

## Temperate Bass (Family Moronidae) Diversity in North Carolina

North Carolina is home to 3 of the 6 species of Temperate Basses, plus one hybrid (Table 1) (Tracy et al. 2020). The 4<sup>th</sup> North American species of *Morone*, *M. mississippiensis*, Yellow Bass, is found primarily in the Midwest in the Mississippi River drainage. The two other species of Temperate Basses, European Seabass and Spotted Seabass, are known from the eastern Atlantic Ocean off the coast of Europe and Africa south to Senegal, the Mediterranean Sea, and the Black Sea (<https://www.fishbase.in/identification/SpeciesList.php?genus=Dicentrarchus>).

**Table 1. Species of Temperate Basses found in North Carolina. Striped Bass Hybrid, Bodie Bass, and Palmetto Bass are not accepted common names by the American Fisheries Society (Page et al. 2013).**

| Scientific Name/<br>American Fisheries Society Accepted Common Name | Scientific Name/<br>American Fisheries Society Accepted Common Name                                 |
|---|---|
| <i>Morone americana</i> – White Perch                               | <i>Morone saxatilis</i> – Striped Bass  |
| <i>Morone chrysops</i> – White Bass                                 | <i>Morone saxatilis</i> X <i>Morone chrysops</i> - “Striped Bass Hybrid, Bodie Bass, Palmetto Bass” |

Temperate Basses in North Carolina may be found primarily east of the Appalachian Mountains in our big rivers such as the Cape Fear, Yadkin, Catawba, Roanoke, Neuse, and Tar; in Piedmont reservoirs and the tail races below these dams; in natural lakes such as lakes Waccamaw and Mattamuskeet; and in the Albemarle and Pamlico sounds.

In North Carolina, rather than hearing them called Temperate Basses, you will hear them referred to as Waccamaws (perhaps because of White Perch’s abundance in Lake Waccamaw), silver perch (but not to be confused with the true Silver Perch, *Bairdiella chrysoura*, an estuarine and marine species), wiper, white lightning, rockfish (because of the Striped Bass’s spawning habits over shoals and rocky substrates or living among rocky ledges), blue-nosed perch, gray perch, stripe, striper, hybrids, and silver bass. Whatever they are called locally, the American Fisheries Society has officially accepted common names (Page et al. 2013) (Table 1) and each species has a scientific (Latin) name (Table 1; Appendix 1).

Striped Bass is one of our largest freshwater species, exceeded in length only by Atlantic Sturgeon, *Acipenser oxyrinchus*. Maximum Total Lengths, reported by Rohde et al. (2009) for 3 of the 4 species are Striped Bass - 2000 mm (about 80 inches); White Bass - 450 mm (about 18 inches); and White Perch - 350 mm (about 14 inches).

Reports of Striped Bass weighing more than 100 pounds in the late 1800s were noted by Smith (1907) and Jenkins and Burkhead (1994), but Striped Bass in North Carolina waters no longer reach that size, although they do get as heavy as 50+ pounds. Recent data also show that Striped Bass along the Atlantic Coast may live as long as 30+ years (McCargo 2020).

Historically, there were only two indigenous (native) species of Temperate Basses in North Carolina – Striped Bass and White Perch. Although populations of Striped Bass along the Atlantic Coast have diminished over the past 300 years, both species are still found in Coastal Plain and nearshore coastal waters with the anadromous Striped Bass making late winter-early spring spawning runs up the larger rivers to the Fall Zone at the eastern edge of the Piedmont. Today, Striped Bass is found in all basins from the Catawba, where it has been introduced, eastward to the Atlantic Ocean, including the Lumber and Waccamaw River basins. Land-locked populations, as a result of stockings, can be found in many of the larger reservoirs in the Hiwassee, Catawba, Yadkin, Cape Fear, and Roanoke basins (Tracy et al. 2020; NCWRC 2020b).

White Perch make semi-anadromous spawning runs from brackish waters up the coastal rivers to fresh water, but not to the extent that Striped Bass do. Today, White Perch are abundant in reservoirs and rivers upstream from the Fall Zone where they are considered unauthorized bait-bucket introductions by anglers, whereas downstream, Coastal Plain populations are considered indigenous (Tracy et al. 2020). White Perch are now known from throughout the entire Catawba and Yadkin Chain-of-Lakes, from lakes

Townsend, Cammack, and Shearon Harris in the Cape Fear basin, and in Kerr Reservoir in the Roanoke basin.

White Bass, a nonindigenous (non-native) species, was introduced into North Carolina waters as a new sportfish as early as the 1950s and today is found in our larger rivers and reservoirs from the Hiwassee to the Roanoke basin (Tracy et al. 2020).

Striped Bass hybrid, also known as Bodie Bass or Palmetto Bass, is an aquaculture-created hybrid which did not occur naturally in North Carolina. These hybrids, first created in the mid-1960s, can be fertile and are known to back-cross with either parent in the wild (Hodson 1989). They are currently stocked by the North Carolina Wildlife Resources Commission in Hyco Reservoir (NCWRC 2019; <https://hicolakemagazine.com/bodi-bass-introduced-into-hyco-lake/>), Moss Lake, Oak Hollow Lake, Lake Townsend, Lake Thom-A-Lex, Salem Lake, W. Kerr Scott Reservoir, and Lake Norman (NCWRC 2010g; NCWRC 2020b) and are also stocked privately in farm ponds. They also occur in Lake Chatuge and in the Albemarle and Pamlico sounds (NCWRC 2020b) and are known to occur in the Neuse River at Milburnie (Wake County) and in the Cape Fear River.

Because all the species in the Family Moronidae are classified as well-sought after recreationally and commercially important game species, they are managed and regulated with seasonal and river-basin specific creel and landing limits by the North Carolina Wildlife Resources Commission and the North Carolina Division of Marine Fisheries (NCWRC 2020b; NCDMF 2020). Implementation of strict harvesting quotas, improved instream flows downstream of reservoirs, and more strict enforcement of water quality standards has helped the Striped Bass on its road to recovery. Although some Striped Bass populations continue to be severely depleted with poor recruitment, no species is listed as imperiled in North Carolina (NCAC 2017; NCNHP 2020; NCWRC 2017). Additional information on our four species of Temperate Basses may be found at NCWRC (2010d-2010g).

Key characteristics for their proper identification include the length and thickness of the 2<sup>nd</sup> and 3<sup>rd</sup> anal fin spines; the presence or absence and shape of a medial tooth patch on the tongue; the joining or separation of the two dorsal fins; body shape; and the intactness of the lateral striping along the sides.

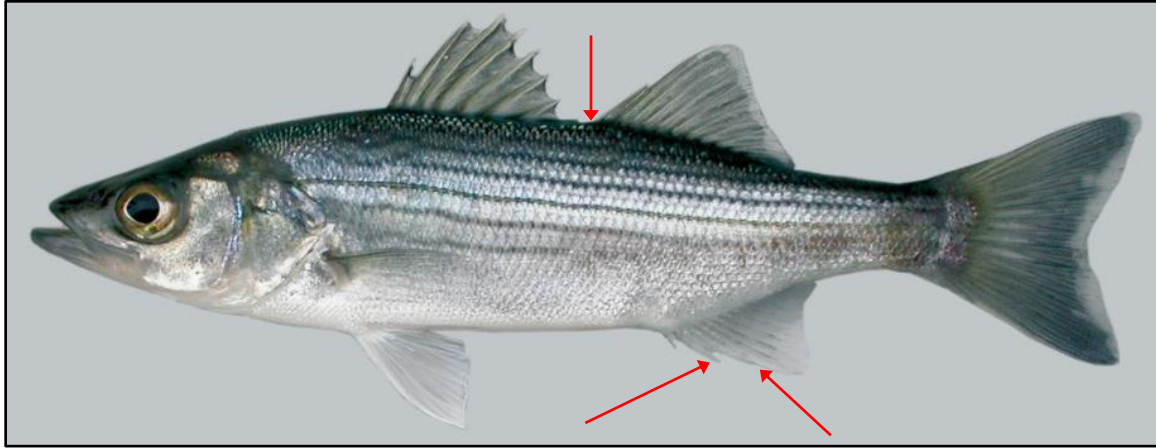
**Identification Key to the Species of Temperate Basses (Family Moronidae) in North Carolina**

1a. Two dorsal fins joined distinctly by a membrane (Figure 1). 2<sup>nd</sup> anal fin spine almost as long as, and thicker than, the 3<sup>rd</sup> (Figure 1). Median tooth patch on the tongue absent ..... White Perch, *Morone americana*

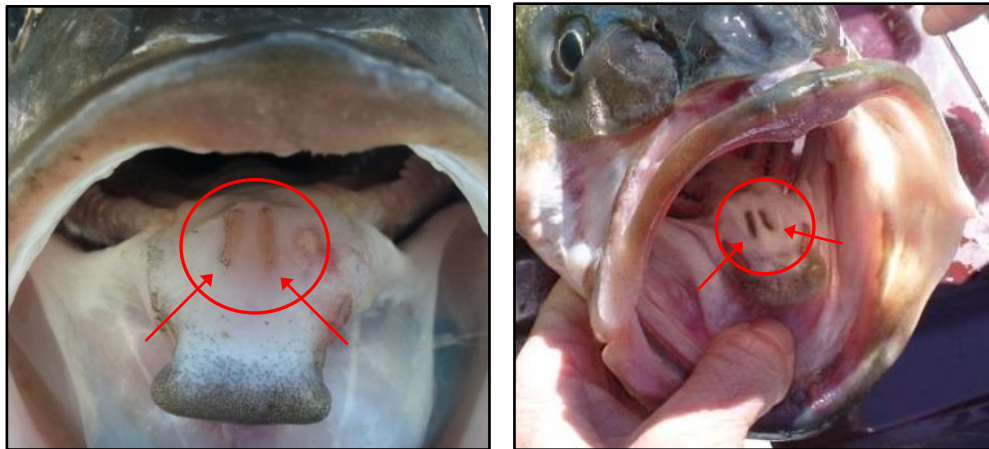
1b. Two dorsal fins slightly separate, not joined by a membrane (Figure 2). 2<sup>nd</sup> anal fin spine shorter than the 3<sup>rd</sup> and thinner or equal to the 3<sup>rd</sup> in thickness (Figure 2). Median tooth patch on the tongue present (Figure 3) .....2



**Figure 1. White Perch. Top - Red arrow pointing to the two dorsal fins joined distinctly by a membrane; Bottom – Red arrows pointing to the 2<sup>nd</sup> anal fin spine almost as long as, and thicker than, the 3<sup>rd</sup> anal spine.**

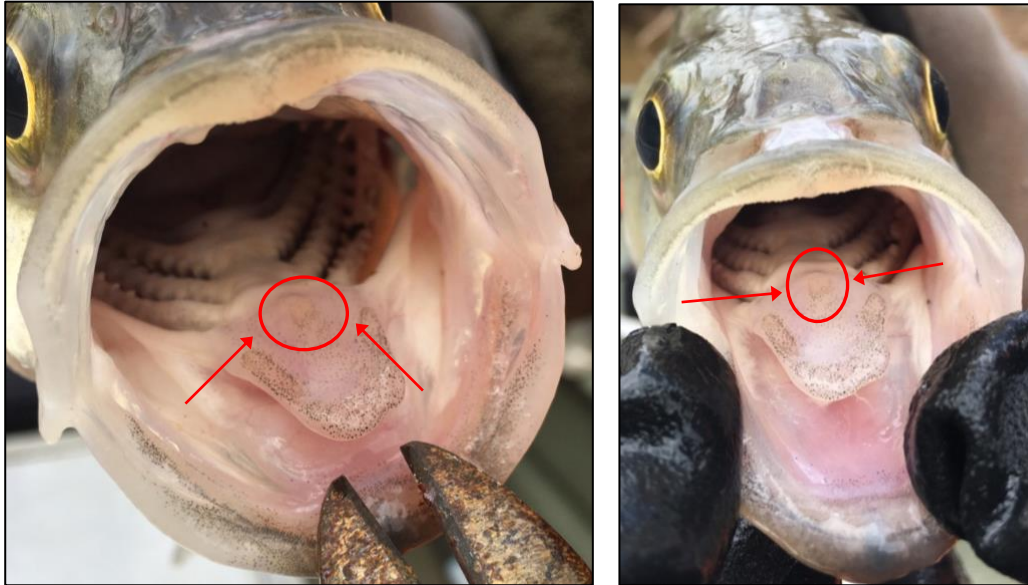


**Figure 2. Juvenile Striped Bass with red arrows pointing to the two dorsal fins slightly separated, not joined by a membrane and to the 2<sup>nd</sup> anal fin spine shorter and thinner than the 3<sup>rd</sup> anal spine.**

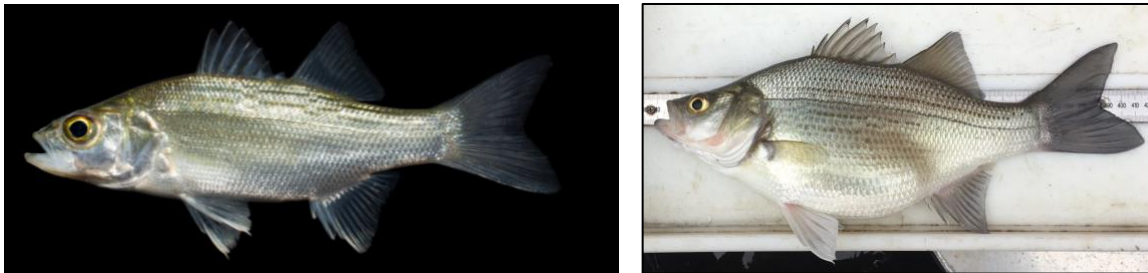


**Figure 3. Views of the mouth of Striped Bass with red arrows pointing to well-separated median tooth patches on the tongues encircled in red. Left – Striped Bass from the lower Neuse River basin; Right - Striped Bass from Kerr Scott Reservoir; photograph courtesy of Kin Hodges, North Carolina Wildlife Resources Commission.**

- 2a. Median tooth patch on tongue elongate, clearly divided (Figure 3) .....3
- 2b. One medial oval tooth patch at the rear of the tongue, occasionally divided (Figures 4 and 5).....  
 ..... White Bass, [Morone chrysops](#)



**Figure 4. White Bass. Views of the mouth of White Bass with red arrows pointing to a single, medial, oval tooth patch at the rear of the tongue.**



**Figure 5. White Bass. Left - Juvenile from Lake Marion, SC; Right – Adult from South Yadkin River, NC (photograph courtesy of Casey Grieshaber, North Carolina Wildlife Resources Commission).**

- 1a. Body elongate; depth less than 33% of the Standard Length; slight arching of the back (Figure 2). Dorsum color more blueish than green. Bold lateral striping, occasionally broken (Figures 6 and 7) ..  
.....Striped Bass, [Morone saxatilis](#)
- 3b. Body is not elongate; depth greater than 33% of the Standard Length; pronounced arching of the back (Figure 8). Dorsum color is more greenish than blue. Bold lateral striping, often broken (Figure 8).....Striped Bass Hybrid (female Striped Bass X male White Bass; also known as Bodie Bass)



**Figure 6. Striped Bass showing bold lateral striping.**



**Figure 7. Atlantic migratory Striped Bass in the Atlantic Ocean during winter. Left - Stephen D. Taylor (NCDMF, retired); Right - NOAA Corps Officer, Lt. Jeremy Adams. Photographs courtesy of Wilson Laney (USF&WS, retired) and the USF&WS, Cooperative Winter Tagging Cruise Scientific Party.**



**Figure 8. Striped Bass Hybrids showing the “chunkiness” of the body and the broken lateral striping. Photographs courtesy of Kelsey Roberts (left) and Kin Hodges (right) of the North Carolina Wildlife Resources Commission.**