

“Three-of-a Kind” - Pike (Family Esocidae) Diversity in North Carolina
By the NCFishes.com Team

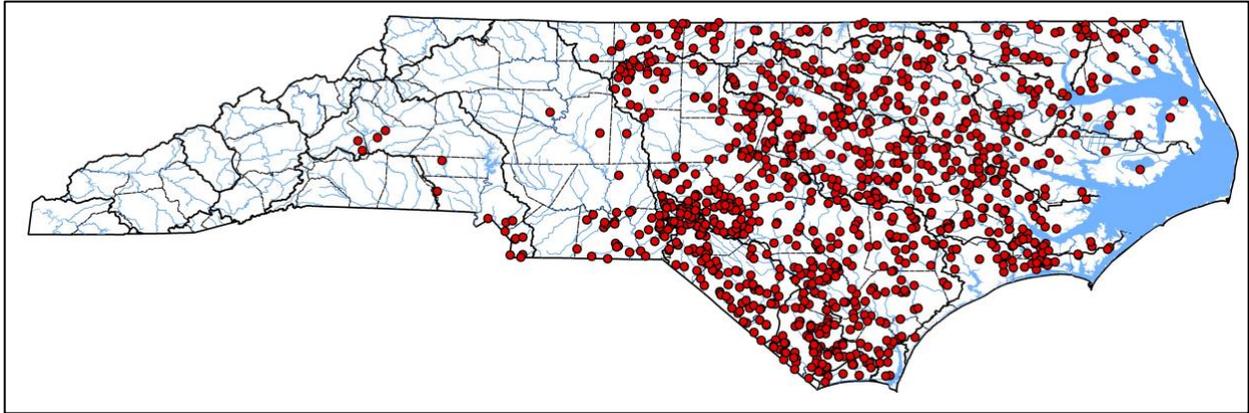
North Carolina is home to 3 of the 4 species of *Esox* known to occur in North America: Redfin Pickerel, *Esox americanus*, Chain Pickerel, *E. niger*, and Muskellunge, *E. masquinongy* (Tracy et al. 2020). [Please note: Tracy et al. (2020) may be downloaded for **free** at: <https://trace.tennessee.edu/sfcproceedings/vol1/iss60/1>.] There are two subspecies of *E. americanus* recognized: *E. americanus americanus*, Redfin Pickerel, and *E. americanus vermiculatus*, Grass Pickerel. Grass Pickerel do not occur in North Carolina. Decades ago, Northern Pike, *E. lucius*, was introduced into several river basins (Yadkin and Roanoke) (<https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=676>), but thankfully, the introductions were unsuccessful. The Family Esocidae is colloquially known as pikes and often you will hear our species referred to as Little Pickerel, Pickerel, Pike, Jack, Jackfish, and Musky. Their American Fisheries Society-accepted common names are Redfin Pickerel, Chain Pickerel, and Muskellunge (Page et al. 2013) and each of their scientific (Latin) name actually means something (please refer to The Meanings of the Scientific Names of Pikes, page 6).

Both Redfin Pickerel and Chain Pickerel are native (indigenous) east of the Mountains (Map Nos. 1 and 2). [Please note: see Supplemental Maps 1-3, page 7, showing North Carolina's 100 counties, 21 river basins, and 4 physiographic regions.] Redfin Pickerel is primarily a Coastal Plain species but there are records from the western Piedmont in the Catawba basin and from the upper Roanoke basin (Map No. 1). Chain Pickerel, whose distribution overlaps that of the Redfin Pickerel, is introduced (nonindigenous) in the French Broad basin (Buncombe, Henderson, and Transylvania counties) where they are likely to be confused with the indigenous Muskellunge (Map No. 2). By comparison, Muskellunge is indigenous to the Tennessee drainage (Nolichucky, French Broad, Little Tennessee, Hiwassee basins), but it has been stocked as a sport fish in the New River and in the Broad River and Lake Adger (Broad basin) (Map No. 3). All three species are considered an inland game fish (NCWRC 2020).

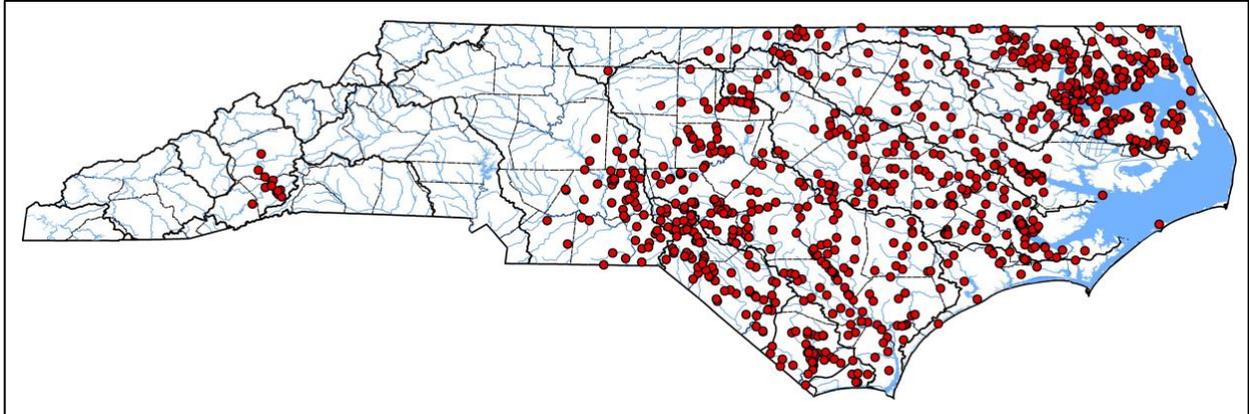
North Carolina's pickerels are common inhabitants of the Coastal Plain's swamps, sloughs, creeks, mill ponds, and our natural lakes. Redfin and Chain pickerels are frequently found in tannin-stained blackwater and acidic Coastal Plain and Sand Hills streams wherever there is cover such as vegetation, brush piles and logs (Rohde et al. 2009). In the Piedmont, pickerels are also found, though less common, in creeks, rivers, and reservoirs. Muskellunge tend to inhabit our bigger, deeper, and slower moving rivers in the Mountains such as the French Broad and New, along with reservoir populations in Lake Adger and Fontana Reservoir.

Their identification is relatively straight-forward. Key characteristics for their proper identification include the presence/absence of a subocular bar, color and spotting of the fins, scalation of the opercle, and the relative length of the snout (please refer to the Identification Key to the Species of Pikes (Family Esocidae) in North Carolina. Additionally, size can also aid in their identification: the maximum size of Redfin Pickerel is about 15 inches, about 40 inches for the Chain Pickerel, and up to 72 inches for the Muskellunge (Rohde et al. 2009).

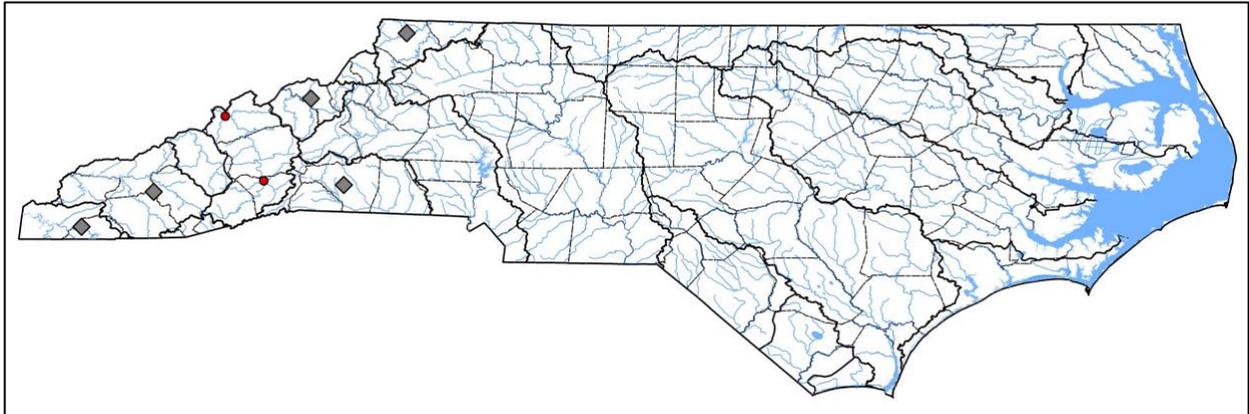
Hybridization is known to occur between Redfin Pickerel and Chain Pickerel which can make those specimen's identification problematic. If you have troubles with your identifications, just send us (<https://ncfishes.com/contact/>) an e-mail and include as many quality digital photographs as you can along with all the pertinent locality descriptors so that we will know from where the fish came.



Map 1. Distribution of Redfin Pickerel, *Esox americanus*, in North Carolina. Map originally appeared in Tracy et al. (2020).



Map 2. Distribution of Chain Pickerel, *Esox niger*, in North Carolina. Map originally appeared in Tracy et al. (2020).



Map 3. Distribution of Muskellunge, *Esox masquinongy*, in North Carolina. Map originally appeared in Tracy et al. (2020). Gray diamonds in the approximate middle of a basin represent known occurrences within the basin, but for which no vouchered specimens are known to exist.

Identification Key to the Species of Pike (Family Esocidae) in North Carolina

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

1. Black bar beneath eye. Opercle completely scaled. Fins with no black spots. 4 mandibular pores on the underside of each jaw2

No black bar beneath eye (Figure 1). Opercle scaled only on upper half. Dorsal and anal fins with black spots. Usually 6 or more mandibular pores on the underside of each jaw
 Muskellunge, *Esox masquinongy*



Figure 1. Muskellunge. Photograph courtesy of the North American Native Fishes Association.

2. Sides of adults longer than 100 mm with dark vertical bars, bars are faint in individuals less than 50 mm (Figures 2 and 3). Distance from center of eye to tip of snout less than or equal to the distance from the center of the eye to the upper end of the gill opening (Figures 3 and 5). Subocular bar usually slanted posteriorly from eye (Figures 2 and 3). Dorsal and anal fins rounded in shape; at least some fins with red or reddish color in life (Figure 2)
 Redfin Pickerel, *Esox americanus americanus*

Sides of adults longer than 200 mm with numerous elongate light spots (chain-like pattern), young with bars (Figures 3 and 4). Snout longer; distance from center of the eye to the tip of the snout greater than the distance from center of the eye to the upper end of gill opening (Figures 3 and 6). Subocular bar vertical (Figures 3 and 4). Dorsal and anal fins rectangular in shape. No fins with red (Figure 4) Chain Pickerel, *Esox niger*



Figure 2. Redfin Pickerel showing red fins, slanting subocular bar, dark vertical bars, and its “duck-bill”- like snout.

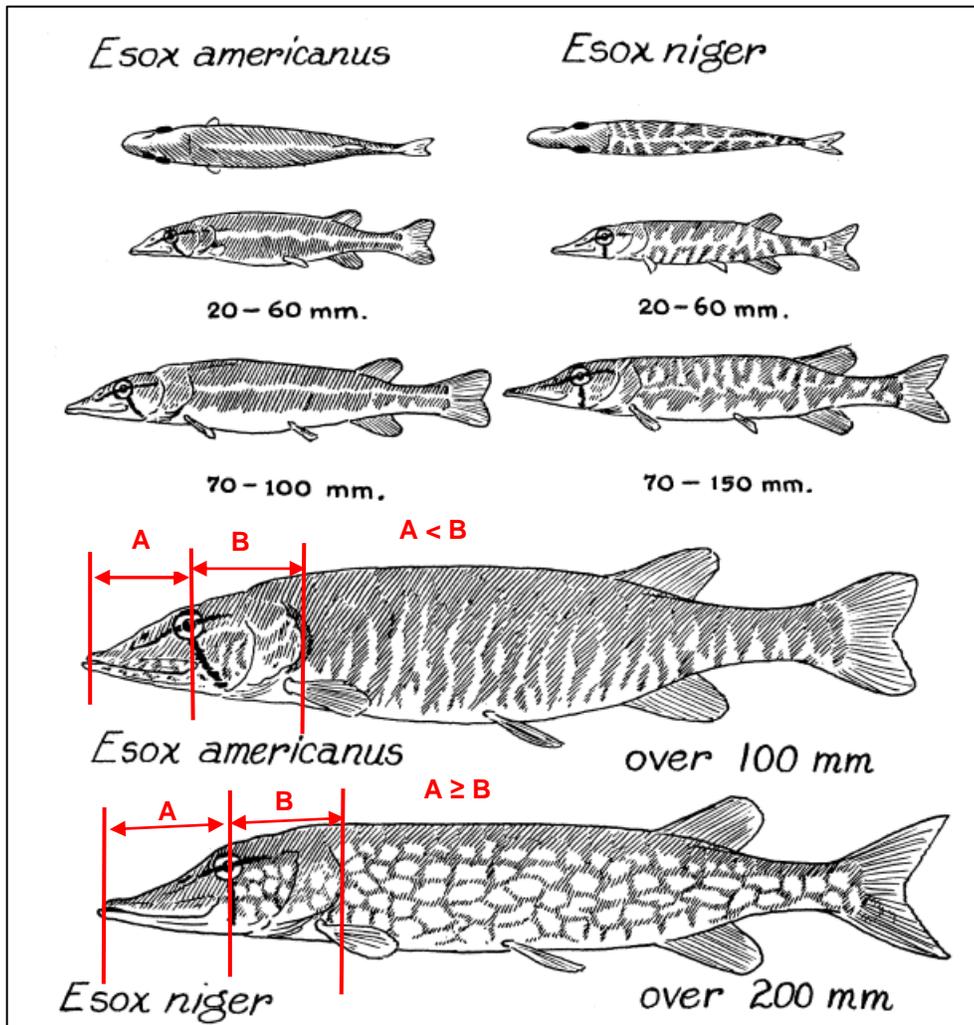


Figure 3. Comparison of body shape and color pattern of Redfin Pickerel, *Esox a. americanus* and Chain Pickerel, *E. niger* at various sizes. Illustration courtesy of Crossman (1962).



Figure 4. Chain Pickerel showing unpigmented fins, vertical subocular bar, vertical bars in young fish and “chain-like” pattern along the sides in mature fish.

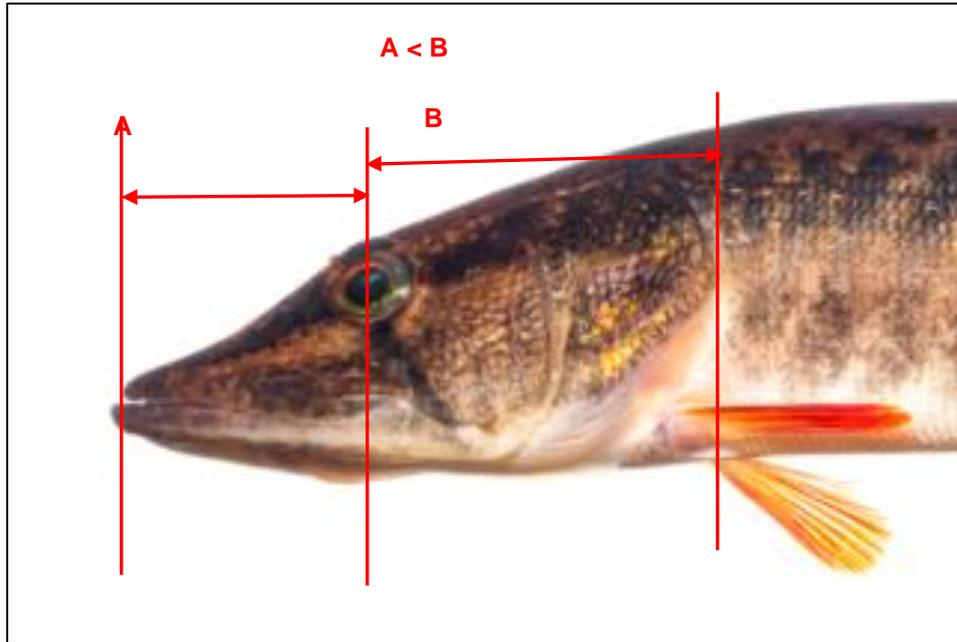


Figure 5. Redfin Pickerel showing the distance from center of eye to tip of snout less than or equal to the distance from the center of the eye to the upper end of the gill opening.

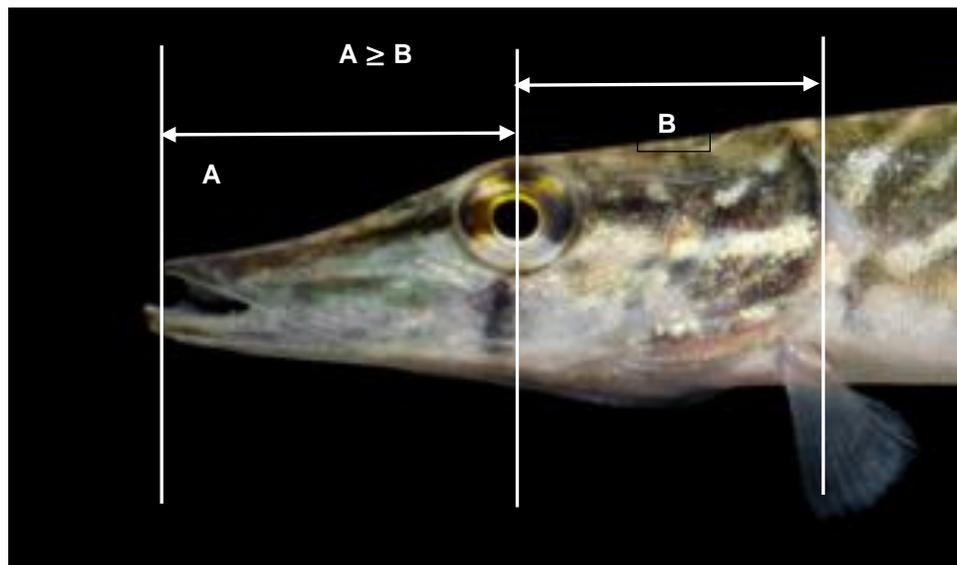


Figure 6. Chain Pickerel showing the distance from center of eye to tip of snout greater than or equal to the distance from the center of the eye to the upper end of the gill opening.

References

- Crossman, E.J. 1962. The Redfin Pickerel, *Esox a. americanus* in North Carolina. *Copeia* 1962:114-123.
- Menhinick, E.F. 1991. The freshwater fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh, NC. 227p.
- North Carolina Wildlife Resources Commission (NCWRC). 2020. North Carolina inland fishing, hunting, and trapping regulations digest 2020–2021. North Carolina Wildlife Resources Commission. Raleigh, NC. 96p.
- 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, Bethesda, MD. 384p.
- 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.
- Scharpf, C. 2020. The authorial mystery of *Esox masquinongy*. *American Currents*. 45:33.
- 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 Pikes

Adopted from the ETYFish Project by Christopher Scharpf and Kenneth J. Lazara, accessed November 24, 2020, <http://www.etyfish.org/>

Family Esocidae Pikes

***Esox* Linnaeus 1758** - Latinized Gaulish word for a large fish from the Rhine, possibly originally applied to a salmon, now applied to pikes

***Esox americanus americanus* Gmelin 1789** - American, distinguishing it from the circumpolar *E. lucius*

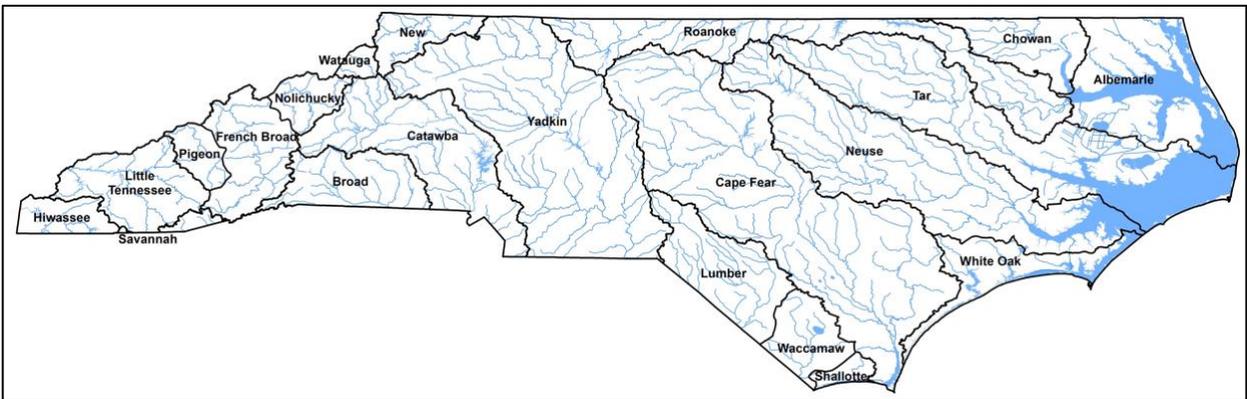
***Esox masquinongy* Mitchill 1824** - Native American name for this species, from the Ojibway (Chippewa) *mask*, ugly; *kinongé*, fish [due to a bibliographic error, Mitchill's description had been "lost" since its publication until 2015, when it was rediscovered by Ronald Fricke, upon which it was revealed that Mitchill used a vernacular name instead of proposing a new binomial; Jordan, who searched for Mitchill's description but never found it, nevertheless treated the name as valid in 1885, a decision accepted by every fish taxonomist ever since; technically, name and/or author and/or date should change depending on first available name (not researched), but prevailing usage may apply]. See Scharpf (2020).

***Esox niger* Lesueur 1818** - black or dark, referring to its juvenile coloration

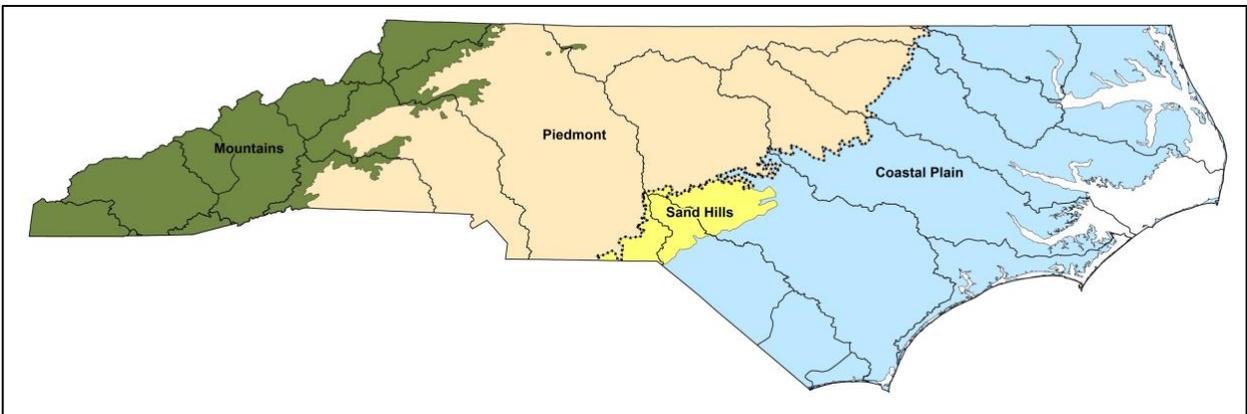
Supplemental Maps



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).