Ref ID: 71991
Rep ID: 17099

MONTANA STATE DEPARTMENT OF FISH AND GAME
FEDERAL AID IN FISH RESTORATION SECTION

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F-7-R-3 Work Plan No. V Job No. V-A

Title of Job: Effectiveness of Smith Lake Rearing Pond

Abstract:

In July 1952, 25,000 cutthroat trout fry were planted from a boat in Smith Lake Rearing Pond. The pond was drained in June 1953, and 5,882 cutthroat and 87 eastern brook trout were recovered. The cutthroat trout averaged 6.9 inches in length and the total weight of these fish was 584.57 pounds. Thus 23.5 percent of the fry planted survived. Weighing the monetary value of the fish produced against the cost of the fry planted, the cost of operation, and construction, it was shown that the Department saved $139.85 by raising these fish in this rearing pond instead of a rearing station during the fiscal year 1952-1953. Only one of these fish was reported caught by an angler in Whitefish Lake.

Objective:

The primary objectives are to measure the actual annual production of Smith Lake as received from a known number of fry cutthroat planted and to determine the economics of the operation considering the cost of the installation, the cost of the fry, the cost of operation, and the value of the yearling fish produced. As an incidental objective, since each fish must be handled for weighing and measuring, each fish will be marked prior to release into Whitefish Lake. Random creel checks and resort operator reports will indicate the percentage contribution of these fish to the total catch.

Techniques Used:

The inlet stream and outlet of the lake were kept under observation and the diversion on the inlet was manipulated so that no water went over the dam and yet a maximum level in the lake was maintained. On June 12 all of the water of the inlet stream was made to by-pass the lake and two planks were taken out of the dam of the lake in order to lower the lake gradually. Screens were maintained at the outlet of the lake from April 23 to the time of releasing the fish on June 17. From June 17 to 24, the cutthroat trout were captured, left pelvic and adipose fins clipped, and the fish were placed in the stream below the pond. All of the trout were measured and 50 were weighed, in addition to being measured, so that the weights of the remainder could be calculated. After being drained, the pond was left dry until July 16 when water was allowed to enter the pond. On August 11, 1952, 25,000 cutthroat fry were planted from a boat, scattering them well over the lake. Posters requesting anglers to report any fin-clipped cutthroat trout caught were distributed to the resort owners on Whitefish Lake and to sport-tackle dealers in Whitefish. The local newspapers gave the program publicity.

Fig. 1 Looking over Smith Lake Rearing pond from the dam.

Fig. 2 The diversion in the inlet stream. The opening to the right allows water to flow into the lake while the opening on the left by-passes water below the lake.

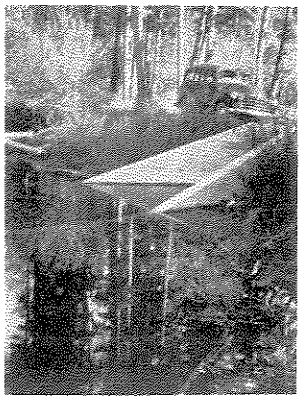

Fig. 3 The spillway of the pond

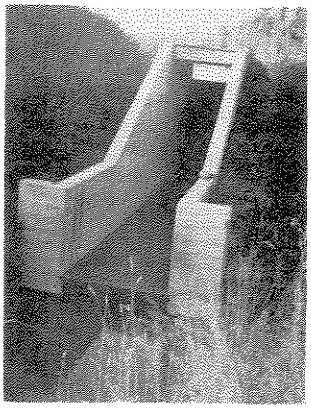

Fig. 4 The tailrace of the spillway.

Findings:

In 1952, 25,000 cutthroat fry were planted from a boat and scattered over the lake. A total of 5,882 cutthroat trout and 87 eastern brook trout were taken out of the pond in 1953. The average length of the cutthroat trout was 6.9 inches with a range of 2.4 to 9.4 inches (total length). The calculated total weight of the cutthroat was 584.57 pounds. The headgate was manipulated as was done in 1952, and no water went over the spillway during the time the trout were in the pond. Only one fish with a left pelvic fin clipped was reported caught in 1953 in Whitefish Lake. No fish from the two previous years' release were reported caught. Resort owners report that the only fish caught are lake trout and bitterly complained about the lack of the formerly abundant cutthroat trout. Whitefish Lake is one mile from Smith Lake by stream.

Analysis and Recommendations:

The number of fish taken from the pond was 23.5 percent of the number planted. The value of the 584.57 pounds of fish produced is $876.85, based on an amount of $1.50 per pound, the cost of raising a pound of cutthroat trout at a hatchery. The economics of production of the rearing pond is as follows:

25,000 fry at $9.50 per thousand	$ 237.50
Law enforcement (pond is closed to fishing)	28.00
Cost of operation (14 man days)	149.00
Transportation (350 miles at 7¢)	24.50
Expected return on investment (5% of $5,960 which was cost of dam to the Department)	298.00
Cost of one year of operation	737.00
Value of fish produced	876.85
Savings for the year	$ 139.85

This is the first time that this operation has shown a profit, that is, it would be cheaper for the Department to raise fish in this rearing pond than it would be to raise the same number in a rearing station.

No water went over the spillway and, therefore, no fish were lost over the dam. The diversion dam for the inlet stream is about three hundred feet from the lake and it is doubtful if any fish can go upstream over the dam. The survival of fish was four times higher than the previous years. The only change in the entire operation was that the fry planted in 1952 were scattered over the entire lake by a boat, whereas in 1950 and 1951, the fish were planted in one spot at the end of a road.

Various aspects of weather conditions in the area for the three years of the study are presented in Tables 1, 2, and 3. It is not possible, with the knowledge now at hand, to make a correlation between weather and pond production and, in fact, such a correlation may not even exist. These data are presented here so that the reader may make such comparisons of weather as he may desire, and so that this data will be on record for future use.

As was mentioned, the survival of fish was four times higher in 1953 than in the previous years. Certain questions then arise: Did method of planting make this difference? Were the fry planted in 1952 in better condition than in the two

previous years? Did the better survival in 1953 result from more favorable weather conditions that year? Was the higher survival in 1953 caused by some other factor over which there was no control? It is recommended that this study be continued for an indefinite period and that an effort be made to determine the cause of survival differences. It is further recommended that on alternate years the fish be scattered over the lake from a boat and be poured directly into the lake from the planting boat. This will test the inference that method of liberation was responsible for the higher production noted in 1953.

TABLE 1. The average daily maximum and minimum temperature by month taken at Flathead County Airport for the three seasons the fish production was measured in Smith Lake Rearing Pond.

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Maximum												
1950-51	78.7	79.0	70.8	54.1	38.0	35.4	28.4	36.7	37.4	56.3	62.8	66.7
1951-52	82.0	76.4	64.6	48.5	38.2	23.9	27.3	37.6	41.9	61.7	66.4	70.3
1952-53	79.1	79.9	74.1	63.3	39.8	33.5	40.1	39.4	47.1	51.2	62.9	68.3
Minimum												
1950-51	50.3	48.4	38.9	35.4	23.6	22.9	9.4	18.9	17.8	28.0	39.4	42.2
1951-52	48.2	46.3	39.4	33.5	24.8	8.1	10.2	18.2	20.3	31.3	40.6	45.4
1952-53	45.7	46.9	39.2	29.0	21.7	12.8	28.9	25.0	26.8	30.7	37.0	43.8

TABLE 2. The monthly snowfall in inches for the three seasons taken at Flathead County Airport that the fish production was measured in Smith Lake Rearing Pond.

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
1950-51	0	0	0	0	7.0	13.7	16.2	13.7	6.2	6.2	5.0	0	68.0
1951-52	0	0	0	9.9	8.3	49.7	17.1	7.7	8.2	0.3	0	0	101.2
1952-53	0	0	0	0	0.8	12.8	11.4	11.4	7.9	0.4	0	0	44.7

TABLE 3. The number of days by month taken at Flathead County Airport, that the maximum temperature was 32 degrees F and below, the minimum temperature was 32 degrees F and below and zero degrees and below for the three seasons the fish production was measured in Smith Lake Rearing Pond.

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Maximum 32° & below												
1950-51	0	0	0	0	8	8	15	5	8	0	0	0
1951-52	0	0	0	2	7	23	17	8	2	0	0	0
1952-53	0	0	0	0	6	12	3	0	2	0	0	0
Minimum 32° & below												
1950-51	0	0	6	8	26	26	31	26	30	24	1	2
1951-52	0	0	2	16	23	31	30	26	31	18	3	1
1952-53	0	0	3	23	28	31	18	25	24	18	5	0
Minimum 0° and below												
1950-51	0	0	0	0	0	1	9	1	5	0	0	0
1951-52	0	0	0	0	0	11	8	1	0	0	0	0
1952-53	0	0	0	0	0	0	0	0	0	0	0	0

Summary:

In July 1952, 25,000 cutthroat trout fry were planted in Smith Lake Rearing Pond. The pond was drained in June, 1953 and 5,882 cutthroat and 87 eastern brook trout were recovered. The cutthroat trout averaged 6.9 inches total length, and weighed 584.57 pounds. Thus, 23.5 percent of the fry planted survived. Weighing the monetary value of the fish produced against the cost of the fry planted, the cost of operation, and construction, it was shown that the Department saved $139.85 by raising the fish in this rearing pond instead of at a rearing station for the fiscal year 1952-53. The percentage contribution of the fish to the creel in Whitefish was almost nil, only one was reported caught.

Data and Reports:

The original data is with the fisheries biologist at Kalispell, Montana and the Superintendent of Fisheries in Helena, Montana.

Prepared by Frank A. Stefanich Approved by

Date April 12, 1954