Ref ID: 70961

JOB COMPLETION REPORT

INVESTIGATIONS PROJECTS

State of Montana

Project No. F-7-R Work Plan No. VII Job No. VII-B

Title of Job: Food Taken by Mature Cutthroat Trout and Yellow Perch during the Summer Months After Their Eggs are Hatched.

Objectives:

The aim of this job is to determine the feeding habits of the perch after the trout fry have come out of the gravel, to determine to what extent perch spawn and fry are used as food by trout and to determine to what extent cannabilism prevails. Samples will be taken in such a manner that competition between perch and trout can be evaluated.

Techniques Used:

Both yellow perch and cutthroat trout were taken by angling to insure specimens with stomachs in as a natural condition as was feasible. The fish were rendered unconscious immediately so as to minimize regurgitation as much as possible. A slit was made in the body cavity and then the fish were placed in a ten percent solution of formalin. Contents of the stomach were analyzed at the department's laboratory in Bozeman during the winter months. Lengths of the fish were taken to the nearest tenth of an inch. The sex of the fish was determined when the stomach was removed for examination of contents. Contents were examined for frequency occurrence with the aid of a microscope. Identification was aided by comparison with organisms captured and preserved from the feeding areas of the lakes and streams.

Findings:

Fish used for this study came chiefly from Lower Thompson Lake. The stomach contents of the cutthroat trout were examined qualitatively for frequency of occurrence in each individual (Table 1).

Table 1. Food of 15 two year old and 10 three year old cutthroat trout from Lower Thompson Lake expressed as percentage of frequency of occurrence of the food item indicated to the total stomachs examined in that age group, June 25 to September 25, 1952.

Food Item	2 year age class	3 year age class
Ants		20
Damsel fly	13	30
Coleoptera	30	40
Diptera	33	20
May fly	30	
Plankton	100	
Vertebrates (Mice and fish)		30

Plankton (Leptodora, Gammarus, and Daphnia) were found in all of the two plus age class of cutthroat trout and none was found in the three plus age group. The chief items of food taken by two year old trout (average length 7.9 inches) was plankton and larval and adult insects. For the three year old trout, the most frequent item of food was beetles (Coleoptera), followed closely by adult damsel flies and vertebrates (chiefly fish fry). The bulk of the food for the three year old trout was large adult insects and vertebrates. The following is an example of the food taken by a 14.5 inch cutthroat trout: 13 perch fry, 5 beetles and 1 butterfly.

The stomach contents of 300 yellow perch taken over a period of 90 days were examined (Table 2).

Table 2. Food of 300 yellow perch from Lower Thompson Lake expressed as percentage of frequencies of occurrance of the food item indicated to the total stomachs examined, June 25 to September 25, 1952.

Food Item	Nymph	Adult
Dragon fly	3	
May fly	7	1
Diptera	4	1
Chironomus (pupae	8	1
Coleoptera		3
Tricoptera		1
Plankton		72
Snails		6
Fish (mostly perch fry)		6

These perch varied in age from the two plus age class to about the seven plus age class. The most frequent item of food taken by fish that were less than six years old was plankton; however, fish fry were found in stomach of perch five years old and older. Very few perch were captured that were five years old. The fish fry consumed by the perch were chiefly yellow perch fry. No cutthroat trout fry were identified in the stomachs of perch.

The stomachs of 12 squawfish were examined and seven of these contained one or more adult cutthroat trout (5 to 6.5 inches).

Analysis and recommendations:

There appears to be competition for food, mainly plankton, between the yellow perch of the two to five year olds and the two year old cutthroat trout. However, the appearance of both yellow perch and cutthroat trout was good, that is they were robust, had small heads and had generally a healthy appearance. No trout fry were ever observed in the lake or in the stomachs of any fish. This is probably due to a low population of cutthroat trout in the lake. From the study this far, it is indicated

that the yellow perch do not consume their own fry until they are about five years old. Cutthroat trout did not take any fish until three years old. Alm's (1946) description of a perch population fits these lakes well. He states, "The population has, owing to abundant propagation and insufficient fishing, become too large in proportion to the supply of food. The perch have therefore had to feed on plancton and insect larvae, and only a few have attained the size at which (14 - 15 cm) they can begin to feed on small fish which would stimulate to better growth". It may be mentioned that he worked with Perca fluviatilis. For management of lakes with a stunted perch population Alm (1946) recommends, "A stunted perch population can also be utilized by the planting of fish of prey in the form of large youngs of principally the pike, but sometimes also of the trout." However, for this area, it is felt that pike is not the species that is desirable and that the cutthroat trout would be more suitable.

It is recommended that this study be continued another year so that more information can be gathered on the feeding habits of the cutthroat trout.

Summary:

Stomach contents of 25 cutthroat trout and 300 yellow perch were examined. The most frequent item of food was plankton in two year old cutthroat trout and two to five year old yellow perch. The frequency of fry in three year old trout was 30 percent of the fish examined, while in five year old and older yellow perch the frequency was six percent. Yellow perch fry was the most abundant fish taken. No trout fry was identified in either yellow perch or cutthroat trout stomachs, probably due to the scarcity of these fish in the lake.

Data and Reports:

All data and reports are with the project assistant at Montana State College, Bozeman, Montana.

Prepared by John Echo Approved by _____

Date May 5, 1953

Alm, Gunnar.
1946. Reasons for the occurrence of stunted fish populations. (With special regard to the perch). Reports from the Swedish Institute of Fresh-Water Fishery Research, Drottningholm. No. 25, pp.1-146.