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AGE AND RATE OF GROWTH OF THE YELLOW BASS IN REELFOOT LAKE, TENNESSEE, FOR 1957 AND 1962[1]

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In 1937 an investigation was undertaken to determine the age and rate of growth of game and rough fish in Reelfoot Lake. These investigations included both scale-bearing fish and fish having skin without scales, *i.e.*, catfish. From the beginning of these investigations to May 1955, commercial fishing of game fish was legal in Reelfoot Lake. Commercial fishing of game fish was abolished by the 1955 Tennessee Legislature. This act made one exception: it allows the yellow bass to be taken commercially. This has increased the sale of yellow bass and the number taken commercially. There has also been an increased interest in yellow bass by sport fishermen. A number of resort owners have extended electric lights out into the lake for night fishing. Fishing under the lights with minnows results in catches of several hundred yellow bass per fisherman per night. The number of yellow bass taken by each fisherman under the lights depends on the amount of bait he has and how long he can stand the mosquitos. Since yellow bass or striped jack, *Monroe interrupta* Gill, is the only game fish taken commercially and is being taken in increased numbers by both commercial fishermen and sportsmen it is hoped this study along with other studies of game fish will determine what effect protection is having on the rate of growth of game fish.

A preliminary study was made in 1939 (Schoffman, 1940). Additional studies were made in 1955 and 1957 (Schoffman, 1956 and 1958). Collections for the 1955 and 1957, and 1962 studies were obtained from commercial catches with trout lines. 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 2 annuli and be in its third year of life. Age determinations were made for both studies by the method of Schoffman (1939).

RATE OF GROWTH

The histogram (Fig. 1) shows the distribution of 511 yellow bass in 1957 and 600 in 1962 arranged according to age groups. In 1957 age group 2 represents 13 per cent, age group 3, 46 per cent, age group 4, 35 per cent, and age group 5, 6 per cent of all the specimens. In 1962 age group 2 represents 10 per cent, age group 3, 35 per cent, age group 4, 38 per cent, and age group 5, 17 per cent of all the specimens. In 1957 and 1962 age groups 3 and 4 represent the largest number caught. In 1962 a group 5 represented 11 per cent more than in 19 showing larger and older fish were being caught

The average rate of growth in length and weig of 511 yellow bass in 1957 and 600 in 1962 for ea age group is shown in Table 1 and Figure 2. If t length for age group 5 (10.66 inches) is taken 100 per cent, it may be stated that 68 per cent the total growth in length is completed by spe mens of age group 2, 79 per cent by age group and 89 per cent by age group 4. In 1962 the leng of age group 5 was 9.56 and if taken as 100 p cent, it may be stated that 77 per cent of the to growth in length is completed by specimens of a group 2, 86 per cent by age group 3, and 95 p cent by age group 4.

The growth in weight based on the aver weight of the age groups is shown in Table Figure 2 shows a progressive increase in weig during all ages of life. This suggests that yell bass are a fast growing fish and the yearly inc ments are large in the older age groups. If t average weight in age group 5 in 1957 (10 ounces) is taken as 100 per cent it may be said th 34 per cent of the total weight is acquired specimens of age group 2. In 1962 the same d shows 42 per cent of the total weight is acqui by specimens of age group 2. The total weig

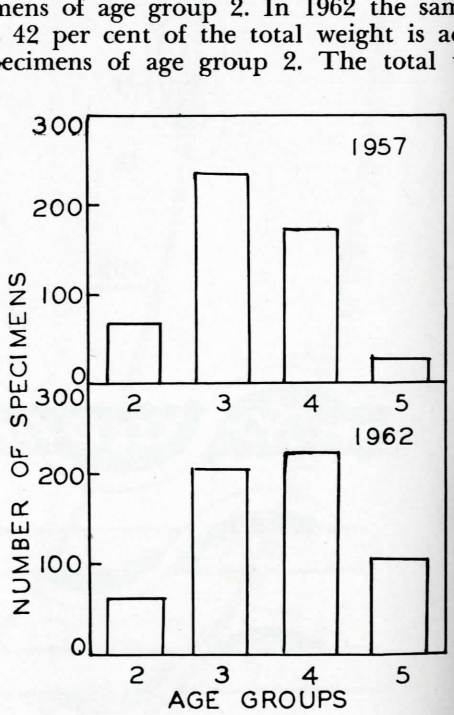

Fig. 1. Frequency distribution of 1211 Reelfoot Lake yel bass; 511 for 1957 and 600 for 1962, grouped into age gro

1. Contribution from the Reelfoot Lake Biological Station No. 93. The study here reported was made possible by a grant from the Reelfoot Lake Biological Station of the Tennessee Academy of Science, to whom th author wishes to express his appreciation.

TABLE 1. Average Total Length and Weights for Each Age Group for 511 Yellow Bass from Reelfoot Lake for 1957 and 600 for 1962.

Age Group 1957	Number of Fish	Average Length Inches	Average Weight Ounces	Age Group 1962	Number of Fish	Average Length Inches	Average Weight Ounces
2	68	7.20	3.66	2	62	7.63	3.60
3	236	8.44	5.39	3	207	8.27	4.69
4	177	9.50	7.67	4	227	9.04	6.51
5	30	10.66	10.73	5	104	9.56	8.62

acquired for the third and fourth age groups for 1957 are: 50 per cent and 71 per cent. For 1962 the same data shows that 54 per cent of the total weight is acquired for age group 3 and 74 per cent for age group 4. The increase in weight for 1957 is greater than in 1962. For both years age group 3 and 4 the increase in weight is almost identical. Figure 2 shows a progressive increase in length and weight for all age groups both in 1957 and 1962. Table 1 and Figure 2 show that in 1962 the length was less in age groups 3, 4, and 5 than in 1957. In 1962 age group 2 was greater than in 1957. In 1957 the weight was greater that in 1962 in all age groups.

The increment in length for 1957 shows a slow but steady decrease in length. In 1962 the increment in length in age groups 3 and 4 remains about the same with a marked decrease in age group 5. The increment in length for both 1957 and 1962 shows a steady increase in weight for all age groups.

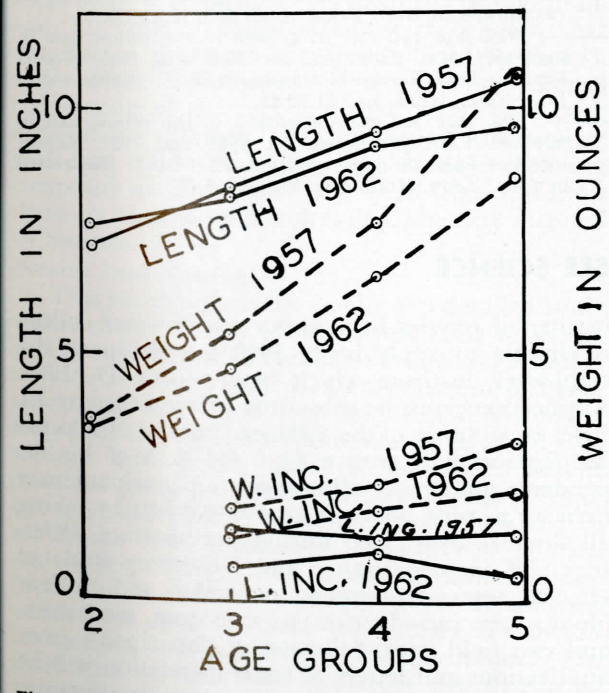

Fig. 2. Growth, weight and increment curves of 1211 Reelfoot Lake yellow bass; 511 for 1957 and 600 for 1962. The increment curves represent the annual increase in length and weight.

Figure 3 shows a steady increase in length and weight for both 1957 and 1962. In 1962 the older fish showed a greater increase. In both years the oldest fish were in age group 5 and no fish were over 6 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 the yellow bass covers a six year period. It also shows that intensive commercial and sport fishing is successfully harvesting the crop of yellow bass and that over a period of years the size has decreased slightly and the number the same or greater.

Table 2 shows the size groups and age groups. In all size groups except the first and the last for each year there is an overlapping of age groups. Fish over 7.1 inches may belong to two or three age groups. The majority belong to two age groups.

Conclusions

Yellow bass in Reelfoot Lake have a rapid and steady rate of growth and are being harvested during their life history. Few are left to die of old age or other natural causes. Since there is no creel limit

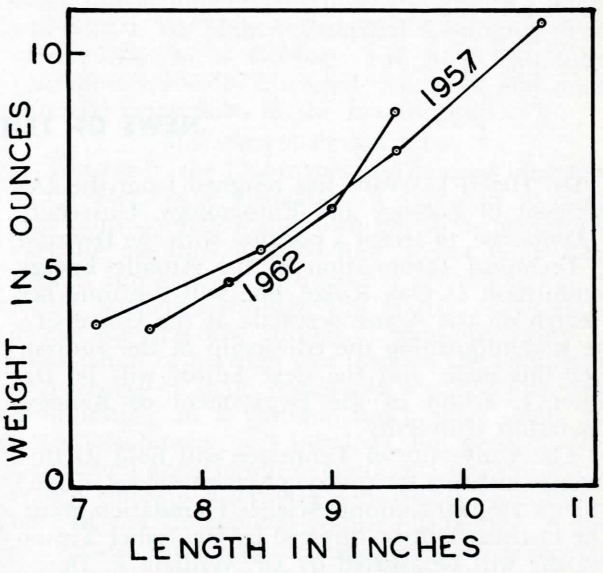

Fig. 3. Length and weight relationship of 1211 Reelfoot Lake yellow bass; 511 for 1957 and 600 for 1962.

TABLE 2. Size and Age Groups for 511 Yellow Bass from Reelfoot Lake for 1957 and 600 Yellow Ba for 1962.

Length intervals inches	Number of Fish		Age Groups 2		3		4		5	
	1957	1962	1957	1962	1957	1962	1957	1962	1957	1962
6.6- 7.0	13	1	13	1						
7.1- 7.5	29	31	27	31	2					
7.6- 8.0	75	102	27	22	48	80				
8.1- 8.5	114	150	1	8	111	104	2	38		
8.6- 9.0	106	133			71	23	35	105		5
9.1- 9.5	85	139			3		82	76		63
9.6-10.0	53	36			1		51	8		28
10.1-10.5	19	6					7		12	6
10.6-11.0	16	2							16	2
11.1-11.5	1	0							1	

or size limit, for commercial and sport fishing it is of interest to note that the growth rate of the bass is not being affected to any extent. From the view point of fish management the protected game fish should be checked to determine if protection is beneficial to growth rate.

ACKNOWLEDGMENTS

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, also Red Basham and Charles Carter of Walnut Log, Tennessee, for aid in obtaining commercial catches.

LITERATURE CITED

Baker, C. L. 1937. The commercial game and rough fish Reelfoot Lake. *Report Reelfoot Lake Biological Stati* 1:9-54 (Reprinted in *Jour. Tenn. Acad. Sci.,* 12:9-54).

Hubbs, Carl L., and Karl F. Lagler. 1941. Guide to the fis of the Great Lakes and tributary waters. *Canbr Institute of Science,* Bull. No. 18.

Schoffman, Robert J. 1939. Age and growth of the red-ea sunfish in Reelfoot Lake. *Report Reelfoot Lake Biolo cal Station,* 3:61-71 (Reprinted in *Jour. Tenn. Acad. S* 14:61-71).

———. 1940. Age and growth of the black and white cr pie, the warmouth bass, and the yellow bass in Reelf Lake, *Report Reelfoot Lake Biological Station,* 4:22- (Reprinted in *Jour. Tenn. Acad. Sci.,* 16:22-42).

———. 1956. Age and rate of growth of the yellow bass Reelfoot Lake, Tennessee, for 1939 and 1955. *Rep Reelfoot Lake Biological Station,* 20:20-25. (Reprinted *Jour. Tenn. Acad. Sci.,* 31:20-25.

———. 1958. Age and rate of growth of the yellow bass Reelfoot Lake, Tennessee for 1955 and 1957. Rep *Reelfoot Lake Biological Station,* 22:101-105. (Reprin in *Jour. Tenn. Acad. Sci.,* 33:101-105.

NEWS OF TENNESSEE SCIENCE

Dr. Helen L. Ward has resigned from the Department of Zoology and Entomology, University of Tennessee, to accept a position with the Division of Technical Information of the Atomic Energy Commission at Oak Ridge. She will continue her research on the Acanthocephala at the University. She is relinquishing the editorship of the *Journal* after this issue, and the next Editor will be Dr. James J. Friauf of the Department of Biology, Vanderbilt University.

The University of Tennessee will hold its first summer institute for college physics teachers in 1963 under a $35,000 National Science Foundation grant. The institute will be directed by Dr. Isabel Tipton and she will be assisted by Dr. William E. Deeds. Six other members of the U-T Physics Department and three visiting lecturers will serve part time. Any teacher of physics in a junior or four-year colle is eligible to apply for a $600 fellowship to t eight-week institute which begins June 17, 19 Applications must be submitted before February 1 1963. In addition to the $600, each of the 24 selec participants will receive $120 for each of his d pendents and travel allowance. A participant m earn up to nine hours of graduate credit by taki all three courses given during the institute. Offe ings will include lecture and laboratory study selected topics in atomic molecular and nucle physics, an introduction to quantum mechani and two field trips. Selection of participants fro applications and letters of recommendation will based on their ability to profit from the institu and their past performance and future promise teaching physics. Announcements and applicati

(Continued on Page 41)