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AGE AND GROWTH OF BLUE CATFISH, *Ictalurus furcatus* (LeSueur), IN THE RECENT DELTA OF THE MISSISSIPPI RIVER [1]

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ABSTRACT

Age and growth of blue catfish, *Ictalurus furcatus* (LeSueur), collected on Delta National Wildlife Refuge, Venice, Louisiana were determined by length frequency and the pectoral spine technique. Lengths calculated from pectoral spines agree with the length frequency mode for age I fish collected during January, 1965. Three regressions were computed for the data and the cubic equation provided the best fit. This equation indicated that weight increased faster than the cube of the length.

INTRODUCTION

Data were collected from 193 blue catfish taken on Delta National Wildlife Refuge, Plaquemines Parish, Louisiana, in 1963, 1964, and 1965. The blue catfish is the most important commercial species of fish occurring in this area. Yelverton (1963) stated that Fish and Wildlife Service records show an annual harvest of over 34 tons of blue catfish taken from Delta Refuge waters.

This estuarine portion of the Mississippi River is characterized by shallow mud-bottom ponds, interlaced with distributaries from the Mississippi River. The ponds annually receive flood waters keeping them virtually fresh, however, during late summer and fall saline waters from the Gulf of Mexico invade the ponds and gradually increase the salinity. All specimens collected were in waters having salinities of less than 7.0 ppt. with most individuals being taken in waters having salinities of 0.8 to 2.0 ppt.

Age was determined by counting the rings on a cross section of the pectoral spine following the procedure outlined by Sneed (1951).

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DETERMINATIONS OF AGE AND GROWTH FROM THE SPINES

Spines were collected from January, 1964 through January, 1965. Cross sections of the dried spines were cut less than 0.5 millimeters thick with a Dremel Noto-tool and dental separating saw blades. The sections were mounted between glass slides and viewed with a dissecting scope containing a calibrated ocular micrometer. Prior to age determination the sections were soaked in 95% ethyl alcohol. This increased the differentation between the opaque and translucent zones (Probst and Cooper, 1955).

Spines were measured from the center of the lumen to the expanded posterior radius (Sneed, 1951). Muncy (1959), lists some of the variables encountered in preparing and viewing spine cross sections which would affect the body spine relationship: (1) Obtaining the section from the same location each time, (2) the curved shape of the spine causes difficulty in obtaining a perpendicular section, (3) the center of the lumen is difficult to determine in larger fish, (4) the maximum expanded portion of all annuli did not always lie in a straight line along the maximum radius of the spine, and (5) the first annuli was approximately circular whereas the others extended into the expanded portion. In this study similar difficulties in aging and preparing blue catfish spines were encountered.

Growth rate was computed for each fish assuming that the increase in the radius of the spine was proportional to the growth in length of the fish.

GROWTH RATES

The rate of growth was calculated from the pectoral spine rings. The calculated lengths (Table I) should be considered as approximate because of many unmeasurable variables. The data indicate that growth in length was greatest during the first two years of life.

The growth of blue catfish collected on Delta Refuge is almost double that of specimens reported on by Conder and Hoffarth (1964) from Kentucky Lake. This fast growth rate is probably due to the extended growing season and high fertility of the waters on the study area.

Length frequency data (Fig. 1) indicate the presence of six age groups. Modes for age groups I, II, and III are readily distinguishable whereas modes for the older age groups are not apparent. Modes of each age group tend to be slightly higher than the average calculated lengths for specimens of the same age.

Table 1. Average calculated total length (inches) at each annulus of blue catfish taken in 1964 and 1965 from Delta National Wildlife Refuge, Venice, Louisiana.

Year class	Age group	Number of fish	1	2	3	4	5	6
1964	I	3	5.6					
1963	II	26	7.1	15.5				
1962	III	4	8.4	16.6	21.4			
1961	IV	9	7.7	14.9	20.5	24.9		
1960	V	12	8.3	14.8	18.2	25.3	29.1	
1959	VI	3	8.2	14.7	19.9	25.0	29.7	33.4
Av. calculated length			7.5	15.2	20.0	25.1	29.5	33.4
Av. annual increment			7.5	7.6	4.8	5.0	4.5	3.9

LENGTH-WEIGHT RELATIONSHIP

Three regression equations were computed for the data and an analysis of variance calculated to determine the best fitting curve. The cubic equation had the smallest F-value and fit the data better

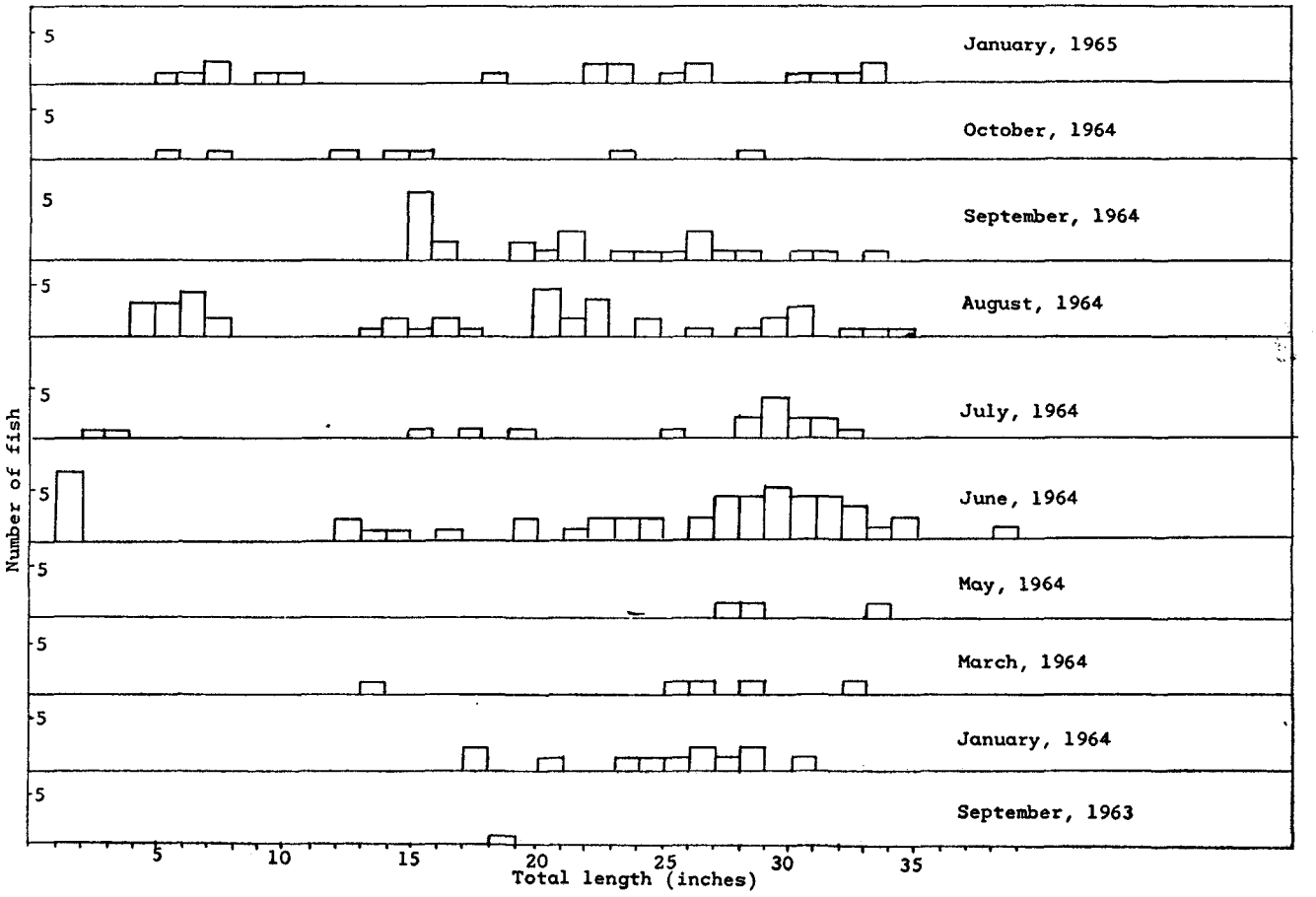

Figure 1. Length frequency of blue catfish collected from Delta National Wildlife Refuge, 1963-1965.

than the linear or quadratic equation. The cubic equation used was $Y=a+bX+cX^2+dX^3$.

When the computed data were plotted a sigmoid curve (Fig. 2) resulted. A rapid increase in weight is apparent as fish attain a length of 28 inches. It is in this period that maximum gain in weight per unit of length occurs.

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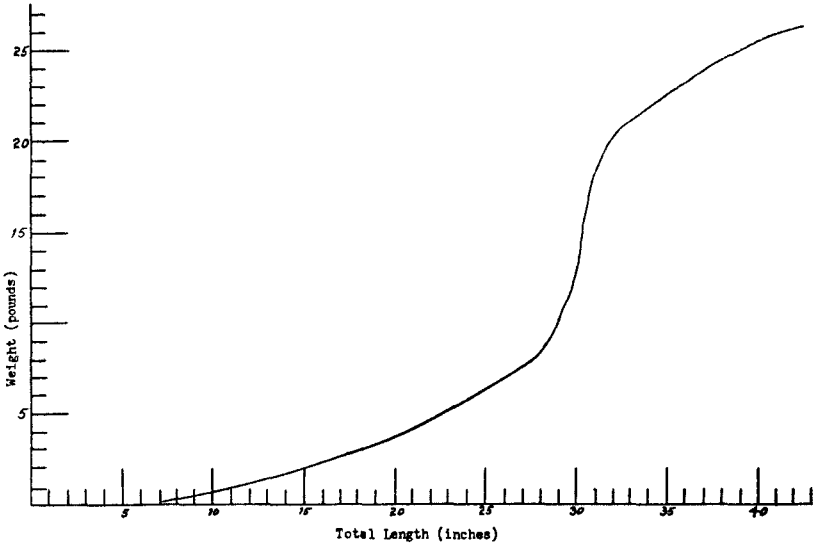

Figure 2. Length-weight relationship of blue catfish collected Delta National Wildlife Refuge, 1963-1965.

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