Expenditures to July 1, 1966: Printing of the Report for 1966 \$1,100.00 Scholarships Social Security Penalty Printing of the Report for 1966 \$1,000 250.00 78.95	
	\$1.428.95
Total	13.67
Balance on Hand July 1, 1900	
Appropriation by the State of Tennessee, July 1, 1966	\$3,000.00
T Plane to Iophipry SU()	
Scholarship and Salary	
Operating Expense	
Automobile Expense	
Social Security Penalty	\$1,371.96
Total 1 1067	
Balance on Hand January 1, 1967	· · · ·

Expenditures to July 1, 1967: Printing of Report for 1967 \$1,264.90 Operating Expense 125.26 Scholarship
Total\$1,590.16Balance on Hand July 1, 196751.55Appropriation by the State of Tennessee, July 1, 1967\$3,000.00Expenditures to January 1, 1968: Scholarship and Salary\$1,000.00 39.30 Automobile Expense
Total

JOURNAL OF THE TENNESSEE ACADEMY OF SCIENCE Volume 43, Number 1, January, 1968

AGE AND RATE OF GROWTH OF THE LARGEMOUTH BLACK BASS IN REELFOOT LAKE, TENNESSEE, FOR 1961 AND 1967¹

ROBERT J. SCHOFFMAN, C.S.V. Griffin High School, Springfield, Illinois 62702

INTRODUCTION

In 1937 an investigation was undertaken to determine the age and rate of growth of game and rough fish in Reelfoot Lake. Since the original investigation of the largemouth black bass, *Huro salmoides* (Lacepede), Schoffman 1938), fishing regulations pertaining to the largemouth black bass have undergone various changes, some of which will be considered in the succeeding paragraphs.

In this and previous studies, age determinations were made by the method of Schoffman (1939) on each specimen and the specimens arranged into age groups, *i.e.*, a fish in the first age group would show one annulus and be in the second year of life; one in the second age group would be in its third year of life and so on. In this study eleven age groups are considered for each year (1961 and 1967).

RATE OF GROWTH

The histogram (Fig. 1) shows the distribution of 250 largemouth black bass for 1961 and 250 for 1967 arranged according to age groups. In 1961 age groups three, four, five, and six represent the largest numbers caught, while in 1967 age groups three, four, and five

represent the largest numbers caught. In 1961 age groups three, four, five, and six represent 76% of the specimens caught while in 1967 age group three, four, and five represent 71% of the specimens caught. In 1961 age group five represents 28% of the total while in 1967 age group three represents 37% of the total. This seems to indicate that the proportion of young is increasing.

The average rate of growth in length for 250 largemouth black bass for each age group 1961 and 1967 is shown in Table 1 and Figure 2. If the average length for age group eleven in 1961 (21.13 inches) is taken as 100%, it may be stated that 44% of the total growth is completed by specimens of age group two. The total growth for the third to the tenth age group inclusively is: 52, 58, 63, 68, 74, 86, 88, and 95 per cent. In 1967 the average length for age group eleven was 21.17 inches and if taken as 100%, it may be stated that 45% of the total growth is completed by specimens of age group two. The total growth for the third to the tenth age group inclusively is: 51, 56, 63, 69, 78, 85, 91, and 94 per cent.

The average growth in weight for all age groups for 250 largemouth black bass for 1961 and 1967 is shown in Table 1 and Figure 2. Figure 2 shows a progressive increase in all age groups. If the average weight for age group eleven in 1961 (91.00 ounces) is taken as 100%, it may be stated that 8% of the total weight is

¹ Contribution from Reelfoot Lake Biological Station No. 99. This 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.



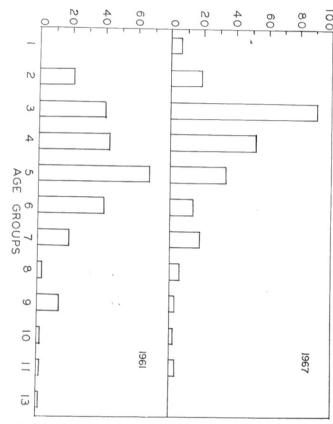


Fig. 1. Frequency distribution of 500 Reelfoot Lake largemouth black bass; 250 for 1961 and 250 for 1967.

acquired by specimens of age group two. The total weights acquired for the third to the tenth age groups inclusively are: 13, 18, 25, 33, 42, 57, 68, and 88 per cent. For 1967 the corresponding data shows 8% of the total weight is acquired by age group two. The total weights acquired for the third to the tenth age groups inclusively are: 11, 18, 23, 32, 46, 57, 72, and 82 per cent.

TABLE I

Average Total Length and Weight for Each Age Group for 250 Largemouth Bass for 1961 and 250 for 1967.

						1967	
Age Group	No. of Fish	Average Length (inches)	Average Weight (ounces)	Age Group	No. of Fish	Average Length (inches)	Average Weight (ounces)
1	0			1	7	8.14	4.28
2	21	9.42	7.57	2	19	9.51	7.58
3	40	10.96	11.80	3	91	10.73	10.96
4	43	12.16	16.97	4	53	11.85	16.11
5	67	13.39	22.87	5	34	13.43	21.09
6	39	14.46	30.00	6	14	14.66	29.43
7	19	15.62	37.94	7	18	16.54	42.61
8	3	18.25	52.00	8	6	18.00	51.83
9	13	18.71	62.16	9	3	19.17	65.33
10	2	20.00	80.00	10	2	20.00	74.50
11	2	21.13	91.00	11	3	21.17	90.67
12	0			12	0		
13	1	22.25	112.00	13	0		

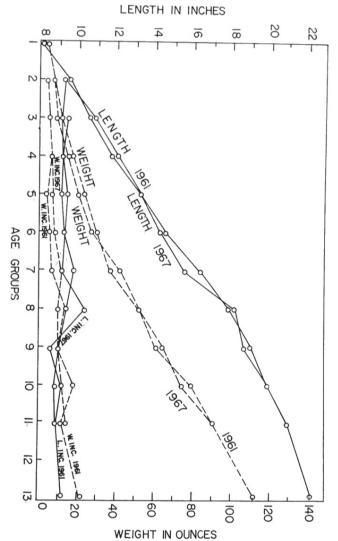


Fig. 2. Growth, weight, and increment curves of 500 Reelfoot Lake largemouth black bass; 250 for 1961 and 250 for 1967. The increment curves represent the annual increase in length and weight.

The increment in length between the successive age groups for fish taken in 1961 shows very little difference except for age groups seven and eight which show an increase. In 1967 the length increment was steady except for age group eight which showed an increase. There was a steady increase in the weight increment of fish taken during both years.

Table II shows the size groups and age for each size group for 1961 and 1967. In 1961 the overlapping of age groups started with age group two and 9.1 inches. The overlapping continued through age group nine and 20 inches. In 1967 the overlapping started with age group one and 8.1 inches and continued through age group ten and 20 inches.

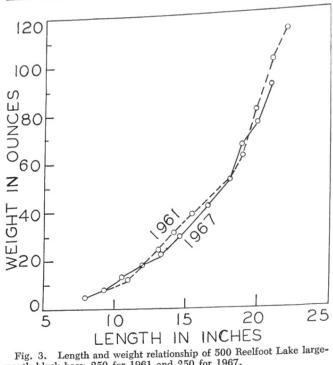
Figure 3, a graph of the length and weight relationship, shows a steady increase for collections of both years.

Conclusions

The study of age and growth of largemouth black bass in Reelfoot Lake, Tennessee, has extended over

TABLE

I



mouth black bass; 250 for 1961 and 250 for 1967.

a period of thirty one years. During this period changes of growth rate have taken place. In 1937 the growth rate was above that of 1952 (Schoffman 1938). In 1961 the growth rate was below that of 1952. Between 1937 and 1952 the commercial fishing of largemouth black bass was abolished; this resulted in an increase in the number of largemouth black bass each year. In 1955 commercial fishing of game fish was abolished, increasing the number of all species of game fish. With the stopping of commercial fishing of game fish, the summer fishing of rough fish has decreased, with an increase in the number of rough fish. Thus the sportsmen's catches consisted mostly of small specimens.

The natives and professional guides report that the spawning of largemouth black bass in the spring of 1967 was unusually good which means for the next three or four years there will be an increase of small bass caught. The decrease in the growth rate of largemouth black bass and the increasing number of small fish is in accord with the decreased growth rate of bluegills, white crappies, and channel catfish (Schoffman 1938, 1951, 1952, 1960, 1961, 1965, 1967). Thus the question is: do sportsmen want small largemouth black bass or should commercial fishing of game fish be made legal?

The author's gratitude is extended to Dr. C. L. Baker, Director of the Reelfoot Lake Biological Station, for many helpful suggestions. He also wishes to acknowledge his indebtedness to Marvin Hayes of Samburg, Tennessee, Robinson's and Grays of Tiptonville, Tennessee for the use of their docks.

LITERATURE CITED

- Schoffman, Robert J. 1938. Age and growth of the bluegills, and largemouth black bass in Reelfoot Lake. Report of the Reelfoot Lake Biological Station, 8: 8-87 (Reprinted in Jour. Tenn. Acad. Sci., 13: 81-103).
 - . 1939. Age and growth of the red-eared sunfish in Reelfoot Lake. Report of the Reelfoot Lake Biological Station, 3: 61-71. (Reprinted in Jour. Tenn. Acad. Sci., 14: 61-71).

			,			
Size and Age Groups for 250 Largemouth Black Bass from Reelfoot Lake for 1961 and 250 for 1967.	$\begin{array}{cccc} 4 & \mathbf{Age \ Group} \\ 5 & 6 \\ 6 \\ 1961 \ 1967 \ 1961 \ 1961 \ 1967 \ 1961 \ 1961 \ 1967 \ 1961 \ 1$			1 1 2 1 1 3 6 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 2 2 1 I	
	1 1967 1		0	о По С С С С С С С С С С С С С С С С С С		
	ELFOOT	Age Group 6 11 1967 19		41	3 -	
emouth Black Bass from Ree	DM REI	Age 6 1961 19		4 5	8	
	5 1967	,	141 13	4 01		
	1961		12 40	1 1		
	$\frac{4}{1967}$		⁵ 67	-		
			- ⁸ 12 1 20 1 20			
	LARG	3 11 196	4 5 62 13		-	
Size and Age Groups for 250]	37 196	$\begin{array}{c} 13\\15\\1\\1\\1\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\$	N			
)61 ² 19(57 II 1				
	967 19	4 to 1				
	$1961 \begin{array}{c} 1\\ 1967 \end{array} \begin{array}{c} 2\\ 1961 \end{array} \begin{array}{c} 2\\ 1961 \end{array} \begin{array}{c} 3\\ 1967 \end{array}$					
	Number of Fish 1961 1967	$ \begin{array}{c} 68 \\ 68 \\ $	$\begin{array}{c} 43\\ 36\\ 19\\ 13\end{array}$	ααοωωγ	77	
	I Jo 1 Jo 1 Jo	$\begin{smallmatrix}&1\\2\\2\\1\\2\\1\\2\\1\\2\\1\\2\\1\\2\\1\\2\\1\\2\\1\\2\\1$	32 32 3 9 5 3 6	00041-00 00041-00	0101	
		Length Intervals Inches	$\begin{array}{c} 7.1 - 8.0 \\ 8.1 - 9.0 \\ 9.1 - 10.0 \\ 10.1 - 11.0 \\ 10.1 \\ $	11.1 - 12.0 12.1 - 13.0 13.1 - 14.0 14.1 - 15.0	$\begin{array}{c} 14.1 \\ 15.1 \\ 16.1 \\ 16.1 \\ 17.1 \\ 18.1 \\ 19.0 \\ 19.1 \\ 20.0 \end{array}$	20.1 - 21.0 21.1 - 22.0 22.2 - 23.0