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JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F7R6 Name Northwestern Montana Fishery Study

Job No. II Title Effectiveness of Smith Lake Rearing Pond.

Period Covered May 1, 1956 to Nov. 30, 1956

Abstract:

In August, 1955, 25,200 cutthroat fry were scattered throughout Smith Lake. The pond was drained during late June and early July, 1956, and 11,368 cutthroat and 6 eastern brook trout were recovered and marked by excising the pelvic fins. The cutthroat averaged 5.3 inches in length and their calculated total weight was 563.9 pounds. This was a survival of 45.1 percent of the fry. The ecomonics of rearing these fish resulted in a net loss of $12.82 to the Department from what it would cost to produce the same amount in a hatchery. Figures indicate that the approximate maximum productive capacity, in pounds of fish produced in the lake, may have been established during the past four years. None of the marked fish were reported caught in Whitefish Lake.

Objectives:

The primary objectives are twofold: (1) to measure the actual production in pounds of cutthroat trout in Smith Lake by planting a known number of fry and measuring the growth increase of those recovered the following summer, and (2) to determine the economics of the operation by correlating the costs of the installation, operation, and fry against the value of the fish produced.

The method of liberation of the fry apparently has some effect upon the numbers of fish surviving. In 1950 and 1951, the fish were planted in one place directly from the truck, and in 1952 and 1953, they were scattered over the lake from a planting boat. In 1953, the recovery was approximately four times greater than the two previous years and more than five times greater in 1954. However, in 1955, there was a high survival despite the fish being planted all in one place.

In light of these facts, it is deemed advisable to study more closely the correlation between method of liberation and survival. This year the fish will be planted in one spot and in succeeding years, boat and shore plants will be alternated until definite conclusions can be drawn.

As an incidental objective, the percentage contribution of these fish to the total catch in Whitefish Lake will be determined.

Techniques Used:

After the pond had been drained and the fish marked in 1955, the inlet was again diverted into the basin. During high water in the spring of 1956, the inlet

stream was diverted past the lake and a screen, constructed of ¼ sq. in. hardware cloth was placed in the outled to allow excess water to pass out and yet retain the fish. On August 4, 1955, 25,200 cutthroat fry were scattered throughout the lake from a planting boat. The lake was drained and the fish captured by a system of screens in the outlet from June 24, 1956, to July 9, 1956. All fish recovered were marked by removing both pelvic fins. Seven thousand, five hundred and seventy four (7,574) fish were measured and 50 of these weighed so that the weights of the remainder could be calculated. The small pool of water remaining after the water had drained was allowed to stand for five days to insure that any fish trapped in them would be killed by the high water temperatures. A visual count of the dead fish in the basin was taken and revealed 404 dead trout. On July 13, 1956, water was again diverted into the basin and the planks in the outlet replaced and secured. On July 27, 1956, 25,200 cutthroat fry were planted at one spot in the lake.

Random creel census and resort operator reports will be used to determine the return of these fish to the creel in Whitefish Lake.

Findings:

Of the 25,200 fry planted, a total of 11,368 fish were recovered, a return of 45.1 percent. Six eastern brook trout were also captured. The cutthroat ranged from 3.3 to 8.2 inches in length and averaged 5.3 inches in length. The calculated total weight of the fish was 563.9 pounds.

No marked fish were reported caught in Whitefish Lake from the previous year's marking. Whitefish Lake is one mile drownstream from Smith Lake.

Analysis and Recommendations:

Since 45.1 percent of the fish planted were recovered, a total of 563.9 pounds, the value of these fish, calculated on the amount of $1.50 per pound as the cost of raising a pound of cutthroat trout at a hatchery is $845.82. The economics of production of the rearing pond is as follows:

25,200 fry at $9.50 per thousand	$239.40
Law enforcement (pond is closed to fishing)	28.00
Cost of operation (Salaries)	244.80
Transportation (832 miles at 7 cents)	58.80
Expected return on investment (5% of the $5,960 which was cost of dam to the department	298.00
Cost of one year's operation	$869.00
Value of fish produced	845.82
Cost for year	$ 23.18

This is the second year in a row that the operation of the pond has shown a small loss, although the value of the fish produced was $12.82 more than for 1955. The loss can be attributed to the higher cost of operation.

Table 1. - Number of Cutthroat Trout Planted and Recaptured in Smith Lake Rearing Pond for the Years 1951 through 1956.

Year	No. of Fish Planted Previous Years	Method of Release	No. of Fish Captured	Percent Return	Total Weight	Range in Length	Average Length
1951	30,000	One spot	1,707	5.7	143.9	2.9-9.2	6.0
1952	29,000	One spot	1,670	5.8	226.5	4.6-9.2	7.5
1953	25,000	Scatter	5,882	23.5	584.6	2.4-9.4	6.9
1954	25,000	Scatter	9,076	36.3	591.6	2.9-8.6	6.0
1955	25,070	One Spot	8,288	33.1	555.7	2.7-8.7	5.7
1956	25,200	Scatter	11,368	45.1	563.9	3.3-8.2	5.3

The interest in this project, especially in the method of release of fish, by the fish culturists, has created a desire in a more careful release of hatchery reared fish. The project leader participated in only two of the annual plantings and could not be present at other plantings due to other work. The entire cost of this project has not been high, considering that this project pointed out to all fishery workers in this state the necessity of careful handling of fish from the rearing stations and into the waters where they were to be placed. Most of the rearing stations now have boats, motors and planting boats which are used to distribute fish in the various lakes in the state.

It was found that the so-called plant of 30,000 fish in 1950 was incorrect but was recorded as such. The rearing station at Somers was short of cutthroat trout for their planting program that year and Smith Lake Rearing Pond plant was cut down. Exactly how may fish were planted that year will never be known.

The spot plant of fish in 1954 gave a 33.1 percent return of fish. This return is high considering the two previous spot plants. The difference is not understood.

In the last four years, the poundage of fish has varied somewhat and it appears that maximum production of this lake has been reached. This is in spite of the large range in numbers recovered. It is readily observed that the numbers of fish planted per acre is too high, as the percentage survival increases the average length of the fish decreases. For actual production and angler use, it would be desirable to have the trout grow to the catchable size as soon as possible. The ideal number to plant was not determined, but it appears it was exceeded.

It is recommended that this project as such be discontinued. It would be many years before an ideal solution to the various problems of this project could be obtained. Since publicity of this project did not produce any returns by anglers, the intensive creel census required to obtain returns can hardly be justified.

It is further recommended that this pond be used to determine survival of successive years planting of trout with a harvest taken at the time of census to simulate angling harvest. Since little or nothing is known of fish populations in a lake that has been rehabilitated and planted, it is highly desirable that this be done at this time.

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