

Monospecific Families of Freshwater Fishes with no Saltwater Relatives Found in North Carolina

There are 12 families of predominantly freshwater fishes that are monospecific (having only one species) in North Carolina (Table 1; Tracy et al. 2020). The Family Xenocyprididae (the single species of Grass Carp, *Ctenopharyngodon idella*) is combined with the Cyprinidae (Barbs and Carps) and Leuciscidae (Minnows) (<https://ncfishes.com/minnow-species-diversity-in-north-carolina/>). Some species listed in Table 2 might be represented by one species in fresh water, but are more diverse in estuarine or marine waters (e.g., families Engraulidae, Belonidae, Paralichthyidae, and Archiridae) (<https://ncfishes.com/marine-fishes-of-north-carolina/>). Each species has an American Fisheries Society-accepted common name (Page et al. 2013) and a scientific (Latin) name (Table 1; Appendix 1).

Table 1. Families with only one species of freshwater fish in North Carolina.

Family	Scientific Name	American Fisheries Society Accepted Common Name
Polyodontidae	<i>Polyodon spathula</i>	Paddlefish
Lepisosteidae	<i>Lepisosteus osseus</i>	Longnose Gar
Amiidae	<i>Amia calva</i>	Bowfin
Hiodontidae	<i>Hiodon tergisus</i>	Mooneye
Anguillidae	<i>Anguilla rostrata</i>	American Eel
Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental Weatherfish
Loricariidae	<i>Pterygoplichthys pardalis</i>	Amazon Sailfin Catfish
Umbridae	<i>Umbra pygmaea</i>	Eastern Mudminnow
Aphredoderidae	<i>Aphredoderus sayanus</i>	Pirate Perch
Amblyopsidae	<i>Chologaster cornuta</i>	Swampfish
Cyprinodontidae	<i>Cyprinodon variegatus</i>	Sheepshead Minnow
Gasterosteidae	<i>Apeltes quadracus</i>	Fourspine Stickleback

[Polyodon spathula, Paddlefish.](#)

- **Unique Characteristics:** Long, canoe paddle-shaped snout that is about one-third the body length (Figure 1). Huge mouth. Heterocercal caudal fin. Large, fleshy, pointed flap on rear edge of gill cover. Tiny eyes (Page and Burr 2011). Toothless jaws as adults.
- **In Fresh Water Most Likely to be Confused With:** No other species.



Figure 1. Paddlefish. Photograph courtesy of the U.S. Fish & Wildlife Service.

[Lepisosteus osseus, Longnose Gar](#)

- **Unique Characteristics:** Elongate, slender jaws with many needlelike teeth. Long, slender body covered with armorlike ganoid scales. Dorsal fin short, less than half of total length located near caudal fin (Figure 2). Dorsal fin and anal fin higher than long. Caudal fin abbreviate heterocercal. Scales large, lateral line scale series about 55 (Rohde et al. 2009).
- **In Fresh Water Most Likely to be Confused With:** Atlantic Needlefish (Family Belonidae, *Strongylura marina*, <https://ncfishes.com/marine-fishes-of-north-carolina/strongylura-marina/>).

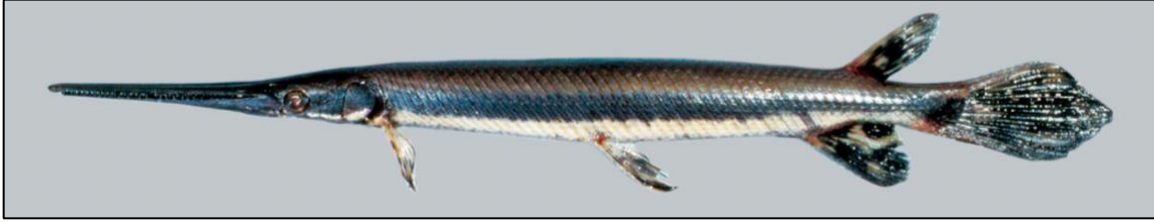


Figure 2. Longnose Gar, juvenile.

Amia calva, Bowfin

- **Unique Characteristics:** Long, stout, round body with paired fins placed low on body and far apart. Long dorsal fin that extends for more than half the body length (Figure 3). Large, hard bony plate (gular plate) found on the chin between the two jaws (Rohde et al. 2009).
- **In Fresh Water Most Likely to be Confused With:** Juvenile Eastern Mudminnow (Family Umbridae, <https://ncfishes.com/freshwater-fishes-of-north-carolina/umbra-pygmaea/>) and Snakehead (Family Chanidae, <https://ncfishes.com/freshwater-fishes-of-north-carolina/amia-calva/>).

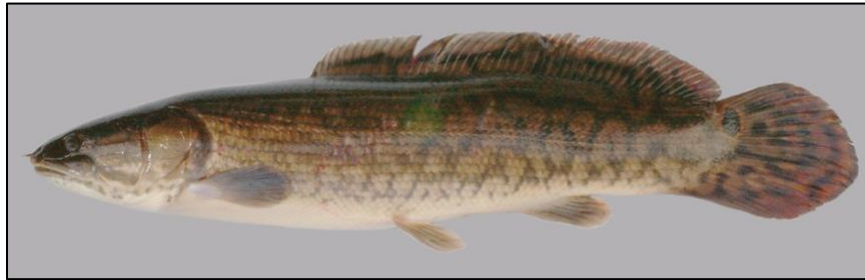


Figure 3. Bowfin.

Hiodon tergisus, Mooneye

- **Unique Characteristics:** Lateral line present. Breast without a sawtooth margin. Untoothed keel along the belly from the pelvic fin bases to the anus. Strongly laterally compressed body. Scales absent from atop the head. A single dorsal fin; fins without spines. Large eyes with adipose eyelids (Page and Burr 2011). Anal fin origin behind dorsal fin origin (Figure 4).
- **In Fresh Water Most Likely to be Confused With:** Gizzard and Threadfin Shad (Family Clupeidae, <https://ncfishes.com/freshwater-fishes-of-north-carolina/>). However, shads do not have a lateral line and do possess a jagged keel along the belly.



Figure 4. Mooneye. Photograph courtesy of the North American Native Fishes Association.

[Anquilla rostrata, American Eel.](#)

- **Unique Characteristics:** Body elongate and serpentine-like (Figure 5). Dorsal fin long. Jaws present. One pair of gill openings. Pectoral fins present, pelvic fins absent. Tiny, embedded scales (Rohde et al. 2009).
- **In Fresh Water Most Likely to be Confused With:** Lampreys (Family Petromyzontidae, <https://ncfishes.com/freshwater-fishes-of-north-carolina/>).



Figure 5. American Eel.

[Misgurnus anguillicaudatus, Oriental Weatherfish](#)

- **Unique Characteristics:** Elongate body; subterminal mouth surrounded by 10-12 barbels (Figure 6). Caudal fin rounded. Stout spine on pectoral fin. Dorsal fin origin above pelvic fin origin. Tiny scales (Page and Burr 2011).
- **In Fresh Water Most Likely to be Confused With:** No other species.



Figure 6. Oriental Weatherfish. Photograph courtesy of the North American Native Fishes Association.

[Pterygoplichthys pardalis, Amazon Sailfin Catfish](#)

- **Unique Characteristics:** Body covered with flexible bony plates. One pair of barbels on a large, subterminal mouth; papillose sucking lips. Spine anterior to adipose fin. Dorsal fin with one spine and 10-14 rays (Page and Burr 2011) (Figure 7).
- **In Fresh Water Most Likely to be Confused With:** No other species.



Figure 7. Amazon Sailfin Catfish.

[*Umbra pygmaea*, Eastern Mudminnow.](#)

- **Unique Characteristics:** Stout, cylindrical body with broad head and short snout. Body color brown with 10-14 thin dark-brown stripes on the sides and a black bar just before the caudal fin base (Figure 8).
- **In Fresh Water Most Likely to be Confused With:** Eastern Mudminnow may be mistaken for juvenile Bowfin (Family Amiidae, <https://ncfishes.com/freshwater-fishes-of-north-carolina/amia-calva/>).



Figure 8. Eastern Mudminnow.

[*Aphredoderus sayanus*, Pirate Perch](#)

- **Unique Characteristics:** Stout-bodied with a large head, terminal mouth, and single dorsal fin. Dark bar below the eye and a larger one at caudal fin base (Figure 9). In the adult the anus is located in the throat.
- **In Fresh Water Most Likely to be Confused With:** Small sunfish and bass (Family Centrarchidae, <https://ncfishes.com/freshwater-fishes-of-north-carolina/>).



Figure 9. Pirate Perch.

[Chologaster cornuta, Swampfish](#)

- **Unique Characteristics:** Bicolored fish with brown back that contrasts sharply with creamy white to yellow belly and has three dark stripes on the sides (Figure 10). Lacks pelvic fins and mouth is supraterminal. Eyes position “normal”; eyes covered with translucent skin. Anus in throat region between the gills. Scales embedded, not visible (Rohde et al. 2009).
- **In Fresh Water Most Likely to be Confused With:** No other species.



Figure 10. Swampfish.

[Cyprinodon variegatus, Sheepshead Minnow.](#)

- **Unique Characteristics:** Deep bodied with an arched back and 5-8 triangular-shaped dark bars on the side (Figure 11). Humeral scales at least twice as large as surrounding scales. One row of tricuspid teeth on each jaw (Rohde et al. 2009).
- **In Fresh Water Most Likely to be Confused With:** No other species.



Figure 11. Sheepshead Minnow.

[Apeltes quadracus, Fourspine Stickleback.](#)

- **Unique Characteristics:** Scaleless body with four dorsal spines angled alternately left to right. Long slender caudal peduncle; no bony plates on sides; and the pelvic fins below pectoral fins (Figure 12).
- **In Fresh Water Most Likely to be Confused With:** Threespine Stickleback *Gasterosteus aculeatus*. Not yet recorded from North Carolina; it has been documented in Chesapeake Bay. It has three dorsal spines, a short caudal peduncle, bony plates on the sides, and pelvic fins behind pectoral fins.



Figure 12. Fourspine Stickleback. Photograph courtesy of David Neely.