

Sturgeon (Family Acipenseridae) Diversity in North Carolina
By the [NCFishes.com](https://www.ncfishes.com) Team

Three of our largest freshwater fishes are found in our coastal waters, rivers, and estuaries and even in our largest mountain river. These three species are: Shortnose Sturgeon, *Acipenser brevirostrum*, Lake Sturgeon, *A. fulvescens*, and Atlantic Sturgeon, *A. oxyrinchus* ([NCFishes.com](https://www.ncfishes.com); Tracy et al. 2020). [Please note: Tracy et al. (2020) may be downloaded for **free** at: <https://trace.tennessee.edu/sfcproceedings/vol1/iss60/1.>]

Unlike most fish species found in North Carolina's waters, the Family Acipenseridae are known simply as sturgeons. Their three common names – Shortnose, Lake, and Atlantic sturgeons are the American Fisheries Society-accepted common names (Page et al. 2013) and each of the scientific (Latin) names actually means something (please refer to The Meanings of the Scientific Names of Soles, page 8).

In 1585-1593, John White illustrated in remarkable and accurate detail Atlantic Sturgeon labeled with the Algonquin word used by the Croatoan First Peoples, *Coppáuteo* (<https://www.coastalcarolinaindians.com/updated-algonquian-word-list-by-scott-dawson/>), and noted: “*The Sturgeon. Some 10. 11. 12. or 13 foote in length*” (Figure 1). Coincidentally, this measurement is almost identical to that (14.1 feet) reported almost 425 years later by Rohde et al. (2009).

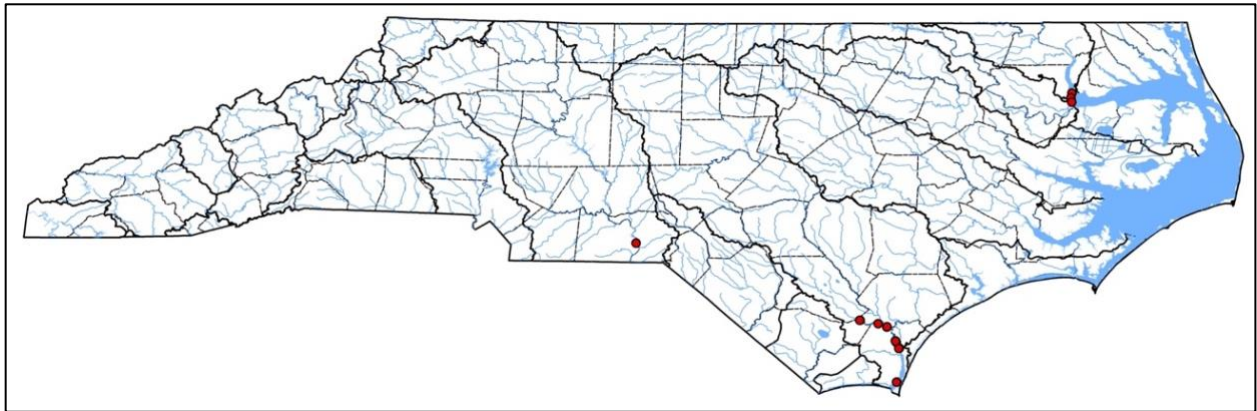


Figure 1. Painting of Atlantic Sturgeon by John White, 1585-1593. Painting courtesy of the British Museum, Museum No. SL,5270.111 (https://www.britishmuseum.org/collection/object/P_SL-5270-111).

More than a century after John White painted this fish, sturgeon was mentioned as occurring in North Carolina's waters by John Lawson in 1709: “. . . *the Sturgeon, of which we have Plenty, all the fresh Parts of our Rivers being well stor'd therewith. The Indians upon and towards the Heads and Falls of our Rivers, strike a great many of these, and eat them; yet the Indians near the Salt-Waters will not eat them. I have seen an Indian strike one of these Fish, seven Foot long, and leave him on the Sands to be eaten by the Gulls. In May, they run up toward the Heads of the Rivers, where you see several hundred of them in one day. The Indians have another way to take them, which is by Nets at the end of a Pole. The Bones of these Fish make good Nutmeg-Graters*” Lawson (1709, p158-159).

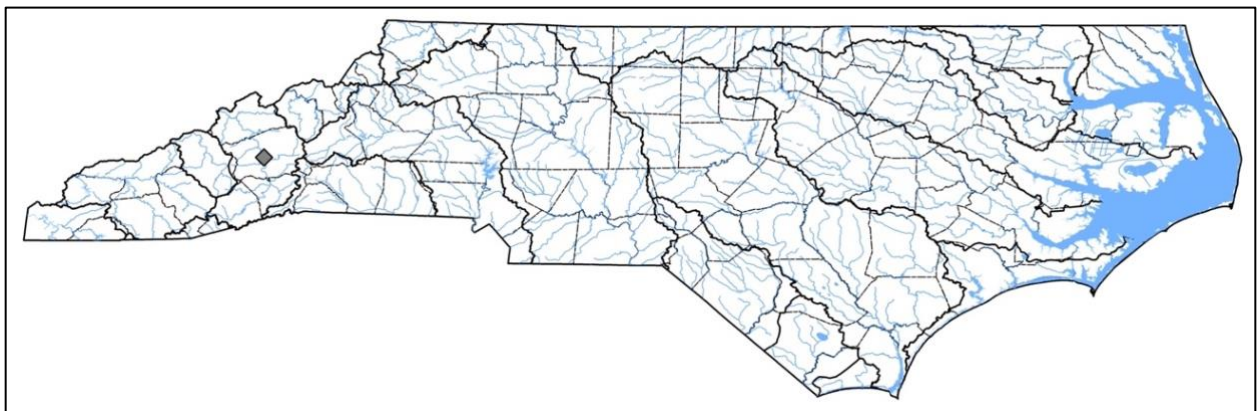
As previously written in our blog posting on Livebearers (Family Poeciliidae; <https://ncfishes.com/freshwater-fishes-of-north-carolina/heterandria-formosa/>), our smallest freshwater species is the Least Killifish, *Heterandria formosa*, measuring only 36 mm (1.4 inches) in length. Conversely, our largest freshwater fish species, Atlantic Sturgeon, is almost 120 times the Least Killifish's size! Atlantic Sturgeon range in size from 880 mm to 4300 mm (34.6-169.3 inches), followed by Lake Sturgeon up to 2700 mm (108 inches) in length, and Shortnose Sturgeon 430 mm to 1090 mm (16.9-42.9 inches in length (Page and Burr 2011; Rohde et al. 2009).

Shortnose Sturgeon is an anadromous species meaning it migrates from the ocean into fresh water to spawn. However unlike the Atlantic Sturgeon, Shortnose Sturgeon do not venture much beyond the high salinity estuaries into the ocean (Map 1; Rohde et al. 2009). [Note: see Supplemental Maps 1-3, page 9, showing North Carolina's 100 counties, 21 river basins, and 4 physiographic regions.] Until the late 1980s, the only valid historical record of Shortnose Sturgeon was from Salmon Creek in Bertie County (Chowan basin) in 1881. In 1985 a gravid female was caught in the Pee Dee River (Yadkin basin) downstream from the US 74 bridge. None have since been detected in the North Carolina portion of the Pee Dee River, but the South Carolina Department of Natural Resources (SCDNR) tracked several in 2002-03 to within 5.6 kilometers of the state line. The first verifiable record from the Cape Fear basin was captured in a gill net in the lower Cape Fear River in 1978. Other more records include an adult captured in Albemarle Sound in 1998 and another near the mouth of the Chowan River, downstream from Salmon Creek in 2016 (Tracy et al. 2020).



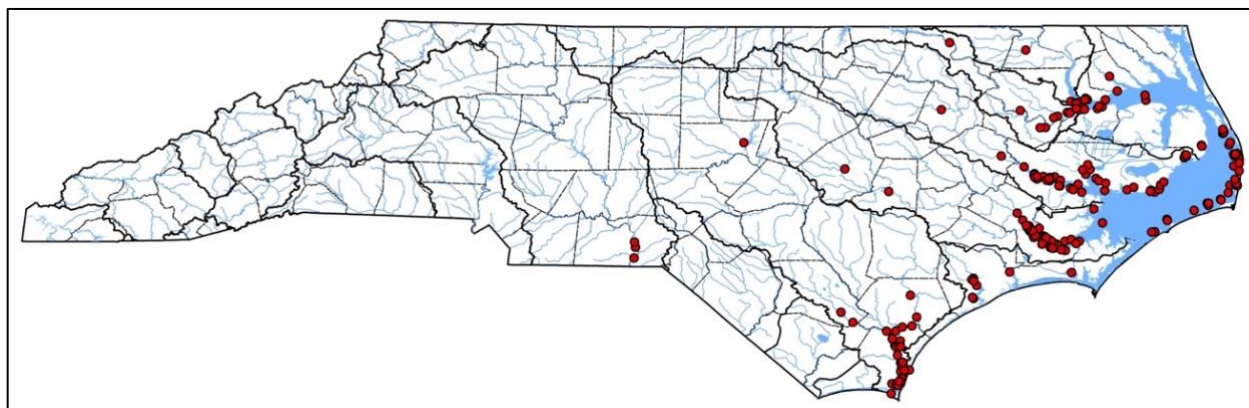
Map 1. Distribution of Shortnose Sturgeon, *Acipenser brevirostrum*. Map originally appeared in Tracy et al. (2020).

Until recently, Lake Sturgeon was considered extirpated from the state (NCNHP 2020). But beginning in 2015, more than 24,000 young juvenile Lake Sturgeon have been released into the French Broad River between the towns of Hot Springs and Marshall as part of a re-introduction effort back into their native waters in the French Broad basin (Map 2; Tracy et al. 2020). Lake Sturgeon are potadromous meaning they migrate up and down rivers to and from their spawning grounds.



Map 2. Distribution of Lake Sturgeon, *Acipenser fulvescens*. [Note: When a species was known to occur within a basin, but vouchered material was not present, the occurrence was designated with a gray diamond in the approximate middle of the basin.] Map originally appeared in Tracy et al. (2020).

Atlantic Sturgeon, also an anadromous species, is found in all the major rivers from the Chowan to the Yadkin basin, except in the Lumber, Waccamaw, and Shallotte basins. It is also found in the sounds and Atlantic Ocean (Map 3; Tracy et al. 2020). It also migrates out into the Atlantic Ocean and along the coast (Rohde et al. 2009). There is an anecdotal record from 1882 of the capture of a 201 kilogram (about 440 pounds) specimen from the Haw River, Chatham County (Cape Fear basin). It is possible that Atlantic Sturgeon historically may also have migrated and spawned up into the Fall Zone in the Cape Fear, Catawba, and Broad basins. In the Roanoke basin, there are recent records from the Roanoke River as far upstream as Weldon, in the Chowan basin beyond NC 11 in Potecasi Creek, in the Tar basin from the Tar River near Tarboro, and in the Neuse basin from the Neuse River at Goldsboro and Smithfield. In mid-September 2018 a large adult, perhaps a fall spawning migrant, was detected at Blewett Falls Dam near Rockingham (Tracy et al. 2020) and in 2019 migrating to and from the upper Pee Dee River to spawn (<https://www.fisheries.noaa.gov/feature-story/return-atlantic-sturgeon-pee-dee-river-signals-improved-health-population>).



Map 3. Distribution of Atlantic Sturgeon, *Acipenser oxyrinchus*. Map originally appeared in Tracy et al. (2020).

Shortnose Sturgeon and Atlantic Sturgeon are federally-listed as Endangered species; Lake Sturgeon is state-listed as Special Concern (NCAC 2017; NCNHP 2020; NCWRC 2017). The recreational and commercial harvesting (take) of any species of sturgeon is prohibited (NCDMF 2020; NCWRC 2020). Any sturgeon caught must be immediately released (NCWRC 2020).

Most of us will never encounter a live sturgeon in North Carolina waters unless we visit one of the larger public aquaria in North Carolina (Fort Fisher, Pine Knoll Shores, or Roanoke Island) or Tennessee (Tennessee Aquarium in Chattanooga, TN). If you do, it should be released as quickly as possible and hopefully, unharmed. If you should find a stranded, injured, or dead sturgeon, please report it to the National Oceanic and Atmospheric Administration (NOAA) at (978) 281-9328 or in the Southeast at (844) STURG-911 or (844) 788-7491, or send NOAA an email at NOAA.Sturg911@noaa.gov (<https://www.fisheries.noaa.gov/species/atlantic-sturgeon>). Instructions for resuscitating a sturgeon can be found at: <https://media.fisheries.noaa.gov/dam-migration-miss/Resuscitation-Cards-120513.pdf>.

The identification of sturgeons can be based upon geographical distribution (e.g., Lake Sturgeon being the only species west of the Appalachian Mountains) or on morphological traits (e.g., presence or absence of bony plates between the anal fin and the midlateral scutes and the relative sizes of mouth gape widths and snout lengths (please refer to the Identification Key to the Sturgeons (Family Acipenseridae) in North Carolina).

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 Sturgeons (Family Acipenseridae) in North Carolina

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

(Identification Key adapted from Hochleithner and Vecsei (2004); Page and Burr (2011); and Rohde et al. 2009))

Identification Key based upon morphological traitsA

Identification Key based upon geographical distributions and morphological traitsB

A.

1a. Plates present along both sides of the anal-fin base. 3 or more post-dorsal and post-anal plates (some in pairs). Mouth opening usually less than 60% of the interorbital width Atlantic Sturgeon, *Acipenser oxyrinchus*

1b. No plates at the sides of the anal fin base. 3 or fewer post-dorsal and post-anal plates. Mouth opening usually more than 60% of the interorbital width2

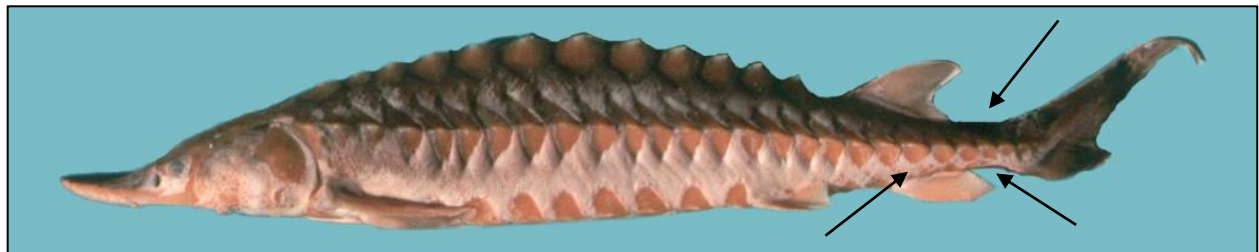


Figure 1. Atlantic Sturgeon with black arrows pointing to the location of plates of taxonomic importance.

2a. Anal fin origin beneath dorsal fin origin (Figure 2). Fewer than 23 anal fin rays. Back and lateral scutes are lighter than the body background. 42 or fewer dorsal fin rays. Restricted to Atlantic slope basinsShortnose Sturgeon, *Acipenser brevirostrum*

2b. Anal fin origin posterior to dorsal fin origin (Figure 3). More than 23 anal fin rays. Back and lateral scutes almost the same color as the body back ground. Restricted to the French Broad River downstream from Marshall in Madison County Lake Sturgeon, *Acipenser fulvescens*



Figure 2. Shortnose Sturgeon with black bar showing the origin of the anal fin beneath the origin of the dorsal fin.



Figure 3. Young Lake Sturgeons showing the origin of the anal fin posterior to the origin of the dorsal fin. Photograph courtesy of David Neely.

- B.
- 1a. Restricted to the French Broad River downstream from Marshall in Madison County (Figure 3)
Lake Sturgeon, *Acipenser fulvescens*
 - 1b. Restricted to Atlantic Slope basin rivers and coastal waters2
 - 2a. Bony plates absent between the anal fin and the midlateral scutes (Figure 4). Mouth large, the inner gape width (measured between the inside corner of the lips) is usually more than 62% of the interorbital width (distance between the eyes) (Figure 5)
Shortnose Sturgeon, *Acipenser brevirostrum*
 - 2b. Bony plates present (rarely absent) between the anal fin and the midlateral scutes (Figure 6). Mouth small, the inner gape width is usually less than 60% of the interorbital width (Figure 5)
Atlantic Sturgeon, *Acipenser oxyrinchus*



Figure 4. Shortnose Sturgeon with black arrow showing the absence of bony plates between the anal fin and the midlateral scutes.

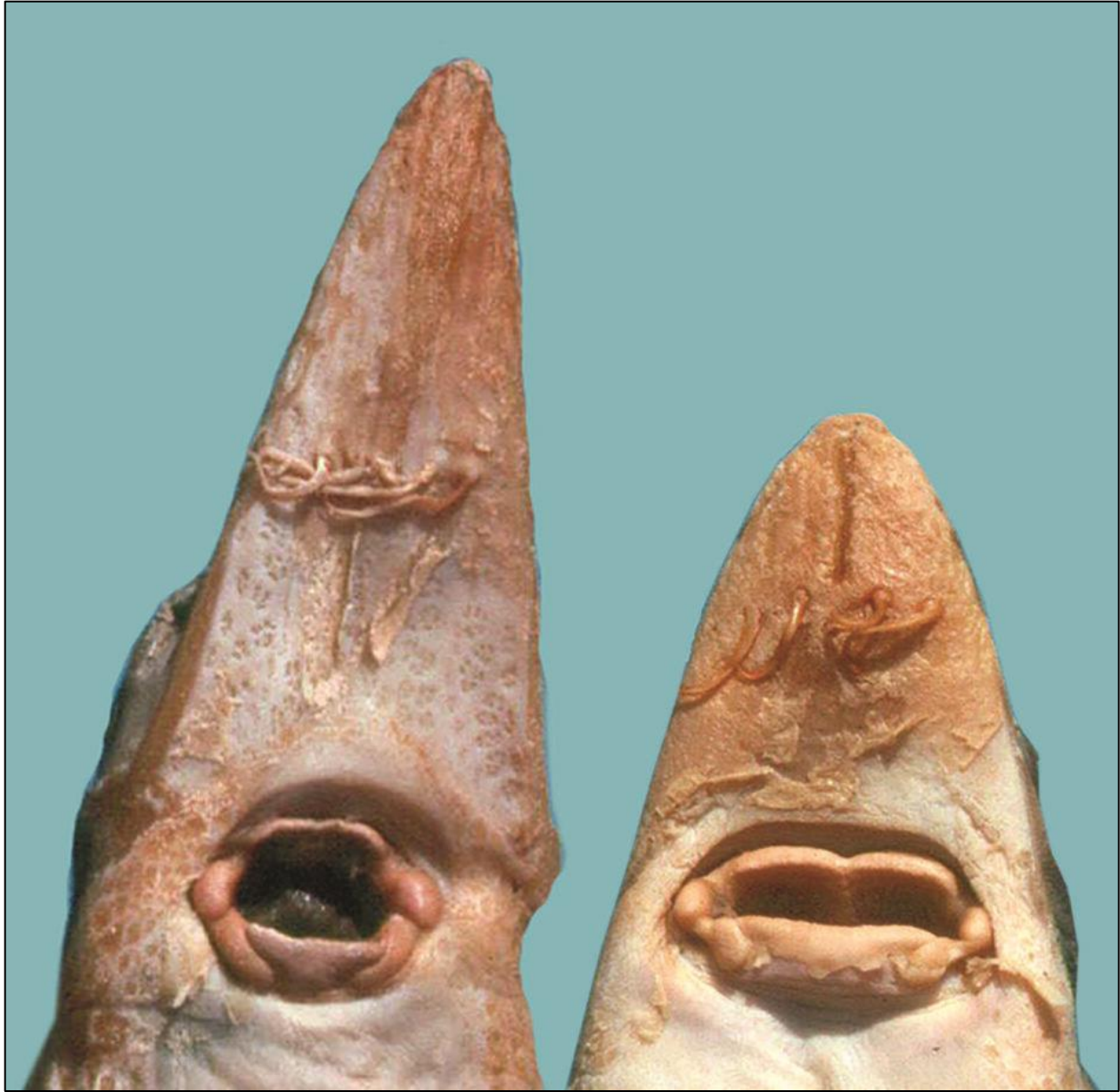


Figure 5. Sturgeon mouths showing relative sizes of gape widths and snout lengths (Rohde et al. 2009). Left – Atlantic Sturgeon; Right – Shortnose Sturgeon.

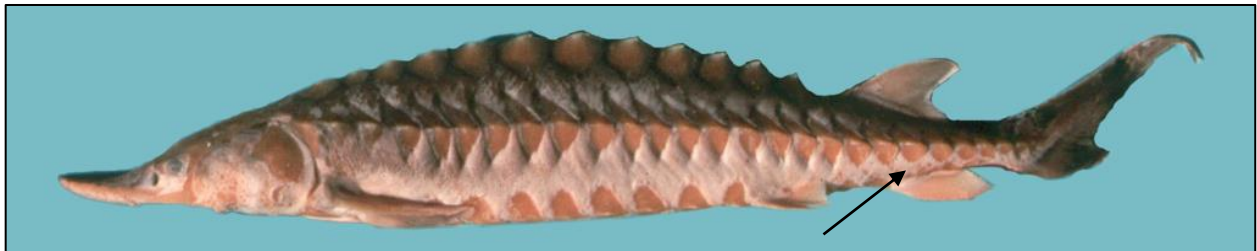


Figure 6. Atlantic Sturgeon with black arrow showing the presence of bony plates between the anal fin and the midlateral scutes.

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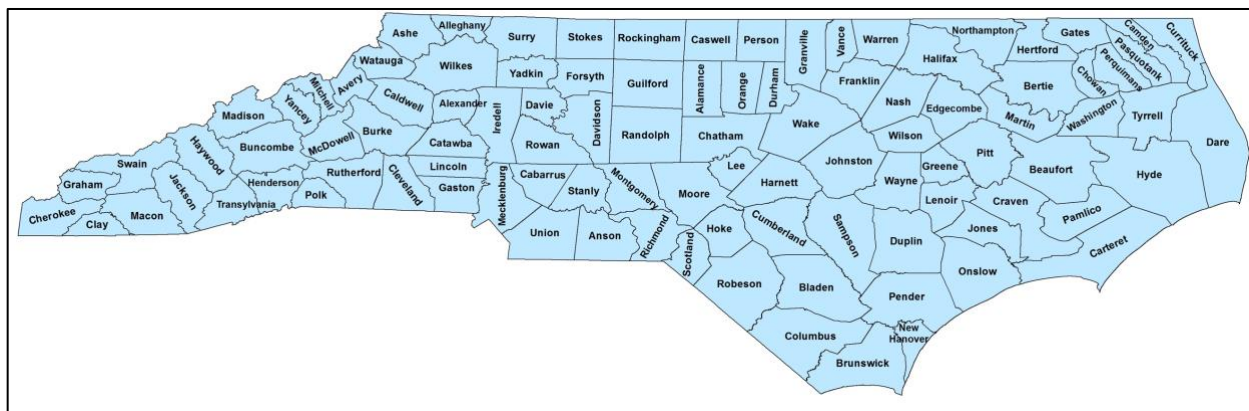
The Meanings of the Scientific Names of Sturgeons

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

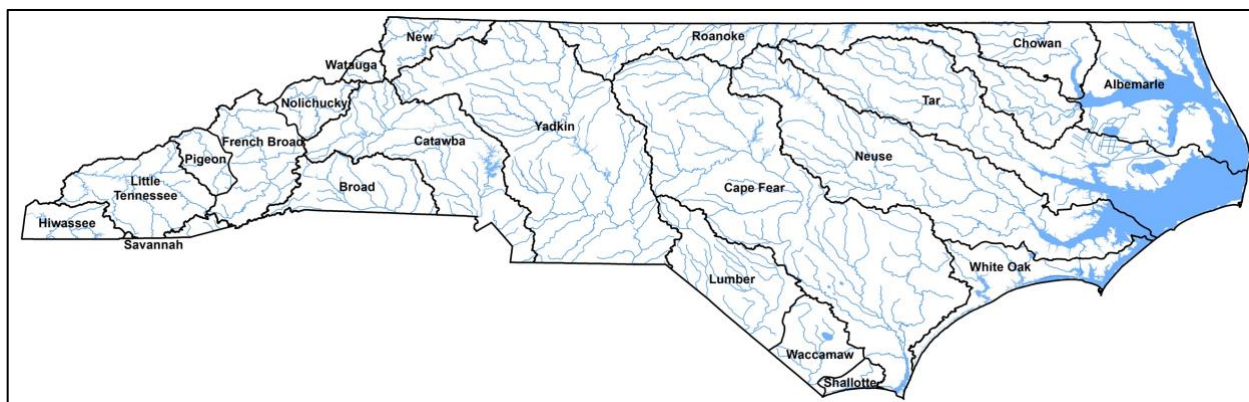
Family ACIPENSERIDAE Bonaparte 1831, Sturgeons

- i. ***Acipenser* Linnaeus 1758** - Latin for sturgeon, derived from *akis*, point; *pente*, five, referring to five rows of body scutes
 - a. ***Acipenser brevirostrum* Lesueur 1818** - *brevis*, short; *rostrum*, nose, referring to shorter snout compared to *A. oxyrinchus*
 - b. ***Acipenser fulvescens* Rafinesque 1817** - *fulvous*, yellowish-brown; *-escens*, becoming, referring to olive-brown coloration on upper half of body
 - c. ***Acipenser oxyrinchus* Mitchell 1815** - *oxy*, sharp; *rhynchus*, snout, referring to sharply V-shaped snout

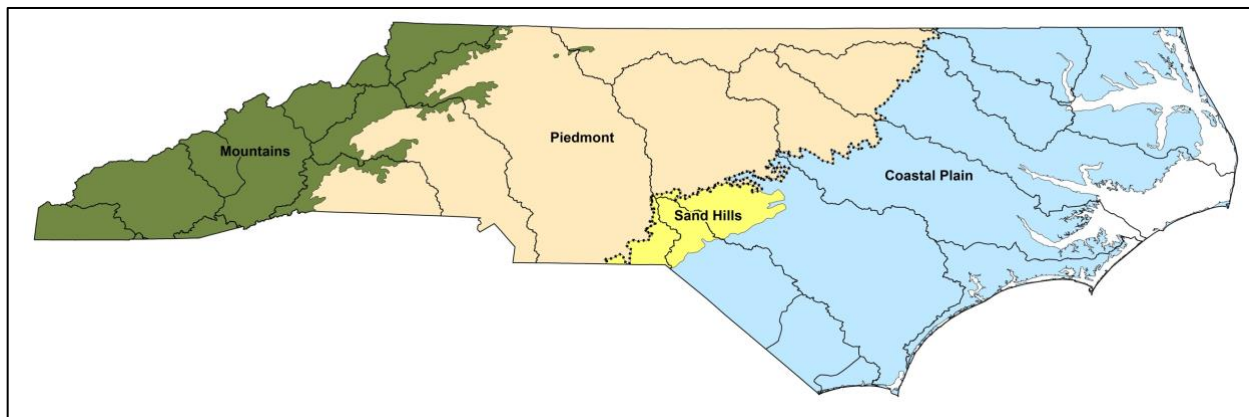
Supplemental Maps



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).