

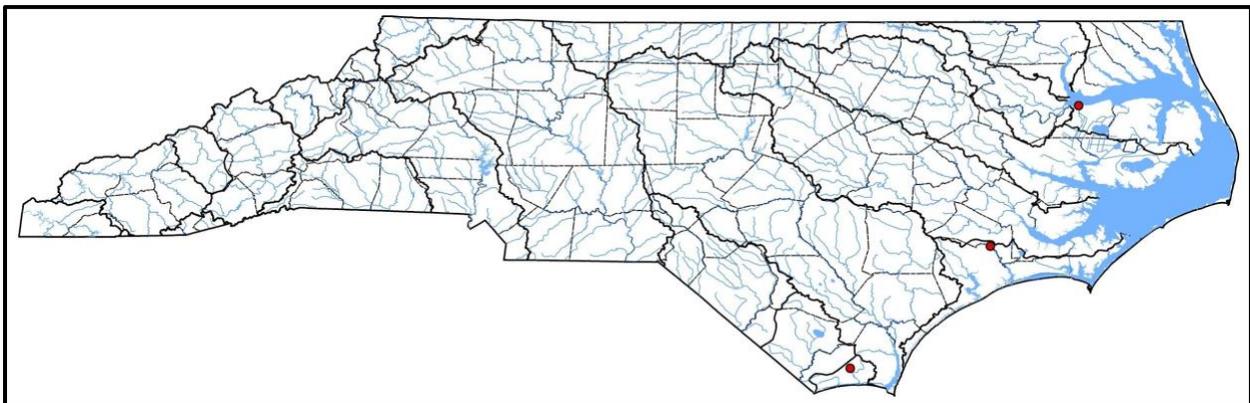
Mullet (Family Mugilidae) Diversity in North Carolina By the NCFishes.com Team

North Carolina is home to three species of mullets: Mountain Mullet, *Dajaus monticola*, Striped Mullet, *Mugil cephalus*, and White Mullet, *Mugil curema* (Tracy et al. 2020; NCFishes.com). [Please note: Tracy et al. (2020) may be downloaded for free at: <https://trace.tennessee.edu/sfcproceedings/vol1/iss60/1/>.] The family name, Mugilidae, is derived from the Latin, *mugil*, meaning Mullet, which in turn is probably derived from *mulgeo*, meaning suck (Boschung and Mayden 2004 as cited in Powers 2020).

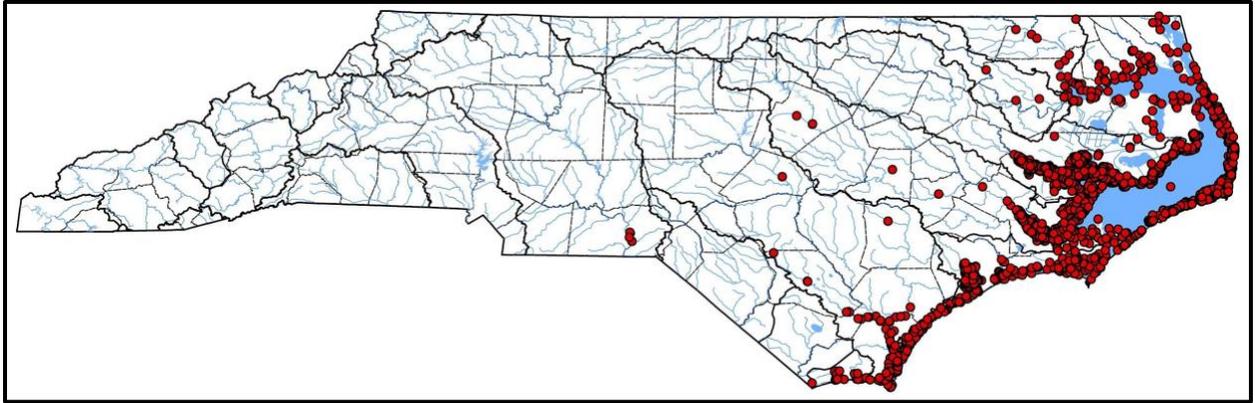
Travelling in active schools in our coastal waters, one may hear mullets referred to as Finger Mullet when they are young adults because of their size and importance as a bait fish, Jumping Mullet because of their tendency to leap out of the water, Silver Mullet, Common Mullet, Black Mullet, Grey (Gray) Mullet, or Callifaver Mullet (<https://www.fishbase.se/Summary/FamilySummary.php?ID=359>). Another vernacular name for mullets that is sure to raise some eyebrows is “Turd Wrestlers”, which originates from the observations that mullets feed on plankton and detritus, which they extract (suck) from the bottom sediments or via coprophagy (Powers 2020). However, the American Fisheries Society-accepted common names are more socially and politically acceptable: Mountain Mullet, Striped Mullet, and White Mullet (Page et al. 2013) and each of their scientific (Latin) name actually means something (please refer to The Meanings of the Scientific Names of Mullet, page 7).

Our mullets range in size from about 356 mm Total Length (14 inches) for Mountain Mullet to about 915 mm (36 inches) for White Mullet to about 1220 mm (48 inches) for Striped Mullet (Kells and Carpenter 2011). All three species are or believed to be catadromous species meaning they live in fresh or estuarine waters, but spawn in the ocean. Mountain Mullet may also be amphidromous meaning they migrate between salt and fresh water, but the migrations are not directly related to spawning but related to some other activity such as feeding (Rohde et al. 2009).

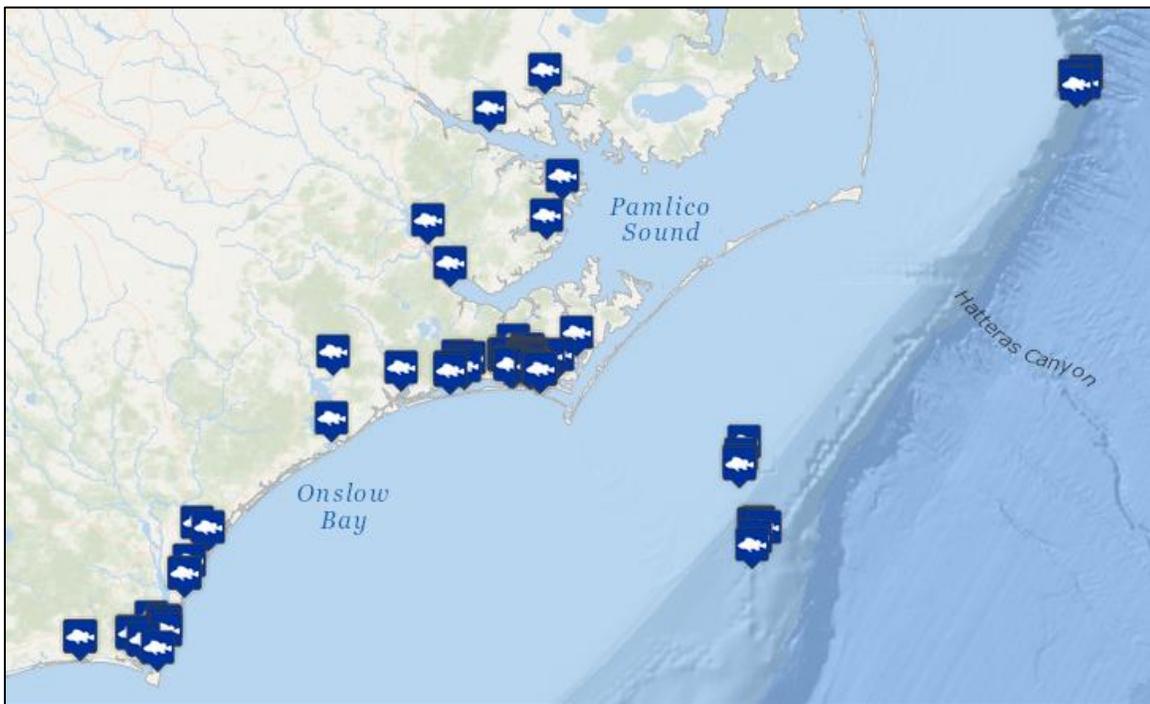
Mountain Mullet is a rarely encountered species in North Carolina waters where it is a seasonal inhabitant of fresh water (Map 1). [Note: see Supplemental Maps 1-3, page 8, showing North Carolina’s 100 counties, 21 river basins, and 4 physiographic regions.]. It may, however, be more common in U.S. waters than is generally thought because it is difficult to capture with most collecting gear (Pezold and Edwards 1983 as cited in Tracy et al. 2020). Striped Mullet is a seasonal inhabitant in all Coastal Plain river basins and can be found as far upstream as near the Fall Zone near Rockingham (Yadkin basin), at Lillington on the mainstem Cape Fear River (Cape Fear basin), and at Raleigh (Neuse basin) (Map 2). White Mullet has been rarely found distant from brackish and saltwater coastal waters. Vouchered specimens at the North Carolina Museum of Natural Sciences document the species only as far upstream as the Neuse River at New Bern and in Northeast Creek near Jacksonville (Neuse and White Oak River basins, respectively).



Map 1. Distribution of Mountain Mullet, *Dajaus monticola*. Map originally appeared in Tracy et al. (2020).



Map 2. Distribution of Striped Mullet, *Mugil cephalus*. Map originally appeared in Tracy et al. (2020).



Map 3. Distribution of White Mullet, *Mugil curema*. Map based upon vouchered specimens at the North Carolina Museum of Natural Sciences; accessed 01/29/2021. Note: many locations are beyond “North Carolina” waters (> 13.8 miles = 22.2 km, and 12 nautical miles).

As stated previously, mullets are able to convert phytoplankton and benthic organic matter into fish biomass. In turn mullets then become important prey items for piscivorous species such as flounders, Striped Bass, Bluefish, Spotted Seatrout, Red Drum, King Mackerel, Spanish Mackerel, and many other commercially and recreationally important species (Manooch 1984). None of the mullet species are state- or federally-listed species (NCAC 2017; NCNHP 2020; NCWRC 2017), but the recreational and commercial harvesting (take) of both the Striped Mullet and White Mullet are regulated by the North Carolina Division of Marine Fisheries (NCDMF 2020).

Their identification is “relatively” straight-forward. Key characteristics for their proper identification include the shape of the head, the presence or absence of an adipose eyelid and an axillary process at the base of the pectoral fin, extent of scalation of the second dorsal and anal fins, and body pigmentation.

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 Mullet (Family Mugilidae) in North Carolina

(Please refer to NCFishes.com for pictures and identifying characteristics for all species)

(Illustrations courtesy of Harrison (2002); Identification Key adapted from Rohde et al. 2009)

- 1a. Head convex across the dorsal surface (Figure 1). Adipose eyelid absent (Figure 2). Black spot present on the caudal peduncle. No axillary process at the base of the pectoral fin. Yellow areas on fins. Dorsal fin yellow with darkly pigmented areas (Figure 3).....Mountain Mullet, *Dajaus monticola*
- 1b. Head relatively flat on the dorsal surface (Figure 1). Adipose eyelid present in individuals over 30 mm Total Length (Figure 2). No spot on caudal peduncle. Axillary process present at the base of the pectoral fin2

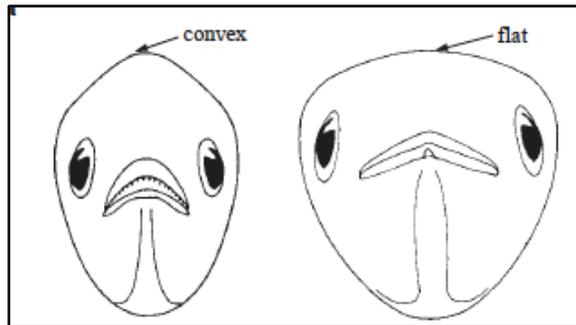


Figure 1. Anterior view of head. Left – Mountain Mullet; Right – *Mugil* sp.

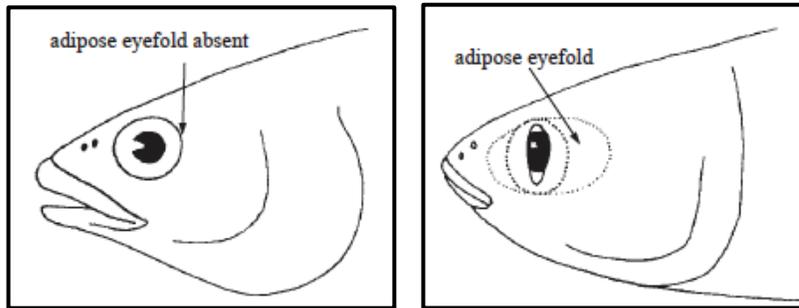


Figure 2. Left – Adipose eyelid absent; Right – Adipose eyelid present.



Figure 3. Mountain Mullet, *Dajaus monticola*.

- 2a. Second dorsal fin and anal fin unscaled (a few scales may be present in the anterior basal portion of both these fins) (Figure 4). Stripes present on body (Figure 5) Striped Mullet, *Mugil cephalus*
- 2b. Second dorsal fin and anal fin well scaled (Figure 4). No stripes present on body (Figure 5). Occurs only in brackish and salt water White Mullet, *Mugil curema*

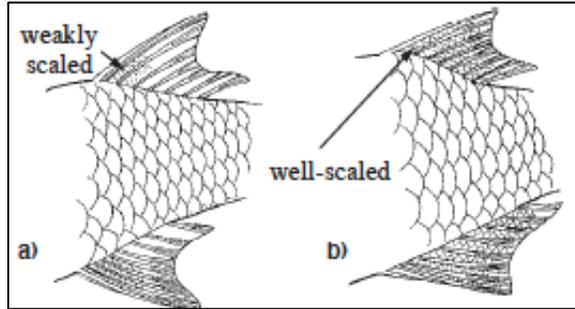


Figure 4. Second dorsal and anal fins. Left – Unscaled or weakly scaled; Right – Well scaled.



Figure 5. Top - Striped Mullet; Bottom - White Mullet.

Glossary

(Adapted from Rohde et al. (2009))

Adipose Eyelid – Fatty translucent tissue that totally or partially covers the eye in some fishes

Axillary Process – Narrow flap of flesh located just above the outside base of the pectoral or the pelvic fin

References

- Harrison, I.J. (FAO 2002). 2002. Mugilidae. Mulletts. pp 1071-1085. Carpenter, K.E. (ed.). The living marine resources of the Western Central Atlantic. Volume 2. Bony fishes part 1 (Acipenseridae to Grammatidae). Food and Agriculture Organization of the United Nations, Rome, Italy. 4099p. (Available at: [FAO 2002](#)).
- Kells, V.A., and K. Carpenter. 2011. A field guide to coastal fishes: from Maine to Texas. Johns Hopkins University Press, Baltimore, MD. 447p.
- Manooch, C.S., III. 1984. Fisherman's guide. Fishes of the southeastern United States. North Carolina State Museum of Natural History, Raleigh, NC., 362p.
- 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 Division of Marine Fisheries (NCDMF). 2020. North Carolina recreational coastal waters guide for sports fishermen – December 2020 and subsequent versions. North Carolina Division of Marine Fisheries. Morehead City, NC. Available at: [NCDMF Coastal Fishery Guide](#).
- North Carolina Natural Heritage Program (NCNHP). 2020. Natural Heritage Program list of rare animal species of North Carolina 2020. 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.
- Powers, S.L. 2020. Chapter 24. Mugilidae: Mulletts. p. 367-383. Warren, M.L., Jr. and B. M. Burr. (eds.) Freshwater fishes of North America. John Hopkins University Press, Baltimore, MD. *i-xx* + 911p.
- 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.
- 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>).
-

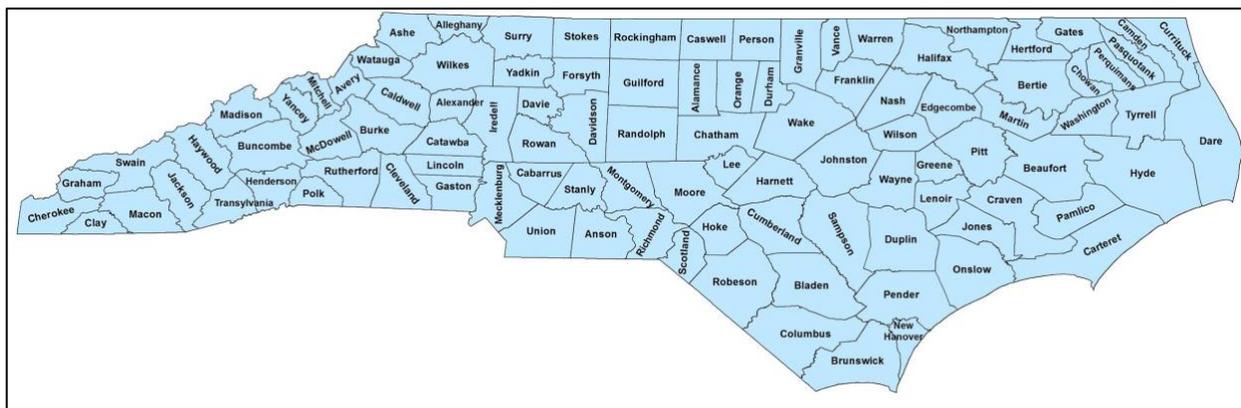
The Meanings of the Scientific Names of Mulletts (Mugilidae)

(Adopted from the ETYFish Project by Christopher Scharpf and Kenneth J. Lazara, accessed January 29, 2021, <http://www.etyfish.org/>)

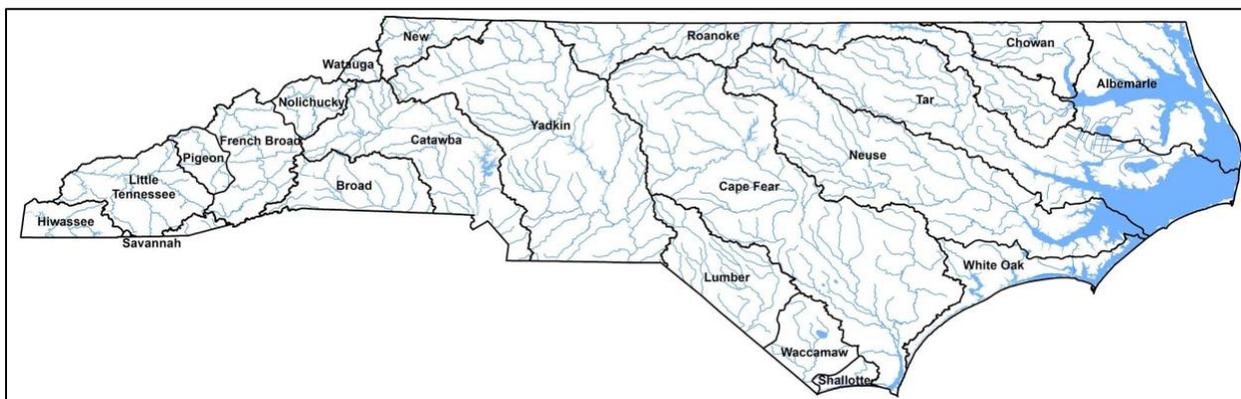
Family MUGILIDAE Jarcoki 1822 - Mulletts

- i. ***Dajaus Valenciennes 1836*** - Latinization of *dajao*, local name for this mullet in Puerto Rico
 - a. ***Dajaus monticola (Bancroft 1834)*** - of the mountains, referring to its occurrence in steep forested streams as high as 1500 m
- ii. ***Mugil Linnaeus 1758*** - Latin for mullet, possibly derived from *mulgeo*, to suck, referring to how *M. cephalus* feeds by sucking up sediment
 - a. ***Mugil cephalus Linnaeus 1758*** - *kephalos*, a name dating to Aristotle (it is not clear if the name relates to *cephalus*, meaning head)
 - b. ***Mugil curema Valenciennes 1836*** - *Curema*, Portuguese vernacular used by Dutch naturalist Jorge Marcgrave in his 1648 *Historia Naturalis Brasiliae*, doubtless corresponding to the Spanish vernacular *querimana* (or *queriman*)

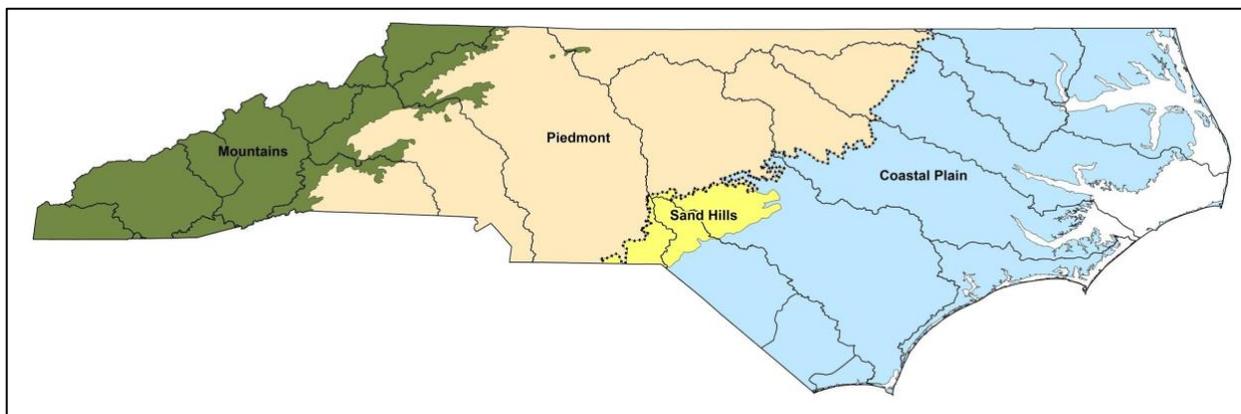
Supplemental Maps



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).