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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-4 Job No. VI-A

Title of Job: The Relationships of Cutthroat Trout and Yellow Perch in Lower Thompson Lake

Abstract:

The entire shoreline of Lower Thompson Lake was treated on July 1 and 2 with a fish toxicant when the yellow perch fry were in schools along shore. Three days after treating, many perch, sunfish and squawfish lay at the water's edge. Fourteen days after poisoning, the lake shore appeared to be non-toxic and cutthroat trout fry were planted at a rate of 510 per surface acre in Lower Thompson Lake and at a rate of 250 per surface acre in Middle Thompson Lake. The trout fry were scattered over the littoral zone of the lakes with the aid of a planting boat. Gill net sets were made in September and November, 1954 and February of 1955. Eighteen overnight sets were made in each lake for each period. Netting information indicates that the partial treatment of the lower lake had decreased the number of adult perch. No information was obtained on the success of the trout plant. No perch fry were observed in the lower lake after treatment, and they were extremely numerous in the middle lake.

Objective:

The relationships of yellow perch and cutthroat trout have been studied in 1952 and 1953 in Middle and Lower Thompson Lakes in order to determine any weak link in the life cycle of the perch. These two lakes have an area of 970 acres and the cost of complete removal of the stunted yellow perch population would be prohibitive at the present time. During the study, it was found that concentrations of both the perch fry and adults could be effective and economically killed with the use of rotenone. One of the objectives of this job is to determine the effects of partial poisoning and subsequent planting of fish in one lake as compared with just planting of fish in another lake. The over-all objective is to determine the most economical method to develop a fishery in a lake that has a stunted yellow perch population.

Techniques Used:

A one-fourth inch mesh screen was installed blocking about one-half of the channel connecting Lower Thompson and Middle Thompson Lakes. Before the entire stream was screened it was decided that only a portion of the stream should be screened to determine the feasibility of installing a complete screen. A twenty-foot section was installed on July 29 and removed on September 13.

Observations were made in June for yellow perch fry concentrations. The fry were first observed on June 13, and were congregated in schools on June 24. On July 1 and 2, concentrations of yellow perch fry in Lower Thompson Lake were treated with a spray of toxicant (Fish-Tox) from a pump placed in a boat. The spraying unit worked offshore and treating was always done toward the shoreline and ahead of the boat so as not to disturb the fish. All shore and shallow areas were treated. Adult perch in weed bed areas were concentrated by "chumming" with hamburger. After a large number of adults were gathered, a solution of "Fish-Tox" was spread around them.

On July 14, cutthroat trout fry were planted from a planting boat at the rate of 510 per surface acre in Lower Thompson Lake and at a rate of 250 per surface acre in Middle Thompson Lake. These fish were well scattered over the littoral zone of the lakes.

In September and November of 1954 and in February of 1955, both lakes were sampled with gill nets. Nets were of the sampling type, 125-feet long with five mesh sizes of 25-feet each (3/4, 1, 1 1/4, 1 1/2, and 2 inch bar measure). Eighteen overnight net sets were made in each lake during each sampling period.

Creel census was taken periodically on both of the lakes.

Findings:

A study was made of the yellow perch in the Thompson Lakes and reported in Work Plan VII, Job No. VII-A, B, C, and D in 1954. Since the cost of rehabilitation of the three lakes would be prohibitive at the present time, it was recommended that poisoning of large concentration of perch fry be tried. The yellow perch fry were kept under observation during June to determine when they congregated into large schools along the shore. Perch fry were first observed on June 13 and were observed in schools on June 24. On July 1 and 2 the entire shoreline of Lower Thompson Lake was treated with "Fish-Tox". The effects of the toxicant were noticeable within an hour and persisted for several hours. Countless dead fish were found along the shore, especially perch fry. Many squawfish and sunfish were also found along with a few whitefish and large-mouth bass. After treatment, no schools of perch fry could be found in the lake.

On July 14, 121,800 cutthroat trout fry were planted in Lower Thompson Lake and 181,440 in Middle Thompson Lake.

A test screen was installed in the channel between the two lakes. The stream between the two lakes is approximately seven hundred feet long. Due to the large amount of debris flowing through with the water, it was decided to screen experimentally about one-half of the stream. The screen was installed on July 29 and was examined periodically and cleaned. A large amount of vegetation grows in the channel and it was found to be impractical to screen the entire stream. The screen was finally removed on September 13, because the installation and maintenance of a complete screen would not yield information commensurate with the effort expended. Rarely was there any yellow perch observed in any part of the channel.

From September 2 to 14, eighteen overnight gill net sets were made in each on the lakes (Table 1.) The nets were set in Lower Thompson Lake where large numbers of perch were caught in the two previous years. Simultaneously, nets were set in Middle Thompson Lake. Only five yellow perch were caught in the Lower Thompson Lake while 622 were caught in the middle lake. There were only two cutthroat

trout were captured and both were from the middle lake. Mountain whitefish, suckers, squawfish and sunfish were also caught in less numbers in the lower lake. The gill net sets were repeated again from November 8 to 27. Again there were less yellow perch caught in the lower lake. The only cutthroat trout caught at this time was in the lower lake. Considerably less whitefish, suckers, squawfish and sunfish were caught in the lower lake than in the middle lake. Many kokanee were caught at this time in the middle lake, since they were moving along the shores of the lake and were apparently seeking spawning areas. Their large numbers along the shore may have driven away other species of fish that otherwise mith have been captured. The same number of gill net sets were made from February 1 to 11, while ice cover was on the lake. Sets were made under the ice with the aid of a device called an "ice-jigger". Less yellow perch were caught again in the lower lake. No cutthroat trout were captured at this time. Mountain whitefish, suckers, squawfish and sunfish were caught in both lakes, however not in the proportions caught in the previous two sampling periods.

A partial creel census was conducted on the lakes. Information gathered is by no means complete. Very little fishing was done by anglers in Lower Thompson Lake. In 21 hours of fishing, two cutthroat trout and two kokanee were caught. In Middle Thompson Lake, a record was obtained of 38 anglers that fished 137 hours. Nineteen yellow perch, 1 whitefish, 1 rainbow trout, 7 cutthroat trout and 122 kokanee were captured.

Table 1.
Total Number of Fish Captured in 18 Overnight Gill Net Sets
During the Sampling Periods of September and November, 1954 and February, 1955
in Middle and Lower Thompson Lakes

	September 1954		November 1954		February 1955	
Species	Lower Thompson Lake	Middle Thompson Lake	Lower Thompson Lake	Middle Thompson Lake	Lower Thompson Lake	Middle Thompson Lake
Yellow perch	5	622	1	75	2	87
Cutthroat trout	0	2	1	0	0	0
Mountain whitefish	6	119	59	136	12	11
Suckers	7	75	1	40	5	11
Squawfish	12	52	1	16	2	19
Sunfish	7	98	1	4	1	0
Bass	0	7	0	0	0	0
Kokanee	1	4	6	595	1	5
Eastern brook trout	0	0	2	0	2	1

Recommendations:

It can be safely stated that nearly all of the young of the year's yellow perch were eliminated from Lower Thompson Lake as well as a good number of adult perch. Along with the perch some squawfish, sunfish, bass, and whitefish are known to have succumbed to the toxicant. The catch of yellow perch is comparable for the two lakes during the study in 1952 and 1953. (Table 2.) The gill net catch for 1952 and 1953 was done in the spring and summer months and are averaged together. These figures are calculated from 72 gill net sets in 1952-53 for Lower Thompson Lake and 20 gill net sets in 1953 for Middle Thompson Lake. The catch for the past year is actual figures from 54 gill net sets of which 18 sets were made in each month in September and November of 1954, and February of 1955. There is a slight

difference in the catch for Middle Thompson Lake of the two sampling periods compared, but this difference may be due to time of year the nets were set. The 1952-53 calculated gill net sets for Lower Thompson Lake is roughly the same as the catch in Middle Thompson Lake for the two periods compared. The gill net catch for Lower Thompson Lake after treatment with a toxicant is considerably less than before treatment. From these figures, it is apparent that the toxicant was effective on the size fish that could be netted in the sampling gill net used. It is presumed that fish too small to be captured in the nets used also suffered high casualties. The toxicant was not only effective on the yellow perch but also on squawfish, suckers, and whitefish.

Table 2.
The Number of Fish Captured in 54 Overnight Gill Net Sets
in Lower Thompson Lake Before and After Treatment
and in Middle Thompson Lake for the Same Sampling Periods

	Lower Thompson Lake		Middle Thompson Lake	
Species	Summers 1952-53	Year 1954-55	Summer 1953	Year 1954-55
Yellow perch	731*	8	648**	784
Cutthroat trout	5	1	5	2
Mountain whitefish	232	77	151	266
Suckers	243	13	257	126
Squawfish		15	143	87
Sunfish		9	41	102
Bass		0	3	7
Kokanee		8	0	604
Eastern brook trout		2	5	1

* This column of figures calculated from 72 gill net sets made in spring and summer months of 1952 and 1953.

** This column of figures calculated from 20 gill net sets made in spring and summer months of 1953.

The cost of the operation in 1954 on Lower Thompson Lake was as follows:

Toxicant	$ 416.00
Labor	196.50
Subsistence	35.00
Travel	22.50
Operation of Equipment	7.00
Cutthroat trout	1,452.00
Total Cost	$2,129.00

The acreage of this lake is 240-acres with a maximum depth of 150-feet. Assuming this lake had an average depth of 40-feet and planting cutthroat trout fry at a rate of 300 per surface acre, the estimated cost of total rehabilitation would be as follows:

Toxicant	$7,430.00
Labor, travel, etc.	300.00
Cutthroat trout	864.00
Total Estimated Cost	$8,594.00

The total rehabilitation of Lower Thompson Lake would be four times as high as the partial poisoning that was done last summer. However, there are three lakes connected with short channels and the entire three lakes (total acreage 1,345) would have to be treated. Total estimated cost of rehabilitation of the three lakes is $48,257.00. Whether such a large expenditure in an area such as this is justifiable will depend on the amount of anglers attracted into the area. A hard surfaced highway parallels these lakes and an excellent state park is located on the Middle Lake. The lakes are about midway between Libby (population 2,500) and Kalispell (population 10,000). At the present time it is thought that such a large expenditure would not be justified.

It is recommended that this study be continued and that observations be made on yellow perch fry in both Middle and Lower Thompson Lakes. After the fry concentrate in schools in Lower Thompson Lake they should be treated with a toxicant. The program on planting cutthroat trout fry should be continued at a rate of 300 per surface acre in both lakes. Partial creel census and sampling by gill nets should also be continued to determine the effectiveness of the planted fish and the shoreline treatment of the lower lake.

Summary:

The shoreline of Lower Thompson Lake was treated with rotenone on July 1 and 2, 1954, after yellow perch fry had congregated in large schools along the shore. No perch fry were observed after the shoreline treatment. Cutthroat trout fry were planted at the rate of 510 per surface acre in Lower Thompson Lake and at the rate of 250 per surface acre in Middle Thompson Lake on July 14. These were scattered in the littoral zone on both lakes with the aid of a planting boat. Gill net sets were made in September and November of 1954 and February of 1955. Eighteen overnight sets were made in each lake for each sampling period. Netting information indicates that the partial treatment of the lower lake has decreased the number of adult yellow perch. No information was obtained on the effectiveness of the trout plant.

Prepared by Frank A. Stefanich Approved by _____

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