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A number of changes in the nomenclature and composition of the Arkansas ichthyofauna have occurred since the appearance of Robison and Buchanan's (1988) treatise on the fishes of Arkansas. We listed 215 species of fishes inhabiting state waters including 197 native species, two of which were undescribed, and 18 introductions. Although we were aware of many of the impending nomenclatural changes for Arkansas fishes, these anticipated changes were to be published subsequent to 1988 (e.g., Robins et al., 1991; Mayden, 1989) and we decided to use established ichthyological nomenclature rather than acting prematurely in anticipation of possible changes.

Leis and Paxton (1993) in a review of Robins et al. (1991) reminded nonsystematists that instability in nomenclature is understandably difficult for them, because they may not appreciate the dual purpose of binomial nomenclature: (1) to provide a "handle" for each species, and (2) to provide an hypothesis of relationships. Instability results as hypotheses change and as systematists interpret and implement the Code of Zoological Nomenclature.

Since the appearance of Robison and Buchanan (1988) three important works affecting Arkansas fishes have been published, namely Mayden (1989), Robins et al. (1991), and Coburn and Cavender (1992). Mayden (1989) elevated a number of subgenera within the former cyprinid genera, *Hybopsis* and *Notropis*. The result has been widespread nomenclatural changes which affect Arkansas fishes. Review of recent revisions hopefully will assist the nonsystematist working with Arkansas fishes who may be confused by, or unaware of, changes.

To keep workers on Arkansas fishes updated, recent changes in the Arkansas ichthyofauna are presented. Biologists employed by state and federal agencies, colleges and universities, or the private sector, need as complete a record as possible before attempting to evaluate the impact of environmental alterations, population status, management, protocol, speciation events, and biogeographic patterns or to direct students (Cashner and Matthews, 1988).

Changes were grouped into two categories: Species Additions and Nomenclatural Changes.

Species Additions

Cyprinidae - Carps and Minnows

1. *Luxilus cardinalis* (Mayden). Cardinal shiner. Formerly, *Notropis sp.* undescribed. Robison and Buchanan (1988) included the cardinal shiner as an undescribed *Notropis* (p. 225-226) in Arkansas. While the *Fishes of Arkansas* was in press, the formal description of the cardinal shiner appeared in which Mayden (1988) designated *Notropis pilsbryi* populations of the Arkansas River drainage of Arkansas, Oklahoma, Kansas, and Missouri, in addition to the Red River populations in Oklahoma, as a new species, *Notropis cardinalis*. An addendeum to Robison and Buchanan (1988:253) was added to note the change. Later, Mayden (1989) formally elevated the subgenus *Luxilus* of *Notropis* to generic level. *Luxilus pilsbryi* is thus confined to the White River system of Arkansas and Missouri.
2. *Scardinius erythrophthalmus* (Linnaeus). Rudd. The rudd is a wide ranging cyprinid native to Europe and central Asia (Berg, 1949; Banarescu, 1964). The earliest verified date of the introduction of the rudd to the United States was 1916 (Cahn, 1927). Courtney et al. (1986) provided a history of the rudd's introduction and early distribution in the United States. In the early 1980's the rudd underwent an explosive anthropogenic dispersal similar to that of the common carp (Burkhead and Williams, 1991). The recent dispersal of the rudd was due primarily to successful marketing by the Arkansas fish farming industry of the rudd as a new, hardy, and colorful bait minnow. The rudd has been distributed in 14 states and has escaped or been released and subsequently captured in eight states (Pigg and Pham, 1990). The rudd has become a popular bait fish used for striped bass fishing. Recently, Burkhead and Williams (1991) reported the disturbing news that the rudd could hybridize with the golden shiner (*Notemigonus crysoleucas*). Jennings et al. (1990) reported the rudd collected in the open waters of Lonoke

County, Arkansas. The Game and Fish Commission received one verbal report of a single specimen taken from the White River drainage following the December, 1987 flooding of over 4000 acres of minnow farms in Lonoke and Prairie counties. On 24 May 1991 Jeff Farwick collected two specimens of the rudd in Horseshoe Lake, Crittenden County (Ken Shirley, pers. comm.).

Nomenclatural Changes

Salmonidae - Trouts

1. *Oncorhynchus mykiss* (Walbaum). Rainbow trout. Two recent discoveries involving the rainbow trout have necessitated a scientific name change for this and other trout species (Smith and Stearly, 1989). First, the rainbow trout, *Salmo gairdneri* Richardson, has been shown to be the same as the earlier described Kamchatka trout, *Salmo mykiss* Walbaum. Second, studies of osteology (Vladykov, 1963; Cavender and Miller, 1982; and Sanford, 1987) and biochemistry (Berg and Ferris, 1984) of trouts and salmons indicate that rainbow trout and cutthroat trout and their relatives, the golden, Mexican, Gila, and Apache trouts, are related more closely to Pacific salmons (genus *Oncorhynchus*) than to brown trout and Atlantic salmon (*Salmo*) (See discussion by Smith and Stearly, 1989). Based on the arguments of these investigators, Robins et al. (1991) accepted *Oncorhynchus* for the Pacific salmonids leaving *Salmo* as the genus of salmonids native to Europe, western Asia, and the Atlantic basin. Thus the rainbow trout becomes *Oncorhynchus mykiss* (Walbaum).
2. *Oncorhynchus clarki* (Rafinesque). Cutthroat trout. Smith and Stearly (1989) showed that relationships of the trouts of the cutthroat and rainbow series lie with the genus *Oncorhynchus* rather than *Salmo*. The cutthroat trout, formerly known as *Salmo clarki*, is now *O. clarki*.

Cyprinidae - Carps and minnows.

3. *Cyprinella camura* (Jordan and Meek). Bluntface shiner. The bluntface shiner, formerly *Notropis camurus*, is a member of the subgenus *Cyprinella* elevated by Mayden (1989) to full generic status.
4. *Cyprinella galactura* (Cope). Whitetail shiner. Formerly *Notropis galacturus*.
5. *Cyprinella lutrensis* (Baird and Girard). Red shiner. Formerly was *Notropis lutrensis*.
6. *Cyprinella spiloptera* (Cope). Spotfin shiner. Formerly *Notropis spilopterus*.
7. *Cyprinella venusta* Girard. Blacktail shiner. Formerly *Notropis venustus*.
8. *Cyprinella whipplei* Girard. Steelcolor shiner. Formerly *Notropis whipplei*.
9. *Erimystax harryi* (Hubbs and Crowe). Ozark chub. The Ozark chub was formerly considered a sub species of *Hybopsis dissimilis*, the streamline chub. The streamline chub is now placed in the genus *Erimystax* (gender masculine) on the basis of recent genealogical analysis by Coburn and Cavender (1992) and Mayden (1989). Harris' (1986) dissertation provided the documentation for elevation of *Hybopsis dissimilis harryi* to species level. Because of the aforementioned studies this chub is now known as *Erimystax harryi*, the Ozark chub.
10. *Erimystax x-punctatus* (Hubbs and Crowe). Gravel chub. Formerly known as *Hybopsis x-punctata*. See above discussion on the genus *Erimystax*.
11. *Luxilus chrysocephalus* Rafinesque. Striped shiner. Although Robison and Buchanan (1988) used the name *Notropis chrysocephalus* for the striped shiner in Arkansas, this form has been the source of continuous debate for years. Mayden (1989) elevated the subgenus *Luxilus* of *Notropis* to generic status, an action supported by Coburn and Cavendar (1992) and used in Robins et al. (1991), thus we recognize *Luxilus chrysocephalus* as the correct name of the striped shiner.
12. *Luxilus pilsbryi* (Fowler). Duskystripe shiner. Formerly *Notropis pilsbryi*.
13. *Luxilus zonatus* (Putnam). Bleeding shiner. Formerly *Notropis zonatus*.
14. *Lythrurus fumeus* (Evermann). Ribbon shiner. Formerly *Notropis fumeus*. This generic change is due to Mayden's (1989) elevation of the *Lythrurus* group to generic level.
15. *Lythrurus snelsoni* (Robison). Ouachita Mountain shiner. Formerly *Notropis snelsoni*. Although Robins et al. (1991) used the common name Ouachita shiner, we retain the common name Ouachita Mountain shiner as used by Robison (1985) as a more descriptive name for this Ouachita Mountain endemic species. Changing to simply "Ouachita shiner" seems to imply that this fish lives in the Ouachita River system which it does not.
16. *Lythrurus umbratilis* (Girard). Redfin shiner. Formerly *Notropis umbratilis*.
17. *Macrhybopsis aestivalis* (Girard). Speckled chub. The speckled chub was formerly called *Hybopsis aestivalis*. Coburn and Cavendar (1992) rearranged the species of the polyphyletic "genus" *Hybopsis* and resurrected the genus *Macrhybopsis* for the four species of barbelled minnows (*aestivalis, geli-*

da, *meeki* and *storeriana*), all of which occur in Arkansas waters. Mayden (1989) placed the speckled chub in the monotypic genus *Extrarius*; however, we follow Coburn and Cavendar (1992) as did Robins et al., (1991).

18. *Macrhybopsis gelida* (Girard). Sturgeon chub. Formerly *Hybopsis gelida*.
19. *Macrhybopsis meeki* (Jordan and Evermann). Sicklefin chub. Formerly *Hybopsis meeki*.
20. *Macrhybopsis storeriana* (Kirtland). Silver chub. Formerly *Hybopsis storeriana*.
21. *Notropis amblops* (Rafinesque). Bigeye shiner. The bigeye shiner was formerly known as *Hybopsis amblops*. In his dissertation Clemmer (1971) regarded *Hybopsis amblops*, *Notropis amnis*, and four other species as an intimately interrelated group. Later, Mayden (1989) accepted these six forms as a monophyletic group and more recently, Coburn and Cavendar (1992) classified the six as a subgenus of *Notropis*, an action which Robins et al. (1991) accepted. Since *Notropis* (*Hybopsis*) *amblops*, as *Hybopsis gracilis* Agassiz, 1854 is the type species of *Hybopsis*, this move restricts the name to these six species as a subgenus, thus the "genus" *Hybopsis* is no longer recognized (Robins et al. (1991).
22. *Opsopoeodus emiliae* Hay. Pugnose minnow. Formerly *Notropis emiliae*. Gilbert and Bailey (1972) transferred this fish to the genus *Notropis*; however, recent discoveries in breeding behavior (Page and Johnson, 1990) and osteology (Coburn and Cavender, 1992) point to a sister-group relationship with *Pimephales*. We are following these investigators in retaining the genue *Opsopoeodus* for the pugnose minnow.
23. *Platygobio gracilis* (Richardson). Flathead chub. Formerly *Hybopsis gracilis*. Ictaluridae - Bullhead catfishes.
24. *Ameiurus catus* (Linnaeus). White catfish. Formerly *Ictalurus catus*. Bailey and Robins (1988) noted that, under the 1985 Code of Zoological Nomenclature, names proposed for divisions of genera are valid and available. This action made *Ameiurus*, held to be invalid under previous codes, a valid and available name. Lundberg (1982) had earlier separated *Ameiurus* from *Ictalurus* and we recognize this action as did Robins et al. (1991).
25. *Ameiurus melas* (Rafinesque). Black bullhead. Formerly *Ictalurus melas*.
26. *Ameiurus natalis* (Lesueur). Yellow bullhead. Formerly *Ictalurus natalis*.
27. *Ameiurus nebulosus* (Lesueur). Brown bullhead. Formerly *Ictalurus nebulosus*.

Centrarchidae - Sunfishes

28. *Lepomis miniatus* Jordan. Redspotted sunfish. Formerly *Lepomis punctatus*. Warren (1992) elevated the western subspecies of the spotted sunfish, *L. p. miniatus*, to specific status and we concur.
29. *Micropterus dolomieu* Lacepede. Smallmouth bass. Formerly *Micropterus dolomieui*. A popular game species, the smallmouth bass has had its name changed slightly. Originally, the smallmouth bass was named for M. Dolomieu, a French mineralogist for whom the mineral dolomite also was named. Bailey and Robins (1988) noted that patronymic names proposed in apposition with the generic name are approved by the 1985 Code (Article 31a) and that, therefore, the "i" previously added to such names is to be dropped and the original name retained.

Percidae - Perches

30. *Crystallaria asprella* (Jordan). Crystal darter. Formerly *Ammocrypta asprella*. Simons (1991) resurrected the monotypic genus *Crystallaria* for the crystal darter which forms the sister group to all other darters.
31. *Percina vigil* (Hay). Saddleback darter. Formerly *Percina ouachitae*. Because of extensive analysis of Suttkus (1985), this species was changed by Robins et al. (1991) to *Percina vigil*, an action which we accept.

These 31 nomenclatural changes and the formal description of one previously undescribed species, plus the addition of one introduced species, the rudd, to the state ichthyofaunal list bring the current total number of fishes in the state of Arkansas to 216. Of this number, 197 species are native while 19 were introduced deliberately or inadvertently by man.

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