

1976

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Recommended Citation

Yeager, Bruce E. and Beadles, John K. (1976) "Fishes of the Cane Creek Watershed in Southeast Missouri and Northeast Arkansas," *Journal of the Arkansas Academy of Science*: Vol. 30, Article 40.

Available at: <https://scholarworks.uark.edu/jaas/vol30/iss1/40>

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Fishes of the Cane Creek Watershed in Southeast Missouri and Northeast Arkansas

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ABSTRACT

A survey of the fishes of Cane Creek in southeast Missouri and northeast Arkansas was made between 25 August 1974 and 16 July 1975. Field collections, literature records, fisherman reports, and museum specimens showed the fishes of Cane Creek to be composed of 90 species distributed among 20 families. Records of *Lampetra aepyptera* (Abbot), *Hiodon alosoides* (Rafinesque), *Etheostoma histrio* Jordan and Gilbert, and *Percina uranidea* (Jordan and Gilbert) were either the first records of these species in this stream or reaffirmed their presence.

The fish collected were common to the Ozark, Ozark-lowland, lowland, and wide-ranging faunal groups of Pflieger (1971). The Ozark faunal group was restricted primarily by topography and the confluence of Ten Mile Creek with Cane Creek. The lowland faunal group was influenced by fish migrating between Cane Creek and Black River. Channelization of lower Cane Creek in 1907 and 1908 undoubtedly influenced the immigration and emigration of fishes from Black River.

INTRODUCTION

Cane Creek is a medium-size stream originating from numerous small springs and surface runoff. The watershed is unusual in that it consists of an Ozark region and a distinct lowland region. In the Ozark region the substrate is composed of rock and gravel and pools are separated by swift rocky riffles, whereas in the lowland region the substrate is clay, silt, and sand and pools are intermittent. Farming activities have caused an increase in turbidity in the lower part of the stream.

Beginning in southeastern Carter County, Missouri, Cane Creek flows southward 68 miles to its confluence with the Black River, 8.5 miles northeast of Corning in Clay County, Arkansas. Ten Mile Creek, the only major tributary of Cane Creek, originates approximately one-half mile south of Cane Creek and flows parallel with it 29 miles to its confluence at a point due west of Poplar Bluff, Missouri. Other named tributaries are Goose and Proctor Creeks and Fletcher Branch.

No complete study of Cane Creek is known, although Pflieger (1971) reported two sites sampled between 1905 and 1945 and two sampled between 1946 and 1962 which yielded a list of 63 species. Similar studies have been conducted on the Black River and its tributaries by Black (1940), Funk et al. (1953), Funk and Campbell (1953), Martin and Campbell (1953), and Green and Beadles (1974).

The following report is based primarily upon collections made by Pflieger (1971) and the writers. All specimens taken by the writers are housed at Arkansas State University.

DESCRIPTION

Cane Creek begins at an elevation of 890 ft and drops to an elevation of 360 ft where it joins Ten Mile Creek, covering a distance of 30 miles. As the stream leaves the Ozark escarpment near Harviell, Missouri, it drops to an elevation of 315 ft in a total distance of 55 miles to produce a stream gradient of 10 ft/mile. In the lowland region the stream covers 13 miles and drops only 25 ft to an elevation of 290 ft for a stream gradient of 2.3 ft/mile (U.S. Forest Service 1964). Cane Creek originates in southeastern Carter County, Missouri, where it cuts through rocks of the Ordovician System of the Ozark Highland Physiographic Province (Fenneman 1938). Major geologic formations are the Roubidoux, composed of sandstone, chert, and fine-grained dolomite, and the Gasconade, composed of coarsely crystalline cherty dolomite with a basal sandstone (Missouri

Geological Survey 1961). The creek enters the northwest corner of Butler County, Missouri, where it turns south and runs along the western edge of the county. At a point due west of Poplar Bluff it joins Ten Mile Creek, its only major tributary. From this point, because there is little change in elevation, the stream flow slows and Cane Creek begins to assume the appearance of a lowland stream.

Channelization of the last 9 miles of the stream has left a 12-mile segment of the stream, known locally as Old Cane Creek, cut off from the rest of the system. Vegetation has taken over much of this area, leaving shallow pools with no current. However, during spring floods, fish are able to move in and out of this area. Channelization was done in 1907-1908 as a result of local complaints of annual flooding. No dredging has been done since the original work, except for minor repair of the flood levees. At the present time no major changes of the stream are planned, although flooding still occurs one to three times annually.

Although no major source of pollution for the entire system is known, several factors combine to keep the water of the lowland region turbid. In the Ozark region livestock are allowed free access to the stream and produce a source of organic fertilizer. Several land owners conduct gravel mining operations which increase the silt content of the stream. Other factors are indiscriminate removal of trees along the shore, and poor agricultural practices which allow silt and fertilizer to empty into the stream.

PURPOSE

The purpose of this study was to determine the qualitative variations of fishes in the Cane Creek watershed. Because the stream is divided into an Ozark region and a lowland region, it was thought that differences between the fish populations of the two parts might be observed. Finally the study sought to determine a preference for pool or riffle habitats by some species.

METHODS

Eight sampling stations were established within Cane Creek watershed. Two sites were on lower Cane Creek, three on Ten Mile Creek, and three on the Ozark region of Cane Creek, where access was available between 25 August 1974 and 16 July 1975. Because most of the lowland region is not suitable for seining year round, 36 supplemental samples were made by various methods.

Most specimens were collected with a 30 x 6-ft seine with ¼-in. mesh or a 12 x 4-ft seine with 3/16-in. mesh. Several specimens were taken at night with a gig. An electrofishing sample was conducted at night at the confluence of Cane Creek and Black River.

All specimens were fixed in 10% formalin for 3 to 7 days, then washed, identified, and preserved in 40% isopropanol. Identification of fishes was made from keys by Buchanan (1973), Cross (1967), Miller and Robison (1973), Moore (1968), Pflieger (1968), and Taylor (1969). Genera and species are arranged alphabetically within each family in accordance with the scheme proposed by Greenwood et al. (1966). Scientific and common names of fishes follow those of Bailey et al. (1970) except where noted.

ACKNOWLEDGEMENTS

Dr. George A. Moore, Professor Emeritus, Oklahoma State University, kindly made verification of certain darters and cyprinids. Drs. George L. Harp, V.R. McDaniel, and Dewey H. Sifford verified certain darters and cyprinids, read the manuscript, and served on the thesis committee, respectively. Several high school students from Neelyville, Missouri, and graduate students from Arkansas State University aided in the collection of fishes.

ANNOTATED CHECKLIST OF FISHES
OF CANE CREEK WATERSHED

Petromyzontidae (Lampreys)

Ichthyomyzon castaneus Girard. Chestnut lamprey.

Common inhabitant of the lower Ozark region and the lowland region.

Lampetra aepyptera (Abbott). Least brook lamprey.

Collected from shallow riffles of the Ozark region during late winter and early spring. One specimen was taken in a pool in 4 ft of water from inside a log. This is the first record of *Lampetra aepyptera* in the Black River system; however, Harp and Matthews (1975) reported this fish in Arkansas in the upper part of the White River system.

Polyodontidae (Paddlefishes)

Polyodon spathua (Walbaum). Paddlefish.

Although not represented in the writers' collections, this species has been reported by local fishermen. One report is as recent as October 1975.

Lepisosteidae (Gars)

Lepisosteus oculatus (Winchell). Spotted gar.

Common inhabitant of quiet deep pools in the lowland region.

Lepisosteus osseus (Linnaeus). Longnose gar.

Rare inhabitant of the lowland region, taken only from the channeled part. However, collecting it was extremely difficult in the lowland region of Cane Creek.

Amiidae (Bowfins)

Amia calva Linnaeus. Bowfin.

Common inhabitant of the sluggish backwaters of the lowland region and Old Cane Creek.

Anguillidae (Freshwater Eels)

Anguilla rostrata (Lesueur). American eel.

Not collected, but local fishermen report taking this species on trot lines and by gigging.

Clupeidae (Herrings)

Dorosoma cepedianum (Lesueur). Gizzard shad.

Abundant throughout the medium to large parts of the stream.

Hiodontidae (Mooneyes)

Hiodon alosoides (Rafinesque). Goldeye.

Collected in the channeled part of the stream, over sandy bottom. This is the first record of this species in the Black River system.

Hiodon tergisus Lesueur. Mooneye.

Taken only at the mouth of the stream by electrofishing. Most likely an occasional visitor from the Black River.

Esocidae (Pikes)

Esox americanus vermiculatus Lesueur. Grass pickerel.

Relatively common throughout the system, taken from shallow water in or near vegetation.

Esox niger Lesueur. Chain pickerel.

Inhabitant of deeper pools, often near surface or submerged vegetation.

Cyprinidae (Minnows)

Campostoma anomalum pullum (Agassiz). Central stoneroller.

Present throughout the watershed, from the headwaters to the lowland. Most often taken in moderate to swift current over rock and gravel bottom.

Campostoma oligolepis Hubbs and Greene. Largescale stoneroller.

Abundant throughout the Ozark region. Commonly taken over rock and gravel bottom in moderate to swift current. One of the most abundant cyprinids in the system. The writers concur with Pflieger (1971) in recognizing *C. oligolepis* and *C. anomalum* as distinct species.

Cyprinus carpio Linnaeus. Carp.

Fairly common inhabitant of shallow and deep pools, often near submerged logs and trees.

Dionda nubilata (Forbes). Ozark minnow.

One of the most common cyprinids of the Ozark region, generally inhabiting clear water over gravel bottom with moderate to swift current.

Hybognathus nuchalis Agassiz. Silvery minnow.

Collected in both the Ozark and lowland regions; however this species seems to be distributed throughout the watershed.

Hybopsis amblops (Rafinesque). Bigeye chub.

Inhabitant of clear water, often present in moderate to swift current over gravel or sand. It was last reported by Pflieger (1971).

Nocomis biguttatus (Kirtland). Hornyhead chub.

Rare inhabitant of clear water in the upland region. Collected only from shallow riffles.

Notemigonus crysoleucas (Mitchell). Golden shiner.

Common bait minnow, collected from quiet backwaters, ditches, and occasionally from the main stream.

Notropis amnis Hubbs and Greene. Pallid shiner.

An inhabitant of lowland streams. Pflieger (1971) reported this species was last collected in Cane Creek prior to 1945.

Notropis atherinoides Rafinesque. Emerald shiner.

Common inhabitant of the lower region of the stream, most often collected from sandy-bottomed pools.

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Notropis boops Gilbert. Bigeye shiner.

Collected throughout the watershed; most abundant, however, in the clear Ozark waters. One of the most abundant cyprinids in the system.

Notropis cornutus chrysocephalus (Rafinesque). Striped shiner.

Common inhabitant of rocky pools, young occasionally taken in slow riffles. The writers follow R.J. Miller (1968) in considering *N. chrysocephalus* a subspecies of *N. cornutus* (Mitchell).

Notropis fumeus Evermann. Ribbon shiner.

Fairly common inhabitant of the lowland region. Collected in pools over sand and mud bottom.

Notropis telescopus (Cope). Telescope shiner.

Moderately abundant in the clear, high-gradient areas of the watershed.

Notropis texanus (Girard). Weed shiner.

Rare cyprinid of the lowland region.

Notropis umbratilis cyanocephalus (Copeland). Northern redbfin shiner.

Frequently collected from the upper regions of the watershed and from quiet pools along the main stream.

Notropis venustus (Girard). Blacktail shiner.

Most abundant cyprinid of the lowland region.

Notropis volucellus volucellus (Cope). Northern mimic shiner.

Rare inhabitant of the turbid waters of the channeled part of the stream.

Notropis zonatus (Putnam). Bleeding shiner.

An inhabitant of clear streams with moderate to swift current. Although not represented in the writers' collections, it was reported by Pflieger (1971).

Opsopoeodus emiliae Hay. Pugnose minnow.

Rare inhabitant of the lowland region. Found in turbid water around aquatic vegetation.

Pimephales notatus (Rafinesque). Bluntnose minnow.

Common inhabitant of quiet pools, backwaters, and small tributaries throughout the watershed.

Pimephales tenellus (Girard). Slim minnow.

Rare inhabitant of the lowland area. All specimens taken were collected in the channeled region of the stream over sand and mud bottom.

Pimephales vigilax (Baird and Girard). Bullhead minnow.

Rare inhabitant of the lowland region, also taken from the channelized part.

Semotilus atromaculatus (Mitchell). Creek chub.

Common in shallow pools of small tributaries in the Ozark region.

Catostomidae (Suckers)

Erimyzon oblongus (Mitchell). Creek chubsucker.

Common inhabitant of the shallow pools of the Ozark region.

Hypentelium nigricans (Lesueur). Northern hog sucker.

One of the most abundant catostomids of the system. A common inhabitant of the deep pools and swift riffles of the Ozark region.

Ictiobus bubalus (Rafinesque). Smallmouth buffalo.

Most common buffalo fish of the system. An inhabitant of the deep pools of the lowland region, also taken from the channeled region.

Ictiobus cyprinellus (Valenciennes). Bigmouth buffalo.

Rare inhabitant of the lowland region. Its population is supported by immigration from the Black River.

Minytrema melanops (Rafinesque). Spotted sucker.

Rare inhabitant of the deep pools of the Ozark region.

Moxostoma carinatum (Cope). River redhorse.

An inhabitant of the clear waters of the Ozark region. Although not represented in the writers' collections, Pflieger (1971) reported this species.

Moxostoma duquesnei (Lesueur). Black redhorse.

Common throughout the Ozark region, but ranges well into the lowland area.

Moxostoma erythrurum (Rafinesque). Golden redhorse.

Most common redhorse in the system. Most abundant in the Ozark region but common throughout the watershed.

Ictaluridae (Catfishes)

Ictalurus melas (Rafinesque). Black bullhead.

Common inhabitant of the lowland region, drainage ditches, and backwaters.

Ictalurus natalis (Lesueur). Yellow bullhead.

Most common ictalurid occupying the Ozark region. Collected from quiet shallow pools.

Ictalurus punctatus (Rafinesque). Channel catfish.

Collected from the deep pools of the lower Ozark and lowland regions near submerged logs. Common.

Noturus gyrinus (Mitchell). Tadpole madtom.

Rare inhabitant of the lowland region. Only one specimen was taken, from a field drainage ditch.

Noturus miurus Jordan. Brindled madtom.

Most common madtom in the system. Present in both the Ozark and lowland regions. Usually collected from shallow pools.

Noturus nocturnus Jordan and Gilbert. Freckled madtom.

Collected in the lowland region from shallow pools and mud- and gravel-bottomed riffles. Uncommon.

Pylodictis olivaris (Rafinesque). Flathead catfish.

Local fishermen as well as Pflieger (1971) report the presence of this species in the system.

Aphredoderidae (Pirate Perches)

Aphredoderus sayanus (Gilliams). Pirate perch.

Rare inhabitant of sluggish backwaters of the lowland and Ozark regions. Collected in or near submerged vegetation.

Cyprinodontidae (Killifishes)

Fundulus catenatus (Storer). Northern studfish.

Uncommon throughout the Ozark region. Collected in shallow water with moderate current over gravel substrate.

Fundulus notti (Agassiz). Starhead topminnow.

Rare inhabitant of the lowland region. Collected in deep water with slow current near aquatic vegetation.

Fundulus olivaceus (Storer). Blackspotted topminnow.

Abundant throughout the watershed. Occupying quiet pools with aquatic vegetation, backwaters, drainage ditches, and evaporation pools.

Poeciliidae (Livebearers)

Gambusia affinis (Baird and Girard). Mosquitofish.

Common inhabitant of quiet pools, sluggish backwaters, and evaporation pools throughout the system. Most common in the lowland region and the channeled section.

Atherinidae (Silversides)

Labidesthes sicculus (Cope). Brook silverside.

Common throughout the watershed. Most often collected in the Ozark region, though never in large numbers.

Percichthyidae (Temperate Basses)

Morone chrysops (Rafinesque). White bass.

Rare, migrating from Black River during the spawning season from the middle and lower part of the stream.

Elassomatidae (Pygmy Sunfishes)

Elassoma zonatum Jordan. Banded pygmy sunfish.

Uncommon inhabitant but was collected in the turbid waters of sluggish backwaters and Old Cane Creek. Collected in or near submerged aquatic vegetation.

Centrarchidae (Sunfishes)

Ambloplites rupestris (Rafinesque). Rock bass.

Collected from clear pools of the Ozark region around submerged rocks or aquatic vegetation.

Centrarchus macropterus (Lacepede). Flier.

Common inhabitant of sluggish backwaters and Old Cane Creek.

Chaenobryttus gulosus (Cuvier). Warmouth.

Rare inhabitant of sluggish backwaters of the lowland region. The writers follow Miller and Robison (1973) in retaining the genus *Chaenobryttus*.

Lepomis cyanellus Rafinesque. Green sunfish.

Common throughout the lowland region.

Lepomis humilis (Girard). Orangespotted sunfish.

A rare inhabitant of sluggish backwaters. Collected only from Old Cane Creek.

Lepomis macrochirus Rafinesque. Bluegill.

Common in the lower Ozark and lowland regions.

Lepomis megalotis (Rafinesque). Longear sunfish.

The most abundant centrarchid, found throughout the watershed. An inhabitant of shallow and deep pools. Most common in the Ozark region; in the lowland region it is replaced by *L. cyanellus* and *L. macrochirus*.

Lepomis microlophus (Gunther). Redear sunfish.

Rare inhabitant of the Ozark region. Only a single specimen was collected from a shallow pool. The presence of the redear sunfish in the system is possibly due to its having escaped from local farm ponds.

Lepomis punctatus (Jordan). Spotted sunfish.

This species last was collected from Cane Creek before 1945 (Pflieger 1971).

Micropterus dolomieu Lacepede. Smallmouth bass.

Uncommon centrarchid of the clear Ozark headwaters.

Micropterus punctulatus (Rafinesque). Spotted bass.

Most abundant bass in the system. Collected throughout the watershed from pools and riffles.

Micropterus salmoides (Lacepede). Largemouth bass.

Fairly common inhabitant of the entire watershed.

Pomoxis annularis Rafinesque. White crappie.

Confined to the turbid waters of the channelized region and the sluggish waters of Old Cane Creek.

Pomoxis nigromaculatus (Lesueur). Black crappie.

Common throughout the watershed. Most often taken from clear pools.

Percidae (Perches)

Etheostoma blennioides Rafinesque. Greenside darter.

A common resident of swift riffles of the Ozark region. A few specimens were taken from the lowland region over sandy bottom.

Etheostoma caeruleum Storer. Rainbow darter.

The most abundant darter in the system. Collected throughout the Ozark region in slow to swift current over gravel bottom.

Etheostoma chlorosomum (Hay). Bluntnose darter.

Collected only from the channeled part of the system. Taken from quiet pools over sandy bottom.

Etheostoma flabellare Rafinesque. Fantail darter.

A resident of the headwaters and small clear tributaries of the Ozark region. Collected from swift riffles over gravel and rocky bottom. Pflieger (1971) reported that the nominate subspecies, *E. f. flabellare*, inhabited the upper two thirds of the Current and Black River systems whereas *E. f. lineolatum* (Agassiz) possibly intergrades with the nominate subspecies in the lower Current River.

Etheostoma gracile (Girard). Slough darter.

Rare inhabitant of sluggish pools and backwaters of Old Cane Creek and the lowland region. Most often collected in or near aquatic vegetation.

Etheostoma histrio Jordan and Gilbert. Harlequin darter.

Rare inhabitant of the lowland region. All specimens were taken from moderate to swift current over mud and sand bottom.

Etheostoma nigrum Rafinesque. Johnny darter.

Uncommon inhabitant of moderate riffles and shallow pools of the Ozark region.

Etheostoma proeliare (Hay). Cypress darter.

Common inhabitant of quiet sandy-bottomed pools of the Ozark region.

Etheostoma spectabile (Agassiz). Orangethroat darter.

Common inhabitant of the headwaters, collected from swift current over gravel or rubble bottom.

Etheostoma stigmaeum stigmaeum (Jordan). Speckled darter.

Common throughout the lowland region, most often taken from quiet pools over sandy bottom.

Etheostoma zonale (Cope). Banded darter.

Rare inhabitant of the lower Ozark and lowland region.

Percina caprodes (Rafinesque). Logperch.

Uncommon inhabitant of shallow pools and deep riffles of the Ozark region. Also collected from sandy areas of the lowland region.

Percina maculata (Girard). Blackside darter.

Uncommon inhabitant of the lower Ozark and lowland regions. Collected in moderate to slow current over gravel and sandy bottom.

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Percina sciara (Swain). Dusky darter.

Rare inhabitant of the lower Ozark and lowland regions.
Collected from slow current over a sandy bottom.

Percina uranidea (Jordan and Gilbert). Stargazing darter.

The most abundant member of the genus *Percina* in the system.
Collected from moderate to slow current over gravel and sandy bottom. Found in the lower Ozark and lowland regions.

Stizostedion vitreum (Mitchell). Walleye.

Local fishermen report the walleye to be rare in the deep pools of the lowland region. Not collected by the writers.

Sciaenidae (Drums)

Aplodinotus grunniens Rafinesque. Freshwater drum.

Rare inhabitant of deep pools in the lowland region.

DISCUSSION

The known fish fauna of Cane Creek watershed is composed of 90 species distributed among 20 families. The great ichthyofaunal diversity is due to the presence of an Ozark region and a lowland region in the watershed. This survey resulted in a range extension of *Lampetra aepyptera*, *Hiodon alosoides*, and *Pimephales tenellus*. It reaffirms the continued presence of *Esox niger*, *Opsopoeodus emiliae*, *Noturus gyrinus*, *Etheostoma histrio*, and *Percina uranidea* populations as reported by Pflieger (1971).

Of the several species reported by Pflieger (1971) and not collected by the writers, the most unusual are *Hybopsis ambiops* and *Notropis zonatus*. Both species are typically Ozarkian and are common in the major Ozark streams of the area. The failure to collect either of these species suggests that they may have been eliminated from the system as a result of either a changing stream environment, competition, gravel mining operations, indiscriminate removal of trees along the shore, or poor agricultural practices. This hypothesis is reinforced by Pflieger (1971), who last reported these species prior to 1945.

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