

**AGE AND RATE OF GROWTH  
OF THE WHITE CRAPPIE IN REELFOOT LAKE,  
TENNESSEE, FOR 1950 AND 1959<sup>1</sup>**

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In 1937 an investigation was started to determine the age and rate of growth of game and rough fish in Reelfoot Lake. Since the original investigation of white crappie, *Pomoxis annularis* (Schoffman, 1940), changes have taken place that have caused a re-check to be made from time to time. In 1937, 1938, and 1939 commercial fishing was legal, allowing the use of hoop nets with an inch and a half mesh (square measure), trammel nets, gill nets, and wire set nets of the basket type made from poultry netting of one and a half inch mesh. In 1941 the use of wire set nets was prohibited. In 1939 the legal length was 9 inches. In 1947 the legal length was reduced to 8 inches and in 1949 the legal length was removed and commercial fishermen limited to 25 per day. In 1959 commercial fishing was abolished. Thus a re-check in 1948, 1950 (Schoffman 1951 and 1952) and the present re-check. Scale collections for 1937, 1938, 1939, 1948, and 1950 studies were obtained from both commercial and sportsmen's catches. In 1949 only sportsmen's catches were used. Age determinations were made for all studies for each specimen and arranged according to age groups, *i.e.*, a fish in age group 2 would show one annulus and be in its second year of life. Age determinations were made for all studies by the method of Schoffman (1939).

**Rate of Growth**

The histogram (Fig. 1) shows the distribution of 215 white crappies for 1950 and 500 for 1959 arranged according to age groups. In 1950 age group 3 represents 36 per cent, age group 4, 28 per cent, age group 5, 15 per cent, age group 6, 10 per cent, age group 7, 8 per cent, and age group 8, 3 per cent of all the specimens. In 1959 age group 2 represents 10 per cent, age group 3, 26 per cent, age group 4, 24 per cent, age group 5, 24 per cent, age group 6, 9 per cent, age group 7, 4 per cent, and age group 8, 3 per cent. In 1950 age group 2 was not represented. In 1950 age groups 3 and 4 represent the largest numbers caught. In 1959 age groups 3, 4, and 5 represent the largest numbers caught. In 1959 an additional age group, age group 2, is present, accounting for 10 per cent of the specimens caught.

<sup>1</sup>Contribution from the Reelfoot Lake Biological Station No. 91. 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.

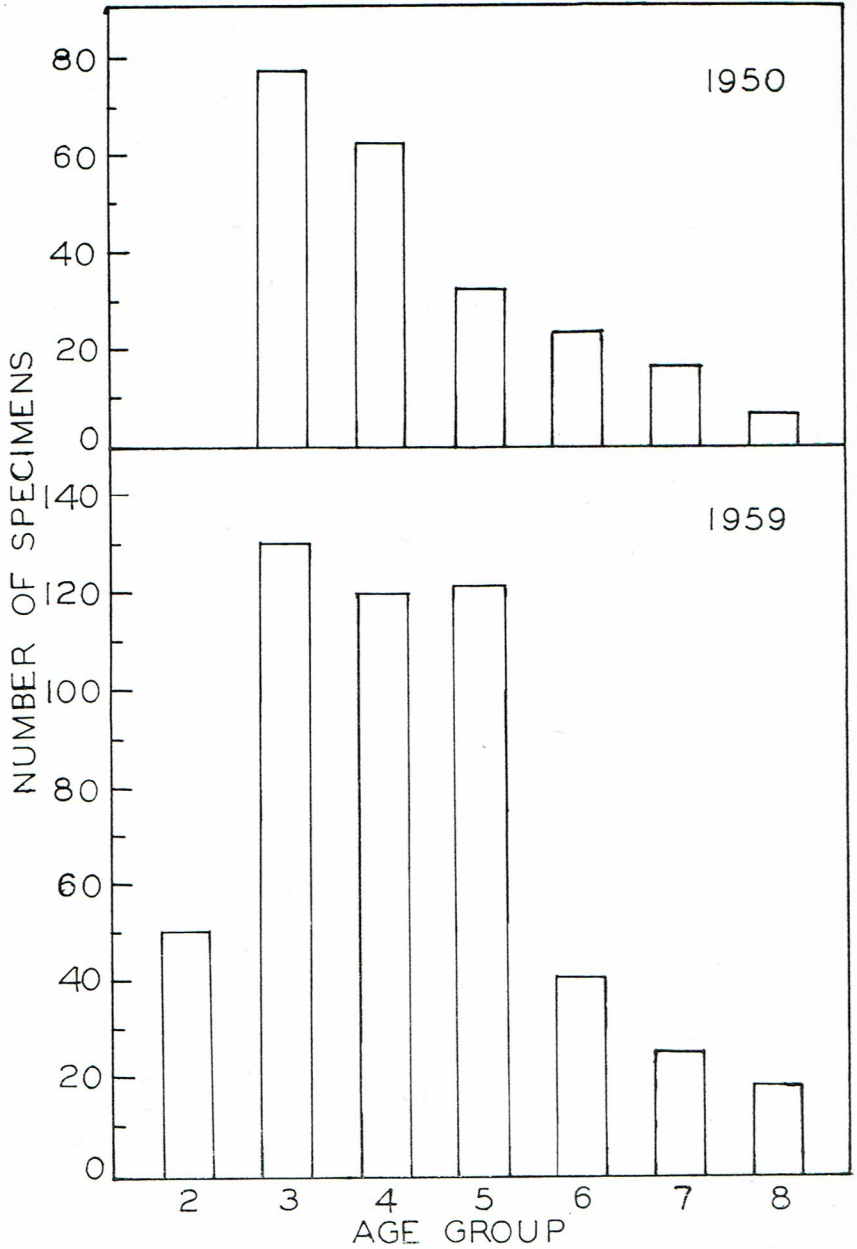


Fig. 1. Frequency distribution of 715 Reelfoot Lake white crappies; 215 for 1950 and 500 for 1959.

The average rate of growth in length and weight of 215 white crappies for each summer of life in 1950 and 500 white crappies in 1959, is shown in table 1 and figure 2. If the length for age group 8 in 1950 (14.32 inches) is taken as 100 per cent, it may be stated that 58 per cent of the total growth in length is completed by specimens of age group 3, 64 per cent by age group 4, 70 per cent by age group 5, 81 per cent by age group 6, and 90 per cent by age group 7. In 1959 the length of age group 8 was 13.72 inches and if taken as 100 per cent, it may be stated that 53 per cent of the total growth in length is completed by specimens of age group 2, 59 per cent by age group 3, 65 per cent by age group 4, 72 per cent by age group 5, 76 per cent by age group 6, and 82 per cent by age group 7. The per cent of growth completed by each age group in 1950 was greater than in 1959.

TABLE 1. Average Total Length and Weights for Each Age Group for 215 White Crappies from Reelfoot Lake for 1950 and 500 for 1959.

Group Number Age 1950	Age of Fish	Average Length inches	Average Weight ounces	Group Age 1959	Number of Fish	Average Length inches	Average Weight ounces
				2	50	7.30	2.80
3	77	8.37	5.13	3	128	8.11	4.85
4	60	9.20	7.05	4	118	9.01	5.46
5	32	10.21	9.41	5	119	10.04	7.62
6	23	11.51	13.52	6	43	10.41	9.95
7	16	12.88	18.44	7	24	12.63	14.29
8	7	14.32	24.43	8	18	13.72	20.06

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 for all age groups. If the average weight for the eighth summer of life in 1950 (24.43 ounces) is taken as 100 per cent it may be said that 21 per cent of the total weight is acquired by specimens of age group 3, 29 per cent by age group 4, 39 per cent by age group 5, 55 per cent by age group 6, and 75 per cent by age group 7. For 1959 the same data shows 24 per cent of the total weight is acquired for age group 3, 27 per cent for age group 4, 38 per cent for age group 5, 50 per cent for age group 6, and 71 per cent for age group 7. In 1950 age group 2 is not represented and has acquired 14 per cent of its total weight. In 1948 there was an increase of weight over 1938 and 1950 (Schoffman, 1951 and 1952). In 1950 there was an increase of weight over 1959 in all age groups.

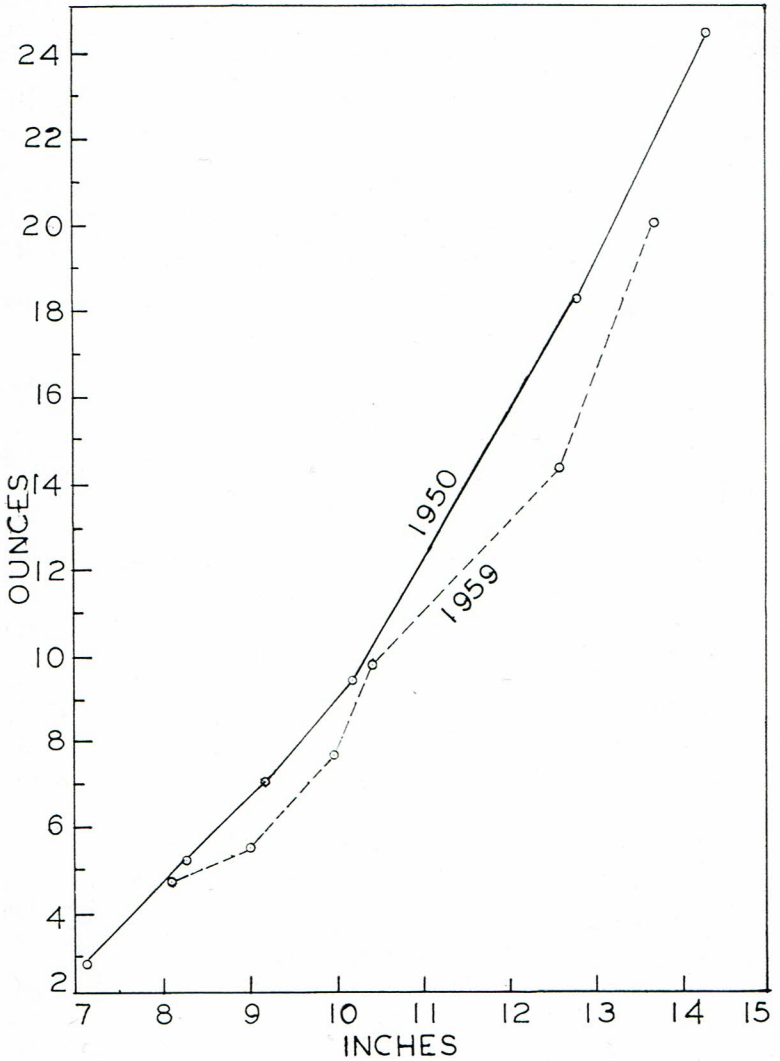


Fig. 2. Growth, weight and increment curves of 715 Reelfoot Lake white crappies; 215 for 1950 and 500 for 1959. The increment curves represent the annual increase in length and weight.

The increment in length in 1959 showed a decrease in all age groups except age group 8 which showed an increase over 1950. In both years the increment was constant. Figure 3 shows a steady increase in length and weight for both 1950 and 1959. In both years the oldest fish were in age group 8 and no fish were over nine years old. The increase in length is slow after the second year of life while the increase in weight is greater in the older age groups. This information indicates that the life history of white crappie covers a nine year period.

In 1948 there was an increase in both length and weight over 1938 (Schoffman, 1951). During this period commercial fishing

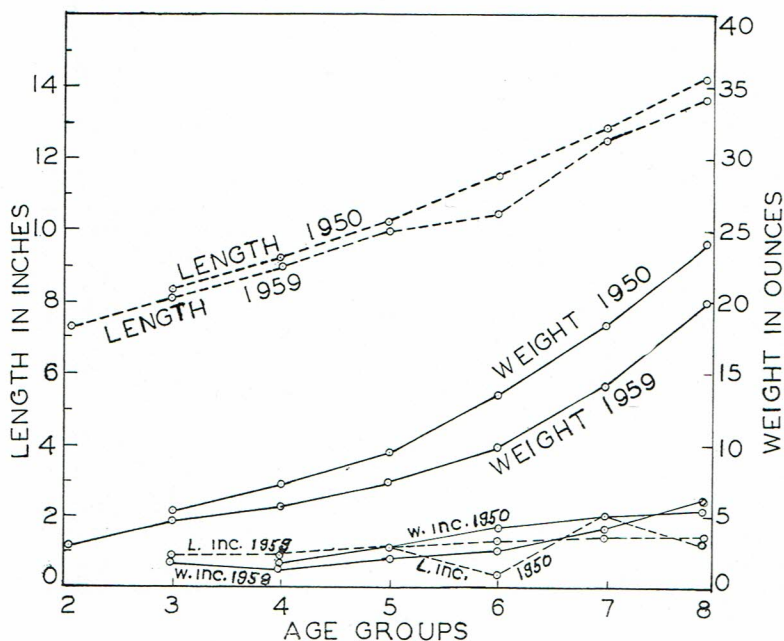


Fig. 3. Length and weight relationship of 715 Reelfoot Lake white crappies; 215 for 1950 and 500 for 1959.

was legal with no limit on the number of fish taken. However, in 1941 wire set nets were outlawed. The legal length from 1938 through 1946 was 9 inches. In 1947 the legal length was reduced to 8 inches.

In 1950 there was a decrease in length and weight in age groups 3, 4, 5, and 6 under 1948 with an increase in both length and weight in 1950 over 1948. In 1949 the legal length of 8 inches was removed and commercial fishermen limited to 25 per day.

In 1959 there was a decrease in length and weight in all age groups. In 1955 commercial fishing of game fish was abolished. This gives age groups 2, 3, and 4 complete protection from commercial fishing. Age group 5 has one year of protection; age group 6, two years of protection; age group 7, three years of protection; and age group 8, four years of protection.

#### Conclusions

The study of age and growth of white crappies in Reelfoot Lake, Tennessee, has extended over a period of twenty-one years, and during this period a change in growth rate has slowly been taking place. A decrease in the length and weight of each age group has slowly been taking place since 1948. Between each check changes in fishing regulations have been made. Each change has reduced the number of fish caught thus increasing the population. The appearance of age group 2 in 1959 shows the increase in population with a reduction in size and weight which has been observed by the author and dock owners, guides, commercial fishermen, resort owners and sportsmen with whom the author discussed fishing conditions. During the summer sportsmen are catching smaller crappies since commercial fishing of game fish was prohibited in 1955. The same was found to occur in bluegills (Schoffman, 1959). Studies should be continued to determine if the increase in population will reach such proportions that an undesirable white crappie will appear. White crappies in Reelfoot Lake are becoming just white crappies as caught in any other body of water and not the superior white crappie with which Reelfoot has been noted.

#### Acknowledgments

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