

AGE AND GROWTH OF WHITE CRAPPIES IN REELFOOT LAKE FOR 1938 AND 1948¹

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In 1937 an investigation was started to determine the age and growth of game and rough fish in Reelfoot Lake. In 1947 a check was made on bluegills, *Lepomis macrochirus*, to determine if the growth rate had changed during a ten year period. Scale samples from white crappies *Pomoxis annularis* were collected at the same time to determine if other species followed the same pattern as bluegills.

Collections for this study were obtained from commercial catches with hoop nets with an inch and a half mesh (square measure). The 1938 collections were taken both with hoop nets and wire set nets. The wire set nets were of the basket type, made from poultry netting of one and a half inch mesh. These nets were put in hollow stumps. In 1941 the use of wire set nets was prohibited so no specimens in the 1948 collections were obtained in this manner. All specimens for both studies were weighed on a spring-type scale of two-pound capacity, each pound registered by quarter ounces. Measurements were made to the nearest 1/8 inch. In 1938 the legal length was 9 inches, in 1947 it was reduced to 8 inches, and in May, 1949, size limits were removed. Age determinations were made for both studies for each specimen and expressed in terms of summers of life, instead of years of life. Thus a fish in age group 4 is 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 scale growth of the preceding year. The age rings were counted by means of a magnifying apparatus (using Polarized light) which has been described in a previous paper (Schoffman, 1939).

GROWTH OF WHITE CRAPPIES

The histogram (Fig. 1) shows the distribution of 391 white crappies for 1938 and 204 for 1948 arranged according to age groups for summers of life. Age group 3 represents the greatest number caught in 1948. This age group is not represented in the 1938 collections because the legal length at that time was 9 inches. Age group 3 in 1948 represents 41 percent or two fifths of the fish caught. Age group 4 represents the greatest number (39 percent) caught in 1938. This was more than one-third of the summer's collections. This same age group represents 31 percent or nearly one third of the specimens collected in 1948. In both studies six

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age groups were represented. In 1938 the oldest group was age group 9 containing 2.5 percent of the total. In 1948 the oldest group was age group 8 containing 2 percent of the total.

The average rate of growth in length and weight is shown table 1 and figure 2. Table 1 shows that in 1938 the average white crappie reached legal length (9 inches) late in the third summer of life. In 1948 the legal length (8 inches) was reached late in the second summer of life. If the length at the end of the ninth summer of life in 1938 (14.17 inches) is taken as 100 percent, it may be stated that 66 percent of the total growth in length is completed during the first summer of life and the same for 1948 shows that 60 percent of the

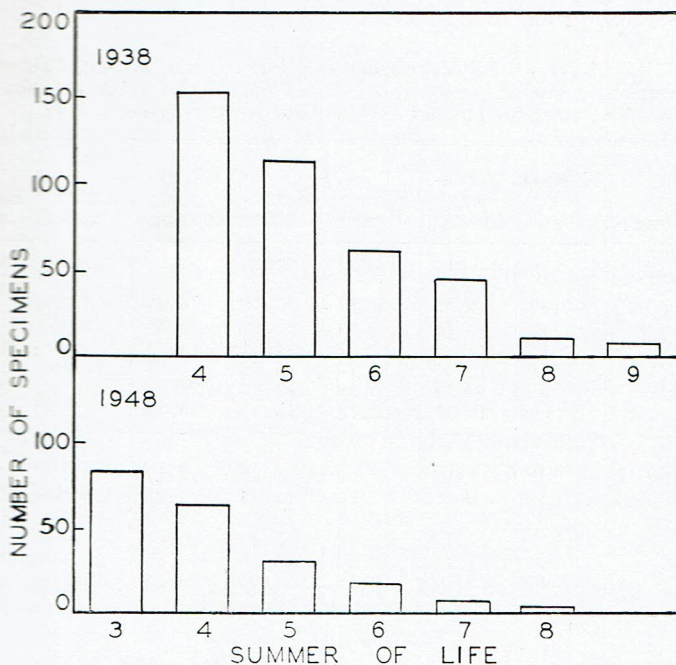


Fig. 1. Frequency distribution of 595 Reelfoot Lake white crappies; 391 for 1938, and 204 for 1948.

total growth in length is completed during the first summer of life. The yearly increments are 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 during all summers of life. This suggests that white crappies are still in the midst of a fast-growing period of life and the yearly weight increments are large in the upper age groups. If the average weight in the ninth summer of life in 1938 (30.12 ounces) is taken as 100 percent it may be said that 21 percent of the total

weight is acquired in the first summer of life. In 1948 the same data shows that 20 percent of the total weight is acquired in the first summer of life. The total weights acquired for the fourth to the eighth summers of life for 1938 inclusively are: 29 percent, 43 percent, 56 percent, and 79 percent. For 1948 the same data shows that 20 percent of the total weight is acquired in the third summer, 28 percent in the fourth summer, 45 percent in the fifth summer, 64 percent in the sixth summer, and 69 percent in the seventh summer. Since the oldest fish are still in a rapid growing period, so far as weight is concerned, these percentages would be less for each year of life if they had been figured on the basis of older fish. Figure 3 shows that in 1948 the white crappies caught are longer and lighter for each size group than in 1938.

TABLE 1. *Average total lengths and weights, shortest, longest, lightest, and heaviest specimens for each summer of life for 391 white crappies from Reelfoot Lake in 1938, and 204 white crappies in 1948*

AGE IN SUMMERS	NUMBER OF FISH	AVER-AGE LENGTH	SHORT-EST	LONG-EST	AVER-AGE WEIGHT	LIGHT-EST	HEAVI-EST
		inches	inches	inches	oz.	oz.	oz.
1938:							
4	153	9.43	7.67	9.48	6.39	5.00	9.00
5	114	10.13	9.44	11.02	8.84	7.00	14.00
6	61	11.26	10.62	12.01	12.97	9.50	24.00
7	45	12.43	12.20	13.38	16.97	14.00	24.00
8	10	13.74	13.38	13.97	23.72	21.00	25.00
9	8	14.17	13.77	14.56	30.12	22.00	30.50
1948:							
3	83	8.57	7.00	9.25	4.87	2.75	7.00
4	64	9.46	7.00	11.25	6.69	5.00	11.25
5	30	10.93	10.00	11.75	10.94	9.00	13.75
6	17	12.19	11.50	13.25	15.41	9.50	22.50
7	6	12.75	12.00	13.75	16.75	13.50	19.50
8	4	14.19	13.25	15.00	24.25	21.50	29.25

The increase in length and weight of 1948 white crappies over 1938 is very apparent but there does not seem to be any appreciable change in the length of the growing season or the amount of food. The only changes that have occurred are an increase in the water level due to the digging of channels to open up all parts of the lake resulting in a free flow of water at all times, and the abolishing of the use of wise set nets. In both studies white crappies were caught during a rapid-growing period which is desirable and indicates that the crop is being harvested. In 1949 the size limit on white crappies was removed and commercial fishermen were limited to twenty crappies per day, the same creel limit allowed sportsmen. No creel census is available but the owners of boat landings and guides at the North end of the lake report that fall crappie fishing in

1949) was the best that end of the lake had ever experienced. However sportsmen are still complaining about the poor fishing conditions and the proposed Conservation Code for 1951, if accepted and enforced, will abolish commercial fishing for all game fish. What effect this will have on fishing in Reelfoot Lake cannot be determined for several years. However from existing facts there doesn't seem to be any valid reason to limit or prohibit commercial fishing. During the ten year period that occurred between the original and the present study, the crappie population held its own and the size and weight

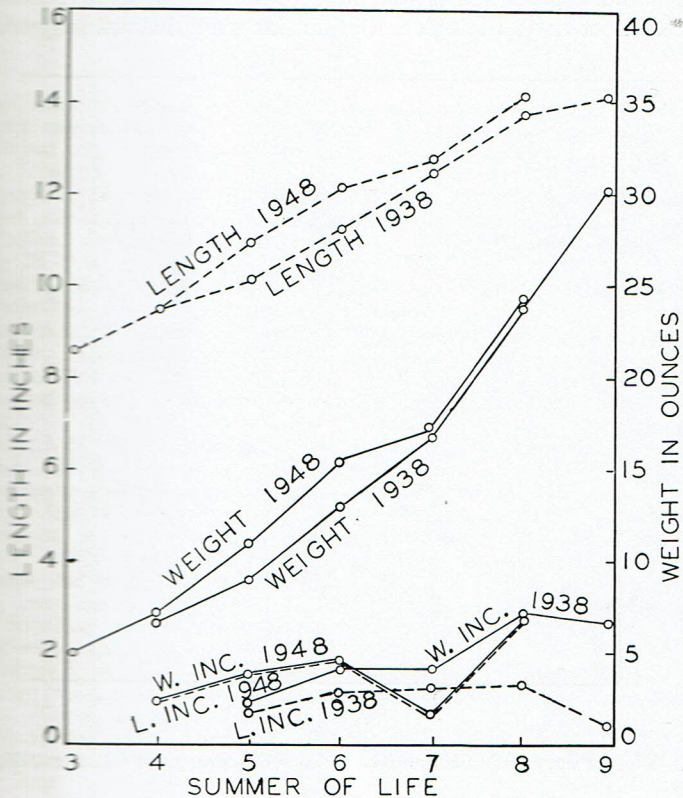


Fig. 2. Growth, weight, and increment curves of 595 Reelfoot Lake white crappies; 391 for 1938, and 204 for 1948. The increment curves represent the annual increase in length and weight.

of the crappie caught increased. The reduction of the size limit had no apparent effect on the numbers of fish caught or their size. With the present limitation on numbers caught or the proposed abolishing of commercial fishing, the number and size of crappies may increase, but what effect will this have on the balance of the lake? Increased numbers of crappies in competition with other fish, especially sun-

fish, for food and spawning grounds will change the balance and may affect the sportsman's catch for other species of fish. The sportsmen's catch at the present time is not due to the lack of fish but to other conditions (Schoffman, 1950). Thus it would seem best to improve fishing conditions rather than abolish commercial fishing with its possible upset in the balance of the lake. The vote of sportsmen is taking away the scientific management of Reelfoot Lake.

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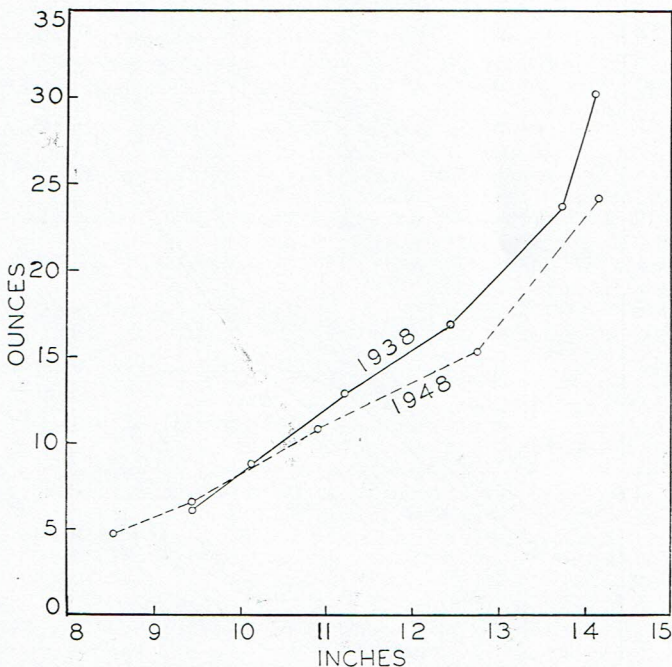


Fig. 3. Weight curve of 595 Reelfoot Lake white crappies; 391 for 1938, and 204 for 1948.

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