

how to
know the
**freshwater
fishes**

Third Edition

Samuel Eddy

formerly University of Minnesota

James C. Underhill

*James Ford Bell Museum of National History
and University of Minnesota*



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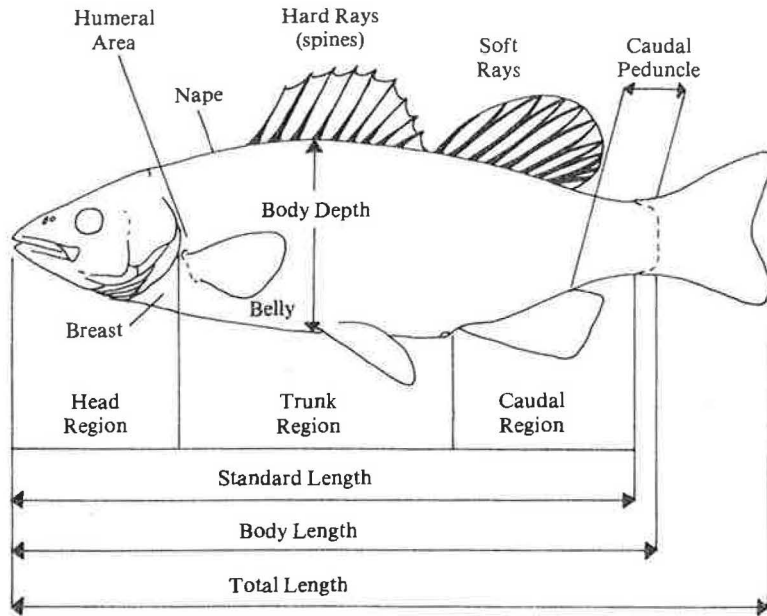


Figure 1.

are usually short and are not divided at their tips and are known as *rudimentary soft rays* (Fig. 2). When counts of the fin rays are made, the short rudimentary rays are not included, but the long unbranched ray usually found at the front of the dorsal and anal fins is usually included in the count. The last soft ray of both dorsal and anal fins is often split almost to the base and may be mistaken for two rays.

In a few fishes, such as the catfishes and

the carp, groups of soft rays may fuse into a stiff spine-like structure known as *hard rays*. These are usually barbed. If their membranous covering is removed their jointed structure will be detected. *True spines* (Fig. 1) are stiff rays ending in sharp points and do not show a jointed structure.

The median or unpaired fins of a fish consist of the dorsal, caudal, and anal fins. The *dorsal fin* (Fig. 2) extends along the middle of

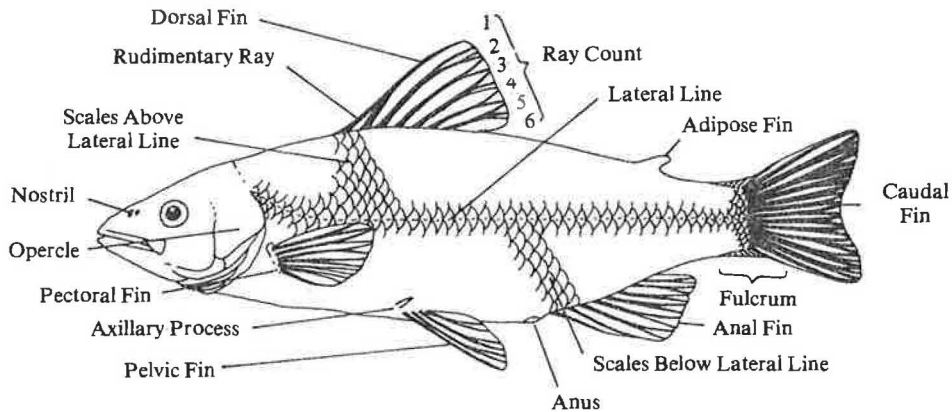


Figure 2.

the back and may be divided into several parts, the anterior portion often being spiny. The tail terminates in the *caudal fin* which has developed several types. Primitive fishes or relicts of ancient groups have a *heterocercal* type (Fig. 3) in which the vertebral column

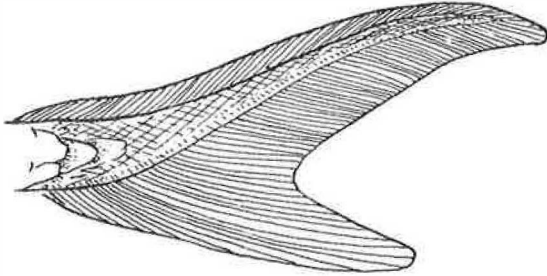


Figure 3.

tends out into the upper lobe of the fin. A modification of this type (See Fig. 14.) occurs in the families Amiidae and Lepisosteidae, where the young are hatched with typical heterocercal fins, but lose the upper lobe as they grow. Most fishes have a *homocercal* type (Fig. 4) of caudal fin where the vertebral col-

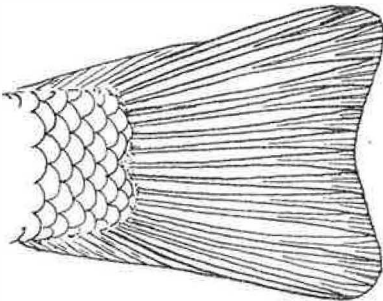


Figure 4.

umn ends at the base of the fin. This type may be forked, rounded, or square. The caudal fin is composed of soft rays with rudimentary rays on each side. The term *fulcrum* (Fig. 2) applies to the swollen area above and below the base of the caudal fin produced by the continuation of the rudimentary rays.

The *anal fin* (Fig. 2) is a median ventral fin located just posterior to the anus. It may be

composed of both spines and soft rays. The shape of the anal and dorsal fins is usually not highly variable, but sometimes one or both of these fins may assume a *falcate* (sickle-shape) form (Fig. 5) with an "S"-shaped edge.

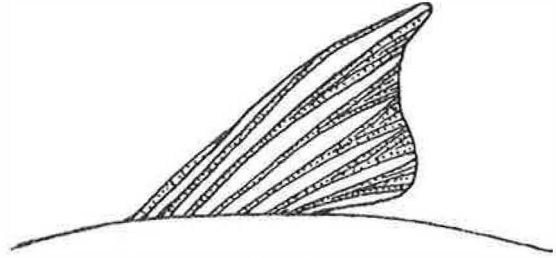


Figure 5.

Fins corresponding to arms and legs are present on most fishes, although one or both pairs are lost in a few fishes. The anterior pair of fins are the *pectoral fins* (Fig. 2) located laterally on the shoulder girdle just back of the *opercle*. The *pelvic fins* (Fig. 2) are typically located just anterior to the anus, but in many fishes they move forward. When the pelvic fins are near the anus, they are termed abdominal in position (See Fig. 22.), but when they are near or under the pectorals they are termed thoracic in position. (See Fig. 23.) In some species they may be anterior to the pectoral fins and are termed jugular in position. In many fishes slender ridges or structures known as *axillary processes* (Fig. 2) are found in the angles at the base of the pelvic fins.

Another type of fin found in some fishes is the *adipose fin* (Fig. 2) characteristic of trout, catfishes and several other groups. This is a small median fin behind the dorsal fin distinguished by being a soft fleshy structure without any rays or spines.

The body of a fish is ordinarily more or less covered with *scales*: sometimes the scales are so small they can barely be detected. Areas without scales are usually said to be naked. A few fishes have lost their scales entirely. Scales are of several types. Several of the most primitive bony fishes possess hard rhomboid or

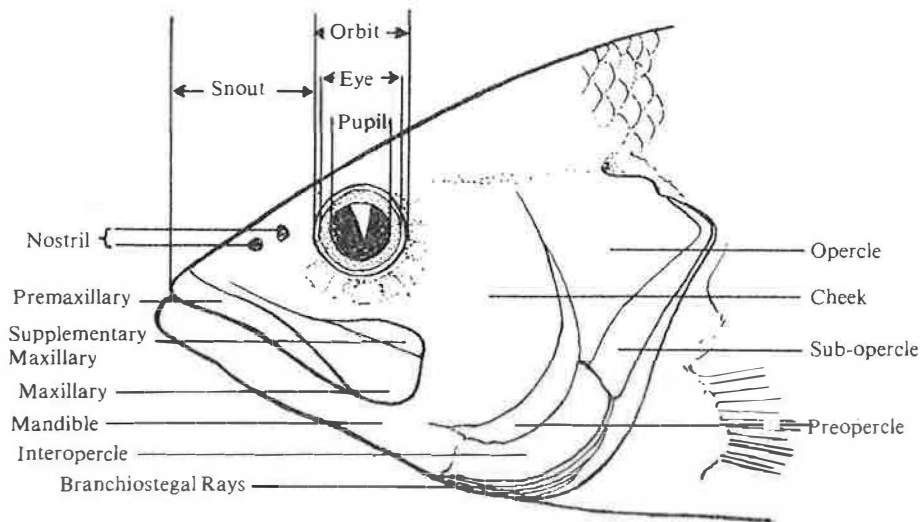


Figure 9.

(Fig. 9). The upper jaws under the snout are formed of bones covered by skin and a thin layer of flesh except in a few fishes which develop fleshy lips. The upper jaw (Fig. 9) consists of several pairs of bones. The front and outer pair is the *premaxillaries* which may be separated from the snout by a distinct groove (See Fig. 181.) in which case they are termed *protractile*. If a bridge of flesh crosses the groove and connects the premaxillaries to the snout (See Fig. 182.), they are termed *non-protractile*. The *maxillary* (Fig. 9) is on each side of the upper jaw and above and behind, but often parallel to the premaxillary. A splint-like supplementary maxillary may be applied to the upper edge of the maxillary. The posterior end of the maxillary usually marks the end of the jaw, and its position in relation to the eye or orbit is often used in identification.

The lower jaw consists of several bones, the most important consisting of the *dentaries* which usually bear teeth. In a few primitive fishes, a prominent shield-like bone, the *gular plate* (Fig. 10), lies between the right and left jaws. The length of the lower jaw varies in different species; in some it may protrude beyond the upper jaw while in others it may be equal or

may be shorter or *inferior*. The forward angle of the mandible forms the *chin*.

Almost any bone in the mouth of fishes is capable of bearing teeth. The roof is formed by an unpaired median *vomer* on each side of which are *palatines* extending to the pterygoids. In the floor of the mouth a bump formed by the protrusion of the *hyoid* bone and frequently bearing teeth, forms the *tongue*. The mouth when approximately at the anterior end of the head is said to be *terminal*. If the snout extends

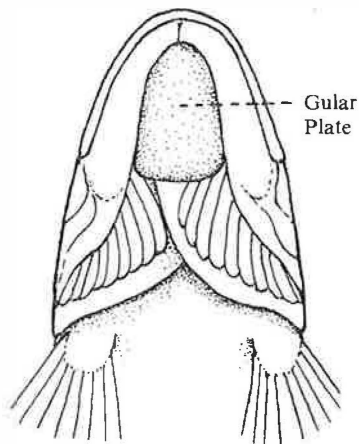


Figure 10.

Key to the Families of Fishes Found in the Fresh Waters of the United States*

- 1a Mouth without jaws and within a funnel-like depression lined with horny teeth; no paired fins; nostrils consist of an unpaired median pit; seven separate gill apertures on each side. Fig. 13.
 (p.26) LAMPREY FAMILY, *Petromyzonidae*



Figure 13.

- 1b Mouth with upper and lower jaws and not located in a funnel-like depression; nostrils consist of paired openings; one or two pairs of fins present; gills covered by a bony flap or opercle. Fig. 2. 2

- 2a Caudal fin is typical or modified heterocercal type. Figs. 3, 14. 3

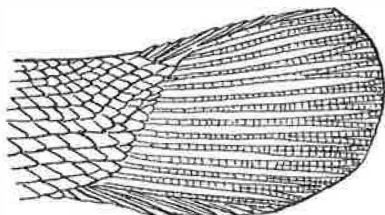


Figure 14.

- 2b Caudal fin is homocercal type. Fig. 4. . . 6

- 3a Caudal fin is typically heterocercal (Fig. 3); mouth is under and behind tip of projecting snout (sub-terminal) and with no or with poorly developed teeth 4

- 3b Caudal fin is modified heterocercal type (Fig. 14); mouth is located at tip of snout (terminal) and has well-developed teeth 5

- 4a No scales or bony plates apparent on body; snout is very long and paddle-like; two tiny barbels in front of mouth. Fig. 15.
 (p. 35) PADDLEFISH FAMILY, *Polyodontidae*

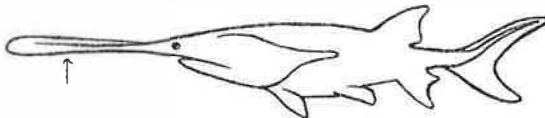


Figure 15.

*Many families of marine fishes contain species which occasionally invade fresh and brackish waters at the mouths of rivers. Some, but not all, of these families are included here.

4b Prominent bony plates on head; 5 rows of keeled plates on body; snout is shovel-like; 4 well-developed barbels in front of mouth. Fig. 16.
 (p.32) **STURGEON FAMILY, Acipenseridae**

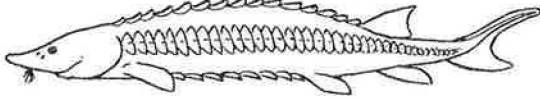


Figure 16.

5a Jaws very elongate; body covered with hard diamond-shaped or ganoid scales (Fig. 6); dorsal fin short and near caudal fin. Fig. 17
 (p. 36) **GAR FAMILY, Lepisosteidae**

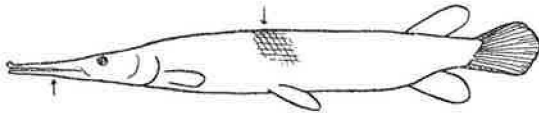


Figure 17.

5b Jaws not elongate; body covered with cycloid scales (Fig. 7); dorsal fin very long, extending over most of the back and almost to the caudal fin. Fig. 18.
 (p.36) **BOWFIN FAMILY, Amiidae**

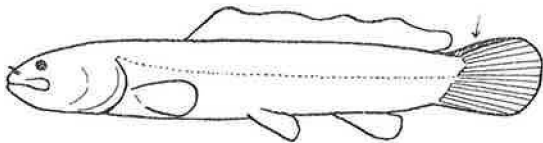


Figure 18.

6a Body elongate or eel-like 7

6b Body not elongate or eel-like 9

7a Snout elongate with small mouth at tip; body covered with annular rings or plates;

dorsal fin small and not reaching caudal fin. Fig. 19
 (p. 150) **PIPEFISH FAMILY, Syngnathidae**

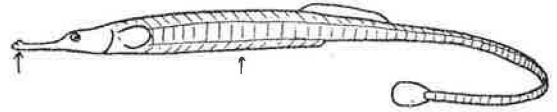


Figure 19.

Marine, but occasionally enter fresh water.

7b Snout not elongate; body covered with scales, scales may be small and difficult to see; dorsal fin long. 8

8a Dorsal fin extending from caudal fin to head, but not continuous with caudal fin. Fig. 20.
 (p. 196) **GUNNEL FAMILY, Pholidae**

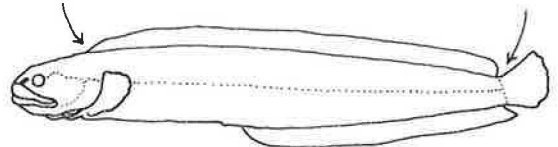


Figure 20.

Marine, but occasionally enter fresh water.

8b Dorsal fin extending from about the middle of the body and continuous with the caudal fin. Fig. 21
 (p.39) **FRESHWATER EEL FAMILY, Anguillidae**

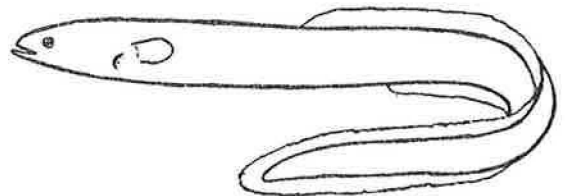


Figure 21.

9a Pelvic fins near anus, abdominal in position. Fig. 22. 10

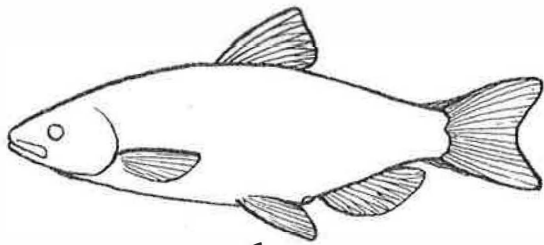


Figure 22.

9b Pelvic fins near, under or in front of pectoral fins, thoracic or jugular in position. Fig. 23. 32

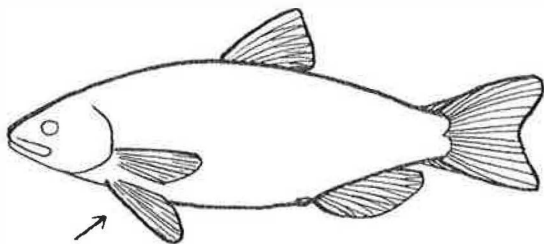


Figure 23.

10a Head covered with bony scutes; with 3 or more bony scutes alongside of body. Fig. 24. (p. 131) ARMORED CATFISH FAMILY, *Loricariidae*

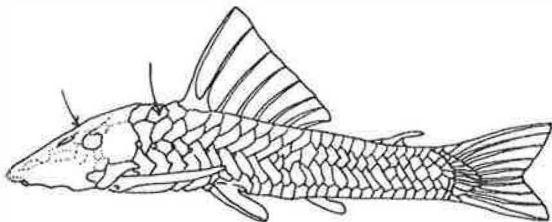


Figure 24.

10b Head without bony scutes; no bony scutes on side of body 11

11a Head without scales. 12

18 Key to the Families

11b Head more or less covered with scales 25

12a Fins usually without spines, spines present only in fins of introduced minnows (carp and goldfish) and some desert minnows from southwestern United States 13

12b Fins with both spines and soft rays. 22

13a Four or more branchiostegal rays (Fig. 9) present on each side 14

13b Less than four branchiostegal rays present on each side 20

14a No adipose fin present 15

14b Adipose fin present. Fig. 2. 19

15a Belly with rounded and smooth margin 16

15b Belly with saw-toothed or with a knife-like margin 17

16a Last ray of dorsal fin greatly elongated. Fig. 25. (p. 38) TARPON FAMILY, *Megalopidae*

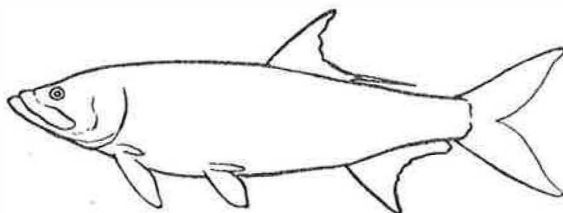


Figure 25.

Marine, sometimes enters fresh water.

16b Last ray of dorsal fin not elongated.
 Fig. 26.
 (p. 39) TEN POUNDER FAMILY,
Elopidae

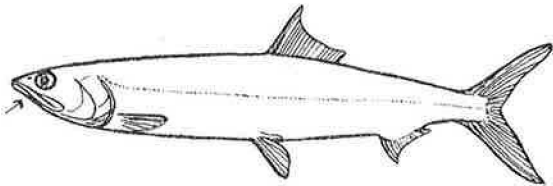


Figure 26.

17a Mouth very large with maxillary
 extending behind posterior margin of eye.
 Fig. 27.
 (p. 42) ANCHOVY FAMILY,
Engraulidae

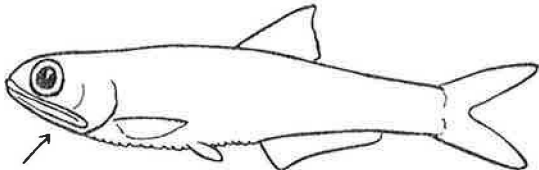


Figure 27.

17b Mouth not large; maxillary does not
 extend behind posterior margin of eye. 18

18a Lateral line absent; belly with
 saw-toothed margin entire length.
 Fig. 28.
 (p. 40) HERRING FAMILY,
Clupeidae

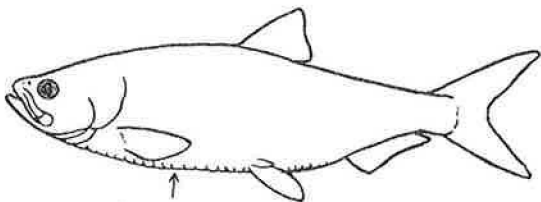


Figure 28.

18b Lateral line present; part of belly with
 sharp but not saw-toothed margin.
 Fig. 29.
 (p. 42) MOONEYE FAMILY,
Hiodontidae

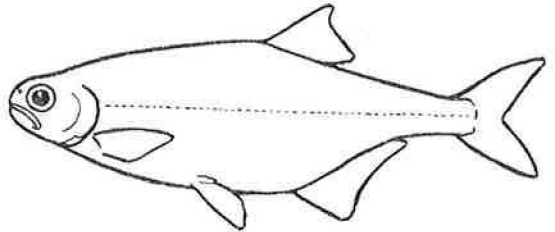


Figure 29.

19a No axillary process present at base of
 pelvic fin. Fig. 30.
 (p. 54) SMELT FAMILY,
Osmeridae

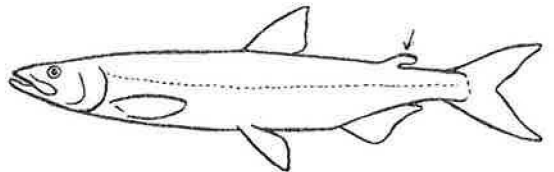


Figure 30.

19b Axillary process present at base of pelvic
 fin. Fig. 31.
 (p. 43) SALMON FAMILY,
Salmonidae

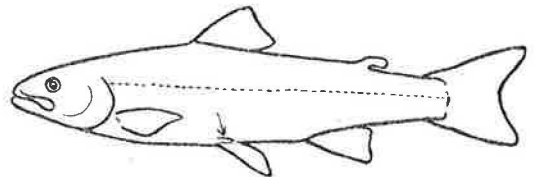


Figure 31.

20a Adipose fin present; teeth are present in
 mouth. Fig. 32.
 (p. 59) CHARACIN FAMILY,
Characidae

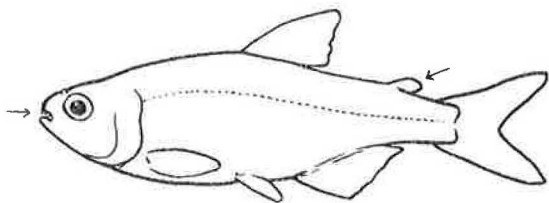


Figure 32.

20b Adipose fin absent; no teeth present in mouth 21

21a Usually more than 10 dorsal rays: (some western suckers have 9-10 dorsal rays) more than 10 well-developed teeth on each pharyngeal arch confined to a single row (Fig. 33); lips more or less sucker-like, lower lip more or less thick. Fig. 34. (p. 110) SUCKER FAMILY, *Catostomidae*

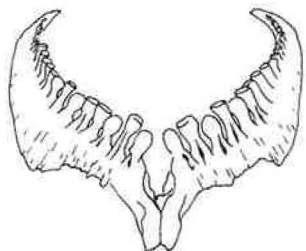


Figure 33.

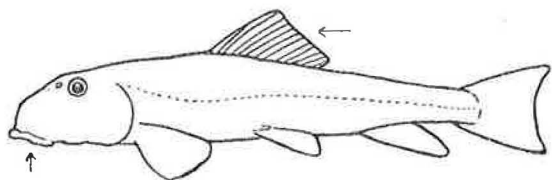


Figure 34.

21b Usually not more than 10 dorsal rays (except in introduced carp, goldfish, and in several western minnows); less than 10 teeth on each pharyngeal arch confined to

2 or 3 rows; or if in a single row, only 4-5 teeth on each side (Fig. 35); lips usually not sucker-like. Fig. 36 (p. 60) MINNOW FAMILY, *Cyprinidae*

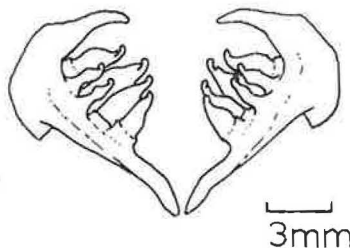


Figure 35.

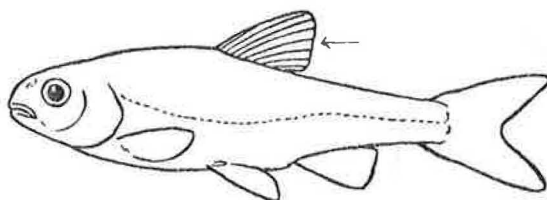


Figure 36.

22a Two to 10 pairs of barbels present; barbels above and below the mouth . . . 23

22b Barbels lacking or with a single median barbel under the chin. Fig. 49 24

23a Adipose fin present; dorsal fin short, with fewer than 30 soft rays; epibranchial organs absent. Fig. 37 (p. 121) FRESHWATER CATFISH FAMILY, *Ictaluridae*

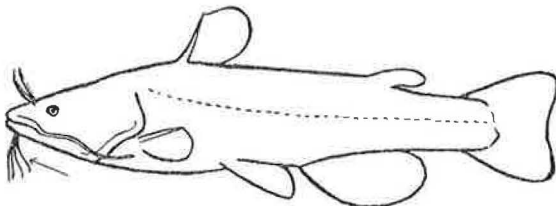


Figure 37.

23b Adipose fin absent; dorsal fin long, with 60 or more soft rays; epibranchial organs highly developed. Fig. 38.
 . . (p. 131) AIRBREATHING CATFISH FAMILY, *Clariidae*

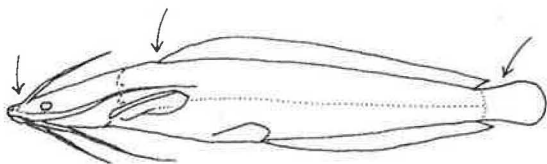


Figure 38.

26b Lower jaw does not extend beyond upper jaw; eye partly covered by vertical adipose membrane. Fig. 41
 (p. 193) MULLET FAMILY, *Mugilidae*

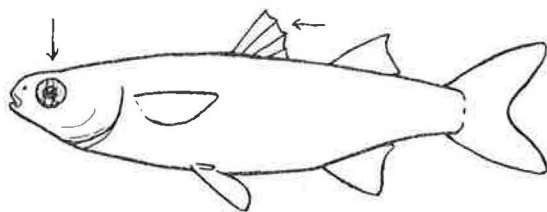


Figure 41.

Marine, sometimes enter fresh water.

24a Adipose fin present. Fig. 39.
 (p. 134) TROUTPERCH FAMILY, *Percopsidae*

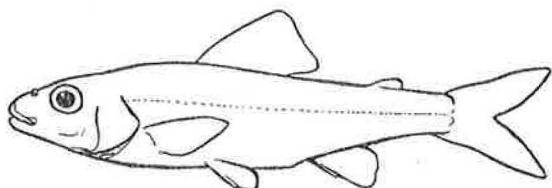


Figure 39.

27a Lateral line ventral in position; about 300 scales in lateral line; jaws very long and slender. Fig. 42
 (p. 135) NEEDLEFISH FAMILY, *Belonidae*

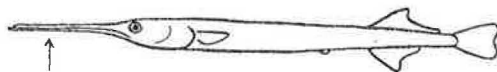


Figure 42.

24b Adipose fin absent. 25

25a Small spiny dorsal fin in front of soft dorsal fin. 26

25b No spiny dorsal fin in front of soft dorsal fin 27

27b Lateral line imperfect or absent; dorsal in position when present; jaws variable, but not slender; less than 200 scales in lateral line 28

26a Lower jaw more or less extending before upper jaw, snout flattened; eye not partly covered by adipose membrane. Fig. 40
 (p. 147) SILVERSIDE FAMILY, *Atherinidae*

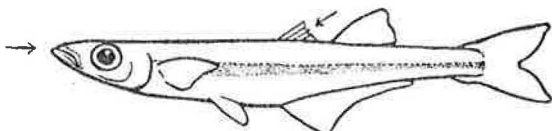


Figure 40.

28a Both jaws extend forward and shaped like a duckbill. Fig. 43
 (p. 56) PIKE FAMILY, *Esocidae*

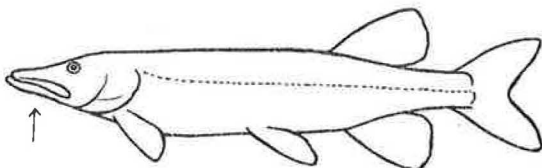


Figure 43.

28b Both jaws not extending far forward and not shaped like a duckbill. 29

29a Lower jaw not protruding. Fig. 44.
 (p. 58) MUDMINNOW FAMILY,
Umbridae



Figure 44.

29b Lower jaw protruding 30

30a Eye degenerate or small; pelvic fins minute or absent; anus tends to be jugular. Fig. 45
 (p. 132) CAVEFISH FAMILY,
Amblyopsidae

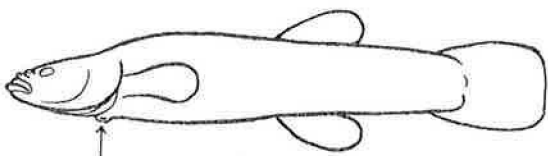


Figure 45.

30b Eyes normal; pelvic fins usually well developed (except in a few desert species) 31

31a Third anal ray (including rudimentary rays) not branched (Fig. 46); anal fin of male modified into elongated intromittent organ (gonopodium). Fig. 47.
 (p. 145) TOPMINNOW or LIVE-BEARER FAMILY, *Poeciliidae*

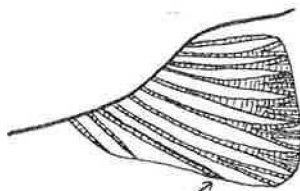


Figure 46.



Figure 47.

31b Third anal ray branched; may not be completely divided in immature individuals; in some the second ray is also branched; anal fin of males not modified. Fig. 48.
 (p. 135) KILLIFISH FAMILY,
Cyprinodontidae

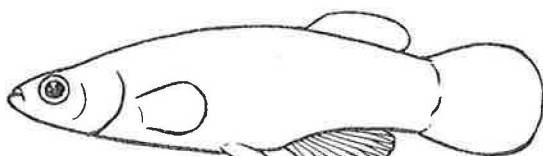


Figure 48.

32a Fins without spines or hard rays. 33

32b Fins with spines or hard rays 36

33a Both eyes on one side of head; body compressed laterally and fish lives on its sides; (FLATFISHES, marine, but some species are frequent invaders of fresh water) 34

- 33b Eyes normal; body not compressed laterally; median barbel under chin. Fig. 49. (p. 134) COD FAMILY, *Gadidae*

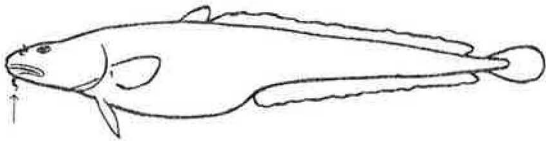


Figure 49.

- 34a Margin of preopercle hidden by skin; left pectoral fin rudimentary or absent, right pectoral fin may or may not be present. Fig. 50. (p. 196) SOLE FAMILY, *Soleidae*

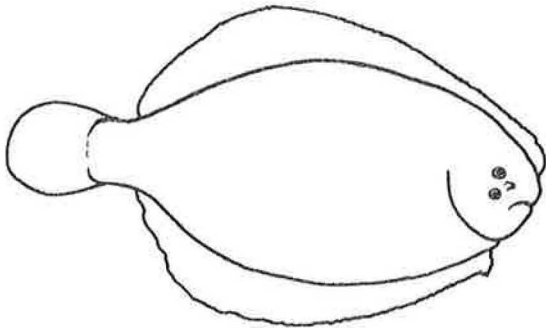


Figure 50.

Marine, sometimes enter fresh water.

- 34b Margin of preopercle not obscured by skin; both pectoral fins present 35

- 35a Pelvic fins not symmetrical but pelvic fin on eyed side located on ventral margin. Fig. 51. (p. 195) LEFT EYE FLOUNDER FAMILY, *Bothidae*

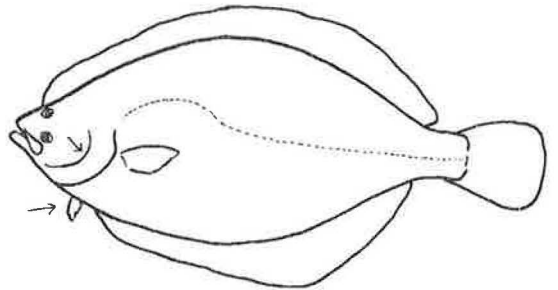


Figure 51.

- 35b Pelvic fins symmetrical, pelvic fin on eyed side not on ventral margin. Fig. 52. (p. 195) RIGHT EYE FLOUNDER FAMILY, *Pleuronectidae*

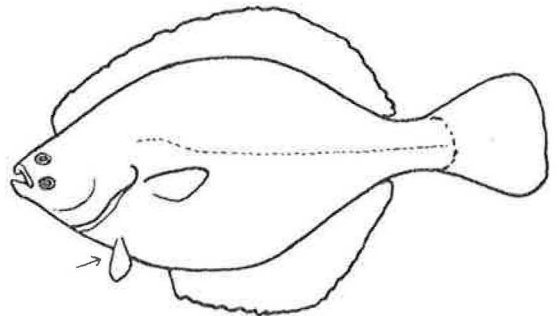


Figure 52.

- 36a Adults with anus anterior to usual position, usually under throat (jugular). Fig. 53. (p. 133) PIRATE PERCH FAMILY, *Aphredoderidae*

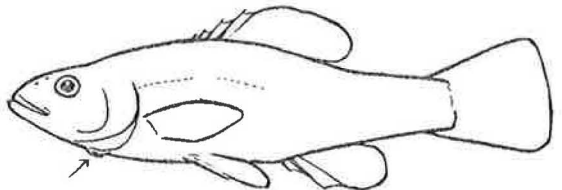


Figure 53.

36b Adults with anus in normal position. . . 37

37a Body without scales, naked or covered with tiny spines or with plates 38

37b Body with scales 39

38a Free spines in front of soft dorsal fin; pelvic fin formed of one spine. Fig. 54. (p. 148) STICKLEBACK FAMILY, *Gasterosteidae*.

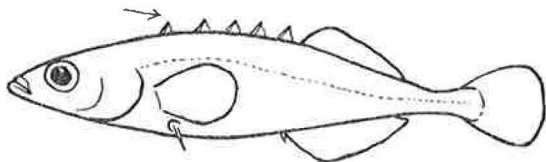


Figure 54.

38b Dorsal spines not free but united to each other by fin membrane; pelvic fins with 3 or 4 soft rays; pectoral fins very large. Fig. 55. (p. 151) SCULPIN FAMILY, *Cottidae*

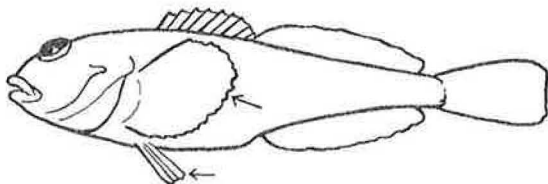


Figure 55.

39a Dorsal fin with 16 or more spines 40

39b Dorsal fin with less than 16 spines 41

40a Distinct ridge of scales along base of dorsal fin; lateral line complete. Fig. 56. (p. 191) SURFFISH FAMILY, *Embiotocidae*

One freshwater species, one marine species may enter fresh water.

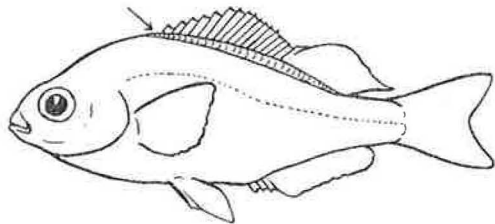


Figure 56.

40b No distinct ridge of scales at base of dorsal fin; lateral line broken under posterior part of dorsal fin. Fig. 57 (p. 192) CICHLID FAMILY, *Cichlidae*

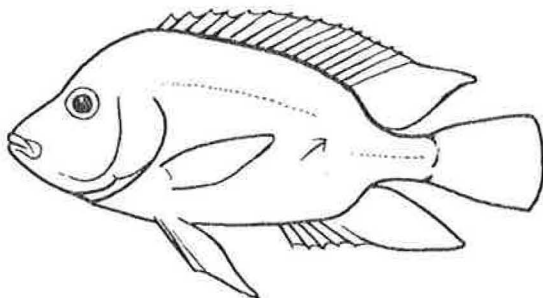


Figure 57.

41a Dorsal fin with 6 to 8 rather filamentous spines; pelvic fins close together, sometimes united. Figs. 58, 59. (p. 193) GOBY FAMILY, *Gobiidae*

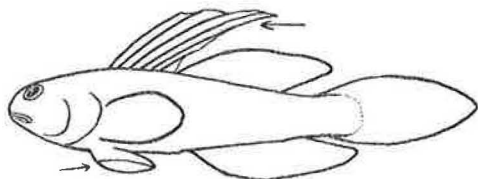


Figure 58.

Mostly marine, several species enter fresh water.

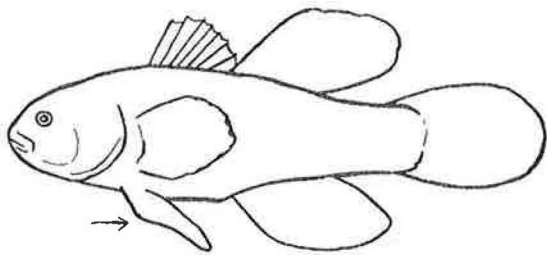


Figure 59.

41b Dorsal fin with 4 to 15 rather stiff spines; pelvic fins never united 42

42a Dorsal fin with 4 spines; pectoral fins on upper half of body. (See Fig. 41.)
..... (p. 193) MULLET FAMILY,
Mugilidae

42b Dorsal fin with 6 to 15 spines; pectoral fins on lower half of body 43

43a Anal spines 3 or more 44

43b Anal spines less than 3 45

44a Opercles with well-developed spine; well-developed patch of gill filaments (pseudobranchia) on inner surface of opercle. Fig. 60
. (p. 157) TEMPERATE BASS FAMILY,
Percichthyidae

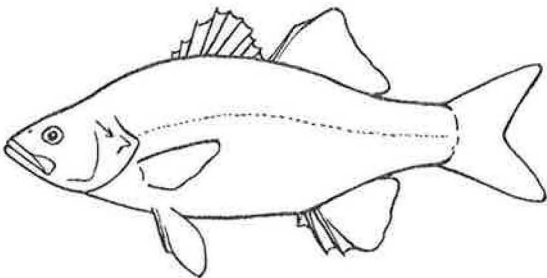


Figure 60.

44b Opercles without a well-developed spine; poorly developed and partly concealed vestigial gill filaments (pseudobranchiae) on the inner surface of the opercle. Fig. 61.
..... (p. 158) SUNFISH FAMILY,
Centrarchidae

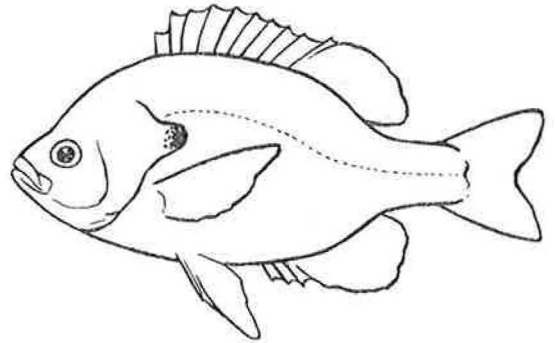


Figure 61.

45a Second anal spine broad and long; lateral line extends onto the caudal fin. Fig. 62. .
..... (p. 190) DRUM or SHEEPHEAD
FAMILY, *Sciaenidae*

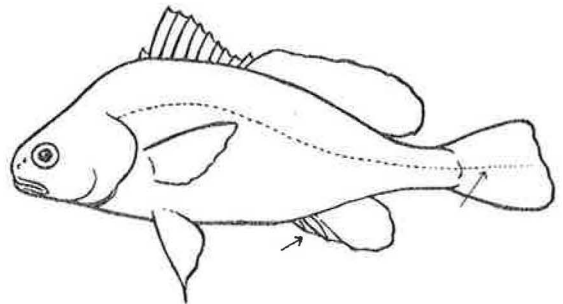


Figure 62.

45b Second anal spine not very broad and long; lateral line not extending onto caudal fin. Fig. 63 (p. 167) PERCH FAMILY, *Percidae*

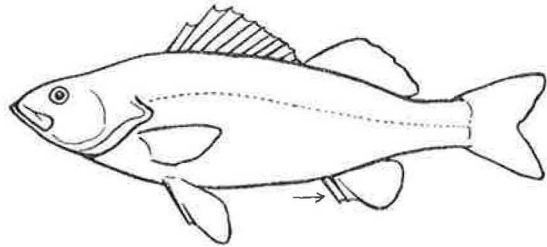


Figure 63.

LAMPREY FAMILY *Petromyzonidae*

The members of the lamprey family are eel-like forms with a sucker-disc mouth structure (buccal funnel) filled with horny spines called teeth. The lampreys are highly specialized descendants of the earliest known type of vertebrates and have never possessed upper and lower jaws, true teeth, and paired fins. Their skeleton is very primitive, consisting chiefly of an incomplete cartilaginous brain case and a notochord on top of which are vestiges of vertebrae. No true bone is present. The gills are highly specialized and lie in separate pockets represented by seven clefts on each side of the body. They possess a long dorsal fin which is more or less continuous with the caudal fin. Lampreys vary in size from six inches to several feet. Most of the freshwater species are pale brown or fawn color.

Adult lamprey are modified for a parasitic or predaceous life, possessing a sucker-disc by which they can attach to fishes and rasp a hole for gorging on the blood and tissues. The adults of some species have abandoned this mode of feeding, and do not feed after metamorphosis, but live just long enough in the adult stage to reproduce. The latter, non-predaceous species, have smaller buccal funnels and usually feeble buccal teeth. The buccal teeth are important characters for identification and their general arrangement and

terminology is shown in the diagram (Fig. 64). The mouth in the center of the funnel is armed with a set of cutting or rasping plates (*laminae*). In some species the inner lateral teeth may be double or with two points and are termed *bicuspid*. The number of trunk myomeres or muscle segments is another character useful in the identification of lampreys. This count begins with the first myomere posterior to the last gill opening and ends with the myomere whose posterior angle lies partially or entirely above the cloaca or vent. The count is difficult in preserved material but can be facilitated by scraping the skin toward the posterior end, removing the congealed mucous that may be present. Creases in the skin may also make the count more difficult but by flexing the specimen it is usually possible to distinguish the margins of the myomeres from the creases.

The lampreys deposit their eggs in nests made on the bottom of swift streams by pulling back the pebbles. The eggs hatch into larval forms known as *ammocoetes*. These have undeveloped eyes and no sucking disc. The larval forms spend approximately 4 to 5 years in the bottom mud of streams where they feed on organic detritus, eventually metamorphosing into adults with eyes and sucker-discs (buccal funnels).

Several species live in the sea and enter

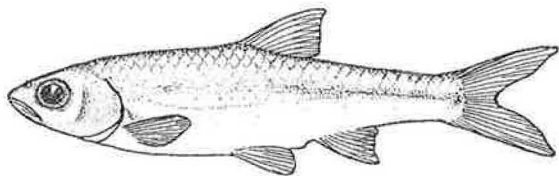


Figure 358.

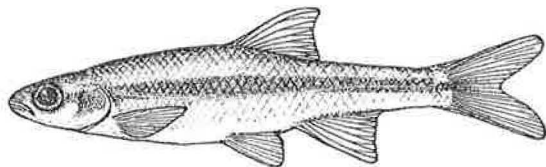


Figure 359.

Length 2 1/2 inches. Santee River drainage, North and South Carolina to Savannah River.

OCMULGEE SHINER, *Notropis callisema* (Jordan). Bluish above, silvery below; large dark spot on last rays of dorsal fin; white tips on dorsal, anal, and caudal fins; dark lateral band ending in caudal spot. Teeth 4-4. Length 2 3/4 inches. Altamaha River drainage, Georgia.

BLUESTRIPE SHINER, *Notropis callisema* Bailey and Gibbs. Very similar to *N. callisema*. Caudal spot confluent with lateral band as in blacktail shiner. Teeth 1,4-4,1.

Length 3 inches. Chattahoochee River, Alabama and Georgia.

BLUE SHINER, *Notropis caeruleus* (Jordan). Fig. 360. Bluish above, silvery white

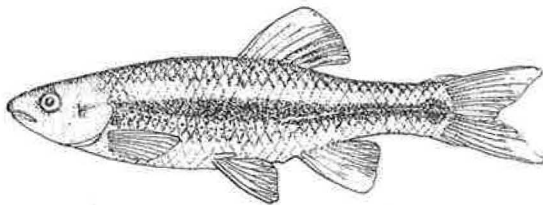


Figure 360.

below; lateral band continuous with inconspicuous caudal spot; faint blotch in upper part of dorsal fin; milky tips on dorsal, anal and caudal fins. Snout rather pointed and overhanging. Teeth 1,4-4,1. Length 3 inches, Coosa and Cahaba Rivers in Mobile Bay drainage, Alabama and Georgia.

OHOOPEE SHINER, *Notropis leedsi* Fowler. Slender individuals will key here. (See Fig. 277, couplet 7b.)

BLACKTAIL SHINER, *Notropis venustus* (Girard). Slender forms with faint caudal spots will key here. (See Fig. 273, couplet 5a and couplet 56a.)

SUCKER FAMILY Catostomidae

This family is closely allied to the minnow family. The suckers are soft-rayed fishes and possess a toothless and more or less sucker-like protrac-tile mouth with thick lips. Lips may be covered with *plicae* which are longitudinal folds separated by fine creases or may be covered by numerous papillae. The last pharyngeal arch bears a row of numerous comb-like teeth (See Fig. 384.) which distinguishes the suckers from the minnows which have either two rows of

teeth, or one row with only a few (5) teeth. Suckers usually have more than 10 dorsal rays, whereas, most native minnows have no more than 10 dorsal rays.

The heads are naked, and the body is covered with smooth cycloid scales. They are extremely bony as the ribs, including a set of accessory ribs, are distributed from the head to the tip of the tail. Otherwise, the flesh of most members of this family is quite edible.

This family contains many species which are quite widely distributed in the United States and furnish an important group of our so-called forage fishes. They are mostly omnivorous, feeding on the bottom where they eat a large variety of animal matter as well as some plant material.

They spawn in the spring, many species making spectacular spawning "runs" up small tributary streams. They are very prolific, and the eggs are scattered at random and develop without any parental care. During spawning season the males in some species may develop tubercles on the head, brighter colors and elongated anal fins.

1a Dorsal fin long with 25 to 40 rays. 2

1b Dorsal fin short with 10 to 18 rays 4

2a Lateral line scales more than 50; eyes in back part of head; head small and abruptly more slender than body; body is 6-7 times length of head *Cycleptus*

BLUE SUCKER, *Cycleptus elongatus* (Lesueur). Fig. 361. Dark back and dusky silvery on sides. Reaches a length of over 2 feet. In large rivers from southern Minnesota and Wisconsin to Tennessee, Mobile Bay drainage, and Mexico.

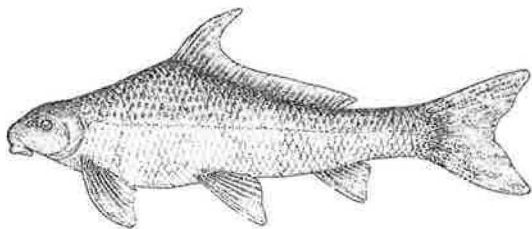


Figure 361.

2b Lateral line scales less than 45; eyes in front part of head; head large and not abruptly more slender than body 3

3a Distance from eye to lower posterior angle of preopercle about 3/4 distance to upper corner of gill cleft; sub-opercle widest at middle; pharyngeal arch thick, triangular in cross section

. **BUFFALOFISHES, *Ictiobus***

This genus contains three species. They are large golden or reddish brown fishes with deep bodies.

LARGEMOUTH BUFFALOFISH, *Ictiobus cyprinellus* (Valenciennes). Fig. 362. Mouth large with upper lip about level with lower margin of eye. Reaches a length of about 3 feet. Saskatchewan and North Dakota to Lake Erie and south to Alabama and northern Texas. Introduced into reservoirs of Gila River, Arizona and Los Angeles Aqueduct system, southern California.

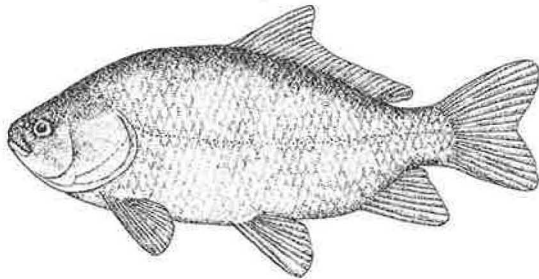


Figure 362.

SMALLMOUTH BUFFALOFISH, *Ictiobus bubalus* (Rafinesque). Mouth small (Fig. 363) with upper lip far below lower margin of eye; back quite elevated. Reaches a length of 2 1/2 feet. Southern Minnesota to Michigan and south to Mexico.

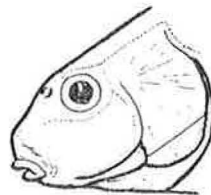


Figure 363.

BLACK BUFFALOFISH, *Ictiobus niger* (Rafinesque). Mouth same as for smallmouth buffalofish, but back not much elevated. Reaches length of 3 feet. Southern Minnesota and Michigan to Texas.

- 3b Distance from eye to lower posterior angle of preopercle about equal to distance to upper corner of gill cleft; subopercle widest below middle (Fig. 364); pharyngeal arch almost paper thin.**
 **CARPSUCKERS, *Carpiodes***

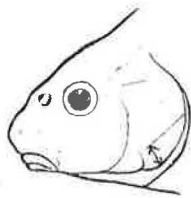


Figure 364.

Color more or less silvery. Some may reach a length of over 20 inches. This genus contains three species in the United States.

QUILLBACK CARPSUCKER, *Carpiodes cyprinus* (Lesueur). Fig. 365. No nipple-like structure on lower lip (Fig. 366);

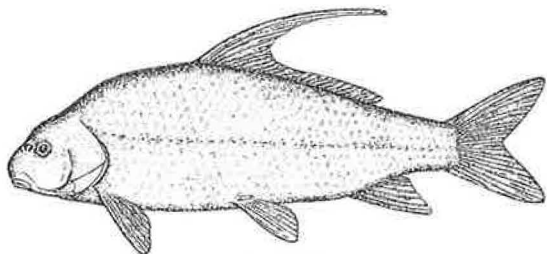


Figure 365.

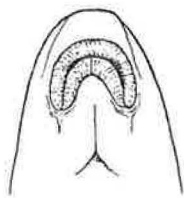


Figure 366.

anterior dorsal rays elongated, or as long as base of fin; lateral line scales 37-40; nostril posterior to middle of mouth (Fig. 364).

HIGHFIN CARPSUCKER, *Carpiodes velifer* (Rafinesque). Nipple-like structure on lower lip (Fig. 367); anterior dorsal rays much elongated; mouth mostly posterior to nostrils (Fig. 368); front of upper lip under nostrils; lateral line scales 33-37. Minnesota to Pennsylvania and south to Tennessee.

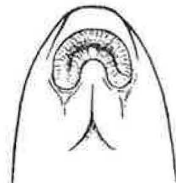


Figure 367.

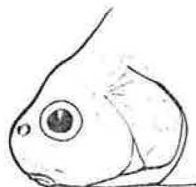


Figure 368.

CARPSUCKER, *Carpiodes carpio* (Rafinesque). Fig. 370. Nipple-like structure on lower lip (Fig. 367); anterior dorsal rays only slightly elongated, not reaching more than 1/2 the base of the fin; mouth mostly posterior to nostrils; front of upper lip almost under nostril (Fig. 369); lateral line scales 33-37. Montana to Pennsylvania and south into Mexico and northern Florida.

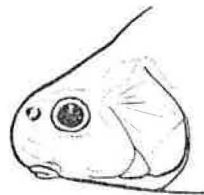


Figure 369.

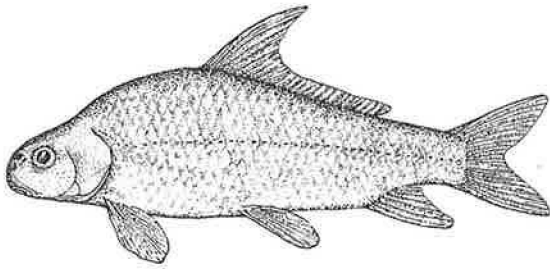


Figure 370.

4a Lateral line absent or incomplete in adults 5

4b Lateral line complete in adults 6

5a Lateral line partly or almost complete; each scale with a distinct spot, forming a pattern of rows of dotted lines on sides; mouth inferior and horizontal

..... *Minytrema*

SPOTTED SUCKER, *Minytrema melanops* (Rafinesque). Fig. 371. Silvery, distinctly characterized by a spot on each scale. Reaches a length of about 18 inches. Larger streams, southern Minnesota to Pennsylvania and south to eastern Texas and Florida.

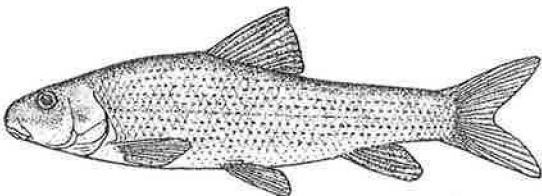


Figure 371.

5b Lateral line absent; sides of young with longitudinal stripe which breaks up into blotches in adults; mouth sub-terminal and oblique

..... CHUBSUCKERS, *Erimyzon*

Small silvery fishes reaching a length of about 10 inches.

LAKE CHUBSUCKER, *Erimyzon sucetta* (Lacépède). Fig. 372. Longitudinal scale

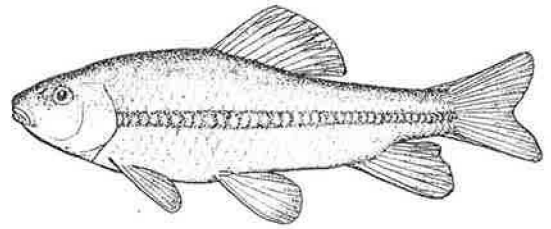


Figure 372.

rows 36-38. Southern Wisconsin to New England and south to Florida and eastern Texas.

CREEK CHUBSUCKER, *Erimyzon oblongus* (Mitchill). Longitudinal scale rows 39-41. Wisconsin to New England and south to Alabama and Texas.

SHARPFIN CHUBSUCKER, *Erimyzon tenuis* (Agassiz). Fig. 373. Differs in that first dorsal ray is as long as base of dorsal fin. Dark lateral band present in young individuals and continues around snout. Gulf drainage of Mississippi, Alabama, and western Florida.

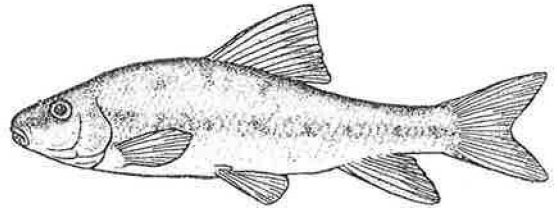


Figure 373.

6a Pronounced hump on back just behind head

Xyrauchen
HUMPBACK SUCKER, *Xyrauchen texanus* (Abbott). Fig. 374. Rather olivaceous. Reaches length of 2 feet. Colorado River, Wyoming southward.

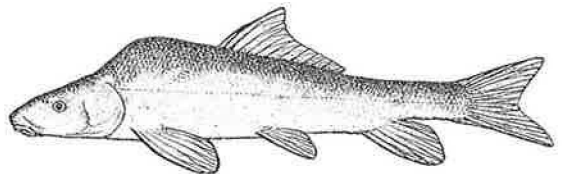


Figure 374.

6b No pronounced hump on back just behind head. 7

7a Scales less than 55 in lateral line and not crowded anteriorly 8

7b Scales more than 55 in lateral line and crowded anteriorly. 12

8a Top of head between eyes concave; swim bladder in 2 parts.

. **HOGSUCKERS, *Hypentelium***

Dusky silver, mottled with black. Reaches a length of about 10-12 inches.

NORTHERN HOGSUCKER, *Hypentelium nigricans* (Lesueur). Fig. 375. Dorsal rays 11; lateral line scales 46; total pectoral rays for both sides 34; dark saddle crosses back before dorsal fin. Minnesota to New York and south to Oklahoma and Alabama.

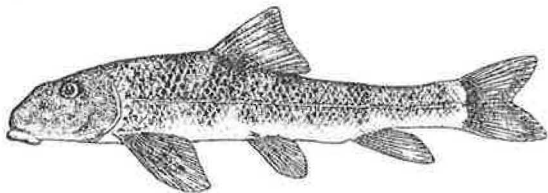


Figure 375.

ROANOKE HOGSUCKER, *Hypentelium roanokense* Raney and Lachner. Dorsal rays 11, but differs from northern hogsucker in having 41 lateral line scales and in having total pectoral rays for both sides 31, dark saddle not developed before dorsal fin. Headwaters of Roanoke River, Virginia.

ALABAMA HOGSUCKER, *Hypentelium etowanum* (Jordan). Fig. 376. Differs in having dorsal rays 10 (9-11). Dorsal fin with black tip anteriorly. Chattahoochee River system of Alabama and Georgia, and throughout the Mobile Bay drainage.

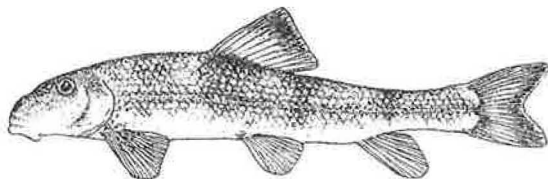


Figure 376.

8b Top of head usually convex between eyes; air bladder obsolete or in 3 parts 9

9a Premaxillary not protractile; lower lip separated from upper lip by lateral notches and divided into two separate lobes (Fig. 377) **Lagochila**

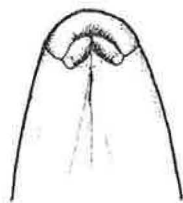


Figure 377.

HARELIP SUCKER, *Lagochila lacera* Jordan and Brayton. Length up to 18 inches. Rare in larger streams of central Mississippi valley.

9b Premaxillary protractile; lower lip not divided from upper lip by lateral notches and not completely divided into two lobes (***Moxostoma*, REDHORSES**) 10

10a Lower lip with plicae (longitudinal ridges) which are broken posteriorly by diagonal creases which may form oval or round papillae (Figs. 378, 379).
. **TORRENT SUCKER, *Moxostoma (Thoburnia) rhotheca* (Thoburn)**

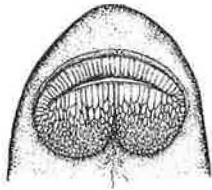


Figure 378.

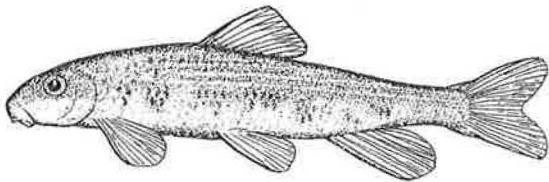


Figure 379.

Somewhat mottled with lateral streaks on sides; halves of lower lip slightly rounded posteriorly and separated by deep notch (Fig. 378). Headwaters of the James, Kanawha, and perhaps the Potomac Rivers, Virginia.

RUSTYSIDE SUCKER, *Moxostoma (Thoburnia) hamiltoni* (Raney and Lachner). Similar to torrent sucker; no pigment in dorsal fin; halves of lower lip separated by deep notch but rounded posteriorly. Roanoke River system, Virginia.

BLACKFIN SUCKER, *Moxostoma atripinne* Bailey. Fig. 380. Black blotch on distal half of first 5-6 dorsal fin rays; lower lip with posterior margin almost straight and with a shallow marginal groove; plicae of lips broken by a few transverse creases and with no papillae. Barren River system, Greene River, Tennessee.

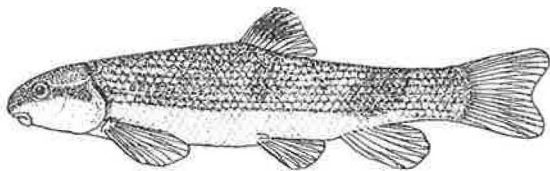


Figure 380.

10b Lower lip with plicae which may be smooth or may be broken by transverse creases. 11

11a Scales around peduncle 12, usually 5 above and 5 below lateral line; more or less reddish brown and silvery, fins tend to be reddish. Length of 24 inches or more. Fig. 381.
 **SILVER REDHORSE, *Moxostoma anisurum*** (Rafinesque)

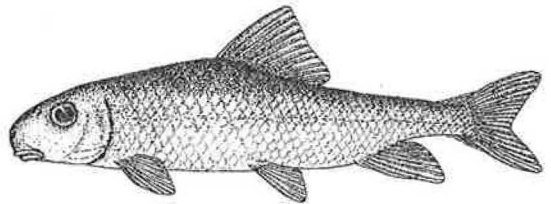


Figure 381.

Halves of lower lip thin and meet at an acute angle (Fig. 382A); plicae broken by transverse creases; dorsal fin rounded at tip. Saskatchewan to St. Lawrence drainage and south to Missouri and Alabama.

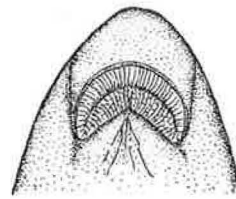


Figure 382A.

SHORTHEAD REDHORSE, *Moxostoma macrolepidotum* (Lesueur). Fig. 383. Halves of lower lip meet in almost a straight line (Fig. 382B); plicae of lower lips are almost smooth but may be broken in corners. Dorsal fin pointed, about 13 rays. Pharyngeal arch thin, teeth fine and comb-like (Fig. 384A).

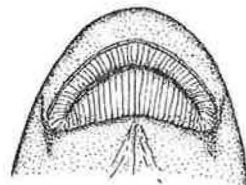


Figure 382B.

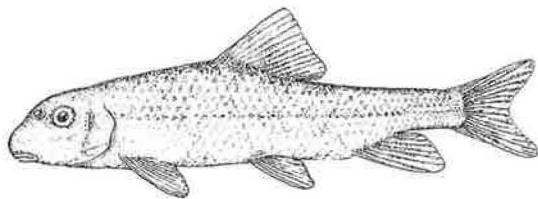


Figure 383.

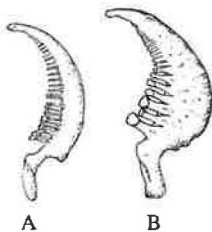


Figure 384.

Wide spread, Mackenzie River system to James Bay and south to Colorado, Oklahoma and Chesapeake Bay.

CAROLINA REDHORSE, *Moxostoma coregonus* (Cope). Similar to the shorthead redhorse but with a projecting snout and a deep median crease in lower lip. Catawba and Yadkin River systems, North Carolina.

RIVER REDHORSE, *Moxostoma carinatum* (Cope). Body large and thick; dorsal fin somewhat falcate; upper lobe of caudal fin is much longer than lower lobe. Differs from most redhorses in very heavy pharyngeal arch, triangular in cross section and in large molariform pharyngeal teeth (Fig. 384B). Minnesota to St. Lawrence River and south to Kansas, Mississippi, Alabama and western Florida.

SUCKERMOUTH REDHORSE, *Moxostoma pappillosum* (Cope). More or less silvery; lower lip with a deep median cleft and quite papillose. Coastal streams from Roanoke River, Virginia to Georgia.

BLACK REDHORSE, *Moxostoma duquesnei* (Lesueur). Rather slender; scales in lateral line 44-47 instead of 39-45 as in most other redhorses; 10 rays in pelvic fin instead of the usual 9 pelvic rays. Plicae of lips smooth or only slightly broken (Fig. 385). Southern Min-

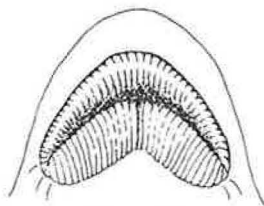


Figure 385.

nesota to Ontario and south to Alabama and Oklahoma in the Mississippi drainage and from the Great Lakes drainage to western Florida.

GOLDEN REDHORSE, *Moxostoma erythrurum* (Rafinesque). Plicae of lips with no transverse creases; lower halves meet in almost straight line (Fig. 386). Similar to greater

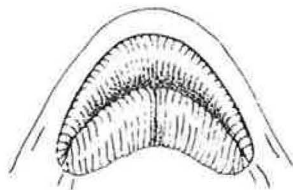


Figure 386.

redhorse except scale bases have no black spots and the dorsal fin is scarcely falcate and is black on sharp tip and near the margin; also differs in scales on peduncle. Minnesota and southern Ontario south to Oklahoma and Georgia.

NEUSE REDHORSE, *Moxostoma lachrymale* (Cope). Resembles the golden redhorse so closely that it may be a sub-species. Neuse River, North Carolina.

BLACKTAIL REDHORSE, *Moxostoma poecilurum* Jordan. Fig. 387. Similar to the northern redhorse except the lower lobe of the caudal fin is black and is narrower and longer

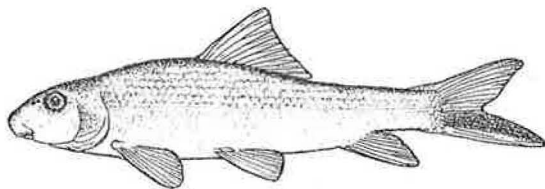


Figure 387.

than the upper lobe. Coastal streams of the Gulf of Mexico from eastern Texas to Florida.

11b Scales around peduncle 16, unusually 7 above and 7 below lateral line when counted from side GRAY REDHORSE, *Moxostoma congestum* (Baird and Girard)

Resembles northern redhorse but differs in number of peduncle scales and has a rather low dorsal fin with 11-12 rays instead of 13. Halves of lower lip meet at acute angle with a deep median groove; lips plicate but broken into papillae in corners. Anal and distal half of dorsal fins dusky. Central Texas to Rio Grande River.

BLACK JUMPROCK, *Moxostoma cervinum* (Cope). Fig. 388. Dark saddles on back and light longitudinal streaks on sides; dorsal and caudal fins with black tips. Posterior margin of lower lip concave. Coastal streams from James to Neuse Rivers, Virginia.

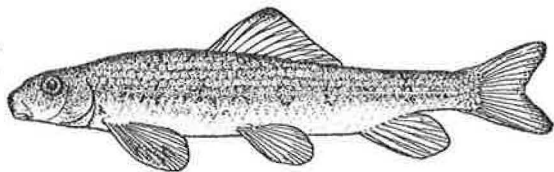


Figure 388.

STRIPED JUMPROCK, *Moxostoma rupiscartes* Jordan and Jenkins. Very similar to black jumprock except tips of fins are dusky instead of black; may retain juvenile blotches on sides and back. North Carolina southward in Santee, Savannah, Altamaha and Chatahoochee River systems.

GREATER JUMPROCK, *Moxostoma lachneri* Robbins and Raney. Related to striped jumprock with about 8 lateral streaks but has 12 dorsal rays instead of 10-11. Lower lobe of caudal fin dusky or black except for milky white lower ray as in blactail redhorse. Apalachicola River system, Georgia.

SMALLFIN REDHORSE, *Moxostoma robustum* (Cope). Lateral streaks as in striped

jumprock but head is shorter and lacks black pigment on tip of dorsal fin. Lower lip concave posteriorly, plicae may be slightly broken. Yadkin to Altamaha River systems in North Carolina to Georgia.

BIGEYE JUMPROCK, *Moxostoma ariommum* Robbins and Raney. Body with lateral streaks; lower lip very papillose. Differs from other redhorses as very concave between eyes. Upper Roanoke River, Virginia.

COPPER REDHORSE, *Moxostoma hubbsi* Legendre. Resembles river redhorse except body is heavier and shorter. Lake Ontario and St. Lawrence River drainages.

GREATER REDHORSE, *Moxostoma valenciennesi* Jordan. Lips with plicae not broken by transverse creases, lower halves meet at an angle. Resembles golden redhorse but dorsal fin is not falcate and has a whitish tip; scale bases lack dark spots. Minnesota, and Great Lakes and St. Lawrence drainages south to Iowa and Illinois but absent in most of the Ohio River drainage.

12a Mouth terminal, lips rather thin with smooth or weakly broken plicae; lower lip divided by very wide median notch (Fig. 390) *Chasmistes*

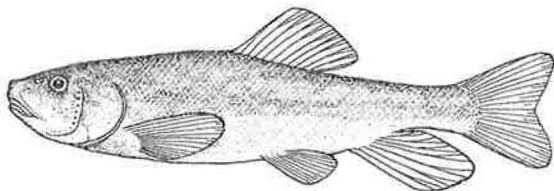


Figure 389.

A small group of western suckers with rather humped snouts; no axillary process present at the base of the pelvic fins. Rather restricted in their distribution.

SHORTNOSE SUCKER, *Chasmistes brevirostris* Cope. Fig. 389. Dusky above, pale

below. Lateral line scales 70-80. Length up to 18 inches. Klamath Lake, Oregon.

JUNE SUCKER, *Chasmistes liorus* Jordan. Scales on back with small punctulations; lateral line scales 58-65. Lower lip with broken plicae and with wide median notch (Fig. 390). Length 18 inches. Utah Lake, Utah.

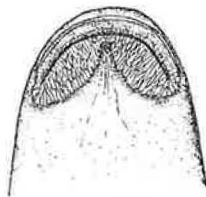


Figure 390.

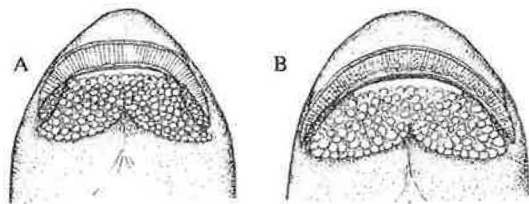


Figure 391.

CUI-UI, *Chasmistes cujus* Cope. Pale olive above, very similar to June sucker except lateral line has 13-14 scales above instead of 7-11 scales. Restricted to Pyramid Lake, Nevada.

12b Mouth usually subterminal; lips rather thick, lower lip usually strongly papillose. SUCKERS, *Catostomus* 13

This genus contains a large number of species usually with dark backs shading to silvery below. Some species develop reddish streaks on sides during spawning season. Several former western genera have been recently included in this genus which now includes the mountain suckers, *Pantosteus*, and the lost sucker, *Deltistes*. Only several species are widespread east of the Rockies but many species have developed in the isolated stream systems west of the Rockies. Many suckers reach a length of 18 inches or more.

13a Lower lip separated from upper lip by distinct lateral notches Figs. 391A, B, C (*Pantosteus*) *Catostomus*

MOUNTAIN SUCKER, *Catostomus (Pantosteus) platyrhynchus* (Cope). Fig. 392. Axillary process of pelvic fin well developed. Lower lip (Fig. 391B) moderately notched in center with 3-4 rows of papillae in mid-line; outer surface of upper lip without papillae. Length 7-8 inches. Widespread in Great Basin of Utah and Wyoming, Fraser and upper Columbia drainages; Green River in Utah and Wyoming; upper Saskatchewan River drainage; upper Missouri River drainage including the Black Hills.

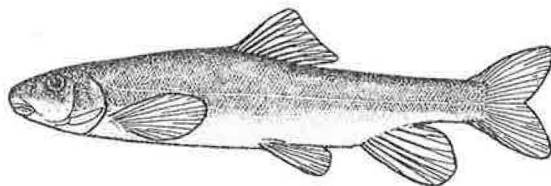


Figure 392.

RIO GRANDE SUCKER, *Catostomus (Pantosteus) plebius* Baird and Girard. Axillary process of pelvic fin undeveloped. Lower lip with deep median notch, only 2-3 rows of papillae in mid-line (Fig. 391C), outer face of upper lip with papillae. Length 4-6 inches. Rio Grande River drainage in Colorado, New Mexico and northern Mexico.

COLORADO SUCKER, *Catostomus (Pantosteus) discobolus* Cope. Fig. 393. Axillary process of pelvic fin undeveloped. Lower lip with shallow median notch, more than 3 rows of papillae in mid-line. Predorsal scales usually more than 50. Colorado River drainage above Grand Canyon, upper Snake River drainage and drainage of Bear River and Weber Lake, Idaho, Utah and Nevada. Length up to 18 inches. Quite variable and includes former species, *P. virescens* Cope, *P. delphinus* (Cope) and others.

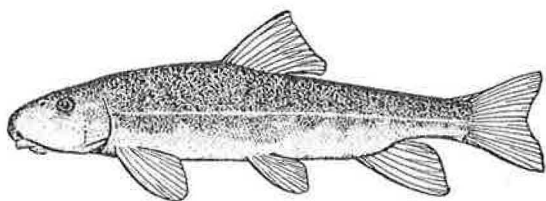


Figure 393.

DESERT SUCKER, *Catostomus (Pantosteus) clarki* Baird and Girard. Fig. 394. Axillary process of pelvic fin poorly developed or absent. Lower lip (Fig. 391A) with shallow median notch, 4-5 rows of papillae in midline, outer face of upper lip without papillae. Predorsal scale number variable, less than 50 (13-50). Length up to 14 inches. Colorado River drainage below Grand Canyon including Gila River system of Arizona and New Mexico, White River and Virgin River drainages in Nevada and Utah.

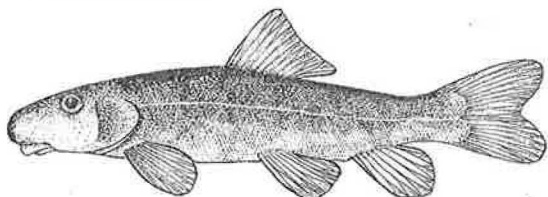


Figure 394.

SANTA ANA SUCKER, *Catostomus (Pantosteus) santaanae* (Snyder). Axillary process of pelvic fin variable in development. Lower lip with shallow notch and with

numerous rows of papillae in mid-line. Outer face of upper lip may be weakly papillose. Length about 6 inches. Santa Clara, San Gabriel and Santa Ana River drainages in southern California.

BRIDGELIP SUCKER, *Catostomus (Pantosteus) columbianus* (Eigenmann and Eigenmann). Some individuals may show shallow notches between upper and lower lips and may key here. See couplet 14b.

13b Lower lip not separated by lateral notches from upper lip; both lips papillose. *Catostomus* Figs. 395A, B, C. 14

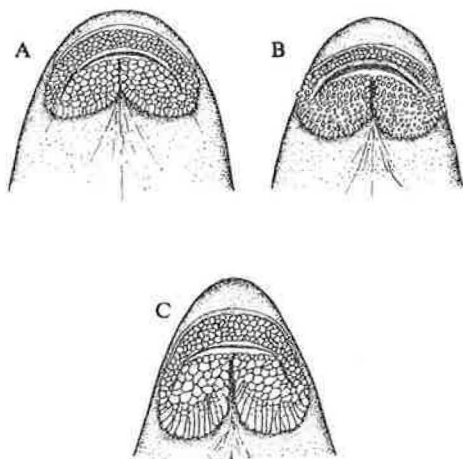


Figure 395.

14a Coarse scaled suckers, less than 80 lateral line scales. Fig. 396 WHITE SUCKER, *Catostomus commersoni* (Lacepede)

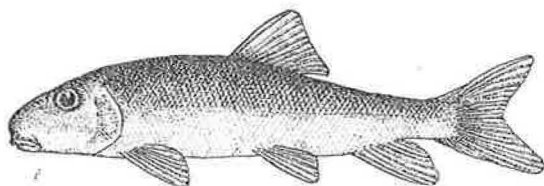


Figure 396.

Lateral line scales 55-70. Lips papillose and almost divided (Fig. 395A). Very common east

of the Rockies from northwestern Canada eastward and to Colorado, Missouri and Georgia. It is represented on the Great Plains from Montana to Mexico by the sub-species *C. c. suckli* Girard. Introduced elsewhere including the Colorado River system. Length up to 18 inches.

UTAH SUCKER, *Catostomus ardens* Jordan and Gilbert. Lateral line scales 70-72. Upper lip deep, lower lip almost divided by deep median groove. Bonneville Basin, Utah and upper Snake River drainage in Wyoming, Idaho and Nevada.

WEBUG SUCKER, *Catostomus fecundus* Cope and Yarrow. Lateral line scales 64-75. Lower lip deeply incised. Utah Lake, Utah.

LARGESCALE SUCKER, *Catostomus macrocheilus* Girard. Lateral line scales 65-75. Upper lip wide; lower lip with deep median groove. Sides with dusky lateral band. Coastal drainage from Skeena River south into Oregon.

SONORA SUCKER, *Catostomus insignis* Baird and Girard. Lateral line scales 56-67. Gila River system, Arizona and New Mexico.

WARNER SUCKER, *Catostomus warnerensis* Snyder. Lower lip with shallow median groove. Lateral line scales 69-77. Warner Lakes drainage, Oregon.

KLAMATH LARGESCALE SUCKER, *Catostomus snyderi* Gilbert. Lateral line scales 69-77. Deep median groove in lower lip. Above falls of Klamath River, Oregon and California.

SACRAMENTO SUCKER, *Catostomus occidentalis* Ayres. Fig. 397. Lateral line scales 58-75; lips thin; dorsal rays 12-14. Four sub-species. Sacramento-San Joaquin Rivers and coastal streams northward from San Francisco Bay in California.

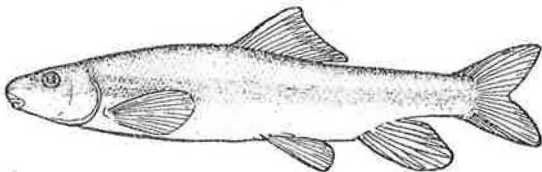


Figure 397.

14b Fine scaled suckers, more than 80 scales in lateral line. Fig. 398. LONGNOSE SUCKER, *Catostomus catostomus* (Forster)

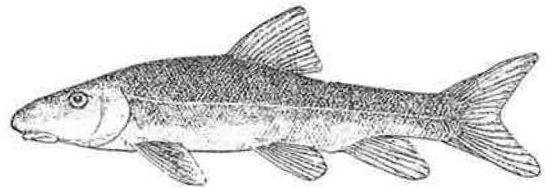


Figure 398.

Lateral line scales 90-117; snout long and pointed. Lower lip large and almost divided (Fig. 395B). Breeding males with distinct reddish lateral band. Length up to 18 inches. Widely distributed east of the Rockies from Alaska to Maine, in Great Lakes drainage but not in Mississippi River drainage except in drainage of upper Missouri River where it is represented by *C. c. griseus* Girard. Also present in Columbia River system west of the Rockies.

FLANNELMOUTH SUCKER, *Catostomus latipinnis* Baird and Girard. Fig. 399. Lower lip very thick and elongated (Fig. 395C), completely divided by median groove; dorsal rays 10-11. Lateral line scales more than 80. Length over 18 inches. Colorado River drainage.

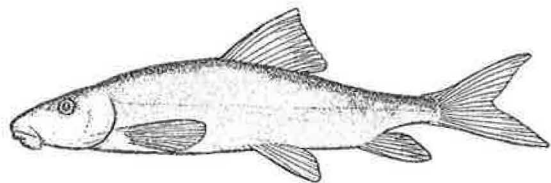


Figure 399.

MODOC SUCKER, *Catostomus microps* Rutter. Lateral line scales 81-87. Lower lip deeply divided; dorsal fin rays 10-11. Upper Pit River drainage, Modoc County, California.

TAHOE SUCKER, *Catostomus tahoensis* Gill and Jordan. Fig. 400. Lower lip deeply incised; lateral line scales 83-92. Breeding males bicolor, with prominent red lateral band. Lake

Tahoe and Lahontan Basin, California and Nevada.

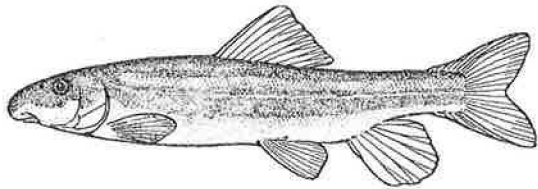


Figure 400.

OWENS SUCKER, *Catostomus fumiventris* Miller. Similar to Tahoe sucker but with larger scales, usually fewer than 80 scales in lateral line. Breeding males without prominent red stripe. Native to the Owens River and its tributaries, California.

KLAMATH SMALLSCALE SUCKER, *Catostomus rimiculus* Gilbert and Snyder. Fig. 401. Axillary process at base of pelvic fin not developed. Lower lip with deep median groove; lateral line scales 81-93. Trinity, Klamath and Rogue Rivers in Oregon and California.

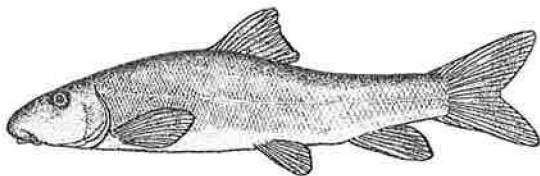


Figure 401.

BRIDGELIP SUCKER, *Catostomus columbianus* (Eigenmann and Eigenmann). Axillary process at base of pelvic fin not developed. Lateral line scales 100-111; lower lip not deeply notched; sometimes with weak lateral notches between upper and lower lips. See couplet 13a. Middle and lower Columbia River northward to Fraser River.

LOST RIVER SUCKER, *Catostomus luxatus* (Cope). Snout with distinct hump (Fig. 402). Lateral line scales more than 80 (82-88); lower lip with small papillae, a few on corners of upper lip (Fig. 403). Lower lip almost completely divided by wide median notch. Klamath River system in Oregon and California.

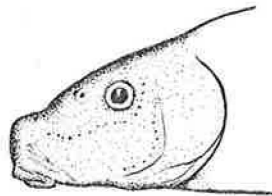


Figure 402.

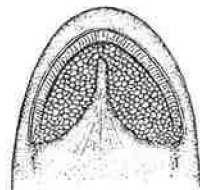


Figure 403.

CATFISH FAMILY Ictaluridae

The members of this family are readily distinguished by their scaleless bodies, broad flat heads, sharp heavy pectoral and dorsal spines, and long barbels about the mouth. They possess bands of numerous bristle-like teeth in the upper jaw. Their barbels are arranged in a

definite pattern, four under the jaws, two above and one on each tip of the maxillary. Originally the family Ictaluridae was found in the United States only east of the Rockies, but now various species have been widely introduced in the western states. All the larger

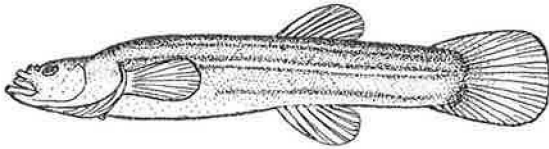


Figure 430.

Brown above, lighter below, entire body sprinkled with black specks. Three dark longitudinal stripes on sides. Center stripe may become pale. Length 1 1/2 inches. Springs in southern Illinois, Kentucky and Tennessee. A population of the spring cavefish has recently been discovered in southeastern Missouri.

4b Body without ridges or papillae; caudal fin with black blotch at base, behind which is a white blotch or 2 white spots (may form a bar); remainder of fin is black.
SWAMPFISH, *Chologaster cornuta*
Agassiz

Dark brown above, whitish below, entire body sprinkled with black specks. Three black longitudinal stripes on sides. Dorsal fin white, may be edged with black. Length up to 2 inches. Found in lowland swamps from southern Virginia to central Georgia.

PIRATE PERCH FAMILY Aphredoderidae

This family contains but one species, the pirate perch, *Aphredoderus sayanus* (Gilliams), Fig. 431, in the central Mississippi valley from southern Minnesota southward and along the coastal plain from New York southward to eastern Texas.

The body is dark olive, somewhat speckled; with two dark bars at the base of the caudal fin and becomes quite iridescent during the spawning season. Length about 5 inches. The outstanding character is the location of the anus. This moves forward as the fish grows until it is located under the throat (jugular) of the adults. The lateral line on the sides is only slightly or partly developed in most mid-western specimens but those from the Atlantic

coastal region show a much better developed lateral line.

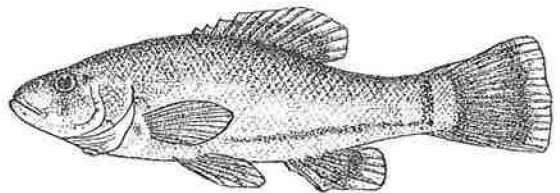


Figure 431.

The pirate perch build a nest and both parents are claimed to guard the nest. They are predaceous, feeding mostly on aquatic insects and other small aquatic animals.