowth of aquatic plants would be hastened, bringing back the natural cover earlier in the spring.

CONCLUSIONS AND RECOMMENDATIONS

1. It is recognized that fishing success has declined on Silver Creek during the past decade but whether this decline is due to decreased productivity or to increased number of fishermen, or to a combination of the two, is not definitely known.
2. Further investigative studies should be made on Silver Creek and its tributaries. These should include population and age-growth studies, observations of migrations including spawning movements in all streams, creel census work, and studies to determine the true status of the headwater streams as brood areas.
3. Grove Creek supports an extremely heavy population of legal size fish during the summer months.
4. Parts of Stocker and Loving Creeks show deficient fish populations. This is probably due to the nature of the stream bottom through these areas.
5. The lack of sufficient cover in some of these streams during the early spring months, particularly during the spawning season, may be a contributing factor to the decline of productivity.
6. It is recommended that all of Silver Creek and its tributaries, or parts thereof, east of the north-south county road which runs south from Gannett, through Punkin Center junction and to the Picabo hills, be opened to fishing the coming season.
7. It is recommended that Stocker and Loving Creeks be planted with legal size rainbow trout before the opening of the fishing season and that observations be made of these planted fish for the necessary length of time following their release to determine their movements, if possible.