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LIFE HISTORY OF THE BLACK CRAPPIE OF LAKES EUSTIS AND HARRIS, FLORIDA

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ABSTRACT

A study of the life history of the black crappie *Pomoxis nigromaculatus* (LeSueur), from Lakes Eustis and Harris, Florida, was made in 1952 and 1953.

A comparison of the age composition of the individual and combined samples of 318 Lake Eustis and 403 Lake Harris black crappie showed a similarity existed between the two populations. The scale reading indicated few crappie reached the VIII group or older in Lake Eustis and few reached the VII group or older in Harris. Males and females showed only minor differences in growth. Calculations of growth from scale measurements yielded the following estimates of length at the end of the first eight years of life in Lake Eustis: first—2.0 inches; second—4.4 inches; third—6.8 inches; fourth—8.3 inches; fifth—9.4 inches; sixth—10.4 inches; seventh—11.2 inches; and eighth—11.7 inches. Results of calculations of crappie from Lake Harris were: first—1.9 inches; second—4.2 inches; third—6.6 inches; fourth—8.5 inches; fifth—9.8 inches; sixth—11.2 inches; seventh—12.2 inches; eighth—13.0 inches and ninth—13.8 inches. A comparison of growth with other areas in the Southeast, indicated growth of Eustis and Harris crappie was slower and they lived longer.

An analysis of the length-frequency distribution of 1,888 fish from Lake Eustis and 3,521 from Lake Harris did not aid materially to substantiate age and growth calculations based on scale measurements. Selectivity of the net resulted in a pronounced bias.

Sex ratio varied during the months of study. It was found males were fewer than females during the period of examination. A similarity of sex ratios existed between crappie of the two lakes. Progression to spawning condition of both sexes was noted during the study in both lakes.

A comparison of average weight of catches per haul and temperature data indicated larger catches were made during the colder months.

Length-weight data of 1,471 black crappie from Lake Eustis and 2,118 from Lake Harris is presented.

INTRODUCTION

An effort was made by the Game and Fresh Water Fish Commission of Florida in 1952 and 1953 to improve sport fishing in Lakes Eustis and Harris, two central Florida lakes. This was accomplished by removal of all pan and rough fish taken with haul seines. In conjunction with the work, studies of the black crappie *Pomoxis nigromaculatus* (LeSueur) in the two lakes were conducted.

Lakes Eustis and Harris located near Leesburg, Florida in Lake County totaled approximately 25,216 acres. Of these, Lake Eustis comprised 7,232 acres and Lake Harris 17,984 acres. The major portions of the lakes were eight to twelve feet deep, and had sand and mud bottoms. Lake Harris drains into Lake Eustis by means of the Dead River a two mile long, wide, sluggish stream.

METHODS

Fish used in the study were taken by means of commercial seines and trawls. Two twelve-foot otter trawls with body meshes of one inch stretched mesh and tail meshes of ⅜ inch stretched mesh were used. The trawls were pulled ten minutes and were estimated to have moved from 300 to 400 yards on sand or shell bottom. On mud bottom it was estimated they covered 200 yards. Five commercial seines used were 1,600 yards in length with a minimum of 3¾ inch stretched mesh.

A number and weight sample comprising at least 10 percent by weight of all bluegill redear, and crappie caught was used to determine the total weight of each species. The majority of detailed data was obtained from fish brought into the Leesburg laboratory. Scale studies were conducted as by Huish (1954).

AGE COMPOSITION AND STRENGTH OF YEAR CLASSES

A comparison of age composition of the individual and combined samples of 318 Lake Eustis and 403 Lake Harris black crappie (Tables I and II) showed similarity existed between the two populations. A variation from 0.2 percent in the seven-year class of all fish examined to 9.4 percent of the one-year class occurred. Dissimilarity of year classes may be explained by different methods employed to collect fish from the two lakes. Trawl caught fish were on the average considerably younger than seine caught fish. These made up 11.3 percent of the Eustis samples and 24.3 percent of the Harris samples. An examination of crappie taken only from haul seines showed strength of age classes taken in both Eustis and Harris to be nearly the same. Variation was from 0.9 percent of the total haul seine caught fish in the IV-year class to 6.1 percent in the V-year class.

TABLE I

AGE COMPOSITION OF THE INDIVIDUAL AND COMBINED SAMPLES OF LAKE EUSTIS BLACK CRAPPIE COLLECTED IN 1952 AND 1953

	Number of Fish in Each Age Group										
Month and Year	*0*	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*Total*
January, 1952	..	11	7	..	..	..	..	..	..	..	18
May	5	8	1	..	..	1	..	..	..	..	15
July	..	..	2	1	..	..	..	..	..	..	3
September	..	1	14	42	27	11	6	1	..	..	102
December	..	4	5	13	32	25	11	6	3	..	99
TOTAL FOR 1952	5	24	29	56	59	37	17	7	3	..	237
Percentage	2.1	10.1	12.2	23.6	24.9	25.6	7.2	3.0	1.3	..	..
January, 1953	..	..	..	..	3	18	17	20	16	7	81
Percentage	..	..	..	..	3.7	22.2	21.0	24.7	19.8	8.6	..
TOTAL FOR 1952-53	5	24	29	56	62	55	34	27	19	7	318
Percentage	1.6	7.5	9.1	17.6	19.5	17.3	10.7	8.5	6.0	2.2	..

TABLE II

AGE COMPOSITION OF THE INDIVIDUAL AND COMBINED SAMPLES OF LAKE HARRIS BLACK CRAPPIE COLLECTED IN 1952 AND 1953

	Number of Fish in Each Age Group										
Month and Year	*0*	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*Total*
February, 1952	..	15	2	..	..	..	1	..	..	..	18
May	4	49	13	4	..	..	..	..	..	..	71
July	..	..	2	..	..	..	..	..	..	..	2
September	..	..	4	22	35	17	11	7	..	1	97
November	4	3	2	16	16	8	4	1	2	..	56
December	..	..	1	4	14	22	7	13	1	2	64
TOTAL FOR 1952	8	67	24	46	65	48	23	21	3	3	308
Percentage	2.6	21.8	7.8	14.9	21.1	15.6	7.5	6.8	1.0	1.0	.
January, 1953	..	1	..	2	5	30	27	14	5	11	95
Percentage	..	1.1	..	2.1	5.3	31.6	28.4	14.7	5.3	11.6	.
TOTAL FOR 1952-53	8	68	24	48	70	78	50	35	8	14	403
Percentage	2.0	16.9	6.0	11.9	17.4	19.4	12.4	8.7	2.0	3.5	.

An examination of strength of year classes of trawl-caught fish did not show as close an agreement. The variation was from 1.0 percent of the IV-year class to 15.2 percent of the I-year clasas. Greater variation of this portion of the samples may have been due to the disproportionate number of fish examined from the two lakes; Harris, 97; Eustis, 36. Such close agreement of strength of year classes suggests factors affecting reproduction and survival of crappie in one lake acted also on the crappie of the other lake.

GROWTH IN LENGTH

The scales collected from 66 males and 115 females during 1952 and January, 1953 in Eustis and from 76 males and 147 females in Harris revealed no great difference in growth rate of the sexes. Sex difference in the grand average calculated lengths of Lake Eustis fish varied from 0.0 inches to 0.2 inches. A wider range of variation occurred with Lake Harris fish. This was from 0.1 inches to 0.4 inches during the first six years of life. The 0.6 inch variation of females over males of the seventh and eighth years may be attributed to the small number of males in the samples. Length at capture of Harris fish showed females to be larger than males, whereas, length at capture of Eustis fish showed males to be larger in some age classes. Differences in all figures for sexes were small and of questionable significance (Tables III and IV).

Huish (1954) concluded growth difference due to sex of black crappie from Lake George to be insignificant, as did Stroud (1948) on Norris Reservoir.

Growths of the black crappie from Lakes Harris and Eustis were, therefore, described from figures for the sexes combined (Tables V and VI). Growth based on the grand average calculated length for all age groups (bottom of Tables V and VI) indicate the greatest growth in length took place during the second and third year of life. An increment of 2.3 inches occurred in second year Harris fish, whereas 2.4 inches occurred in the third year. Eustis fish were found to have an increment of 2.4 inches during the second and third years. In each lake growth of the second and third years was found to exceed growth of the first year. Increments of crappie from both lakes decreased during remaining years represented in the study. However, Lake Harris crappie were found to have a larger increment than those of Lake Eustis in each of the remaining years (fourth through eighth). Thus it is suggested a more rapidly growing crappie population was present in Lake Harris. Fish from Lake Eustis attained an estimated mean length of 4.4 inches in two years 9.4 inches in five years and 11.7 inches in eight years. Harris crappie attained a mean length of 4.2 inches in two years, 9.8 inches in five years, 13.0 inches in eight years and 13.8 inches in nine years.

TABLE III

AVERAGE CALCULATED LENGTH (INCHES) AND INCREMENT OF LENGTH FOR EACH YEAR OF LIFE OF THE MALE AND FEMALE BLACK CRAPPIE COLLECTED FROM LAKE EUSTIS IN 1952 AND 1953

Age Group	*No. of Fish*		*Total Length at Capture*		*Calculated Length at End of Year of Life*															
					1		*2*		*3*		*4*		*5*		*6*		*7*		*8*	
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*
I	1	3	8.7	8.5	3.2	5.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
II	3	3	9.1	7.3	2.0	2.9	6.6	6.1	..	..	..	..	..	..	..	..	..	..	..	..
III	6	10	8.9	9.3	2.6	2.5	5.1	5.6	7.8	8.0	..	..	..	..	..	..	..	..	..	..
IV	24	26	9.3	9.5	1.8	1.7	4.3	4.3	6.9	6.9	8.5	8.7	..	..	..	..	..	..	..	..
V	16	26	9.9	10.0	1.3	1.6	3.1	3.4	5.9	5.9	7.8	7.9	9.3	9.5	..	..	..	..	..	..
VI	9	22	10.0	10.5	1.5	1.4	2.9	3.1	4.9	5.4	7.0	7.5	8.8	9.1	9.7	10.2	..	..	..	..
VII	6	16	11.5	11.3	1.1	1.4	2.9	3.3	5.0	5.5	7.1	7.3	9.0	9.1	10.4	10.4	11.2	11.1	..	..
VIII	1	9	11.7	12.0	1.1	1.5	5.6	3.6	7.4	5.4	9.0	7.0	10.3	8.7	10.9	10.0	11.3	11.1	11.7	11.7
TOTAL AVERAGE	66	115	9.7	10.1	1.7	1.7	3.8	3.8	6.3	6.1	7.9	7.8	9.1	9.2	10.0	10.2	11.2	11.1	11.7	11.7
Increment	..	..	..	..	1.7	1.7	2.1	2.1	2.5	2.3	1.6	1.7	1.2	1.4	1.9	1.0	1.2	.9	.5	.6
Number of Fish	..	..	66	115	66	115	65	112	62	109	56	99	32	73	16	47	7	25	1	9

TABLE IV

AVERAGE CALCULATED LENGTH (INCHES) AND INCREMENT OF LENGTH FOR EACH YEAR OF LIFE OF THE MALE AND FEMALE BLACK CRAPPIE COLLECTED FROM LAKE HARRIS 1952 AND 1953

Age Group	*No. of Fish*		*Total Length at Capture*		*Calculated Length at End of Year of Life*																	
					1		*2*		*3*		*4*		*5*		*6*		*7*		*8*		*9*	
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*
I	5	9	5.2	4.9	4.7	4.4	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
II	3	4	6.8	7.1	3.1	2.2	6.7	5.4	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
III	11	14	9.0	9.1	2.2	2.6	5.8	5.3	8.0	8.0	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
IV	26	34	9.2	9.6	1.5	1.6	4.2	4.1	6.8	6.8	8.6	8.9	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
V	21	36	10.2	10.3	1.4	1.3	3.5	3.6	5.8	6.0	8.2	8.2	9.6	9.7	. .	. .	. .	. .	. .	. .	. .	. .
VI	7	18	11.4	11.8	1.7	1.6	2.7	2.8	6.7	6.3	8.5	8.3	10.0	10.2	11.1	11.4	. .	. .	. .	. .	. .	. .
VII	2	17	12.8	12.8	1.5	1.3	3.5	3.3	6.5	5.5	8.5	7.6	9.8	9.6	11.3	11.0	12.4	12.2	. .	. .	. .	. .
VIII	1	13	12.7	13.3	1.1	1.4	2.8	3.2	4.5	4.2	6.1	7.6	7.3	9.4	8.5	10.9	9.9	12.1	11.5	13.1	. .	. .
IX	. .	2	. .	14.1	. .	1.3	. .	3.1	. .	4.5	. .	5.6	. .	8.3	. .	10.3	. .	12.1	. .	12.8	. .	13.8
TOTAL AVERAGE	76	147	. .	. .	1.9	1.8	4.2	3.8	6.6	6.3	8.4	8.2	9.6	9.7	10.9	11.1	11.6	12.2	11.5	13.1	. .	13.8
Increment	. .	. .	. .	. .	1.9	1.8	2.3	2.0	2.4	2.5	1.8	1.9	1.2	1.5	1.3	1.4	.7	1.1	.1	.9	. .	.7
Number of Fish	. .	. .	. .	. .	76	147	71	138	68	134	57	120	31	86	10	50	3	32	1	15	. .	2

TABLE V

AVERAGE CALCULATED LENGTH (INCHES) AND INCREMENT OF LENGTH FOR EACH YEAR OF LIFE OF THE BLACK CRAPPIE COLLECTED FROM LAKE EUSTIS IN 1952 AND 1953—DATA FOR THE SEXES COMBINED

Age Group	*No. of Fish*	*Total Lgth. at Capture*	*Calculated Length at End of Year of Life* 1	2	3	4	5	6	7	8
0	3	2.0	..	..	..	..	..	..	..	..
I	8	7.4	4.3	..	..	..	..	..	..	..
II	22	8.4	3.5	6.9	..	..	..	..	..	..
III	59	9.4	2.5	5.4	8.1	..	..	..	..	..
IV	77	9.8	1.9	4.5	7.2	9.0	..	..	..	..
V	53	10.4	1.7	3.8	6.3	8.3	9.8	..	..	..
VI	37	10.7	1.4	3.0	5.5	7.5	9.2	10.2	..	..
VII	23	11.4	1.3	3.3	5.5	7.4	9.1	10.4	11.2	..
VIII	10	12.0	1.4	3.8	5.6	7.2	8.9	10.1	11.1	11.7
TOTAL OR AV.	293	9.9	2.0	4.4	6.8	8.3	9.4	10.4	11.2	11.7
Incr. of Length	..	...	2.0	2.4	2.4	1.5	1.1	1.0	0.8	0.5
No. of Fish	..	...	289	281	259	200	123	70	33	10

TABLE VI

AVERAGE CALCULATED LENGTH (INCHES) AND INCREMENT OF LENGTH FOR EACH YEAR OF LIFE OF THE BLACK CRAPPIE COLLECTED FROM LAKE HARRIS IN 1952 AND 1953—DATA FOR THE SEXES COMBINED

Age Group	*No. of Fish*	*Total Lgth. at Capture*	*Calculated Length at End of Year of Life* 1	2	3	4	5	6	7	8	9
0	9	3.1	..	..	..	..	..	..	..	..	..
I	67	4.9	3.1	..	..	..	..	..	..	..	..
II	26	6.8	2.4	5.3	..	..	..	..	..	..	..
III	51	9.1	2.2	5.2	7.8	..	..	..	..	..	..
IV	95	9.7	1.5	4.2	7.0	8.8	..	..	..	..	..
V	75	10.5	1.4	3.6	6.1	8.4	9.8	..	..	..	..
VI	37	11.9	1.6	4.0	6.3	8.5	10.2	11.4	..	..	..
VII	26	12.9	1.4	3.7	5.9	8.0	9.9	11.2	12.4	..	..
VIII	14	13.3	1.4	3.1	5.1	7.5	9.2	10.7	12.0	13.0	..
IX	3	14.1	1.3	3.3	4.6	6.7	8.7	10.6	12.0	12.9	13.8
TOTAL OR AV.	403	...	1.9	4.2	6.6	8.5	9.8	11.2	12.2	13.0	13.8
Incr. of Lgth.	..	...	1.9	2.3	2.4	1.9	1.3	1.4	1.0	0.8	0.8
No. of Fish	..	...	394	327	301	250	155	80	43	17	3

Calculated lengths of the fish and lengths at time of capture differences may be explained by effect of net selectively, growth during the season and perhaps use of direct proportion calculation.

COMPARISON OF GROWTH

Growths of crappie from Lakes Eustis and Harris were found to be slower than those studied from other lakes and reservoirs of the Southeast. However, they had a longer life span (Table VII). In each of the other studies cited in the table, comparatively rapid rate of growth might have been ascribed to a reduction of the population by sports and commercial fishing or favorable conditions found in relatively new bodies of water.

TABLE VII

COMPARISON OF GROWTH OF BLACK CRAPPIE IN DIFFERENT WATERS

Investigation and Location	*Number of Fish*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Bennett (1945) Onized Lake, Ill.	353	3.4	8.0	11.4	..	..	..	..	..	..
Eschmeyer (1944) Chickamauga Lake, Tenn.	132	2.2	4.8	..	..	..	..	..	..	..
Eschmeyer (1941) Norris Lake, Tenn.	211	5.0	10.9	12.2	..	..	..	..	..	..
Huish (1954) Lake George, Fla.	943	4.4	8.1	9.9	11.5	12.5	12.1	..	..	..
Stroud (1948) Norris Reservoir	925	3.2	9.5	11.8	12.7	13.7	..	..	..	..
Stroud (1949) Cherokee Reservoir, Tenn.	85	1.8	7.2	10.3	..	..	..	..	..	..
Stroud (1949) Hiawassee Reservoir, N. C.	9	2.9	7.5	10.2	11.5	..	..	..	..	..
Stroud (1949) Douglas Reservoir, Tenn.	28	4.7	7.0	8.1	..	..	..	..	..	..
Huish Lake Eustis, Fla.	*292*	*2.0*	4.4	6.8	8.3	9.4	10.4	11.2	11.7	..
Huish Lake Harris, Fla.	403	1.9	4.2	6.6	8.5	9.8	11.2	12.2	13.0	13.8

LENGTH-FREQUENCY DISTRIBUTION OF BLACK CRAPPIE

An effort to use length-frequency studies to verify scale studies was made as was done at Lake George (Huish, 1954). One thousand eight hundred and eighty-eight measurements from Lake Eustis fish and 3,521 from Harris fish (haul seine caught) did not meet requirements for this type study. Haul seine net selectivity occurred at the 8.0-8.5 inch-size classes. The apparently slow growing crappie of Eustis and Harris did not reach this size until their third and fourth year (calculated growth from scales).

Measurements made of 72 trawl caught fish from Lake Eustis during January, May, and July, 1952, indicated a modal peak at the 4.0 inch-size class in January. Some of these fish were used for determination of calculated length at the end of year of age class I (4.3 inches). Annulus formation had not occurred, therefore, calculated growth was based on length at capture (Hile, 1948). In May, age class I modal peak was represented by those fish at the 4.5-inch size class and at 5.5 inches in July. During May the 0 age class mode was indicated at 1.5 inches and July at 2.5 inches.

Lake Harris trawl caught crappie measurements showed modes at 1.5, 4.5, 5.5 and 6.0, and at the 7.0 and 7.5 inch size classes using a combined sample for May and June, 1952. A total of 82 measurements were used to determine these figures.

Conclusions based on such sparse data are not considered significant but may tend to substantiate growth calculations based on scale readings. The average estimate of 4.3 for first year of life and 6.9 for second year may not be too poor, although the grand average estimate for these two age classes of fish was lower.

Measurements taken of fish caught by haul seine tended to further verify existence of separate populations of crappie in the two lakes (Tables VIII and IX). A larger percentage of crappie in smaller size classes from Lake Eustis supplement the age and growth conclusion that these fish were slower growing than those of Lake Harris.

TABLE VIII

LENGTH-FREQUENCY OF BLACK CRAPPIE TAKEN BY HAUL SEINE FROM LAKE EUSTIS DURING 1952-1953 (DATA GIVEN IN PERCENTAGES)

Total Length (Inches)	*August 1952*	*Sept. 1952*	*Nov. 1952*	*January 1953*	*March 1953*	*Total*
7.0	. .	0.3	. .	. .	. .	0.1
7.5	. .	0.3	. .	0.4	3.5	0.3
8.0	. .	1.4	2.1	4.0	10.6	3.6
8.5	4.6	14.4	14.2	19.4	21.2	14.5
9.0	18.3	19.5	27.8	32.5	38.8	26.2
9.5	8.3	18.8	16.4	15.9	12.9	16.0
10.0	7.3	11.0	7.2	5.2	4.7	7.8
10.5	10.1	5.8	7.8	2.4	2.4	6.5
11.0	11.0	7.5	5.7	2.8	2.4	5.6
11.5	11.0	7.2	6.6	2.4	3.5	6.2
12.0	9.2	5.8	6.1	5.2	. .	5.8
12.5	7.3	6.5	4.2	4.0	. .	4.4
13.0	9.2	0.7	1.3	3.6	. .	1.9
13.5	3.7	0.7	0.6	2.0	. .	1.0
14.0	. .	. .	. .	0.4	. .	0.1
NO. OF FISH MEASURED..	109	292	1,038	252	85	1,776

TABLE IX

LENGTH-FREQUENCY OF THE BLACK CRAPPIE TAKEN BY HAUL SEINE FROM LAKE HARRIS DURING 1952-1953 (DATA PRESENTED IN PERCENTAGES)

Total Lgth. (Inches)	*April 1952*	*Aug. 1952*	*Sept. 1952*	*Oct. 1952*	*Nov. 1952*	*Dec. 1952*	*Jan. 1953*	*Mar. 1953*	*June 1953*	*Total*
6.0	0.3	. .	. .	. .	. .	. .	. .	. .	. .	0.1
6.5	1.3	. .	. .	. .	. .	. .	. .	. .	. .	0.3
7.0	2.3	. .	. .	. .	. .	. .	. .	. .	. .	0.5
7.5	3.6	. .	. .	. .	. .	. .	. .	2.8	0.2	0.9
8.0	3.7	0.7	. .	0.2	0.3	. .	2.9	5.6	2.2	1.8
8.5	4.5	6.3	3.0	2.0	3.9	1.0	14.2	19.6	13.0	7.1
9.0	4.2	19.0	15.6	4.8	11.5	9.7	26.0	25.9	30.0	15.1
9.5	6.0	22.5	20.3	15.7	18.9	12.3	19.3	23.8	23.1	16.6
10.0	9.2	9.9	15.6	15.9	9.8	17.3	8.3	9.8	10.6	11.3
10.5	10.3	8.5	7.4	11.6	8.4	16.3	4.8	4.9	7.2	8.9
11.0	14.2	10.6	8.2	11.6	11.0	8.2	4.0	2.8	3.4	8.3
11.5	13.2	3.5	9.1	10.5	11.9	10.2	4.3	1.4	2.4	8.5
12.0	9.8	9.2	8.7	7.7	7.1	9.2	3.8	. .	2.7	6.6
12.5	5.5	3.5	3.9	6.8	6.7	4.6	3.5	0.7	2.6	4.9
13.0	5.5	4.9	2.2	7.5	6.5	7.1	3.5	1.4	1.4	4.7
13.5	3.6	0.7	4.3	3.9	2.9	2.0	3.8	0.7	0.8	2.8
14.0	2.9	0.7	1.7	1.6	0.8	1.0	1.3	0.7	0.3	1.4
14.5	. .	. .	. .	0.2	0.3	0.5	0.3	. .	. .	0.1
15.0	0.1	. .	. .	. .	. .	0.5	. .	. .	. .	0.1
NUMBER MEASURED	677	142	231	440	645	196	373	143	623	3,470

SEX RATIO AND SEXUAL MATURITY OF THE BLACK CRAPPIE

Sex determination was made of 192 crappie from Lake Eustis and of 256 from Lake Harris (Table X). Males from both lakes comprised the smaller part of the samples. These fish were taken during colder months of the year except for two in May, 1952 from Lake Eustis. Percentage of males from all months of sampling was 37.5 in Lake Eustis and 32.0 in Lake Harris. Adequate samples for comparing sex ratio of crappie in the two lakes were obtained in December, 1952 and January, 1953. Similarity of results emphasized the two populations appeared to respond to similar influences. Changes in sex ratio of

TABLE X

SEX RATIO OF BLACK CRAPPIE, LAKES EUSTIS AND HARRIS, FLORIDA, FOR SEVERAL MONTHS

Year and Month	*Lake Eustis* *No. of Males*	*No. of Females*	*% Males*
1952			
January	7	6	53.8
May	..	2	00.0
December	39	62	38.6
1953			
January	26	50	34.2
TOTAL	72	120	37.5
1952			
February	5	8	38.5
November *	..	2	00.0
November	16	34	32.0
December	23	48	32.4
1953			
January	35	66	34.7
February	3	16	15.8
TOTAL	82	174	32.0

* Trawl caught.

Lake George crappie (Huish, 1954) were apparently seasonal. Percentages of males in that study were found to be low during February, March and April.

Conditions of gonad studies during the colder months revealed a progression from an approaching ripeness condition of November collected Lake Harris males to a near ripe and ripe condition in February, 1953. The females showed a similar relationship. Two months of adequate samples in Lake Eustis (December, 1952 and January, 1953) also showed progression to a ripe condition for both sexes.

FLUCTUATION AND RELATIVE ABUNDANCE

Comparison of monthly fluctuations in the catch of black crappie per seine haul in Lakes Eustis and Harris with average air temperature revealed generally a negative correlation (Table XI).

TABLE XI

COMPARISON OF AVERAGE CATCH OF BLACK CRAPPIE PER HAUL IN LAKES EUSTIS AND HARRIS TO AIR TEMPERATURE IN THE VICINITY

Year and Month	*Average Temperature* *	*Lake Eustis Average Catch*	*Lake Harris Average Catch*
April, 1952	69.4	151	252
May	78.3	179	267
June	83.8	...	...
July	83.0	...	...
August	83.5	77	102
September	80.9	108	128
October	73.0	76	140
November	66.1	144	176
December	58.8	104	192
January, 1953	62.1	116	217
February	64.6	146	112
March	71.5	56	70
April	72.5	62	117
May	80.6	51	99
June	82.0	67	112
NUMBER OF HAULS	...	340	617

* Data from Annual Summary U. S. Department of Commerce, Weather Bureau 1952 and 1953, Eustis, Florida station.

The average number of pounds of black crappie caught per haul during the several months of study from Lakes Eustis and Harris showed a variation from 51 to 179 pounds (Eustis) and 70 to 267 (Harris). Except April and May, 1952, largest average catches occurred during the winter months. Data for May (2 and 3 hauls) are not considered as reliable as other months. Since crappie caught during seining operations were removed from the lakes, it may be the lower average catch of months subsequent to April and May, 1952, were due to harvest rate.

With the exception of one month (February, 1952, during which an average of 146 pounds were taken from Eustis and 112 pounds from Harris) average catch of Harris crappie was higher than that of Lake Eustis. Differences in the average catch between the two lakes varied from 14 pounds in March, 1953, to 101 pounds in April, 1952 and January, 1953. No seining was done in June and July, 1952.

LENGTH-WEIGHT DATA

Length-weight relationship of 1,471 black crappie from Lake Eustis and 2,118 from Lake Harris taken from the haul seines are presented in Table XII.

TABLE XII

LENGTH-WEIGHT OF BLACK CRAPPIE FROM LAKES EUSTIS AND HARRIS DURING 1952 AND 1953

Total Length (Inches)	*Lake Eustis*		*Lake Harris*	
	Number	*Avg. Weight (Pounds)*	*Number*	*Avg. Weight (Pounds)*
7.5	4	0.2	5	0.2
8.0	64	0.3	35	0.3
8.5	227	0.3	191	0.3
9.0	417	0.3	415	0.4
9.5	238	0.4	418	0.4
10.0	106	0.5	230	0.5
10.5	92	0.6	167	0.6
11.0	72	0.7	148	0.7
11.5	82	0.8	140	0.8
12.0	78	0.8	102	0.9
12.5	55	1.0	94	1.0
13.0	24	1.1	95	1.1
13.5	11	1.3	51	1.2
14.0	1	1.5	21	1.4
14.5	...	..	5	1.5
15.0	...	..	1	1.8
NO. WEIGHED	1,471	..	2,118	..

Measurements were made by grouping the fish in half-inch size classes. The 5.5-inch class was made up of those fishes from 5.3 inches through 5.7 inches long, the 6.0-inch class of those from 5.8 inches through 6.2 inches; etc. They were then weighed to the nearest one-tenth pound.

Since crappie of Eustis are considered to have been slower growing, the condition of the fish might be expected to have been poorer than those of Lake Harris. However, results obtained from length-weight data did not show consistent differences in average weight by size classes between the crappie of the two lakes.

Approximate lengths of black crappie, at certain selected weights for both lakes were 0.3 pound—8.5 inches; 0.6 pound—10.5 inches; 1.0 pound—12.5 inches and 1.5 pounds at 14.0 and 14.5 inches. The largest fish weighed was 15.0 inches long and weighed 1.8 pounds. Smaller fish of the samples compared favorably with the average weight found at Lake George, Florida (Huish, 1954). However, with an increase of length greater than 10.5 inches the average weight of the Eustis-Harris fish declined when compared to Lake George. A 15.0 inch fish at Lake George weighed 3.0 pounds as compared to 1.8 pounds of a 15.0 inch crappie at Lake Harris. Moody (1957) found twelve 15-inch black crappie from Lake Panasoffkee, Florida, to have an average of 1.8 pounds.

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GIZZARD SHAD REMOVAL IN DEER ISLAND LAKE, FLORIDA

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ABSTRACT

Results of four experiments on 5.5-acre Deer Island Lake demonstrated that selective poisoning was a practical method for reducing the gizzard shad population. Past haul seine efforts had effected only a temporary reduction in this lake.

A concentration of 0.04 p.p.m. of 5 percent emulsified rotenone killed very few gizzard shad. A 0.1 p.p.m. concentration resulted in a conservatively calculated kill of 4,651 pounds or 846 pounds per surface acre. An application of 0.15 p.p.m. concentration killed larger shad as well as a few bass. A subsequent application of 0.1 p.p.m. concentration produced a large unexplained kill of bass.

INTRODUCTION

The earliest experiments with selective poisoning in Florida included a study of Deer Island Lake located on an island in Johns Lake, Orange County, Florida. This lake had a history of gizzard shad and had been the subject of