

Pygmy Sunfish (Family Elasmomatidae) Diversity in North Carolina
By the NCFishes.com Team

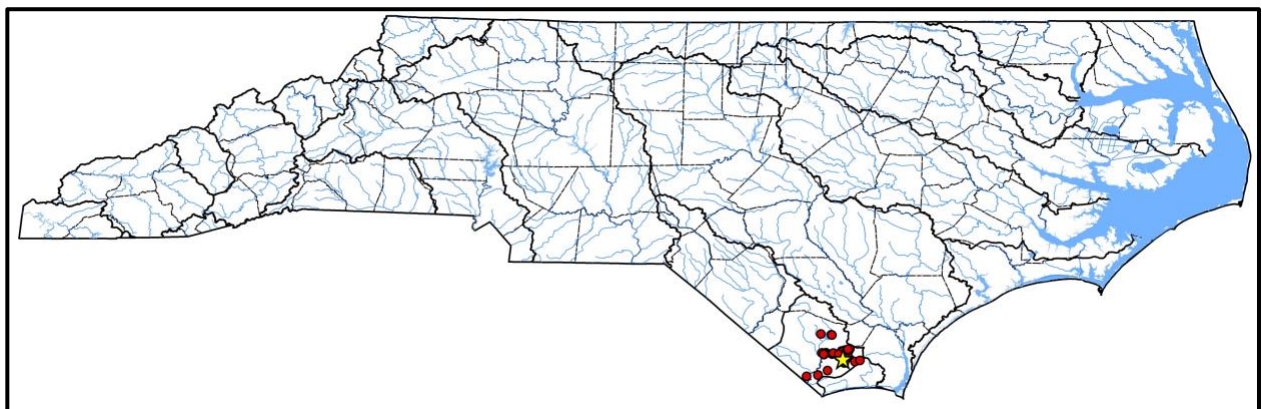
North Carolina is home to 3 of the 7 species of *Elassoma* known to occur in North America: Carolina Pygmy Sunfish, *Elassoma boehlkei*, Everglades Pygmy Sunfish, *Elassoma evergladei*, and Banded Pygmy Sunfish, *Elassoma zonatum* (Gilbert 2004; Snelson 2009; Tracy et al. 2020). [Please note: Tracy et al. (2020) may be downloaded for free at: <https://trace.tennessee.edu/sfcproceedings/vol1/iss60/1/>.] The other four species of *Elassoma* are found in South Carolina, Georgia, Florida, and Alabama (Gilbert 2004).

Collectively, these seven species have been taxonomically placed in the Family Centrarchidae or in their own family (Elasmomatidae; Fricke et al. 2020). There is conflicting evidence that *Elassoma* may (Near et al. 2012) or may not be (Gilbert 2004) related to other genera within the Centrarchidae. Regardless of their placement, the American Fisheries Society-accepted common names are Carolina Pygmy Sunfish, Everglades Pygmy Sunfish, and Banded Pygmy Sunfish (Page et al. 2013) and each of their scientific (Latin) name actually means something (please refer to The Meanings of the Scientific Names of Pygmy Sunfish, page 6).

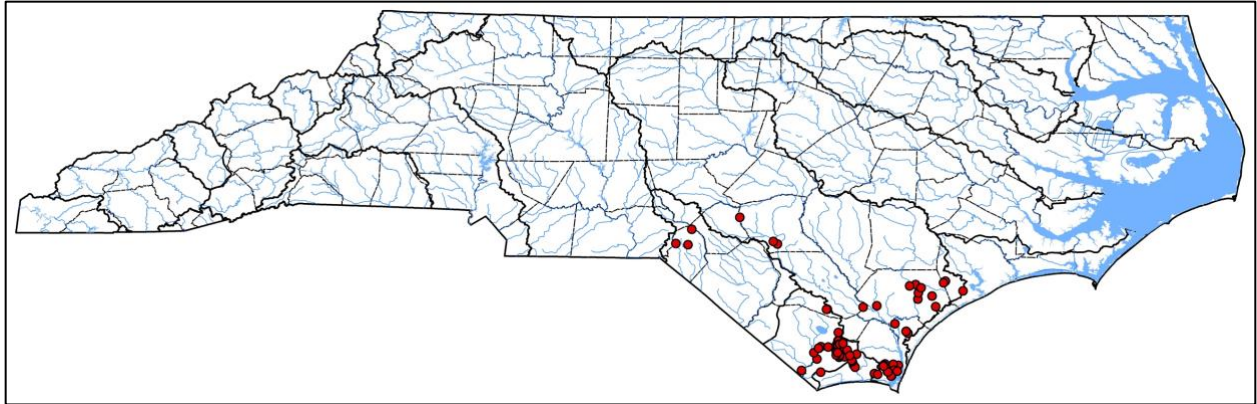
As their common name implies, Pygmy Sunfishes are just that – small fish that sort of look like miniature or dwarf sunfishes. Carolina Pygmy Sunfish and Everglades Pygmy Sunfish range in size from about 20-32 mm (0.8-1.3 inches) while Banded Pygmy Sunfish are the “big-uns” amongst the three species – they get as big as about 50 mm, almost 2 inches!

Shallow and quiet or slow moving water that offers dense vegetation as shelter is where one may find these fishes (Rohde et al. 2009). All three species prefer shallow waters that are darkly stained (tea-colored), of low productivity, and which are acidic (low pH) such as those in ponds, creeks, sloughs, and roadside ditches with luxuriant submerged and emergent aquatic vegetation (Rohde and Arndt 1987, Rohde et al. 2009).

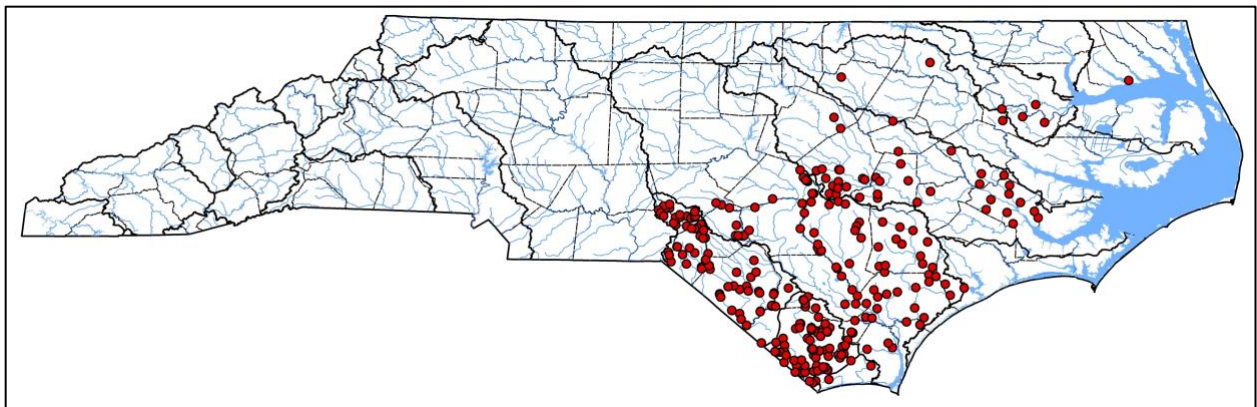
Pygmy Sunfishes are found in the Sand Hills and throughout the Coastal Plain (Maps 1-3); no species are found in the Mountains or Piedmont. [Note: see Supplemental Maps 1-3, page 7, showing North Carolina's 100 counties, 21 river basins, and 4 physiographic regions.] The Carolina Pygmy Sunfish, described by Rohde and Arndt in 1987 from the shallow edges of deep and dark Juniper Creek, is restricted to the Waccamaw basin in Brunswick and Columbus counties (Map 1). It is found nowhere else in the world, except in southeastern North Carolina and northeastern South Carolina (Jones and Ewing 2019; Quattro et al. 2001; Rohde et al. 2009; Sandel and Harris 2007). Because of its limited distribution and potential anthropogenic impacts upon its habitat and water quality, Carolina Pygmy Sunfish is listed as State Threatened (NCAC 2017; NCNHP 2020; NCWRC 2017; Sandel and Harris 2007).



Map 1. Distribution of Carolina Pygmy Sunfish, *Elassoma boehlkei*, in North Carolina. Yellow star denotes the type locality. Map originally appeared in Tracy et al. (2020).



Map 2. Distribution of Everglades Pygmy Sunfish, *Elassoma evergladei*, in North Carolina. Map originally appeared in Tracy et al. (2020).



Map 3. Distribution of Banded Pygmy Sunfish, *Elassoma zonatum*, in North Carolina. Map originally appeared in Tracy et al. (2020).

The Everglades Pygmy Sunfish, as currently understood and following Rohde et al. (2009), is also found in the southeastern corner of the state (Map 2). However, the populations considered to be Everglades Pygmy Sunfish in North Carolina may represent an undescribed species (M. Sandel, University of West Alabama, pers. comm.). The Banded Pygmy Sunfish is our most widely distributed species; found across the Sand Hills and Coastal Plain. But like the other two species, it is also more common in the southeast corner of the state (Map 3).

Their identification is relatively straight-forward. Key characteristics for their proper identification include the presence/absence of scales atop the head; the presence or absence of vertical bars along the side; and the presence or absence of a postocular stripe (please refer to the Identification Key to the Species of Pygmy Sunfishes (Family Elassomatidae) in North Carolina).

However, several species can co-occur within the same habitats at the same time, especially in the Waccamaw basin where all three species are found. Thus, rendering field identifications a challenge.

If you have troubles with your identifications, just send us (<https://ncfishes.com/contact/>) an e-mail and include as many quality digital photographs as you can along with all the pertinent locality descriptors so that we will know from where the fish came.

Identification Key to the Species of Pygmy Sunfishes (Family Eleosomatidae) in North Carolina

(Please refer to NCFishes.com for pictures and identifying characteristics for all species)
 (Identification key adapted from Rohde et al. (2009))

- 1a. Scales present on the top of the head. Side of the body with light streaks, or mottled (Figure 1)
 Everglades Pygmy Sunfish, *Elasoma evergladei*
- 1b. Scales absent on the top of the head. Side of body with distinct bars2
- 2a. Postocular (posterior to the eye) stripe present. 1-3 dark humeral (shoulder) spots present, often faint in life. Dark bars on side usually number 9 (range 7-12) (Figure 2)
 Banded Pygmy Sunfish, *Elasoma zonatum**
- 2b. Postocular stripe absent. No humeral (shoulder) spot(s) present. The dark bars on the side usually number 10 or more (Figure 3)
 Carolina Pygmy Sunfish, *Elasoma boehlkei*

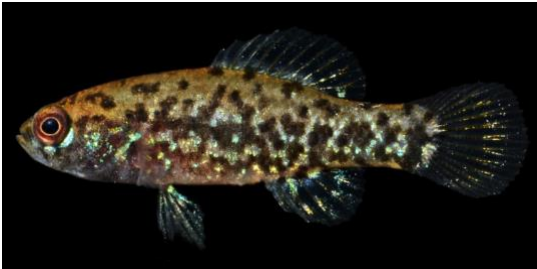


Figure 1. Everglades Pygmy Sunfish.



Figure 2. Banded Pygmy Sunfish.



Figure 3. Carolina Pygmy Sunfish.

*Banded Pygmy Sunfish may be confused with Fat Sleeper (<https://ncfishes.com/marine-fishes-of-north-carolina/dormitator-maculatus/>) whose distributions overlap one another. However, the Banded Pygmy Sunfish has a single dorsal fin and an unscaled head whereas the Fat Sleeper has two separated dorsal fins and a scaled head (Figures 4 and 5) (Rohde et al. 2009).



Figure 4. Banded Pygmy Sunfish with white arrows pointing to a naked (unscaled) head and a single dorsal fin.



Figure 5. Fat Sleeper with white arrows pointing to a scaled head and separate dorsal fins.

References

- Fricke, R., W.N. Eschmeyer, and R. Van der Laan. (eds). 2020. Eschmeyer's catalog of fishes: genera, species, references (<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>; Access Date: 16 December 2020 January 2020).
- Gilbert, C.R. 2004. Family Elasmomatidae Jordan 1877 — pygmy sunfishes. California Academy of Sciences. Annotated Checklists of Fishes No. 33. 5p.
- Jones, B.K. and T.D. Ewing. 2019. *Elassoma boehlkei*, Carolina Pygmy Sunfish, including information from the North Carolina status assessment 2014-2015 and North and South Carolina surveys 2018. North Carolina Wildlife Resources Commission, Raleigh, NC. 26p.
- Near, T.J., M. Sandel, K.L. Kuhn, P.J. Unmack, C. Wainwright, and W.L. Smith. 2012. Nuclear gene-inferred phylogenies resolve the relationships of the enigmatic Pygmy Sunfishes, *Elassoma* (Teleostei: Percomorpha). Molecular Phylogenetics and Evolution 63: 388-395.
- North Carolina Administrative Code (NCAC). 2017. Subchapter 10I - Endangered and threatened species. Amended effective October 01, 2017. North Carolina Administrative Code. Raleigh, NC.
- North Carolina Natural Heritage Program (NCNHP). 2020. Natural Heritage Program list of rare animal species of North Carolina 2018. North Carolina Natural Heritage Program. North Carolina Department of Natural and Cultural Resources. Raleigh, NC. 167p.
- North Carolina Wildlife Resources Commission (NCWRC). 2017. Protected wildlife species of North Carolina. North Carolina Wildlife Resources Commission. Raleigh, NC. 9p.
- Page, L.M., H. Espinosa-Pérez, L.T. Findley, C.R. Gilbert, R.N. Lea, N.E. Mandrak, R.L. Mayden, and J.S. Nelson. 2013. Common and scientific names of fishes from the United States, Canada, and Mexico. 7th edition. American Fisheries Society, Special Publication 34, Bethesda, MD. 384p.
- Rohde, F.C., and R.G. Arndt. 1987. Two new species of Pygmy Sunfishes (Elasmomatidae, *Elassoma*) from the Carolinas. Proceedings of the Academy of Natural Sciences of Philadelphia 139:65-85.
- Rohde, F.C., R.G. Arndt, J.W. Foltz, and J.M. Quattro. 2009. Freshwater fishes of South Carolina. University of South Carolina Press, Columbia, SC. 430p.
- Quattro, J.M., W.J. Jones, and F.C. Rohde. 2001. Evolutionary significant units of rare Pygmy Sunfishes (genus *Elassoma*). Copeia 2001:514-520.
- Sandel, M., and P.M. Harris. 2007. Threatened fishes of the world: *Elassoma boehlkei* (Rohde and Arndt 1987) (Elasmomatidae). Environmental Biology of Fishes. 78:289-290.
- Scharpf, C. 2014. *Elassoma boehlkei* Rohde & Arndt 1987, January 11, 2017 (<https://etyfish.org/name-of-the-week2017/>).
- Snelson, F.F., Jr., T.J. Krabbenhoft, and J. M. Quattro. 2009. *Elassoma gilberti*, a new species of Pygmy Sunfish (Elasmomatidae) from Florida and Georgia. Bulletin of the Florida Museum of Natural History. 48:119-144.
- Tracy, B. H., F.C. Rohde, and G.M. Hogue. 2020. An annotated atlas of the freshwater fishes of North Carolina. Southeastern Fishes Council Proceedings No. 60. 198p. (Available at: <https://trace.tennessee.edu/sfcproceedings/vol1/iss60/1>).

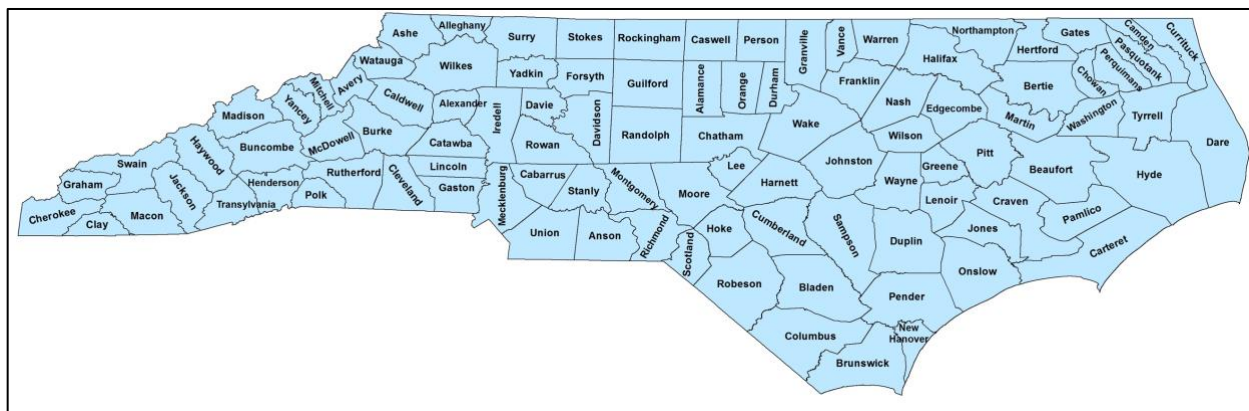
The Meanings of the Scientific Names of Pygmy Sunfishes

Adopted from the ETYFish Project by Christopher Scharpf and Kenneth J. Lazara,
accessed February 27, 2021, <https://etyfish.org/centrarchiformes/>

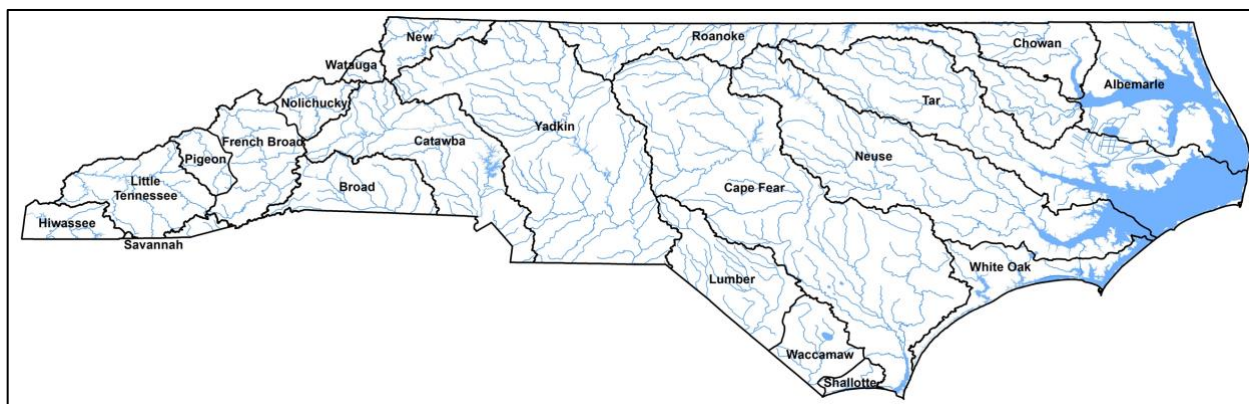
Family *Elassomatidae* Jordan 1877, Pygmy Sunfishes

- i. *Elassoma* Jordan 1877 - *elasson*, smaller; *soma*, body, referring to their diminutive size, or “a being reduced or diminished” (per Jordan)
 - a. *Elassoma boehlkei* Rohde & Arndt 1987 - in honor of James E. Böhlke (1930-1982), late Curator of Fishes, Academy of Natural Sciences of Philadelphia, for his contributions to ichthyology and his interest in *Elassoma*. See also Scharpf (2017). *Elassoma boehlkei* Rohde & Arndt 1987, January 11, 2017 (<https://etyfish.org/name-of-the-week2017/>).
 - b. *Elassoma evergladei* Jordan 1884 - of the Florida Everglades (USA), where type locality (Lake Jessup) is situated (occurs in coastal streams of North Carolina south to the Everglades, west to Alabama).
 - c. *Elassoma zonatum* Jordan 1877 - banded, described as having ~11 parallel, vertical-dark olive bands on body.

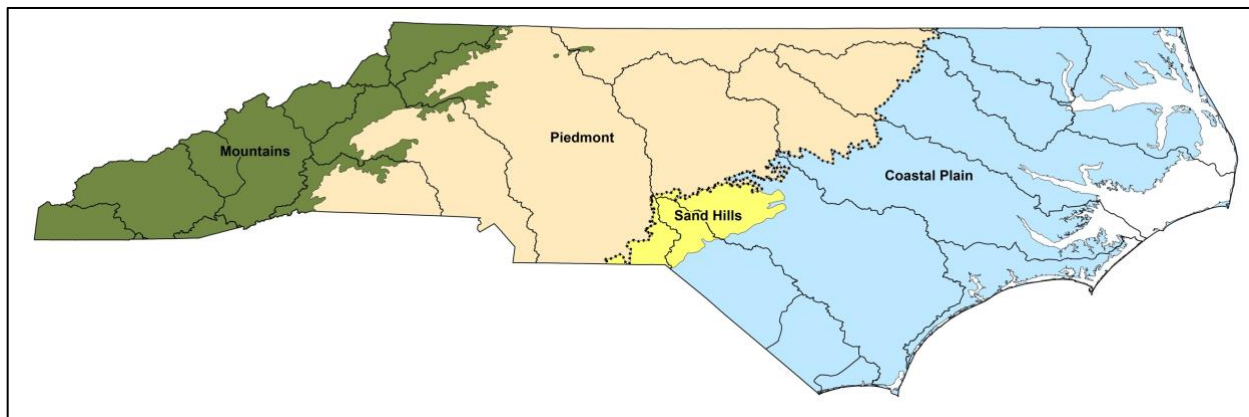
Supplemental Maps



Map No. 1. North Carolina's 100 counties. Map originally appeared in Tracy et al. (2020).



Map No. 2. North Carolina's 21 river basins. Map originally appeared in Tracy et al. (2020).



Map No. 3. North Carolina's four physiographic regions. Map originally appeared in Tracy et al. (2020).