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PROGRESS REPORT ON THE EXPERIMENTAL DREDGING PROJECT, PIGEON RIVER, CHEBOYGAN COUNTY

By E. H. Bacon

This project was designed to determine the value of dredging pools in a trout stream as a management procedure, particularly as to its effectiveness in increasing the cover (i.e., depth of water) and thereby inducing more trout to inhabit the area.

The area selected was a 1,000-foot stretch of the Pigeon River in Cheboygan County immediately above the red bridge (T. 33 N., R. 1 W., Sec. 8). This section of the stream was flat, shallow, and relatively devoid of cover, and had a well impacted bed of fine gravel, rubble and boulders. Drifts of sand, silt, and/or clay lined the shore. Trout-population surveys and checks were to be made before and after the dredging project had been completed. A survey of the stream bed for trout-food organisms was made prior to the dredging.

An initial fish population survey was made in the summer of 1953. The dredging was completed in October, 1953, and subsequent population surveys have been made during the spring and fall of 1954 and 1955. The project will terminate in the fall of 1956, and the data collected to that date will then be evaluated.

Prior to dredging, a map of this experimental area was prepared by the Lake and Stream Improvement Section of the Fish Division, Department of Conservation.

Trout-population checks and estimates were made with the aid of a D. C. shocker. Population checks consisted of enumerating and measuring the trout as they were shocked during a single run through the experimental area. Estimates of the population, made by the mark-and-recapture method (two complete runs), were determined by using the following formula:

$$\text{Population Estimate (or P.E.)} = \frac{A \times B}{C} + A$$

where A = number of fish marked during the first run of population study,

B = number of unmarked fish taken during the second run, and

C = number of marked fish of first run recovered during the second run.

Table 1 is a summary of the trout-population estimates and checks made since the project was initiated. The first population survey concerned all species of fish within the experimental area. The ensuing surveys were concerned only with trout. A large population of forage fish, particularly blacknose and longnose dace, was present during the initial survey (Table 1). Subsequent observations after the dredging had been completed revealed a much reduced population of forage fish.

The brook trout is the predominant salmonid fish in this area, with the brown and rainbow trouts following in that order. The rainbow trout constitutes so small a portion of the population that it is considered of minor importance.

Table 1 shows an interesting comparison between the relatively stable population of brook trout as opposed to the fluctuating population of brown

Table 1

Population estimates and checks of trout in the Pigeon River, before and after an experimental dredging project had been completed

P.E. = Population estimate P.C. = Population check

In parentheses under P.E. are given the numbers of fish, taken by shocker, on which the population estimates are based.

Date		Brook trout Number	Brook trout Size range (inches)	Brown trout Number	Brown trout Size range (inches)	Rainbow trout Number	Rainbow trout Size range (inches)
1953							
June	P.E.	179 (60)	1 - 7	98 (48)	1 - 17	1 (1)	8
July	P.C.	73	2 - 6	77	1 - 17	1	8
August	P.C.	41	2 - 6	50	2 - 17	2	3
September	P.E.	199 (113)	2 - 8	217 (126)	2 - 17	14 (10)	3 - 4
October	Experimental dredging completed						
1954							
April	P.E.	240 (30)	2 - 7	70 (16)	4 - 8	5 (5)	4 - 5
September	P.E.	266 (56)	2 - 8	284 (57)	3 - 14	1 (1)	6
1955							
April	P.E.	232 (55)	2 - 8	62 (28)	3 - 12	3 (3)	4

Population estimates for the three most numerous forage fish encountered during the initial survey of the experimental area

Date		Blacknose dace Number	Blacknose dace Size range (inches)	Longnose dace Number	Longnose dace Size range (inches)	Creek chubs Number	Creek chubs Size range (inches)
1953							
June	P.E.	589 (151)	1 - 4	300 (70)	2 - 5	189 (45)	1 - 6

The following is a list of fish species encountered in the experimental area while conducting population studies:

Common name:	Scientific name:
Brook trout	Salvelinus fontinalis
Brown trout	Salmo trutta
Rainbow trout	Salmo gairdneri
Blacknose dace	Rhinichthys atratulus meleagris
Longnose dace	Rhinichthys cataractae
Creek chub	Semotilus atromaculatus
Common shiner	Notropis cornutus
Fathead minnow	Pimephales promelas
Redbelly dace	Chrosomus eos
Mudminnow	Umbra limi
White sucker	Catostomus commersoni
Blackside darter	Percina maculata
Johnny darter	Etheostoma nigrum nigrum
Log perch	Percina caprodes semifasciata
Northern muddler	Cottus bairdi bairdi
Green sunfish	Lepomis cyanellus
Pumpkinseed	Lepomis gibbosus
Michigan brook lamprey	Ichthyomyzon fossor
American brook lamprey	Lampetra lamottei
Sea lamprey	Petromyzon marinus

trout; the fluctuation in the brown trout population is related to the spawning season. Apparently the brown trout does considerably more moving about prior to spawning than does the brook trout.

A qualitative survey of bottom organisms was made on June 13, 1953; this consisted of collecting organisms from five different stream sites in the experimental area. In addition, on June 15, as a quantitative study, three square-foot bottom samples were taken with a Surber bottom sampler at the lower, middle and upper limits of the experimental area. The volumes of organisms were measured by displacement in water. These three samples contained:

Sample #1 - taken at the upper end, 0.2 cc. of organisms, a total of 48 animals.

Sample #2 - taken in the middle of the area, 0.5 cc. of organisms, a total of 341 animals.

Sample #3 - taken at the lower end, 0.4 cc. of organisms, a total of 112 animals.

On the basis of numbers and volume, this area, prior to dredging, would be classified as only a fair producer of trout food.

The following orders of bottom organisms (nymphal plus adult stages) were found in the experimental area (qualitative and quantitative samples combined):

Nematoda	Hydracarina	Ephemeroptera	Crustacea
Oligochaeta	Plecoptera	Coleoptera	
Gastropoda	Neuroptera	Tricoptera	
Pelecypoda	Odonata	Diptera	

Among the orders of organisms found in the area, the following genera were identified:

Ephemeroptera:	Plecoptera:	Neuroptera:	Tricoptera:
Ephemerella	Oroperla	Chauliodes	Heliocopsyche
Caenis	Pteronarcella		Brachycentrus
Leptophlebia			Glossosoma
Stenonema			Limnophilus
Arthroplea			Hydropsyche
Ametropus			Asentophylax

Members of the order Tricoptera were the most numerous of all organisms found.

Aquatic plants were not numerous. Of the plants noted (algae, moss and potamogetons), the mosses were most abundant.

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