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January 22, 1948

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Report No. 1147

SUMMARY OF RESEARCH AT THE HUNT CREEK FISHERIES

EXPERIMENT STATION FOR 1947

by

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The 1947 activities of the Hunt Creek Fisheries Experiment Station may be classified generally into the categories of intensive creel census, population studies, weir studies, and spawning investigations on the brook trout. In addition the biologist in charge and the staff assisted in various other projects outside of the Hunt Creek drainage which will be mentioned briefly.

Intensive creel census.--Intensive creel census was carried out for the ninth consecutive season on about 2-1/2 miles of Hunt Creek, on about one mile of Fuller Creek, and on East Fish Lake. On the experimental sections of Hunt Creek 607 anglers spent 871.50 hours fishing and caught 187 legal brook trout which weighed 26.34 pounds. This gives a quality index of 0.21 fish per hour or 0.030 pounds of fish per hour for the 1947 season. The average size of the legal brook trout during 1947 was 7.5 inches and 2.3 ounces. These results represent a decline from the 1946 data, when the quality indices were 0.36 fish per hour and 0.056 pounds per hour.

On East Fish Lake 344 anglers spent 711.25 hours and caught 89 legal brook trout which weighed 54.38 pounds. The 1947 catch was of an average length of 11.1 inches and an average weight of 9.8 ounces. Although the total catch was slightly less than in 1946 (when 93 brook trout were caught in 935.25 hours), the 1947 angling pressure was noticeably lower, and calculation of the quality indices for the two years indicates that the angling quality during 1947 was slightly better than in 1946 (0.12 legal fish per hour compared with 0.10 fish per hour). The largest fish taken during 1947 was an 18.2-inch brook trout which weighed 2 pounds, 6-1/4 ounces.

For the second year a special legal limit of 6 inches was operative on four stream sections of the experimental waters--Fuller Creek west of the water wheel, and in Sections C, D, and E of Hunt Creek. During the 1946 season, the first year that this limit was in effect, 750 anglers spent 1,140.75 hours fishing these waters and in this time removed 513 fish between 6 and 7 inches in size which weighed 44.93 pounds. During the 1947 season these same waters were fished by 618 anglers who spent 853.25 hours in removing 352 six- to seven-inch fish weighing 29.99 pounds. It was noted that the catch of brook trout over 7 inches long in these sections declined over 50 percent in 1947. Since a similar decline occurred in sections with the 7-inch size limit it does not appear that the reduction in legal size was an important factor.

Population studies.--During the past few years an increasing amount of time has been spent in developing the equipment for electric fishing and the techniques for stream fish population studies. The "shocker" and the present mode of population study was described in a recent article appearing in the October issue of Michigan Conservation. By means of the

shocker and with the aid of tagging and fin-clipping, pre-season, mid-season, and post-season population counts of the brook trout population of the experimental waters of Hunt Creek were made during 1947, and also in that portion of Gamble Creek flowing through the Rifle River Area in Ogemaw County.

On Hunt Creek a pre-season population of 149 legal brook trout was found to be present. During the season intensive creel census indicated that anglers removed 187 legal brook trout. Immediately following the close of the season investigation with the shocker revealed a post-season population of 116 legal brook trout. A study of the marked fish in both the population studies and in the anglers' catches indicates that the angling stock is composed mainly of legal trout from the following sources: (a) legal fish which survive from the preceding season (b) brook trout which are of less than legal length at the start of the season but which grow into the legal size group during the season, and (c) legal trout which may move into the experimental waters at some time during the season.

The studies on Gamble Creek indicated a pre-season population of 111 brown trout and 2 brook trout of legal size. At mid-season the population was estimated to be 161 legal brown trout and 2 legal brook trout. During the season anglers removed 14 legal trout in 88 hours of fishing according to the intensive creel census records. At the close of the season, the population study showed a population of 142 legal fish. Despite the fact that there was a relatively high population of legal fish present in this $3/4$ -mile of stream, angling was very poor. This brings up the question of how many legal fish per unit of water area must be present in order to produce an average catch of 0.50 or 1.00 fish per hour.

Weir studies.--The weir studies, started shortly after the station was established in 1939, were continued at five sites on the area. A total of 206 brook trout were passed into the main stream from tributaries (1 legal fish, 99 sub-legal fish, 89 fingerlings, 17 fry) and eleven brook trout were noted moving out of the main stream into tributaries (7 fry, 2 fingerlings and 2 sub-legals). All were marked either by jaw-tagging or with a distinctive fin-clip combination, depending on their size. At East Fish Lake 9 sub-legal brook trout were passed into the lake, and 13 brook trout (of which 6 were legal fish) were handled moving out of the lake. Although no formal report has been written on the weir data as yet, it becomes apparent that relatively few brook trout of legal size migrate from the tributaries to the main stream. The great majority of the migrants to the main stream are fingerling and sub-legal brook trout. By means of the fin-clip combinations and tag numbers, it has been noted in the annual creel censuses that from 0.61 to 2.43 percent of the anglers' catches of legal trout in the main stream originate in the tributaries.

Spawning studies.--Studies on the results of spawning of brook trout were prosecuted again during the fall of 1947 by periodic counts on the numbers of redds made in the experimental waters, and also by the confinement of known numbers of adults of known sizes in screen diversions which make possible the recovery of their progeny at some time following hatching. From egg counts on numerous females of varying sizes the theoretical number of fry which might be produced is estimated. During the past four years we have noted survival percentages in the confinement experiments ranging from 2-1/2 percent to 12-1/2 percent of the theoretical numbers which might be produced. The observations on the stream proper

indicate that the length of the spawning season may vary considerably in different years depending on the weather, also that certain suitable spawning sites are used by the brook trout every year. Ordinarily the yolk-sac fry do not emerge before late winter or early spring, usually between late January and early March. However, in 1944 an unusually favorable year for spawning, yolk-sac fry were emerging in mid-December. Observations in 1947 indicated that the East Fish Lake brook trout spawned within the confines of the lake for the second successive year, but the success of such spawning is not known.

Additional marking studies.--During October and November of 1947, approximately 450 wild brook trout were captured with the shocker at several points along Hunt Creek below the experimental waters, scattered from Brailey's cottage to the junction of the Hunt Creek with the Thunder Bay River. These fish, which ranged in size from 5-1/2 to 12 inches, were measured and tagged before release. The object of this work is to gain further knowledge of the growth and movement of the brook trout in the lower reaches of the Hunt Creek drainage. We expect to obtain recoveries on these marked fish both by means of the shocker and through the cooperation of the anglers on Hunt Creek during the 1948 season.

As well as the above lines of investigation, the staff or various members of it aided in the following projects at points away from the Hunt Creek Fisheries Experiment Station:

- a) Monthly collection of brook trout for scale study and aging by E. L. Cooper;
- b) Tagging of legal brown and rainbow trout for tests of comparative efficiency of spot and scatter plantings during the open season;

- c) Lake trout control experiments check-up at Marquette Hatchery;
- d) 1947 fall lake trout fingerling fin-clipping for release in Lake Huron;
- e) Oversee general operation of intensive creel censuses at Guiley Pond and Rifle River Area, and tabulate and write reports on the angling results in those areas;
- f) Perform and assist in occasional lake survey and netting;
- g) Cooperate and assist in experimental work involved in testing a new type of self-cleaning rotary screen;
- h) Gave talks at Mio Sportsmen's Club, Alpena Lion's Club and assisted Ebb Warren of Education Division in preparation of two radio broadcast records.

During 1947 up to December 1, the staff rooms in the laboratory-residence were occupied for 125 man-nights by Department members other than the staff stationed here.

Tentative plans for the modernization of one of the cabins on the area, the enlargement of another, and improvements to the laboratory-residence were drawn up and approved during 1947. Also plans were made and approved for construction of two-way fish traps near the upper and lower end of the experimental section of Hunt Creek. Self-cleaning rotary screens will be placed in all weir and diversion bulkheads. Work orders covering all of this construction have been approved and it is expected that the jobs will be completed by early summer.

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