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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. III

Title of Job: Effectiveness of Smith Lake Rearing Pond

Abstract:

In August 1953, 25,000 cutthroat trout fry were scatter-planted from a boat in Smith Lake Rearing Pond. The pond was drained in June 1954, and 9,076 cutthroat trout and 20 eastern brook trout were recovered. The cutthroat trout averaged 6.0 inches in length, and the total weight of these fish was 591.6 pounds. Thus, 36.3 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 $ 150.40 by raising these fish in the pond instead of a rearing station during the fiscal year 1953-54. None of these fish were reported caught by anglers in Whitefish Lake.

Objective:

The primary objectives are to measure the actual annual production of Smith Lake as received from a known number of cutthroat trout fry 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.

The technique of planting the cutthroat fry was changed in 1952 and increased the survival fourfold. In 1950 and 1951 the fish were planted in one place, and in 1952 and 1953 they were scattered over the lake by the use of a planting boat. As an added objective, it was deemed advisable to continue the work plan to test further the planting technique.

As an incidental objective, since each fish must be handled for weighing and measuring, each fish was marked prior to release into Whitefish Lake. Random creel checks and resort operators reports will indicate the percentage contribution of these fish to the total catch.

Techniques Used:

Both the inlet and outlet of the lake were kept under observation, and the diverstion structure on the inlet was manipulated so that a maximum lake level was maintained without water spilling over the dam. On April 17, most of the water of the inlet stream was made to by-pass the lake. Screens were maintained at the outlet of the lake to the time of releasing the fish on June 17. From June 17 to 24, the pond was drained, the cutthroat were captured, the left pervic fins were 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 weight of the remainder could be calculated. After draining, the pond was left dry until July 16, when water was allowed to enter the pond. On August 26, 25,070 cutthroat trout fry were planted in the usual manner, that is by dumping them from the truck through a pipe to the edge of 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 newspaper gave the program publicity.

Findings:

In 1953, 25,000 cutthroat trout fry were planted from a boat and were well scattered over the lake. A total of 9,076 cutthroat trout and 20 eastern brook trout were taken from the pond by the project leader in 1954. The average length of the cutthroat trout was 6.0 inches with a range of 2.9 to 8.6 inches. The calculated total weight of the cutthroat trout was 591.6 pounds.

On May 5, prior to draining the pond, the project leader discovered that vandals had chopped out the headgate planks and removed enough of the planks so that the lake was about one-half its normal depth. The screen and planks were replaced immediately. It cannot be estimated how many fish went over the spillway when the vandals removed the planks. In the normal routine of draining the pond each spring, one six-inch plank is removed at a time. When a plank is removed to allow a layer of water to drain from the lake, fish work their way toward the outlet and are gradually washed over the spillway where they are trapped in an arrangement of screens. It is, therefore, certain that a goodly number of fish escaped from the pond when the vandals removed the planks.

An interesting observation of temperature tolerance was noted on the afternoon of June 24 when the lake was almost drained. A cutthroat trout was observed swimming out of the very shallow water of the pond which had a water temperature of 84 degrees F.

None of the plant of marked fish was reported caught in Whitefish Lake during 1954. Resort owners report that the only fish caught are lake trout and bitterly complain about the lack of the formerly abundant cutthroat; however, some individual anglers from Whitefish reported good catches of cutthroat trout during the fall of 1954. Whitefish Lake is one mile from Smith Lake by stream.

Analysis and Recommendations:

The number of fish taken from the pond was 36.3 percent of the number planted. The value of the 591.6 pounds of fish produced is $887.40, based on the amount of $1.50 per pound as 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 the $5,960 which was cost of dam to the Department)	298.00
Cost of one year's operation	$ 737.00
Value of fish produced	887.40
Savings for the year	$ 150.40

This is the second 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 dam except during the days when vandals removed about one-half the planks and it is possible that about a half of the trout escaped at that time. It is still impossible for any fish to go up over the inlet diversion dam. The survival of fish, in spite of the vandalism loss, was five and one-half times greater than during the years 1951 and 1952. The only change in the entire operation was that the fry planted in 1952 and 1953 were scattered over the entire lake by boat, whereas in 1950 and 1951, the fish were planted in one spot at the end of the road. The reason for the higher survival in 1954 over 1953 may have been that the personnel planting the fish scattered them more widely than in 1953. Variations in weather conditions during the past five years which would affect the pond environment do not appear to have increased the survival of the trout. With the knowledge now at hand, no correlation can be found between these slight variations in weather and the pond production.

As was mentioned before, the survival of fish was four times higher in 1953 and more than five and one-half times higher in 1954, than in the previous years (Table I). The question arises: Did method of planting make this difference? It is thought at this time that the planting technique is making the difference. It is recommended that this study be continued for an indefinite period and that an effort be made to determine the cause of the survival differences. It is further recommended that on alternate years, (1) the fish be scattered over the lake with a boat; and, (2) the fish be carried by buckets to one spot on the lake from the planting truck. This will test the inference that method of liberation was responsible for the higher production in 1953 and 1954.

Table I.

The Number of Cutthroat Trout Planted and Recaptured in Smith Lake Rearing Pond for the Years 1951 through 1954.

Year	No. of Fish Planted Previous Year	No. Fish Captured	% Return	Total Weight of Fish	Range in Length	Average Length
1951	30,000	1,707	5.7	143.9	2.8 - 9.2	6.0
1952	29,000	1,670	5.8	226.5	4.6 - 9.2	7.5
1953	25,000	5,882	23.5	584.6	2.4 - 9.4	6.9
1954	25,000	9,076*	36.3*	591.6*	2.9 - 8.6	6.0

* These represent minimum production figures. The pond was partially drained by vandals, and a loss of fish most certainly resulted.

Summary:

In August 1953, 25,000 cutthroat trout fry were planted from a boat into Smith Lake Rearing Pond. The pond was drained in June 1954, and 9,076 cutthroat trout and 20 eastern brook trout were recovered. The cutthroat trout averaged 6.0 inches in length and the total weight of these fish was 591.6 pounds. Thus, 36.3 percent of the fish planted survived. Weighing the monetary value of the fish produced against the cost of the fry planted, the cost of the operation, and cost of construction, it was shown that the Department saved $150.40 by raising these fish in the pond instead of a

rearing station during the fiscal year 1953-54. None of these fish were reported caught by anglers in Whitefish Lake.

Data and Reports:

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

Prepared by Frank A. Stefanich Approved by _____

Date March 16, 1955