

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-7-R-3 Work Plan No. VI Job No. VI-A

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 533 eastern brook trout and 275 rainbow trout were captured. Twenty-two of the eastern brook trout and 40 of the rainbow trout had attained a length of 7.0 inches and over. The condition factor of the eastern brook trout averaged 32.9 and for the rainbow 41.3. Logging operations were continued and 300 acres has had timber removed during the current year, varying from a 40 percent cut to clear cutting. Rainbow were found to be more numerous in the lower stations than in the upper, while the reverse was true for the eastern brook trout. While the weight of all trout increased slightly in the four sections that were sampled in the three consecutive years, there was a decrease in weight of brook trout and an increase in the weight of rainbow trout. The number of brook trout in the four sections remained about the same but the number of rainbow increased. The reasons for these changes are not known.

Objectives:

So far as is known, no information is at hand on the change, if any, of a stream population after a drainage has had timber removed. This project is aimed to determine what changes may take place in a stream population after virgin timber has been removed.

Techniques Used:

The same sections that were sampled in 1952 were sampled again in 1953. The sampling was done with a 220 volt AC generator. Each station was blocked off with a 1/2 inch square mesh nets. All fish captured were weighed and measured and scale samples were taken from a representative sample of the fish.

Findings:

The stream has been described in Job Completion Report F-7-R-1, Work Plan VII in 1951 and F-7-R-2, Work Plan VI of 1952. A map of the stream marking the location of all sampling stations is given in Figure 1. Since this study will be continued, a final report cannot be made at this time.

During the year 1953, 200 acres of land were clear cut of spruce and 100 acres was 40 percent cut.

The number of fish captured and their weights are given in Table I. One-half of Section 9 was not sampled due to a number of beaver dams in the area. Length frequency graphs (Figures 2 & 3) are presented for the rainbow trout and eastern brook captured in 1953. Age-growth studies have not been completed for the fish captured.

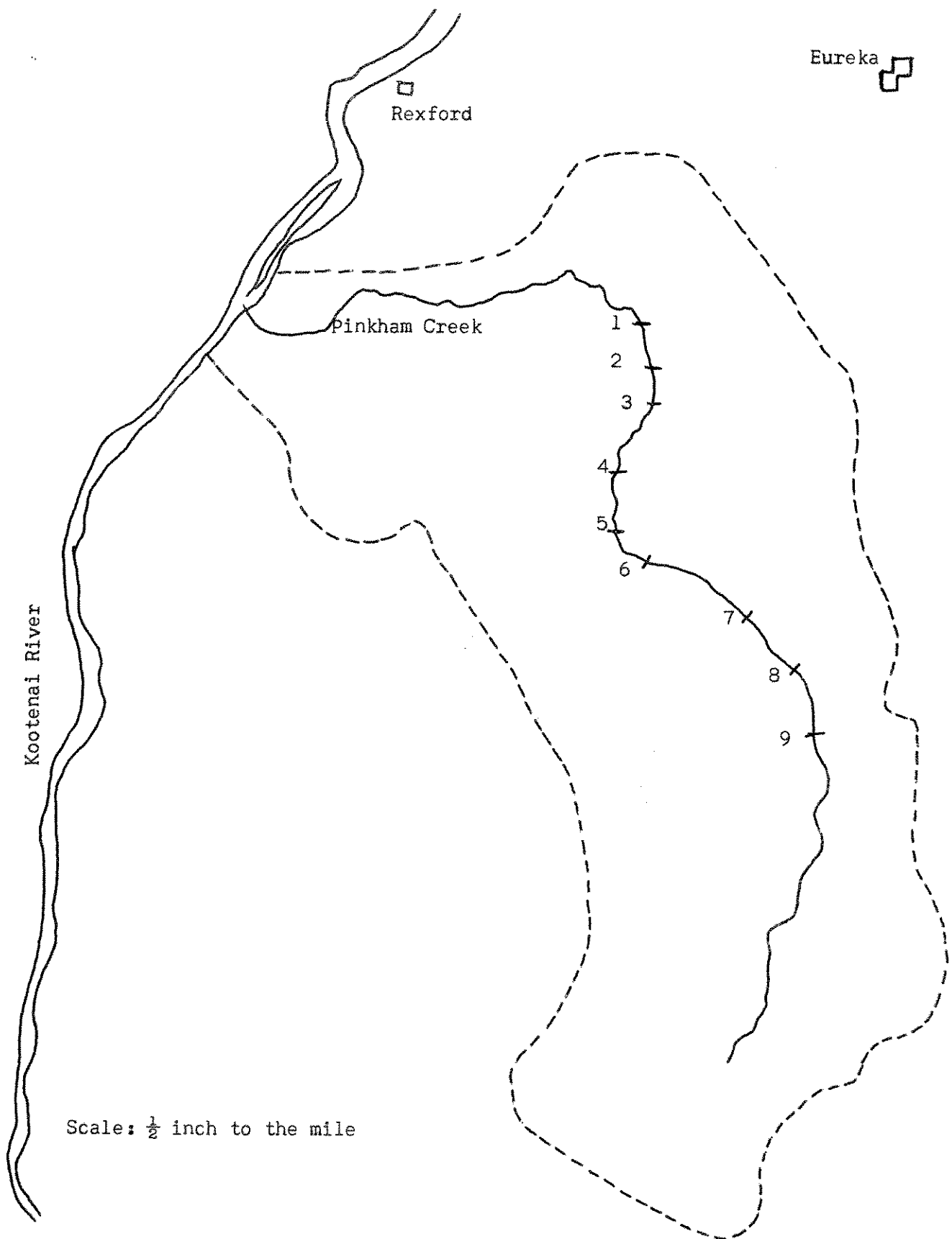


Figure 1. Pinkham Creek showing stations sampled and drainage basin.

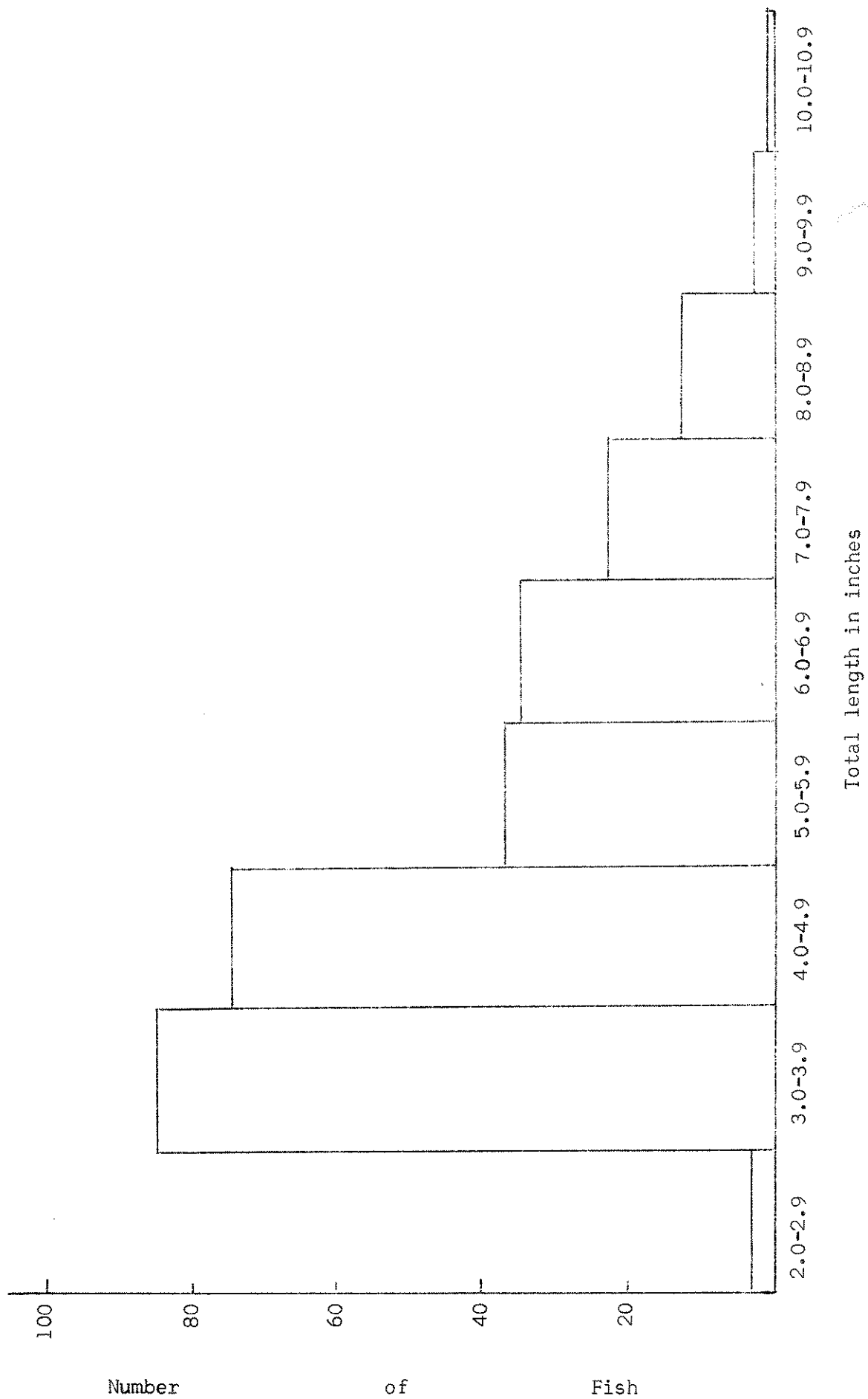


Figure 2. Length frequency of 275 rainbow trout captured in Pinkham Creek in 1953.



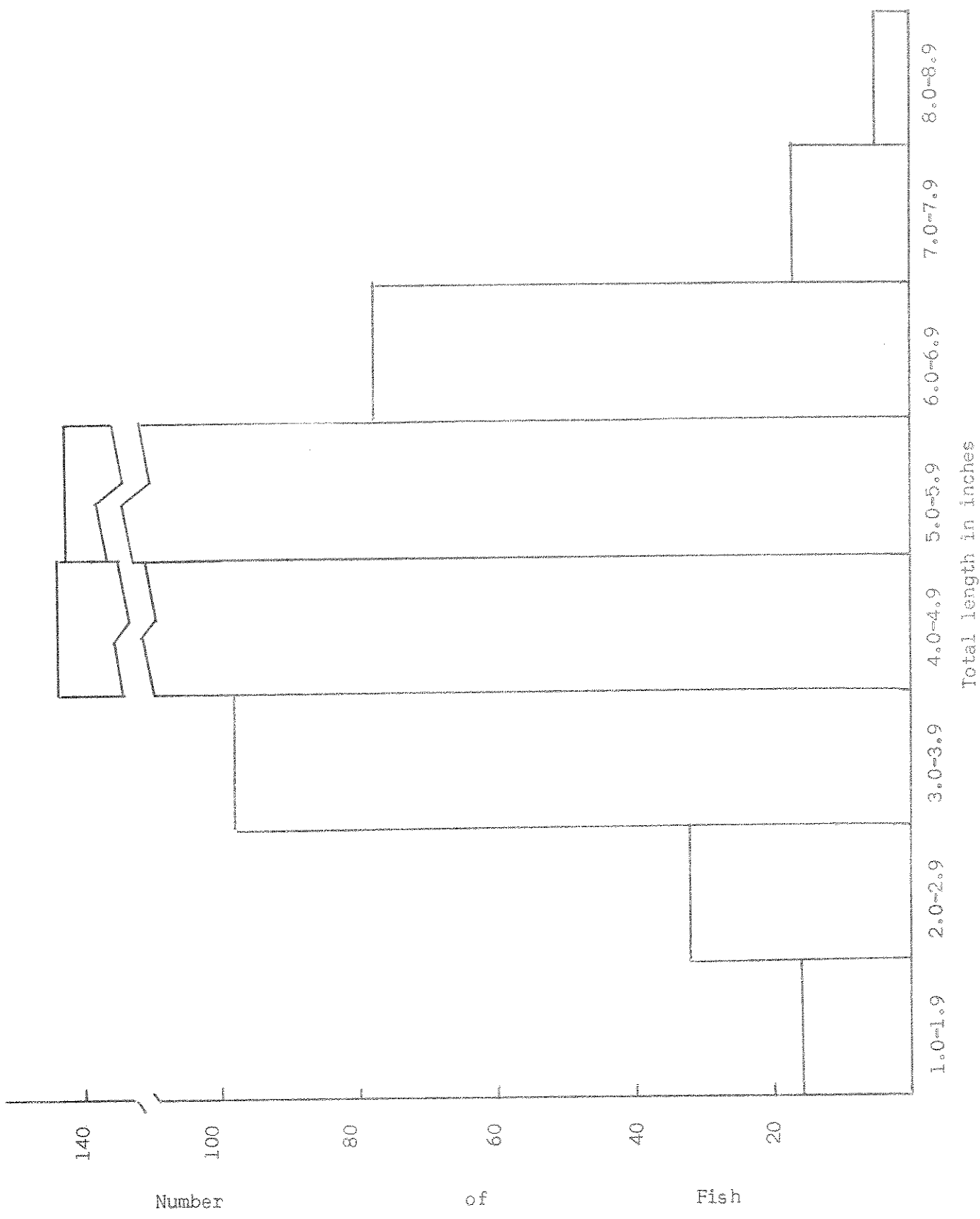


Figure 3. Length frequency of 533 eastern brook trout captured in Pinkham Creek in 1953.



Table 1. Numbers and weights of trout captured in the various sections in Pinkham Creek in 1953.

Section	Species	Number	Weight (pounds)
1	Eastern brook trout	14	.97
	Rainbow trout	81	3.90
2	Eastern brook trout	35	1.88
	Rainbow trout	68	4.63
3	Eastern brook trout	32	1.43
	Rainbow trout	42	2.80
4	Eastern brook trout	70	2.99
	Rainbow trout	37	2.48
5	Eastern brook trout	25	.85
	Rainbow trout	12	.90
6	Eastern brook trout	62	2.96
	Rainbow trout	29	2.33
7	Eastern brook trout	102	4.13
	Rainbow trout	6	.43
8	Eastern brook trout	151	7.11
9*	Eastern brook trout	42	2.42
Total	Eastern brook trout	533	24.74
	Rainbow trout	275	17.47

\*Only lower half of this section was sampled.

Table II. Total numbers and weights of fish captured in the four stations in Pinkham Creek that were sampled in 1951, 1952 and 1953.

Species	Section	1951		1952		1953	
		Number	Weight	Number	Weight	Number	Weight
Eastern brook	2	47	2.29	55	2.59	35	1.88
	5	30	1.99	30	1.51	25	.85
	6	40	2.13	46	2.80	62	2.96
	7	109	6.48	70	3.28	102	4.13
	Total	226	12.89	201	10.18	224	9.82
Rainbow trout	2	26	1.81	41	2.96	68	4.63
	5	7	.49	15	1.63	12	.90
	6	7	.59	22	1.87	29	2.33
	7	1	.27	4	.36	6	.43
	Total	41	3.16	82	6.82	115	8.29
Total		267	16.05	283	17.00	339	18.11



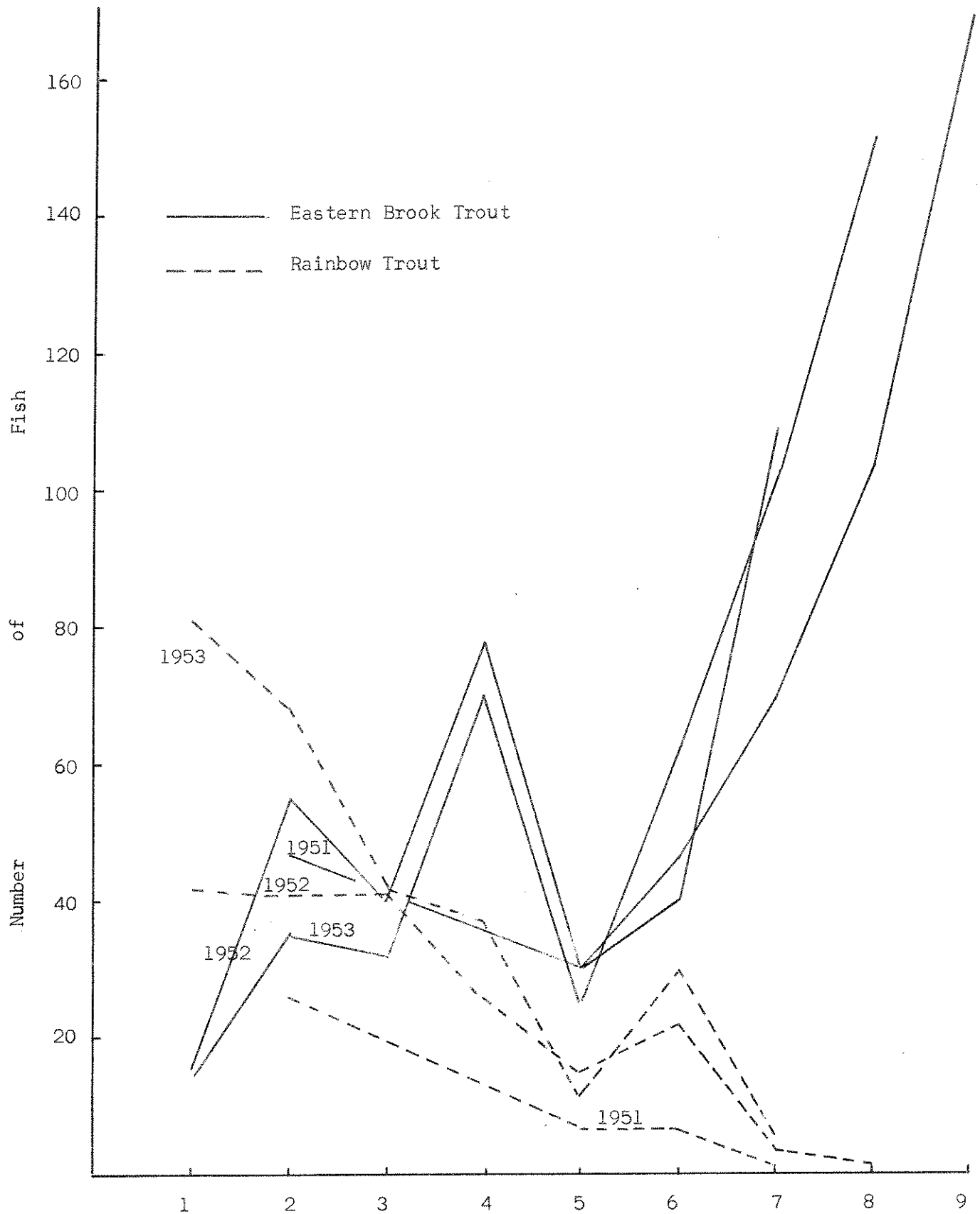


Figure 4. The number of trout in the various sections for the years 1951, 1952 and 1953 in Pinkham Creek.



It was erroneously reported that sections 1 through 4 of 1951 were re-numbered 2, 3, 4 and 5 respectively 1952. This should have read sections 1 through 4 of 1951 were renumbered 2, 5, 6 and 7 respectively in 1952.

The pH of the stream was found to be 8.2 and a temperature of 64° F. was recorded on August 4, 1953.

#### Analysis and Recommendations:

This stream was again found to be an eastern brook water. A total of 533 eastern brook trout were captured of which 22 were of legal size (7.0 inches and over) or about 4 percent (Figure 3), and of the 275 rainbow trout captured, 40 were of legal size or 15 percent. The eastern brook comprised 66 percent of the fish population of the stream areas sampled. The condition factor C of the eastern brook trout averaged 32.9 and that of the rainbow trout 41.3.

The amount of timber removed in the drainage has been small. Approximately 6.7 percent of the drainage has been affected by logging since 1951. The volume of the stream has not changed during the course of the study thus far. Upon examination of the stream population by species, it is interesting to observe the stratification of the rainbow trout and eastern brook trout (Figure 4). The rainbow are dominate in Section 1 and are absent in Section 9, declining more or less gradually as the sampling was done upstream. While eastern brook trout were found in all sampling stations, they were more numerous in the upstream stations.

In the four stations that were sampled in the three consecutive years a decline in weight of eastern brook trout is apparent while there is an increase in weight of the rainbow trout (Table II). There is also a slight increase in total weight of all trout in these four sections. The reasons of these changes are not known.

It is recommended that this study be continued, that changes in population composition may be observed if they occur as logging proceeds.

#### Summary:

Nine randomly selected sections were sampled and a total of 533 eastern brook trout and 275 rainbow trout were captured. The rainbow trout comprised 34 percent of the population and 15 percent were 7.0 inches and over while 4 percent of the eastern brook trout were of this size. Three hundred acres of land were logged during the year.

In comparing the populations in the four sections that were sampled in the three consecutive years, there is a definite increase in the number of rainbow trout with a corresponding increase in weight. The weight of eastern brook trout decreased somewhat but their numbers remained about the same. However, the total number of trout and their weight increased from 1951 through 1953.

#### Data and Reports:

Original data is with the fisheries biologist at Kalispell, Montana.

Prepared by Frank A. Stefanich

Approved by \_\_\_\_\_

Date April 19, 1954

