

## Sturgeon (Family Acipenseridae) Diversity in North Carolina

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://ncfishes.com); Tracy et al. 2020). 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 a scientific (Latin) name (Appendix 1).

Our smallest freshwater species is the Least Killifish, *Heterandria formosa*, measuring only 36 mm (1.4 inches) in length (<https://ncfishes.com/freshwater-fishes-of-north-carolina/heterandria-formosa/>). 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 (Rohde et al. 2009; Tracy et al. 2020). 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).

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 (Tracy et al. 2020). Lake Sturgeon are potadromous meaning they migrate up and down rivers to and from their spawning grounds.

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 (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>).

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 2020a). Any sturgeon caught must be immediately released (NCWRC 2020a).

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](mailto: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).

**Identification Key to the Species of Sturgeons (Family Acipenseridae) in North Carolina**

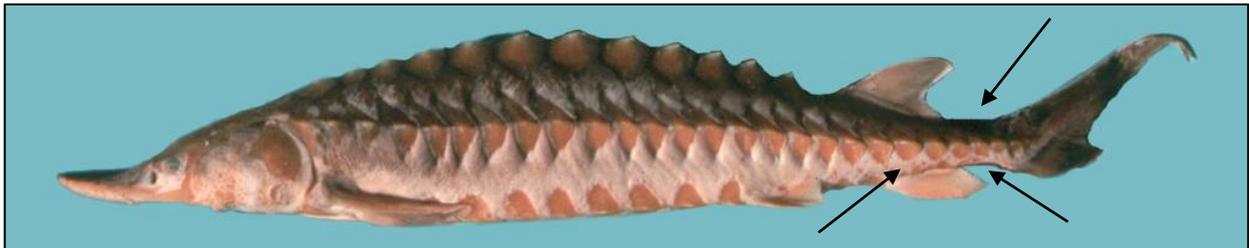
Identification Key based upon morphological traits .....A

Identification Key based upon geographical distributions and morphological traits .....B

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 width .....2



**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 basins .....Shortnose 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.**

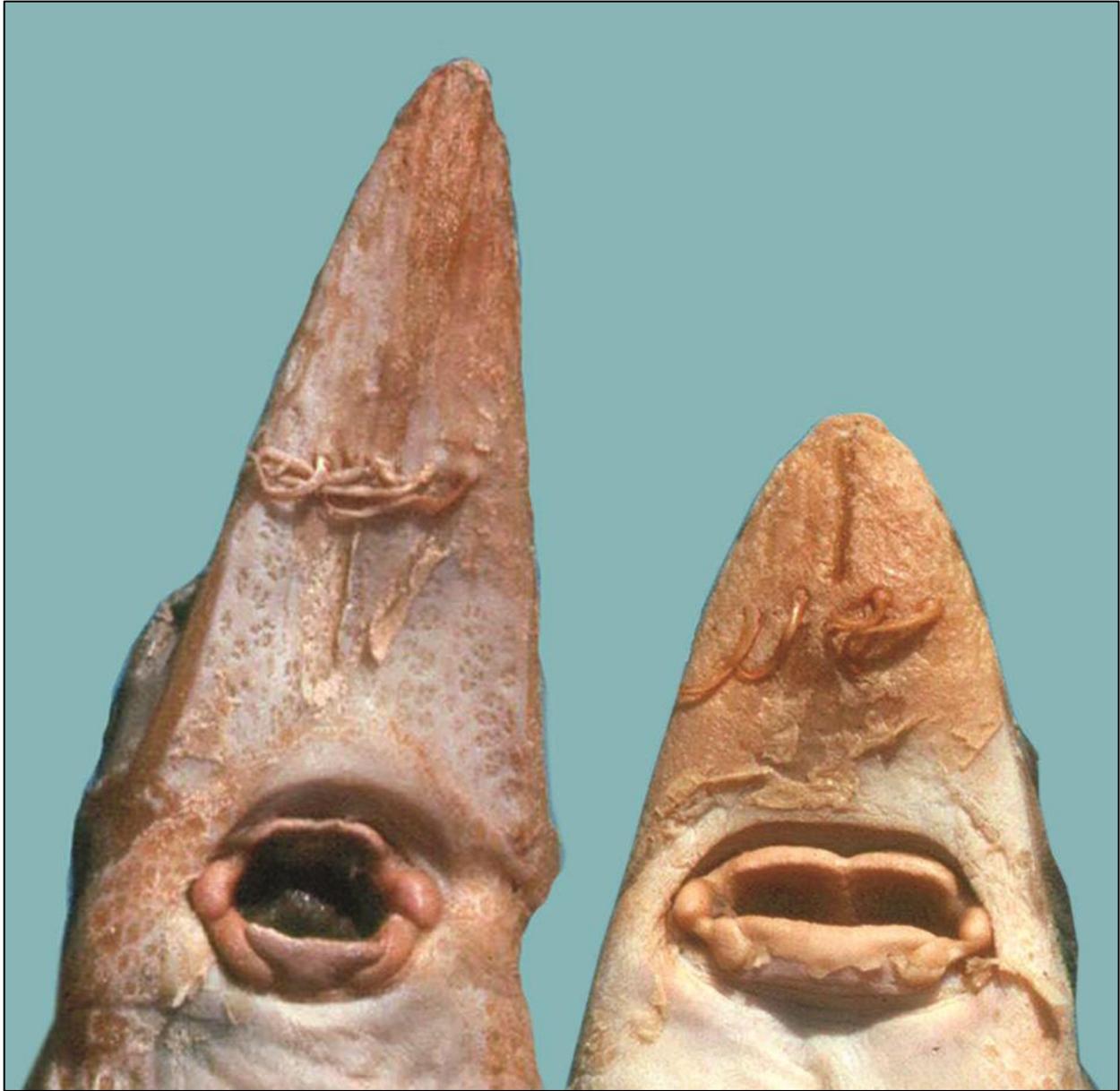


**Figure 3. Young Lake Sturgeons showing the origin of the anal fin posterior to the origin of the dorsal fin. Photograph courtesy of David Neely.**

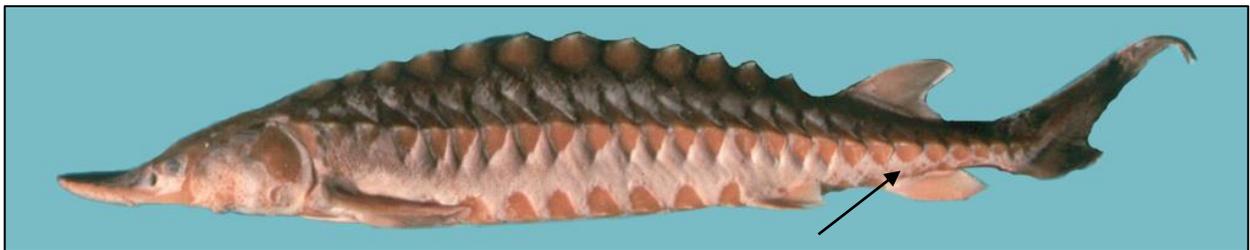
- B.
- 1a. Restricted to the French Broad River downstream from Marshall in Madison County (Figure 3) .....  
 .....Lake Sturgeon, *Acipenser fulvescens*
  - 1b. Restricted to Atlantic Slope basin rivers and coastal waters .....2
  - 2a. Bony plates absent between the anal fin and the midlateral scutes (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. 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.**