

## ***Pimephales vigilax* (Pisces, Cyprinidae) Established in the Missouri River Basin**

FRANK B. CROSS

Museum of Natural History, University of Kansas  
Lawrence, Kansas 66045

STEPHEN G. HASLOUER

Kansas Department of Health and Environment  
Topeka, Kansas 66620

---

The bullhead minnow, *Pimephales vigilax* (Baird and Girard) occurs widely in the Mississippi River system and in Gulf coastal drainages from the Alabama River to the Rio Grande (Lee and Kucas, 1980:343), but is not indigenous to the Missouri River basin. Evermann and Cox (1896:400) listed this fish (as *Cliola vigilax*) from a few localities in eastern Nebraska, and Churchill and Over (1933:42-43) reported it from South Dakota (as *Ceraticthys vigilax*). Hubbs and Black (1947:27, 28, 31, map 1) accepted those reports, without verification, as applicable to *Ceraticthys perspicuus* (Girard), a nominal form which they believed distinct from *C. vigilax*. Subsequently, Hubbs amended both the taxonomic and distributional conclusions of Hubbs and Black as follows (Hubbs, 1951:8): "Recent work shows that *C. perspicuus* is conspecific with *C. vigilax* . . . and warrants the deletion of the northwesternmost records for *C. v. perspicuus*, namely those in the Missouri River drainage basin of Iowa, Nebraska, and South Dakota . . ." Bailey and Allum (1962:109) corroborated Hubbs' later interpretation, based on their examination of many of the specimens in question and on other evidence; they referred the Nebraska and South Dakota records to *Pimephales notatus*, and in effect excluded the Missouri Basin from the range of the bullhead minnow.

There remain some instances of capture of *P. vigilax* in the Missouri Basin, attributed to "bait-bucket" introductions: in Iowa (Bailey and Allum, 1962: 109), and in Kansas ("Jones Pond," Coffee County, as reported by Breukelman, 1940:381 [as *C. taurocephalus*] and by Hubbs and Black, 1947:31). Bait-bucket introductions probably have occurred elsewhere in the basin, but we have evidence of their persistence only in the lower Kansas River basin.

Prior to 1976, no bullhead minnow was found in extensive surveys of fishes in the Kansas River system. In 1976, series of *P. vigilax* were taken from the Kansas River at Lawrence, Douglas County (KU 16751, 27 specimens, 23-69 mm in standard length), and from a channelized section of

Soldier Creek near Topeka, Shawnee County (KU 16825, 156 specimens, 20–43 mm). The presence of juveniles as well as adults implied natural reproduction at both localities. Additional records at Lawrence have been obtained each year since 1976. Captures elsewhere extend the known occurrences of the species westward to the Smoky Hill River in Geary County, Kansas (KU 19017, obtained 10 June 1981), and eastward to the confluence of Kansas River with the Missouri River (KU 18510 through 18520 and other records from Leavenworth, Johnson, and Wyandotte counties, May 1979 through October 1981).

Between DeSoto and Kansas City, Kansas, the bullhead minnow occurred at all of 14 sites that were seined periodically in 1979–1981. Its abundance increased during that period, from an average density of less than one fish per 100 m<sup>2</sup> in 1979 to 16.5 per 100 m<sup>2</sup> in 1981. Its greatest density (128/100 m<sup>2</sup> in 1981) was at a site altered by sand dredging, where flow was sluggish over a substrate of fine sand and silt (particle size <0.4 mm). In 1981, the bullhead minnow ranked fourth in abundance among 18 cyprinid species collected at the 14 sites.

Two congeners of *P. vigilax* are native to the Kansas River basin: the bluntnose minnow, *P. notatus*, and the fathead minnow, *P. promelas*. Both are found regularly in the river, although they attain greater abundance in tributaries than in the mainstream. In collections from DeSoto to Kansas City in 1979, the bullhead minnow was less numerous than either the bluntnose minnow or the fathead minnow, representing 20% of the total number of *Pimephales* captured. In 1981, the bullhead minnow was found almost to the exclusion of the other two species (96% of total *Pimephales* caught). Trends in abundance were similar at all of the sampling sites.

Based on tubercular characters of nuptial males, the Kansas River population of the bullhead minnow originated from eastern stocks (*P. v. perspicuus*). Breeding males have pearl organs in two rows across the snout (5–4), as in that subspecies. *P. v. vigilax*, which occurs from the Red River drainage of western Oklahoma and Texas southwestward, has only a single row of tubercles, usually 5 in number (Hubbs and Black, 1947:21).

#### LITERATURE CITED

- Bailey, R. M., and M. O. Allum. 1962. Fishes of South Dakota. Univ. Michigan Mus. Zool., Misc. Publ. 119:1–131.
- Breukelman, J. 1940. A collection of Kansas fishes in the State University Museum. Trans. Kansas Acad. Sci., 43:377–384.
- Churchill, E. P., and W. H. Over. 1933. Fishes of South Dakota. South Dakota Department of Game and Fish, Pierre. 87 pp.
- Evermann, B. W., and U. O. Cox. 1896. Report upon the fishes of the Missouri River Basin. Rept. U.S. Comm. Fish and Fisheries (1894), Appendix 5. Pp. 325–429.
- Hubbs, C. L. 1951. *Notropis amnis*, a new cyprinid fish of the Mississippi fauna, with two subspecies. Univ. Michigan Mus. Zool., Occ. Pap. 530:1–30.

- Hubbs, C. L., and J. D. Black. 1947. Revision of *Ceratichthys*, a genus of American cyprinid fishes. Univ. Michigan Mus. Zool., Misc. Publ. 66:1-56.
- Lee, D. S., and S. T. Kucas. 1980. *Pimephales vigilax* (Baird and Girard) Bullhead minnow. In D. S. Lee et al., Atlas of North American Freshwater Fishes. North Carolina State Mus. Nat. Hist., Raleigh. i-x + 854 pp.