

## Threatened fishes of the world: *Noturus placidus* Taylor, 1969 (Ictaluridae)

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**Common names:** Neosho madtom (T). **Conservation status:** Listed federally as threatened 22 May 1990 (USFWS 1991).

**Identification:** One of 25 madtom species, distinguished from four madtoms in its range by two distinct crescent-shaped bands of pigment on caudal fin and lack of dark pigment extending to edge of adipose fin (Taylor 1969). Pectoral spines have poorly developed saw-like teeth on front margin. Fin ray counts: anal rays 13–16



(14.72); pelvic rays 8–12 (9.06), soft pelvic rays 7–9 (7.99); caudal rays 49–59 (54.32); vertebrae: 32–36 (33.62). Adults typically greater than 50 mm TL (Bulger & Edds 2001). Males in spawning condition exhibit swollen cephalic epaxial muscles and elongated genital papillae; both sexes exhibit reddened tooth patches during spawning season. Photograph by Janice L. Bryan. **Distribution:** Endemic to Neosho River basin in Kansas, Missouri, and Oklahoma (Taylor 1969). Species' range historically extended south to Illinois River in Oklahoma; currently restricted by reservoirs to approximately two-thirds of original range (Moss 1981). **Abundance:** Large population fluctuations occur seasonally and annually (Moss 1981). In 1 year, Wilkinson et al. (1996) reported a mean summer density of occurrence in the Spring River of 11.3 fish *versus* 30.0 per 100 m<sup>2</sup> in the autumn when generational overlap occurs. Higher mean autumn densities found in the Neosho River compared to the Spring River (Wildhaber et al. 2000a). **Habitat and ecology:** Occur over gravel bars and riffles in fourth to sixth order streams having moderate current, permanent flow, and unconsolidated gravel (Fuselier & Edds 1994; Bulger & Edds 2001). Nocturnal benthic insectivores gathering prey from gravel interstices (Moss 1981). In nature, young-of-the-year (YOY) 15–49 mm TL; mature individuals reach 33–82 mm TL by end of first year (Fuselier & Edds 1994; Bulger & Edds 2001). Suspected life span 1–2 years. **Reproduction:** Sexual maturity reached during first year (Bulger & Edds 2001). Spawning occurs mid-summer; YOY found July–August. Nests excavated beneath large rocks in unconsolidated gravel. Male parental care lasts 18–19 days (Bulger et al. 2002). Clutch size 60; mean chorion diameter 3.1 mm. **Threats:** Impoundments restrict migration, alter natural hydrograph, and with gravel mining, eliminate preferred habitat (USFWS 1991). Water quality and quantity impacted by municipalities, agriculture, zinc–lead mining, urbanization, and industrialization (Wildhaber et al. 2000a). **Conservation actions:** Federally listed as threatened in 1990; threatened status in Kansas and endangered in Missouri and Oklahoma. Recovery plan published in 1991 (USFWS 1991). Five-year moratorium on gravel mining in Neosho River instituted spring 1991. Annual population monitoring conducted since 1991 (Wildhaber et al. 2000b). Recent and ongoing research efforts focused on Neosho madtom ecology. **Conservation recommendations:** Continue to limit gravel mining, prohibit dam construction, and encourage removal of unused dams. Further research needed on life history. **Remarks:** Cooperation of government agencies and private landowners crucial to recovery.

Bulger, A.G. & D.R. Edds. 2001. Population structure and habitat use in Neosho madtom (*Noturus placidus*). *Southwest. Nat.* 46: 8–15.

Bulger, A.G., C.D. Wilkinson, D.R. Edds & M.L. Wildhaber. 2002. Breeding behavior and reproductive life history of the Neosho madtom, *Noturus placidus* (Teleostei: Ictaluridae). *Trans. Kans. Acad. Sci.* 105: 106–124.

Fuselier, L.C. & D.R. Edds. 1994. Seasonal variation in habitat use by the Neosho madtom (Teleostei: Ictaluridae: *Noturus placidus*). *Southwest. Nat.* 39: 217–223.

Moss, R.E. 1981. Life history information for the Neosho madtom, *Noturus placidus*. Kansas Department Wildlife Parks. Final Report. Contract No. 38. Pratt, Kansas. 33 pp.

Taylor, W.R. 1969. A revision of the catfish genus *Noturus* Rafinesque, with an analysis of higher groups in the Ictaluridae. U.S. National Museum Bulletin 282, Smithsonian Institution Press, Washington D.C. 259 pp.

USFWS. 1991. Neosho madtom recovery plan. U.S. Fish and Wildlife Service, Denver, Colorado. 42 pp.

Wildhaber, M.L., A.L. Allert, C.J. Schmitt, V.M. Tabor, D. Mulhern, K.L. Powell & S.P. Sowa. 2000a. Natural and anthropogenic influences on the distribution of the threatened Neosho madtom in a midwestern warmwater stream. *Trans. Amer. Fish. Soc.* 129: 243–261.

Wildhaber, M.L., W.M. Tabor, J.E. Whitaker, A.L. Allert, D.W. Mulhern, P.J. Lamberson & K.L. Powell. 2000b. Ictalurid populations in relation to the presence of a main-stem reservoir in a midwestern warmwater stream with emphasis on the threatened Neosho madtom. *Trans. Amer. Fish. Soc.* 129: 1264–1280.

Wilkinson, C.D., D.R. Edds, J. Dorlac, M.L. Wildhaber, C.J. Schmitt & A.L. Allert. 1996. Neosho madtom distribution and abundance in the Spring River. *Southwest. Nat.* 41: 78–81.