

Rapid #: -14831798

CROSS REF ID: **569737**

LENDER: **COR :: Dayton Memorial Library**

BORROWER: **USD :: Main Library**

TYPE: Article CC:CCL

JOURNAL TITLE: Transactions of the American Fisheries Society

USER JOURNAL TITLE: Transactions of the American Fisheries Society

ARTICLE TITLE: Food of Young Largemouth Bass, *Micropterus salmoides*, in a New and Old Reservoir

ARTICLE AUTHOR: Applegate, Richard L

VOLUME: 96

ISSUE: 1

MONTH:

YEAR: 1967

PAGES: 74-77

ISSN: 0002-8487

OCLC #:

PATRON: **Wesner, Jeff**

Processed by RapidX: 6/16/2019 6:15:37 PM



This material may be protected by copyright law (Title 17 U.S. Code)

2

Rapid #: -14831798

RapidX Upload



Bared

Status	Rapid Code	Branch Name	Start Date
New	USD	Main Library	06/14/2019 09:54 AM
Pending	COR	Dayton Memorial Library	06/14/2019 09:54 AM
Batch Not Printed	COR	Dayton Memorial Library	06/16/2019 02:09 PM

CALL #:**Shelved By Title****LOCATION:****COR :: Dayton Memorial Library :: DML
Periodicals**

REQUEST TYPE: Article CC:CCL
JOURNAL TITLE: Transactions of the American Fisheries Society
USER JOURNAL TITLE: Transactions of the American Fisheries Society
COR CATALOG TITLE: Transactions of the American Fisheries Society
ARTICLE TITLE: Food of Young Largemouth Bass, *Micropterus salmoides*, in a New and Old Reservoir
ARTICLE AUTHOR: Applegate, Richard L
VOLUME: 96
ISSUE: 1
MONTH:
YEAR: 1967
PAGES: 74-77
ISSN: 0002-8487
OCLC #:
CROSS REFERENCE ID: [TN:569737][ODYSSEY:206.107.42.221/USD]
VERIFIED:

BORROWER: **USD :: Main Library****PATRON:** **Wesner, Jeff****RAPID**

This material may be protected by copyright law (Title 17 U.S. Code)
6/16/2019 2:09:02 PM

attached algae were the primary foods found in stomachs. There was a general decrease in volume of zooplankton and an increase in volume of attached algae from late spring to early fall. This probably resulted from a seasonal change in abundance of these organisms. The high frequency of occurrence of insect larvae, attached algae, detritus, and sand indicates that the smallmouth buffalo feeds on the bottom. The absence of *Hexagenia* nymphs in the stomachs, even though it is a dominant bottom organism poses a question. The answer may lie in that *Hexagenia* is most common in deeper silty areas of the lake. Shoreline areas of hard clay rubble, sand, and eroded soil, where the smallmouth buffalo were taken, are inhabited primarily by populations of Chironomidae, Baetidae, and Trichoptera (Swanson, 1966). The latter insects mentioned were all found in smallmouth buffalo stomachs although Chironomidae was most important. Thus, it appears that the smallmouth buffalo was feeding primarily in shallow shoreline areas.

ACKNOWLEDGMENTS

I wish to thank Dr. Norman D. Schoenthal and Dr. Donald R. Progulske, Department of Wildlife Management, South Dakota State University, for their guidance during the study and critical review of the manuscript. Thanks is also due Dr. Norman G. Benson, Chief of North Central Reservoir Investigations, Yankton, South Dakota, for financial support of the study, and publication, and review of the manuscript. Mr. Marvin O. Allum, Water Supply and Pollution Control, PNW, U. S. Public Health Service, Portland, Oregon, deserves thanks for initiating the study.

LITERATURE CITED

- AMERICAN PUBLIC HEALTH ASSOCIATION, AMERICAN WATER WORKS ASSOCIATION, AND WATER POLLUTION CONTROL FEDERATION. 1960. Standard methods for the examination of water and wastewater. 11th ed. Amer. Public Health Assoc., Inc., New York, 626 p.
- FORBES, S. A., AND R. E. RICHARDSON. 1920. The fishes of Illinois. Nat. Hist. Survey Illinois, III: 66-73.
- GOWANLOCH, JAMES NELSON. 1933. Fishes and fishing in Louisiana. Louisiana Dept. Cons. Bull. 23: 431-434.
- JOHNSON, R. P. 1963. Studies on the life history and ecology of the bigmouth buffalo. J. Fish. Res. Bd. Canada 20(6): 1397-1429.
- LAGLER, KARL F., AND WILLIAM E. RICKER. 1943. Biological fisheries investigations of Fouts Pond, Gibson County, Indiana. Invest. Indiana Lakes and Streams 2(3): 47-72.
- MOEN, TOM. 1954. Food of the bigmouth buffalo in northwest Iowa lakes. Proc. Iowa Acad. Sci. 61: 561-569.
- SCIDMORE, W. J., AND DONALD E. WOODS. 1959. Some observations on competition between several species of fish for summer foods in four southern Minnesota lakes in 1955, 1956, and 1957. Minnesota Fish and Game Invest., Fish Series 2: 13-24.
- SWANSON, GEORGE. 1966. Factors influencing distribution and abundance of *Hexagenia* nymphs (Ephemeroptera) in a Missouri River main stem reservoir. In press. Ecology.

THOMAS S. MCCOMISH

Missouri Cooperative Fishery Unit
University of Missouri
Columbia, Missouri

Food of Young Largemouth Bass, *Micropterus salmoides*, in a New and Old Reservoir

INTRODUCTION

Soon after an impoundment is constructed there is usually a rise and decline in production, growth, and angler harvest of the largemouth bass and other fishes (Bennett, 1962). The purpose of this study was to determine the food habits of the largemouth bass during early development in a new and a 14-year-old reservoir. Without facts on food consumption, meaningful interpretation of the role of nutrition in such population dynamics is impossible.

DESCRIPTION AND METHODS

Descriptions of Bull Shoals and Beaver reservoirs, located on the White River in the Arkansas-Missouri Ozarks, have been reported by Mullan and Applegate (in press). Impounded in 1951, Bull Shoals is 45,440 surface acres in area, deep, steep-sided, lacking in aquatic plants, and has submerged trees primarily in the deep limnetic areas. Water level elevation was stable at 650 feet above mean sea level during May through June, 1965. Power pool level is 654 feet and annual fluctuations have averaged 16 feet.

Beaver Reservoir began filling in 1963, reaching and maintaining 6,400 surface acres (23% of ultimate area and 14% of volume) between May and December, 1964. Between January and May, 1965, the water level rose

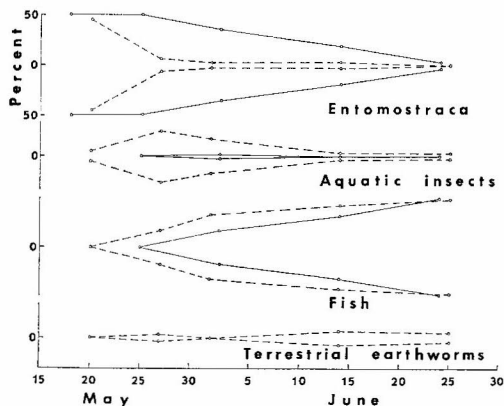


FIGURE 1.—Percentage of total volume of major foods eaten by young-of-year largemouth bass collected in old reservoir (solid line, Bull Shoals) and new reservoir (dashed line, Beaver) from 18 May to 25 June 1965.

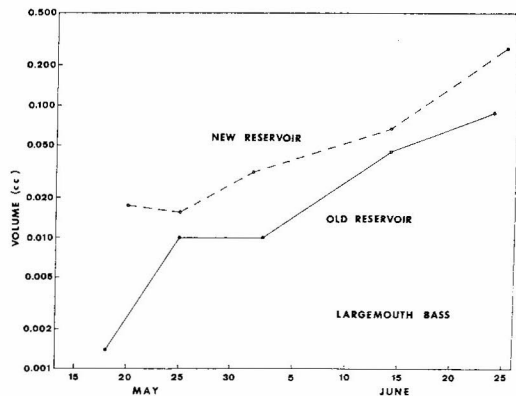


FIGURE 2.—Average volume of stomach contents per young-of-year largemouth bass collected from old reservoir (solid line, Bull Shoals) and new reservoir (dashed line, Beaver) from 18 May to 25 June 1965.

an additional 50 feet, resulting in a pool of 16,200 surface acres (57 and 47% of ultimate area and volume), which was maintained during the study. Recently inundated forest and pasture lands provided abundant terrestrial vegetation in littoral areas.

Fish were collected inshore at mid-reservoir with a 220 volt a-c, boat-mounted electroshocker. Twelve early evening collections, averaging 2 hours, were made at Bull Shoals Reservoir between 18 May and 24 June, 1965. Eight daytime collections, averaging 3 hours, were made at Beaver Reservoir between 20 May and 25 June.

Stomach contents were pooled within species-size groups, and identification of contents made using a dissecting microscope. Volumetric measures were made by water displacement in a calibrated centrifuge tube. Numerical determinations were made with a Sedgwick-Rafter counting cell.

RESULTS

Striking differences were revealed between the stomach contents of 223 young-of-the-year largemouth bass from Bull Shoals Reservoir and 216 examined from Beaver Reservoir during the interval 18 May through 25 June

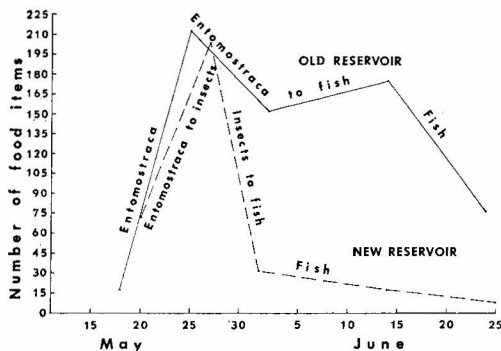


FIGURE 3.—Average number of food items per young-of-year largemouth bass collected in old reservoir (solid line, Bull Shoals) and new reservoir (dashed line, Beaver) from 18 May to 25 June 1965. Trends in food organism succession are indicated.

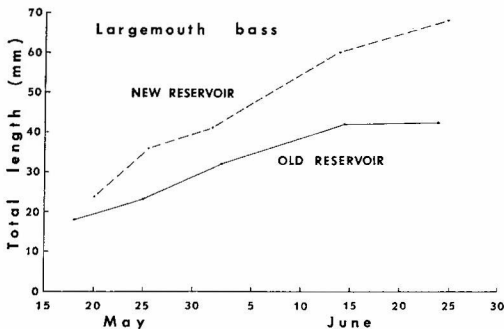


FIGURE 4.—Growth of young-of-year largemouth bass in old reservoir (solid line, Bull Shoals) and new reservoir (dashed line, Beaver) from 18 May to 25 June 1965.

TABLE 1.—Percentage of total volume of foods eaten by young-of-the-year largemouth bass collected at Beaver (1) and Bull Shoals (2) reservoirs from 18 May to 25 June 1965

Reservoir	1	2	1	2	1	2	1	2	1	2
Month	May	May	May	May	June	June	June	June	June	June
Day	20, 24	18	27	24 to 26	1	1 to 3	14	14 to 15	25	23 to 24
Number of bass examined	22	4	39	80	38	75	23	21	94	43
Number of bass with food	22	4	39	80	38	73	23	21	85	43
Median total length (mm)	24	18	36	24	39	32	60	41	66	40
Percentage of total volume of foods eaten										
Entomostraca	89.9	100	6.2	99.7	2.4	71.6	2.7	37.8	0.2	6.0
Aquatic insects	10.1		51.2	0.2	34.4	1.8	3.4		2.7	0.2
Fish			34.3		63.2	25.0	80.9	62.2	92.5	93.7
Terrestrial earthworms			6.9				13.0		4.6	
Miscellaneous ¹			1.4	0.1		1.6				0.1

¹ Includes: Fish eggs, terrestrial insects, water mites (Acari) and amphipods.

(Figure 1, Table 1). Bull Shoals largemouth bass 18 to 40 mm in total length fed primarily on the entomostracans, *Diaptomus* spp., *Bosmina longirostris*, and *Daphnia galeata*, after which larval shad (*Dorosoma* spp.) and unidentified fish fry (6–12 mm in length) became the dominant food. Beaver Reservoir largemouth bass 20 to 25 mm in length, by contrast, ingested mainly *Sida crystallina*, *Scapholebris kingi*, *Ceriodaphnia reticulata*, *Cyclops* spp., and Tenebrionidae larvae, the latter forming 10% of the volume. Midge larvae succeeded Entomostraca as the dominant food when the bass reached 36 mm in length. Gizzard shad (*Dorosoma cepedianum*) superseded midge larvae as the dominant food when the largemouth attained a length of 40 mm.

Largemouth bass in new Beaver Reservoir consumed larger volumes of food items of a larger size (Figures 2 and 3). Midge larvae and the cladoceran, *S. crystallina*, two of the primary foods of bass in Beaver, were many times larger in comparison to the planktonic copepods and cladocerans ingested by the largemouth bass in Bull Shoals. The large items of food, particularly the midge larvae which "bridged the gap" from an entomostracan diet to a fish diet in Beaver Reservoir were almost entirely lacking in the diet of Bull Shoals largemouth bass.

Growth of largemouth bass was substantially faster in the new reservoir (Figure 4). Schools of fry were first observed in Beaver on 20 May (mean length, 18 mm) and in Bull Shoals 24 May (mean length, 24 mm). On 25 June, median and mean lengths of largemouth in Bull Shoals were 40 and 43 mm (range 34 to 74 mm) and in Beaver 66 and 68 mm (range 43 to 106 mm), respectively. Scales from 40 of the larger specimens were examined under a magnification of 80× and none was found to have annuli. Average daily growth in length was 0.52 mm in Bull Shoals and 1.17 mm in Beaver.

Available forage fish of desirable size appeared abundant in Beaver Reservoir for largemouth 40 mm or more in length. Large numbers of gizzard shad (19 to 27 mm total length) were collected with the electroshocker on 20 and 24 May, but were not found in stomachs of the largemouth (median length, 24 mm). However, on 27 May sac fry and fry shad up to 18 mm in length were the major food of 12 largemouth 40 to 48 mm in length. Twenty-seven largemouth less than 40 mm contained no fish. On 1 June, 18 largemouth out of a total sample of 38 were 40 mm or more in length and had primarily relied on 10- to 37-mm shad as food. Largemouth examined after this date were all 40

mm or more in length and primarily subsisted on shad 10 to 40 mm in length.

A more limited consumption of fish in Bull Shoals appeared to stem at least partially from later spawning or slower growth of the forage fishes. Larval threadfin and gizzard shad and unidentified fishes 8 to 12 mm in length were sparse in bass stomachs on 1, 14, and 15 June. Similar-sized larval fish, most of which were identified as shad, were captured in plankton samples in the mid-lake area on 14 June. Shad and unidentified fry only 6 to 12 mm in length made up the bulk of the largemouth diet on 23 and 24 June.

LITERATURE CITED

- BENNETT, GEORGE W. 1962. Management of artificial lakes and ponds. Reinhold Publishing Corp., New York, 283 p.
- MULLAN, JAMES W., AND RICHARD L. APPLIGATE. (In press.) The physical-chemical limnology of a new reservoir (Beaver) and a 14-year-old reservoir (Bull Shoals) located on the White River, Arkansas and Missouri. Proc. Nineteenth Annual Conference Southeastern Association of Game and Fish Comm. (1965).

RICHARD L. APPLIGATE

JAMES W. MULLAN

*Bureau of Sport Fisheries and Wildlife
Fayetteville, Arkansas*