

Evidence of a Contact Zone for Mudpuppies (*Necturus* sp.) in the Lower Mississippi River Basin

Steven G. George and William T. Slack

U.S. Army Corps of Engineers
Engineer Research and Development Center
Environmental Laboratory
Vicksburg, Mississippi 39180 (Steven.G.George@usace.army.mil)

Photographs by the senior author.

The Mudpuppy, *Necturus maculosus*, is frequently recognized as having two subspecies, *Necturus m. maculosus* and *N. m. louisianensis* (e.g., Crother et al. 2008). Originally described as distinct species (Viosca 1937, Cagle 1954) due to their allopatric distributions and distinct morphological features, the two forms are distinguished primarily based on the presence/absence of midventral spots (Powell et al. 1998). Disagreement over the taxonomic status of these forms continues.

While sampling for fishes in the lower White River in Arkansas with trotlines baited with worms (long lines with hooks suspended at intervals), we collected 12 *Necturus* sp. in late January 1999. Further examination revealed eight *Necturus maculosus* and four (based on the absence of midventral spots) *N. louisianensis*. The latter is the only form recorded in Arkansas (Trauth et al. 2004).

Specimens (ten males and two females) ranged in size from 221–226 mm total length (TL). The salamanders were collected in 7.9–10.7 m of water with a substrate of rip-rap (boulder-sized rocks used for bank stabilization) and articulating concrete mats (ACM) at a water temperature of 9 °C. The rocky substrate may act as a refuge. The identity of the Mudpuppies was verified by Dr. Stan Trauth. Preserved specimens were deposited in the Herpetology Collection at Arkansas State University and represent new county records for Desha County, Arkansas (ASUMZ 31398–31409).

Catching Mudpuppies on baited hooks has been reported by many authors (e.g., Brimley 1920, Cagle 1957, Shoop and Gunning 1967). In Louisiana, Cagle (1957) used a variety of hooks and lines but found setlines were satisfactory in catching adult *Necturus*. Shoop and Gunning (1967),

while studying seasonal activity of *Necturus*, used liver as bait for their hook-and-line sets but found electrical shocking to be more effective. In addition, several of these authors (Cagle 1957, Shoop and Gunning 1967) reported catching a fair number of *Necturus* around logjams or structure.

Over a ten-year span of seasonal sampling of the Lower Mississippi River for Pallid Sturgeon (*Scaphirhynchus albus*) using trotlines baited with worms, we have captured only three additional *Necturus*. The lack of *Necturus* in our samples could be due to our sampling efforts and the targeted habitats. The majority of our samples were taken in the main



William E. Lancaster, commercial fisherman, with a *Necturus* hooked on a trotline in the lower White River in Arkansas.



Ventral view of *Necturus maculosus* collected on a trotline in the Mississippi River near Cairo, Illinois.



Ventral view of *Necturus maculosus* collected on a trotline in Claiborne County, Mississippi.



A series of Mudpuppies collected on trotlines in the Lower White River of Arkansas. Patterns of midventral pigmentation suggest the occurrence of two different species.

channel over sand and gravel, and generally not over substrates of rip-rap or ACM. Of these three specimens, only one was retained as a museum voucher. The voucher specimen was a female *N. maculosus* measuring 265 mm TL. That specimen was collected in mid-January 2002 with a water temperature of 5.9 °C over rip-rap in 7 m of water. It represented a new

county record for Claiborne County, Mississippi and was deposited in the Herpetological Collection at the Mississippi Museum of Natural Science in Jackson (MMNS 16712). Of the remaining two specimens, one was measured, photographed, and released; the remaining specimen was retained live for educational purposes. The photographed Mudpuppy was *N. maculosus* and measured 320 mm TL. It was collected in the Mississippi River near the Hwy-60 bridge in Cairo, Illinois on 17 December 2004 in 16.1 m of water with a water temperature of 5.2 °C.

Examination of additional *Necturus* specimens housed at the Mississippi Museum of Natural Science revealed that both species occurred sympatrically in the Yazoo River of Mississippi and in a tributary of the Tennessee River prior to the construction of the Tennessee-Tombigbee Waterway. Further taxonomic studies, including genetic assessments, are needed to elucidate the taxonomic status of these elusive salamanders.

Acknowledgements

We greatly appreciate Dr. Stan Trauth, Arkansas State University, and Dr. Robert L. Jones, Mississippi Museum of Natural Science, for providing material for examination and many hours of thoughtful insight. Work conducted in the Mississippi and White rivers was supported by the Memphis District, U.S. Army Corps of Engineers and Mississippi Valley Division, U.S. Army Corps of Engineers. Permission to publish was provided by the Chief of Engineers.

Literature Cited

- Brimley, C.S. 1920. Notes on *Amphiuma* and *Necturus*. *Copeia* 70:5–7.
- Cagle, F.R. 1954. Observations on the life history of the salamander *Necturus louisianensis*. *Copeia* 1954:257–260.
- Crother, B.I., J. Boundy, J.A. Campbell, K. de Queiroz, D.R. Frost, R. Highton, J.B. Iverson, P.A. Meylan, T.W. Reeder, M.E. Seidel, J.W. Sites, Jr., T.W. Taggart, S.G. Tilley, and D.B. Wake. 2008. *Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in Our Understanding*. 6th ed. Herpetological Circular No. 37. Society for the Study of Amphibians and Reptiles, Salt Lake City, Utah.
- Powell, R., J.T. Collins, and E.D. Hooper, Jr. 1998. *A Key to the Amphibians & Reptiles of the Continental United States and Canada*. University Press of Kansas, Lawrence.
- Shoop, C.R. and G.E. Gunning. 1967. Seasonal activity and movements of *Necturus* in Louisiana. *Copeia* 1967:732–737.
- Trauth S.E., H.W. Robison, and M.V. Plummer. 2004. *The Amphibians and Reptiles of Arkansas*. The University of Arkansas Press, Fayetteville.
- Viosca, P., Jr. 1937. A tentative revision of the genus *Necturus* with descriptions of three new species from the southern gulf drainage area. *Copeia* 1937:120–138.



Sixty-hook trotline baited with worms in a jump box prior to being set.