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-6 Name Northwestern Montana Fishery Study

Job No. III Title The Effects of Logging on Pinkham Creek's Fish Population

Period Covered May 1, 1956 to Nov. 30, 1956

Abstract:

Eight randomly selected stations were sampled and a total of 401 eastern brook trout and 218 rainbow trout taken. The total weight and average condition factor C for the brook trout was 17.42 pounds and 36.1, respectively. For the rainbow trout, figures of 13.29 pounds and 25.3 were obtained for the total weight and average condition factor C. The total number of fish caught was higher than in 1955.

Approximately 1,350 acres of timber were logged on Forest Service land, producing 13,587.26 MBM* and 181,090 linear feet of poles. An estimated 1,000 MBM of timber was cut on private lands. To date, a total of 61,087 MBM of timber has been removed from the Pinkham Creek drainage.

Objectives:

It is the purpose of this job to measure the standing fish population of Pinkham Creek over a period of years so that any changes which may develop in the population may be measured. This area of virgin timber is now being logged. If this logging affects the aquatic environment, it is expected that this change will be reflected in the fish population.

Techniques Used:

Eight randomly selected stations, the same as those used in previous years, each 300 feet long, were sampled by using a 220-volt AC generator, Before sampling, each section was blocked off with one-half inch nets. All fish were measured and weighed before release. The amount of timber cut in the drainage was obtained from the U. S. Forest Ranger at Rexford, Montana.

*MBM - Thousand feet board measure.

Findings:

The stream and drainage have been described in previous completion reports.

In 1956, approximately 1,350 acres of land were logged, resulting in the removal of 13,587.26 MBM and 181,090 linear feet of poles. An estimated 1,000 MBM of timber was cut on private lands in addition to that cut on Forest Service land.

Some of the land that was been previously logged was cut over again this past year. A total of 580 acres were added to the logged off area, and the total acreage logged since the program started is 8,300 acres. There are approximately 39,300 acres of timberland that drain into Pinkham Creek above section 1.

The number and total weight of eastern brook trout captured was more than that of the previous year (Table I), while the number and total weights of the rainbow trout was less. (Table II).

There was a considerable change of the stream channel in four of the stations. There was much erosion of the stream banks and two log jams were carried away, apparently by high water. In another station, the stream banks and surrounding areas were logged off and the non-usable parts of the trees left lay where they were removed from the trees. Some of the trees were dragged across the creek, causing the cutting of stream banks and dragging trash into the stream. Tree branches were so thick in the stream that many had to be removed just to place the blocking nets and it was extremely difficult to collect the fish. It is not known whether the land is privately owned or not.

The total number of all fish captured was 619 that weighed 30.71 pounds(Table I,II & III). Length frequency graphs of the trout captured are given in Figures 1 and 2. Chemical tests were made on September 25, 1956 with the following results: dissolved oxygen - 8.0 p.p.m., Methyl orange alkilinity - 190 p.p.m., free carbon dioxide 0.0 p.p.m., Phenolphthalein alkilinity - 0.0 p.p.m., and hydrogen ion concentration (pH) of 7.0. The temperature of the water was 54° and a rough measure of stream volume was approximately 12 c.f.s.

Recommendations:

There are still only two species of fish in the stream, eastern brook trout and rainbow trout. The eastern brook trout are the dominant species and for 1956 comprised 64.8 percent of all fish caught.

The condition factor of all fish weighing .04 pounds or more were calculated. The average condition factor (c) for eastern brook trout was found to be 36.1 and for rainbow trout 35.3.

Station 1 is the station nearest the mouth of the stream and number 8 is farthest upstream. The eastern brook trout were more numerous in the stations upstream while the reverse is true for rainbow trout (Table I & II). An increase in both numbers and weights of fish was noted over that of the previous year.

In the past five years when all eight stations were sampled, the greatest number of eastern brook trout captured was 491 in 1953 and the least, 291 in 1954, while their total weight varied from 14.26 pounds in 1955 to a high of 22.32 pounds in 1953 (Table I). For the same period, the greatest number of rainbow trout captured was 275 in 1953 and the least was 193 in 1952, while their total weight varied from 17.47 pounds in 1953 to 9.64 pounds in 1954 (Table II). The total number of trout fluctuated considerably in the years when all stations were sampled (Table III). It is expected that there would be a variation of numbers of trout from the various stations sampled but the great variation from one year to the next is not easily explained. It is known that with the differences in the severity of the winters in the area, these weather conditions might explain part of population fluctuation, But what has not been found out is why there are so few fishes over seven inches. The condition of the fish is good and from aging studies done in the past years all of the fish are young and exceedingly few were over three years old. The eastern brook trout in this stream are what is normally called a "stunted"population.

From the data collected thus far in the study, it does not appear that logging had any serious effects on the fish as yet.

Fluctuations of the populations of fish in a stream are to be expected and Pinkham has well demonstrated this (Figures 3 & 4). However, any drastic changes in either a decrease or increase in populations will easily be detected now since a pattern has been established for Pinkham Creek. From what data are now available and observations made at the individual stations, it appears that the run-off in Pinkham Creek is coming off more rapidly than previously. If the channel keeps changing, it will be expected that the fish populations will decrease.

It is recommended that this study be discontinued for three years and started again in 1960 and populations taken in the same stations for two consecutive years, depending upon what conditions exist at that time.

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Approved by George D. Holton

Date March 29, 1957

Table I -- The numbers and weights of eastern brook trout captured in the various sampling sections of Pinkham Creek from 1951 to 1956.

Sections	1951		1952		1953		1954		1955		1956	
	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
1			15	.96	14	.97	14	.84	12	.66	8	.44
2	47	2.29	55	2.59	35	1.88	21	1.66	38	1.56	19	1.17
3			40	1.81	32	1.43	16	.71	25	1.31	35	1.61
4			78	3.06	70	2.99	45	2.15	39	2.01	54	1.54
5	30	1.99	30	1.51	25	.85	31	1.25	54	1.92	34	1.14
6	40	2.13	46	2.80	62	2.96	43	2.23	49	2.35	43	2.38
7	109	6.48	70	3.28	102	4.13	31	1.01	41	1.46	66	2.70
8			103	4.93	151	7.11	90	4.62	87	2.99	142	6.44
Totals	226	12.89	437	20.94	491	22.32	291	14.47	345	14.26	401	17.42

Table II -- The numbers and weights of rainbow trout captured in the various sampling sections of Pinkham Creek from 1951 to 1956.

Section	1951		1952		1953		1954		1955		1956	
	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
1			42	3.22	81	3.90	40	2.08	44	2.81	53	2.58
2	26	1.81	41	2.96	68	4.63	60	2.76	63	4.34	51	2.48
3			42	2.96	42	2.80	31	1.48	34	2.37	47	2.92
4			26	2.17	37	2.48	26	.89	21	1.27	21	1.41
5	7	.49	15	1.63	12	.90	19	.76	29	1.72	17	1.18
6	7	.59	22	1.87	29	2.33	16	.82	28	2.04	19	1.43
7	1	.27	4	.36	6	.43	8	.85	6	.49	10	1.29
8			1	.07	0		0		1	.04	0	.00
Totals	41	3.16	193	15.24	275	17.47	200	9.64	226	15.08	218	13.29

Table III -- The numbers and weights of all fish captured in the various sections in Pinkham Creek from 1951 to 1956.

Sections	1951		1952		1953		1954		1955		1956	
	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
1			57	4.18	95	4.87	54	2.92	56	3.47	61	3.02
2	73	4.10	96	5.55	103	6.51	81	4.42	101	5.90	70	3.65
3			82	4.77	74	4.23	47	2.19	59	3.68	82	4,53
4			104	5.23	107	5.47	71	3.04	60	3.28	75	2.95
5	37	2.48	45	3.14	37	1.75	50	2.01	83	3.64	51	2.32
6	47	2.72	68	4.67	91	5.29	59	3.05	77	4.39	62	3.81
7	110	6.75	74	3.64	108	4.56	39	1.86	47	1.95	76	3.99
8			104	5.00	151	7.11	90	4.62	88	3.03	142	6.44
Totals	267	16.05	630	36.18	766	39.79	491	24.11	571	29.34	619	30.71

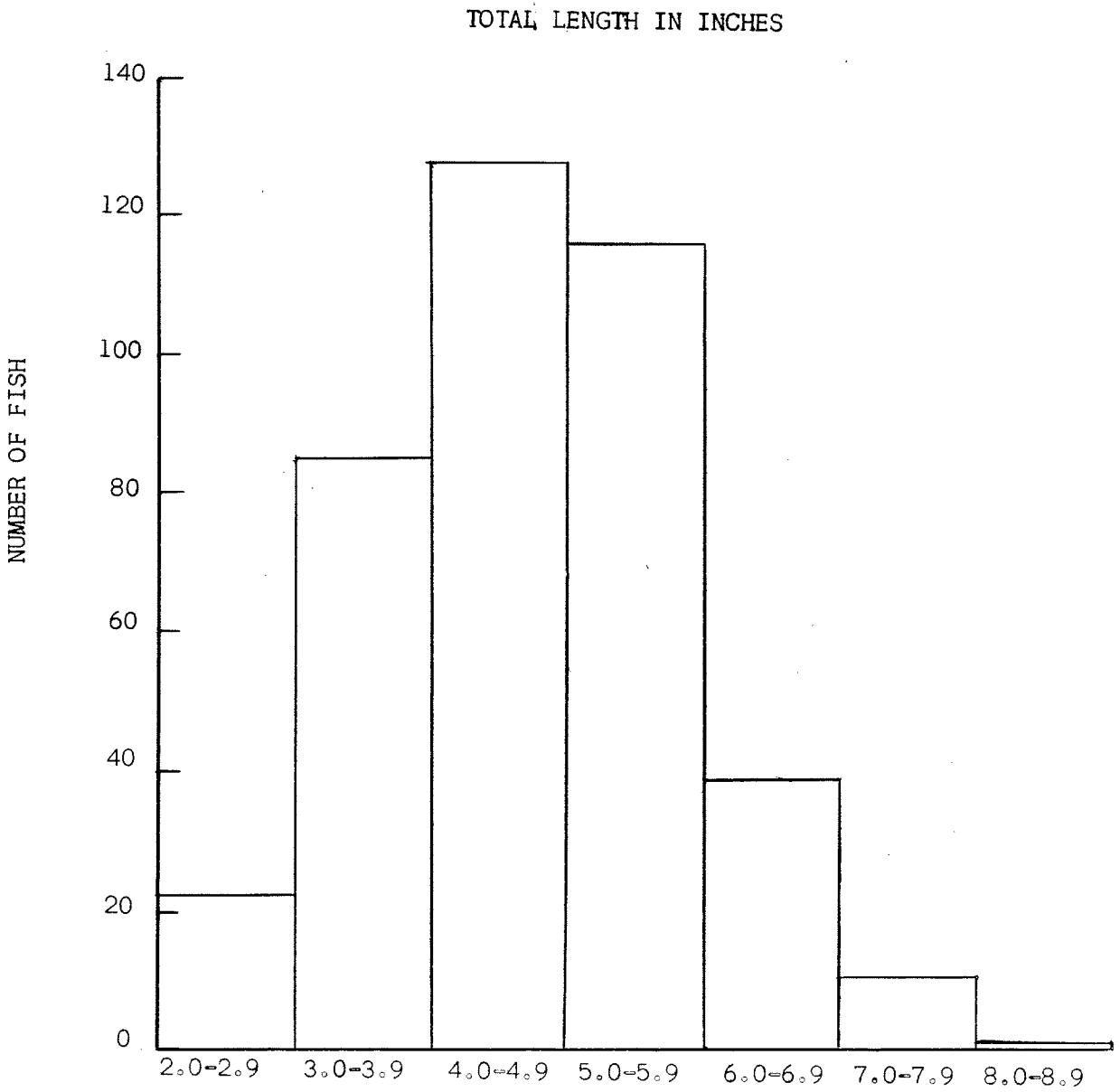

Figure 1. Length frequency of 401 eastern brook trout captured in Pinkham Creek in 1956.

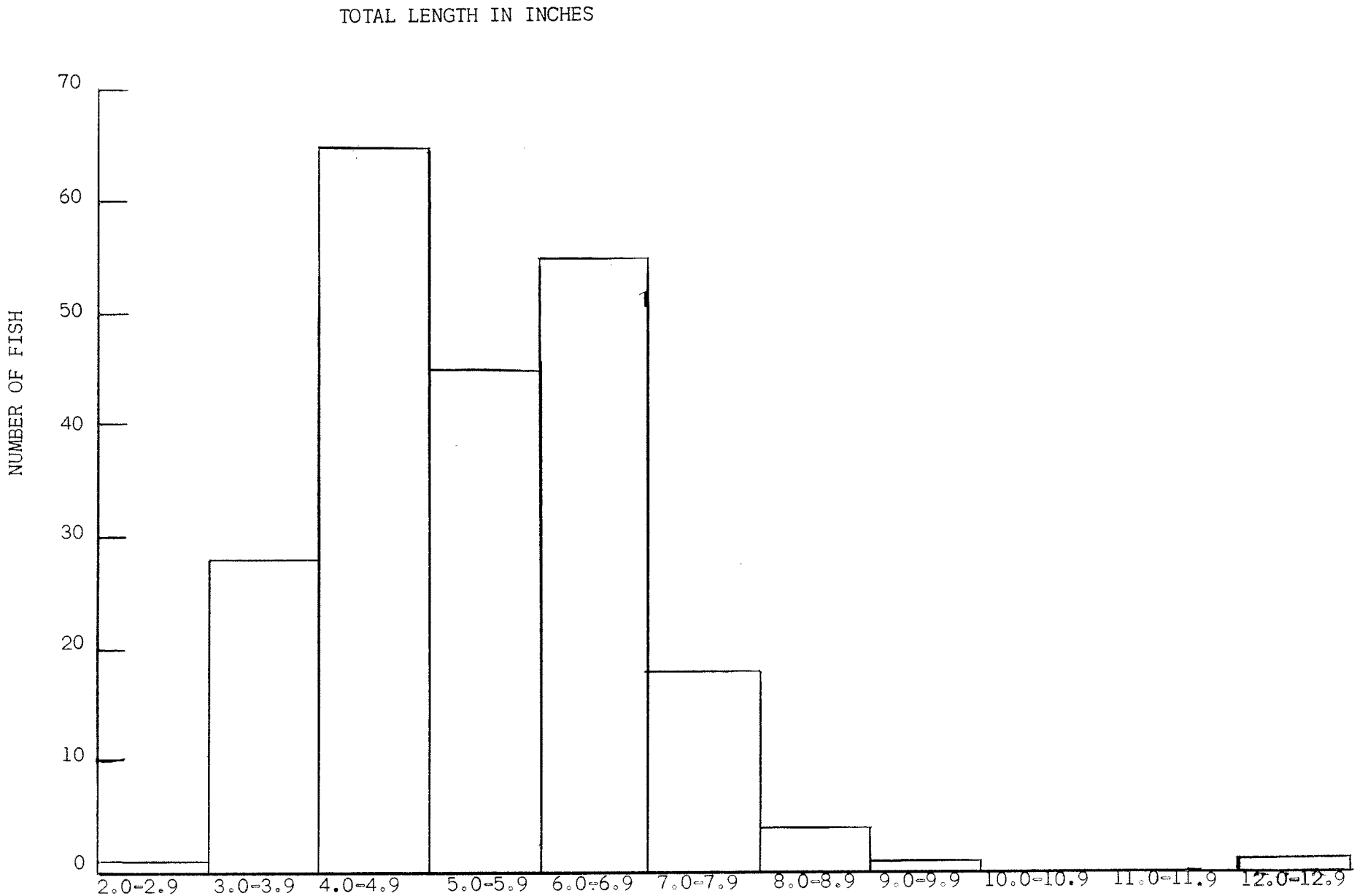

Figure 2. Length frequency of 218 rainbow trout captured in Pinkham Creek in 1956.

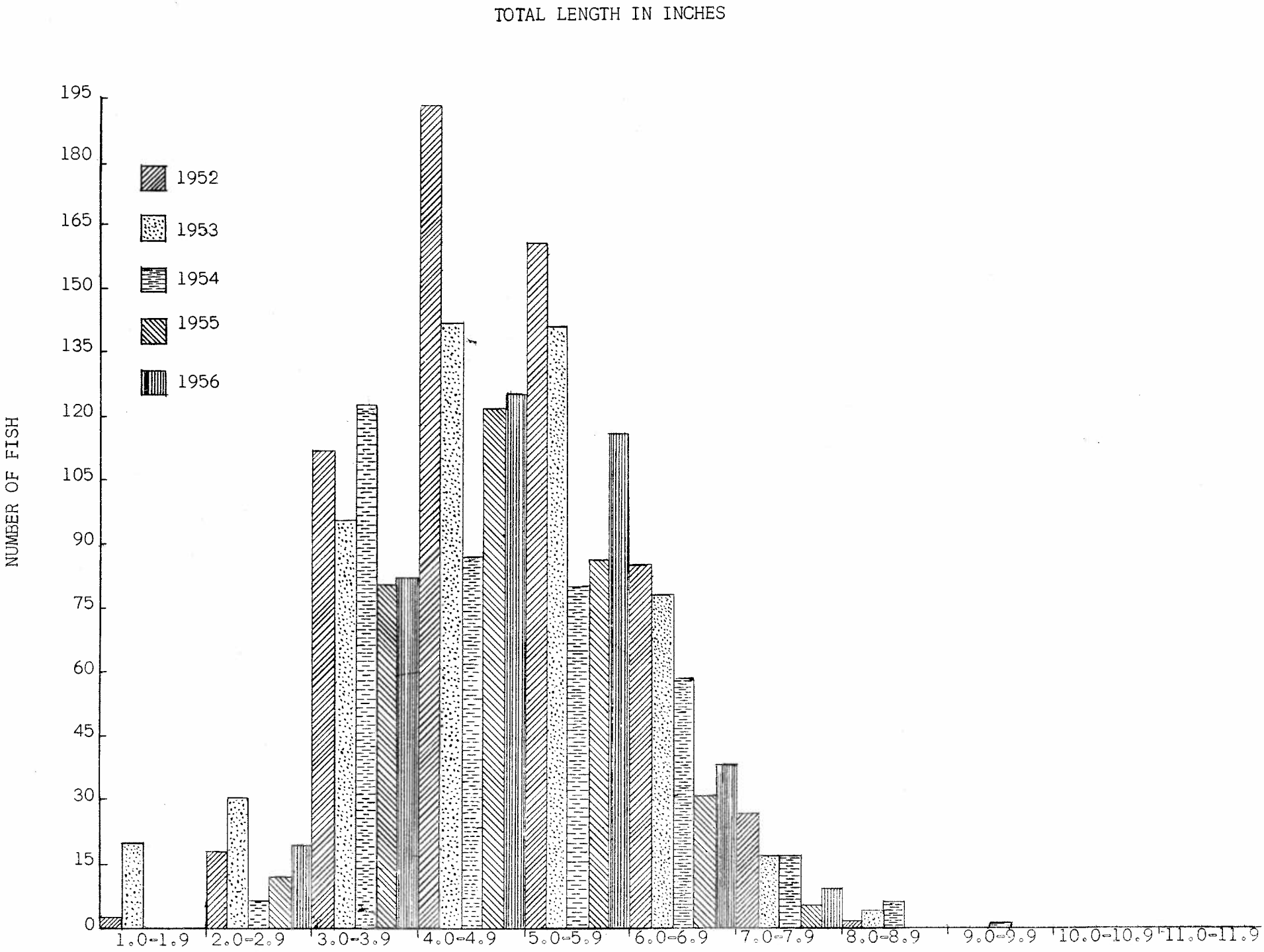

Figure 3. Length frequency of eastern brook trout captured in Pinkham Creek for the years 1952 through 1956.

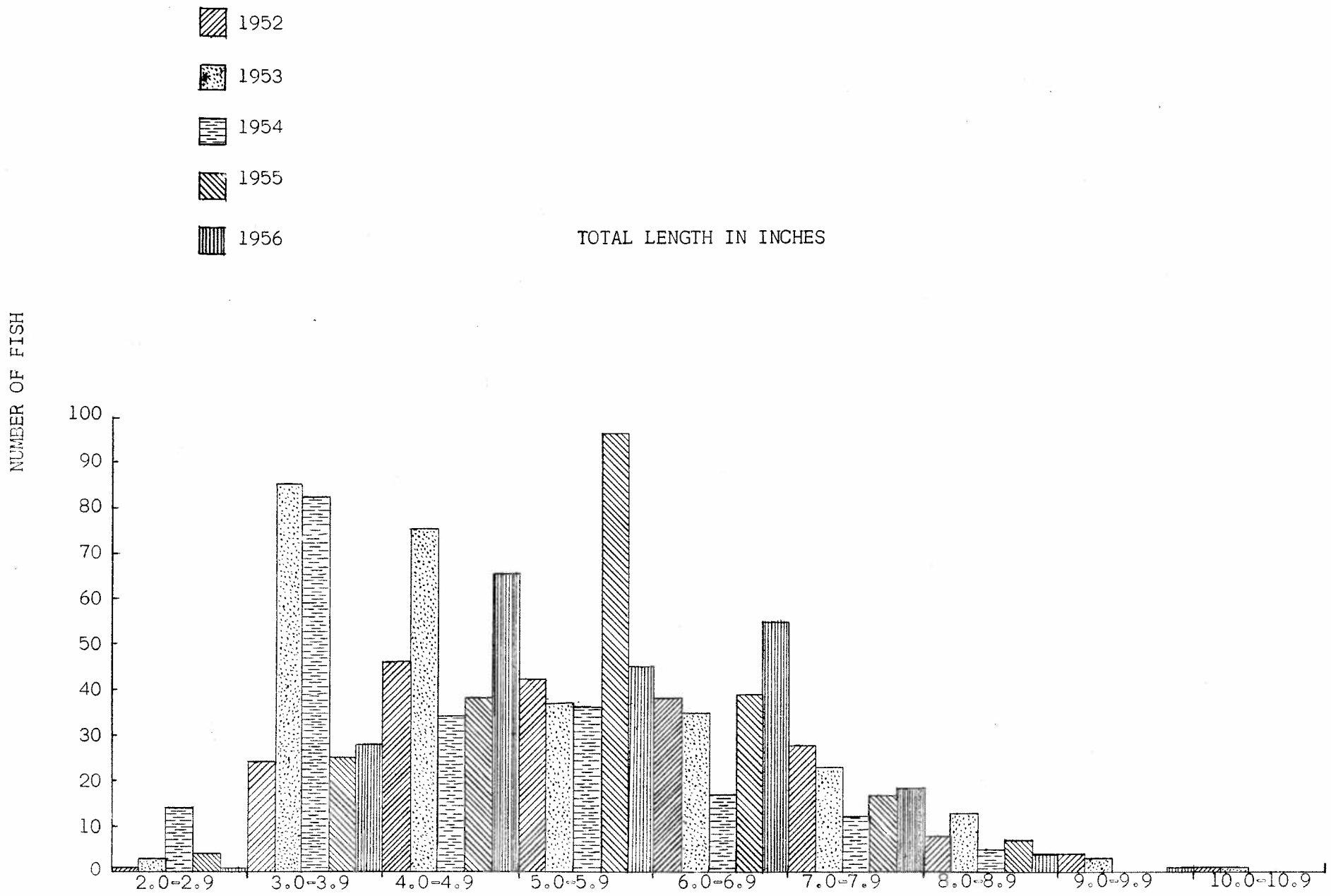

Figure 4. Length frequency of rainbow trout captured in Pinkham Creek for the years 1952 through 1956.