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AGE AND RATE OF GROWTH OF THE CHANNEL CATFISH IN REELFOOT LAKE, TENNESSEE, FOR 1953 AND 1960[1]

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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 channel catfish, *Ictalurus lactustris punctatus* (Schoffman, 1954), changes in fishing regulations have been made that have caused this re-check to be made. In 1955 commercial fishing of game fish was abolished by the Tennessee Legislature. This act made one exception: it allows the yellow bass or striped jack, *Morone interrupta Gill*, to be taken commercially. To determine if the changes in fishing regulations had any effect on the rate of growth re-checks have been made by Schoffman (1948, 1951, 1952, 1953, 1956, 1957, 1958, 1959, and 1960). The re-checks to date show that the growth rate of both game and commercial fish is diminishing. Collections for 1953 and 1960 were obtained from commercial catches with trout lines. In both studies the method of Sneed (1951) was used. The method of collecting and sectioning the pectoral fin spines for both studies was that of Schoffman (1954). Age determinations were made for both 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.

RATE OF GROWTH

The histogram (Fig. 1) shows the distribution of 421 channel catfish for 1953 and 510 for 1960 arranged according to size groups. In 1953 age group 1 represents 1 per cent; age group 2, 17 per cent; age group 3, 30 per cent; age group 4, 28 per cent; age group 5, 18 per cent; age group 6, 4 per cent; age group 7, 1 per cent; and age group 8, 1 per cent. Age groups 3 and 4 represent 58 per cent of all specimens used in this study. In 1960 age group 2 represents 23 per cent; age group 3, 50 per cent; age group 4, 25 per cent; and age group 5, 2 per cent. Age group 2 and 3 represent 73 per cent of all specimens in this study. In 1960 age groups 1, 6, 7, and 8 were not represented. These age groups represent 7 per cent of the 1953 study.

The average rate of growth in length and weight of 421 channel catfish for each age group in 1953 and 510 channel cat-

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fish in 1960 is shown in table 1 and figure 2. If the length for age group 8 (26.13 inches) is taken as 100 per cent, it may be stated that 32 per cent of the total growth is completed by specimens of age group 1, 53 per cent by age group 2, 62 per cent by age group 3, 71 per cent by age group 4, 78 per cent by age group 5, 86 per cent by age group 6, and 93 per cent by age group 7. For 1960 the length of age group 5 was 19.39 inches and if taken as 100 per cent, it may be stated that 65 per cent of the total growth in length is completed by specimens of age group 2, 74 per cent by age group 3, and 87 per cent by age group 4.

The growth in weight based on the average weight for age groups is shown in table 1. Figure 2 shows a progressive increase

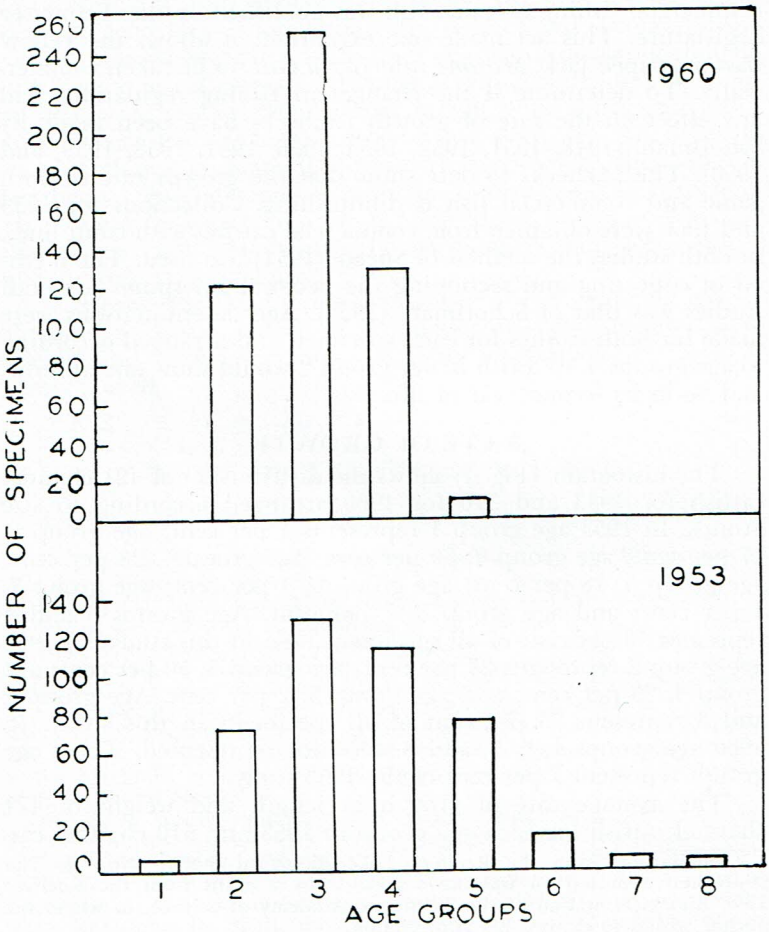

Fig. 1. Frequency distribution of 931 Reelfoot Lake channel catfish; 421 for 1953 and 510 for 1960.

TABLE 1. Average Total Length and Weights for Each Age Group for 421 Channel Catfish from Reelfoot Lake for 1953 and 510 for 1960.

Age Group 1953	Number of Fish	Average Length inches	Average Weight ounces	Age Group 1960	Number of Fish	Average Length inches	Average Weight ounces
1	5	8.35	2.60				
2	71	13.88	13.21	2	120	12.62	9.43
3	128	16.19	14.63	3	254	14.31	15.12
4	116	18.65	35.06	4	127	16.81	23.66
5	75	20.49	49.79	5	9	19.39	38.44
6	17	22.41	65.76				
7	5	24.30	89.60				
8	4	26.13	128.75				

in weight for all age groups. If the average weight for age group 8 in 1953 (128.75 ounces) is taken as 100 per cent, it may be said that 2 per cent of the total weight is acquired by age group 1. The total weights acquired for the second to the eighth age groups inclusively are: 10 per cent, 11 per cent, 27 per cent, 39 per cent, 50 per cent, and 70 per cent. For 1960 the same data shows 25 per cent of the total weight is acquired for age group 2, 39 per cent for age group 3, and 61 per cent for age group 4. In 1960 age groups 1, 6, 7, and 8 are missing. In 1953 there was an increase of length and weight over 1960 in all age groups.

The increment in length for 1953 and 1960 are almost the same for the age groups represented. The increment in weight is just the reverse, increasing steadily except for age group 3 in 1953. In 1960 there is a steady increase for all age groups represented.

Figure 3, a graph of the length and weight relationship, shows a slow rise in 1953 until 16 inches and 15 ounces were reached. From this point on the weight increased rapidly over the length. In 1960 the weight increase was greater than the length increase in all age groups represented.

Table 2 shows the size groups and age for each size group for 1953 and 1960. In 1953 an overlapping of age groups starts with age group 2 and 13.1 inches. In 1960 the maximum overlapping was two age groups. The overlapping starting with age group 2 and 12.1 inches.

CONCLUSION

The study of age and growth of channel catfish in Reelfoot Lake, Tennessee, has extended over a period of eight years. During this period there has been a decrease in length and weight. During the last five years of this period, there has been no commercial fishing of game fish. In 1955 when commerical fishing was abolished those who advocated it predicted more and larger fish. However, this has not been shown by the studies

TABLE 2. Size and Age Groups for 421 Channel Catfish from Reelfoot Lake for 1953 and 510 for 1960.

Length Intervals inches	Number of Fish		Age Groups															
			1		2		3		4		5		6		7		8	
	1953	1960	1953	1960	1953	1960	1953	1960	1953	1960	1953	1960	1953	1960	1953	1960	1953	1960
6.1 — 7.0	1		1															
7.1 — 8.0	2		2															
8.1 — 9.0	1		1															
9.1 — 10.0	0																	
10.1 — 11.0	0	6				6												
11.1 — 12.0	6	19	1		5	19												
12.1 — 13.0	16	85			16	68		17										
13.1 — 14.0	28	83			19	28	9	55										
14.1 — 15.0	66	98			26	2	40	96										
15.1 — 16.0	63	110			5		52	80	6	30								
16.1 — 16.0	39	58					24	3	15	55								
17.1 — 18.0	39	34					3		33	33	3	1						
18.1 — 19.0	43	11							32	7	11	4						
19.1 — 20.0	41	5							22	4	19	1						
20.1 — 21.0	30	1							7		22	1	1					
21.1 — 22.0	20	0							1		12		7					
22.1 — 23.0	11	0									5		6					
23.1 — 24.0	9	0									3		3		3			
24.1 — 25.0	3	0													2		1	
25.1 — 26.0	0	0																
26.1 — 27.0	3	0															3	

of Schoffman (1959 and 1960). There has been an increase in the number of bluegills and white crappies caught by sportsmen but a decrease in length, weight, and age groups, the younger age

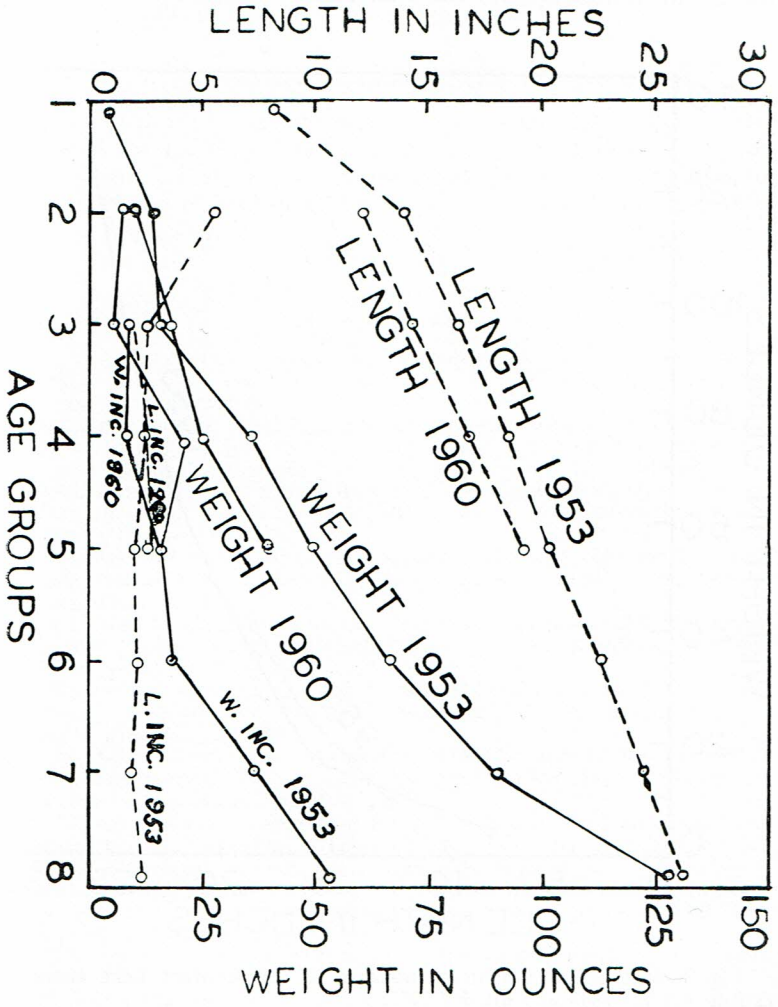

Fig. 2. Growth, weight and increment curves of 931 Reelfoot Lake channel catfish; 421 for 1953 and 510 for 1960. The increment curves represent the annual increase in length and weight.

groups having the largest number of specimens. This is also true of channel catfish, the length, weight, and age groups decreasing and the younger age groups having the largest number of spe-

cimens. The number of channel catfish is not increasing but the increase of other species along with the intensive fishing of this species is without doubt the cause of this decrease. Prior to 1959 Reelfoot Lake was able to supply large channel catfish to the eating places around the Lake, as well as outside markets.

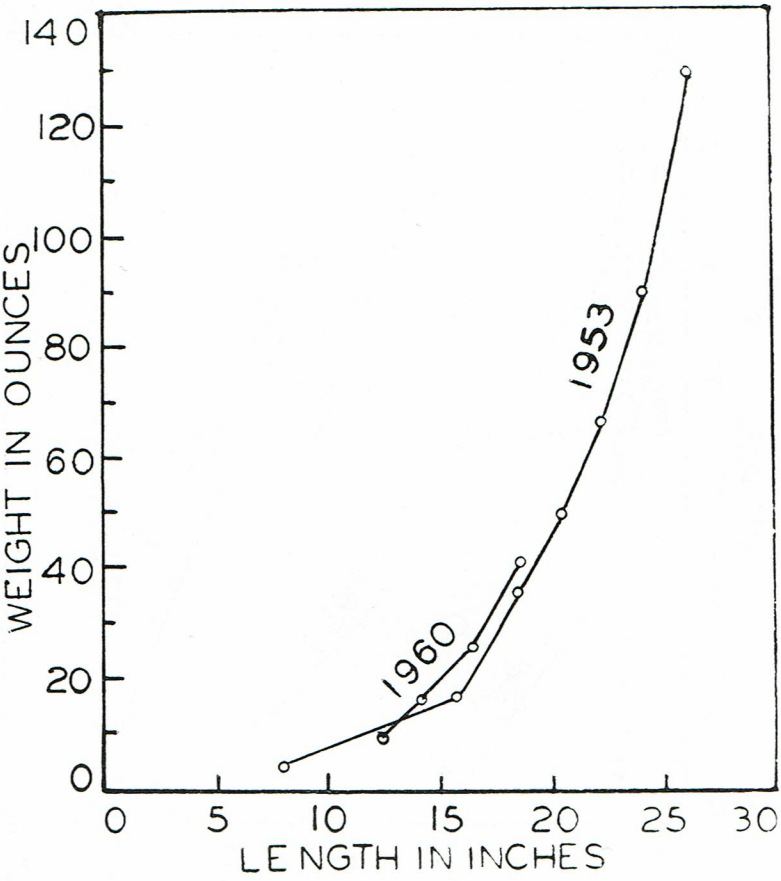

Fig. 3. Length and weight relationship of 931 Reelfoot Lake channel catfish; 421 for 1953 and 510 for 1960.

This past year the large channel catfish supplying the above markets were imported from the Tennessee River. Reelfoot Lake has an increasing population of small fish. The sportsmen's catch has increased in quantity and decreased in quality. This condition will continue until sportsmen no longer want small

fish. By this time will it be too late to rectify this condition? Should fishing regulations remain as they are or should Reelfoot Lake be open for commercial fishing of both game and rough fish as prior to 1955? The author believes commercial fishing should be as prior to 1955 (Schoffman, 1950).

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