MONTANA STATE DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION
HELENA, MONTANA

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F-12-R-3 Name Western Montana Fishery Study

Job No. IV Title Rock Creek Placer Mining Study

Period Covered May 1, 1956 - November 1, 1956

Abstract

A placer mine was proposed on the West Fork of Rock Creek in the summer of 1955. This job was set up to obtain information on the water quality and on the fish population of that stream prior to the mining operation.

Four stations were selected, both within and below the site of the proposed mine. Turbidity samples were taken once each month from accessible stations. Four 300-foot sections of the stream were sampled by electro-fishing.

No work was done on the mining claim in 1956, and it has been reported that the prices of the "rare earths", which were to have been mined, have fallen to the point where the operation would no longer be profitable.

It is recommended that this job be discontinued until such time as the mining operation may again be undertaken.

Objectives

To measure the effects of a new placer mining operation on the water, flora and fauna of Rock Creek.

Techniques Used

In the summer of 1955, it was reported that a placer mining operation was planned in the Sand Basin area of the West Fork of Rock Creek. The location of this area is T5N, R17W, S10 & 15, Granite County, Montana. The basin is at an elevation of over 5000 feet in the Sapphire Mountains, and is about two miles south of the Skalkaho road. This road is the only one serving the area, and is usually blocked by snow from November to June of each year.

The area was investigated in the summer of 1955 and it was found that a new access road had been built from the Skalkaho road into Sand Basin and that several small excavations had been made in the basin itself. These excavations were not near the stream's edge and had no function other than to allow the mining company to show a certain amount of work done in order to keep their claims. It was reported that the Moose Horn Mining Company planned to move a dredge into the basin in the summer of 1956 and to start placer mining operations for certain "rare earths".

Four stations were selected from which samples were to be collected once each month for turbidity analysis. These stations were located as follows: Station four was in Sand Basin at the general area of the proposed dredge operation, T5N, R17W, S15, Granite County; station two was about one mile downstream from station four, just off the new access road, T5N, R17W, S2, Granite County, stations one and three were about eight and ten miles below Sand Basin, along the main Skalkaho road, T6N, R16W, S35 and T6N, R15W, S31 respectively. Sampling began in February, 1956 and samples were taken from accessible stations once each month through December 1956. Stations two and four were not accessible for November and December collections and only station one was accessible from February through May.

The samples taken during February through May were analyzed on a Hellige turbidometer at the Department's fishery laboratory in Bozeman. In May of 1956, the Montana State Board of Health requested that all further samples be sent, because our sampling concerned pollution, to their laboratory in Helena. Project personnel complied with this request.

On July 16 and 17, 1956 four 300-foot sections of the West Fork of Rock Creek were sampled by electro-fishing. Sections one, two and three were adjacent to one another, and were within the placer mine claim in Sand Basin. Section four was about four miles below the basin. An attempt was made to sample sections on the North Fork of Rock Creek, which is a small tributary of the West Fork. This stream is outside the proposed placer mining operation and it was felt that sample stations on it could be used as controls for the stations on the West Fork. However, fish were found to be so scarce in this small stream that electro-fishing catch records from it would have had no value for control data.

The mining company did no further work in the area in the summer of 1956 and it was reported that the "rare earths", which were to have been mined, had fallen in price so that the proposed operation no longer appeared profitable.

Findings

Readings from the turbidity samples which were analyzed at the Bozeman laboratory are show in Table 1. No such comparable data were obtained from the Board of Health laboratory. The Board of Health stated that they considered all turbidities of less than 10 ppm as a trace and reported the June and July samples in that manner. All samples from August through December, 1956 were analyzed for ppm dissolved solids instead of turbidity. No reason for this change was given. These readings are shown in Table 2.

The West Fork of Rock Creek in Sand Basin was found to have several characters unusual for a high mountain stream. The basin itself is a high mountain meadow, and the stream within it has a fairly moderate gradient, grass-lined banks, mostly sand bottom and little shade cover from brush or trees. This is in sharp contrast, both to most of our other mountain streams and also to the West Fork itself, after it leaves the basin. These other streams are usually characterized by having steep gradients, boulder and rubble banks and stream beds, and good shade cover from brush, trees and high cliffs.

It was reported that a Civilian Conservation Corps (CCC) crew under the direction of Dr. Tarzewell, had done stream improvement work in this area in the early 1930's. During the 1956 survey, many of these old structures were located. A few of them were still functioning, particularly the ones which had been deisgned to furnish submerged cover.

The first sampling attempt was made in June, with the 230-volt DC generator from project F-13-R. Practically no fish were taken. A second attempt was made on July 16 and 17 with both the DC machine and the 230-volt AC generator from this project. The three sections within Sand Basin (numbers 1, 2 and 3) were each done with both generators in the following manner:

Sec. 1 - one downstream run with the DC unit followed by an upstream and downstream run with the AC unit.

Sec. 2 - one upstream and downstream run with the AC unit followed by one downstream run with the DC unit.

Sec. 3 - two downstream runs with the DC unit followed by one upstream and one downstream run with the AC unit.

Section 4 was sampled with the AC machine only. The numbers of fish taken from each section by each generator are shown on Table 3. It is quite apparent, upon consideration of these data, that in this particular stream the AC unit is far superior to the DC as a sampling device.

Recommendations

Because the proposed placer mining operation on the West Fork of Rock Creek has not been undertaken, the major portions of this study should be discontinued until such time as the mining operation starts.

It would be well to have electro-fishing data from several sections, on both the West Fork and the main Rock Creek, well below Sand Basin. It is recommended that this suggested sampling be done under the regular survey, which is to be carried out under a state project in 1957.

It is further recommended that the turbidity samples be collected from all accessible stations once each month from June through December of 1957. These should be run on the turbidometer at the Bozeman laboratory in order to obtain June through December data comparable to the February through May data collected in 1956.

Summary

1. In the summer of 1955, it was reported that a placer mining operation was contemplated on the West Fork of Rock Creek. Investigation disclosed that a new access road had been built into the Sand Basin area of this creek, and that several small excavations had been made in order for the company to maintain its claim.

2. Turbidity samples were collected once each month from the West Fork of Rock Creek from February through December, 1956. These were collected from one to four stations each month, depending upon the accessibility of the higher areas.

3. February through May samples were analyzed at the Department's Fishery Laboratory at Bozeman. June through December samples were sent to the Montana State Board of Health in Helena.

4. Four 300-foot sections of the West Fork of Rock Creek were sampled by electrofishing.

5. The proposed mining operation was not undertaken in 1956. The reason proposed for this was that the prices of the "rare earths", which were to have been mined, had fallen to the point where the mining operation would no longer be profitable.

6. The following recommendations are given:

a. This job should be discontinued until such time as mining starts in Sand Basin.

b. Several sections in the lower parts of Rock Creek drainage should be sampled by electro-fishing in 1957. This should be done under a regular survey job.

c. Turbidity samples should again be collected from June through December, 1957 and should be analyzed at the Bozeman Fishery Laboratory. This also should be done under the survey job.

Data and Reports

The original data and reports are with the project leader in Missoula.

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Date May 5, 1957

Approved George D. Holton
GEORGE D. HOLTON

Table No. 1 Turbidity readings, Station 1, West Fork Rock Creek, 1956. Stations 2, 3 and 4 were inaccessible from February through May.

Date	Turbidity (ppm SiO_2)
February 3, 1956	2.5
March 23, 1956	0.5
April 12, 1956	1.5
May 2, 1956	1.0
May 19, 1956	3.2

Table No. 2 ppm dissolved solids, West Fork Rock Creek, 1956. Stations 2 and 4 were inaccessible in November and December.

	Station			
Date	1	2	3	4
July 17, 1956	18.3	18.0	29.2	16.0
August 7, 1956	22.7	22.5	33.5	23.3
August 31, 1956	17.8	33.0	33.5	18.7
October 26, 1956	26.5	18.8	36.8	20.0
November 28, 1956	29.8		76.0	
December 18, 1956	23.0		44.0	

Table No. 3. Catch per 300' section by type of electro-fishing device, West Fork Rock Creek.

	Section						
	1		2		3		4
Species	AC	DC	AC	DC	AC	DC	AC only(DC not used)
Cutthroat Trout	4	0	10	0	10	0	2
Dolly Varden trout	0	1	3	0	3	0	11
Mountain whitefish	2	0	20	0	28	1	2
Fine-scaled sucker	0	0	3	0	10	0	1
Cottus	9	0	18	0	5	0	1
TOTAL	15	1	54	0	56	1	17