PCWA-L-189

INSTREAM BENEFICIAL USE ASSESSMENT

(IBUA)

WATER RIGHT
APPLICATION No.
FERC No. 7722

For

LONG CANYON CREEK
Placer County, California

APPENDICES

By

ENVIRO HYDRO, INC.
9200 Shanley Lane
Auburn, California 95603

VOLUME 2 OF 2

Appendix B -

Pre-Project Fish Population Monitoring Study for the Proposed Long Canyon Creek Hydroelectric Project (FERC No. 6485), Placer County, California

ABSTRACT: Rainbow trout (Salmo gairdnerii) were the only fish captured by electrofishing during two visits in 1984 to Long Canyon Creek. The total population of young-of-the-year and adults for the study reach was an estimate of 221 ± 4 fish for the 259-foot study reach. This estimate was extrapolated to 4505.3 fish per mile and 58.2 lbs. per acre. Catchable fish were estimated at 19 ± 0 fish in the study reach and 387.3 fish per mile and 22.9 lbs. per acre.

INTRODUCTION

ENVIRO HYDRO, INC. in Auburn, California has submitted an application for license to the Federal Energy Regulatory Commission (FERC) for a hydroelectric project on Long Canyon Creek (FERC No. 7722) in Placer County, California.

This report summarizes pre-project baseline fisheries data collected in September 1984. Standing crop, number of fish per mile of the stream, and a length frequency histogram was determined from the September population survey. Data from a February 1984 qualitative fish survey is compared with this September 1984 data.

METHODS

A 259-foot reach of Long Canyon Creek, which encompasses the existing IFG-4 site (Figure 1), was electrofished on September 7, 1984. The length of the study reach was purposely designed at that length so the results of the fish study could be compared to the IFG-4 output.

The width of the stream was measured at intervals to determine the existing surface area at the time of electrofishing. The reach electrofished is representative of the low gradient reach prior to the steep gradient. Deeper pools were not included in the IFG-4 site or electrofishing reach because of the difficulties in performing either function in the deep pools. The reach was electrofished with a Smith-Root Type 11-A backpack electrofisher fitted with dual catching electrodes. A block net was in place at the bottom of the study reach. A natural hydraulic feature served as upstream terminus of the study reach. The reach was salted prior to each pass with pelletized salt in addition to block salt, which was placed in the stream before the initial pass.

The number of fish in the study reach was estimated by employing a three-pass successive removal-depletion technique and the Moran-Zippen population estimation equation, which is as follows:

$$N = \frac{C}{1 - (1-Q)} \underline{N}$$

C = total catch (all samples)
$\underline{N}$ = number of samples
Q = probability of capture

The population estimate is at the 95 percent confidence interval and the probability of capture with its variance is shown in Table 1.

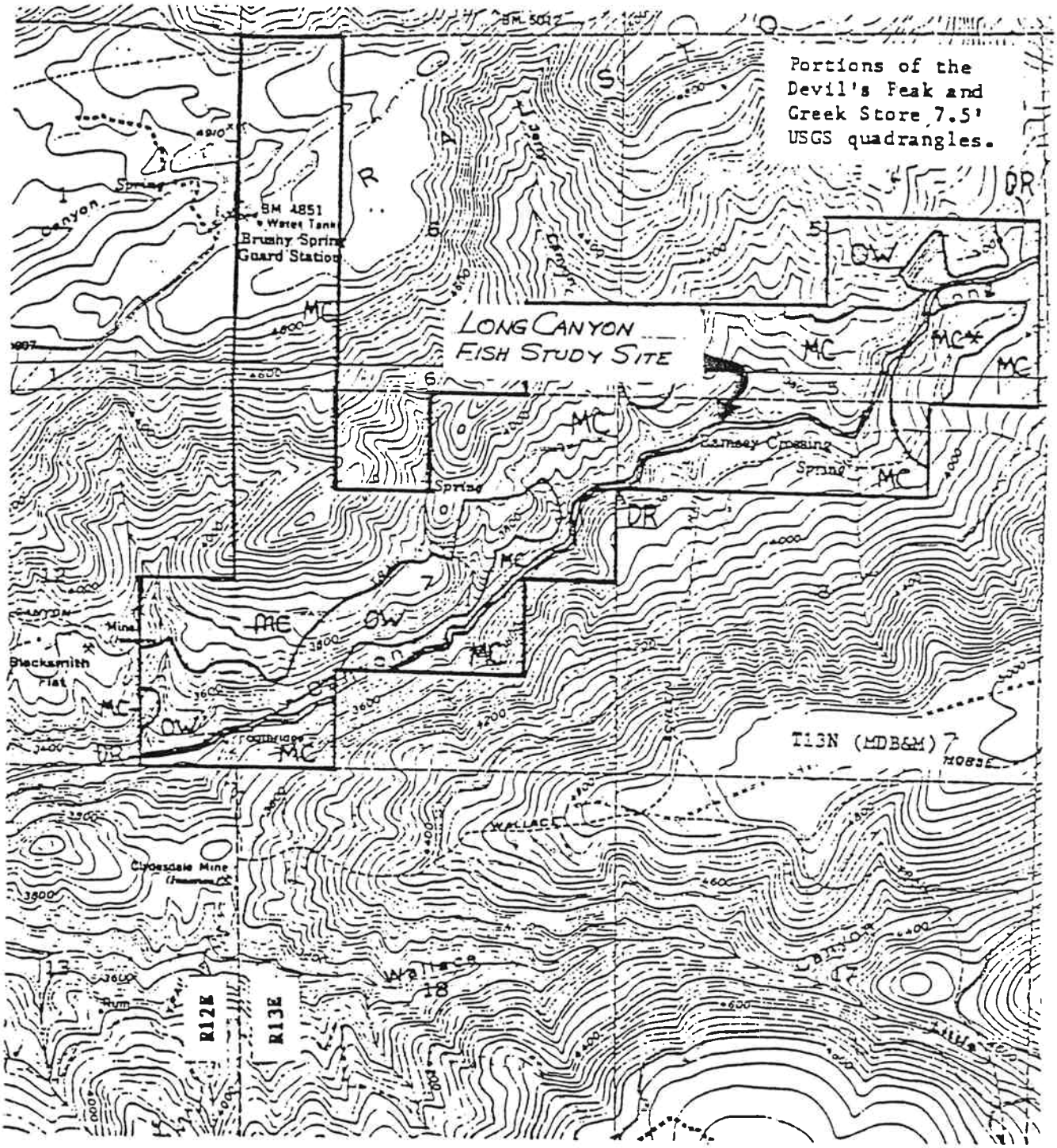


FIGURE 1 LONG CANYON CREEK FEBRUARY AND SEPTEMBER FISH POPULATION EVALUATION SITE

TABLE 1 RESULTS OF ELECTROFISHING EFFORTS AND POPULATION ESTIMATES FOR LONG CANYON CREEK, 1984

TABLE 1.

Category	Fish Caught in Pass 1	2	3	Probability of Capture	Variance	Estimated Population	Fish Per Mile	Pounds Per Acre
Adults and Fry	165	45	8	.76	.001	221 ± 4	4505.3	58.99
Adults (15 cm.)	18	1	0	.95	.002	19 ± 0	387.3	22.93

Fish were measured (fork length) to the nearest 0.5 centimeters and weighed to the nearest 0.5 grams on Pesola 50 gm. or 100 gm. spring scales. A triple-beam balance was used for fish over 100 gm. Captured fish were anesthesized with MS-222, measured, weighed, and retained in a live cart until after the last pass.

The standing crop of fish is derived from the estimated total biomass of fish captured in relation to the amount of surface area of water in the study reach.

The number of fish per 100 feet of stream and fish per mile were estimated from the electrofishing results. A length frequency histogram was prepared from these data. Population estimations were made for all fish captured and for fish greater than 15 cm.

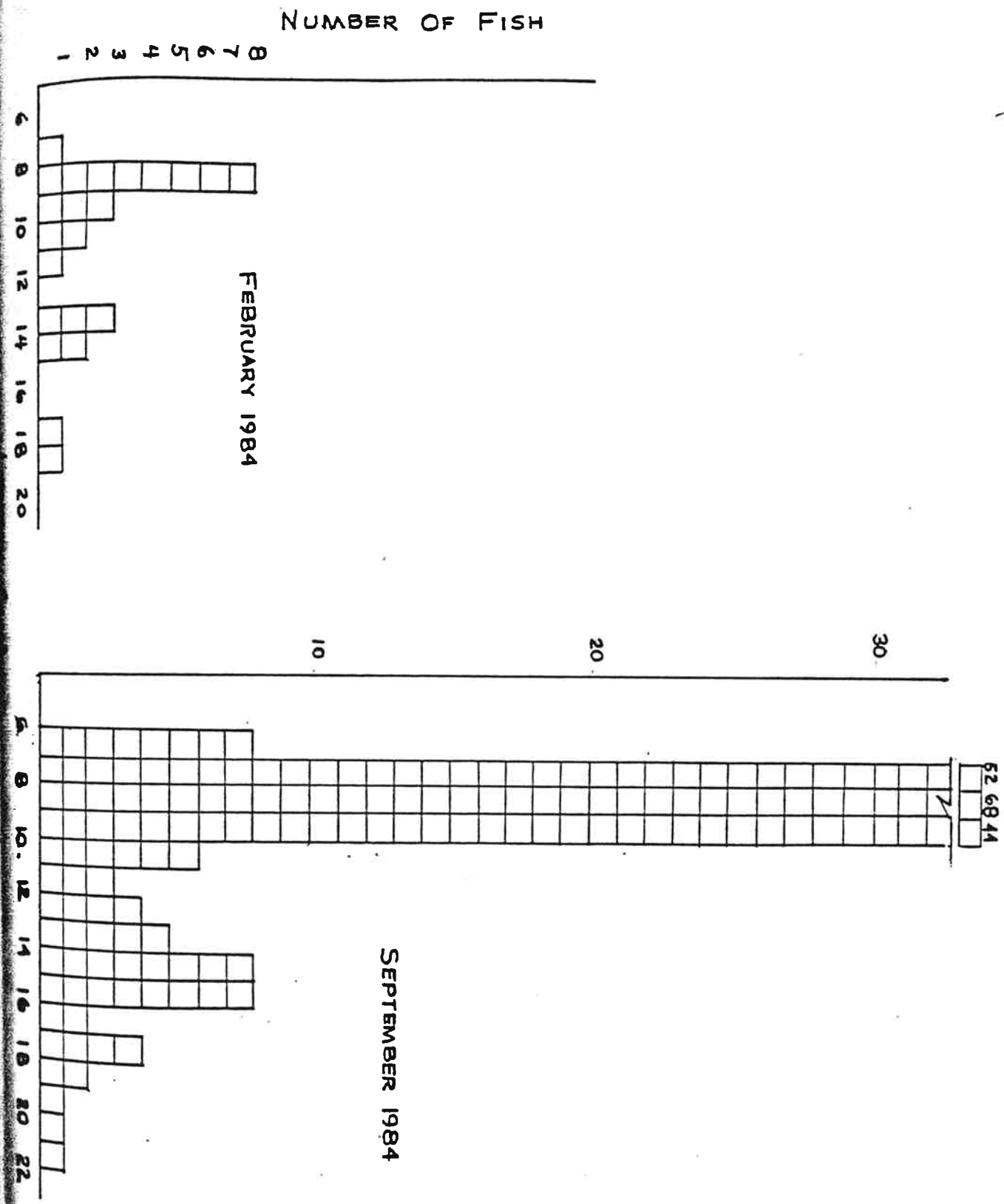
RESULTS

Rainbow trout (Salmo gairdnerii) were the only species captured in the study reach. Fork length frequency histograms for trout captured during March and September study periods are presented in Figure 2. The standing crop of rainbow trout is 58.99 lbs. per acre. The calculated total weight for all fish captured is 6.19 lbs (2808 gm.). The total water surface area of the study reach sampled on September 7, 1984 was 4636.0 square feet. The greatest biomass was occupied by 198 juvenile fish (less than 15 cm.). Their total weight of 3.75 lbs. (1701 gm.) is 60 percent of the fish biomass in the study reach. The catchable fish has a combined weight of 2.44 lbs. (1107 gm.). This respresents 22.93 lbs. of fish per surface acre.

The results of the electrofishing efforts and population estimates are presented in Table 1. The trout were divided into two categories: catchable (greater than 15 cm.), and catchables and young-of-the-year. The adult population was estimated at 19 $\pm$ 0 fish. The fish per mile is 4505.3 for catchables and young-of-the-year, and 387.3 for catchables greater than 15 cm.

DISCUSSION

The smaller size class Rainbow trout (less than 15 cm.) contributed the greatest biomass to the standing crop of fish in the Long Canyon Creek study reach. The proximity of the study reach to a nearby road probably accounts for a moderate fishing pressure that crops off the larger size classes of fish. Electrofishing results from February 1, 1984 (Figure 2) indicates a similar size class distribution but in reduced numbers. More fish may have been present in February, but higher flow conditions hampered the capture of the stunned fish. The larger size classes present in February were not present in September. This could be due to out-migration, natural mortality, or fishing pressure.



LENGTH FREQUENCY HISTOGRAMS FOR RAINBOW TROUT FOR LONG CANYON CREEK CAPTURED BY ELECTROFISHING IN FEBRUARY AND SEPTEMBER 1984

DISCUSSION (cont.)

The large numbers of fish in the smaller size class indicates that adequate seeding of fry is occurring from the limited spawning habitat available. The amount of habitat available to support the fry and juveniles appears to be adequate. The number of fish in the larger size classes are limited by either the lack of adult habitat or food. Some portions of the fish study reach contained exclusively fry or juvenile fish.

The habitat in these reaches was shallow bedrock pools or runs. There was little or no protective cover in these reaches from the higher velocities that occur during storm discharges.

APPENDIX A

PRE-OPERATIONAL FISH POPULATION MONITORING STUDY FOR THE PROPOSED LONG CANYON CREEK HYDROELECTRIC PROJECT (FERC NO. 7722), PLACER COUNTY, CALIFORNIA

PRE-OPERATIONAL FISH POPULATION MONITORING STUDY FOR THE PROPOSED LONG CANYON CREEK HYDROELECTRIC PROJECT (FERC NO. 7722), PLACER COUNTY, CALIFORNIA 1984.

Prepared for

ENVIRO HYDRO, INC.
Auburn, California

By

DOUGLAS PARKINSON AND ASSOCIATES

82 Deerfern Lane
Bayside, California 95524

INTRODUCTION

ENVIRO HYDRO, INC. in Auburn, California has submitted an application for license to the Federal Energy Regulatory Commission for a hydroelectric project on Long Canyon Creek (FERC NO. 7722), Placer County, California.

This report summarizes baseline fisheries data collected during February 1984. Another fish survey will be conducted in the fall of 1984 to assess standing crop of fish stocks at that time. Population estimates for the study reach were computed.

METHODS

A 300-foot section of Long Canyon Creek, that brackets the IFG-4 site, was established. The reach was electrofished with a Type 11-A Smith-Root backpack electrofisher, fitted with dual catching electrodes. Flow conditions prevented the use of a stationary block net. A shorter block net was continually moved to be in position downstream of the electrofisher. The Moran-Zippen method of population estimation was utilized to estimate population size. Three successive passes were made through each study reach. Fish were measured (fork length) and retained in a live box until after the last pass. Population estimates, 95 percent confidence limits and probability of capture and its variance were computed. The estimated number of fish per 100 lineal feet of stream was computed also. Frequency distribution histograms were prepared from the data.

RESULTS

Fork length frequency histograms are presented in Figure 1. The results of electrofishing efforts and fish population estimates are presented in Table 1. The only species of fish that was captured in Long Canyon Creek was rainbow trout (Salmo gairdnerii).

DISCUSSION

The absence of larger fish from the sample suggests that either the fish are cropped during the fishing season or are difficult to capture in turbulent water. Casual observation in the early fall during the low water period did not reveal any larger fish than were captured in this survey. The proximity to a well-traveled road suggests that angling pressure is probably responsible for the removal of larger fish from the population. The presence of a good fry crop, 75 to 100 mm., indicates successful spawning by rainbow trout.

The higher flow did limit the effectiveness of the moving block net which may have accounted for some larger fish escaping. Instream cover in the study reach may have been limited due to the predominance of bedrock in the study reach.

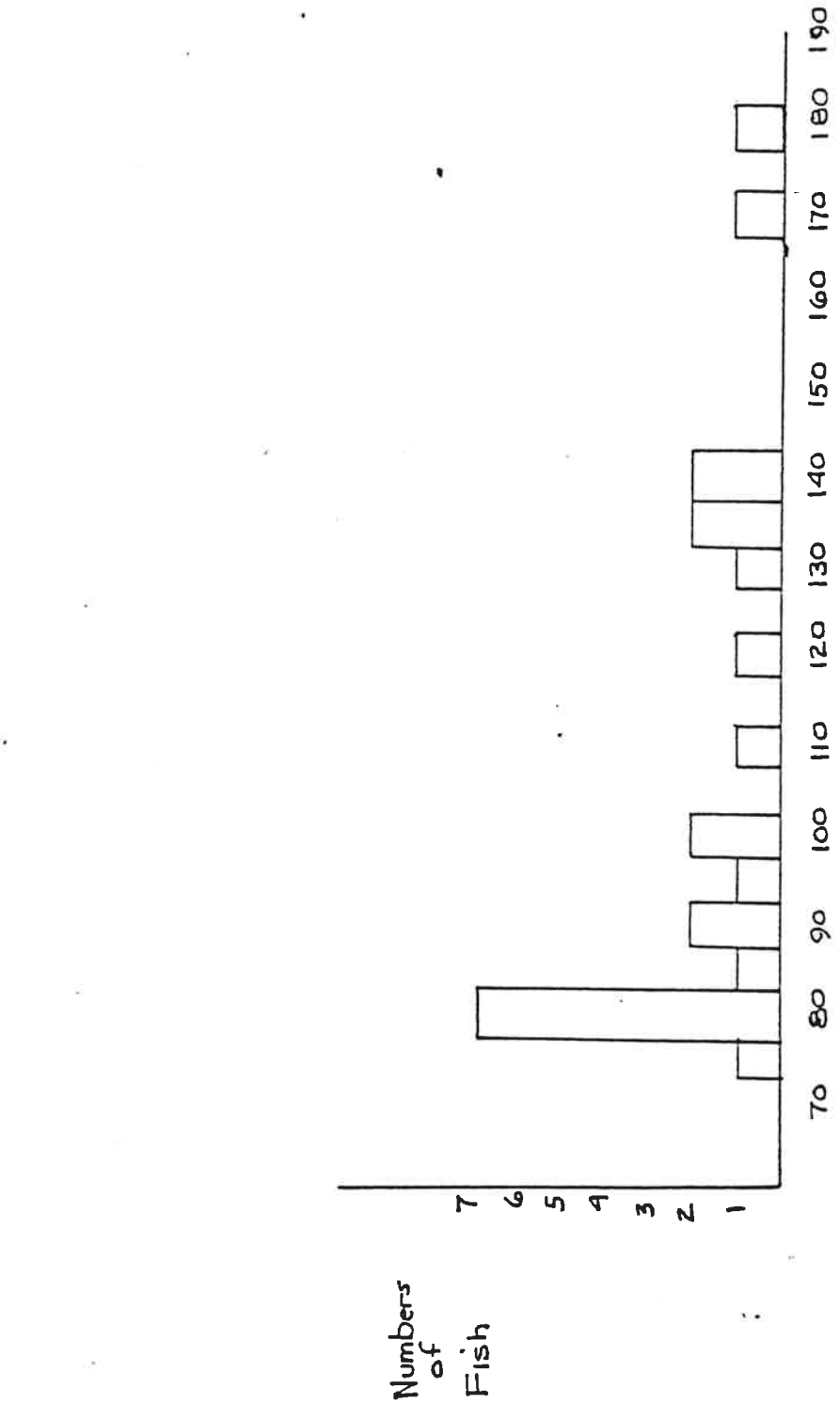


Figure 1 Length Frequency Histogram for Rainbow Trout
Long Canyon Creek 1984

TABLE 1 Results of electrofishing efforts and population estimates for Long Canyon Creek, 1984

Reach (length)	Fish Caught in Pass 1	2	3	Prob. of Capture	Variance	Estimated Population*	Fish/100 Ft.
300 Ft.	10	6	6	0.24	.041	39 ± 48	12.6

* ± 95% confidence interval.