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GROWTH OF THE LARGEMOUTH BLACK BASS IN REELFOOT LAKE, TENNESSEE[1]

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In 1937 an investigation was started to determine the age and growth of game and rough fish in Reelfoot Lake. Since the original investigation was undertaken, a check was made on bluegills, *Lepomis macrochirus macrochirus* Rafinesque (Schoffman, 1938; 1952); white crappies, *Pomoxis annularis* (Schoffman, 1951; 1952), and black crappies, *Pomoxis nigro-maculatus* (Le Sueur) (Schoffman, 1951).

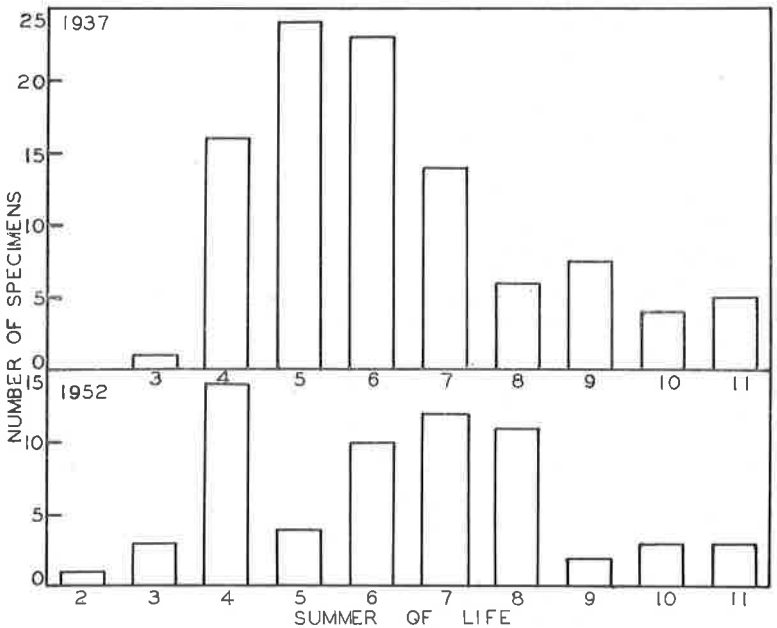

Fig. 1. Frequency distribution of 196 Reelfoot Lake largemouth black bass; 100 for 1937, and 96 for 1952.

The problems and conditions that exist at Reelfoot Lake require a constant check on the growth rate. Since no re-check has been made on the largemouth black bass, *Huro salmoides* (Lacépède), it was thought advisable to undertake this study. Scale collections for this re-check were made during the summer of 1952 from sportsmen's catches. The 1937 collections were obtained from commercial

[1]Contribution from the Reelfoot Lake Biological Station No. 82. The study here reported on was made possible by a grant from the Reelfoot Lake Biological Station of the Tennessee Academy of Science, to whom the author wishes to express his appreciation.

and sportsmen's catches. Specimens for both studies were weighed on a spring type scale, each pound being registered to the closest quarter ounce. Measurements were made to the nearest ⅛ inch. The legal length of 9 inches in 1937 remained until May, 1949, when all size limits were removed. The daily creel limit has varied from 12 fish in 1937 to 8 in 1948. The present daily creel limit is 10. Age determinations were made for all studies of each specimen and expressed in terms of summers of life instead of years of life. Thus a fish in age group 4 would be three years old and in its fourth summer of life, *i.e.*, beginning its fourth year of life. A fish in age group 4 would have 3 annual rings on its scales. No attempt was made to determine the year of origin of the outer margin of the scale growth of the preceding year. The age rings were counted by means of a magnifying apparatus (using polarized light) as described in a previous paper (Schoffman, 1939).

The histogram (Fig. 1) shows the distribution of 100 largemouth black bass for 1937 and 96 for 1952 arranged according to age groups for summers of life. Age group 5 and 6 represent the greatest number caught in 1937, while age groups 4, 6, 7, and 8 represent the greatest number caught in 1952. Age group 5 and 6 represent 47 percent of all the specimens in 1937 while age groups 4, 6, 7, and 8 represent 49 percent of the 1952 specimens. In 1952 the catch was more evenly distributed.

TABLE 1. *Average total lengths and weights for each summer of life for 100 largemouth black bass from Reelfoot Lake 1937 and 96 in 1952*

Age in Summers	Number of Fish	Average Length	Average Weight	Age in Summers	Number of Fish	Average Length	Average Weight
1937		inches	ounces	1952		inches	ounces
				2	1	9.25	7.00
3	1	9.66	7.00	3	3	11.08	12.66
4	16	11.77	14.31	4	14	12.04	16.36
5	24	13.58	23.45	5	4	13.25	25.00
6	23	15.00	33.68	6	10	14.73	32.30
7	14	16.36	43.07	7	12	16.83	47.67
8	6	18.10	50.50	8	11	18.23	61.10
9	7	18.81	67.57	9	2	20.25	60.50
10	4	20.03	72.00	10	3	20.58	74.66
11	5	20.59	77.00	11	3	22.00	96.33

The average rate of growth in length and weight of 100 largemouth black bass for each summer of life in 1937 and 96 in 1952 is shown in table 1 and figure 2. If the length at the end of the eleventh summer of life in 1937 (20.59 inches) is taken at 100 percent, it may be stated that 47 percent of the total growth in length was completed during the first three summers of life. The same assumption for 1952 shows that 42 percent of the total growth in length was completed during the first three summers of life. The yearly increments were thereafter much smaller for both years.

The growth in weight based on the average weight of the age groups is shown in table 1. Figure 2 shows a progressive increase in weight except for the ninth summer of life for 1952. The greatest increase for 1937 was in the ninth summer of life and in the eleventh summer for 1952. This suggests that largemouth black bass are still in the midst of a fast-growing period of life and the yearly increments are larger in the older age classes. If the average weight in the eleventh summer of life in 1937 (77 ounces) is taken as 100 percent it may be said that 9.1 percent of the total weight was acquired in the first three summers of life. In 1952 the same data shows that

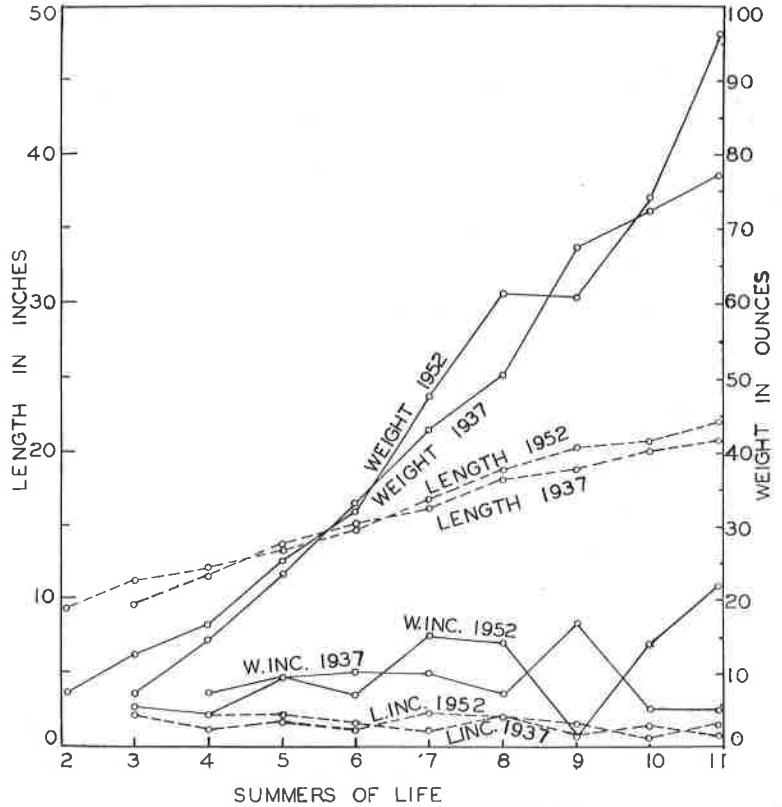

Fig. 2. Growth, weight, and increment curves of 196 Reelfoot Lake largemouth black bass; 100 for 1937, and 96 for 1952. The increment curves represent the annual increase in length and weight.

13 percent of the total weight was acquired in the first three summers of life. The total weights acquired for the fourth to the tenth summers of life for 1937 inclusively were: 19 percent, 31 percent, 44 percent, 56 percent, 66 percent, 88 percent, and 94 percent. For 1952 the same data show 17 percent, 26 percent, 33 percent, 50 percent, 63 percent, 63 percent, and 75 percent. Since the oldest fish are still in

a rapidly growing period, so far as weight is concerned, the percentages would be less for each year of life if they had been figured on the basis of older fish. Figure 3 show that in 1952 the largemouth black bass caught were slightly longer and heavier for each size group then in 1937.

The increase in length and weight of 1952 largemouth black bass over 1937 is apparent, but apparently there was not any appreciable change in length of growing season or in the amount of available food. The only changes that have occurred since the 1937 study (Schoffman, 1938) are the prohibiting of the sale of largemouth black bass in 1939, the removal of the size limit in 1949, and the changing of the daily creel limit. The creel limit has varied from 12 in 1937 to 8 in 1948, and to 10 in 1952. From 1937 until its removal, the size limit was 9 inches. It is doubtful if any of these fishing regulation changes were responsible for the slight increases. There is no explanation apparent for the decrease in weight during the summer of 1952.

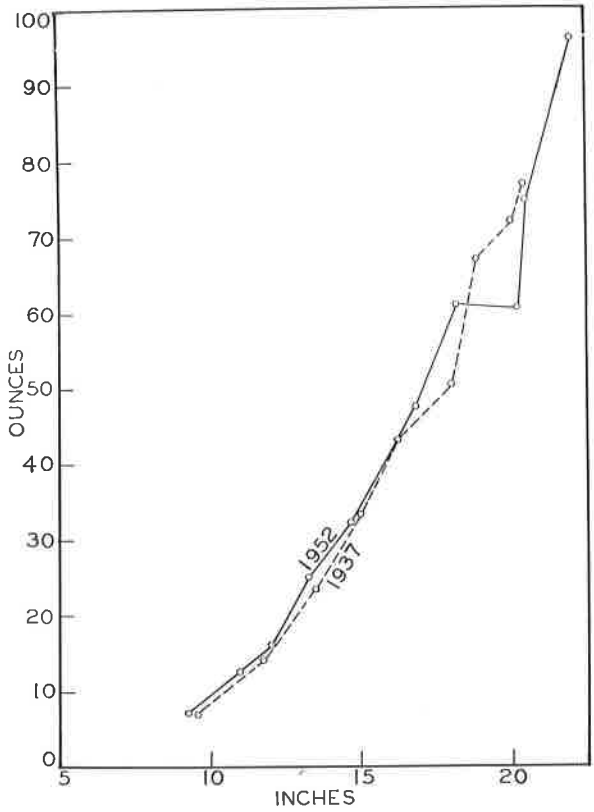

Fig. 3. Weight curve of 196 Reelfoot Lake largemouth black bass; 100 for 1937, and 96 for 1952.

The original studies on growth of fish in Reelfoot Lake showed that both game and rough fish were growing rapidly. The checks and rechecks made on game fish show a continued rapid growth. These studies also show that the game fish are being caught during a rapidly growing period, which is desirable, and shows that the crop is being harvested. However, sportsmen are still complaining about the small daily catches. The daily catch is not due to the lack of available fish but to changing lake conditions (Schoffman, 1950; 1952). To increase the daily catch it will be necessary to improve lake conditions.

ACKNOWLEDGMENTS

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LITERATURE CITED

Hubbs, Carl L., and Karl F. Lagler. 1941. Guide to the fishes of the Great Lakes and tributary water. *Cranbrook Institute Science,* Bull. 18. Aug.

Schoffman, Robert J. 1938. Age and growth of the bluegills and large-mouth black bass in Reelfoot Lake. *Rep. Reelfoot Lake Biol. Sta.,* 2:5-27 (Reprinted in *Jour. Tenn. Acad. Sci.,* 13:81-103).

Schoffman, Robert J. 1939. Age and growth of the red-eared sunfish in Reelfoot Lake. *Rep. Reelfoot Lake Biol. Sta.,* 3:61-71 (Reprinted in *Jour. Tenn. Acad. Sci.,* 14:61-71).

Schoffman, Robert J. 1948. Age, growth, and size distribution of bluegills in Reelfoot Lake for 1937 and 1947. *Rep. Reelfoot Lake Biol. Sta.,* 12:12-19 (Reprinted in *Jour. Tenn. Acad. Sci.,* 23:12-19).

Schoffman, Robert J. 1950. Conservation of fish in Reelfoot Lake, Tennessee. *Rep. Reelfoot Lake Biol. Sta.,* 14:65-75 (Reprinted in *Jour. Tenn. Acad. Sci.,* 25:65-75).

Schoffman, Robert J. 1951. Age and growth of white crappies in Reelfoot Lake for 1938 and 1948. *Rep. Reelfoot Lake Biol. Sta.,* 15:26-31 (Reprinted in *Jour. Tenn. Acad. Sci.,* 26:26-31).

Schoffman, Robert J. 1952. Growth of the bluegills and crappies in Reelfoot Lake, Tennessee. *Rep. Reelfoot Lake Biol. Sta.,* 16:15-26 (Reprinted in *Jour. Tenn. Acad. Sci.,* 27:15-26).

NEWS OF TENNESSEE SCIENCE

(Continued from page 2)

Campbell, Ph.D. from Wisconsin, instructor in plant pathology; and Robert A. Dietz, Ph.D. from Washington University in St. Louis, instructor in cytogenetics.

At the University of Tennessee Medical School, Memphis: Three new members have been added to the staff of the Division of Anatomy: Dr. George G. Robertson, Ph.D. from Yale, Professor; Dr. Harry H. Wilcox, Ph.D. Michigan, Assistant Professor, and Dr. Marvin H. Gottlieb, Ph.D. George Washington University, instructor. Dr. Hilde Fiedler, formerly an assistant professor at the Technische Hochschule, Munich, Germany, has joined the staff of the Department of Biochemistry. Seven new appointments have been made in the Division of Pathology and Bacteriology: Dr. Yo Seup Song, Seoul, Korea; Dr. Pierre-Antoine Finck, University of Geneva; Dr. Bengt Larsson, Sweden; Dr. Luis Prieto and his wife, Dr. Helen Prieto, from Tulane University and Washington University in St. Louis, respectively; Dr. W. S. Gilmer,

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