

1993

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Recommended Citation

Board, Veryl V.; Allen, Charlotte; and Reeves, Andrea (1993) "Ichthyofauna of a Cypress-Tupelo Swamp," *Journal of the Arkansas Academy of Science*: Vol. 47, Article 32.

Available at: <https://scholarworks.uark.edu/jaas/vol47/iss1/32>

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Ichthyofauna of a Cypress-Tupelo Swamp

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The objectives of this paper are to list the families and species of ichthyofauna collected in Hattie's Brake and the immediate surrounding area, and to note the presence of ichthyofauna not commonly found in the Black River drainage. Hattie's Brake, which can be classified as an alluvial river swamp, is a small cypress-tupelo swamp surrounded by cultivated fields and located in the Black River bottoms in Independence County, 6.4 km east of Cord, Arkansas (Mitsch and Gosselink, Wetlands, 1986). The exact area of study was concentrated in 12N; 3W; 25. Those sections immediately surrounding the study area (e.g., Sections 23, 24 and 26) are currently used for agricultural purposes, such as growing rice, soybeans, and sorghum.

Hattie's Brake takes the form of an oxbow lake, which may have resulted when meanders from the nearby Black River were cut off by sedimentary deposits. The swamp itself covers approximately 8.1 ha in permanently standing water on a 67 m contour. Its depth ranges from 91 cm to 183 cm, with 91 cm to 122 cm being the average depth. It has a soft mud bottom which is laden with debris.

Both Saltwork and Milligan Sloughs drain into the swamp, but only Milligan Slough feeds directly into the swamp year around. During flood season the Black River, which lies less than 1.6 km to the south of Hattie's Brake, rises from its normal 64 m above sea level to 67 m or above, thus backing up water into tributaries which overflow into the swamp.

Hattie's Brake has remained permanently flooded throughout the year, with only seasonal fluctuations in water level, for between 10 and 15 yrs. Extremely low water levels occurred during the summer and early fall of 1991, when the water level of the swamp fell to such a point that the arm of Milligan Slough which feeds into the brake was reduced to small isolated pools of standing water.

An increase in the concentration of dissolved nutrients can be seen after seasonal flooding of the Black River and other tributaries occurs and the water levels return to normal. This nutrient increase along with slowly flowing waters and low turbidity, not only encourages the growth of bald cypress and water tupelo, but also leads to the development of healthy growths of duckweed mats (e.g., *Lemna* spp. and *Spirodela* spp.) and to a large and diverse population of invertebrates including crayfish, snails, freshwater shrimp, clams, amphipods, and insects. The presence of bald cypress and water tupelo in combination

with the growth of duckweed mats and invertebrates play an important role in both the spawning and breeding habits of the many fish species that permanently inhabit similar swamps (Mitsch and Gosselink, Wetlands, 1986).

During a three year study of Hattie's Brake and the immediate surrounding area, excluding the Black River, fish were collected from various sites in and around the swamp. The sites ranged from isolated pools to sloughs that flowed directly into the swamp to backwaters created by beaver dams to the main body of the swamp. A majority of the specimens collected came from the main body of the swamp, with the second largest sampling coming from backwaters and sloughs, isolated pools were the least sampled because of the great fluctuation in water level. Most of the specimens were collected during the spring, summer, and early fall, with only a few specimens collected in late fall and winter.

Three seines, sizes 1.2 m x 3.1 m, 1.2 m x 6.1 m, and 1.8 m x 9.1 m, in addition to several kick nets were used to capture the fish from these areas. The fish were temporarily stored in 10% formalin once they were collected and then preserved permanently in 70% isopropanol. Keys from H.W. Robison's and T.M. Buchanan's (1988) book *Fishes of Arkansas* and W.L. Pflieger's, (1978) book *The Fishes of Missouri* were used to confirm the identification of fish species.

Thirty-one species of fish representing fourteen families have been identified as permanent inhabitants of Hattie's Brake and the immediate surrounding area as listed in Table 1, the list compiled probably represents the majority of the ichthyofauna of the swamp. It is interesting to note that four species of fish, not commonly found within the Black River or the area surrounding it, were collected at Hattie's Brake. The flier (*Centrarchus macropterus*), which was collected from several different sites in the swamp, has an erratic distribution within the state and is not commonly found in the northeastern region of Arkansas. The orangespotted sunfish (*Lepomis humilis*), which has a wide-spread distribution over the state but isn't commonly found in the Black River, was also found at the swamp. The other two species collected, the swamp darter (*Etheostoma fusiforme*) and the slough darter (*Etheostoma gracile*), also have a limited distribution within the Black River system. The swamp darter, which was collected from two different areas at Hattie's Brake, has an extremely limited distribution within the state (Robison and Buchanan, *Fishes of Arkansas*, 1988).

Our appreciation is expressed to Mr. Jim Barnett, representing the owners, and to Mr. Don Colemann, who leases the land, for their cooperation in allowing us entry into the study area. The study has been supported by funds from the Natural Sciences and Mathematics Division and by a faculty development grant from Arkansas College.

Table 1. Fishes of Hattie's Brake

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- I. **Lepisosteidae** Gars
 - A. *Lepisosteus oculatus* (Winchell). Spotted Gar.
 - B. *Lepisosteus osseus* (Linnaeus). Longnose Gar.
 - C. *Lepisosteus platostomus* Rafinesque. Shortnose Gar.
 - II. **Amiidae** Bowfins
 - A. *Amia calva* Linnaeus. Bowfin.
 - III. **Clupeidae** Herrings
 - A. *Dorosoma cepedianum* (Lesueur). Gizzard Shad.
 - IV. **Esocidae** Pikes
 - A. *Esox americanus* Gmelin. Grass Pickerel.
 - V. **Cyprinidae** Minnows and Carps
 - A. *Campostoma anomalum* (Rafinesque). Central Stoneroller.
 - B. *Cyprinus carpio* Linnaeus. Common Carp.
 - C. *Notemigonus crysoleucas* (Mitchill). Golden Shiner.
 - VI. **Catostomidae** Suckers
 - A. *Carpiodes carpio* (Rafinesque). River Carpsucker.
 - VII. **Ictaluridae** Bullhead catfishes
 - A. *Ictalurus melas* (Rafinesque). Black Bullhead.
 - B. *Ictalurus natalis* (Lesueur). Yellow Bullhead.
 - VIII. **Aphredoderidae** Pirate perches
 - A. *Aphredoderus sayanus* (Gilliams). Pirate Perch.
 - IX. **Fundulidae** Killifishes
 - A. *Fundulus dispar* (Agassiz). Northern Starhead Topminnow.
 - B. *Fundulus notatus* (Rafinesque). Blackstripe Topminnow.
 - C. *Fundulus olivaceus* (Storer). Blackspotted Topminnow.
 - X. **Poeciliidae** Livebearers
 - A. *Gambusia affinis* (Baird and Girard). Mosquitofish.
 - XI. **Atherinidae** Silversides
 - A. *Labidesthes sicculus* (Cope). Brook Silverside.
 - XII. **Centrarchidae** Sunfishes
 - A. *Centrarchus macrochirus* (Lacépède). Flier.
 - B. *Lepomis cyanellus* (Rafinesque). Green Sunfish.
 - C. *Lepomis gulosus* (Cuvier). Warmouth.
 - D. *Lepomis humilis* (Girard). Orangespotted Sunfish.

- E. *Lepomis macrochirus* (Rafinesque). Bluegill.
 - F. *Lepomis megalotis* (Rafinesque). Longear Sunfish.
 - G. *Lepomis microlophus* (Gunther). Redear Sunfish.
 - H. *Lepomis punctatus* (Valenciennes). Spotted Sunfish.
 - I. *Micropterus salmoides* (Lacépède). Largemouth Bass.
 - J. *Pomoxis annularis* (Rafinesque). White Crappie.
- XIII. **Elassomatidae** pygmy sunfishes
- A. *Elassoma zonatum* (Jordan). Banded Pygmy Sunfish.
- XIV. **Percidae** Perches
- A. *Etheostoma fusiforme* (Girard). Swamp Darter.
 - B. *Etheostoma gracile* (Girard). Slough Darter.
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