GROWTH AND POPULATION DENSITIES OF TWO SYMPATRIC TROUTS, BIG CREEK, IDAHO PRIMITIVE AREA

A proposal for undergraduate research

at the

University of Idaho

by

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TABLE OF CONTENTS

Since 1960, much work has been done on fish populations on the Middle Fork of the Salmon River (Mallet, 1963; Ortman, 1969), but little has been done on the tributaries to the Middle Fork and in particular, Big Creek in the Idaho Primitive Area. Studies of fish populations in tributary streams are important, because the tributaries provide spawning and nursery areas for sea-run rainbow trout, commonly called steelhead (Salmo gairdneri) and for cutthroat (S. clarki) trout (Mallet, 1963), which are both highly prized sport fishes. The main purpose of this study is to establish the characteristics of these two species and to study those aspects of their life history which enable them to live sympatrically in Big Creek. A secondary objective is to initiate a tagging study of the cutthroat population in Big Creek, which would provide the Idaho Fish and Game Department with necessary data for the proper management of this desirable species of trout (Reingold, pers. comm; Appendix A). As a side issue, this study would provide valuable field experiences and could possibly form a foundation for a Masters thesis.

This study would be carried out during the summer of 1977 and all data collected would be analyzed at the Taylor ranch facility and at the University of Idaho.

The specific objectives of this study are:

1. To evaluate and compare growth characteristics of steelhead and cutthroat trout through age, weight and length relationships.

2. To make population estimates of all species present in lower Big Creek and to utilize these estimates to determine densities of steelhead and cutthroat trout.

3. To determine habitat preference of these two sympatric species.

4. To provide information to the Idaho Fish and Game Department on cutthroat populations to supplement their studies done on the Middle Fork of the Salmon River (Mallet, 1963; Ortman, 1969).

Big Creek is a main tributary to the Middle Fork of the Salmon River, and is situated in the Idaho Primitive Area. It was chosen primarily for it's importance in both spawning and rearing habitat for both steelhead and cutthroat trout and for it's close proximity to the Taylor Wilderness Research Ranch. It is also one of the few places in Idaho where fluvial cutthroat trout still exist in substantial numbers (Anonymous, 1972).

Observations will be limited to lower Big Creek and tributaries, starting from the mouth and extending 20 km upstream.

Growth Studies

Growth characteristics of steelhead and cutthroat trout will be measured through age, weight and length parameters. Fish will be sampled at various sites (not at drift stations) along lower Big Creek, and will be grouped into 2-inch length classes and 5-10 fish in each length class weighed. Length measurements will be taken as the fork length, measured from the most anterior part of the fish to the fork in the caudal fin (Hubbs and Lagler, 1958). Scales for age analysis will be taken just above the lateral line below the insertion of the dorsal fin (Averett, 1963; Rankel, 1971). Scales will be put in coin envelopes, and marked as to species, date, location and length of fish. Methods used in analysis of scales will be those outlined by (Lagler,1958). Back calculations will then be made, annual growth estimated and comparisons made between the two species (Averett and MacPhee, 1971; Lux,1960). All samples will be collected by angling, except in the case of fry and fingerling, in which seining of tributaries to Big Creek may be needed.

Population and Density Studies

A skin suit diver equipped with snorkel and mask will identify and count fish at 6 stratified drift stations,

which will be randomly selected and consist of one or more pool-riffle units per station. These drift sites will be determined and marked, so that they may be observed 3 times throughout the summer. Counts will be made only at times when the visibility is greatest (Everest, 1969; Griffith, 1970). Three lengthwise passes will be made over each 100 m drift station, one on each side and one down the middle.

Fish will be classified according to species and roughly to size (small, medium, large). The species may include dolly vardon (Salvelinus malma), mountain whitefish (Prosopium williamsoni) and chinook salmon (Oncorhynchus tshawyscha), as well as the two trout species. Data will include the location of cutthroat and steelhead and their distances from one another. All records will be kept on waterproof maps (Everest, 1969; Pollard and Bjornn, 1973). Fish per unit densities will then be calculated and expanded to the entire study area (Horner and Bjornn, 1976).

In the case of the tributaries of lower Big Creek, the relative abundance, distribution and size of cutthroat and steelhead will be determined by angling.

Tagging Studies

A tag and release study will be initiated on cutthroat trout. This will enable the Idaho Fish and Game Department to supplement earlier tagging studies done on the Middle Fork

of the Salmon River (Mallet, 1963). Circular, monel-metal jaw tags will be used and only fish over 250 mm will be tagged (Rankel, 1971). Data recorded will include species, location, tag number, date and length. Total hours spent fishing will also be recorded as suggested by (Reingold, pers. comm; Appendix A), to help define future population trends of cutthroat trout in the area.

This study will provide valuable life history information on cutthroat, through subsequent recaptures of tagged fish and will not interfere with the main research objectives.

EQUIPMENT	SOURCE OR COST
Wetsuit, Snorkel and Mask	$250.00
Balance Scales	College of FWR
Jaw Tags and Pliers	Idaho Fish and Game
TRAVEL	
Airplane Travel	College of FWR
LODGING	
Taylor Ranch Facility	College of FWR
OTHER EXPENSES	
Current Meter Repair	$250.00
Miscellaneous (waterproof paper, tape measure, scale envelopes, measuring board, topographic maps)	$100.00
GRAND TOTAL	$600.00

Robert James Jateff was born in Akron, Ohio on May 25, 1950. He attended Firestone High School in Akron, and graduated from there in June, 1968. Colorado State University, Fort Collins, Colorado was his choice for college, and he was a student there in fish and wildlife biology from 1968 to 1972. He left school to get married in June, 1972, , and worked as a carpenter until January, 1975, where upon he and his wife moved to Hayden Lake, Idaho. In Hayden Lake, he worked one summer with the Idaho Department of Lands at Coeur d'Alene as a research assistant, and after that he again worked as a carpenter while his wife completed school at North Idaho College. After his wife's graduation, he decided to return to school and enrolled at the University of Idaho in the summer of 1976. He is presently a junior in the College of Forestry, Wildlife and Range Sciences working towards a Bachelors degree in fisheries resources.

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STATE OF IDAHO

DEPARTMENT OF FISH AND GAME

SALMON SUBREGIONAL OFFICE
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SALMON, IDAHO 83467

January 26, 1977

Bob Jateff
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Moscow, Id.

Dear Bob:

After reading your letter, it looks to me like you have a chance at an exceptional opportunity, not only for some independant research, but for a summers' experience in a beautiful piece of country.

Idaho Fish & Game Biologists have been doing sampling work on the Middle Fork since 1959 in an attempt to monitor the cutthroat population in that river. We use snorkel observations and angling to count and collect fish. Some similar work on a major tributary such as Big Creek would tie in very nicely with this.

Snorkel transect counts would be excellent and I might suggest you not only note species present but in the case of cutthroat trout make a definition between fish less than 6 inches, 6 to 12 inches and greater than 12 inches. Two week observation intervals would be fine but instead of randomly picked stations I would select areas that would contain fish such as pools in the stream. I would think 10 - 12 transects or so, both above and below the Taylor Ranch would suffice.

Back in 1959-60, Jerry Mallet did a lot of work on the Middle Fork in which he caught large numbers of cutthroat, placed numbered jaw tags on them, and fished for and recaught them through the season. From this work we learned that the Middle Fork cutthroat is a migratory strain and depends on wintering in the main Salmon River for part of its life history. This led to protective regulations for this species.

Similar work on Big Creek could prove interesting, and we might possibly determine if Big Creek fish contribute to the Middle Fork fishery. Movement within Big Creek, if any, could also be determined. If enough fish were tagged, recoveries in future years could provide growth information.

If you were to initiate this type of effort, all you would need to record would be the area of capture, (you would need a scale map of lower Big Creek), species, tag number, tagging date, and total length of the fish. Any subsequent recaptures should show the area of recapture and an approximation of the number of stream miles (kilometers) above or below the original capture site. You might recapture individual fish several times and learn something about their habits and movements. Dr. MacPhee should be able to provide you with tags and tagging pliers.

When you are angling you should keep accurate records of the time spent to catch the fish, particularly the cutthroat. This data provides good angler-effort information that can be used in the future as a parameter of population trend. We have considerable fish-per-hour data on the Middle Fork, but none on tributaries.

This kind of work on Big Creek should keep one fellow busy all summer. Tough to get paid to go fishing! It could provide some valuable usable data and if you do it I would be interested in seeing what you collected.

I hope you find some of these suggestions to your interest. If you are planning on attending the Idaho Chapter American Fisheries Society meeting at McCall February 18-19, I will be there and perhaps we can talk about it.

Sincerely,

Mel Reingold

Mel Reingold
Principal Fisheries Research Biologist