

Sucker Species (Catostomidae) Diversity in North Carolina

There are 29 species of suckers including five undescribed species inhabiting North Carolina waters (Tracy et al. 2020; Tracy et al. 2021; Table 1). You might have heard fishermen calling them Mulletts, Redhorses, Hoovers, Creek Trout, Razor Back, or many more colloquial names. But each species has an American Fisheries Society-accepted common name (Page et al. 2013) and a scientific (Latin) name (Table 1; Appendix 1). Twelve species are considered imperiled in North Carolina (Table 2; NCAC 2017; NCNHP 2020; NCWRC 2017).

Table 1. Species of suckers found in North Carolina. Common names enclosed within tick marks (“”) are scientifically undescribed species.

Scientific Name/ American Fisheries Society Accepted Common Name	Scientific Name/ American Fisheries Society Accepted Common Name
<i>Carpiodes carpio</i> - River Carpsucker	<i>Moxostoma breviceps</i> - Smallmouth Redhorse
<i>Carpiodes cyprinus</i> - Quillback	<i>Moxostoma carinatum</i> - River Redhorse
<i>Carpiodes</i> sp. "Atlantic" Highfin Carpsucker	<i>Moxostoma cervinum</i> - Blacktip Jumprock
<i>Carpiodes</i> sp. "Carolina" Quillback	<i>Moxostoma collapsum</i> - Notchlip Redhorse
<i>Catostomus commersonii</i> - White Sucker	<i>Moxostoma duquesnei</i> - Black Redhorse
<i>Erimyzon oblongus</i> - Eastern Creek Chubsucker	<i>Moxostoma erythrurum</i> - Golden Redhorse
<i>Erimyzon sucetta</i> - Lake Chubsucker	<i>Moxostoma macrolepidotum</i> - Shorthead Redhorse
<i>Hypentelium nigricans</i> - Northern Hog Sucker	<i>Moxostoma pappilosum</i> - V-lip Redhorse
<i>Hypentelium roanokense</i> - Roanoke Hog Sucker	<i>Moxostoma robustum</i> - Robust Redhorse
<i>Ictiobus bubalus</i> - Smallmouth Buffalo	<i>Moxostoma rupiscartes</i> - Striped Jumprock
<i>Ictiobus cyprinellus</i> - Bigmouth Buffalo	<i>Moxostoma</i> sp. "Brassy" Jumprock
<i>Ictiobus niger</i> - Black Buffalo	<i>Moxostoma</i> sp. "Carolina" Redhorse
<i>Minytrema melanops</i> - Spotted Sucker	<i>Moxostoma</i> sp. "Sicklefin" Redhorse
<i>Moxostoma anisurum</i> - Silver Redhorse	<i>Thoburnia hamiltoni</i> – Rustyside Sucker
<i>Moxostoma ariommum</i> - Bigeye Jumprock	

Table 2. Imperiled species of suckers in North Carolina (NCAC 2017, NCNHP 2020, and NCWRC 2017).

Level of Imperilment	Species
Endangered	Robust Redhorse, Rustyside Sucker
Threatened	Bigeye Jumprock, <i>Moxostoma</i> sp. "Sicklefin" Redhorse, <i>Moxostoma</i> sp. "Carolina" Redhorse
Special Concern	River Carpsucker, <i>Carpiodes</i> sp. "Atlantic Highfin" Carpsucker
Significantly Rare	Quillback, <i>Carpiodes</i> sp. "Carolina" Quillback, Smallmouth Buffalo, Black Buffalo, Smallmouth Redhorse

Suckers are found throughout North Carolina in streams, big rivers, and reservoirs from Cherokee County in the Mountains to Dare County along the Albemarle Sound. Every county has at least one species, but Stokes County takes the prize for having the most – 11 species! They are Northern Hog Sucker, Roanoke Hog Sucker, Notchlip Redhorse, Golden Redhorse, V-lip Redhorse, Bigeye Jumprock, Blacktip Jumprock, "Brassy" Jumprock, White Sucker, Rustyside Sucker, and Quillback (Beane 2017; Hogue and Tracy 2014).

Three species are found in only one river basin: Rustyside Sucker and Bigeye Jumprock which are found only in the upper Roanoke River basin and Black Buffalo found only in the lower French Broad River basin. White Sucker is our most widely distributed species; it is found in 15 of our 21 river basins, but absent from waters east of Interstate 95 in the Chowan, Albemarle Sound, White Oak, Shallotte, Waccamaw, and Lumber basins (Tracy et al. 2020).

More species of suckers, 17, are found in the Yadkin River basin than in any of the other 21 basins. Those 17 species include four species that have been introduced from other basins in North Carolina - Northern Hog Sucker, Roanoke Hog Sucker, Smallmouth Buffalo and Striped Jumprock, and one species introduced from outside the state, Bigmouth Buffalo. Our least speciose basin is the New basin where only Northern Hog Sucker and White Sucker are found (Tracy et al. 2020).

The correct identification of suckers may be intimidating to those students or citizens just beginning to discover their existence. With much practice and with a keen eye to details, one can master this skill, although it might take a while and require handling and examining many fish. Key characteristics for identification include the shape and texture of the lips (Hogue and Tracy 2014), lateral line scale counts, dorsal fin rays counts, and pharyngeal teeth structure.

Identification Key to the Species of Suckers (Family Catostomidae) in North Carolina

- 1a. Dorsal fin base short (Figure 1); 10-18 dorsal fin rays; dorsal fin margin not strongly falcate; anterior dorsal rays not greatly elongated2
- 1b. Dorsal fin base long (Figure 1); 22-30 dorsal fin rays; dorsal fin margin strongly falcate; anterior dorsal rays greatly elongated 23

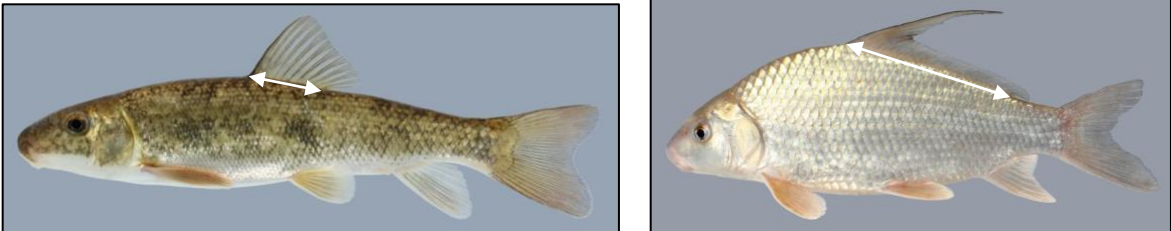


Figure 1. Left – Short dorsal fin base; Right – Elongated dorsal fin base.

- 2a. Lateral line absent or virtually so3
- 2b. Lateral line complete and visible5
- 3a. In adult each scale with a dark spot at the base, forming longitudinal stripes (Figure 2). Range restricted to the middle and lower Yadkin and Cape Fear and the Lumber, Waccamaw, Shallotte, and White Oak basins Spotted Sucker, [*Minytrema melanops*](#)
- 3b. Side with single wide dark stripe in young (Figure 2), occasionally blotches in adult4

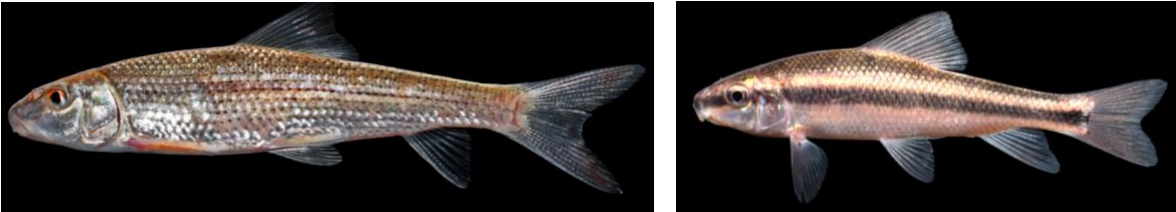


Figure 2. Left - Spotted Sucker; Right – Juvenile *Erimyzon* sp. Chubsucker

- 4a. Mid-lateral scales usually 34-38. Anterior tip of upper lip generally near the level of the lower rim of the eye (Figures 3 and 4). In mature specimens, eye larger, snout shorter; eye diameter going 1.5-1.8 times in snout length. Configuration of body in cross section – more laterally compressed, deeper bodied; maximum body width ~1.8-2.2 times in maximum depth. Found in all Atlantic slope basins, except for the Savannah, Broad, and Catawba basins..... Lake Chubsucker, [*Erimyzon sucetta*](#)
- 4b. Mid-lateral scales usually 40-46. Anterior tip of upper lip generally well below level of lower rim of the eye (Figures 3 and 4). In mature specimens, eye smaller, snout longer; eye diameter going 2.1-2.6 times in snout length. Configuration of body in cross section – less compressed, somewhat more cylindrical; maximum body width ~ 1.4-1.7 times in maximum depth. Found in all Atlantic slope basins, except for the Savannah and Broad basins...
..... Eastern Creek Chubsucker, [*Erimyzon oblongus*](#)

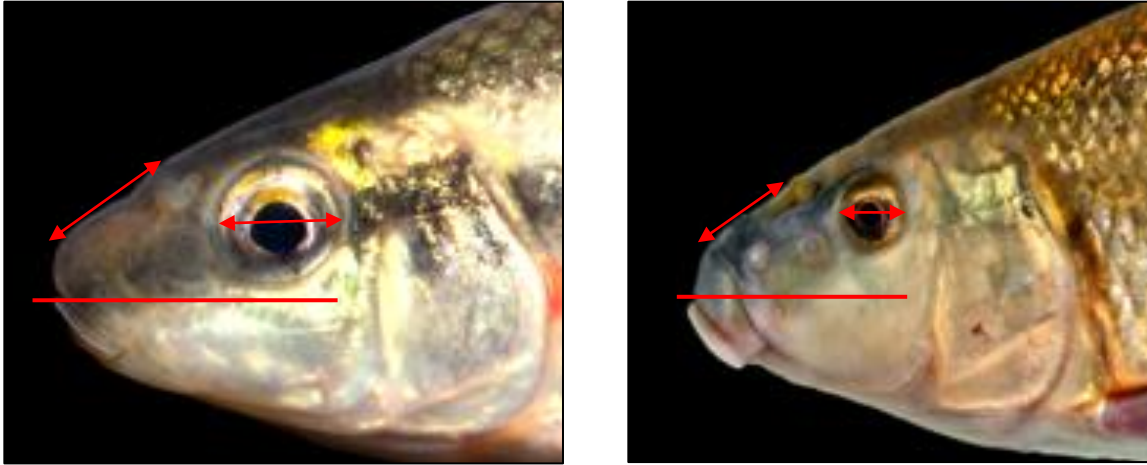


Figure 3. Left – Lake Chubsucker with anterior tip of upper lip generally near the level of the lower rim of the larger eye in relation to snout length; Right – Eastern Creek Chubsucker with anterior tip of upper lip generally well below level of lower rim of the smaller eye in relation to snout length.

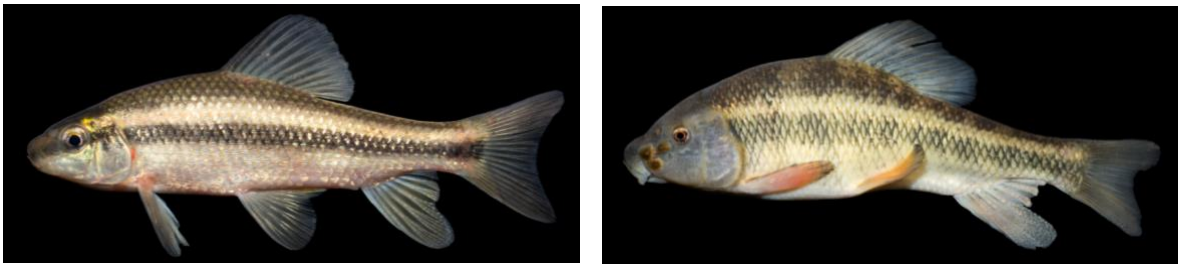


Figure 4. Left – Lake Chubsucker; Right – Tuberculate male Creek Chubsucker.

- 5a. Body scales becoming progressively smaller from the caudal peduncle to the head (Figure 5). Widespread but absent from waters east of Interstate 95 in the Chowan, Albemarle Sound, White Oak, Shallotte, Waccamaw, and Lumber basins White Sucker, [Catostomus commersonii](#)
- 5b. Body scales not becoming progressively smaller from the caudal peduncle to the head6



Figure 5. White Sucker.

- 6a. Head that is concave between the eyes7
- 6b. Head that is not concave between the eyes8

7a. Upper lip with smaller papillae and no plicae (Figure 6). Lateral line scales (minimum 44) 45-48 (maximum 50). Body form elongate. Dark and light horizontal stripes usually absent or faint (Figure 7). Range widespread (i.e., Hiwassee, Little Tennessee, Pigeon, French Broad, Nolichucky, Watauga, New, Savannah, Broad, Catawba, Yadkin, Roanoke, Neuse, and Tar basins) Northern Hog Sucker, *Hypentelium nigricans*

7b. Upper lip coarsely papillose on the outer border but plicate or subplicate on the inner edge (Figure 6). Lateral line scales (minimum 38) 40-43 (maximum 44). Body form stocky anteriorly. Dark and light horizontal stripes usually moderately developed (Figure 7). Range restricted to the Roanoke basin with an introduced population in the upper Ararat River watershed (Yadkin basin) Roanoke Hog Sucker, *Hypentelium roanokense*

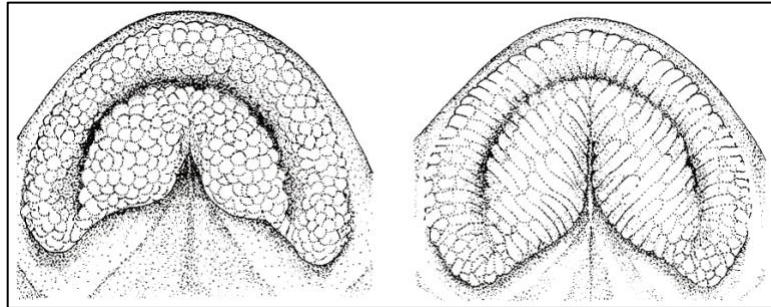


Figure 6. Left – Northern Hog Sucker with upper lip with smaller papillae and no plicae; Right – Roanoke Hog Sucker with upper lip coarsely papillose on the outer border, but plicate or subplicate on the inner edge.

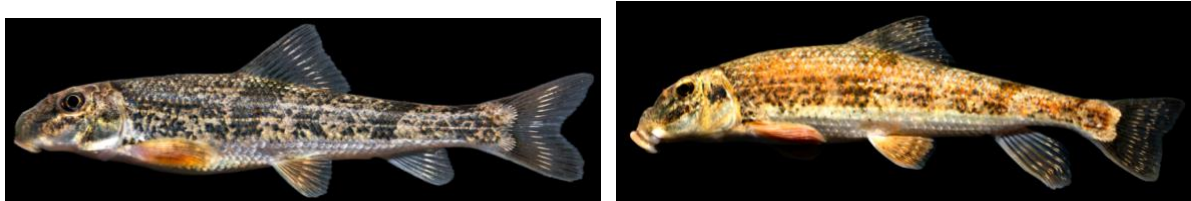


Figure 7. Left – Northern Hog Sucker; Right – Roanoke Hog Sucker.

8a. Circumpeduncle scales 16 (14-16) (Figure 8). Dorsal fin rays 10-12 (13).....9

8b. Circumpeduncle scales 12 or 13 (Figure 8). Dorsal fin rays almost always 13 or more 13

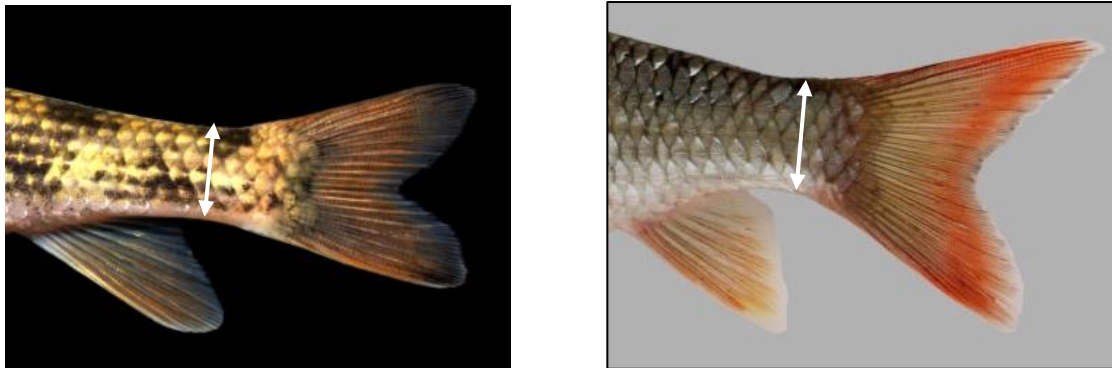


Figure 8. Left – Circumpeduncle scales 16 (encircling the caudal peduncle); Right – Circumpeduncle scales 12 or 13 (encircling the caudal peduncle).

9a. Posterior part of lower lip papillose, flared posteriorly to form a free flap (Figure 9). Inner surface of lips with firm, smooth rim, often separated from outer part of lips by a narrow groove. Range restricted to the upper Roanoke basin. 10

9b. Posterior part of lower lip plicate or semi-plicate, not flared posteriorly to form a free flap (Figure 9). Inner surface of lips without a firm, smooth rim. Range not restricted to the Roanoke basin 11

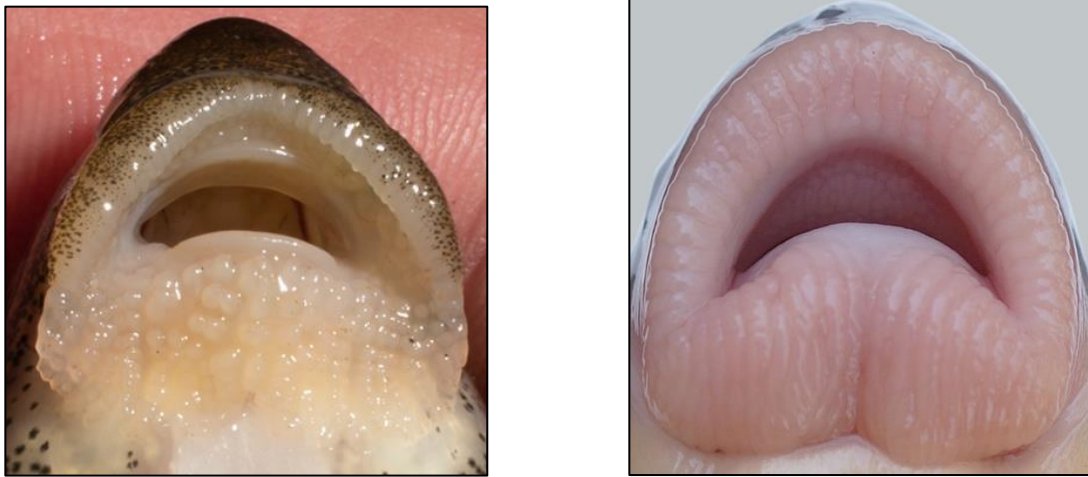


Figure 9. Left – Papillose lower lip; Right – Plicate lower lip.

10a. Upper lip papillose (Figure 10). Eye and head large. Caudal base lacking two large pale areas (Figure 11). Range restricted to the upper Roanoke basin Bigeye Jumrock, [Moxostoma ariommum](#)

10b. Upper lip plicate (Figure 10). Eye and head small. Caudal base with two large pale areas (Figure 11). Range restricted to the upper Roanoke basin Rustyside Sucker, [Thoburnia hamiltoni](#)

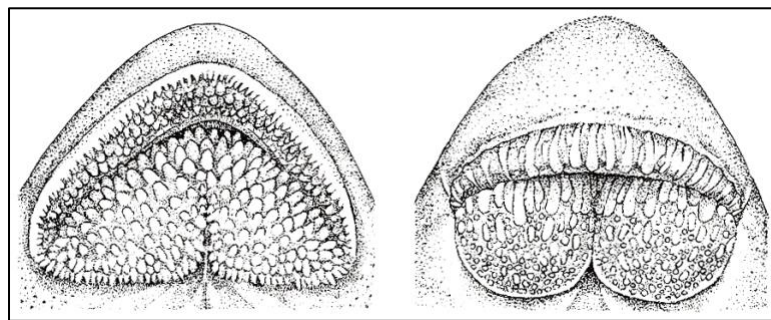


Figure 10. Left – Bigeye Jumrock with upper lip papillose; Right – Rustyside Sucker with upper lip plicate.

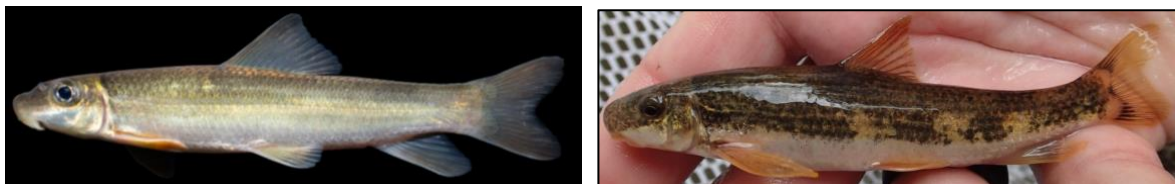


Figure 11. Left – Bigeye Jumrock; Right – Rustyside Sucker (photograph courtesy of Thomas Russ, North Carolina Wildlife Resources Commission).

- 11a. Dorsal and caudal fins with black tips (Figure 12). Range restricted to the Roanoke, Tar, and Neuse basins Blacktip Jumprock, [Moxostoma cervinum](#)
- 11b. Dorsal and caudal fins without black tips. Range does not include the Roanoke, Tar, or Neuse basins 12



Figure 12. Blacktip Jumprock. Right – Photograph courtesy of the North American Native Fishes Association.

- 12a. Body form stout. Head dorsum between eyes strongly convex, well elevated above the orbit. In juveniles and small adults, lateral body stripes below the lateral line – pale stripes wider than or equal in width to dark stripes (Figure 13). Lateral body blotches absent in medium juveniles and adults. Dorsal rays 12. Lower lip plicae with few or no deep transverse grooves. 28-34 gill rakers. Range restricted to the Broad, Catawba, Yadkin, and Cape Fear basins [Moxostoma sp. “Brassy” Jumprock](#)
- 12b. Body form elongate, cigar-shaped. Head dorsum between eyes flat or slightly convex, little or not at all elevated above orbit. In juveniles and small adults, lateral body stripes below the lateral line – pale stripes narrower in width than dark stripes (Figure 13). Lateral body blotches usually retained in juveniles and adults, often very blotchy and mottled. Dorsal rays usually 11. Lower lip plicae usually with numerous transverse grooves (subplicate). 23-26 gill rakers. Range restricted to the Catawba, Broad, and Savannah basins; introduced into the upper and middle Yadkin basin..... Striped Jumprock, [Moxostoma rupiscartes](#)

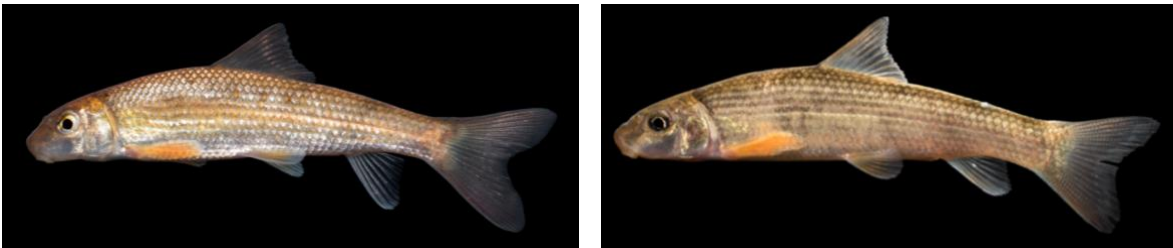


Figure 13. Left – *Moxostoma* sp. “Brassy” Jumprock with lateral body stripes below the lateral line – pale stripes wider than or equal in width to dark stripes; Right – Striped Jumprock with lateral body stripes below the lateral line – pale stripes narrower in width than dark stripes.

- 13a. Lips fully or nearly fully papillose or semi-papillose (Figure 14). V-lipped, halves of lower lip mostly unconnected medially. Posterior margin of lower lip medially forming a moderately or very acute angle..... 14
- 13b. Lips plicate or sometimes appearing corrugate (with shallow transverse creases) or upper lip plicate and lower lip subplicate. Full lipped, halves of lower lip mostly fully connected medially (Figure 14). Posterior margin of lower lip wholly forming slightly acute to very obtuse angle, or margin straight 16

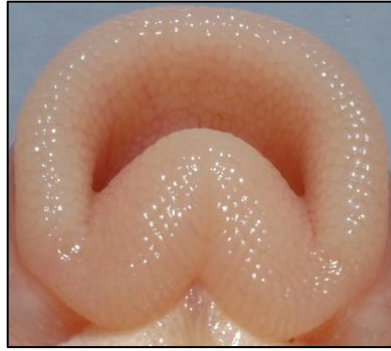


Figure 14. Left – Papillose lower lip; Right – Plicate lower lip.

- 14a. Lower lip papillose, papillae rounded at edges, regularly arranged, small, and mostly subequal or equal in size (Figure 15). Front of upper lip papillose in medium juveniles to adults. Lower lip with smoothly curved posterior margin, not abruptly thinned at a point distinctly anterior to its juncture with upper lip. Dorsal fin margin of large juveniles and adults almost always slightly to moderately falcate (Figure 16). Rather shallow form; profile elongate, little or not at all elevated towards dorsal fin. Scale bases dark. Most Atlantic slope river basins (i.e., Broad, Catawba, Yadkin, Cape Fear, Neuse, Tar, Roanoke, and Chowan basins) V-lip Redhorse, [Moxostoma pappilosum](#)
- 14b. Lower lip semi-papillose, its fine ridges (plicae) deeply, transversely, and somewhat irregularly dissected, resultant papillae-like subdivisions somewhat irregularly arranged and unequal in size (Figure 15). Front of upper lip smooth, lacking papillae. Lower lip abruptly thinned at a point distinctly anterior to its juncture with upper lip. Dorsal fin margin of large juveniles and adults convex, straight or slightly concave. Moderate or high-backed form. Scale bases pale 15

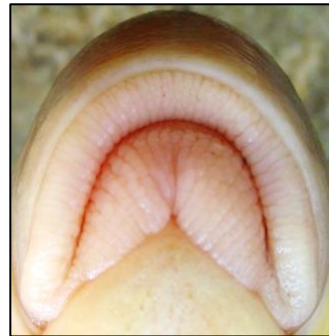


Figure 15. Left – V-lip Redhorse lower lip with smoothly curved posterior margin, not abruptly thinned at a point distinctly anterior to its juncture with upper lip; Right – Notchlip Redhorse lower lip that is abruptly thinned at a point distinctly anterior to its juncture with upper lip.



Figure 16. V-lip Redhorse.

- 15a. Body elevated; body depth at dorsal fin origin (minimum 27) 28-32 (maximum 34)% standard length. Dorsal fin margin usually slightly convex in adults (Figure 17). Restricted to river basins west of the Appalachian Mountains (i.e., Nolichucky, French Broad, Little Tennessee, and Hiwassee basins)..... Silver Redhorse, [Moxostoma anisurum](#)
- 15b. Body form moderate; body depth at dorsal fin origin (minimum 23) 24-28 (maximum 30)% standard length. Dorsal fin margin slightly concave or straight in adults (Figure 17). Found across most Atlantic slope basins (i.e., Broad, Catawba, Yadkin, Cape Fear, Neuse, Tar, Roanoke, and Chowan basins)..... Notchlip Redhorse, [Moxostoma collapsum](#)



Figure 17. Left – Silver Redhorse (photograph courtesy of the North American Native Fishes Association); Right – Notchlip Redhorse.

- 16a. Dorsal fin very falcate (Figure 18), the anterior tip when appressed exceeding the posterior tip, usually markedly. Pharyngeal arch stout; lower teeth slightly molariform, 8-9 teeth on lower half of tooth row. Lower lip usually subplicate, posterior margin truncate or nearly so. Range restricted to the Little Tennessee and Hiwassee basins [Moxostoma sp. “Sicklefin” Redhorse](#)
- 16b. Dorsal fin margin straight to moderately falcate (rarely very falcate in adult Smallmouth Redhorse) (Figure 18) 17



Figure 18. Left – *Moxostoma* sp. “Sicklefin” Redhorse with dorsal fin margin strongly falcate; Right – *Moxostoma* sp. “Carolina” Redhorse with moderately straight dorsal fin. *Moxostoma* sp. “Sicklefin” Redhorse photograph courtesy of Luke Etchison, North Carolina Wildlife Resources Commission.

- 17a. Pharyngeal arch stout; lower teeth large, molariform, 6-9 teeth on lower half of tooth row. Lips plicate. Head medium or large. Caudal and dorsal fins bright red in life. [Note: The only other redhorse with bright red dorsal and caudal fins are the Shorthead Redhorse and Smallmouth Redhorse, which have a tiny mouth with the posterior border of the lower lip straight, a moderately falcate dorsal fin, and a very slab-sided rather than cylindrical body cross-section.] Snout of breeding males with obvious, medium-sized nuptial tubercles..... 18
- 17b. Pharyngeal arch light; lower teeth thin, comb-like; 12-30 teeth on lower half of tooth row. Caudal and dorsal fins not bright red in life, except in occasional young. Snout of breeding males with or without medium-sized breeding tubercles. Head medium or small 19

- 18a. Body laterally with dark-and-pale scale pattern and uniformly shaded or gradually changing shade from shoulder to tail and back to flank; stripes and irregular dusky patches absent. Upper body dominantly brassy, coppery, or olive (Figure 19). Pelvic rays usually 9-9. Males with few or no nuptial tubercles on opercle. Restricted to river basins southwest of the Appalachian Mountains (i.e., French Broad, Pigeon, Little Tennessee, and Hiwassee basins).....
 River Redhorse, [*Moxostoma carinatum*](#)
- 18b. Body laterally with dark-and-pale scale pattern non-uniform from shoulder to tail and (or) back to flank, having stripes and/or irregular dusky patches (Figure 19). Upper body dominantly golden brown in life. Pelvic fin rays 10-10 or 10-9. Males with many nuptial tubercles on opercle. Restricted to the Catawba (extirpated) and lower Yadkin (Pee Dee) basins.....
 Robust Redhorse, [*Moxostoma robustum*](#)



Figure 19. Left – River Redhorse; Right – Robust Redhorse. River Redhorse photograph courtesy of Luke Etchison, North Carolina Wildlife Resources Commission.

- 19a. Lower lip subplicate laterally, laterally and posteriorly, or entirely; plicae deeply transected into small to large, oval elements (Figure 20). Head small and short 20
- 19b. Lower lip plicate, plicae undissected or with shallow creases (corrugate) (Figure 20). Head not small or short..... 21

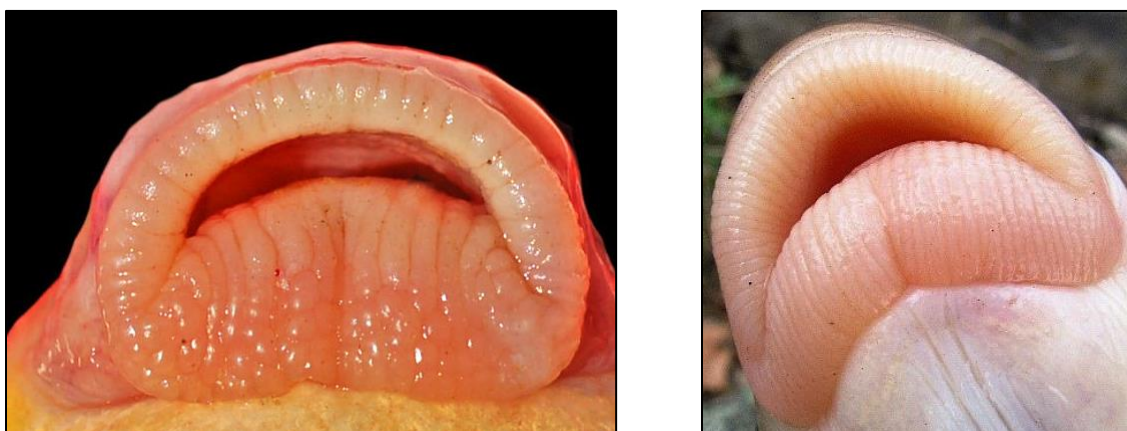


Figure 20. Left – Lower lip subplicate laterally and posteriorly; Right – Lower lip plicate, plicae undissected.

- 20a. Pelvic fin rays modally 10-10. Dorsal fin rays modally 12. Restricted to river basins west of the Appalachian Mountains (i.e., Nolichucky, French Broad, Pigeon, Little Tennessee, and Hiwassee basins) (Figure 21)..... Smallmouth Redhorse, [*Moxostoma breviceps*](#)
- 20b. Pelvic fin rays modally 9-9. Dorsal fin rays modally 13. Found across most Atlantic slope basins (i.e., Catawba, Yadkin, Cape Fear, Neuse, Tar, Roanoke, Chowan, and Albemarle basins) (Figure 21) Shorthead Redhorse, [*Moxostoma macrolepidotum*](#)

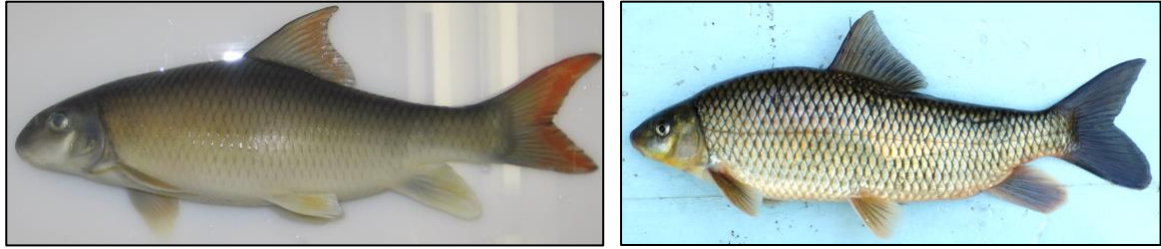


Figure 21. Left – Smallmouth Redhorse; Right – Shorthead Redhorse.

- 21a. Lateral line scales (minimum 43) 44-48 (maximum 51). Breast usually with a small scaleless area anteromedially, anteromedialmost breast scales much smaller than anterior belly scales. Embedded breast scales. Snout of breeding males with minute or no nuptial tubercles; without medium to large breeding tubercles on snout (Figure 22). Pelvic fin rays modally 10-10 (but modally 9-9 in the Blue Ridge of Tennessee River drainage. Angle of posterior edge of lower lip (95) 120-160 (175)°. Widespread in all basins west of the Appalachian Mountains (i.e., Watauga, Nolichucky, French Broad, Pigeon, Little Tennessee, and Hiwassee basins), except for the New basin; two records from the upper Green River in the Broad basin..... Black Redhorse, [Moxostoma duquesnei](#)
- 21b. Lateral line scales (minimum 37) 39-43 (maximum 45). Breast usually fully scaled (exposed), anteromedial breast scales slightly to moderately smaller than anterior belly scales. Snout of breeding males with obvious, medium to large--sized nuptial tubercles (Figure 22). Pelvic fin rays modally 9-9. Angle of posterior edge of lower lip 90-130 (155)° 22



Figure 22. Left – Black Redhorse without medium to large nuptial tubercles on snout; Right – *Moxostoma* sp. “Carolina” Redhorse with obvious, medium to large--sized nuptial tubercles on snout.

- 22a. Supratemporal canal usually interrupted medially. Dorsal fin rays 14 or 15. Pectoral fin rays 10-10. Lateral line scales 43 or 44. Range confined to the middle Cape Fear and lower Yadkin basins (Figure 23).....[Moxostoma](#) sp. “Carolina” Redhorse
- 22b. Supratemporal canal not usually interrupted medially. Dorsal fin rays 12 or 13. Pectoral fin rays 10-9 or 9-10, but usually 9-9. Lateral line scales usually less than 42. Range confined to the Roanoke and all basins west of the Appalachian Mountains (i.e., Nolichucky, French Broad, Pigeon, Little Tennessee, and Hiwassee), except for the Watauga and New basins (Figure 23) Golden Redhorse, [Moxostoma erythrurum](#)



Figure 23. Left – *Moxostoma* sp. “Carolina” Redhorse; Right – Golden Redhorse (photograph courtesy of the North American Native Fishes Association).

- 23a. Subopercle asymmetrical (triangular) (Figure 24). Pelvic and anal fins seldom pigmented. Anal fin rays 7, rarely 8 24
- 23b. Subopercle symmetrical (rounded) (Figure 24). Pelvic and anal fins with melanophores. Anal fin rays 8-11 27

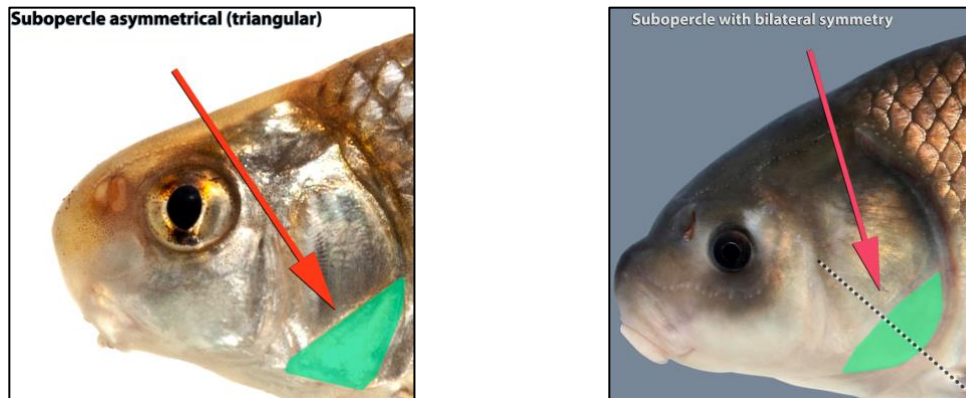


Figure 24. Left – Arrow pointing to the green shaded-in triangular subopercle; Right – arrow pointing to the green shaded-in rounded subopercle.

- 24a. Nipple-like projection present on tip of lower lip (Figure 25). Mouth extends posteriorly to or below the eye (Figure 26). Lateral line scales 36 or fewer (33-37). Dorsal fin rays usually 27 or fewer .. 25
- 24b. Nipple-like projection absent from tip of lower lip (Figure 25). Mouth does not extend posteriorly to or below the eye (Figure 26). Lateral line scales 37 or more (36-40). Dorsal fin rays usually 28 or more 26

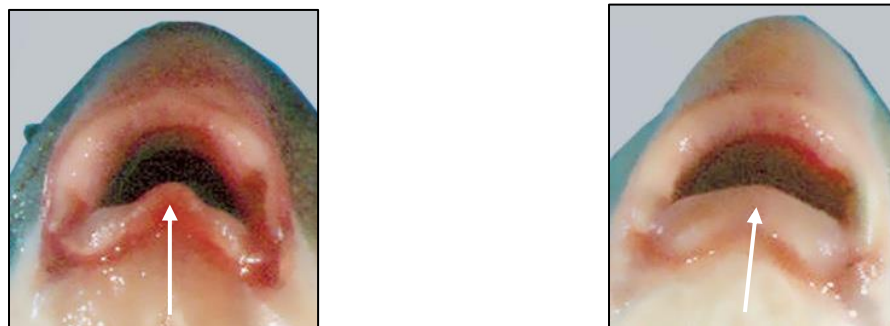


Figure 25. Left – White arrow pointing to the tip of lower lip with a nipple-like projection; Right – White arrow pointing to the tip of the lower without a nipple-like projection.

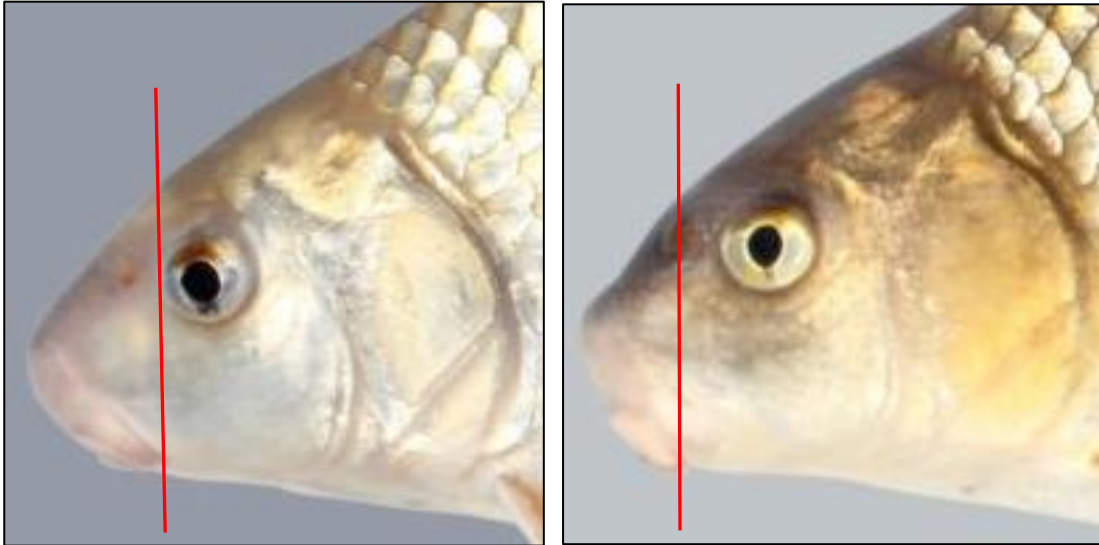


Figure 26. Left – Mouth extending to or below the eye; Right – mouth not extending below eye.

- 25a. Snout of adults blunt and rounded (Figure 27). Breeding tubercles large, larger on snout and top of head than on operculum. Tubercles on most of body scales. Range restricted to the Catawba, Yadkin (Pee Dee), and Cape Fear basins [Carpiodes sp. “Atlantic Highfin” Carpsucker](#)
- 25b. Snout angular (Figure 27). Breeding tubercles small, smaller on snout and top of head than on operculum. Tubercles absent from most of body. Range restricted to French Broad and Nolichucky basins River Carpsucker, [Carpiodes carpio](#)

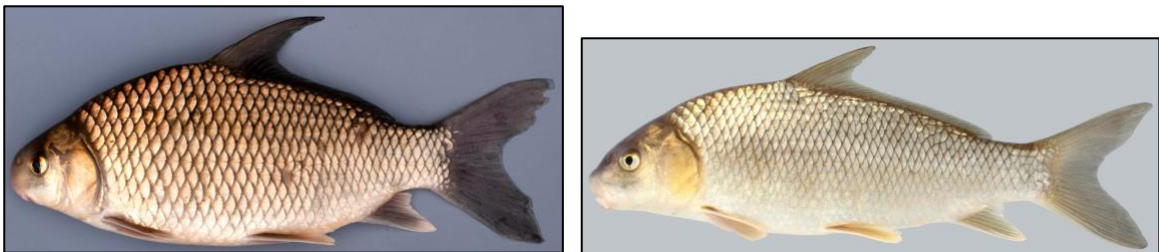


Figure 27. Left – *Carpiodes* sp. “Atlantic Highfin” Carpsucker with snout blunt and rounded; Right – River Carpsucker with snout angular. Photograph of River Carpsucker courtesy of the North American Native Fishes Association.

- 26a. Range restricted to the Roanoke, French Broad, and Pigeon basins (Figure 28)
..... Quillback, [Carpiodes cyprinus](#)
- 26b. Range restricted to the Broad, Catawba, and Yadkin basins (Figure 28)
..... [Carpiodes sp. “Carolina” Quillback](#)



Figure 28. Left – Quillback; Right – *Carpíodes* sp. “Carolina” Quillback. Photograph of Quillback courtesy of the North American Native Fishes Association.

- 27a. Tip of upper lip nearly level with lower margin of eye (Figure 29). Mouth oblique, large. Lips nearly smooth. Introduced in the Catawba and Yadkin basins Bigmouth Buffalo, [Ictiobus cyprinellus](#)
- 27b. Tip of upper lip far below eye, midway between lower margin of eye and bottom of head (Figure 29). Mouth nearly horizontal; small. Lips plicate..... 28

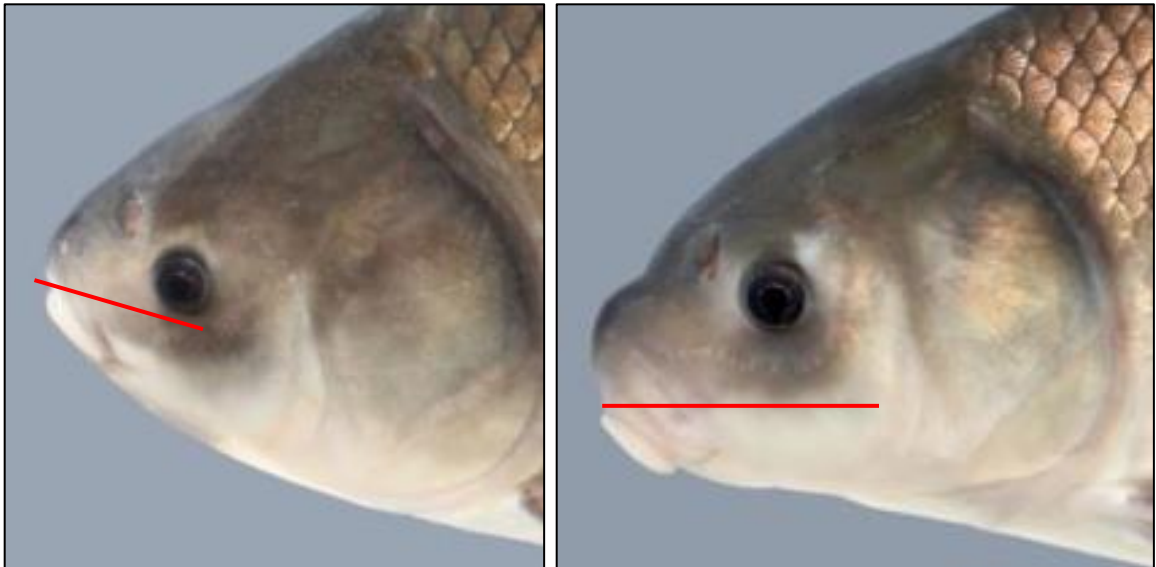


Figure 29. Left – Bigmouth Buffalo with tip of upper lip nearly level with lower margin of eye; Right – with tip of upper lip far below eye, midway between lower margin of eye and bottom of head. Photographs courtesy of the North American Native Fishes Association.

- 28a. Body deep and compressed, body depth, even in juveniles, usually less than 2.7 times in standard length (Figure 30). Eye diameter greater than distance from fleshy posterior tip of maxilla to fleshy anterior tip of lower jaw (may not be true in extremely large fish). Back sharply ridged anterior to dorsal fin. Found in the Yadkin, Catawba, Nolichucky, and French Broad basins Smallmouth Buffalo, [*Ictiobus bubalus*](#)
- 28b. Body depth usually more than 2.9 times in standard length (Figure 30). Eye diameter equal to or less than distance from fleshy posterior tip of maxilla to fleshy anterior tip of lower jaw in adults. Back rounded anterior to dorsal fin. Range restricted to the lower French Broad basin Black Buffalo, [*Ictiobus niger*](#)

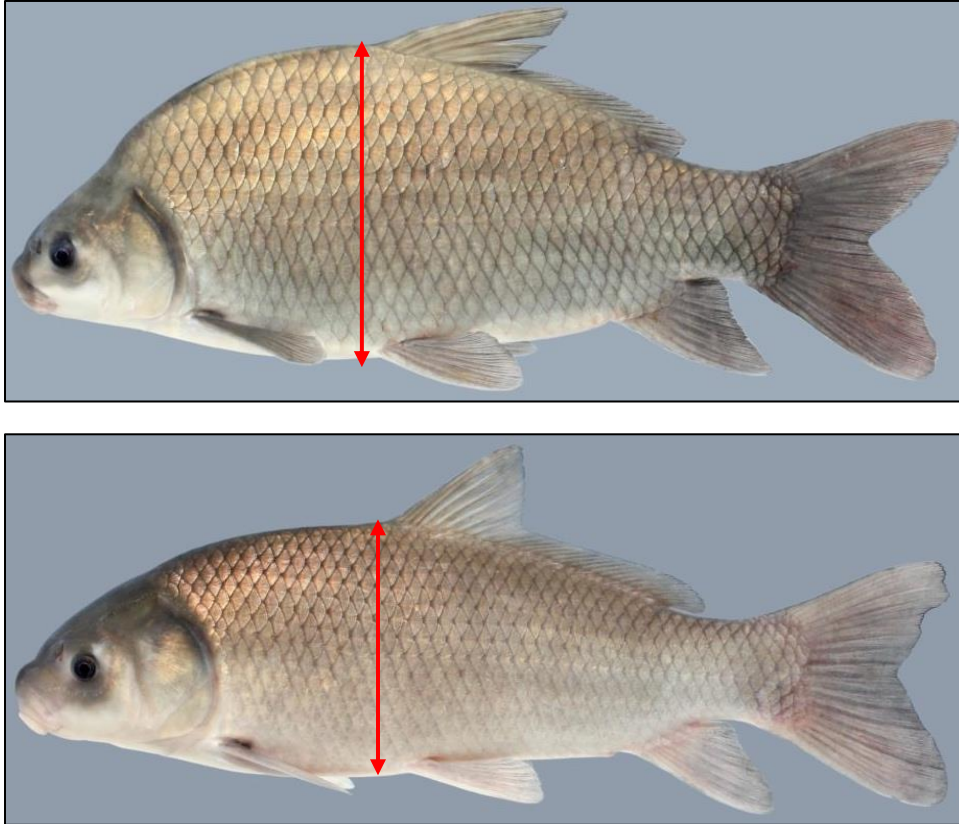


Figure 30. Top – Smallmouth Buffalo, body deep and compressed; Bottom –Black Buffalo, body depth not deep or compressed. Photographs courtesy of the North American Native Fishes Association.