

OBSERVATIONS ON THE FOOD HABITS OF THE FLATHEAD AND BLUE CATFISH IN ALABAMA

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ABSTRACT

In the Tombigbee, Alabama, and Tensaw Rivers, 34 flathead catfish (*Pylodictis olivaris*) and 152 blue catfish (*Ictalurus furcatus*) were collected by use of telephone-magneto shockers for stomach analysis. Transition in feeding habits from invertebrates to major use of fish occurred in flathead catfish at approximately 10 inches total length, and in blue catfish through the inch groups 8-13. Feeding habits in the three rivers are compared. Data on lengths of catfish and foods eaten are presented.

INTRODUCTION

Catfish comprise a large percentage of the fish populations in the major rivers in Alabama. Swingle (1954) showed that these river populations could be interpreted to be in states of balance similar to those in farm ponds if channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), and flathead catfish (*Pylodictus olivaris*) in the 16-inch group and larger were considered to be predatory or "C" species. This paper presents the results of limited stomach analyses of blue and flathead catfish in Alabama.

COLLECTION OF FISH

During 1951, 1952, and 1954, biologists of the Alabama Department of Conservation and of Auburn University cooperated in fish population surveys of the Alabama, Tensaw, and Tombigbee Rivers. On these surveys 152 blue catfish and 34 flathead catfish, ranging in length from 2 to 42 inches, were collected for stomach analyses by telephone-magneto shockers. The frequency of occurrence of each type of food was recorded in the field. This method of sampling was relatively unsuccessful in capturing channel catfish, and only six fish, all under 7 inches were taken.

SAMPLE AREAS

The areas sampled in the three rivers were similar in depth and width. All were several hundred feet wide and ranged from 5 to 30 feet in depth. The sample from the Tensaw River in 1951 was located near Stockton, Alabama. In this area the current was slight and tidal movement was evident. The 1951 and 1954 samples from the Tombigbee River were taken near Jackson, Alabama. In this area tides caused a fluctuation in depth amounting to 2 feet. The 1952 Tombigbee sample was made just below the junction of the Black Warrior and Tombigbee Rivers near Demopolis, Alabama. Here the surface current was about 1.5 feet per second. In the Alabama River, the sample was taken near Camden, Alabama in 1954 in an area where the surface flow was about 2.0 feet per second.

RESULTS

Flathead Catfish

The flathead catfish examined included 22 that contained food. The results from all rivers are combined. Table 1 shows the frequency of occurrence of various items in the stomachs examined from these fish. Invertebrates were found in stomachs of the smaller flathead catfish but not in those individuals over 11 inches in total length. In the size range 12 to 42 inches, fish occurred in 62 percent of the stomachs while debris was present in 75 percent. Debris consisted of such miscellaneous items as bits of wood, mud, and plant material. The smallest catfish that contained fish were in the 11-inch group.

Tensaw River

It is worthwhile to examine these data in greater detail and discuss what organisms were found in the catfish stomachs. In the Tensaw River minnows were the predominant fish species eaten by flathead catfish. In addition a single blue catfish had been eaten. The main invertebrates

TABLE 1.
STOMACH CONTENTS OF FLATHEAT CATFISH COLLECTED DURING THE
PERIOD 1951 THROUGH 1954 FROM THE ALABAMA, TENSAW, AND
TOMBIGBEE RIVERS.

Inch Group	No. of Fish Examined	No. With Stomach Containing:			
		Empty	Fish	Invert.	Debris
3	2	1	..	1	..
7	1	..	..	1	..
9	1	..	..	..	1
11	4	1	2	2	2
12	6	..	2	..	6
13	6	3	2	..	3
14	2	2	..	..	..
15	5	3	1	..	1
17	1	..	..	..	1
19	2	..	1	..	1
20	1	..	1	..	..
22	1	1	..	..	..
23	1	1	..	..	..
42	1	..	1	..	..
Totals	34	12	10	4	15

found were chironomids. The other invertebrates identified were: caddis flies, termites, and fingernail clams.

Tombigbee River

In the Tombigbee samples only one of the flathead catfish contained identifiable stomach contents. This fish had eaten a freshwater drum (*Aplodinotus grunniens*).

Alabama River

Two of the three flathead catfish taken in the Alabama River had fed on fish. One of the fish was identified as a longear sunfish (*Lepomis megalotis*). The only invertebrate found was a hellgramite.

Blue Catfish

Blue catfish stomach contents are reported separately for each river in Tables 2 and 3, because feeding appeared to be different in the various sample areas. In the Tombigbee River, fish comprised the main part of the diet in all sizes of the 56 catfish examined. However, stomachs of some of the smaller individuals contained invertebrates. In the Alabama River the seven blue catfish ranging from the 15- through 24-inch groups had eaten only invertebrates. It is desirable to contrast the feeding habits of blue catfish from the Tombigbee and Tensaw Rivers over the same size range. In the 8- through 13-inch groups, 45 and 29 catfish were examined from the Tombigbee and Tensaw Rivers, respectively. There was a preponderance of fish and a lack of debris in the stomachs of blue catfish from the Tombigbee River and a lack of fish but an abundance of debris in those from the Tensaw River. Also, slightly over half of the catfish from the Tensaw River containing invertebrates had eaten crayfish, where as none was found in catfish from the Tombigbee River. Crayfish were found in blue catfish in the 10-inch group and larger. A different picture is seen when the fish taken from the Alabama River are compared with those taken from the Tombigbee River over the same size range (15-24 inches). All 7 of the fish from the Alabama River had fed on invertebrates only. In the Tombigbee River none of the 11 blue catfish in these inch groups contained invertebrates.

Tensaw River

Fish consumed by blue catfish in the Tensaw River were mainly minnows, although a bluegill (*Lepomis macrochirus*) and a catfish were eaten. Crayfish and chironomids were the most important invertebrates identified. Other invertebrates found were: dragonflies, freshwater shrimp (*Palaemonetes* sp.), fingernail clams, and freshwater mussels.

TABLE 2.
STOMACH CONTENTS OF BLUE CATFISH FROM THE TOMBIGBEE RIVER
AUGUST 3, 1951, AUGUST 8, 1952, AND AUGUST 5, 1954

Inch Group	No. of Fish Examined	No. With Stomach Containing:			
		Empty	Fish	Invert.	Debris
6	1	1	..	..	..
8	10	2	5	4	..
9	9	2	6	3	..
10	6	..	5	4	..
11	4	..	4	1	..
12	11	..	11	4	2
13	5	..	3	1	1
14	2	..	2	..	..
17	3	..	3	..	..
20	1	..	1	..	..
22	1	1	..	..	..
23	1	..	1	..	..
24	1	..	1	..	..
28	1	..	1	..	..
Totals	56	6	43	17	3

TABLE 3.
STOMACH CONTENTS OF BLUE CATFISH FROM THE TENSAW RIVER
SEPTEMBER 24, 1951

Inch Group	No. of Fish Examined	No. With Stomach Containing:				
		Empty	Fish	Crayfish	Other Invert.	Debris
3	4	3	1	..	1	..
4	5	2	..	..	2	2
5	5	3	..	..	2	..
6	24	11	1	..	5	11
7	13	7	..	..	..	6
8	5	3	..	..	..	2
9	4	..	..	..	1	3
10	5	1	..	1	2	3
11	8	..	..	3	1	8
12	6	..	1	2	1	5
13	1	..	1	..	..	..
Totals	80	30	4	6	15	40

Tombigbee River.

The blue catfish taken in the Tombigbee River had different stomach contents in each of the three samples. In the 1952 sample only three blue catfish were taken. No invertebrates were found in the stomachs of fish from this sample, and the only identifiable fish was a logperch (*Percina caprodes*). In 1951, no invertebrates were identified among the stomach contents. The only fish eaten were identified as minnows. In 1954, 41 blue catfish were examined. The forage fish most frequently found in the stomachs of fish in this later sample was the anchovy (*Anchoa mitchilli*). Approximately 300 of these fish were identified from 15 blue catfish stomachs. Sixty-three threadfin shad (*Dorosoma petenense*), were found in 14 stomachs and 3 skipjack herring (*Alosa crysochloris*) were found in 3 stomachs.

The only invertebrates eaten by blue catfish in the Tombigbee River were found in the 1954 sample. They were primarily immature mayflies, which occurred in 11 stomachs. The other invertebrates found were freshwater mussels.

Alabama River

In the Alabama River sample none of the blue catfish had fed on fish. These catfish were in the 15- to 24-inch groups. Immature mayflies

were predominant, although one fish had eaten mussels and another a hellgramite.

DISCUSSION

Some of the differences in the species of fish eaten by catfish in the various samples were also evidenced in the species compositions of the various samples of the fish populations obtained by use of rotenone in the rivers near the areas where the telephone-magneto shockers were used. Anchovies, which were the predominant fish eaten by catfish in the 1954 sample from the Tombigbee River, were abundant in the rotenone sample that year but did not occur in any other of these rotenone samples. Threadfin shad were also abundant in that population study and were not common in the other Tombigbee samples or in the Alabama River. In the Tensaw River, threadfin shad in the 4- and 5-inch groups were abundant but were not utilized by the catfish. The most abundant small fish found in all of the rotenone population studies were young catfish and drum, yet these appeared infrequently in the stomach analyses. There were always a few small sunfish and minnows collected in all the population studies but these were never abundant.

Flathead catfish examined in this study appeared to be piscivorous. This agrees with such authors as Eddy and Surber (1947) and Forbes and Richardson (1908). Although the data in this present study are insufficient to draw definite conclusions, a change from invertebrate to fish food appears to take place when the flathead catfish are about 10 inches in total length. Minckley and Deacon (1959) found that flathead catfish over 10 inches long in two Kansas rivers fed mainly on fish and crayfish depending on availability.

Blue catfish as small as 4 inches contained fish, although the transition from small invertebrates to fish and macro-invertebrates seems to occur when the catfish are between 8 and 13 inches in total length (Tables 2-4). However, the sample taken in the Alabama River showed that blue catfish as large as 24 inches had fed on small invertebrates. In general, this agrees with the findings of Darnell (1958), who concluded after analysing 78 stomachs that blue catfish in Lake Pontchartrain, Louisiana, fed mainly on zooplankton until they reached length of 4 inches, that those 4 to 9.5 inches in length utilized mainly bottom organisms, even though fish appeared frequently in their diets, and that blue catfish larger than 9.5 inches fed primarily on fish and other macro-organisms. Lambou (1961) found that blue crabs were the only items eaten by 20 large blue catfish captured in south Louisiana. Invertebrates utilized by blue catfish in Alabama were usually bottom forms. The results of the present study show the omnivorous nature of the feeding habits of the blue catfish. This is in agreement with statements by Harlan and Speaker (1956).

The size at which catfish begin feeding primarily on fish is important in determining what individuals to call "predatory" for the purpose of utilizing population ratios. Swingle (1954) suggested that catfish over 15.5 inches in total length be considered as predatory fish. This study suggests that blue and flathead catfish may be predatory long before they reach the 16-inch group.

LITERATURE CITED

- Darnell, R. M. 1958. Food Habits of fishes and larger invertebrates of Lake Pontchartrain, Louisiana, an estuarine community. *Inst. Mar. Sci.* 5, 353-416.
- Eddy, S. and T. Surber. 1943. Northern fishes; with Special Reference to Upper Mississippi Valley. Univ. Minn. Press. Minneapolis, Minn. XI + 252 pp.
- Forbes, S. A. and R. E. Richardson. 1908. The fishes of Illinois. III. *Nat. Hist. Surv. CXXXI* + 357 pp.
- Harlan, J. R. and E. B. Speaker. 1956. Iowa Fish and Fishing. Iowa State Cons. Comm., Des Moines, Iowa, VIII + 377 pp.
- Lambou, V. W. 1961. Utilization of macrocrustaceans for food by freshwater fishes in Louisiana and its effect on the determination of predator-prey relations. *Prog. Fish Cult.* 23 (1), 19-25 pp.
- Minckley, W. L. and J. E. Deacon. 1959. Biology of the flathead catfish in Kansas. *Trans. Am. Fish Soc.* 88 (4), 344-355.
- Swingle, H. S. 1954. Fish populations in Alabama rivers and impoundments. *Trans. Am. Fish. Soc.* 83 (1953) 47-57.