FISH POPULATION STUDY OF WEST CACHE CREEK WITH EMPHASIS ON SEARCH FOR THE WICHITA SPOTTED BASS, *MICROPTERUS PUNCTULATUS WICHITAE*.

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This study was initiated to determine the status of the Wichita spotted bass, *Micropterus punctulatus wichitae,* last collected in West Cache Creek, Oklahoma in 1928.

West Cache Creek on the Wichita Mountains National Wildlife Refuge was sampled with seines, electrofishing, rotenone, and hook and line in an attempt to collect specimens of the Wichita spotted bass. A total of 98 bass were collected, none of which were identified as the target subspecies. It was determined that the Wichita spotted bass is probably no longer present in the area. Other species collected are listed.

INTRODUCTION

The Wichita spotted bass, *Micropterus punctulatus wichitae* Hubbs and Baily, was first reported as *M. pseudaplites* by Hubbs and Ortenburger (1) in 1929 from collections made by A. I. Ortenburger from West Cache Creek and its tributary Blue Beaver Creek in 1923, 1927, and 1928. A total of 442 specimens are preserved in the National Museum and the University of Oklahoma Museum of Zoology. One specimen collected by W. D. Dean in 1906 is preserved at the National Museum at the University of Michigan. These specimens were examined by Hubbs and Baily in 1940 and reclassified as *M. punctulatus wichitae* (1). The last collection (2 specimens) determined to be *M. p. wichitae* was made in 1928 by the Oklahoma Biological Survey from Blue Beaver Creek, a tributary of West Cache Creek.

The bulk of the samples were collected from an area below Camp Boulder on the Wichita Mountains National Wildlife Refuge known as the "narrows", which is a stretch of West Cache Creek bounded on both sides by precipitous rock walls and ledges. There are several relatively deep pools in the area which historically contain water even during the worst drought conditions.

It was felt that this area would be the most likely area in which the subspecies could have survived since its last collection. The creek bed below the "narrows" lies on a gravel substrate and often is dried up during summer months, and therefore could have acted as a survival barrier downstream. Several dams have been built upstream from Camp Boulder, which effectively blocked upstream migration.

METHODS

Collections were made with seines, electrofishing, rotenone, and hook and line during a period from July 20 through July 29, 1976, at locations from Camp Boulder along West Cache Creek to the south boundary of the Wichita Mountains Refuge.

A 6.1-m seine with a 6.4-mm square mesh was used in every suitable location of the study site. Electrofishing was conducted with a 240-V, A.C. generator and hand-held electrodes.

A 0.06-ha pool in the lower section of the "narrows" was chosen for the rotenone sampling. All fish were killed with rotenone application and picked up over a two-day period.

Approximately 12 man hours of hook-and-line sampling were conducted on 23 and 29 July, 1976. Specimens were collected and preserved in formalin for later examination.

DISCUSSION

It is believed that a thorough search was made of the area on West Cache Creek wherein the greatest likelihood of

the presence of the Wichita spotted bass existed. The large numbers of largemouth bass collected would tend to indicate that the available habitat was well sampled.

The meristic characteristics used to identify bass from the samples included lateral line scale counts, dorsal fin emargination, length of maxilla, and pyloric caeca branching.

Hubbs (1) reported that lateral line scale counts from *M. punctulatus wichitae* specimens exhibited a mean of 66.3. The 47 fish from West Cache Creek that were examined produced a mean lateral line scale count of 63.0. This falls well within the range for typical largemouth bass populations. Dorsal fin emargination on all bass examined was deep and typical of *M. salmoides.*

Length of maxilla was also examined closely for evidence of species identity. All bass examined exhibited maxillary length well posterior of the eye margin typical of *M. salmoides.* Pyloric caeca were examined on 33 of the preserved specimens. All exhibited a degree of branching typical of northern largemouth bass, *M. salmoides.* This character was not examined or reported on by Hubbs from the *M. p. wichitae* specimens, but it is assumed that these fish would exhibit a lack of branching in pyloric caeca typical of *M.p. punctulatus.*

The ecology of the area has been significantly affected by construction of several dams on West Cache Creek above the sampling sites and by historically lowering ground water levels. Due to these and other less understood factors, it is believed that the Wichita spotted bass no longer exists in West Cache Creek. The largemouth bass has been apparently better able to adapt to the prevalent conditions of the watershed and has replaced completely the Wichita spotted bass from its formerly occupied niche.

RESULTS

A total of 20 species and one hybrid combination of fishes was identified from the samples collected by seining, electrofishing, rotenone, and hook and line (Tables 1-4).

Collections made with the seine were dominated by large numbers of sunfish. primarily bluegill, *Lepomis macrochirus,* and longear sunfish, *L. megalotis.* The largemouth bass, *M. salmoides,* collected ranged from 51 mm to 152 mm in total length (Table 1).

The electrofishing samples were also dominated by various sunfish species, but a total of 20 largemouth bass were collected. The bass ranged from 38 to 483 mm in total length (Table 2).

A total of 53 largemouth bass was collected with hook-and-line techniques. They ranged from 127 to 483 mm in total length. These fish were well distributed throughout the sample area.

Sunfish species were the most abundant among fishes collected in the rotenone samples (Table 3). They comprised 77.61% of the sample by numbers and 30.70% by weight. A total of nineteen largemouth bass

TABLE 1. *West Cache Creek Seine Samples, 7/20/76*

Species	Number	Size
Largemouth Bass	6	51-152 mm
Bluegill	161	young of yr.
Bluegill	12	adults
Longear Sunfish	63	adults
Longear Sunfish	2	young of yr.
Redear Sunfish	18	adults
Hybrid Sunfish	1	adult
Gambusia affinis	18	adults
Log Perch	1	adult

TABLE 4. *West Cache Creek Species List with Total Number Collected by All Methods*

Common Name	Scientific Name	Number
Largemouth Bass	*Micropterus salmoides*	98
Channel Catfish	*Ictalurus punctatus*	4
Bluegill	*Lepomis macrochirus*	350
Longear Sunfish	*Lepomis megalotis*	185
Redear Sunfish	*Lepomis microlophus*	32
Green Sunfish	*Lepomis cyanellus*	255
Warmouth	*Chaenobryttus gulosus*	14
Hybrid Sunfish	*L. macrochirus* X *L. cyanellus*	13
Carp	*Cyprinus carpio*	29
Freshwater Drum	*Aplodinotus grunniens*	1
Smallmouth Buffalo	*Ictiobus bubalus*	2
Golden Redhorse	*Moxostoma erythrurum*	6
River Carpsucker	*Carpiodes carpio*	1
Black Bullhead	*Ictalurus melas*	21
Yellow Bullhead	*Ictalurus natalis*	5
Gizzard Shad	*Dorosoma cepedianum*	4
Brook Silversides	*Labidesthes sicculus*	2
Mosquito Fish	*Gambusia affinis*	21
Stoneroller	*Campostoma anomalum*	4
Logperch	*Percina caprodes*	13
Orangethroat Darter	*Etheostoma spectabile*	31
	TOTAL	1091

TABLE 2. *West Cache Creek Shocker Samples, 7/22/76*

Special	Number	Length Range (mm)
Laregmouth Bass	20	38-483
Bluegill	73	53-165
Longear Sunfish	69	36-137
Green Sunfish	69	33-244
Redear Sunfish	13	107-190
Hybrid Sunfish	9	131-165
Warmouth	2	99-147
Channel Catfish	1	381
Golden Redhorse	4	180-259
Yellow Bullhead	2	99-218
Black Bullhead	19	163-251
Carp	10	269-483
Stoneroller	4	94-119
Gambusia affinis	1	51
Total	296	

TABLE 3. *Rotenone Sample from West Cache Creek, 26 & 27 July, 1976, (0.06-ha pool with estimated 100% recovery)*

Species	Pick-up No.	Pick-up Wt.(g)	Occurrence (%) No.	Occurrence (%) Wt.
Largemouth Bass	19	5769	4.13	22.51
Channel Catfish	3	560	0.65	2.19
Bluegill	104	5672	22.61	22.13
Longear Sunfish	51	201	11.09	0.78
Redear Sunfish	1	100	0.22	0.39
Green Sunfish	186	1276	40.43	4.98
Hybrid Sunfish	3	314	0.65	1.23
Warmouth	12	305	2.61	1.19
Carp	19	7448	4.13	29.06
Freshwater Drum	1	310	0.22	1.21
Smallmouth Buffalo	2	610	0.43	2.38
River Carpsucker	1	440	0.22	1.72
Black Bullhead	2	480	0.43	1.87
Yellow Bullhead	3	650	0.65	2.54
Golden Redhorse	2	450	0.43	1.76
Gizzard Shad	4	910	0.87	3.55
Brook Silversides	2	<5	0.43	<0.01
Logperch	12	132	2.61	0.52
Gambusia affinis	2	<5	0.43	<0.01
Etheostoma spectabile	31	<10	6.74	<0.01
TOTAL	460	25627	100	100

were picked up in the pool treated with rotenone.

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REFERENCES

1. C. L. HUBBS and R. M. BAILY, Misc. Pub. Museum of Zoology, University of Michigan, No. 48: 1-51, 6 plates, 2 maps (1940).
2. ROY C. HEIDINGER, *in*: RICHARD H. STROUD and HENRY CLEPPER (eds.), *Life History of the Largemouth Bass: Black Bass Biology and Management,* Sport Fishing Institute, 1975, pp. 11-20.
3. LOUIS E. VOGELE, *in:* RICHARD H. STROUD and HENRY CLEPPER (eds.), *The Spotted Bass, Black Bass Biology and Management,* Sport Fishing Institute, 1975, pp. 21-33.