

Central Stoneroller

Campostoma anomalum michauxi

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DESCRIPTION



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Taxonomy and Basic Description

The Central Stoneroller was first described in 1820 from Kentucky (Jenkins and Burkhead 1994). The genus *Campostoma* is systematically complex and dynamic. Five species are currently recognized: *C. anomalum*, widespread in central and eastern North America; *C. ornatum* in Mexico, southern Arizona and Texas (Etnier and Starnes 1993); *C. oligolepis* in the middle and lower Tennessee drainage; *C. pauciradii* in the southeastern United States (Jenkins and Burkhead 1993); and *C. pullum* in the Great Lakes drainage, the Wabash River portion of the Ohio River drainage, the Susquehanna River drainage, and direct tributaries to Mississippi River (Etnier and Starnes 1993). There are two subspecies of *Campostoma anomalum*: *C. a. anomalum*, and *C. a. michauxi* (Lee et al. 1980). The geographic limits of these subspecies have not been defined, but upper Tennessee and Santee drainage fish are considered to be *C. a. michauxi* (Jenkins and Burkhead 1993). Page and Burr (1991) tentatively assigned *C. a. anomalum* to the Ohio River and upper Atlantic drainages, and *C. a. michauxi* to the Santee and Savannah River drainages. Based on zoogeographical evidence (Ross 1970) of an historic connection between the upper Savannah and upper Tennessee River system, Central Stonerollers in South Carolina would most likely be *C. a. michauxi*. Further investigation is needed to make this determination.

Adult Central Stonerollers range in length from 122 to 239 mm (4.8 to 9.4 in.) (Rohde 1994). The species is a round-bodied, chub-like minnow with a ventral mouth, hard ridge along the lower jaw, moderate head and eye, and a rounded snout. The back is brown to olive with a brassy sheen. The belly and fins are typically light colored (Jenkins and Burkhead 1994).

Status

The Central Stoneroller is currently stable within its native range (Warren et al. 2000). NatureServe (2013) lists the status as secure globally (G5). Its current state ranking for South Carolina is possibly imperiled (S2?) (NatureServe 2013).

POPULATION SIZE AND DISTRIBUTION

The Central Stoneroller is found throughout much of the Eastern and Central US in the Atlantic, Great Lakes, Mississippi River, and Hudson Bay (Red River) basins from New York and southern Ontario west to North Dakota and Wyoming, and south to South Carolina and Texas;

Thames River system, Ontario; Gulf Slope drainages from Galveston Bay, Texas to Rio Grande, Mexico; and isolated populations in Southwestern Mississippi and Eastern Louisiana (Page and Burr 1991). In South Carolina, the Central Stoneroller is found in the Mountain and Upper Piedmont ecoregions of the upper Savannah River, Saluda River, and Broad River drainages (SCDNR unpublished data).

In the broad sense, the Central Stoneroller is common to ubiquitous throughout its native range (Etnier and Starnes 1993) and common in most Blue Ridge drainages westward. Page and Burr (1991) describe the species as common to abundant throughout much of its range, generally absent in the Piedmont and in the Coastal Plain and uncommon in the Great Plains. The Central Stoneroller is very abundant in the Chattooga River (SCDNR unpublished data). Based on South Carolina Stream Assessment data from 2006-2011, the mean statewide density estimate for the Central Stoneroller in wadeable streams was 0.0007 (95% confidence interval: 0.0002–0.001) per 100 m².

HABITAT OR NATURAL COMMUNITY REQUIREMENTS

The Central Stoneroller is found in small to medium rivers with cool clear water, moderate or sometimes rapid current, and gravel or rubble substrates. It commonly occurs in pools with a current and in riffles of small rocky streams. Occasionally Central Stonerollers are found in slow-moving turbid water (NatureServe 2013).

CHALLENGES

The Central Stoneroller may be somewhat vulnerable in South Carolina due to its limited distribution that is apparently associated with drainage changes (Ross 1970). Additionally, development, deforestation, loss of riparian cover, siltation, and impoundments in cool water streams adversely affect this species.

CONSERVATION ACCOMPLISHMENTS

South Carolina Stream Assessment data have facilitated the calculation of standardized abundance (density) estimates for this species at multiple spatial strata including statewide, river basin, level-IV ecoregion, and “ecobasin” (ecoregion x river basin). These estimates, for the first time, provide an objective measure of current population status that will serve as a baseline for following future population trends and gauging the effectiveness of conservation actions.

Educational materials have been developed in order to raise public awareness of nongame species and their ecological importance to the natural history of South Carolina’s aquatic habitats, including:

- The Reel Art program creates a topic for secondary school students and judges the artists’ submissions (e.g. a list of the Piedmont Fishes of SC to select from as subjects for drawing or painting).
- We compiled information and photographs for the development of nongame fish description web pages which are currently in development.
- We developed the Blackwater River Guide and interactive Powerpoint.

- <http://www.dnr.sc.gov/education/pdf/BlackwaterInteractivePoster.pdf>
- <http://www.dnr.sc.gov/education/pdf/BlackwaterRivEdGuide.pdf>
- We developed and printed the Fish Species of Concern Coloring Book (2009).
○ <http://www.dnr.sc.gov/aquaticed/pdf/SCFishesofConcernColoringBook.pdf>

CONSERVATION RECOMMENDATIONS

- Use South Carolina Stream Assessment decision-support GIS modeling tools to identify levels and spatial distributions of critical habitat factors to sustain the species in geographic areas of interest.
- Use South Carolina Stream Assessment decision-support GIS modeling tools to identify priority regions and watersheds at greatest risk of decline in stream integrity.
- Describe life history and habitat requirements for the Central Stoneroller.
- Protect critical habitats from future development and further habitat degradation by following Best Management Practices and protecting and purchasing riparian areas.
- Promote land stewardship practices through educational programs both within critical habitats with healthy populations and other areas that contain available habitat.
- Encourage responsible land use planning.
- Consider this species' needs when participating in the environmental permit review process.
- Continue to develop of educational materials in order to raise public awareness of nongame species and their ecological importance to the natural history of South Carolina's aquatic habitats.
- Educate motor vehicle operators of the negative effects of crossing streams at multiple locations and using stream bottoms as trails.

MEASURES OF SUCCESS

Determining the distribution, life history, habitat needs, and Southeastern population structure and trends would represent a measure of success for this species. Methods that protect water quality are also likely to protect this species and others. In the event that more protective BMPs are implemented, population studies of these fish could assist in determining the effectiveness of those measures. An increase in native Eastern Brook Trout populations within the State would also indicate that restoration and habitat protections were successful.

LITERATURE CITED

- Etnier, D.A. and W.C. Starnes. 1993. The Fishes of Tennessee. The University of Tennessee Press. Knoxville, Tennessee. 681 pp.
- Jenkins, R.E., and N.M. Burkhead. 1994. Freshwater Fishes of Virginia. American Fisheries Society. Bethesda, Maryland. 1079 pp.
- Lee, D.S., C.R. Gilbert, C.H. Hocutt, R.E. Jenkins, D.E. McAllister and J.R. Stauffer, Jr. 1980. Atlas of North American Freshwater Fishes. Publication #1980-12 of the North Carolina Biological Survey. North Carolina State Museum of Natural History. 867 pp.

NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: March 26, 2013).

Page, L.M. and B.M. Burr. 1991. A field guide to freshwater fishes: North America north of Mexico. Houghton Mifflin Company. Boston, Massachusetts. 432 pp.

Rohde, F.C., R.G., Arndt, D.G. Lindquist and J.F. Parnell. 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. The University of North Carolina Press. Chapel Hill, North Carolina. 222 pp.

Ross, R.D. 1970. The Distributional History of the Biota of the Southern Appalachians. Pp 29-37. In: Research Division Monograph 4, P.C. Holt, Editor. Virginia Polytechnic Institute and State University. Blacksburg, Virginia.

Warren, M.L., Jr., B.M. Burr, S.J. Walsh, H.L. Bart, Jr., R.C. Cashner, D.A. Etnier, B.J. Freeman, B.R. Kuhajda, R.L. Mayden, H.W. Robison, S.T. Ross and W.C. Starnes. 2000. Diversity, distribution, and conservation status of the native freshwater fishes of the southern United States. *Fisheries* 25(10):7-31.