

Pike (Family Esocidae) Diversity in North Carolina

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). 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 species has a scientific (Latin) name (Appendix 1).

Both Redfin Pickerel and Chain Pickerel are native (indigenous) east of the Mountains (Tracy et al. 2020). 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. 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. 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). All three species are considered an inland game fish (NCWRC 2020a).

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.

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. 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). Lastly, hybridization is known to occur between Redfin Pickerel and Chain Pickerel which can make those specimen's identification problematic.

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

1a. 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.

2a. 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*](#)

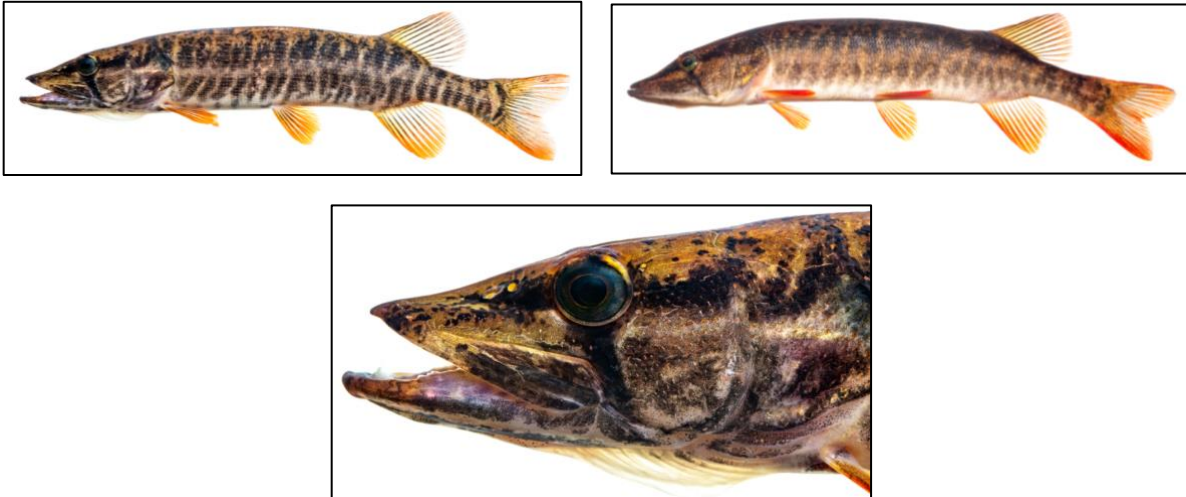


Figure 2. Redfin Pickerel showing red fins, slanting subocular bar, dark vertical bars, and its “duck-bill”- like snout.

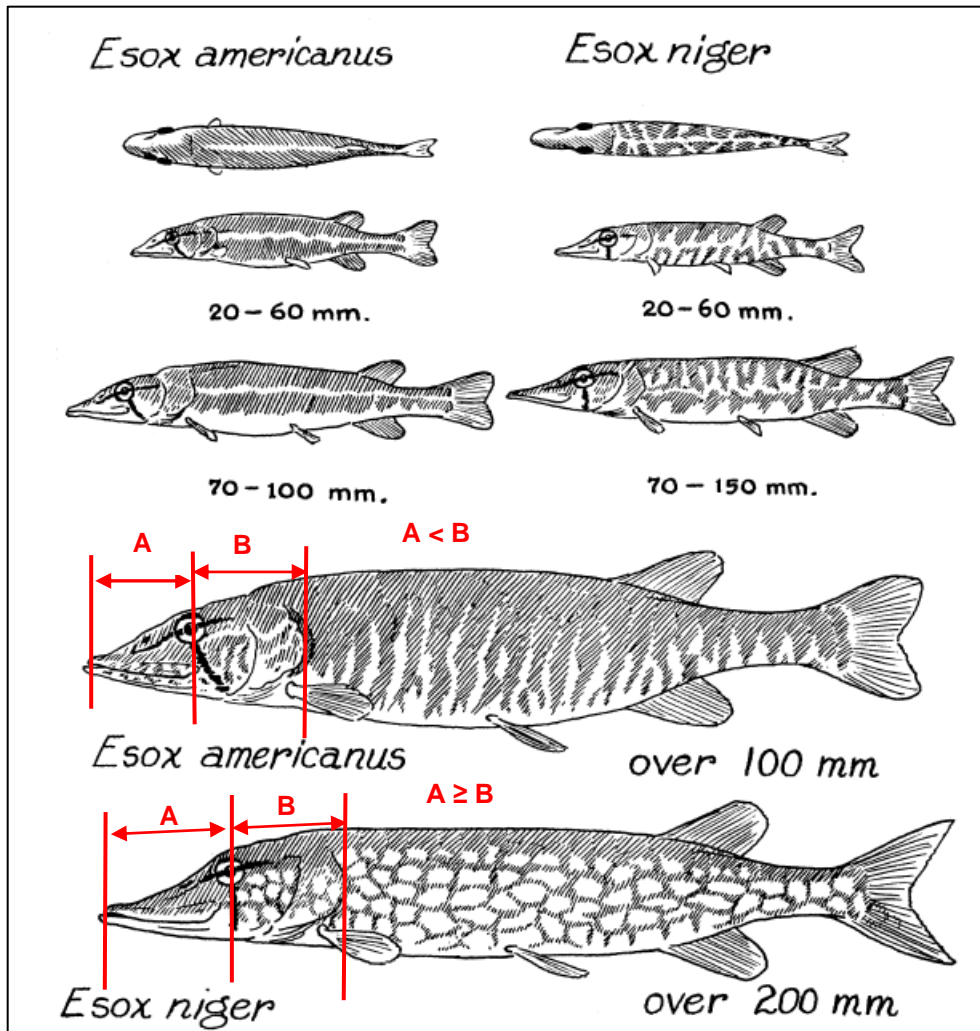


Figure 3. Comparison of body shape and color pattern of Redfin Pickerel, *Esox a. americanus* and Chain Pickerel, *E. niger* at various sizes. Illustrations courtesy of Crossman (1962).



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.

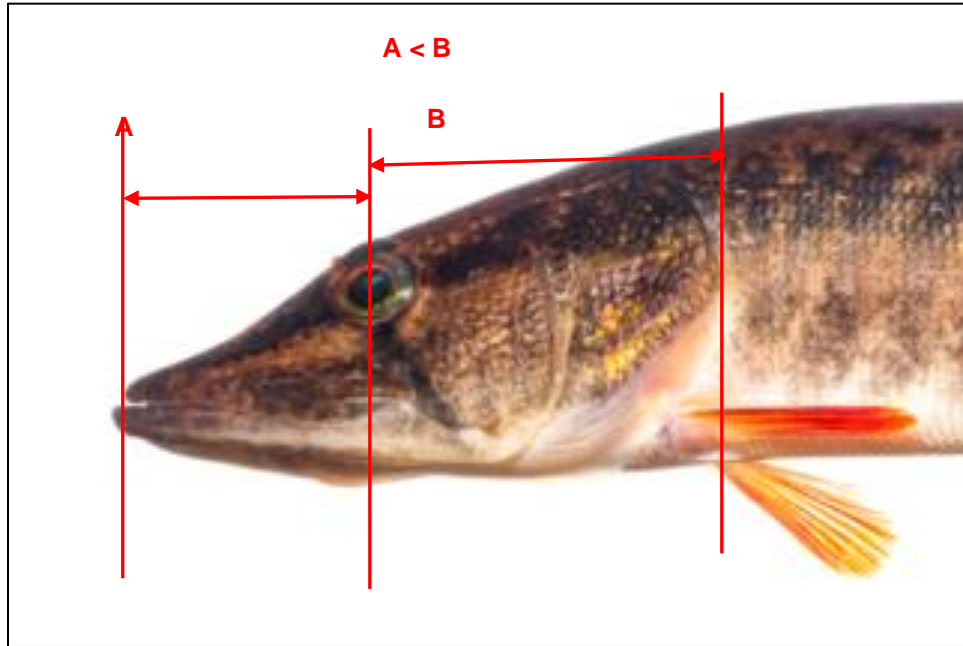


Figure 5. Redfin Pickerel showing the distance from center of eye to tip of snout less than or equal to the distance from the center of the eye to the upper end of the gill opening.

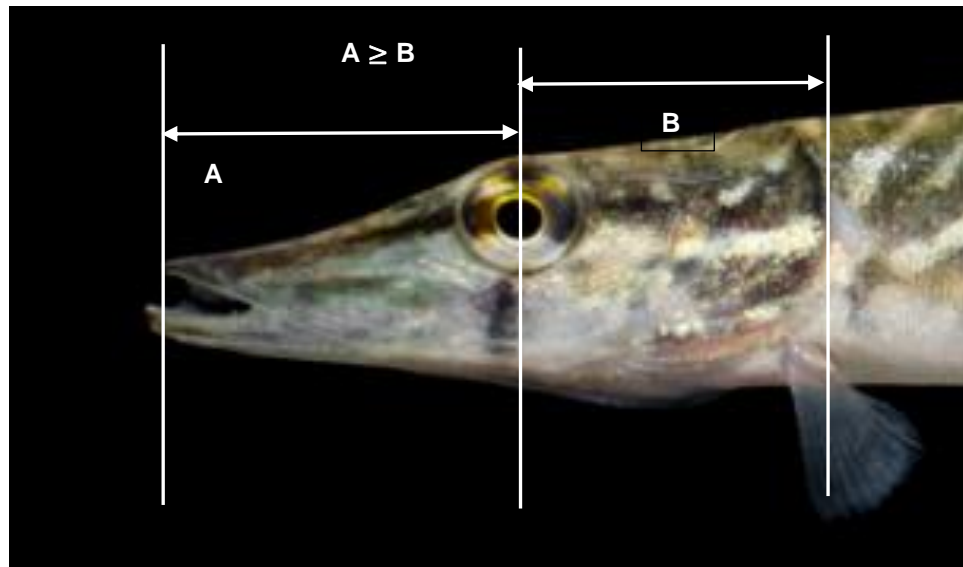


Figure 6. Chain Pickerel showing the distance from center of eye to tip of snout greater than or equal to the distance from the center of the eye to the upper end of the gill opening.