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Distribution and Habitat of the Taillight Shiner, *Notropis maculatus* (Hay), in Arkansas

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ABSTRACT

The distribution of the taillight shiner, *Notropis maculatus* (Hay), within Arkansas is discussed based on personal collections, literature citations and a search of museum records. *N. maculatus* appears to be a typical Coastal Plain physiographic province inhabitant occurring below the Fall Line, and it nears its western and northern range limits west of the Mississippi River in Arkansas. Data are provided on preferred habitat, and suggestions are provided as to the current status of the taillight shiner within Arkansas.

INTRODUCTION

Cyprinid fishes of the genus *Notropis* are among the most numerous, yet least known species taxonomically and distributionally of the Arkansas ichthyofauna. One of these, the taillight shiner, *Notropis maculatus* (Hay), is a small, distinctive shiner which ranges from southeastern Kentucky to extreme southeastern Oklahoma, east along the Gulf Coast to Florida, and north to the Waccamaw drainage in North Carolina (Miller and Robison, 1973; Cowell and Barnett, 1974; Burr and Page, 1975). Within Arkansas this shiner nears the western and northern terminus of its range west of the Mississippi River and previously has been seldom encountered, due in part to its small size and inadequate collecting of the lowland, often inaccessible habitats preferred by this species. Such reported scarcity originally precipitated listing of *N. maculatus* as rare and vulnerable (rare) in Arkansas by Robison (1974) and Buchanan (1974), respectively. New collections from throughout the Coastal Plain are now available necessitating a redescription of the geographic range of *N. maculatus* within Arkansas and a re-evaluation of its status within the state. In a continuing series of papers dealing with the Arkansas ichthyofauna, this study details known localities for *N. maculatus* in Arkansas based on extensive personal collections, literature citations, and a search of museum records. Data are presented on preferred habitat, and suggestions are provided on the current status of *N. maculatus* within the state.

METHODS AND MATERIALS

Material used in this study is housed variously in the Southern Arkansas University Vertebrate collection, the Arkansas State University Museum, and the Northeast Louisiana University Museum of Zoology. In addition, several locality records were gleaned from the literature. Specific locality data are presented in the form of museum records by county in Arkansas. Localities are not repeated, although several collections may have been made at the same time or site. The appropriate museum catalog number is followed by the number of specimens (in parentheses), and brief locality data with survey coordinates are provided when available. The following institutional abbreviations are used in the text: SAU - Southern Arkansas University; ASU - Arkansas State University; and NLU - Northeast Louisiana University.

In order to gain insight into the habitat preferences of *N. maculatus*, certain physicochemical parameters were measured in accordance with standard methods (American Public Health Association, 1971) at selected sites in the Ouachita River basin where the species was collected. Additional habitat data were assembled from detailed field notes of ten collections of *N. maculatus* made by the writer.

DISTRIBUTION

In Arkansas, *N. maculatus* has been previously reported from several scattered localities throughout the Coastal Plain physi-

graphic province. Initially, Black (1940) reported *N. maculatus* from Arkansas on the basis of two juvenile specimens taken during his state ichthyofaunal survey from the upper Saline River (Ouachita River system). Not until over thirty years later were additional specimens collected from Bayou Dorcheat (Red River system) in Columbia County, by the author, thus re-establishing its presence in Arkansas. Buchanan (1973) illustrated this locality along with another site in the St. Francis River drainage in eastern Arkansas. Since that time, an additional 23 collections from 16 different locations in Arkansas have been made by the author and others.

Typically, as in other areas of its range, these new collections suggest *N. maculatus* occupies low-gradient streams below the Fall Line in the Coastal Plain physiographic province of Arkansas (Figure 1). The Fall Line is an ecotonal belt of varying width (Thornbury, 1965) which describes an abrupt transition from the Coastal Plain physiographic region to the Interior Highlands. Previous collections, a recent survey of the Arkansas River (Buchanan, 1976), and several ongoing ichthyofaunal surveys of the tributary streams of the Arkansas River have failed to reveal the presence of the taillight shiner above the Fall Line.

N. maculatus nears its northern range limits west of the Mississippi River in northeastern Arkansas, as Pflieger (1975) noted only four localities in Missouri. These are in the state's extreme southeastern tip near the Arkansas-Missouri border. Within Arkansas the northernmost record for *N. maculatus* (ASU 2551) was collected near the Fall Line from an oxbow lake of the Black River in Randolph County. *N. maculatus* is apparently able to take advantage of the suitable backwater habitat conditions of the Black River northward along its margins as the river traverses the eastern edge of the Ozark Plateau, thus penetrating into the lowlands of southeastern Missouri.

An apparent hiatus which seems to exist between these northern Arkansas populations in Craighead, Jackson, and Randolph Counties (Figure 1) and more southerly ones is probably a reflection of the paucity of collecting along the lower White, L'Anguille, and St. Francis rivers and the associated lowland streams dissecting this region rather than an indication of true absence. *N. maculatus* is quite common in the extreme southeastern portion of the state in many of the oxbows along the Mississippi River, especially those east of the levee near the river proper. Many of the weed-choked borrow pits along and seasonally contiguous with the river are inhabited by the taillight shiner. The taillight shiner appears to become more abundant in the southern portion of the state, particularly in the Ouachita River system where the largest collections appear; however, this may simply reflect a more intensive collecting effort in this precise area. Two of the largest series known from Arkansas (NLU 31553 of 129 specimens and NLU 31679 of 211 specimens) were both taken from backwater areas along the Ouachita River. The largest series (NLU 32152 of 239 specimens) was collected from Bayou Bartholomew in Jefferson County.

Westward *N. maculatus* becomes less common, although it probably inhabits some of the numerous oxbows of the Red River and Little River systems which have not yet been adequately sampled. Suitable habitat abounds along these systems. However, although

several ichthyofaunal surveys have been conducted in the Arkansas portion of the Little River system, no taillight shiners have been captured (Ethrige, 1974; Cloutman and Olmsted, 1974; Douglas, pers. comm.; pers. collections).

Listed below are the localities from which records have been assembled. Localities are listed only once, even though more than one collection may have been taken from that particular site.

ARKANSAS CO.: Bayou Meto (Buchanan, 1974). **ASHLEY CO.:** NLU 31553 (129). Backwaters of Ouachita River at U. S. Hwy. 82. **BRADLEY CO.:** NLU 31679 (211). Backwaters of Ouachita River in Moro Bay State Park. **CALHOUN CO.:** SAU uncat. (8). Backwater of Ouachita River along U. S. Hwy. 167, 12 mi. S.W. of Hampton (Sec. 2, T16S, R14W). SAU uncat. (1). Locust Bayou, 3.5 mi. S. of Locust Bayou, Ark. **CHICOT CO.:** SAU uncat. (15). Barrow pit under U. S. 82 bridge over Mississippi River. SAU uncat. (21). Borrow pit 8 mi. S. of U. S. Hwy. 82 bridge. **COLUMBIA CO.:** SAU uncat. (1). Big Creek at St. Hwy. 132, 1 mi. W. of Magnolia. SAU uncat. (12). Bayou Dorcheat at St. Hwy. 160 bridge (Sec. 9, T19S, R22W). **CRAIGHEAD CO.:** ASU 2993 (1). St. Francis River, 1.4 mi. N. of Lake City. ASU 4880 (13). Oxbow of St. Francis River (Sec. 14, T14N, R63). **GRANT CO.:** Saline River (Black, 1940). **JACKSON CO.:** ASU 2745 (18). Village Creek, 1 mi. S. of Alicia (Sec. 4 and 9, T14N, R1W). ASU 2908 (5). Village Creek, 3.5 mi. E. Tuckerman (Sec. 26, T12N, R2W). **JEFFERSON CO.:** NLU 32052 (239). Bayou Bartholomew (Sec. 28, T6S, R9W). **MONROE CO.:** Tributary to Water's Bayou near Hog Thief Lake, White River National Wildlife Refuge (Buchanan, 1974). **RANDOLPH CO.:** ASU 2551 (20). Oxbow of Black River, Gas Plant lake (Sec. 35, T20N, R2E). **ST. FRANCIS CO.:** Keithley Lake (Buchanan, 1974). **UNION CO.:** NLU 31432 (24). Backwaters of Ouachita River, ½ mi. E. of U. S. Hwy. 167 on road to Calion. SAU uncat. (5). Grand Marais Lake near Hutgig.

HABITAT

Pflieger (1971) reported *N. maculatus* from sluggish sections of lowland rivers and creeks in Missouri. Miller and Robison (1973) described similar preferred habitat in Oklahoma. Douglas (1974) collected most specimens in Louisiana in quiet bayous, oxbows and large lakes and less often in rivers and streams. In Arkansas, the taillight shiner seems to show a proclivity for shallow, tannin-stained waters of low-gradient streams, sloughs, lakes, including oxbows, and swamps of the Coastal Plain physiographic province, particularly

those less disturbed portions. Localities in lotic situations where *N. maculatus* is taken are typically backwater areas, without direct current, over substrates of decomposing vegetation, silt and soft mud. Gravel areas are generally avoided as are swifter stream sections. In lentic waters *N. maculatus* typically frequents weed-choked lake margins, but also can be found distributed in deeper waters. *N. maculatus* seems to prefer waters with medium to heavy aquatic vegetation, including *Mynriophyllum*, *Lemna*, *Typha latifolia* L., *Nuphar* sp., and *Taxodium distichum* (L.) Rich. Field and laboratory observations suggest *N. maculatus* is a schooling, mid-water shiner which utilizes the luxuriant aquatic vegetation normally present for cover. Many of the lowland streams where *N. maculatus* occurs have a moderate to heavy canopy of bottomland hardwoods; however, the species frequents areas in the middle of oxbow lakes such as Grand Marais, Union County, away from any cover, where water temperatures are relatively higher than in marginal areas.

Streams in the Ouachita River basin, where *N. maculatus* was studied in more detail, were characterized by the following physico-chemical parameters: pH ranged from 6.1 to 6.9; dissolved oxygen from 5.3 to 7.0 mg/l; total solids of 105 to 162 mg/l; and dissolved solids of 97 to 141 mg/l. The highest recorded water temperature associated with this species was 26°C. Turbidity ranged from less than 25 to 130 Jackson turbidimeter units. While these data are not intended to be indicative of parameter limits for *N. maculatus*, they are suggestive of the general type of waters frequented.

STATUS

Unfortunately, there is little baseline data to clearly illustrate the decline of the taillight shiner in the ecologically disturbed areas of the Coastal Plain physiographic province, especially of the eastern sector of Arkansas. Early workers neglected these inhospitable lowland regions of the state in favor of the clear, swift streams of the Ozark uplands. Because of the scarcity of documented collections and known destruction of habitat in eastern Arkansas both Robison (1974) and Buchanan (1974) chose to list *N. maculatus* as a rare state inhabitant until further work could be done to more clearly establish the status of this shiner. With additional intensive collecting over the past few years throughout the Coastal Plain, the status of *N. maculatus* can presently be refined more accurately.

N. maculatus has probably inhabited the lower Mississippi Valley since preglacial time (Pflieger, 1971) and thus probably the Coastal Plain province of Arkansas. There is little doubt that *N. maculatus* has declined in abundance in the once sluggish, meandering streams of eastern Arkansas. Channelization, clearing of prime timberland and the widespread application of pesticides to row crops in historic times have drastically altered the ecological balance of that region of the state (Holder, 1970) thereby destroying or otherwise altering streams which probably were formerly inhabited by *N. maculatus*.

Nevertheless, despite its probable extinction from some areas of its former range in eastern Arkansas, *N. maculatus* seems to be surviving adequately in sloughs, oxbow lakes, margins of various large rivers and in sluggish streams of the less ecologically disturbed south-central and southwestern portions of the state, particularly in the Ouachita River system. Because of the number of recent collections in Arkansas indicating a rather widespread, if spotty, occurrence within the state, a status of "uncommon" is urged for *N. maculatus*.

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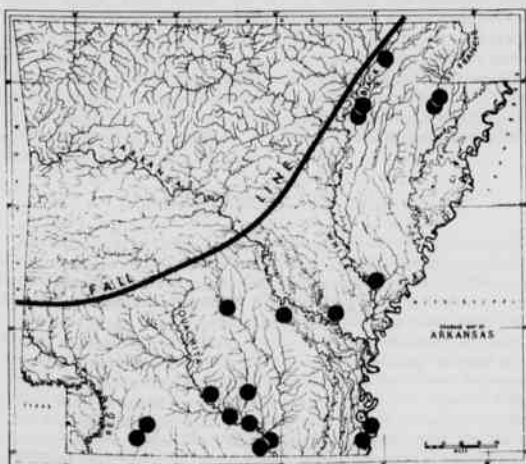


Figure 1. Distribution of *Notropis maculatus* in Arkansas.

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