

WHAT EVER HAPPENED TO THE SILVERY MINNOW *HYBOGNATHUS NUCHALIS* IN THE TENNESSEE RIVER?



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During the winters of 1977 and 1978 we, accompanied by TVA biologists Charles Saylor, Gary Hickman, and Joe Feeman; and University of Tennessee graduate students Noel Burkhead, John Harris, and Dave Nieland, had the opportunity to spend two weeks in the University of Michigan Museum of Zoology for the purpose of sorting fish collections from the Tennessee River system. Samples had been collected by TVA field crews during 1937–43, and then sent to Michigan for identification and deposition in accordance with an agreement between TVA and Dr. Carl L. Hubbs. Although a large number of these samples had already been sorted and catalogued by UMMZ staff, an inventory of 256 unsorted samples comprising over 49,000 specimens remained. We thank TVA for defraying travel expenses, and Ms. Ellie Baker and Drs. R. M. Bailey and R. R. Miller for cooperating with us at UMMZ.

A large amount of our time was spent counting small purple stonerollers and Warpaint Shiners, and separating large mixed series of the very similar *Notropis volucellus*, *N. stramineus*, and Sawfin Shiner (*Notropis* sp.). We did uncover a number of unexpected and extremely interesting records, several of which are reported here. A limited number of xerox copies of the collection summaries are still available from the authors.

Hybopsis cahnii, the Slender Chub, always considered as endemic to the Clinch and Powell rivers in Tennessee, is now represented by a single adult specimen from Holston River at “island above Three Springs,” Hamblen Co., Tenn., 14 Sept. 1941. This locality, at Holston River Mile 87.2, is now under Cherokee Reservoir, which was impounded in December, 1941.

Hemitremia flammea, the Flame Chub, is currently restricted to four known localities in the upper Tennessee River system. The

TVA collections indicated that it formerly occurred in nine additional sites in Blount, Loudon, Rhea, and Roane counties, Tenn.

Notropis ariommus, the Popeye Shiner, was previously represented from the Holston River system by a single specimen collected in 1888 in Watauga River, Carter Co., Tenn. (Gilbert, 1969). The TVA collections revealed its former presence in both Robinson and Poor Valley creeks, tributaries to the lower Holston River (Cherokee Reservoir) in Hawkins Co., Tenn.

Percina maculata, the Blackside Darter, an extremely rare species in the upper Tennessee River system, was represented by one specimen from Poplar Creek, tributary to the lower Clinch River, Roane Co., Tenn.

Percina macrocephala, the Longhead Darter, previously known from a single 1967 specimen from the Little Pigeon River (French Broad River System) was represented by an additional specimen from Walden Creek, tributary to West Fork Little Pigeon River at Pigeon Forge, Sevier Co., Tenn.

Percina copelandi, the Channel Darter, was previously represented in the main channel of the Tennessee River by a single 1893 collection of seven specimens (USNM 70686) from the Tennessee River five miles west of Knoxville, Knox Co., Tenn. (R. D. Suttkus, in Lit.). Other Tennessee River system records were restricted to the Clinch-Powell system of the upper Ten-



Mississippi Silvery Minnow (Menorkenut Slough, Butler County, MO). “Mississippi” was added to the accepted common name by Robbins et al. (1980) after this article’s original publication. (Photo by Konrad Schmidt)

Editor’s Note: This article originally appeared in the *Southeastern Fishes Council Proceedings* (January 1979). We are reprinting it here as another acknowledgement of the many significant contributions David and Bruce made to ichthyology during their careers (see remembrances for both in the Summer 2023 AC). It is also a valuable reminder of the importance of collections that may hold secrets of lost fauna that would otherwise go undetected. David’s article in the Spring 2016 issue of *American Currents* (“Serendipity: the *Nothonotus wapiti* Story,” available at <http://www.nanfa.org/ac/serendipity-nothonotus-wapiti.pdf>) also involved collections and another species almost slipping through the cracks into oblivion.

nessee. It was represented by a specimen from the lower Tennessee River at the upper end of Blood Island, Calloway Co., Ky., 22 Oct. 1942. Kentucky Reservoir, impounded in 1944, now covers this area.

Hiodon alosoides, the Goldeye, not recently collected from the entire Tennessee River system but possibly persistent in the extreme lower portion of the river, was represented by specimens from Kentucky Dam site, and from the mouth of Pond Creek in the upper Tennessee River in Loudon Co., Tenn.

A trammel net sample from the main channel of the Tennessee River near Decatur, Alabama, contained only 58 specimens and 11 species, dominated by *Ictiobus bubalus*, the Smallmouth Buffalo (23) and *Ictalurus punctatus*, the Channel Catfish (12). Of the remaining 23 specimens, 5 were *Acipenser fulvescens*, the Lake Sturgeon, 3 were *Scaphirhynchus platyrhynchus*, the Shovelnose Sturgeon, and 1 was *Cycleptus elongatus*, the Blue Sucker. All of those are currently extremely rare or extirpated from the Tennessee River system.

Notropis stramineus, the Sand Shiner, is currently of spotty occurrence in the upper Tennessee River system only in the lower Little Pigeon and Little rivers. It was formerly much more widespread, occurring in 28 of the TVA samples from tributaries to the Tennessee and lower Clinch rivers in Roane County, and upstream through Tennessee, Holston, and French Broad River tributaries in Blount, Knox, Loudon, Hamblen, Hawkins, Grainger, Jefferson, and Cocke counties.

It is obvious from these records that many changes have occurred in the Tennessee River fish fauna coincident with main channel impoundments (Wilson Reservoir, 1924; Wheeler, 1936; Pickwick, 1938; Guntersville, 1939; Chickamauga, 1940; Watts Bar, 1942; Loudon, 1943; Kentucky, 1944), and major tributary impoundments (Norris Reservoir, 1936, Clinch River; Cherokee, 1941, Holston River; Douglas, 1943, French Broad River; Fontana, 1944, Little Tennessee River). It is not surprising to note the disappearance of many of the above species in response to drastic alteration of the Tennessee River system. The decrease in range of the supposedly tolerant *Notropis stramineus* is difficult to explain, but it may be related to this shiner's finding suitable habitats only in and near mouths of small tributaries to the Tennessee River and its larger tributaries. Our lack of knowledge concerning the ecology of this species is apparent.

Even more surprising, and finally justifying the title of this paper, is the apparent complete disappearance of *Hybognathus nuchalis*, the Silvery Minnow from the entire Tennessee River system since the early 1940s. It was common in pre-impoundment small stream samples (Fig. 1), and was often the dominant species in both numbers and biomass. The explanation for this sudden demise is lacking, but we suspect that *H. nuchalis* depended on an unimpounded Tennessee River for certain aspects of its life history. The apparent isolation of the former upper Tennessee River population (Fig. 1) is probably a collection artifact, since pre-impoundment samples between Rhea Co., Tenn., and Marshall Co., Ala., are lacking or virtually lacking. The same paucity of pre-impoundment collections prevails from areas near or in the Tennessee River between Pickwick Dam and the Kentucky border, and *H. nuchalis* was likely present in that area.

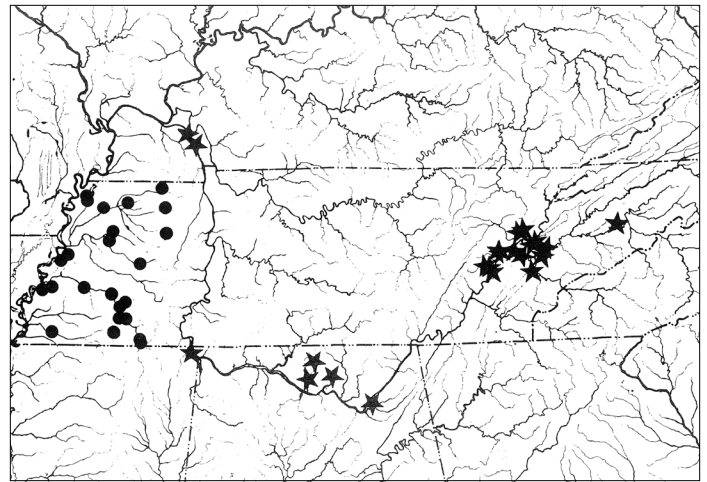


Figure 1. Distribution of *Hybognathus nuchalis*. Stars represent its distribution in the Tennessee River prior to impoundment. Dots represent the present-day distribution of *H. nuchalis* in Tennessee.

Species composition of the samples suggests that, even though rotenone was often used, little attempt was made to adequately sample riffle communities. Pool-inhabiting cyprinids, catostomids, and centrarchids dominate the samples, and unfortunately, only occasional specimens of *Phenacobius*, *Erimystax* chubs, and riffle darters were encountered. More to be regretted is the almost complete lack of collections of small fishes from the main channel of the Tennessee River. Apparently, there was little appreciation of the possibility that there may have been strictly riverine small fishes that never or only rarely ventured into tributary streams. It seems highly likely that the Tennessee River was inhabited by one or more such species that are now extinct and were never seen.

There is ample evidence provided by changing fish and mussel faunas to indicate that the Tennessee no longer exists as a river. The foremost aquatic biologists of the late 1930s could not have predicted the effects of impoundment on species such as *Hybognathus nuchalis*, *Notropis stramineus*, and *Hiodon alosoides*. The loss of the Tennessee River is an environmental tragedy of immense proportions, but equally tragic is our failure to be sufficiently impressed by the historical lessons to be learned. It is obvious that we are still unable to accurately assess the effects of habitat alteration on the faunas involved, and that any habitat alteration involving complex faunas is almost certain to adversely affect one more of the involved species. The overwhelming lesson is that habitat alteration will, often in ways we cannot guess, result in continued species decimation. Although our knowledge of the biota is incomplete, we are sufficiently informed to say unequivocally that the environmental effects of any major water project will never be "insignificant."

Literature Cited

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