

MONTANA DEPT. FISH, WILDLIFE & PARKS
FISHERIES DIVISION
Job Progress Report

State: Montana

Project No: F-33-R-13

Title: Flathead Lake Fisheries
Investigation

Job No: I-a

Title: Seasonal, area & depth
distribution of cutthroat
trout and Dolly Varden in
Flathead Lake

Period Covered: July 1, 1978 to June 30, 1979

OBJECTIVES

The primary objective of this job is to identify diel and seasonal movements of the cutthroat trout and Dolly Varden as they are associated with species habitat preference or with spawning migration activities.

PROCEDURES

Time limitations precluded work on the secondary objective which was to describe the seasonal distribution patterns of the lake trout.

A segment of this job is to define the summer-fall shoreline distribution patterns and concentrations of cutthroat and Dolly Varden in the lake. Associated with fish sampling, measurement of the basic chemical, physical and biological characteristics of the sample area were to be made. Another segment was to coordinate the lake phase of the mark and recapture study of these fish, now underway in the Upper Flathead River drainage.

ACCOMPLISHMENTS

An objective of this job was to test the effectiveness of hydroacoustic equipment in locating cutthroat trout and establishing seasonal distribution and population trends in Flathead Lake. This acoustical technique has been useful in the northwest to establish population densities of pelagic or schooling fish, i.e., kokanee (salmon). However, its use with other species has been limited. This phase of the project received a secondary priority which limited the amount of time to be spent developing the technique. The use of acoustic equipment on cutthroat trout and Dolly Varden suggested the following considerations.

Species Habitat Differences

Habitat preferences of cutthroat trout and Dolly Varden differed significantly from those of kokanee and would require separate and specific surveys for each fish species. In particular, the surface oriented cutthroat trout will require more modification of the technique than the deeper dwelling Dolly Varden. It was not ascertained whether the evening survey time, as used in kokanee work, is an advantage for either of these two species.

During daylight and evening acoustic surveys for kokanee, fish targets larger than kokanee have been recognized and were found to frequent a layer of water from 12 to 40 feet below the salmon concentrations. These targets are individual fish and are believed to be Dolly Varden; however, trawl hauls have yet to verify this belief. It has been assumed the trawling speed is too slow to capture the Dolly Varden.

Overlap of Size Range of Cutthroat Trout and Kokanee

In Flathead Lake, species recognition of kokanee and cutthroat trout by target size alone is impossible because of their similar size range from 230 to 350 mm (0.0 to 14.0 inches) total length. The two species are believed to share mutual areas in the lake since creel checks have shown catches of both cutthroat trout and kokanee by anglers trolling specifically for salmon. Species identification during these times of mutual inhabitation should be possible with the aid of a mid-water trawl; however, the trawling efforts of the past four seasons have not yielded a cutthroat trout. Again, it is assumed that the trawling speed was too slow. The trawl has a 10' x 10' square opening that ends in a cod of $\frac{1}{4}$ inch stretch measure. It has been successful in collecting salmon, pygmy whitefish, peamouth, lake whitefish, yellow perch, sculpins spp., largescale suckers and longnose suckers ranging in size from 10 mm to 400 mm (0.5 to 16.0 inches) total length. The usual trawling speed of 1.25 meters/second is near the maximum towing speed (1.3 m/sec) i.e., the speed the net can be towed without causing water to outwell at the mouth and cause the net to start to buffet.

A new trawl was purchased to increase the speed and in turn the net's efficiency to collect the faster swimming fish. The trawl has the same overall dimensions but has larger mesh in the cod end (one inch st/measure). The new net has the capability for attachment of a smaller mesh insert. Testing of the new net during the period did show a slight increase in the towing speed (from 1.25 to 1.5 m/sec) but offered no real advantage in the catch over the old net. Comparative catches of the two trawls showed both collected salmon, 100 mm and larger, equally well. However, the old or smaller meshed net did retain the smaller fish (less than 100 mm).

Other accomplishments of this project included the continued coordination of the lake phase of the recapture of cutthroat trout and Dolly Varden being marked in the upper Flathead River drainage. Twelve cutthroat trout were recaptured in Flathead Lake during the period - all were from fish tagged in the upper river system. Analysis of these tags were described by Huston and Schumacher. ^{1/}

Some assistance was given to river personnel initiating age and growth studies on the juvenile cutthroat trout and Dolly Varden in the upper Flathead System. Efforts were directed toward techniques that could be incorporated into the analysis of fish scales collected from the larger and more mature Flathead Lake fish. Preliminary examination of scales from past Flathead Lake collections have stressed the importance of maintaining compatibility in aging techniques of juvenile and adult fish. A good understanding of the early growth characteristics are essential before age and growth analysis in the lake can be undertaken.

Fish collected during fall netting, designed specifically to sample adult kokanee at shoreline spawning sites, included 3 cutthroat and 19 Dolly Varden. Because of gilling, none of these fish could be tagged and released, thus stomach samples were taken and preserved for future food analysis. Although 11 fish species were represented in the catch during this series of nettings, only the occurrence of a hybrid (squawfish - peamouth) will be described at this time. This cross has been described previously for Flathead Lake by Weisel, 1955. ^{2/} The present collections include samples from the southern area of Skidoo Bay and the sample site north of the Westshore State Park. These fish ranged in size from 205 to 315 mm (8.0 to 12.5 inches) and both sexes were represented in near equal numbers. Egg size development at this November sampling date had reached 2 mm in diameter. Specimens were preserved for future reference.

^{1/} Huston, Joe E. and Robert E. Schumacher. 1978. Report on fish migration studies in Flathead River between Flathead Lake and the confluence of the South Fork with the main stem. Comp. Report for Bureau of Reclamation. Mont. Dept. Fish and Game. Multil. 16pp.

^{2/} Weisel, George F. 1955. Three new intergeneric hybrids of cyprinoid fishes from western Montana. Amer. Midl. Nat. 53:396-411.

Prepared By: Delano A. Hanzel

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Waters Referred To: Flathead Lake

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