

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

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Job No. IV-A

Project No. F-7-R-4

Title of Job: The Effects of Logging on Pinkham Creek's Fish Population

Abstract:

Nine randomly selected sections, each 300 feet long were sampled and 388 eastern brook trout and 200 rainbow trout were captured. The eastern brook trout comprised 66 percent of the population. The condition factor of the brook trout averaged 37.4 and the rainbow trout 38.9. Logging operations have continued and 1,250 acres have had some timber removed during the current year. Ninety percent of the logging was selective cut pine, fir and larch and the remainder was clear cut spruce. The rainbow trout were found to be more numerous in the lower sections than in the upper. There was a decrease in both numbers and weights of fish from that of the previous years. The rainbow trout suffered the greatest reduction. Some new erosion of the stream banks was observed in the portion of the stream in which the lower three stations are located.

Objectives:

To measure the fish population of a trout stream over a period of years in a locality where virgin timber is being removed so that any changes which may take place in the population may be determined.

Techniques Used:

The same nine randomly selected stations that were sampled in 1952 and 1953 were sampled again in 1954. Each station is 300 feet long. The sampling was accomplished with a 220 volt AC generator. Before sampling each station was blocked off with one-half inch square mesh nets and all fish captured were weighed and measured. Scale samples were taken from a representative sample of the fish at each station. The amount of timber cutting done in the drainage was obtained from the U. S. Forest Ranger at Rexford, Montana.

Findings:

The stream and drainage has already been described in the three previous completion reports.

During the year 1954, 1,250 acres of land were logged, yielding 20,000,000 board feet of timber. A total of 125 acres was clear cut of spruce for 2,000,000 board feet of lumber. The remaining 1,125 acres were from 15 to 90 percent selective cut of pine, fir and larch, yielding 18,000,000 board feet of timber. Since this study has started, 27,000,000 board feet of timber has been cut of which 20,000,000 was cut in 1954.

The number of fish captured and their weights are given in Table I. Length frequency graphs of all fish captured are presented in Figures 1 and 2. The pH of the stream was found to be 8.2 and a temperature of 54 degrees F. was recorded on August 30, 1954.

Some new erosion of the stream banks was observed in the portion of the stream in which the lower three stations are located.

Table I.
The Numbers and Weights of Eastern Brook Trout and Rainbow Trout
Captured in the Various Sampling Sections of Pinkham Creek from 1951 to 1954.

	:	1951		:	1952		:	1953		:	1954					
Sections	:	Number	: Weight	:	Number	: Weight	:	Number	: Weight	:	Number	: Weight				
<u>EASTERN BROOK TROUT</u>																
1	:	:	:	:	15	:	.96	:	14	:	.97	:	14	:	.84	
2	:	47	:	2.29	:	55	:	2.59	:	35	:	1.88	:	21	:	1.66
3	:	:	:	:	40	:	1.81	:	32	:	1.43	:	16	:	.71	
4	:	:	:	:	78	:	3.06	:	70	:	2.99	:	45	:	2.15	
5	:	30	:	1.99	:	30	:	1.51	:	25	:	.85	:	31	:	1.25
6	:	40	:	2.13	:	46	:	2.80	:	62	:	2.96	:	43	:	2.23
7	:	109	:	6.48	:	70	:	3.28	:	102	:	4.13	:	31	:	1.01
8	:	:	:	:	103	:	4.93	:	151	:	7.11	:	90	:	4.62	
9	:	:	:	:	170	:	9.25	:	42	:	2.42	:	97	:	5.60	
Total	:	226	:	12.89	:	607	:	30.19	:	533	:	24.74	:	388	:	20.07
<u>RAINBOW TROUT</u>																
1	:	:	:	:	42	:	3.22	:	81	:	3.90	:	40	:	2.08	
2	:	26	:	1.81	:	41	:	2.96	:	68	:	4.63	:	60	:	2.76
3	:	:	:	:	42	:	2.96	:	42	:	2.80	:	31	:	1.48	
4	:	:	:	:	26	:	2.17	:	37	:	2.48	:	26	:	.89	
5	:	7	:	.49	:	15	:	1.63	:	12	:	.90	:	19	:	.76
6	:	7	:	.59	:	22	:	1.87	:	29	:	2.33	:	16	:	.82
7	:	1	:	.27	:	4	:	.36	:	6	:	.43	:	8	:	.85
8	:	:	:	:	1	:	.07	:	:	:	:	:	:	:	:	:
9	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Total	:	41	:	3.16	:	193	:	15.24	:	275	:	17.47	:	200	:	9.64
Total of all trout	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	267	:	16.05	:	800	:	45.43	:	808	:	42.21	:	588	:	29.71

TOTAL LENGTH IN INCHES

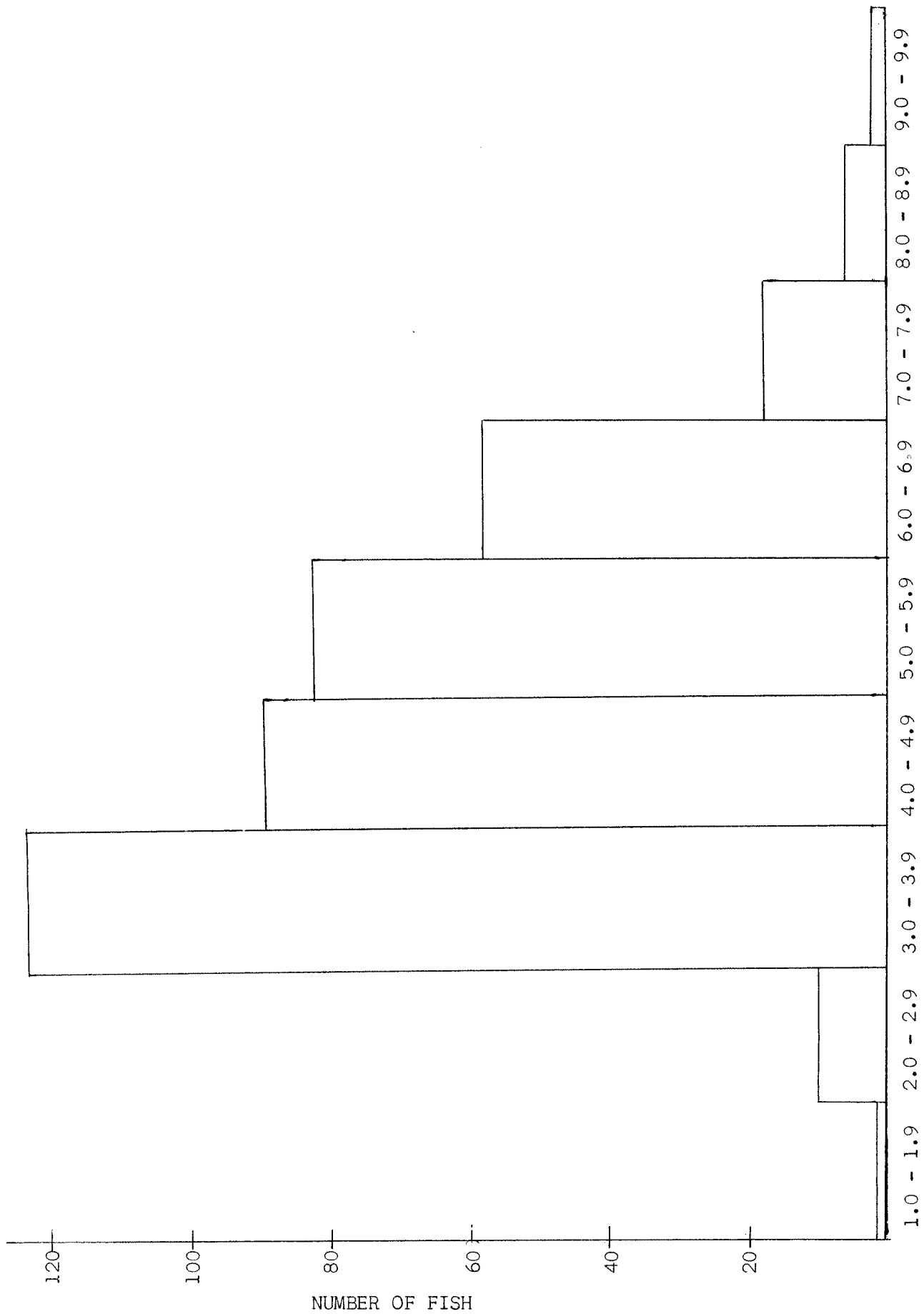


Figure 1. Length frequency of 388 eastern brook trout captured in Pinkham Creek in 1954.

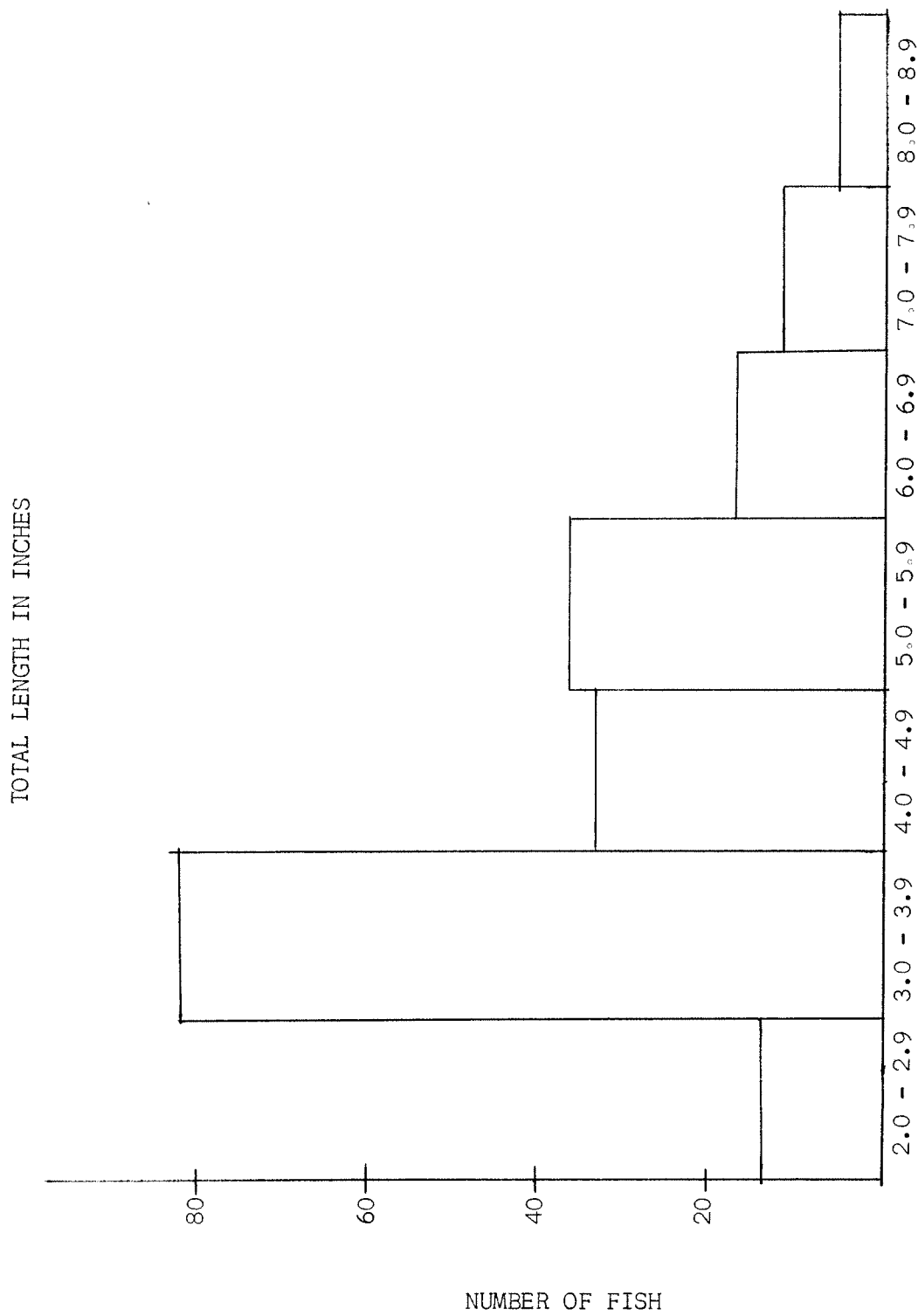


Figure 2. Length frequency of 200 rainbow trout captured in Pinkham Creek in 1954.

Analysis and Recommendations:

The stream is still an eastern brook trout water. A total of 388 eastern brook trout and 200 rainbow trout were captured. The eastern brook trout comprised 66 percent of the fish populations of the stations sampled. The condition factor C of the rainbow trout averaged 38.9 and that of the eastern brook trout 37.4.

The amount of timber removed from the drainage during 1954 was almost as much as that removed in the three previous years. Roughly 12 percent of the drainage has had some timber removed since the project began in 1951. No noticeable change of the stream volume has been observed, however, some new erosion has occurred in the lower part of the study section.

The stratification of rainbow trout and eastern brook trout is about the same as last year, that is, the rainbow trout progressively decrease in numbers upstream until they are absent in the two uppermost stations. The eastern brook trout were found in all stations but were more numerous in the two uppermost sampling stations.

In comparing the weight and number of fish captured for the past two years (Table I), there is a considerable decrease in numbers as well as total weight of fish. The decrease is chiefly of fish from 4 to 6 inches in length, and is not in the stations where the new erosion has occurred. No explanation can be given for the decrease at this time.

It is recommended that this study be continued, so that changes in populations and population composition may be observed as the logging proceeds.

Summary:

Nine randomly selected stations each 300 feet long were sampled and a total of 388 eastern brook trout and 200 rainbow trout were captured. The eastern brook trout comprised 66 percent of the population. During the year, 1,250 acres of land were logged, varying from a 15 percent cutting to clear cutting.

There was a decrease in both numbers and total weights of fish from that of the previous years. The rainbow trout suffered the greatest reduction. Some new erosion of the stream banks was observed in the portion of the stream in which the lower three stations are located.

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Approved by _____

Date March 22, 1955