

THE FISHES OF THE MOUNTAIN FORK RIVER
IN ARKANSAS AND OKLAHOMA
WITH DESCRIPTIONS OF TWO NEW PERCID FISHES

BY

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PREFACE

The study of the fishes of the Mountain Fork River in Arkansas and Oklahoma is largely based on collections made from August 16 to 23, 1948, by the Mountain Fork River Survey Party under the direction of Dr. George A. Moore. The data for this study are derived from 5,897 specimens collected during the course of the survey. The collections include 16 families, 43 genera, 79 species and 2 hybrid combinations, 1 of which is new to science. The study has revealed two species as being new and several of considerable interest.

Some species taken in Oklahoma for the first time and recently reported (Moore and Poole, 1948; Moore and Cross, 1950; and Reeves and Moore, in press) are listed. Other species such as Schilbeodes eleutherus and Ulocentra histrio, now practically or completely extirpated in the Poteau River where they were taken by early collectors, were found to be fairly common near the mouth of the Mountain Fork River.

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INTRODUCTION AND ACKNOWLEDGMENTS

Fishery investigations of the Mountain Fork River have been very few. The early explorers working with the Railway Survey Crews did not enter the then inaccessible country bounded on the south by Little River and Red River and on the north by the Ouachita Mountains. Marcy (1854) did not explore the Mountain Fork but crossed Red River near the mouth of Cache Creek and near the Cotton-Jefferson County boundary. Jordan and Gilbert (1886) collected in the Washita (= Ouachita) River in Arkansas and Red River at Fulton but did not penetrate Indian Territory, except in the region of Fort Smith, Arkansas. Meek (1896) was able to go by rail from Fort Smith southwestward through Indian Territory and Texas and, after investigations near Sallisaw and the vicinity of Fort Smith, he stopped at Poteau, Kiamichi and Goodland. Thus the early investigators studied fishes north, east and west of the Mountain Fork but did not collect in that river.

Apparently the first fish collection from the Mountain Fork is that of the University of Oklahoma Museum of Zoology Expedition, 10 miles southeast of Broken Bow in June and July 1925, as reported by Ortenburger and Hubbs (1927). Later, in 1927, collectors from the University of Oklahoma Museum of Zoology secured some fishes from tributaries of the Mountain Fork in Polk County, Arkansas.

From time to time, students in various classes from the

Department of Zoology, Oklahoma Agricultural and Mechanical College, under the leadership of Drs. John D. Mizelle, William H. Irwin and George A. Moore, have collected in the river. Dr. A. P. Blair of the University of Tulsa and his student, J. T. Herbelin, also have generously contributed specimens and data.

During the period 16 to 23 August, 1948, a cooperative survey, sponsored by the Department of Zoology of the Oklahoma Agricultural and Mechanical College and directed by Dr. George A. Moore, was conducted. The Oklahoma Game and Fish Department and the Corps of Army Engineers, Tulsa District, gave their hearty support to this project.

The writer is especially indebted to Col. C. H. Chorpening of the Tulsa District, Corps of Army Engineers, for making available the services of Mr. Cecil Haight, who was particularly helpful on this and other similar occasions. Mr. Kelly DeBusk, Director of the Oklahoma Game and Fish Department, placed the services of Mr. Donald Poole at the disposal of the survey director.

The generous assistance of Dr. Carl L. Hubbs, of the Scripps Institution of Oceanography, and Dr. Reeve M. Bailey, of the University of Michigan, in the identification of some troublesome specimens is deeply appreciated. The 1948 survey collections were largely sorted and identified by Joshua J. Harmon and later checked by Dr. George A. Moore. The writer wishes to thank Mr. Harmon for permission to use his data. Doctors Walter P. Taylor, Fred M. Baumgartner, and Wendell H. Krull kindly read the manuscript and offered helpful suggestions. The writer wishes to pay especial homage to Dr. George A. Moore, who in his capacity as

adviser, worked long hours with me on this problem giving freely of his time and offering helpful suggestions on occasions too numerous to mention. Dr. V. Brown Monnett, Head of the Department of Geology at Oklahoma Agricultural and Mechanical College, very kindly furnished information concerning the geology of the river.

The Mountain Fork River rises in the southeastern section of LeFlore County, Oklahoma, flows eastward and is joined by Horsepen Creek near the Oklahoma-Arkansas line. After crossing the state line, the river's course is southeast for about four miles, then southward for about seven miles, and later flows in a southwesterly direction to again cross the Oklahoma-Arkansas state line a few miles east of Beachton in McCurtain County, Oklahoma. Near Smithville, Oklahoma, the course is changed to a southerly direction which is maintained to its confluence with Little River a few miles south of Eagletown, Oklahoma.

The Mountain Fork River is about 85 miles in length with a drainage area of approximately 784 square miles. The basin is characterized by steep forested slopes in a mountainous region, which accounts for a very crooked course and a gradient of over 6 feet per mile. Most of the tributaries of the Mountain Fork River have their origin in the Ouachita National Forest and the Kiamichi Mountains.

The rainfall of the drainage area averages between 40 and 50 inches per year. Heavy rains often cause flash floods of torrential proportions which may influence the fluctuation in abundance of some species by the destruction of fish nests.

During the month of August, 1948, the pH of the water

varied from 6.8 - 7.3 and the temperature of the water varied from 22.5°C. to 33°C.

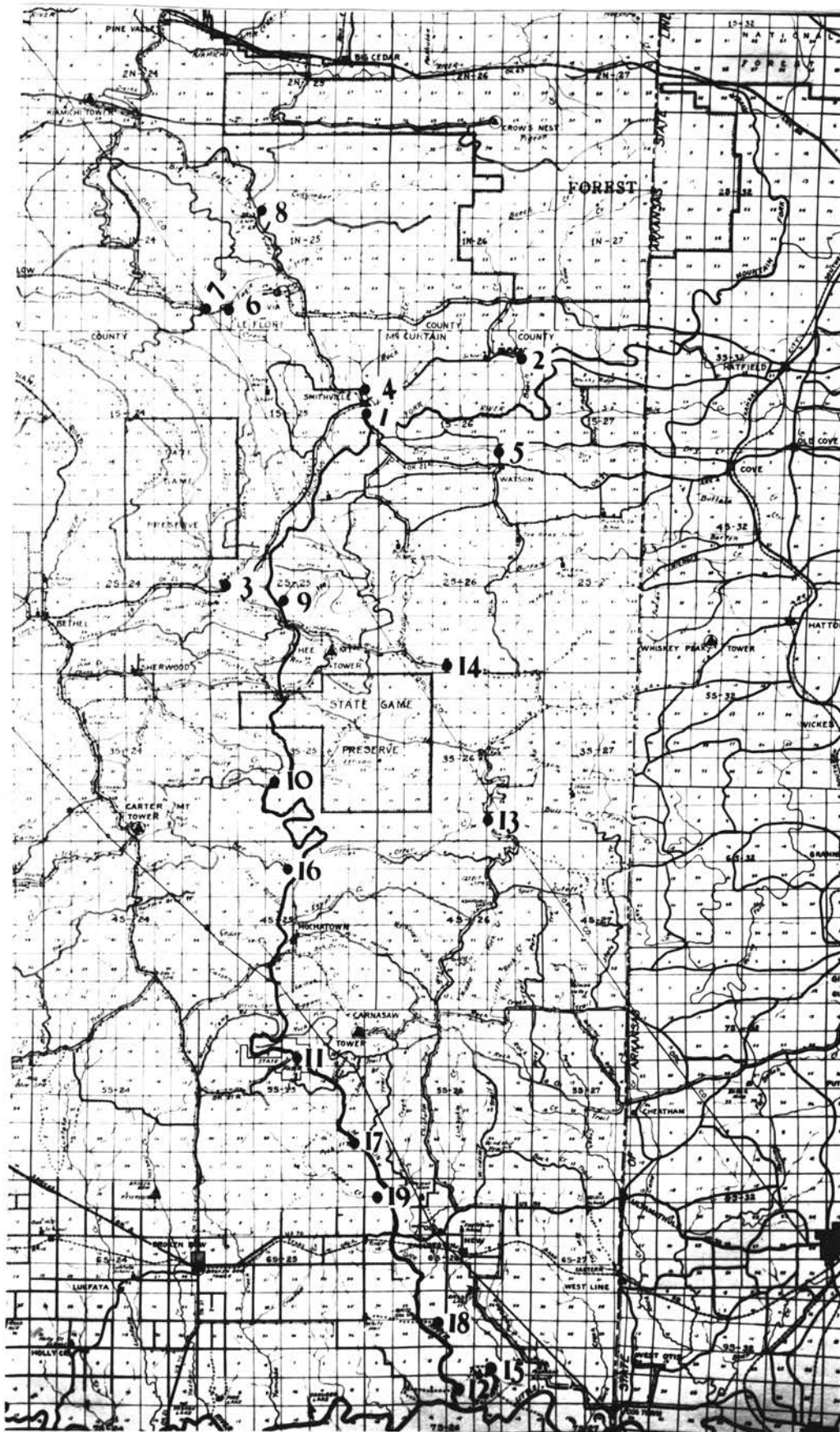
The Mountain Fork River flows over a variety of geologic formations. The headwaters and the upper third of the River are in a series of carboniferous sandstones and shales. From Smithville southward to the junction with Little River, the Mountain Fork flows over alternating beds of sandstone, shale, and a few silicious strata, with a noticeable absence of limestone formations in this region. The river terminates on the Cretaceous Trinity Sandstone, a good aquifer in extreme southeastern Oklahoma. Upon encountering the Trinity Sandstone between Eagletown and Beavers Bend State Park, the river enters an entirely different geologic and physiographic province known as the Coastal Plain, which is characterized by strata which dip gently toward the gulf and form a relatively flat topography.

The oldest rocks crossed by the stream near Hochatown are Ordovician; the youngest rocks are of Cretaceous origin and are found at the extreme southern end of the stream. The geological time intervening between the formation of these two periods amounts to approximately 250,000,000 years. Other than the restriction of several species to the general area of the Coastal Plain province, there seems to be little relationship between the geology of the drainage system area and its fish fauna.

MATERIALS AND METHODS

The survey party was provided with the following materials and equipment: one 7 passenger station wagon, one $\frac{1}{2}$ ton pick-up truck for transporting equipment, two pH sets, three thermometers, cheesecloth, collecting cans, camp cooking equipment, first-aid kits, two nylon nets 4 feet long by 3 feet deep, knotted seines of 10 to 30 feet in length of $\frac{1}{4}$ to $\frac{3}{8}$ inch mesh and one gill net of 2 inch mesh. Members of the party had both fly and casting rods and other personal equipment.

The fishes were fixed in 10 percent formalin and later were washed in water and stored in 70 percent alcohol. After the survey was completed, the fishes were sorted to species, counted, measured, and deposited in the Museum of Zoology of the Oklahoma Agricultural and Mechanical College, unless otherwise specified.



Collecting stations on the Mountain Fork River August, 1948.

Collecting Stations, in McCurtain County, 1948

Station 1: - Mountain Fork River, near Smithville, sec. 13, T. 1 S., R. 25 E.; August 17, 18 and 19, 1948.

Station 2: - Beech Creek, secs. 1 and 12, T. 1 S., R. 26 E.; August 17, 1948.

Station 3: - Boktuklo Creek, secs. 8, 17, 18 and 19, T. 2 S., R. 25 E.; August 17, 1948.

Station 4: - Rock Creek, secs. 12 and 13, T. 1 S., R. 26 E.; August 17, 1948.

Station 5: - Dry Creek, sec. 26, T. 1 S., R. 26 E.; August 17, 1948.

Station 6: - Big Eagle Creek, 2 miles west of Octavia, sec. 31, T. 1 N., R. 25 E.; August 17, 1948.

Station 7: - Little Eagle Creek, 2½ miles west of Octavia, sec. 36, T. 1 N., R. 4 E.; August 18, 1948.

Station 8: - Cucumber Creek, 3½ miles north of Octavia, sec. 8, T. 1 N., R. 25 E.; August 18, 1948.

Station 9: - Buffalo Creek, sec. 21, T. 2 S., R. 25 E.; August 18, 1948.

Station 10: - Holly Creek, sec. 21, T. 3 S., R. 25 E.; August 20, 1948.

Station 11: - Mountain Fork River, near Beavers Bend State Park, sec. 10, T. 4 S., R. 25 E.; August 20, 1948.

Station 12: - Mountain Fork River near the mouth and west of Forked Lake, sec. 10, T. 7 S., R. 26 E.; August 20, 1948.

Station 13: - Small spring fed tributary to Otter Creek, sec. 35, T. 3 S., R. 26 E.; August 21, 1948.

Station 14: - Hutson Creek, sec. 33, T. 2 S., R. 26 E.;

August 21, 1948.

Station 15: - Forked Lake, sec. 2, T. 7 S., R. 26 E.;

August 22, 1948.

Station 16: - Bee Creek, secs. 4 and 9, T. 4 S., R. 25 E.;

August 21, 1948.

Station 17: - Cedar Creek, sec. 20, T. 4 S., R. 25 E.;

August 21, 1948.

Station 18: - Swamp 3 miles south of Old Eagletown, sec. 33,

T. 6 S.; R. 26 E.; August 20, 1948.

Station 19: - Cooper Creek, sec. 6, T. 6 S., R. 26 E.;

August 21, 1948.

Other Collections

In addition to the 1948 survey collections, other collections have been made at different times and locations in McCurtain County, Oklahoma. The collectors, with dates and localities, are listed in chronological order. The symbols M1, M2, M3, etc. are used to avoid repetition of data in the annotated list.

Irwin, W. H. and class.

I1 10 miles east of Broken Bow, sec. 16, T. 6 S., R. 26 E.;
April 19, 1947.

Moore, George A. and class.

M1 Swamp 1 mile west of Eagletown, sec. 16, T. 6 S., R. 26 E.;
June 4, 1947.

M2 Cooper Creek, sec. 35, T. 5 S., R. 25 E.; June 5, 1947.

M3 Mountain Fork River, sec. 25, T. 5 S., R. 25 E.; June 5,
1947.

M4 Beaver's Bend State Park, sec. 10, T. 5 S., R. 25 E.; June
6, 1947.

M5 10 miles east of Broken Bow, sec. 16, T. 6 S., R. 26 E.;
June 4, 1947.

Moore, George A. and Frank Bernard Cross.

MC1 Mountain Fork River below the dam at Beaver's Bend State
Park, sec. 10, T. 5 S., R. 25 E.; May 5, 1948.

MC2 Luksukelo Creek, sec. 16, T. 6 S., R. 26 E.; June 2, 1948.

MC3 Swamp 3 miles south of Eagletown, sec. 33, T. 6 S., R. 26
E.; June 2, 1948.

Blair, A. P. and J. T. Herbelin.

BH1 Mountain Fork River, Beaver's Bend State Park, sec. 10, T. 5
S., R. 25 E.; April 14, 1949.

BH2 Mountain Fork River, sec. 8, T. 6 S., R. 26 E.; June 29,
1949.

ANNOTATED LIST
OF SPECIES OF FISHES OF THE MOUNTAIN FORK RIVER

The annotations, under the scientific and common names, are given in the following order: literature references, 1948 collecting stations, abbreviations for other collections, and pertinent notes. The following abbreviations are used to designate the various museums of zoology. UMMZ = University of Michigan, UOMZ = University of Oklahoma, OAM = Oklahoma Agricultural and Mechanical College.

PETROMYZONIDAE

1. Ichthyomyzon Girard

1. Ichthyomyzon castaneus Girard: chestnut lamprey.

Station 12.

Two ammocoetes (23.5 - 32 mm.), are assigned to castaneus on the basis of the low myomere count (50 and 52 between the last gill opening and the vent) and the habitat as indicated by Hubbs and Trautman (1937), who listed a specimen of castaneus taken by the Oklahoma Biological Survey party from Glover Creek, a tributary of Little River, near Broken Bow.

LEPISOSTEIDAE

2. Lepisosteus Lacepede

2. Lepisosteus osseus oxyurus Rafinesque: northern long-nose gar.

Ortenburger and Hubbs (1927), Moore and Paden (1950).

Stations 1 and 12. M1, MC3.

The larger specimens have a lateral-line scale-count varying

from 62-64; pre-dorsal scale count 51; anal rays 8-9; and dorsal rays of 7-8.

The smaller 2 specimens have 43 and 44 myotomes in front of the dorsal, and 55 and 56 myomeres to the base of the caudal. The top of the head is finely speckled with a light brown color which extends backward through the upper $\frac{1}{2}$ of the eye and along the sides above the lateral line and is divided in the middle of the back by a broader, darker chocolate brown stripe. Below the lateral line, and extending above it posteriorly and also extending full length of the body and under parts of the head, is an intensely black area interrupted by small light areas. The fins are colored as follows: dorsal with black bars, interradi- al membranes immaculate; caudal with intensely black areas; and the pelvics crossed by a single black bar. These smaller specimens have fleshy pectoral anlagen and differ from the others in having the ventrum light and heavily speckled with brown color cells.

These specimens are referred to the subspecies oxyurus on the basis of comparison with specimens from the Illinois River (Moore and Paden, 1950). The Illinois specimens have lateral-line scales varying from 62-64; pre-dorsal scales 50-52; dorsal fin rays 7-9; anal fin rays 8-10.

AMIIDAE

3. Amia Linnaeus

3. Amia calva Linnaeus: bowfin.

Ortenburger and Hubbs (1927). Moore and Poole (1948).

The bowfin is probably fairly common in the swamps and oxbow lakes, such as Forked and Grassy Lakes.

HIODONTIDAE

4. Amphiodon Rafinesque4. Amphiodon alosoides Rafinesque: goldeye.

Stations 11 and 12. BH2.

Only four specimens are known for the entire river, and these are from the lower portion of the stream. Jordan and Gilbert (1886) reported goldeye from Fulton, Arkansas as Hyodon alosoides Rafinesque. The fish occurs in Red River proper in great numbers and is abundant in Lake Texoma.

CLUPEIDAE

5. Pomolobus Rafinesque5. Pomolobus chrysochloris Rafinesque: skipjack.

Station 12.

This fish is known to occur in the Illinois, Poteau, and Grand Rivers in Oklahoma and was reported from the Red River at Fulton, Arkansas (Jordan and Gilbert, 1886) as Clupea chrysochloris (Rafinesque). Fowler (1945) did not list the skipjack from the Piedmont and Coastal Plain.

6. Dorosoma Rafinesque6. Dorosoma cepedianum (Le Sueur): gizzard shad.

Station 12. MC3.

The gizzard shad is not very abundant in the Mountain Fork River. Jordan and Gilbert (1886) reported it from the Red River at Fulton, Arkansas.

CATOSTOMIDAE

7. Ictiobus Rafinesque

7. Ictiobus bubalus (Rafinesque): smallmouth buffalo.

Station 1.

Although this species is quite common in the Red River (Jordan and Gilbert, 1886), only one specimen was taken by the survey party.

8. Erimyzon Jordan

8. Erimyzon oblongus claviformis (Girard): Western Creek chubsucker.

Ortenburger and Hubbs (1927) as Erimyzon sucetta oblongus (Mitchell); Hubbs and Ortenburger (1929b).

Stations 1, 3, 5, 8, 9, 13, 16, 17 and 19. BH2, MC2, M5. Very abundant.

9. Minytrema Jordan

9. Minytrema melanops (Rafinesque): spotted sucker.

MC3, M3.

Only 3 specimens are known for the entire river. Our very young (18 to 20 mm) specimens, which bear little resemblance to the adult, were identified by Dr. Carl L. Hubbs, and compare favorably with the description of Hubbs and Ortenburger (1929b).

10. Moxostoma Rafinesque

10. Moxostoma duquesnii (Le Sueur): black redhorse.

Hubbs and Ortenburger (1929b).

Stations 1, 2, 5, 9, 11 and 12.

This apparently common redhorse, taken by Jordan and Gilbert (1886) from the Ouachita River at Arkadelphia, is perceptibly slenderer and specimens agree better with the description as given by Hubbs (1930) than others of the same species we have

from the Illinois River.

11. Moxostoma erythrurum (Rafinesque): golden redhorse.
Stations 5, 11 and 12. MC2 and MC3.

Like duquesnii, this species is fairly common and more easily differentiated, from the preceding species, in these collections than in collections from the Arkansas River Basin.

11. Placopharynx Cope

12. Placopharynx carinatus Cope: river redhorse.
Station 12.

The river redhorse, taken by Jordan and Gilbert (1886) at Arkadelphia, Arkansas, is represented by only one specimen in our collections.

CYPRINIDAE

12. Semotilus Rafinesque

13. Semotilus atromaculatus atromaculatus (Mitchill):
northern creek chub.
Stations 3, 13, 14 and 17.

Semotilus was taken only in small spring-fed tributaries.

13. Opsopoeodus Hay

14. Opsopoeodus emiliae Hay: pugnose minnow.
Stations 12, 15 and 18. MC3.

This species was fairly common in swamps, oxbows and overflow pools.

14. Notemigonus Rafinesque

15. Notemigonus crysoleucas (Mitchill): golden shiner.
Moore and Poole (1948).
Stations 12 and 18. MC3, M1 and I1.

Speciation in Oklahoma Notemigonus has received some attention in the past, but with very little data on specimens from the Red River Basin. Schultz (1926) showed that the anal ray count increases southward and eastward and indicated a correlation between temperature and the number of anal rays. Schultz found that the average number of rays, in the Arkansas River System, is 12.9, a figure exactly the same as that given by Moore and Paden (1950) for the Illinois River (Arkansas River Basin). A compilation of the data of Ortenburger and Hubbs (1927) and Hubbs and Ortenburger (1929 a and b) gives a slightly lower average, (12.5), for 228 specimens (Table 1).

Although the number of specimens is small, the data included in Table 1 show a strong possibility that the golden shiners of the Red River System can be divided into 2 populations with different average anal ray counts: that of the Kiamichi River and all streams and lakes westward in the Red River System with an average of 11.84, in 39 specimens; and that of the Little River System with an average of 13.70, in 84 specimens. There is indicated herein some corroboration of Schultz's (1926) conclusion, in that the anal rays increase eastward. The average number of rays in the western portions of the Red River Basin is lower than the average for the Arkansas River System, which is farther north and should show a lower count. Since the Little River specimens are from the Coastal Plains Region, a higher count could be expected. There is a possibility that the upper Red River population is not greatly influenced by the Coastal Plains population. If this is true, the Little River population

could be assigned to the subspecies N. c. seco (Girard), as indicated by Hubbs (1946) and personal communication. A similar, but geographically antithetic, situation is evident in the populations of Campostoma anomalum in Oklahoma with pullum in the central and eastern portions and plumbeum in the extreme western portions of the Arkansas River Basin.

Table No. 1

Anal Rays of Oklahoma Notemigonus crysoleucas

Locality	Number of principal Anal Rays							Total Speci- mens	Ave.
	10	11	12	13	14	15	16		
Cache Creek System		1	1	1				3	
Wildhorse Creek (Lake Duncan)				2				2	
Blue River		2	7	4				13	
Kiamichi River (Ponds in Push- mataha County)	1	9	10	1				21	
Little River (Eagletown Swamps)			5	22	30	10	4	71	
(Streams)			4	3	6			13	
Totals									
Kiamichi River and westward	1	12	18	8				39	11.84
Little River System			9	25	36	10	4	84	13.70
Arkansas River System*	3	22	83	101	17	2		228	12.5

*Data from Ortenburger and Hubbs (1927) and Hubbs and Ortenburger (1929 a and b).

15. Notropis Rafinesque

16. Notropis fumeus fumeus Evermann: southern ribbon shiner. Hubbs and Ortenburger (1929b).

Stations 1 to 3 incl., 5 to 12 incl., 14 and 17. MC2, M3, M4, BH1.

This little shiner, erroneously reported by Moore (1948) as N. atherinoides, is one of the most abundant fishes in the Mountain Fork and was found in most habitats. On May 30, 1948, George A. Moore and Frank Bernard Cross took some field notes on the color and courtship of this species at Beaver's Bend State Park. These field notes are: "Many males were swimming at the surface about us as we stood in waist-deep water. Occasionally a female, seemingly disinterested in the males, swam among them. Upon observing a female, a male would give pursuit and nudge her side. If another male came near, the first male would dash out to drive his rival away and then quickly return to the female. Although this behavior was repeated many times, we never observed actual spawning and assumed that we were observing a courtship pattern."

"The males at this time were brilliantly colored. The head is bright red above and in front of the eyes, the same color extends on each mandible and is intensified on the chin. The back and sides are a beautiful iridescent green."

Breeding males are somewhat smaller than the females, the maximum size of which is 44 mm.

17. Notropis umbratilis (Girard): redfin shiner. Ortenburger and Hubbs (1927).

Stations 5, 11 and 12. M3, M5.

Although often associated with N. fumeus, umbratilis is far less abundant due to the lack of its favorite habitat, sluggish water.

18. Notropis cornutus isolepis Hubbs and Brown: common shiner.

Ortenburger and Hubbs (1927).

Stations 12 and 19. M5, MC2.

The specimens collected at station 12 of this survey may be regarded as topotypes since "10 miles southeast of Broken Bow" must be approximately the same location as our Station 12. N. c. isolepis is much more abundant in the clear Red River tributaries in Johnston and Pontotoc counties.

19. Notropis whipplii (Girard): steelcolor shiner.

Ortenburger and Hubbs (1927). Hubbs and Ortenburger (1929b).

Stations 1, 9, 11 and 12. M5, M3, MC1, I1, BH2, BH1.

This species was most abundant in swift water of the main channels. Breeding individuals were taken below the dam at Beaver's Bend State Park May 30, 1948.

20. Notropis amnis Hubbs and Greene: pallid shiner.

Station 8.

These specimens have been examined by Dr. Carl L. Hubbs who, with Dr. Willard C. Greene, expect to submit for publication a paper concerned with the subspecies of this minnow.

21. Notropis venustus (Girard): blacktail shiner.

Station 12.

The first record of N. venustus for Oklahoma is that of

Meek (1896) who took specimens from the Red River System at Goodland, although Jordan and Gilbert, earlier, (1886), took it at Fulton, Arkansas. In recent years venustus has become abundant in Lake Texoma and its tributaries. It is rare in the Mountain Fork -- 2 specimens.

22. Notropis volucellus (Cope): mimic shiner.

Station 12. BH1, BH2.

The mimic shiner is listed in the binomial because the subspecies have been incompletely studied. The relationship of the Red River form and a similar shiner of the Arkansas River System is at present unknown. It is certain that these specimens do not represent any of the subspecies treated by Hubbs and Greene (1928), Hubbs and Ortenburger (1929 a and b) and Trautman (1931). These specimens may prove to be of the same subspecies mentioned by Moore and Paden (1950) for the Illinois River.

23. Notropis zonatus pilsbryi Fowler: Arkansas striped shiner.

Hubbs and Moore (1940).

The presence of N. z. pilsbryi in the Mountain Fork, and elsewhere in the Red River Basin, was discussed by Hubbs and Moore (1940) who suggested the possibility of the accidental transfer of data or of living fish. However, some associates of pilsbryi are now known to occur in the Red River System. The following records are included to substantiate the earlier records: Notropis rubellus (herein reported); Dionda nubila Forbes, collected by Moore and party in J. N. Creek, a tributary of Blue River, Bryan County, Oklahoma, April 15, 1949; Nocomis

biguttatus (Kirtland), collected in Blue River at Hughes Crossing 10 miles west of Wapanuka and 3 miles south of Highway 7 by Moore and party on April 6, 1947. Although these species are not so restricted in their range as pilsbryi, they are represented in collections from the Red River System by single specimens and may be interpreted as accidentally distributed by means of bait buckets.

24. Notropis perpallidus Hubbs and Black: colorless shiner. Moore (1948).

Station 12. M4.

This rare shiner, first reported for Oklahoma by Moore (1948), we had hoped to take in considerable numbers. The 2 specimens from near the river's mouth now makes a total of 5 known specimens. The additional material agrees with the types (Hubbs and Black, 1940) and with the specimen reported by Moore. The anal rays are 9 in 1 and 10 in 1.

25. Notropis ortenburgeri Hubbs: Kiamichi shiner. Ortenburger and Hubbs (1927); Hubbs and Ortenburger (1929b).

Although our survey station 12 is the approximate type locality of this species, no specimens were taken by the survey crews.

The following locality data from OAM files are given to more definitely indicate the range of this little known species: Ouachita River at Eagleton, Polk County, Arkansas, Moore et al June 3, 1947; tributary of Saline River, 2 miles west of Dierks, Arkansas, Moore et al June 3, 1947; Yanubbe Creek, a tributary of Little River, 2 miles north of Broken Bow, Oklahoma, Moore et al

June 5, 1947; same locality, Poole and Carter, April 19, 1947 and Blair and Herbelin, April 15, 1949; Pond near Little Cedar Creek, tributary Kiamichi River on Highway 271 N.E. Antlers, Pushmataha County, Oklahoma, Wyota Earl, March 10, 1945; Tributary Kiamichi River 10 miles west Talihina, Latimer County, Oklahoma, Carter and Poole, April 20, 1947; Reichert Creek, tributary Poteau River 3 miles north of Reichert, LeFlore County, Oklahoma, John Paden et al August 22, 1947; Longs Creek in sections 16 and 21, township 15 N., Range 22 East LeFlore County, Oklahoma, Gordon Hall et al August 21, 1947.

26. Notropis deliciosus (Girard): sand shiner. Ortenburger and Hubbs (1927).

Although this form is abundant in the Red River System farther west, it is undoubtedly scarce in the Mountain Fork; the only record is that above cited.

27. Notropis chalybaeus (Cope): ironcolor shiner. Ortenburger and Hubbs (1927) as Notropis nux Evermann.

In Oklahoma this species occurs only in the Mountain Fork River on the basis of specimens (now deposited in UOMZ and UMMZ) reported by Ortenburger and Hubbs (1927). This material has recently been reexamined by Dr. Hubbs who (personal communication) assigned it to chalybaeus.

28. Notropis percobromus (Cope): plains shiner. Moore and Poole (1948). Ortenburger and Hubbs (1927) as Notropis atherinoides Rafinesque.

Hubbs (1945:16) indicated that Notropis percobromus "throughout most of Oklahoma wholly replaces atherinoides." The occurrence of atherinoides in the Mountain Fork is doubtful (see item 16).

Station 12.

29. Notropis rubellus (Agassiz): rosyface shiner.

Stations 11 and 12.

The status of this species is being studied by Dr. Reeve M. Bailey of the University of Michigan.

30. Notropis boops Gilbert: bigeye shiner.

Ortenburger and Hubbs (1927), Hubbs and Ortenburger (1929b).
Stations 1 to 12 inclusive, 14, 16 and 17. M4, M5, MC1, MC2,
BH1, BH2.

Very abundant.

16. Hybognathus Agassiz

31. Hybognathus nuchalis Agassiz: silvery minnow.

Ortenburger and Hubbs (1927) as H. hayi Jordan (misidentification).

Station 12.

Reported by Jordan and Gilbert (1886) at Fulton, Arkansas, this species is rare in the Mountain Fork (2 specimens taken in 1948). Hubbs and Ortenburger (1929b) corrected the earlier report of H. hayi for the Mountain Fork and assigned the specimens to H. nuchalis.

17. Hyborhynchus Agassiz

32. Hyborhynchus notatus (Rafinesque): bluntnose minnow.

Ortenburger and Hubbs (1927), Hubbs and Ortenburger (1929b).
Stations 1 to 12 inclusive, 17 and 18. MC1, MC2, M2, M3, M5,
BH1, BH2.

This very abundant species exhibits 2 color phases which are apparently correlated with the hooked or nonhooked pharyngeal

teeth. Further study is needed to determine the status of these characters. The distribution in Oklahoma, of this and the next species, will be discussed by Moore and Buck in a subsequent paper.

33. Campostoma anomalum pullum (Agassiz): central stone-roller.

Hubbs and Ortenburger (1929b).

All stations except 15 and 18. M3, M5, MC2, MC1, BH1, BH2.

The Mountain Fork population of this species appears to be pullum, on the basis of fewer than 44 rows of scales around the body in front of the dorsal fin.

AMEIURIDAE

18. Ameiurus Rafinesque

34. Ameiurus melas (Rafinesque): black bullhead.

Moore and Poole (1948).

Stations 1, 12 and 17. Il.

This species is rare in the Mountain Fork, but is occasionally found in swamps and backwaters.

35. Ameiurus natalis (Le Sueur): yellow bullhead.

Moore and Poole (1948).

Stations 1, 5, 6, 7, 10, 12, 14, 15, 16 and 19. Il.

The yellow bullhead is fairly common in quieter portions of the main river, as well as in swamps and backwaters.

19. Schilbeodes Bleeker

36. Schilbeodes eleutherus (Jordan): furious madtom.

Station 12.

The taxonomic status of the members of this genus is being

studied by Mr. Ralph Taylor at the University of Michigan.

Our 8 specimens constitute a third locality for this species in Oklahoma. It is found also in the Illinois and Poteau Rivers (Moore and Paden, 1950).

37. Schilbeodes mollis (Hermann): tadpole madtom.
Moore and Cross (1950).
Stations 12 and 15.

These specimens briefly reported by Moore and Cross, agree with other Oklahoma materials discussed by them. In 31 specimens the anal rays are 15.8 (15 to 17). This apparently large population may prove to be subspecifically different than the northern form.

38. Schilbeodes nocturnus (Jordan and Gilbert): freckled madtom.
Stations 1 and 12.

The Red River nocturnus appear to differ from those of the Arkansas River Basin and may prove to be subspecifically distinct.

20. Ictalurus Rafinesque

39. Ictalurus lacustris punctatus (Rafinesque): southern channel catfish.
Ortenburger and Hubbs (1927) as Ictalurus punctatus (Rafinesque).
Station 1.

Although the channel catfish is known to be common in the Red River Basin, and was reported by Jordan and Gilbert (1886), the 1948 survey did not indicate it as an abundant species in the Mountain Fork.

21. Pilodictis Rafinesque

40. Pilodictis olivaris (Rafinesque): flathead catfish.

Stations 1 and 12.

Jordan and Gilbert (1886) reported this apparently uncommon species as Leptops olivaris at Fulton, Arkansas.

ESOCIDAE

22. Esox Linnaeus

41. Esox vermiculatus Le Sueur: grass pickerel.

Ortenburger and Hubbs (1927), Hubbs and Ortenburger (1929b).

Stations 1, 5, 7, 8, 12, 15, 18 and 19. M1, MC3, MC1, MC2.

Since Meek (1896) reported Lucius reticulatus (= Esox niger) from the Red River at Arthur, we were particularly careful to check all Esox for specimens of niger, however, none seem to be of this species. In 27 specimens examined, the branchiostegals average 12.1 (10-14) in 21; the dorsal-fin rays average 15.5 (14-17) in 27; the anal-fin rays average 14.1 (13-15) in 27; and the lateral-line scales average 107 (102-112) in 6 specimens.

On the basis of these counts the Mountain Fork specimens fit the key as given by Hubbs and Lagler (1947) for E. vermiculatus quite closely, there being only 1 specimen with 14 branchiostegals and not differing, otherwise, from vermiculatus.

These specimens are being held in OAM for Vianny Legendre, of the University of Michigan, who is preparing a revision of the genus.

CYPRINODONTIDAE

23. Fundulus Lacepede

42. Fundulus dispar (Agassiz): starhead topminnow.

Reeves and Moore (1950).

Stations 15 and 18.

These specimens, mentioned by Reeves and Moore, constitute a new locality record for Oklahoma. The only other listing of this species for Oklahoma is that of Meek (1894 and 1896) as Zygonectes escambiae Bollman.

43. Fundulus notatus (Rafinesque): blackband topminnow. Ortenburger and Hubbs (1927). Stations 1 to 12 inclusive, 16, 17, 18 and 19. I1, M4, BH2, M3, M5, MC2, MC3.

Jordan and Gilbert (1886) reported this fish as Zygonectes notatus from the Red River at Fulton. All specimens from the Red River System so far examined by us are referable to notatus. Fundulus olivaceus Storer appears to be restricted, in Oklahoma, to the Arkansas River Basin. The specific differences are given by Hubbs (in Moore and Paden 1950).

POECILIIDAE

24. Gambusia Poey

44. Gambusia affinis (Baird and Girard): mosquitofish. Ortenburger and Hubbs (1927) as Gambusia patruelis (Baird and Girard). Stations 12, 15 and 18. MC3, I1, M1, M5 and BH2.

The mosquitofish, widely used in the control of mosquitos, is indigenous in the Mountain Fork River and evidently in a large part of the Red River Basin. Jordan and Gilbert (1886) found it at Fulton.

APHREDODERIDAE

25. Aphredoderus Le Sueur45. Aphredoderus sayanus (Gilliams): pirateperch.

Moore and Poole (1948).

Stations 12, 15, 18 and 19. I1, MC3, MC2, and M1.

The pirateperch is particularly common in the swamps and overflow pools, even roadside mudholes, in the Mountain Fork Basin where Moore and Poole found it breeding in April. Some females, collected in April, show large eggs near the genital pore.

SERRANIDAE

26. Lepibema Rafinesque46. Lepibema chrysops (Rafinesque): white bass.

Station 12.

The occurrence of the white bass (1 specimen) near the mouth of the Mountain Fork is in accord with the observations of Sigler (1949) who pointed out that the larger populations are found in larger rivers and lakes. The species is known to be common in the Red River and Lake Texoma.

PERCIDAE

27. Hadropterus Agassiz47. Hadropterus scierus Swain: dusky darter.

Stations 1 and 12. M5.

These specimens (large series) have been examined by Dr. Carl L. Hubbs who expects to study this species.

48. Hadropterus pantherinus Moore and Reeves, N. sp.:

leopard darter.

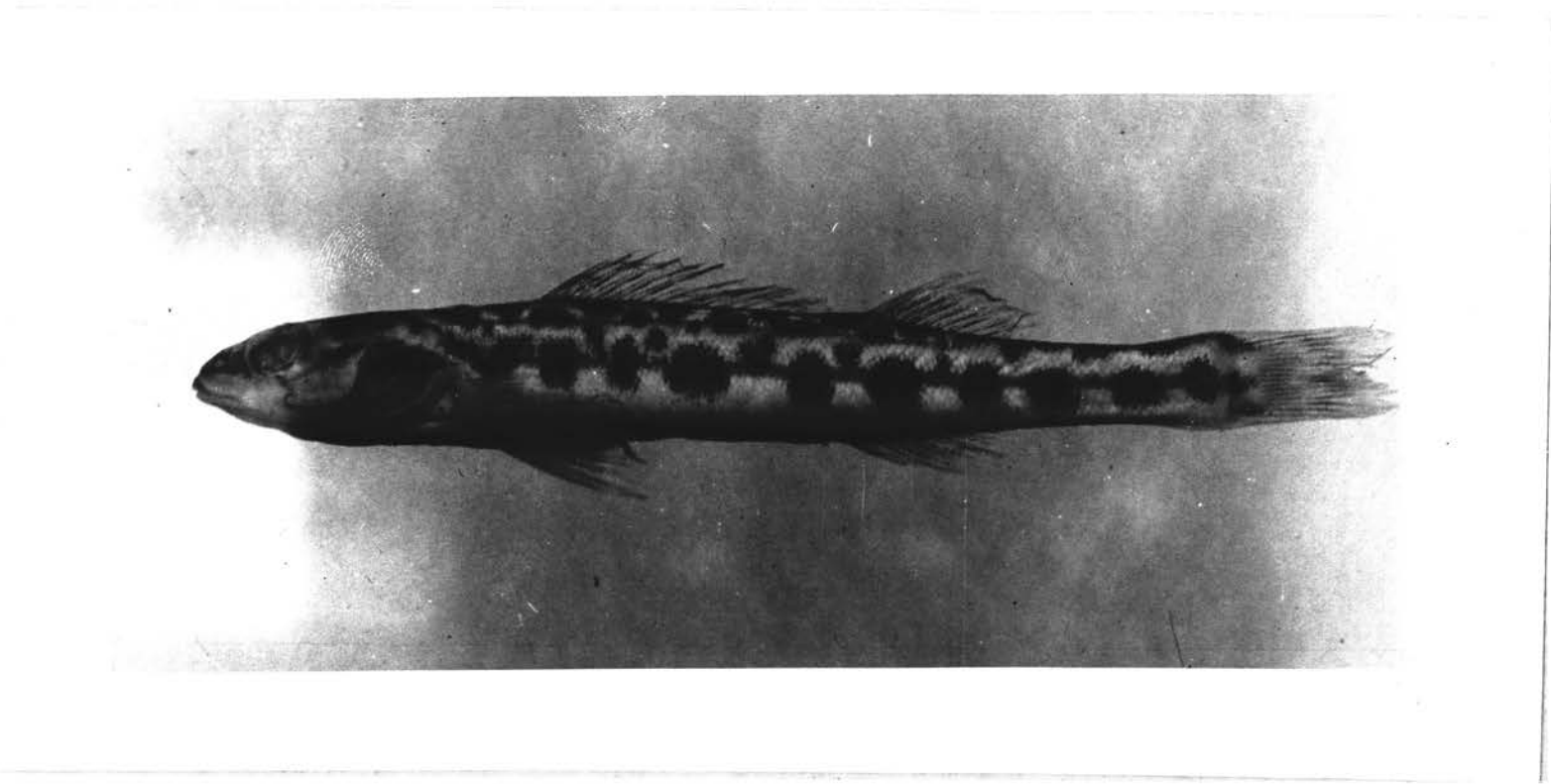


Figure 1. Holotype of Hadropterus pantherinus.

Four different expeditions to the Little River System of southeastern Oklahoma and southwestern Arkansas have each yielded from 1 to 2 specimens of an apparently new species of Hadropterus. The first specimen taken (see Paratype UMMZ 81185 below) was provisionally reported by Hubbs and Ortenburger (1929b) as Hadropterus macrocephalus (Cope), along with specimens later catalogued as H. maculatus (Girard) from the Arkansas River System in Arkansas and Oklahoma. These writers recognized the need for further study of Oklahoma and Arkansas Hadropterus. Hubbs and Raney (1939) indicated that H. maculatus is probably a complex of subspecies, an observation which we feel can prove to be correct. We, therefore, propose the name Hadropterus pantherinus, suggested by Dr. Carl L. Hubbs, to accommodate that portion of the maculatus complex from the Little River System of Oklahoma and Arkansas.

Material examined

Through the courtesy of Drs. R. M. Bailey and R. R. Miller we have had an opportunity to compare the new species with related forms as indicated below. Unless otherwise stated the specimens examined are Hadropterus maculatus. UMMZ numbers are followed, in parentheses, by the number of specimens.

- Alabama. Glass Mill Cr., 5 mi. north of Maroyn: 123924 (1).
 Opintlocco Cr., 3 mi. southeast of Tuskegee: 123985
 (1). Benton, Lowndes County: 111240 (Metal tag)
 (1).
- Arkansas. Fourche la Fave River, 9 mi. south of Waldron,

Scott County: 81186 (1). Little War Eagle Cr.,
 Madison County: 123112 (1). Cache R., Lawrence-
 Craighead County line: 123637 (2). Frog Bayou,
 Crawford County: 127757 (1). Bodeau Cr.,
 Lafayette County: 128207 (1). Frog Bayou, Craw-
 ford County: 128414 (1).

Kentucky. Rockcastle R. or Parker Branch: 96945 (7). Peters
 Cr., on U. S. Highway 31E, Barren County: 154700
 (11). Hadropterus macrocephalus, ibid: 154701 (1).

Oklahoma. Ten mile Cr., Pushmataha County: 109032 (1).
 Poteau R., LeFlore County: 127229 (1). ibid: 127266
 (3). Poteau R., Slate Ford, LeFlore County: 137915
 (3).

Ontario. Tributary Thames R. west of Thamesville: 89014 (56).

Virginia. - North Fork Holston R., Smyth County: 119678 (3).
Hadropterus notogrammus, North R., Rockbridge
 County: 144697 (3). Hadropterus macrocephalus,
 North Fork Holston R., above Saltville: 96879 (3).

West Virginia. Hadropterus macrocephalus, Elk R., 9 mi. below
 Ivy: 119637 (1).

Wisconsin. Thornapple R., Rusk County: 95884 (60).

HADROPTERUS PANTHERINUS new species: leopard
 darter.

Types. The holotype, OAM 2319 now UMMZ , is a half-

grown specimen 41 mm. in standard length collected by Carl C. Rigney and George A. Moore in the Mountain Fork River at Smithville, S. 13, T. 1 S., R. 25 E., in McCurtain County, Oklahoma on August 17-19, 1948.

The five paratypes bear the following data with the number of specimens followed by size ranges, museum numbers, collectors locality data, and date in that order: 1 (59 mm.) UMMZ 81185, University of Oklahoma Museum of Zoology Expedition, Tributary of Mountain Fork River in Polk County, Arkansas, June 29, 1927; 1 (38 mm.) OAM 2559, George A. Moore in Mountain Fork River at Beaver's Bend State Park in S. 10, T. 5 S., R. 25 E., McCurtain County, Oklahoma August 21, 1948; 3 (22-27mm.) OAM 2123, Frank Bernard Cross and George A. Moore, at the same locality, May 30, 1948; and 1 (35 mm.) UOMZ , Albert P. Blair in Little River at Honobia, McCurtain County, Oklahoma.

Diagnosis. -- A species closely related to Hadropterus maculatus from which it differs as follows (data for maculatus in parentheses): more numerous scales in the lateral line 81 to 89 (62-77); scales above the lateral line averaging 10.3 (8.04) with extremes of variation 9-11 (7-10); scales below the lateral line averaging 17.3 (11.6) with extremes of variation 16-18 (9-15); scales around the caudal peduncle usually 32, 31 in 1 specimen, (24.3, 22-30); background color white in young to half grown (darker, a shade of olive); lateral blotches round or deeper than long (seldom round, usually longer than deep).

Although H. pantherinus is not as closely related to H.

macrocephalus as to H. maculatus, the differences between pantherinus and macrocephalus are pertinent in this connection.

H. macrocephalus was described by Jordan and Evermann (1896) as having incompletely scaled cheeks and opercles, a naked breast, 9 confluent black lateral blotches, above which there is a light wavy line, and an incomplete lateral line. We feel that the specimens forming the basis of this description may have been a complex of forms, since specimens of macrocephalus examined by us have the cheeks and opercles naked and the breast naked or with the usual scales between the pelvics. In contrast pantherinus has the cheeks, opercles, and breast well invested with scales, those on the cheeks embedded. H. macrocephalus further differs from pantherinus in having a conspicuous black spot at the origin of the spinous dorsal (less intense, but perceptible, in adults); a wavy light line bordering the lateral band, which is broad and with expansions where the blotches occur; the lack of discrete unconnected blotches--rather, each scale of the dorsum usually with its posterior half covered with small melanophores (UMMZ 154701 has 2 elongated blotches anterior to the spinous dorsal); and a light brown color (Jordan and Evermann, loc. cit.) instead of white.

Hubbs and Raney (1939) and Bailey (1941) stated that the distance from the insertion of the pelvic fins to the union of the gill membranes, in macrocephalus, is contained 0.8 to 1.2 (our data 0.8 to 1.1) times in the distance from the union of the gill membranes to the tip of the mandible. This value in pantherinus ranges from 0.55 to 0.82.

Description of types. -- The characters of the holotype, with the limits of variation in meristic characters and proportional measurements of all 7 specimens in parentheses, are as follows: scales small 10-86-16 (9 to 12--85 to 89--16 to 18) and 32 (in all 7 specimens) around the caudal peduncle; cheeks, opercles, and nape completely invested with exposed or imbedded scales; breast with a patch of scales between the pelvic fin bases; dorsal fin XV--12 (XIV to XV--11 to 13); anal fin II, 10 (II, 9 to 10); pectoral fins 14-14 (13-14 or 14-14); pelvic fins 6-6 in all; principal caudal rays 17 (16 or 17) head in length 3.5 (3.2-3.7); head depth at occiput 7.3 (6.7-7.5); head depth in head length 2.1 (2-2.2); upper jaw in head 3(2.8-3); orbit in head 3.9 (3.4-4.6); eye in head 4.5 (4.0-5.2); fleshy inter-orbital width in snout 1.7 (1.3-1.7); postorbital length of head in head 1.9 (1.8-2.0); snout in head 4 (3.8-4.7); snout in orbit 1 (.97-1.3); least depth of caudal peduncle in length of caudal peduncle 3.1 (2.8-3.7); and least depth of caudal peduncle in head length 3.5 (3.3-4.4).

Coloration. -- Adult breeding colors are unknown. No color notes are available for the only adult specimen (UMMZ 81185). The young and half-grown specimens are white with a pattern of 11 to 13 squarish dorsal blotches and a row of 10 or 11 round lateral blotches, faintly connected by a very narrow lateral band. In the region of the spinous dorsal, the middorsal blotches are broken mesially in two, the ones of opposite sides alternating. There is an irregular row (occasionally doubled anteriorly) of smaller blotches lying between the dorsal and lateral series.

There is a small black spot in the caudal base. The ventrum is immaculate; except for a row of 11 black spots on each side of the anal base which are followed posteriad, on the midventral line of the caudal peduncle, by a sharply defined black streak. The subocular bar, absent in the young, increases in conspicuousness with age. Juveniles have a few melanophores on the lower surface of the mandibular rami. The preopercular bar extends forward below the posterior nostril to cover the premaxillary frenum and thence backward along the premaxillaries. The parietal patch is solid brown. The fins, except the pectorals and pelvics, which are immaculate, are faintly barred with brown.

Distribution and habitat. -- The species is known only from the Little River System, of which the Mountain Fork River is a tributary. These streams are clear, except at flood stage, and flow over a bed of boulders, coarse gravel and some sand. The young and half-grown specimens from the Mountain Fork were taken in swift riffle water in association with Hadropterus scierus Swain and Hadropterus phoxocephalus (Nelson). Apparently maculatus does not occur in the Little River Basin.

Discussion. -- Hadropterus pantherinus is one of several species that has undergone its separate evolution due to isolating mechanisms in which extreme turbidity of the Red River doubtless plays an important role. Another possible explanation, but one that we feel is of lesser importance, is that these forms are relict races that formerly enjoyed a wider distribution, but now are facing extinction.

The fact that the only adult specimen was taken from the

headwaters of the Mountain Fork in June and that in May only young were taken at Beaver's Bend State Park, strongly suggests that the species is quite likely a spring breeder which prefers the Mountain headwater brooks. Careful collecting in such habitats may show that the species is more abundant than is now indicated. Those specimens from the lower portions of the Mountain Fork River may represent a relatively small part of the main population swept down stream in torrential spring flash floods so common in the region.

H. pantherinus and several forms of Poecilichthys, being inhabitants of clear swift tributaries, have remained quite isolated for long periods of time. In contrast, mud-loving species such as Microperca proeliaris Hay, Hololepis gracilis (Girard), Boleosoma chlorosomum (Hay), and others are widely distributed in southeastern Oklahoma, are not restricted to either the Red or Arkansas River Systems, and form apparently undifferentiated and more widely distributed populations.

49. Hadropterus phoxocephalus (Nelson); slenderhead darter. Station 12.

This species, under study by Mr. Milton Curd of Oklahoma Agricultural and Mechanical College, was a complete surprise since previous experience has indicated it as an inhabitant of sandy plains streams. Its absence in the clear tributaries of Johnston and Pontotoc counties is difficult to explain.

28. Percina Haldeman

50. Percina caprodes (Rafinesque): logperch.

Hubbs and Ortenburger (1929b) as Percina caprodes caprodes

(Rafinesque).

Stations 1, 2 and 12. MCl.

This widely distributed form is uncommon in the Mountain Fork.

29. Cottogaster Putnam

51. Cottogaster copelandi (Jordan): river darter.

Stations 1, 10 and 12. MCl, M4.

The river darter, though not abundant, is apparently well distributed in the Red River System of Oklahoma. The following records are taken from OAM files:

Ouachita River 5 miles northwest of Mount Ida, Montgomery County, Arkansas. George A. Moore, Bryan P. Glass and Paul Gordon May 3, 1947, 3 specimens.

Confluence of Little River and Rock Creek, LeFlore County, Oklahoma. Moore, Glass and Gordon June 7, 1947, 7 specimens.

Blue River 10 miles west of Wapanuka and 3 miles south of Highway 7 at Hughes Crossing, Johnston County, Oklahoma. G. A. Moore and J. M. Paden April 6, 1947, 1 specimen.

Blue River at Highway 99, Johnston County, Oklahoma. Moore and Paden April 5, 1947, 7 specimens.

Clear Boggy Creek 6 miles south and $\frac{1}{2}$ mile west of Ada, Pontotoc County, Oklahoma, Moore and Paden April 6, 1947, 1 specimen.

30. Ammocrypta Jordan

52. Ammocrypta vivax Hay: southeastern sand darter.

Station 12.

Only 1 specimen was collected.

31. Ulocentra Jordan

53. Ulocentra histrio (Jordan and Gilbert): harlequin darter.

Station 12.

Personal discussion, with Dr. Hubbs to the effect that this darter has been rediscovered in Oklahoma, is of great interest. Apparently this species was very scarce and was known in Oklahoma only from the Poteau (Jordan and Gilbert, 1886). Dr. Hubbs expressed personal delight when he saw our relatively large collection (48 specimens). In view of the fact that the harlequin darter is seldom collected, we include the following description as recorded in the field.

The general coloration is dark, blackish above with 6 saddles; parietal region black; a dark line extending downward and forward from the eye to the upper jaw; a vertical black bar extends below the eye; the breast has a green bar at the margins of the gill membranes, is washed with orange and finely speckled with black; gill membranes, opercles, cheeks and chin with conspicuous black spots; sides of the belly washed with green; pupil of the eye green, iris blue black; and spinous dorsal with a bright red spot on first interradiial membrane extending backward. The other membranes have less conspicuous brick red areas near their margins. The basal 2/3 of the fin is finely speckled with black, the last membrane intensely black. The interradiial membranes of the pectoral are clear; those of the pelvic, anal, and soft dorsal are speckled. The fin rays of all fins except spinous dorsal are alternately checkered with orange yellow and

black.

32. Boleosoma De Kay

54. Boleosoma chlorosomum (Hay): bluntnose darter.

Stations 15 and 18. MC1, MC3.

In addition to records of this form from the Poteau River (to be discussed by Frank Bernard Cross), specimens of this species, in OAM, were collected from a tributary of McAlester Lake in Pittsburg County by W. H. Irwin and class on July 19, 1947. Wherever it occurs in Oklahoma, B. chlorosomum is found in sluggish water in contrast with the flowing-water habitat of B. nigrum.

55. Boleosoma nigrum nigrum (Rafinesque): western Johnny darter.

Stations 1, 9, 10, 11 and 12.

At present this species is known in Oklahoma only from the Poteau, Kiamichi (Hubbs and Ortenburger, 1929b), and the Mountain Fork River Systems. It is found in small brooks and in riffles of the main rivers.

33. Poecilichthys Agassiz

56. Poecilichthys spectabilis Agassiz: orangethroat darter.

Station 12. M5.

The orangethroat darter in Oklahoma is listed herein in the binomial because there is evidence that the species is a complex of subspecies requiring study. Specimens from the Blue River in Johnston County have a bright orange spot near the center of a green anal fin. This peculiar color pattern has been noticed only in specimens from Thomas Bricken's Spring at the Blue River

Bridge on Highway 99.

57. Poecilichthys jessiae Jordan and Brayton.

Station 12. M5.

The distribution, in Oklahoma, of this species has been discussed by Moore and Cross (1950). Dr. Reeve M. Bailey has indicated (personal communication) that it consists of several distinct subspecies.

The very slender caudal peduncle, scaly cheeks, complete infraorbital canals and coloration serve to distinguish jessiae from spectabilis.

58. Poecilichthys whipplii radiosus Hubbs and Black:

southern redbfin darter.

Hubbs and Black (1941).

Stations 1, 2, 5 to 14 inclusive, 16, 17 and 19. MC1, MC2, M2, I1, M3, M5, BH1 and BH2.

Hubbs and Black (1941) indicated the presence in the Mountain Fork by map (location presumably based on a specimen taken by J. D. Mizelle in 1940.)

Moore and Rigney have prepared a manuscript, in which this form is indicated as one of 3 subspecies of radiosus which is given specific rank with the range extending westward in the Red River System to the Blue River in Johnston County.

59. Poecilichthys parvipinnis (Gilbert and Swain).

Moore and Cross (1950).

Station 1.

The single Mountain Fork specimen has been discussed by Moore and Cross (ibid) who removed the name from the synonymy

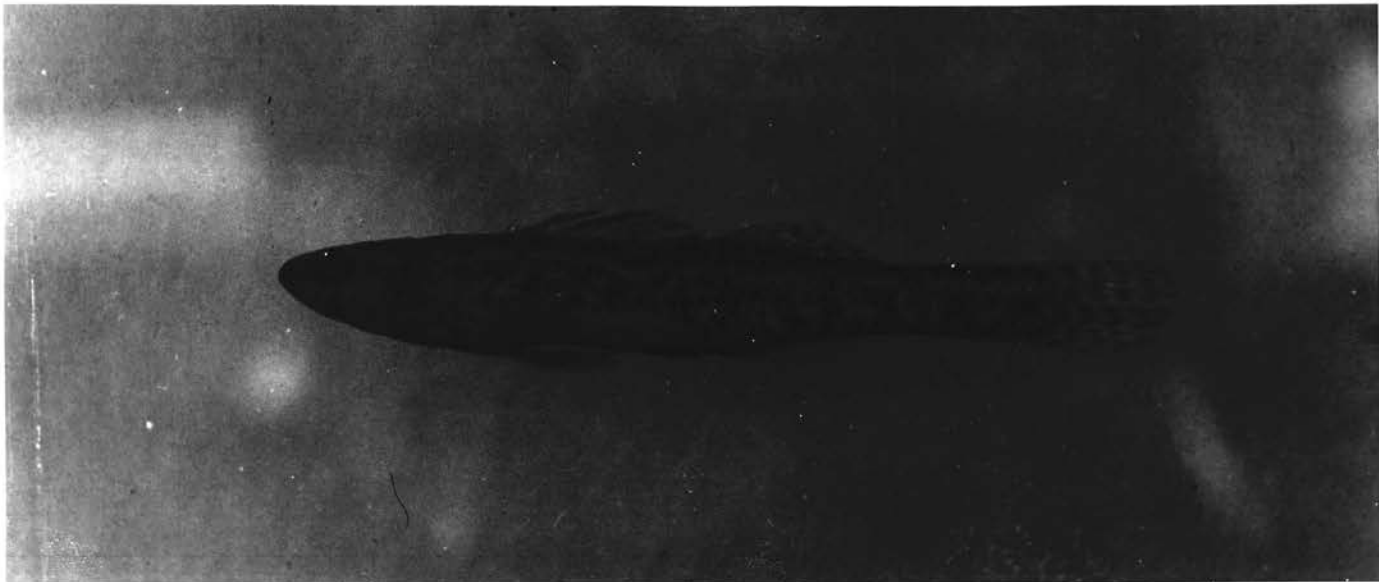


Figure 2. Holotype of Hololepis angusticeps.

of Poecilichthys squamiceps (Jordan).

34. Hololepis Agassiz

60. Hololepis gracilis (Girard): western swamp darter.

Ortenburger and Hubbs (1927) as Hololepis fusiformis (Girard),
Hubbs and Cannon (1935) - synonymy.

Stations 12, 15 and 18. Il, MC3.

The western swamp darter is also recorded in OAM files from Gates Creek at Fort Towson, Choctaw County, G. A. Moore and Frank B. Cross May 29 and June 3, 1948; and Big Elk Creek 1 mile west and $\frac{1}{4}$ mile north of Checotah in McIntosh County, M. D. Townsend October 25, 1948. Many records from the Poteau System will be discussed by Frank B. Cross.

61. HOLOLEPIS ANGUSTICEPS Moore and Reeves, new species:
narrowhead darter.

Station 18.

On June 2, 1949, George A. Moore and Frank Bernard Cross took 10 young specimens of an apparently new species from a swamp 3 miles south of Eagletown, in the Mountain Fork River Drainage, McCurtain County, Oklahoma. Later, August 20, 1949, Moore and party took 10 half grown specimens of the same species at the same locality. Both of the collections of the new species were taken in about equal numbers with Hololepis gracilis, an interesting fact since Hubbs and Cannon (1935:67) stated that H. serrifer Hubbs and Cannon and H. thermophilus Hubbs and Cannon are the only members of the genus that have been taken together in single collections. An effort was made by Mr. James Lindzey, working under high water conditions, to obtain

adults from the type locality on February 19, 1950, without success. At that time breeding Hololepis gracilis and Boleosoma chlorosomum were the only darters taken.

Hubbs and Cannon (1935) limited the range of Hololepis barratti (Holbrook), the closest relative of the new species, to South Carolina, Georgia, and Florida. Fowler (1945:364) listed H. barratti from Biloxi, Mississippi, on the basis of an undescribed specimen, which Fowler (personal communication) stated has been misplaced.

The area south of the Ouachita Mountains, in southeastern Oklahoma and southern Arkansas, is in the northern edge of the coastal plain with its characteristic cypress swamps and palmetto flats. It is from this area that several forms new to Oklahoma have been reported as follows: Elassoma zonatum (Moore and Poole, 1948); Notropis atrocaudalis, Poecilichthys jessiae, Poecilichthys parvipinnis, Lepomis symmetricus, and Menidia audens (Moore and Cross, 1950); and Lepomis marginatus (Reeves and Moore, in press). Doubtless other discoveries are yet to be made in this very interesting section of Oklahoma.

Through the courtesy of Dr. R. M. Bailey of UMMZ we had, for comparison, 21 specimens of Hololepis barratti (UMMZ 107083) collected by E. M. Burton October 10, 1933 from Wassamassaw Swamp, Berkeley County, South Carolina.

Two specimens of Hololepis barratti appalachia Bailey and a copy of the manuscript were kindly presented to us by the author, Dr. Joseph Bailey. These specimens differ trenchantly from the new species in several respects as indicated below.

In view of the considerable differences and its apparent geographic removal from near relatives, we propose the name Hololepis angusticeps (narrow head) suggested by Dr. Carl L. Hubbs, who has seen the type material.

Types. -- The very slender holotype is a half-grown specimen (UMMZ,) 31 mm. in standard length collected by Moore and party in a cypress swamp 3 miles south of old Eagletown in McCurtain County, Oklahoma on August 20, 1948. There are 9 paratypes (OAM 3078, 25 to 30 mm. in standard length) (6 specimens catalogued as UMMZ, 3 specimens deposited in UOMZ are catalogued as number) collected with the holotype. Ten specimens, OAM 2165 (17 to 21 mm. in standard length), are not designated as paratypes and are retained in OAM. The latter specimens were collected at the type locality by Moore and Frank Bernard Cross on June 2, 1948.

Diagnosis. -- Hololepis angusticeps differs from its closest relative, H. barratti, in the possession of the following characters (characters of barratti in parentheses): a sharper, longer and more pointed snout, into which the interorbital width enters 1.2(1) times; the lower jaw decidedly included (slightly included); the shorter lateral line, 12-18 pores (16-35); usually 5 scales (usually 3) above the lateral line and below the origin of the second dorsal; usually 9 scales (usually 8) below the lateral line; and the parietal region completely invested with scales extending anteriorly between the eyes or, if not forming a continuous patch, covering an area as wide on the median line of the parietal region as the length of the eye (naked on the midline or

covering a distance about equal to the length of the pupil). The pectoral fin is usually equal to the pelvic fin (shorter than the pelvic) and 15 to 19 (21 to 25) one hundredths of the standard length. The posterior nares are longitudinally elongate and with their long axes very nearly parallel (round or subtriangular, if slit-like their long axes divergent posteriad at about a 45 degree angle); preopercle entire (serrated).

Description. -- The methods employed in the following characterization are similar to those used by Hubbs and Cannon (1935), however, we used dividers rather than the projection method. The characters of the holotype, if different from the paratypes, are placed in parentheses after the extremes of variation, also parenthetical. Characters measured in millimeters are expressed in percent of standard length.

The body is quite slender and somewhat compressed; head slender, narrow and tapering gently to the rather blunt fleshy snout; mouth nearly horizontal; lower jaw decidedly included and overhung by the snout; dorsal fin X or XI (X-XIII) (XI) - 10.85 (10-12) (12); Anal fin II (rarely I) (II), 7.35 (6-8) (7); pectoral fins 13-13; pelvic fins I,5; and principal rays of the caudal fin 15.

The strongly ctenoid scales cover the entire body including cheeks, opercles, breast, and the parietal region. The parietal patch extends forward in a narrowed band to a point between the eyes (in some specimens the area is broken by a naked portion whose posterior border lies at least as far forward from the occiput as the eye is long); lateral-line scales 15.53 (12-18)

(16) 40 (36-45) (37); scales above the lateral line at origin of soft dorsal usually 5 (5); scales below the lateral-line 9 (8-10) (10); and scale rows around the caudal peduncle usually 22 (21-23) (22).

The following proportional measurements are in percent of standard length: width of head 10.9 (9.8-11.6) (10.2); snout length 5.9 (5.2-6.4) (5.4); greatest width of body 9.4 (8.5-10) (8.6); body width between lateral lines 7.3 (6.7-7.9) (6.7); head depth at posterior margin of the eye 11.5 (10.9-12.2) (11.1); eye length 6.1 (5.5-6.9) (5.7); body depth at spinous dorsal origin 16.5 (11.6-17.9) (16.6); postorbital length of the head 16.9 (15.9-18.2) (15.9); length of the caudal fin 19.8 (17.6-21.2) (19.1); length of pectoral fin 17.3 (14.8-18.6) (17.8); and length of pelvic fin 17.4 (16.4-18.6) (17.5).

The background color is pale brown with irregular darker tessellations which tend to form blotches along the mid sides; back crossed by 10 indistinct saddles; fins, except pelvics and anal, which are immaculate, checkered with black; underparts of head and breast with melanophores arranged in irregular blotches; caudal fin with 4 irregular bars and a verticle row of 4 rather distinct spots at its base; and a dark streak on the midventral line of the caudal peduncle. There is an indistinct vertical subocular bar and a preocular bar which extends forward to cross the fleshy snout, connect with the one of the opposite side, and extend backward along the premaxillae.

Distribution. -- Known only from the type locality, a cypress swamp 3 miles south of Eagletown in the Mountain Fork River Sys-

tem of McCurtain County, Oklahoma. The form will probably be found southward along the Mississippi Valley in swamps and bayous.

Discussion. -- There is little chance that the Eagletown population of Hololepis angusticeps is an isolated one, but rather this population is probably near the northern edge of the range which may well extend southeastward through the Red River drainage to the Mississippi River and southward where it is probably abundant in the lowland swamps. There is a possibility that this form may intergrade with Hololepis barratti somewhere in the Coastal Plains region of the Gulf of Mexico.

If the adults die after spawning, the absence of the species in previous collections would be easy to explain since the young and even half grown specimens would easily pass through the usual collecting nets. Without the use of the nylon net (Moore, 1949) the type material would, in all probability, have escaped.

35. Microperca Putnam

62. Microperca proeliaris Hay: cypress darter.

Stations 12 and 15.

The presence of proeliaris instead of microperca, records of which from the Red River System were discussed by Paden (1948), is doubtless due to the absence of good springs and the presence of swamps and lowland sluggish streams.

CENTRARCHIDAE

36. Micropterus Lacepede

63. Micropterus punctulatus (Rafinesque): spotted black bass.

Stations 4, 5, 10 and 12. M1, M5.

64. Micropterus dolomieu Lacepede: smallmouth black bass. Hubbs and Ortenburger (1929b). Hubbs and Bailey (1940), map. Stations 1, 3, 4, 6, 7, 10, 11 and 12. MC1.

Hubbs and Bailey (1940) indicated intergrades, dolomieu velox, for this river.

65. Micropterus salmoides salmoides (Lacepede): largemouth black bass. Ortenburger and Hubbs (1927) as Aplites salmoides (Lacepede). Stations 4, 12 and 18. MC1, MC3.

The largemouth bass is scarce in the Mountain Fork River due to the lack of suitable habitat. The nomenclature used herein is in accord with Bailey and Hubbs (1949).

37. Chaenobryttus Gill

66. Chaenobryttus coronarius (Bartram): warmouth. Moore and Poole (1948). Stations 12, 15 and 18.

38. Lepomis Rafinesque

67. Lepomis cyanellus Rafinesque: green sunfish. Ortenburger and Hubbs (1927) as Apomotis cyanellus (Rafinesque). All stations except 4, 13 and 15. I1, MC3, M2, M3, M1, M5, BH1 and BH2.

The green sunfish is very abundant, locally called "goggle-eye", and considered a game fish.

68. Lepomis punctatus (Cuvier): spotted sunfish. Ortenburger and Hubbs (1927) as Sclerotis miniatus (Jordan). Station 12. BH2.

The 3 specimens taken in this survey constitute a second

record for Oklahoma, but does not involve an extension of range, since the first record is from approximately the same locality. An adult specimen was conspicuously marked with bright red spots on the sides. Fishery investigations in the oxbows along Little River may indicate a greater abundance of this species than is now known in Oklahoma.

69. Lepomis humilis (Girard): orangespotted sunfish.

Moore and Poole (1948).

Station 15.

This species which is particularly abundant in ponds and sluggish streams of the plains section of the state is represented in this survey by only 1 specimen.

70. Lepomis symmetricus Forbes.

Moore and Cross (1950).

Station 12 and 18. MC3.

At present symmetricus must be regarded as rare in Oklahoma. There are 6 specimens in OAM, 5 from the Eagletown swamp and 1 from a slough near the mouth of the Mountain Fork.

71. Lepomis marginatus (Holbrook):

Reeves and Moore (1950).

Stations 12 and 18. MC3, I1, M1.

The specimens herein reported are the same as those discussed by Reeves and Moore. In all, 26 specimens are catalogued in OAM.

72. Lepomis megalotis (Rafinesque): longear sunfish.

Ortenburger and Hubbs (1927) as Xenotis megalotis fallax (Baird and Girard). Hubbs and Ortenburger (1929b) as Xenotis Megalotis breviceps (Baird and Girard).

Stations 1 to 12 inclusive, 14, 16, 17, 18 and 19. MC1, MC2, MC3, M3, M1, M2, M5, I1, M4, BH1 and BH2.

The longear sunfish is the most abundant centrarchid of the river, being present in all habitats. We have used the binomial, since a revision of the genus is being prepared by Dr. Reeve M. Bailey. In all probability the subspecies, with which we are here concerned, is breviceps since the type locality of that form is Otter Creek of the Red River System in Commanche County, Oklahoma (Baird and Girard, in Marcy 1854).

73. Lepomis macrochirus Rafinesque: bluegill.

Ortenburger and Hubbs (1927) as Helioperca incisor (Cuvier and Valenciennes).

Stations 1, 7, 9, 12, 15 and 18. MC3, M5, I1, M3, M1.

Rather common in swamps, sloughs and backwaters.

39. Pomoxis Rafinesque

74. Pomoxis annularis Rafinesque: white crappie.

Stations 12 and 14. MC3.

This and the next species is quite uncommon in the Mountain Fork River, but is fairly abundant in the oxbow lakes.

75. Pomoxis nigro-maculatus (Le Sueur): black crappie.

Stations 12 and 18. MC3.

40. Centrarchus Cuvier

76. Centrarchus macropterus (Lacepede): flier.

Moore and Poole (1948), Reeves and Moore (1950).

Stations 12 and 18. M3, M1.

Although the report of Moore and Poole is the first record of the flier for the Mountain Fork River, Ortenburger and Hubbs (1927) reported it from the Little River System not far from the

Mountain Fork. We were surprised to find the species quite abundant in the swamps. There are 207 specimens catalogued in OAM.

41. Elassoma Jordan

77. Elassoma zonatum Jordan: pigmy sunfish.

Moore and Poole (1948), Reeves and Moore (1950).

Stations 12, 15 and 18. M3, 11.

This species is very common in the swamps, oxbows, and quiet backwaters near the river's mouth where it breeds in late winter and early spring. April specimens are adult, but all May, June, and August individuals are young. This absence of adults in collections of late spring and summer suggests a strong possibility that Elassoma dies after spawning.

ATHERINIDAE

42. Labidesthes Cope

78. Labidesthes sicculus (Cope): brook silversides.

Hubbs and Ortenburger (1929b).

All stations except 8, 13 and 14. MC1, MC3, MC2, M5, M4, BH2.

The brook silversides is one of the most abundant species in the river where population pressures are so great that it was found in practically all habitats. Doubtless it is an important forage of game species.

SCIAENIDAE

43. Aplodinotus Rafinesque

79. Aplodinotus grunniens Rafinesque: freshwater drum.

Station 1.

This single specimen and, the only one known to come from the Mountain Fork, was taken by means of sporting equipment -

rod and plug.

HYBRID COMBINATIONS

Notropis umbratilis umbratilis × Notropis zonatus pilsbryi

Station 12.

This single specimen was examined and identified by Dr. Carl L. Hubbs September 26, 1949, and considered (personal communication) by him as a new inter-subgeneric combination Alburnops Girard Lythrurus Jordan. The following notes are from Dr. Hubbs' letter (September 26, 1949) to Dr. Moore: The big eye, large mouth, bright silvery cheeks, opercles and mid-sides strongly suggest N. z. pilsbryi. There are 18 predorsal scales, 9 anal rays, 7 dorsal rays, and teeth 2,4-4,2. The dorsal position (midway between the caudal base and a point just in front of the snout) and a few files of melanophores following the myocommata, both definitely suggest N. u. umbratilis.

Although no specimens of N. z. pilsbryi were taken on the survey, earlier records (see item 23) indicate a possibility that a small population may be present.

Lepomis cyanelus × L. macrochirus

Station 1.

One specimen of this common hybrid was taken.

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