

### 3.—THE FISHES OF TEXAS AND THE RIO GRANDE BASIN, CONSIDERED CHIEFLY WITH REFERENCE TO THEIR GEOGRAPHIC DISTRIBUTION.

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#### INTRODUCTION.

During the months of November and December of 1891, Prof. Evermann was engaged, under the direction of the Commissioner of Fish and Fisheries, Col. Marshall McDonald, in making certain investigations looking toward the establishment of a fish-cultural station at some point in the State of Texas. While carrying on these investigations, extensive collections of fishes were made at various places, particularly at Galveston and Corpus Christi on the coast, and in the vicinity of Houston, Palestine, San Antonio, New Braunfels, and San Marcos in the interior. The report\* upon the specific object of this work was published May 25, 1892. This report contained, in addition, the results of the studies of the species of *Cyprinidae* and *Cyprinodontidae* contained in the collections. Other duties in connection with the fur-seal investigations in the North Pacific and Bering Sea have delayed until now the completion of the report upon the remaining species. When these came to be studied, it was decided to bring together all that is known to date regarding the fishes of Texas and the Rio Grande Basin, particularly respecting their geographic distribution in that region. The present paper has, therefore, been made to include all the species, both salt and fresh water, which have ever been reported from that region, so far as we have been able to learn. Geographically, the paper is made to include not only the State of Texas, but all those portions of Colorado, New Mexico, and Mexico which belong in the hydrographic basin of the Rio Grande.

#### THE GEOGRAPHY OF TEXAS.

##### EXTENT.

The area of Texas is 265,780 square miles, which is about 9 per cent of the entire United States. Texas is equal to the combined areas of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and Ohio, and is nearly 2½ times as large as all Great Britain and Ireland. It is over 800 miles in greatest length and is nearly as wide from east to west. Its greatest length is as great as the distance from Boston

\* Report of the Commissioner of Fish and Fisheries respecting the establishment of Fish-Cultural Stations in the Rocky Mountain Region and Gulf States. Senate Mis. Doc. No. 65, Fifty-second Congress, first session. Pages 1 to IV and 1 to 88; plates 1 to XXXVI. [This report was subsequently reprinted as Articles 1 and 2 of the Bulletin of the U. S. Fish Commission for 1891.]

to Chicago, Chicago to Cheyenne or to Mobile, or from New York to Jacksonville, Fla. The resident of the western part of Texas is nearer San Diego, Cal., than to his own State capital, or more than 200 miles closer to the Pacific than to the Gulf of Mexico. It extends through more than 10 degrees of latitude ( $25^{\circ} 50'$  to  $36^{\circ} 30' N.$ ) and through more than 13 degrees of longitude ( $93^{\circ} 20'$  to  $106^{\circ} 40' W.$ ).

#### CLIMATE.

The climatic conditions presented by a region so vast as this must necessarily be very diverse. The State has been divided into five climatic and topographic divisions, as follows:

1. *The coast plain region.*—This includes a strip along the coast and extending back from 150 to 200 miles, the western boundary being marked approximately by a line drawn through Laredo, San Antonio, Austin, Palestine, and Texarkana. Immediately along the coast it is more or less marshy, and the elevation nowhere exceeds 500 feet. This region receives an abundance of rainfall; at Galveston it amounts to 52 inches and at Palestine to 47 inches.

2. *The black prairie region.*—This is a narrow belt running parallel with the coast plain, and is chiefly characterized by the rich black soil of the undulating prairie. The elevation is 300 to 700 feet, and the mean annual rainfall is probably not over 35 inches.

3. *The central region.*—The central region extends westward from the longitude of Denison to the eastern escarpment of the Llano Estacado and southwest to the mountains of the Trans-Pecos region. In its northern part are forests of stunted growth called "cross timbers," which lie between the Red and Brazos rivers. Westward, between the one hundredth meridian and the escarpment of the Llano, are the "red beds," a gypsiferous region not unlike that just east of the Black Hills in South Dakota. The southern portion of the central is a broken country of limestone formation, and in some parts devoid of streams. The altitude of this region is from 700 to 2,500 feet, and the annual rainfall is probably about 25 inches.

4. *The Llano Estacado.*—The Staked Plains extend from near the Canadian River on the north to the thirty-second parallel on the south. This is an immense plateau with a gentle inclination from northwest to southeast. The elevation above the Gulf is from 2,600 to 4,800 feet. They extend from the Pecos region in New Mexico eastward to near the one hundred and first meridian, where they are terminated by a bold escarpment on the northeast, east, and southeast. On the eastern side extensive canyons penetrate the Plains to various distances, running from northwest to southeast, in a line with the dip of the strata. The Colorado, Brazos, and Red rivers all have their sources in the Plains with numerous branches extending into them a greater or less distance, some of them as far as 100 miles. These canyons are the work of erosion, and no greater force was required than that now at work. When once the upper stratum is broken and the water begins to flow over the soft beds below, the channel is cut deeper each year until the present deep canyons have resulted; all have flowing streams in them, coming from the water-bearing stratum lying at the bottom of the Tertiary formation. The sides of these canyons are usually precipitous, and they are consequently difficult to cross. At various places in the Plains are permanent lakes of greater or less area, some fresh and some salt. Besides these there are numerous depressions or basins in which water collects during the rainy season and remains for several months. These lakes often cover several hundred acres.

All the rivers along the eastern side of the Plains are supplied from springs, mostly from the base of the Cretaceous and Tertiary, but in some instances from the Triassic. Many of these springs are quite large and in them are found some fishes. The streams running from them, in many cases, entirely disappear in the ground during the dry season, while others dry up, except in places where the water stands in holes or deep pools, in some of which fishes, such as catfish, sunfish, cyprinoids, and cyprinodonts, are found in abundance. It has been estimated that not less than 13,000,000 gallons of water flow over the falls of White River daily, yet nearly the entire amount sinks into the ground within a few miles below the falls.

The soils of the Staked Plains have been derived principally from the underlying materials of the late Tertiary. In late Tertiary times the region where the Staked Plains now are was an inland sea, bounded on the east and south by the Cretaceous formation, and on the west by the range of mountains west of the Pecos River. During the early part of this Tertiary time there was great erosion of the Cretaceous and Triassic, and this material of sand and clay was deposited in this inland Tertiary sea until finally, when it was drained of its waters, there was left a series of beds of this Tertiary material varying from 10 to 12 feet on the south to 300 feet on the north, composed of sandy clays in alternate beds of stratification, but none of them so compact as to be impervious to water. Whenever these strata are exposed to atmospheric influences their material readily disintegrates and forms a soil quite homogeneous throughout the entire area of the Plains. This soil is composed chiefly of sand and clay with considerable alkali, and, being easily eroded, of course materially affects the purity of the streams during the rainy season. While there is but little woody vegetation on the Llano, the region is by no means a desert—bunch, gramma, and mesquit grasses grow with luxuriance and render the Plains valuable for grazing.

The following table gives the temperature at three different places on the Plains:

Table showing annual mean temperature on the Staked Plains in Texas.\*

Station.	Elevation.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
Fort Elliott.....	2,500	30.6	36.0	46.0	55.6	63.8	73.0	77.0	74.7	68.2	56.8	42.5	34.4	54.8
Mount Blanco....	3,800	43.7	46.3	54.3	61.0	72.6	76.8	78.9	81.0	73.0	61.2	50.6	40.6	61.7
Midland.....	2,775	39.3	46.9	52.1	64.3	77.5	80.0	84.2	81.1	73.3	61.5	48.0	41.7	62.3

The annual rainfall is about 20 inches, the greater part of which falls during the summer months. The season of greatest drought is during the winter months.

5. *The Trans-Pecos region.*—This embraces all that portion of Texas lying between the Pecos and the Rio Grande, and has an average width of about 150 miles and an average length of over 250 miles; its area is, therefore, considerably greater than that of the State of Maine. The only true mountains in Texas are in this region, the principal ranges being the Guadalupe, Limpia, and Quitman mountains. The general elevation is 3,000 to 5,000 feet above the sea, but some peaks rise much higher. Guadalupe Peak is 9,000 feet and Limpia Peak 8,000 feet. The summits of most of these mountains are covered with a good growth of timber, the principal trees represented being three species of pine (*Pinus ponderosa*, *P. flexilis*, and *P. edulis*), some of which grow to good size.

\*For this table and much of what is here given regarding the climate and geography of the western part of Texas we are indebted to the various reports of the Texas Geological Survey.

The Trans-Pecos region is said to be poorly watered; the annual rainfall is probably less than 20 inches (not over 13 inches at El Paso), and the streams are small and periodic in their flow. There are a good many springs in various parts of the region whose waters do not in every case reach the Pecos or the Rio Grande, but are lost in the ground or by evaporation.

It thus appears that, climatically as well as geographically, Texas is almost all kinds of a State. While the coastal region receives an abundance of rainfall, there is a gradual decrease in the amount of precipitation as we go westward. From a mean annual rainfall of 52 inches at Galveston on the coast, the decrease is more or less gradual until at El Paso, in the most western part of the State, the amount does not exceed 13 inches. The records also show considerable variation in different years, the amount sometimes falling as low as 10 inches in the western part of the State.

The temperature of course varies greatly in different sections of the State. Fort Ringgold, situated on the Rio Grande something over 100 miles above its mouth, has the reputation of being the hottest place in the United States except, perhaps, Fort Yuma and Key West. The mean annual temperature at Fort Ringgold is about 73°, at El Paso 63°, at Galveston 70°, and at Fort Elliott 54°.

The prevailing winds are southerly or southeasterly, and blowing constantly across the State do much toward rendering the summers endurable even in the hottest parts of the State.

#### VEGETATION.

The flora of Texas is greatly diversified. In the northeast and eastern portions there are heavy pine forests, like those of the neighboring States of Louisiana and Arkansas. This does not extend, however, much beyond the Colorado River, and only on its lower course. In the vicinity of Galveston, or rather back from Galveston some miles, there is considerable timber along the streams and an occasional pine forest. Among the trees seen near Nicholstone are pine, three species of oak, elm, cedar, mulberry, ash, box-elder, hackberry, cherry, and holly; one of the most striking features of the flora here is the vast amount of Spanish moss (*Tillandsia usneoides*) covering the oaks along Dickinson Bayou. Most of these species of trees were seen also about Houston. The pine forests, however, were more extensive about Houston and along Clear Creek, where were to be seen a good many magnolias and an occasional persimmon tree. The Spanish moss was less common here than at Nicholstone.

The Black Prairie belt has few trees except along the streams, where there is a good growth of cottonwood, pecan, cypress, oaks, and numerous species of shrubs. About San Marcos, New Braunfels, and San Antonio these trees are abundant. The oaks and other trees situated in the valleys along the streams were thickly overgrown with *Tillandsia usneoides*, but on the higher lands about New Braunfels and between San Antonio and Corpus Christi there are considerable clumps of oaks which are profusely covered with another epiphyte, *Tillandsia recurvata*. West of the Black Prairie the timber is scrubby and of little value except for fuel. The river valleys do not differ materially from those parts lying in the Black Prairie region.

Below El Paso the valley of the Rio Grande widens out into a great plain, which is covered near the river with cottonwoods, willows, and a species of ash.\* On the

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\*Most of the facts regarding the vegetation of this region have been taken from Dr. Havard's valuable Report on the Flora of Western and Southern Texas. Proc. U. S. Nat. Mus., 1885, 449-533.



higher ground the mesquit is abundant and the screw-bean (*Prosopis pubescens*) or *tornillo* of the Mexicans is very common. Further down the Rio Grande the cottonwoods become less abundant, but the mesquit and the other shrubby vegetation increase, while still lower down the valley black willow (*Salix niger*), the long-leaved willow (*Salix longifolia*), water elm (*Ulmus crassifolia*), green ash (*Fraxinus berlandieriana*), which grows 2 to 3 feet in diameter and 40 to 50 feet high, and several other species of smaller trees and shrubs are abundant. On the lower Rio Grande and along the coast toward Corpus Christi are but few trees or bushes of any considerable size. The most important are the shrubby mesquit, huisache (*Acacia farnesiana*), retama (*Parkinsonia aculeata*), ebony, Texas persimmon, hackberry, and black willow. This is the region of the chaparral, great areas being covered with a scraggy, interlocking mass of shrubs all more or less thorny, or with stiff, spiny branches, the whole being almost impenetrable. According to Dr. Havard the principal species represented are mesquit, granjeno, Texas persimmon, junco (*Kæberlinia spinosa*), coyotillo, *Acacia amentacea*, *Acacia flexicaulis*, *Condalia obotrifoliata*, *Castela nicholsoni*, *Xanthoxylum pterota*, *Lippia lycioides*, *Berberis trifoliata*, and *Lantana camara*. Among and over these grow such vines as *Anredera scandens*, *Vitis incisa*, *Serjania brachycarpa*, and *Maximowiczia lindheimeri*.

*Cactaceæ* are of course abundant nearly everywhere on the uplands of Texas. Among the more common are several species of *Mamillaria* (*macromeris*, *meicantha*, *tuberculosa*, and *heyderi*), the strawberry cactus (*Cereus stramineus*), other species of *Cereus* (*chloranthus*, *paucispinus*, and *enncacanthus*), three species of *Echinocactus* (*longhamatus*, *horizontaloniis*, and *intertextus*), and several species of *Opuntia* (such as *frutescens*, *arborescens*, and *grahami*). Another conspicuous plant of southwestern Texas is the Mexican *lechuguilla* or *agave* (*Agave heteracantha*), which is found covering the limestone regions of that part of the State in impenetrable masses. The Texas mescal (*Agave wislizeni*) and the Mexican maguey (*Agave americana*) are also common and conspicuous plants in this region. On the high mesa lands of southern and western Texas (but not on the Llano Estacado) the Spanish bayonet (*Yucca baccata*) is abundant; in places it grows to a height of 25 to 30 feet, is a foot or more in diameter, and is the most characteristic plant of the wide slopes leading up to the bases of the mountains.

#### DRAINAGE.

Texas is drained by the Arkansas, the Red, and the Rio Grande, together with a large number of smaller streams which reach the Gulf at various points along the 400 miles of coast line which the State possesses. The Rio Grande and the Arkansas have their headwaters not far from each other in a limited district in Colorado and New Mexico, but they reach the sea through mouths a thousand miles apart. The most northern counties in the Panhandle of Texas are drained by the North Fork of the Canadian River, while those lying next south are drained by the South Fork of the Canadian, both belonging to the Arkansas system.

The portion of the State which belongs to the Arkansas basin has an area of about 12,000 square miles. The South Fork of the Canadian rises in the Rocky Mountains, in the northeastern part of New Mexico not far from the headwaters of the Pecos, and flows entirely across the Panhandle in the northern part of the Llano, through which it has cut a deep canyon. This river is about 900 miles long, but is in most of its course a rather shallow stream.

The Red River is by far the most important stream of northern Texas. It has its sources in the northern and northeastern portions of the Llano Estacado, forms the northern boundary of Texas through six degrees of longitude (from the one hundredth to the ninety-fourth meridian), and has a total course of more than 1,600 miles. Its hydrographic basin contains over 97,000 square miles, the greater part of which, however, is outside of Texas. Most of the upper heads of the Red River in the Panhandle are said to afford a constant supply of good pure water, and some of them are well shaded with cottonwoods. Further down much of the water sinks in the ground or is lost by evaporation, and the stream becomes small or even dry at times. There is also less timber along this part of its course. Its principal tributaries here are the Pease and Big Wichita rivers, which rise near the eastern escarpment and run through arid, treeless plains with occasional clumps of hackberry, willow, and cottonwood in the side canyons. The Big Wichita is said to be well timbered, however, near its mouth. Below the mouth of the Big Wichita, the southern tributaries of the Red River are all very short and unimportant, the divide between the Red River basin and those of the Sabine, Trinity, and Brazos being well up toward the Red. The only stream of any importance which the Red River receives from Texas below the Wichita is Sulphur River in the extreme northeast part of the State, and which is about 200 miles long. The Red River is subject to great variation in the amount of water which it carries, according to the rainfall. In winter and spring it is frequently a raging torrent of muddy water spreading far beyond its banks, while in the fall it is reduced to a stream of insignificant proportions in its upper and middle portions.

The Sabine River, which forms the eastern boundary of Texas for about 200 miles, is an important stream 500 miles long, having its rise in the northeastern part of the State only a few miles from the Red River.

The Neches, San Jacinto, Trinity, Brazos, Colorado, Guadalupe, San Antonio, and Nueces rivers are the principal streams of Texas which lie wholly within the State. All of these rise in the central or western part of the State and flow south-east in approximately parallel courses to the Gulf of Mexico. The Trinity, Brazos, and Colorado are each about 1,000 miles long and are streams of much importance; like all the others of this State, however, they are subject to great floods and periodic droughts. In the Cretaceous limestone belt running through the State near San Antonio, New Braunfels, San Marcos, and Austin are found numerous springs of enormous size. Each of the cities just named has in its immediate vicinity one or more of these remarkable springs. The temperature of the water in all these springs seems to be about the same and does not vary greatly from 75° throughout the year.

In the narrow Quaternary belt of the coastal region are numerous short tidal streams, usually locally known as bayous. These are frequently quite deep and are navigable for small boats for much of their length. Their banks are generally well wooded and their waters well filled with the species of fish common to lowland, coastal streams. About their mouths are found many of the most important food-fishes of the coast. The water in these bayous is usually warm, frequently quite muddy, and always more or less stained from the vegetation growing in it. The shores and bottoms are in most places made up of soft mud, and snags and logs are abundant.

The Rio Grande del Norte, or the Rio Bravo of the early Spaniards, is in many ways a remarkable river. Having its sources in the San Juan Mountains of Colorado, only a few miles from some of the sources of the Arkansas and the Colorado of the West, it flows east to San Luis Park, then south through that park and entirely across New Mexico, which it divides into nearly equal parts. Upon leaving New Mexico it turns to the southeast, which general direction it maintains until it reaches the Gulf of Mexico in latitude  $26^{\circ}$  north and longitude  $97^{\circ}$  west (approximate). The total length of this river is about 1,800 miles, and it forms the entire boundary between Texas and Mexico, a distance of more than 1,000 miles and considerably more than half of the entire length of the boundary between the United States and Mexico. The tributaries in the San Juan Mountains are all clear, cold streams, excellent for trout, but in the San Luis Park and below the stream is more shallow, the water is warmer and less pure, and trout disappear. Still farther down, except at a few places where the stream has cut through low mountains or hills and is confined in a narrow canyon, the river widens greatly, becomes very shallow, and has a bed of shifting sand and mud. Much of the country drained by the Rio Grande has an adobe soil, which contains a large amount of alkalis, and the water of the river is not only more or less alkaline, but contains much solid matter in suspension or other mineral matter in solution. This of course renders the water objectionable to many species of fishes. The Rio Grande is, however, much purer above the mouth of the Pecos than it is below, owing to the fact that the Pecos flows through softer strata containing a larger percentage of salt and gypsum.

From Bulletin 3 of the Texas Geological Survey the following facts are taken: The banks of the Pecos River are lined with incrustations of salt left by the evaporation of the river water, and present a very white appearance. The sides of canals along the river are similarly incrustated and salt appears in spots over the ground.

The following table contains the analyses of two samples of Pecos River water, made by the chemist of the Texas Geological Survey. No. 1 was collected at Pecos City and received at the laboratory in January, 1889; it gave an alkaline reaction on boiling, and had an alkaline taste; suspended matter made up largely of red soil, which settled quickly on standing. No. 2 was collected in Reeves County and received by the chemist in December, 1889; gave an alkaline reaction and possessed an alkaline taste; suspended matter made up more of silt and lighter soil than in No. 1, and settled only after 24 hours' standing:

Analyses of Pecos River water.	Grains per gallon.	
	No. 1.	No. 2.
Total solid matter .....	308.48	319.39
Soluble after evaporation.....	172.59	204.70
Total mineral matter .....	255.48	259.19
Total lime, as $\text{CaO}$ .....	27.42	37.62
Total sulphuric acid, as $\text{SO}_3$ .....	64.57	76.73
Total chlorine .....	39.05	65.03
Total alkalies, as chlorides.....	58.70	106.50
Total potash, as oxide.....	*	2.95
Total soda, as oxide.....	*	66.08
Total suspended matter .....	36.32	85.76

\* Not separated.

It is not stated just when these samples were collected, but presumably No. 1 was taken in January and No. 2 in December, when the river was lower.

The following analysis of the Rio Grande water is given in the same bulletin, but it is not stated just when or where the sample was obtained:

Analysis of Rio Grande water.	Grains per gallon.
Suspended matter (inorganic) .....	98.65
Total residue in clear water .....	40.65
Organic and volatile matter .....	5.05
Total soluble matter .....	29.15
Lime .....	4.65
Sulphuric acid (anhydrous) .....	3.23
Alkaline chlorides .....	1.77
Silica, iron, and alumina not determined .....	

This water when collected was very muddy, hence the large amount of suspended inorganic matter. The area of the Rio Grande basin is about 240,000 square miles. The only tributaries of any size from the United States are the Pecos and Devil rivers. The Pecos rises in New Mexico and runs approximately due south, then southeast for about 800 miles, the greater part of which distance is through an arid table land nearly destitute of timber. Devil River is a much smaller stream which empties into the Rio Grande several miles below the mouth of the Pecos, and which is said to be a much clearer, colder stream than the other rivers of Texas. The most important affluents which the Rio Grande receives from the Mexican side are the Rio de las Conchas, Rio Salado, Rio Sabinas, and Rio San Juan. Of these the Conchas is by far the largest, and is about 300 miles long.

Beginning as far up the Rio Grande as Wagonwheel Gap and Del Norte in Colorado, and extending down the stream and on its principal tributaries, are found numerous irrigation ditches, many of which are of enormous size. The demands of these ditches are so great that during the season of growing crops the Rio Grande is almost wiped out of existence and is left in many portions of its course only as a wide sandy river bed with but little running water. This very seriously affects the fishes. At Del Norte, Colo., in 1889, I was told that great quantities of trout and other fishes run out into the irrigating ditches and are left to die as the water spreads over the fields. Unless these ditches are screened or some effective means taken to prevent fish from entering them, it will not be many years before the trout of the Upper Rio Grande will be a thing of the past. Suckers and all other species that are more or less migratory will also be seriously affected by the present irrigation methods.

In Chihuahua and the other Mexican states lying along the Rio Grande, and to some extent in the Llano Estacado and the Trans-Pecos region, are found some small isolated bodies of water which have at present no outlet to the sea; most notable among these is Lake Guzman in the northern part of Chihuahua, into which flow the Rio Mimbres and Rio Janos. While these lakes and sinks have at present no connection with the Rio Grande, they probably all did have at one time and properly belong to the basin of that river.

Summing up the climatic and hydrographic features of Texas and the Rio Grande basin, the conditions which are most characteristic and which are most important in their bearing upon the fish life of that vast territory, are the following: The distribution of rainfall throughout the year is very irregular, resulting in periods of heavy rains and long seasons of drought; this results in periodic freshets which suddenly swell the streams to enormous proportions, to be followed by seasons of little rain when these great rivers dwindle to mere creeks, isolated stagnant pools, or in some cases

to dry arroyos. The soil and surface rock over extensive areas contain gypsum, salt, and other easily soluble minerals. As a result of this and the ease with which the surface is eroded, the waters of many of the streams are always more or less alkaline, and after heavy rains are heavily laden with solid matter in suspension. These freshets, laden with the rich, red loam of the plains, usually reach the lower inhabited sections of the plains during their seasons of drought, and are called "red rises."

#### HISTORICAL AND BIBLIOGRAPHICAL.

So far as we have been able to learn, the first collections of fishes in this region for scientific purposes were made by John H. Clark, in 1851. This was under Col. J. D. Graham, of the United States and Mexican Boundary Commission. The streams in which collections were made by this party in 1851 are chiefly of the Nueces and Rio Grande basins. This was followed by the various other parties of the Mexican Boundary Survey, the Pacific Railroad Surveys, and by Captains Marcy and McClellan's Red River expedition, all of which explorations were completed prior to 1858. Each of these expeditions had attached to it one or more persons who officiated as naturalists, each of whom is named in this paper in connection with the consideration of the respective collections. Considering the disadvantages under which they labored, the collections obtained, especially by Mr. John H. Clark, Dr. C. B. R. Kennerly, Dr. George O. Shumard, and Lieut. Couch; are remarkable for their completeness.

The first of these collections was studied and reported upon by Prof. Spencer F. Baird and Dr. Charles Girard, while the later ones were reported upon by Dr. Girard alone. The preliminary reports appeared at intervals from 1853 to 1858, in the proceedings of the Philadelphia Academy of Sciences, the final reports appearing in the Zoölogy of the Mexican Boundary and Pacific Railroad surveys.

The next collection of fishes made in this region was that obtained in Colorado by the Hayden Survey in 1872. These were studied by Prof. Cope, whose report was published in Hayden's fifth annual report.

The various parties of the Wheeler Survey west of the one hundredth meridian made extensive collections of fishes in the upper Rio Grande Basin. These were reported upon by Prof. E. D. Cope and Dr. H. C. Yarrow.

In 1878 Dr. Jordan published a paper on a collection made at Brownsville.

In 1880, in his important paper on the "Zoölogical Position of Texas," Prof. Cope gives notes on 24 species of fishes, chiefly from the basins of the Trinity, Red, and Colorado rivers. Seven of these were described as new.

In 1881 Prof. Samuel Garman published a short paper on 14 species of the Rio Grande basin, 8 of which were regarded by him as new. These specimens are contained in the collections of the Museum of Comparative Zoölogy, but it is not stated by Prof. Garman by whom they were collected.

No collecting of the salt-water fishes of the Texas coast after the time of the Mexican Boundary surveys was done until 1882, when Dr. Jordan obtained about 50 species at Galveston. This was the first considerable collection made on the Texas coast.

Important collections were made in 1884 by Dr. Jordan and Prof. C. H. Gilbert, who obtained over 50 species, many of which were new to the State and 4 new to science. This was the largest collection of fresh-water fishes ever made in Texas up to that time.

In the summer of 1889, during Dr. Jordan's explorations in Colorado and Utah, some collecting was done in the Rio Grande basin near Del Norte and Alamosa, Colo. Only 4 species, however, were obtained.

In the summer of 1890, Mr. Orland Coate, at that time one of Prof. Evermann's students in the Indiana State Normal School, spent some time in the Panhandle of Texas, where he made a small but important collection. This collection embraced 11 species and was made in Fulton and Spring creeks near Creswell. No fishes had ever been collected in that part of the State, and none in the upper Canadian since the time of the exploration of the Red River by Captains Marcy and McClellan.

As stated elsewhere in this paper, Prof. Evermann made collections of Texan fishes in 1891, chiefly about Galveston and Corpus Christi on the coast, and in the basins of the Neches, Trinity, and San Antonio rivers, and Buffalo Bayou. The total number of species obtained is 131, of which 67 are salt-water species and 64 are fresh-water forms. These are the most extensive collections ever made in Texas and add no fewer than 18 species to the known fresh-water fauna of the State. The number of new species is 11.

In the following pages are given the titles of the various papers which have dealt in any way with the fishes of Texas or the Rio Grande region. These titles have been arranged in chronological order; and under each is given a brief summary of the information which it contains.

1853*a*. SPENCER F. BAIRD and CHARLES GIRARD. Descriptions of New Species of Fishes collected by Mr. John H. Clark, on the United States and Mexican Boundary Survey, under Lt. Col. James D. Graham. Proc. Acad. Nat. Sci. Phila., August, 1853, 387-390.

This is the first paper in which were published any of the ichthyological results of the explorations carried on in connection with the United States and Mexican Boundary Survey and the Pacific Railroad surveys. This paper was followed by others from time to time, all of which were published in the Proceedings of the Philadelphia Academy, the final reports appearing later in the volumes of the respective surveys. In this particular paper 17 species are given, all of which were described as new. Of these 17 species, 11 were based upon specimens obtained in Texas, the other 6 having come from the basin of the Colorado of the West. As now understood, only 5 of these 11 nominal species are admitted as tenable species.

In the following table are given (1) the page upon which the species is mentioned in the publication referred to; (2) a list of the nominal species given by Baird and Girard in the above-named paper as having come from the region covered by the geographic limits of the present report; (3) the present identification of each of those nominal species as now understood by us, and (4) the locality from which the specimens were obtained. Names of new species and new genera are printed in italics. This method of treatment is followed in the case of the various other papers which are summarized in this report.

Page.	Nominal species.	Identification.	Locality.
387	<i>Pileoma carbonaria</i> .....	<i>Etheostoma caprodes</i> .....	Rio Salado.
388	<i>Boleosoma lepidum</i> .....	<i>Etheostoma lepidum</i> .....	Upper tributaries of the Rio Nueces.
388	<i>Pomotis aquilensis</i> .....	<i>Lepomis cyanellus</i> .....	Eagle Pass.
389	<i>Fundulus grandis</i> .....	<i>Fundulus heteroclitus grandis</i> .....	Indianola.
389	<i>Hydrargyra similis</i> .....	<i>Fundulus similis</i> .....	Do.
389	<i>Cyprinodon elegans</i> .....	<i>Cyprinodon elegans</i> .....	Rio Grande.
389	<i>Cyprinodon bovinus</i> .....	<i>Cyprinodon variegatus</i> .....	Leon Springs, Rio Grande.
390	<i>Cyprinodon gibbosus</i> .....	..... do .....	Indianola.
390	<i>Heterandria affinis</i> .....	<i>Gambusia affinis</i> .....	Rio Medina and Rio Salado.
390	<i>Heterandria nobilis</i> .....	..... do .....	Leon and Comanche Springs.
390	<i>Heterandria patruelis</i> .....	..... do .....	Rio Sabinal, Rio Leona, Rio Nueces, and Elm Creek, all of the Nueces Basin.

1853b. SPENCER F. BAIRD and CHARLES GIRARD. Description of New Species of Fishes collected by Captains R. B. Marcy and Geo. B. McClellan, in Arkansas. Proc. Acad. Nat. Sci. Phila., August, 1853, 390-392.

Page.	Nominal species.	Identification.	Locality.
390	<i>Pomotis breviceps</i> .....	<i>Lepomis megalotis</i> .....	Otter Creek, Arkansas.
391	<i>Pomotis longulus</i> .....	<i>Lepomis cyanellus</i> .....	Do.
391	<i>Leuciscus lutrensis</i> .....	<i>Notropis lutrensis</i> .....	Do.
391	<i>Leuciscus bubalinus</i> .....	<i>Notropis bubalinus</i> .....	Do.
391	<i>Ceratichthys vigilax</i> .....	<i>Cluola vigilax</i> .....	Do.

1854a. S. F. BAIRD and C. GIRARD. Fishes [collected by Captains R. B. Marcy and Geo. B. McClellan in Arkansas]. Exploration of the Red River of Louisiana, in the year 1852; by Randolph Marcy, Captain, Fifth Infantry, U. S. Army; assisted by George B. McClellan, Brevet Captain, U. S. Engineers. With reports on the Natural History of the country and numerous illustrations. Fishes, pp. 216-223, plates XII-XIV. Washington, 1854.

This exploration of the Red River was made between April 30 and July 29, 1852. The party was accompanied by Dr. George C. Shumard, and it is, no doubt, to him that we owe the small collection of fishes which was made in Otter Creek, either on May 28-29 or July 12-14, the exact date being impossible to determine, as the party camped at the same place near the creek upon the return as well as upon the outward trip. This small collection was, apparently, made near their camp, which was situated about 4 miles above the union of Otter Creek with the North Fork of Red River, which is probably not more than 12 miles from the junction of the North and South Forks of Red River. Otter Creek, which was so named by Captain Marcy because of the abundance of otters there at that time, is described by him as a "fine, bold, running creek of good water, rising in the Wichita Mountains and running a course south 23° west. It is 50 feet wide and 1 foot deep at a low stage of water. The temperature of the water in the creek at our encampment we found to be 72° F." [in May]. It does not appear from Captain Marcy's report that any fishes were collected upon the expedition except those obtained in Otter Creek. This collection was a small one, consisting of but five species, all of which were regarded by Baird and Girard as new, and first described by them in the Proceedings of the Philadelphia Academy in 1853. This paper was reprinted, practically without change, in Captain Marcy's report, but with the addition of three plates illustrating each of the five species. From the table given under the preceding paper it may be seen that three of these nominal species are now accepted.

1854b. S. F. BAIRD and CHARLES GIRARD. Descriptions of New Species of Fishes collected in Texas, New Mexico, and Sonora, by Mr. John H. Clark, on the U. S. and Mexican Boundary Survey, and in Texas by Capt. Stewart Van Vliet, U. S. A. Proc. Acad. Nat. Sci. Phila., March, 1854, 24-29.

In a footnote it is stated that "the species described in this paper from the waters of western Texas and those emptying into the Gila, were collected while the Boundary Survey was in charge of Col. J. D. Graham; the others, while under Maj. W. H. Emory." In the following table is given a list of all the nominal species of that paper from Rio Grande and Texan localities, together with the present identification of each.

Page.	Nominal species.	Identification.	Locality.
24	<i>Pomotis speciosus</i> .....	<i>Lepomis pallidus</i> .....	Brownsville, Texas.
24	<i>Pomotis fallax</i> .....	<i>Lepomis megalotis</i> .....	Elm Creek, Texas.
24	<i>Pomotis convexifrons</i> .....	do .....	Rio Cibolo, Texas.
24	<i>Pomotis nefastus</i> .....	do .....	Rio Cibolo and Rio Salado.
25	<i>Pomotis heros</i> .....	<i>Lepomis heros</i> .....	Rio Cibolo, Texas.
25	<i>Bryttus longulus</i> .....	<i>Lepomis cyanellus</i> .....	Do.
25	<i>Grystea nuecensis</i> .....	<i>Micropterus salmoides</i> .....	Rio Nueces and Rio Frio.
25	<i>Herichthys cyanoguttatus</i> .....	<i>Heros cyanoguttatus</i> .....	Brownsville (fresh water).
26	<i>Ailurichthys marinus</i> .....	<i>Felichthys marinus</i> .....	Indianola, Texas.
26	<i>Arius equestris</i> .....	<i>Tachysurus felis</i> .....	Do.
26	<i>Pimelodus affinis</i> .....	<i>Ictalurus furcatus</i> .....	Rio Grande.
27	<i>Astyanax argentatus</i> .....	<i>Tetragonopterus argentatus</i> .....	Upper tributaries of Rio Nueces.
27	<i>Catostomus congestus</i> .....	<i>Moxostoma congestum</i> .....	Rio Salado, Texas.
28	<i>Catostomus plebeius</i> .....	<i>Pantosteus plebeius</i> .....	Rio Mimbres.
28	<i>Carpiodes tumidus</i> .....	<i>Carpiodes velifer tumidus</i> .....	Near Fort Brown, Texas.
29	<i>Gila pulchella</i> .....	<i>Leuciscus nigrescens</i> .....	Rio Mimbres.

1854c. S. F. BAIRD and CHARLES GIRARD. Notice of a new genus of *Cyprinida*. Proc. Acad. Nat. Sci. Phila. 1854, 158.

In this paper the genus *Cochlognathus* is established and the species *Cochlognathus ornatus* is first described. The specimens upon which the genus and species were based were collected by Capt. Van Vliet, at Brownsville, Tex.

1856a. CHARLES GIRARD, M. D. Recherches upon the Cyprinoid Fishes inhabiting the fresh waters of the United States of America west of the Mississippi Valley, from specimens in the Museum of the Smithsonian Institution. Proc. Acad. Nat. Sci. Phila., September, 1856, 165-213.

This interesting, important, but somewhat troublesome paper also appeared in an author's edition with repagination, pp. 1-54, the last four pages being an "Alphabetical List of the [62] species collected by the United States and Mexican Boundary Commission, Maj. Wm. H. Emory, Commissioner," and an "Index to the Systematic Names not included in the foregoing List." This list contains, of course, only the *Cyprinida* and *Catostomida* of the Mexican Boundary Survey. As this paper contains the original descriptions of so many species from Texas and the Rio Grande basin, it seems proper to reprint a portion of that part referring to the various sources from which the collections were obtained. He says:

The fishes which are the subject of the present memoir were collected at different times and periods by the several naturalists and surgeons attached to the various surveys undertaken within the five years past. And, first of all, there is the survey of the United States and Mexican boundary, from 1851 to 1855. John H. Clark, who accompanied Col. J. D. Graham in 1851, collected extensively in the rivers and creeks of Texas and New Mexico. Under Maj. W. H. Emory, now commissioner of the boundary line, numerous collections were made by Dr. C. B. R. Kennerly in Texas, in the valley of the Rio Grande and provinces of Chihuahua and Sonora.

The survey of routes for a railroad to the Pacific was commenced in 1853 and continued until 1855. Lieut. A. W. Whipple, under whose command the survey near the thirty-fifth parallel of latitude was effected, in securing the services of Dr. C. B. R. Kennerly contributed very largely to our collections of fishes from Texas and the numerous tributaries of the Arkansas River. H. B. Möllhausen, artist to the same expedition, showed also much zeal and industry for collecting. \* \* \* The eastern end of the same thirty-second parallel was explored by Capt. John Pope, who, having attached to his party Dr. Geo. C. Shumard, interesting specimens were obtained therefrom. \* \* \* Lieut. D. N. Couch, U. S. A., explored, in the winter of 1852-53, the Mexican provinces of Tamaulipas, New Leon, and Coahuila, thus adding materials towards an elucidation of the natural history of the country south of the Rio Grande del Norte (Rio Bravo), and but partially explored by the United States and Mexican Boundary Commission. \* \* \* To John Potts, esq., of Chihuahua, we owe some very interesting species from the hydrographic basin of Chihuahua River and the valley of Mexico.



The total number of species given in this paper is 196, of which 66 are given as found in Texas or the basin of the Rio Grande. Of these 66 species, 56 are described as new, of which latter number only 30 are now recognized as good species.

Page.	Nominal species.	Identification.	Locality.
170	<i>Ictiobus tumidus</i> .....	<i>Carniodes velifer tumidus</i> .....	Rio Grande.
171	<i>Moxostoma claviformis</i> .....	<i>Erimyzon sucetta</i> .....	Coal Creek.
171	<i>Moxostoma kennebeci</i> .....	do .....	Dry Creek, near Victoria.
171	<i>Moxostoma victoriae</i> .....	<i>Minytrema melanops</i> .....	Do.
172	<i>Moxostoma campbelli</i> .....	<i>Erimyzon sucetta</i> .....	Live Oak Creek and Devil River.
172	<i>Ptychostomus congestus</i> .....	<i>Moxostoma congestum</i> .....	Rio Salado.
172	<i>Ptychostomus allidus</i> .....	do .....	Rio San Juan, near Monterey.
173	<i>Mimomus plebeius</i> .....	<i>Pantosteus plebeius</i> .....	Rio Mimbres, Lake Guzman.
173	<i>Catostomus (Aromus) guzmanensis</i> .....	do .....	Janos River, Lake Guzman.
176	<i>Campostoma ornatum</i> .....	<i>Campostoma ornatum</i> .....	Chihuahua River.
176	<i>Campostoma formosulum</i> .....	<i>Campostoma formosulum</i> .....	Rio Sabinal, trib. San Antonio River.
176	<i>Campostoma nasutum</i> .....	<i>Campostoma anomalum</i> .....	Cadereita and near Monterey, New Leon.
177	<i>Dionda episcopa</i> .....	<i>Dionda episcopa</i> .....	Headwaters of Rio Pecos and Comanche Spring.
177	<i>Dionda serena</i> .....	<i>Dionda serena</i> .....	Rio Sabinal.
177	<i>Dionda texensis</i> .....	<i>Dionda episcopa</i> .....	Rio Nueces.
178	<i>Dionda papalis</i> .....	<i>Dionda serena</i> .....	Delaware Creek.
178	<i>Dionda argentosa</i> .....	<i>Dionda episcopa</i> .....	San Felipe Creek and Devil River.
178	<i>Dionda chrysitis</i> .....	<i>Dionda serena</i> .....	Live Oak Creek of Pecos River.
178	<i>Dionda melanops</i> .....	<i>Dionda melanops</i> .....	Buena Vista, Coahuila.
178	<i>Dionda couchi</i> .....	do .....	Coajuco, Monterey, and Cadereita, in waters of Rio San Juan, New Leon.
178	<i>Dionda plumbea</i> .....	<i>Zophendum plumbeum</i> .....	Headwaters of Canadian River.
179	<i>Hyborhynchus tenellus</i> .....	<i>Pimephales notatus</i> .....	20 miles west of Choctaw Agency.
179	<i>Hyborhynchus puniceus</i> .....	<i>Zophendum plumbeum</i> .....	Antelope Creek and Llano Estacado.
179	<i>Hyborhynchus confertus</i> .....	<i>Pimephales promelas confertus</i> .....	Hurrah Creek.
181	<i>Algoma amara</i> .....	<i>Dionda amara</i> .....	In a lagoon near Fort Brown.
181	<i>Algoma fluviatilis</i> .....	<i>Dionda fluviatilis</i> .....	Near Monterey, New Leon.
181	<i>Cochlognathus ornatus</i> .....	<i>Cochlognathus ornatus</i> .....	Brownsville.
189	<i>Gobio aestivalis</i> .....	<i>Hypopsis aestivalis</i> .....	Rio San Juan near Cadereita, New Leon.
190	<i>Leucosomus pallidus</i> .....	<i>Semotilus atromaculatus</i> .....	Antelope Creek, Arkansas.
190	<i>Leucosomus incrassatus</i> .....	do .....	20 miles west of Choctaw Agency.
192	<i>Cliola vigilax</i> .....	<i>Cliola vigilax</i> .....	Otter Creek, Arkansas.
192	<i>Cliola velox</i> .....	do .....	San Pedro Creek.
192	<i>Cliola vivax</i> .....	do .....	Leon River.
193	<i>Alburnus amabilis</i> .....	<i>Notropis amabilis</i> .....	Rio Leona.
193	<i>Alburnus megalops</i> .....	<i>Notropis swaini</i> .....	San Felipe Creek.
193	<i>Alburnus eocetus</i> .....	<i>Notropis socius</i> .....	Live Oak Creek of Pecos River,
195	<i>Coloma ornata</i> .....	<i>Notropis ornatus</i> .....	Chihuahua River and tributaries.
197	<i>Cyprinella bubalina</i> .....	<i>Notropis bubalinus</i> .....	Otter Creek, Arkansas.
197	<i>Cyprinella umbrosa</i> .....	do .....	Coal Creek, and 20 miles west of the Choctaw Agency.
197	<i>Cyprinella suavis</i> .....	<i>Notropis lutrensis</i> .....	Near San Antonio.
197	<i>Cyprinella lepidus</i> .....	<i>Notropis lepidus</i> .....	Rio Frio.
198	<i>Cyprinella notata</i> .....	<i>Notropis notatus</i> .....	Do.
198	<i>Cyprinella macrostoma</i> .....	<i>Notropis macrostomus</i> .....	Devil River and at China, New Leon.
198	<i>Cyprinella venusta</i> .....	<i>Notropis venustus</i> .....	Rio Sabinal.
198	<i>Cyprinella texana</i> .....	<i>Notropis texanus</i> .....	Rio Salado and Turkey Creek.
198	<i>Cyprinella luxiloides</i> .....	<i>Notropis macrostomus</i> .....	San Pedro Creek.
199	<i>Moniana lutrensis</i> .....	<i>Notropis lutrensis</i> .....	Otter Creek, Arkansas, and Gypsum Creek.
199	<i>Moniana leonina</i> .....	<i>Notropis leoninus</i> .....	Leon River.
199	<i>Moniana deliciosa</i> .....	<i>Notropis deliciosus</i> .....	Do.
200	<i>Moniana proserpina</i> .....	<i>Notropis proserpina</i> .....	Devil River.
200	<i>Moniana aurata</i> .....	do .....	Piedra Pointe.
200	<i>Moniana complanata</i> .....	<i>Notropis leoninus</i> .....	Brownsville.
200	<i>Moniana latabilis</i> .....	<i>Notropis lutrensis</i> .....	Hurrah Creek.
200	<i>Moniana frigida</i> .....	<i>Notropis leoninus</i> .....	Rio Salado, Rio Sabinal, Rio Medina, and Rio Nueces.
201	<i>Moniana couchi</i> .....	<i>Notropis lutrensis</i> .....	China, New Leon.
201	<i>Moniana rutila</i> .....	do .....	Cadereita, New Leon.
201	<i>Moniana nitida</i> .....	<i>Notropis nitidus</i> .....	Do.
201	<i>Moniana formosa</i> .....	<i>Notropis formosus</i> .....	Rio Mimbres, Mexico.
201	<i>Moniana gracilis</i> .....	<i>Notropis lutrensis</i> .....	Monterey, New Leon.
201	<i>Moniana gibbosa</i> .....	do .....	Brownsville.
203	<i>Luxilus leptosomus</i> .....	<i>Notemigonus chrysoleucus</i> .....	Dry Creek, near Victoria.
203	<i>Luxilus seco</i> .....	do .....	Rio Seco.
203	<i>Luxilus lucidus</i> .....	<i>Notropis umbratilis</i> .....	Coal Creek, and 20 miles west of Choctaw Agency.
206	<i>Tigoma pulchella</i> .....	<i>Leuciscus nigrescens</i> .....	Rio Mimbres, Mexico.
207	<i>Tigoma nigrescens</i> .....	do .....	Boca Grande and Janos River, Mexico.
207	<i>Tigoma pulchra</i> .....	do .....	Chihuahua River and tributaries.

1857. CHARLES GIRARD, M. D. Notice upon New Genera and New Species of Marine and Fresh-water Fishes from western North America. Proc. Acad. Nat. Sci. Phila., November, 1857, 200-202.

In this paper Dr. Girard mentions six species of sunfishes from the region embraced within the scope of the present article, all of which he describes as new. It is not stated when or by whom these fishes were collected, but it is quite certain they form part of the collections of the various Pacific Railroad and Mexican Boundary expeditions. Only one of the six is now regarded as a good species.

Page.	Nominal species.	Identification.	Locality.
200	<i>Calliurus melanops</i> .....	<i>Chaenobryttus gulosus</i> .....	Fresh waters of Texas.
200	<i>Calliurus diaphanus</i> .....	<i>Lepomis cyanellus</i> .....	Rio Blanco, Texas.
200	<i>Calliurus microps</i> .....	do.....	Do.
200	<i>Calliurus murinus</i> .....	do.....	From Texas.
200	<i>Bryttus albulus</i> .....	<i>Lepomis albulus</i> .....	Rio Blanco, Texas.
201	<i>Bryttus signifer</i> .....	<i>Lepomis cyanellus</i> .....	Rio Medina.

1858. CHARLES GIRARD. Reports upon the Fishes collected by the various Pacific Railroad Explorations and Surveys. Vol. VI, Part IV, No. 1, 9-34; Vol. X, Part IV, No. 4, 21-27; Vol. X, Part IV, 1-400; Vol. X, Part IV, No. 4, 83-91; and Vol. X, Part IV, No. 5, 47-59; numerous plates.

Of the Pacific Railroad Reports, vol. X, part 4, contains the reports upon the collections made in Texas and the upper Rio Grande basin. The various exploring expeditions which were sent out by the United States Government in connection with the Pacific Railroad surveys and the United States and Mexican Boundary survey, gave to us our first knowledge of the ichthyology of the southwestern United States and of Mexico. Of the different parties engaged on these surveys, collections of fishes were made within the present limits of the State of Texas or within the hydrographic basin of the Rio Grande by the parties under Capt. John Pope and Lieut. A. W. Whipple. Capt. Pope's party was engaged in the "Exploration of a Route for a Pacific Railroad, near the thirty-second parallel, from the Red River to the Rio Grande." The fishes, reptiles, and insects obtained on this expedition were collected chiefly by Dr. George C. Shumard and Lieut. L. H. Marshall. This party arrived at Doña Ana, on the Rio Grande, from Albuquerque, New Mexico, January 16, 1854, and on February 12 started eastward toward Red River. They reached the mouth of Delaware Creek at the falls of the Pecos March 8, and reported the waters of the Pecos as being discolored and abounding in catfish of a very large size. Lieut. Marshall went up the Pecos about 40 miles to the mouth of the Sacramento River, which he states was about 50 feet wide and 6 feet deep. He found catfish and suckers of a large size, and says that trout are caught higher up the Sacramento. The next stream of importance which is mentioned is the most eastern branch of the Colorado, which they crossed April 16. Here the "stream is deep; the water is beautifully clear and fresh, and there is an abundance of fish—trout, buffalo, catfish, sunfish, perch, and bass, of which we caught a great many."

On April 17 they came upon a stream of running water, a tributary of the Brazos, which contained "an abundance of trout, bass, sunfish, and catfish," some of which they caught. This must have been the stream called Double Mountain Fork on Capt. Pope's map. On April 21 they caught fish in a pond still further east and camped that night upon the Brazos, in which they found "catfish, sunfish, buffalo, trout, gar, etc., abundant." The water was pure and clear, and the bottom firm. This stream,

which is the Clear Fork of the Brazos, was found by Capt. Pope to be a large stream, heavily timbered, about 25 yards wide, and very deep; the water was excellent and abounded in fish. They collected a good many fish here, among them a "gar-fish," which they had not before seen. They described it as being "of a bright yellow color, and enveloped in a hard, scaly covering, more like shell than cuticle. It has a long pointed head, armed with a numerous and formidable set of teeth, well adapted for seizing and holding its prey"—probably the short-nosed gar, *Lepisosteus platystomus*. From there the route led across the Brazos at Fort Belknap, then the West Fork of the Trinity, Turkey Creek, a tributary of the Red, and Elm Fork of the Trinity, which was described as being clear and pure and very deep in some places, with plenty of perch, bass, sunfish, etc. The expedition arrived at Preston, on the Red River, May 15, 1854, the distance traveled having been about 640 miles.

The party under Lieut. Whipple made the "Exploration for a railway route, near the thirty-fifth parallel, from the Mississippi to the Pacific Ocean." Attached to Lieut. Whipple's party were Dr. C. B. R. Kennerly as physician and naturalist, Dr. J. M. Bigelow as surgeon and botanist, and Mr. H. B. Möllhausen as topographer and artist; and the collections of fishes obtained are due to the labors of these gentlemen. The party began its work at Fort Smith on the Arkansas River, July 14, 1853, from which they traveled westward, following closely the course of the Canadian River. On August 13 they camped upon a small branch of Coal Creek, which they describe as being "obstructed by ledges of rock, producing long and deep reservoirs of crystal water, abounding in fish." On August 29 the party passed "Rock Mary, on the south bank of the South Fork of Canadian River, where some fishing was done." On August 31 they "entered a pretty little valley watered by a rivulet, with pools abounding in fishes supposed to be of unknown species. We call the stream Gypsum Creek, from being the first of importance in that formation. It is finely wooded with red oak, post oak, alamo, and elm. The water is tintured with magnesia, and is disagreeable to the taste. The channel is deep, leaving, at the present low water, high steep banks difficult to pass." A few miles west of this a small stream was crossed which received the name Elm Creek and from which some fishes were obtained. From here Lieut. Whipple continued to follow up the South Fork of the Canadian. The divide between the headwaters of the Canadian and those of the Pecos was crossed September 24, and on September 26 they crossed Hurrah Creek, where some fishes were collected. In this creek, which is a tributary of the Gallinas, the water stood simply in holes. About 15 miles more, and the "Rio de Gallinas, a creek of pure running water, but with neither wood nor grass upon its banks," was reached. The Gallinas Creek is a branch of the Rio Pecos, which was reached at Anton Chico on the same day; and nine days later the party arrived at Albuquerque, on the Rio Grande.

The total number of species mentioned in the Pacific Railroad Reports as found within the limits of the region covered by this paper is 49, of which 8 are described as new. Most of the other 41 had already been described as new in the Proceedings of the Philadelphia Academy.

The following table contains a list of these 49 species together with the localities from which they were obtained, the collector, and the present identification of each:

Table showing the species of fishes found in Texas and the Rio Grande Basin by the various Pacific Railroad survey expeditions.

Page.	Nominal species.	Identification.	Locality.	Collector.
4	<i>Dioplites nuecensis</i> .....	<i>Micropterus salmoides</i> .....	Blanco, Frio, Leon, Seco, and Medina rivers. Coal Creek, Arkansas.....	Dr. Kennerly. H. B. Möllhausen. Dr. G. C. Shumard.
			Brazos River.....	Capt. Pope.
			Delaware Creek.....	John H. Clark.
			Frio, Nueces, and Leona rivers, and Live Oak, Turkey, and Elm creeks. San Juan River, New Leon.....	Lieut. Couch. Dr. Kennerly.
			Sabinal and Minneville rivers, and Dry and San Pedro creeks.	
11	<i>Calliurus melanops</i> .....	<i>Lepomis cyanellus</i> .....	Leon and Medina rivers, and Dry and San Pedro creeks.	Do.
13	<i>Calliurus diaphanus</i> .....	do.....	Rio Blanco.....	Do.
14	<i>Calliurus formosus</i> .....	do.....	Tributary of Gypsum Creek.....	H. B. Möllhausen. Capt. Pope.
			Headwaters of Brazos and Colorado rivers, and Red River at Fort Washita.	
16	<i>Calliurus longulus</i> .....	do.....	Brazos River.....	Dr. Shumard. Capt. R. B. Marcy.
			Otter Creek, Arkansas.....	John H. Clark.
			Rio Cibolo.....	Dr. Kennerly.
			Mineville, Texas, and Rio Seco.....	Capt. Pope.
17	<i>Calliurus microps</i> .....	do.....	Pecos River.....	Do.
			Red River at Fort Washita.....	Dr. Shumard.
18	<i>Calliurus murinus</i> .....	do.....	Brazos River.....	Capt. Pope.
			Delaware Creek and headwaters of Brazos River.....	
19	<i>Bryttus albus</i> .....	<i>Lepomis albus</i> .....	Brazos River.....	Dr. Kennerly.
20	<i>Bryttus signifer</i> .....	<i>Lepomis cyanellus</i> .....	Medina River.....	Do.
21	<i>Bryttus humilis</i> .....	<i>Lepomis humilis</i> .....	Near Rock Mary.....	H. B. Möllhausen. Dr. Shumard.
			Brazos River.....	Capt. Van Vliet.
23	<i>Pomotis speciosus</i> .....	<i>Lepomis pallidus</i> .....	Brownsville.....	Capt. Pope.
			Near Indianola.....	Dr. Kennerly.
			Devil, Medina, and Seco rivers.....	Lieut. Couch.
			Cadereita, New Leon.....	Dr. Lindheimer.
24	<i>Pomotis heros</i> .....	<i>Lepomis heros</i> .....	New Braunfels.....	Dr. Kennerly.
			Blanco River and Dry Creek, near Victoria.	
			Cibolo River.....	John H. Clark.
			Nueces River.....	Capt. Pope.
			San Juan River near Cadereita.....	Lieut. Couch.
25	<i>Pomotis aquilensis</i> .....	<i>Lepomis cyanellus</i> .....	Fort Bliss, N. Mex.....	Dr. S. W. Crawford.
			Eagle Pass.....	A. Schott.
			San Felipe Creek, Rio Cibolo, and Rio Nueces.....	John H. Clark.
			Rio Sabinal, San Pedro Creek near San Antonio, Leon and Blanco rivers.	Dr. Kennerly.
26	<i>Pomotis popeii</i> .....	<i>Lepomis megalotis</i> .....	Nueces River.....	Capt. Pope.
27	<i>Pomotis fallax</i> .....	do.....	Headwaters of Colorado River.....	Do.
			Comanche Spring.....	Dr. A. L. Hermann.
			Sans Bois Creek and tributary of Gypsum Creek.	H. B. Möllhausen.
			Seco and Medina rivers and Live Oak and San Pedro creeks.	Dr. Kennerly.
			Cibolo and Salado rivers and Elm Creek.	John H. Clark.
28	<i>Pomotis breviceps</i> .....	do.....	Delaware Creek.....	Capt. Pope.
			Headwaters of Colorado and Brazos rivers, and tributaries of Red River at Fort Washita.	Do.
			Otter Creek, Arkansas.....	Capt. Marcy.
209	<i>Pimelodus felinus</i> .....	<i>Ameiurus natalis</i> .....	Brazos River.....	Dr. Shumard.
			Tributary Gypsum Creek, and Coal Creek, Arkansas.	H. B. Möllhausen.
209	<i>Pimelodus antoniensis</i> .....	do.....	Near San Antonio.....	Dr. Kennerly.
211	<i>Pimelodus lupus</i> .....	<i>Ameiurus lupus</i> .....	From Indianola to Nueces, and headwaters of Rio Pecos.	Capt. Pope.
219	<i>Moxostoma claviformis</i> .....	<i>Erimyzon sucetta</i> .....	Coal Creek, Arkansas.....	H. B. Möllhausen.
227	<i>Dionda episcopa</i> .....	<i>Dionda episcopa</i> .....	Headwaters of Rio Pecos.....	Capt. Pope.
228	<i>Dionda papalis</i> .....	<i>Dionda serena</i> .....	Delaware Creek.....	Do.
228	<i>Dionda plumbea</i> .....	<i>Zophendum plumbeum</i> .....	Headwaters of Canadian River (Llano Estacado).	H. B. Möllhausen.
230	<i>Dionda grisea</i> .....	do.....	20 miles west of Choctaw Agency.....	Do.
231	<i>Hyborhynchus tenellus</i> .....	<i>Pimephales notatus</i> .....	do.....	Do.
232	<i>Hyborhynchus puniceus</i> .....	<i>Zophendum plumbeum</i> .....	Llano Estacado and Antelope Creek.....	H. B. Möllhausen and Dr. Kennerly.
233	<i>Hyborhynchus confertus</i> .....	<i>Pimephales promelas confertus</i> .....	Hurrah Creek.....	H. B. Möllhausen.

Table showing the species of fishes found in Texas and the Rio Grande Basin by the various Pacific Railroad survey expeditions—Continued.

Page.	Nominal species.	Identification.	Locality.	Collector.
251	<i>Leucosomus pallidus</i> ..	<i>Semotilus atromaculatus</i> .	Antelope Creek, Arkansas .....	Dr. Kennerly.
252	<i>Leucosomus incrassatus</i> ..	do .....	20 miles west of Choctaw Agency .....	H. B. Möllhausen.
257	<i>Cliola vigilax</i> .....	<i>Cliola vigilax</i> .....	Otter Creek, Arkansas .....	Capt. Geo. B. McClellan.
258	<i>Cliola velox</i> .....	do .....	San Pedro Creek .....	Dr. Kennerly.
258	<i>Cliola vivax</i> .....	do .....	Leon River .....	Do.
259	<i>Alburnellus dilectus</i> .....	<i>Notropis dilectus</i> .....	Arkansas River, Fort Smith .....	Dr. Shumard.
265	<i>Cyprinella bubalina</i> .....	<i>Notropis bubalinus</i> .....	Otter Creek, Arkansas .....	Capt. McClellan.
266	<i>Cyprinella umbrosa</i> .....	do .....	Coal Creek, and 20 miles west of Choctaw Agency .....	H. B. Möllhausen.
268	<i>Cyprinella suavis</i> .....	<i>Notropis lutrensis</i> .....	Near San Antonio .....	Dr. Kennerly.
268	<i>Cyprinella lepida</i> .....	<i>Notropis lepidus</i> .....	Rio Frio .....	Do.
269	<i>Cyprinella notata</i> .....	<i>Notropis notatus</i> .....	Rio Seco .....	Do.
272	<i>Moniana lutrensis</i> .....	<i>Notropis lutrensis</i> .....	Otter Creek and tributaries of Gypsium Creek, Arkansas .....	Capt. McClellan and H. B. Möllhausen.
273	<i>Moniana leonina</i> .....	<i>Notropis leoninus</i> .....	Leon River .....	Dr. Kennerly.
274	<i>Moniana deliciosa</i> .....	<i>Notropis deliciosus</i> .....	do .....	Do.
275	<i>Moniana letabilis</i> .....	<i>Notropis lutrensis</i> .....	Hurrnh Creek .....	H. B. Möllhausen.
276	<i>Moniana frigida</i> .....	<i>Notropis leoninus</i> .....	Rio Frio .....	Dr. Kennerly.
281	<i>Luxilus seco</i> .....	<i>Notemigonus chrysoleucus</i> .....	Rio Seco .....	Do.
282	<i>Luxilus lucidus</i> .....	<i>Notropis umbratilis</i> .....	Coal Creek, and 20 miles west of Choctaw Agency .....	H. B. Möllhausen.
320	<i>Salar virginalis</i> .....	<i>Salmo mykiss spilurus</i> .....	Utah Creek, tributary of Rio Grande .....	Mr. Kreuzfeld.
351	<i>Lepidosteus leptorhynchus</i> .....	<i>Lepisosteus tristœchus</i> .....	Devil River .....	Dr. Shumard.
352	<i>Lepidosteus (Cylindroteus) latirostris</i> .....	<i>Lepisosteus platystomus</i> .....	Pecos River .....	Capt. Pope.
353	<i>Lepidosteus (Atractosteus) berlandieri</i> .....	<i>Lepisosteus tristœchus</i> .....	Tamaulipas, Mexico .....	L. Berlandier.

1859a. CHARLES GIRARD. Ichthyology of the Boundary. <Report of the United States and Mexican Boundary Survey, made under the direction of the Secretary of the Interior, by William H. Emory, Major, First Cavalry, and United States Commissioner. Vol. 3, Washington, 1858, pp. 1-85, plates 1-40.

In this final report upon the Ichthyology of the Mexican Boundary Survey, Girard mentions 111 species as having been obtained in Texas and the Rio Grande basin, 25 of which he describes as new. Of the remaining 86 species, 2 species were described by Baird and Girard in the 9th Smithsonian Report, 12 in the Proceedings of the Philadelphia Academy for 1853, 14 in the same for 1854, and 39 by Girard in his Researches upon the Cyprinoid Fishes, published in the same Proceedings for 1856. Of the 25 species first described in the paper now under consideration, 9 have stood the test of further exploration and investigation and are still regarded as good species.

Texas and Rio Grande Basin fishes of the Mexican Boundary survey.

Page.	Nominal species.	Identification.	Locality.	Collector.
3	<i>Dioplites nuccensis</i> .....	<i>Micropterus salmoides</i> ..	Frio, Nueces, and Leona rivers, and Live Oak, Turkey, and Elm creeks. San Juan River, New Leon .....	Col. J. D. Graham.
			Sabinal and Minneville rivers, and Dry and San Pedro creeks. Cibolo and Minneville rivers .....	Lieut. D. N. Couch. Maj. Emory.
5	<i>Calliurus longulus</i> .....	<i>Lepomis cyanellus</i> .....	Brownsville .....	Col. Graham and Maj. Emory.
5	<i>Pomotis speciosus</i> .....	<i>Lepomis pallidus</i> .....	Devil River .....	Capt. Van Vliet.
			Cadereita, New Leon .....	Dr. Kennerly.
6	<i>Pomotis heros</i> .....	<i>Lepomis heros</i> .....	Cibolo River .....	Lieut. Couch.
			Dry Creek, near Victoria .....	Jno. H. Clark.
			Rio San Juan, near Cadereita .....	Dr. Kennerly.
7	<i>Pomotis aquilensis</i> .....	<i>Lepomis megalotis</i> .....	Eagle Pass .....	Lieut. Couch.
			San Felipe, Rio Cibolo, and Rio Nueces. Sabinal River .....	A. Schott. Jno. H. Clark. Dr. Kennerly.

## Texas and Rio Grande Basin fishes of the Mexican Boundary survey—Continued.

Page.	Nominal species.	Identification.	Locality.	Collector.
8	<i>Pomotis fallax</i> .....	<i>Lepomis megalotis</i> .....	Cibola and Salado rivers and Elm Creek. Live Oak and San Pedro creeks	Jno. H. Clark. Dr. Kennerly.
10	<i>Pileoma carbonaria</i> .....	<i>Etheostoma caprodes</i> ...	Salado and Medina rivers	Jno. H. Clark.
11	<i>Pacilichthys lepidus</i> ...	<i>Etheostoma lepidum</i> .....	Leona River	Dr. Kennerly.
11	<i>Batrachus tau</i> .....	<i>Batrachus tau</i> .....	Indianola	Jno. H. Clark.
11	<i>Otolithus nothus</i> .....	<i>Cynoscion nothus</i> .....	Brazos Santiago.	Do.
11	<i>Leiostomus obliquus</i> .....	<i>Leiostomus xanthurus</i> .....	do	Lieut. Couch.
11	<i>Homoprion lanceolatus</i> .....	do	Indianola.	G. Würdemann.
11	<i>Homoprion xanthurus</i> .....	do	St. Joseph Island.	Jno. H. Clark.
11	<i>Conodon antillanus</i> .....	<i>Rhomboplites aurorbens</i> .	Brazos	G. Würdemann.
11	<i>Pogonias fasciatus</i> .....	<i>Pogonias chromis</i> .....	St. Joseph Island	Jno. H. Clark.
11	<i>Sargus ovis</i> .....	<i>Archosargus probatocephalus</i> .	Brazos Santiago	G. Würdemann.
12	<i>Otolithus drummondi</i> ...	<i>Cynoscion nebulosus</i> ...	do	Do.
12	<i>Ambiodon neglectus</i> .....	<i>Aplodinotus grunniens</i> .	Indianola and Brazos.	Jno. H. Clark.
13	<i>Umbrina phalena</i> .....	<i>Menticirrhus americanus</i>	Indianola	Dr. Kennerly.
13	<i>Micropogon undulatus</i> ...	<i>Micropogon undulatus</i> ...	Brazos	G. Würdemann.
14	<i>Johnius ocellatus</i> .....	<i>Sciæna ocellata</i> .....	Indianola	Jno. H. Clark.
15	<i>Orthopristis duplex</i> .....	<i>Orthopristis chrysopterus</i> .	Brazos	Dr. Kennerly.
16	<i>Lagodon rhomboides</i> .....	<i>Lagodon rhomboides</i> .....	Indianola	Dr. Kennerly.
17	<i>Eucinostomus argenteus</i> .	<i>Gerres gula</i> .....	Brazos Santiago	G. Würdemann.
18	<i>Neonemismarginatus</i> .....	<i>Lutjanus caxis</i> .....	Mouth of Rio Grande	Jno. H. Clark.
19	<i>Polynemus octonemus</i> .....	<i>Polynemus octonemus</i> .....	Indianola and Galveston	Dr. Kennerly.
20	<i>Mugil berlandieri</i> .....	<i>Mugil cephalus</i> .....	St. Joseph Island	G. Würdemann.
21	<i>Chorinemus lanceolatus</i> .....	<i>Oligoplites saurus</i> .....	Indianola	Clark; Kennerly.
21	<i>Chloroscombrus caribbeus</i> .	<i>Chloroscombrus chrysurus</i> .	Brazos and Indianola	Jno. H. Clark.
22	<i>Doliodon carolinus</i> .....	<i>Trachinotus carolinus</i> .....	St. Joseph Island and Brazos Santiago.	G. Würdemann.
23	<i>Carangus esculentus</i> .....	<i>Caranx hippos</i> .....	Brazos and Indianola	Do.
23	<i>Argyreiosus capillaris</i> .....	<i>Selene vomer</i> .....	Brazos Santiago	Do.
24	<i>Vomer setipinnis</i> .....	<i>Vomer setipinnis</i> .....	Mouth of Rio Grande	Jno. H. Clark.
24	<i>Trichiurus lepturus</i> .....	<i>Trichiurus lepturus</i> .....	Matamoras	L. Berlandier.
25	<i>Gobionellus hastatus</i> .....	<i>Gobionellus oceanicus</i> .....	Brazos Santiago	G. Würdemann.
25	<i>Gobius lyricus</i> .....	<i>Gobius lyricus</i> .....	St. Joseph Island	Do.
25	<i>Gobius würdemanni</i> .....	<i>Gobius würdemanni</i> .....	do	Do.
26	<i>Gobius catulus</i> .....	<i>Gobius saporator</i> .....	Brazos Santiago	Do.
26	<i>Gobius gulosus</i> .....	<i>Lepidogobius gulosus</i> .....	do	Do.
27	<i>Gobiosoma molestum</i> .....	<i>Gobiosoma molestum</i> .....	St. Joseph Island	Jno. H. Clark.
27	<i>Blennius multifilis</i> .....	<i>Hypleurochilus geminatus</i> .	do	Do.
28	<i>Eleotris sumnulentus</i> .....	<i>Dormitator maculatus</i> .....	St. Joseph Island	G. Würdemann.
28	<i>Eleotris gyrynus</i> .....	do	Mouth of Rio Grande	Jno. H. Clark.
29	<i>Philippus dormitator</i> .....	<i>Gobiomorus dormitator</i> .....	do	Do.
29	<i>Ophidion josephi</i> .....	<i>Ophidion marginatum</i> .....	Brazos	Do.
30	<i>Belone scrutator</i> .....	<i>Tylosurus longirostris</i> .....	St. Joseph Island	G. Würdemann.
30	<i>Herichthys cyanoguttatus</i> .	<i>Heros cyanoguttatus</i> .....	St. Joseph Island	Jno. H. Clark.
31	<i>Ailurichthys marinus</i> .....	<i>Felichthys marinus</i> .....	St. Joseph Island	G. Würdemann.
32	<i>Arius equestris</i> .....	<i>Tachysurus folis</i> .....	Brazos	Jno. H. Clark.
32	<i>Pimelodus affinis</i> .....	<i>Ictalurus furcatus</i> .....	St. Joseph Island	G. Würdemann.
33	<i>Pimelodus vulpes</i> .....	<i>Ictalurus punctatus</i> .....	Brazos	Jno. H. Clark.
34	<i>Ictiobus tumidus</i> .....	<i>Carpiodes velifer tumidus</i>	Devil River and lagoon at Fort Brown.	L. Berlandier.
34	<i>Moxostoma kennerlyi</i> .....	<i>Erimyzon sucetta</i> .....	Brownsville.	Capt. Van Vliet.
35	<i>Moxostoma victoria</i> .....	<i>Mny trema melanops</i> .....	Matamoras	L. Berlandier.
35	<i>Moxostoma campbelli</i> .....	<i>Erimyzon sucetta</i> .....	Cadereita and San Juan River, New Leon.	Lieut. Couch.
			Indianola	Jno. H. Clark.
			do	Do.
			Mouth of Rio Grande	Do.
			Brownsville.	Capt. Van Vliet.
			Live Oak Creek	Dr. Kennerly.
			Comanche Spring, Rio Leona, Piedra Painte, Rio Salado, and Devil River.	Jno. H. Clark.
			Near Fort Brown	Do.
			Dry Creek, near Victoria	Dr. Kennerly.
			do	Do.
			Devil River	Jno. H. Clark.
			Live Oak Creek	A. H. Campbell.

## Texas and Rio Grande Basin fishes of the Mexican Boundary survey—Continued.

Page.	Nominal species.	Identification.	Locality.	Collector.
36	<i>Ptychostomus congestus</i>	<i>Moxostoma congestum</i>	Salado River	Jno. H. Clark.
36	<i>Ptychostomus albidus</i>	do	Rio San Juan, near Monterey	Lieut. Couch.
38	<i>Minomus plebeius</i>	<i>Pantosteus plebeius</i>	Rio Mimbres	Jno. H. Clark.
39	<i>Acomus guzmaniensis</i>	do	Janos River	Dr. Kennerly.
41	<i>Campostoma ornatum</i>	<i>Campostoma ornatum</i>	Chihuahua River and tributaries	Jno. Potts.
41	<i>Campostoma formosulum</i>	<i>Campostoma formosulum</i>	Sabinal River	Dr. Kennerly.
42	<i>Campostoma nasutum</i>	<i>Campostoma anomalum</i>	Cadereita and Acapulco, New Leon	Lieut. Couch.
42	<i>Dionda serena</i>	<i>Dionda serena</i>	Sabinal River	Dr. Kennerly.
43	<i>Dionda texensis</i>	<i>Dionda episcopa</i>	Nueces River	Jno. H. Clark.
43	<i>Dionda argentosa</i>	do	San Felipe Creek and Devil River	Do.
44	<i>Dionda chrysitis</i>	<i>Dionda serena</i>	Live Oak Creek	Do.
44	<i>Dionda melanops</i>	<i>Dionda melanops</i>	Buena Vista, Coahuila	Lieut. Couch.
44	<i>Dionda couchi</i>	do	Cuajuco, Monterey, and Cadereita, New Leon	Do.
45	<i>Algomia amara</i>	<i>Dionda amara</i>	Lagoon, near Fort Brown	Jno. H. Clark.
45	<i>Algomia fluviatilis</i>	<i>Dionda fluviatilis</i>	Near Monterey	Lieut. Couch.
46	<i>Cochlognathus ornatus</i>	<i>Cochlognathus ornatus</i>	Brownsville	Capt. Van Vliet.
49	<i>Gobio festivals</i>	<i>Hybopsis festivals</i>	Rio San Juan, near Cadereita	Lieut. Couch.
51	<i>Chilola velox</i>	<i>Chilola vigilax</i>	San Pedro Creek	Dr. Kennerly.
51	<i>Alburnellus amabilis</i>	<i>Notropis amabilis</i>	Leona River	Jno. H. Clark.
52	<i>Alburnellus megalops</i>	<i>Notropis swaini</i>	San Felipe Creek	Do.
52	<i>Alburnellus socius</i>	<i>Notropis socius</i>	Live Oak Creek	Do.
53	<i>Coloma ornata</i>	<i>Notropis ornatus</i>	Chihuahua River and tributaries	Jno. Potts.
54	<i>Cyprinella macrostoma</i>	<i>Notropis macrostomus</i>	Devil River	Jno. H. Clark.
54	<i>Cyprinella venusta</i>	<i>Notropis venustus</i>	China, New Leon	Lieut. Couch.
55	<i>Cyprinella texana</i>	<i>Notropis texanus</i>	Sabinal River	Dr. Kennerly.
55	<i>Cyprinella luxiloides</i>	<i>Notropis macrostomus</i>	Salado River and Turkey Creek	Jno. H. Clark.
56	<i>Moniana aurata</i>	<i>Notropis proserpina</i>	San Pedro Creek	Dr. Kennerly.
56	<i>Moniana complanata</i>	<i>Notropis leoninus</i>	Piedra Pointe, N. Mex.	Jno. H. Clark.
56	<i>Moniana frigida</i>	do	Brownsville	Capt. Van Vliet.
57	<i>Moniana couchi</i>	<i>Notropis lutrensis</i>	Salado, Sabinal, and Medina rivers	Jno. H. Clark.
57	<i>Moniana rutila</i>	do	China, New Leon	Lieut. Couch.
58	<i>Moniana nitida</i>	<i>Notropis nitidus</i>	Cadereita, New Leon	Do.
58	<i>Moniana formosa</i>	<i>Notropis formosus</i>	do	Do.
59	<i>Moniana gracilis</i>	<i>Notropis lutrensis</i>	Rio Mimbres	Dr. Kennerly.
59	<i>Moniana gibbosa</i>	do	Acapulco, near Monterey, New Leon	Lieut. Couch.
59	<i>Moniana proserpina</i>	<i>Notropis proserpina</i>	Brownsville	Capt. Van Vliet.
60	<i>Luxilus leptosomus</i>	<i>Notemigonus chrysoleucus</i>	Devil River	Jno. H. Clark.
62	<i>Tigoma pulchella</i>	<i>Leuciscus nigrescens</i>	Dry Creek, near Victoria	Dr. Kennerly.
64	<i>Tigoma nigrescens</i>	do	Rio Mimbres	Jno. H. Clark.
65	<i>Tigoma pulchra</i>	do	Boca Grande and Janos River	Dr. Kennerly.
68	<i>Cyprinodon elegans</i>	<i>Cyprinodon elegans</i>	Chihuahua River and tributaries	Jno. Potts.
67	<i>Cyprinodon gibbosus</i>	<i>Cyprinodon variegatus</i>	Comanche Springs	Jno. H. Clark.
67	<i>Cyprinodon bovinus</i>	do	Indianola	Do.
68	<i>Hydrargyra similis</i>	<i>Fundulus similis</i>	Leon Spring	Do.
69	<i>Fundulus grandis</i>	<i>Fundulus heteroclitus grandis</i>	Indianola	Do.
70	<i>Pæcilia lineolata</i>	<i>Mollienesia latipinna</i>	do	Do.
70	<i>Limnia pæcilioides</i>	do	Brownsville	Capt. Van Vliet.
71	<i>Limnia venusta</i>	<i>Lucania venusta</i>	Fort Brown	Jno. H. Clark.
71	<i>Gambusia nobilis</i>	<i>Gambusia affinis</i>	Indianola	Do.
72	<i>Gambusia affinis</i>	do	do	Do.
72	<i>Gambusia patruelis</i>	do	Leon Spring, Comanche Spring, and Zoquito	Do.
74	<i>Astyanax argentatus</i>	<i>Tetragonopterus argentatus</i>	Medina and Salado rivers	Do.
75	<i>Saurus mexicanus</i>	<i>Synodus foetens</i>	Salado, Leona, and Nueces rivers, and Elm and Turkey creeks	Do.
75	<i>Anguilla tyrannus</i>	<i>Anguilla chrysepa</i>	Nueces, Leona, and Devil rivers, Zoquito, Comanche Springs, Elm, Turkey, and San Felipe creeks	Col. J. D. Graham.
76	<i>Neomuræna nigromarginata</i>	<i>Gymnothorax ocellatus nigromarginatus</i>	Brownsville	Capt. Van Vliet.
77	<i>Neoconger mucronatus</i>	<i>Neoconger mucronatus</i>	Mouth of Rio Grande and Sabinal River	Maj. Emory.
			Coast of Texas	G. Würdemann.
			Mouth of Rio Grande	Maj. Emory.
			Matamoras	Lieut. Couch.
			St. Joseph Island	G. Würdemann.
			do	Do.

1859b. CHARLES GIRARD, M. D., Ichthyological Notices, Nos. I-LXXVII. <Proc. Acad. Nat. Sci., Phila. 1859.

This is a series of brief notes or papers upon fishes from various regions. Notices 10, 30 to 36 inclusive, 39, 42 to 50 inclusive, 54 to 59 inclusive, and 62 refer to Texas and Rio Grande fishes. Twenty-six species are mentioned, of which 19 are described as new. Six of these are still allowed to stand, though the proper identification of some of them is doubtful.

Page.	Nominal species.	Identification.	Locality.	Collector.
61	<i>Hydrargyra zebra</i> .....	<i>Fundulus zebrinus</i> .....	Between Fort Defiance and Fort Union, N. Mex.	Lieut. C. J. Ives.
101	<i>Abarris lateralis</i> .....	<i>Etheostoma lateralis</i> .....	Mouth of Rio Grande.....	Boundary survey.
101	<i>Diplesion fasciatus</i> .....	<i>Etheostoma fasciatus</i> ?	Chihuahua River.....	John Potts.
102	<i>Aplesion potsii</i> .....	<i>Etheostoma lepidum</i> .....	Chihuahua River and tributaries.....	Do.
102	<i>Oligocephalus leonensis</i> .....	do.....	Leona River.....	Jno. H. Clark.
102	<i>Oligocephalus grahami</i> .....	do.....	Devil River.....	Do.
102	<i>Oligocephalus pulchellus</i> .....	do.....	Gypsum Creek.....	Lieut. Whipple.
103	<i>Boleosoma gracile</i> .....	<i>Etheostoma fusiforme</i> .....	Seco River and Leona River near Fort Inge.	Dr. Kennerly.
103	<i>Boleichthys whipplei</i> .....	<i>Etheostoma whipplei</i> .....	Coal Creek, Ark.....	Lieut. Whipple.
104	<i>Boleichthys elegans</i> .....	<i>Etheostoma fusiforme</i> .....	Piedra Pointe.....	Jno. H. Clark.
114	<i>Mollinesia latipinna</i> .....	<i>Mollinesia latipinna</i> .....	Galveston.....	Dr. Kennerly.
114	<i>Mollinesia lineolata</i> .....	do.....	Brownsville.....	
115	<i>Limia pocilloides</i> .....	do.....	Indianola.....	Jno. H. Clark.
115	<i>Limia formosa</i> .....	do.....	Lagoon at Palo Alto, Mexico.....	Do.
116	<i>Limia couchiana</i> .....	<i>Pecilia couchiana</i> .....	Rio San Juan, Cadereita, New Leon.....	
117	<i>Limia matamorensis</i> .....	<i>Mollinesia latipinna</i> .....	Matamoras.....	L. Berlandier.
118	<i>Adinia multifasciata</i> .....	<i>Adinia multifasciata</i> .....	Galveston.....	Dr. Kennerly.
			St. Joseph Island.....	G. Würdemann.
			Indianola.....	Jno. H. Clark.
118	<i>Lucania venusta</i> .....	<i>Lucania venusta</i> .....	do.....	Do.
118	<i>Lucania affinis</i> .....	do.....	Matamoras.....	L. Berlandier.
120	<i>Gambusia nobilis</i> .....	<i>Gambusia affinis</i> .....	Comanche Spring.....	Lieut. J. G. Parke.
120	<i>Gambusia affinis</i> .....	do.....	San Pedro Creek and Dry Creek, near Victoria.	Dr. Kennerly.
121	<i>Gambusia patruelis</i> .....	do.....	Upper affluents of the Nueces River; Leona, Blanco, and Seco rivers.....	Do.
121	<i>Gambusia speciosa</i> .....	do.....	Rio San Diego, near Cadereita, New Leon.	D. N. Couch.
121	<i>Gambusia gracilis</i> .....	do.....	Matamoras.....	Louis Berlandier.
122	<i>Gambusia senilis</i> .....	do.....	Chihuahua River.....	John Potts.
158	<i>Cyprinodon eximius</i> .....	do.....	do.....	Do.

1872a. EDWARD D. COPE, A. M. Report upon the Recent Reptiles and Fishes of the Survey, collected by Campbell Carrington and C. M. Dawes. Prelim. Report U. S. Geol. Surv. of Montana and Portions of Adjacent Territories, being a fifth annual report of progress, 1872, 467-476.

The material upon which this report was based was collected chiefly in Montana, Idaho, and Utah, but two species of fishes, however, were obtained in a tributary of the Rio Grande at Sangre de Christo Pass, in Colorado. One of these was a minnow, *Leuciscus pulcher*, which Prof. Cope described as *Clinostomus pandora*, while the other was the Rio Grande trout, which was described under the name of *Salmo spilurus*.

1875. Prof. E. D. COPE and Dr. H. C. YARROW. Report upon the Collections of Fishes made in portions of Nevada, Utah, California, New Mexico, and Arizona, during the years 1871, 1872, 1873, and 1874. Zoölogy of the Wheeler Survey, 637-700, 1875.

The geographical explorations and surveys west of the one hundredth meridian, conducted under the direction of Lieut. Geo. M. Wheeler, during the years 1871 to 87 4, inclusive, resulted in greatly increasing our knowledge of the fishes of the upper Rio Grande basin. The naturalists attached to these various expeditions were, as is well known, Dr. H. C. Yarrow, Prof. E. D. Cope, Dr. J. T. Rothrock, Mr. H. W. Henshaw, Dr. Oscar Loew, Mr. W. G. Shedd, Mr. C. E. Aiken, and Lieut. W. L. Marshall. In the report upon the fishes of this survey, written by Cope and Yarrow, 18 species are credited to the Rio Grande basin, of which 5 were described as new to science.



Page.	Nominal species.	Identification.	Locality.	Collector.
639	Scaphirhynchops platyrhynchus.	Scaphirhynchus platyrhynchus.	Rio Grande, at Albuquerque, N. Mex.	Dr. Oscar Loew.
639	Lepisosteus sp .....	Lepisosteus platystomus?	Rio Grande .....	
639	Anguilla tyrannus .....	Anguilla chryssypa .....	Near Santa Fe, N. Mex .....	Dr. H. C. Yarrow.
644	Rhinichthys maxillosus.	Rhinichthys dulcis .....	Abiquiu, N. Mex. [Chama River] .....	Dr. Loew.
			Nutria, N. Mex. ....	W. G. Shedd.
			Costilla Creek, N. Mex. ....	Prof. E. D. Cope.
			Taos and San Ildefonso, N. Mex. ....	Dr. Yarrow.
647	Apocope oscula .....	Agosia yarrowi .....	Rio Grande, Colo. ....	Dr. J. T. Rothrock.
			Nutria, N. Mex. ....	W. G. Shedd.
			"New Mexico" .....	
648	Apocope ventricosa .....	do .....	San Ildefonso, N. Mex. ....	Yarrow and Cope.
649	Alburnellus simus .....	Notropis simus .....	do .....	Do.
650	Alburnellus jemezianus .....	Notropis dilectus .....	do .....	Do.
652	Ceraticichthys sterletus .....	Hybopsis aestivalis .....	Rio Grande at San Ildefonso, N. Mex. ....	Do.
653	Hypsilepis iris .....	Notropis lutrensis .....	San Ildefonso, N. Mex. ....	Do.
660	Gila pandora .....	Leuciscus nigrescans .....	Rio Grande at mouth of Rio Honda, N. Mex. ....	Prof. Cope.
			Rio Grande near San Ildefonso, N. Mex. ....	Dr. Yarrow.
661	Gila gula .....	do .....	Rio de Acama, N. Mex. ....	H. W. Henshaw.
662	Gila egregia .....	do .....	Rio Grande at Loma, Colo. ....	Dr. Rothrock
672	Hybognathus nuchalis .....	Hybognathus nuchalis .....	Rio Grande near San Ildefonso, N. Mex. ....	Yarrow and Cope.
674	Pantosteus jarrovi .....	Pantosteus plebeius .....	Costilla, Taos, and San Ildefonso, N. Mex. ....	Do.
681	Carpiodes grayi .....	Carpiodes velifer tumidus.	San Ildefonso, N. Mex. ....	Prof. Cope.
693	Salmo spilurus .....	Salmo mykiss spilurus .....	Brazos River, a small tributary of Chama River, N. Mex. ....	
693	Salmo pleuriticus .....	do .....	Rio Grande, Colo. ....	} Henshaw, Rothrock, Marshall, Shedd, Aiken, Cope, and Yarrow.
			Fort Garland, Colo. ....	
			Costilla, N. Mex. ....	
			Taos River, N. Mex. ....	
			Chama River, N. Mex. ....	
			San Ildefonso, N. Mex. ....	

1878. G. BROWN GOODE. A Revision of the American Species of the genus *Brevoortia*, with a Description of a new species from the Gulf of Mexico. <Proc. U. S. Nat. Mus. 1878, 30-42.

In this paper Dr. Goode describes the menhaden of the Gulf of Mexico as a new species, proposing for it the name *Brevoortia patronus*. The specimens upon which the species was based were from Brazos Santiago.

1878. DAVID S. JORDAN, M. D. Notes on a Collection of Fishes from the Rio Grande, at Brownsville, Texas. <Bull. U. S. Geol. and Geog. Survey, vol. iv, Nos. 2 and 3, 397-406 and 663-667, May 3, 1878, and July 29, 1878.

In this paper Dr. Jordan gives notes on the species of a small collection of fishes from the Rio Grande at Brownsville. This collection belonged to the National Museum, but when and by whom it was made can not be determined.

The following is a list of the species with the present identification of each. "*Sema signifer*" and "*Decentrus lucens*," names applied in this paper to two supposed new species, should be suppressed for the reason given by Dr. Jordan in the Proc. U. S. Nat. Mus. for 1880, page 327.

Page.	Nominal species.	Identification.	Page.	Nominal species.	Identification.
397	Lepiopus pallidus .....	Lepomis pallidus.	403	Cyprinella bubalina .....	Notropis bubalinus.
398	Apomotis cyanellus .....	Lepomis cyanellus.	404	Notemigonon chrysoleucus ..	Notemigonon chrysoleucus.
400	Hydrargyra similis .....	Fundulus similis.			
401	Campostoma formosolum ..	Campostoma formosolum.	404	Carpiodes tumidus .....	Carpiodes velifer tumidus.
401	Hybognathus amarus .....	Dionda amara.	405	Amiurus natalis antoniensis	Ameiurus natalis.
401	Hybognathus serenus .....	Dionda serena.	003	Xenotis breviceps .....	Lepomis megalotis.
402	Hybognathus melanops .....	Dionda melanops.	663	Pecillichthys lepidus .....	Etheostoma lepidum.
402	Pimephales promelas and later on Pimephales nigellus.	Pimephales promelas confertus.	664	Fundulus zebra .....	Fundulus zebrinus.
403	Alburnops missouriensis ....	Notropis deliciosus.	665	Cyprinella complanata .....	Notropis lutrensis.
			666	Phenacobius scopiferus ....	Phenacobius mirabilis.
			666	Carpiodes cyprinus .....	Carpiodes velifer tumidus.

1880. EDWARD D. COPE. On the Zoölogical Position of Texas. Bull. 17, U. S. Nat. Mus., 1880, 1-51.

In this valuable bulletin Professor Cope gives 24 species of fishes, specimens of which were obtained in Texas by himself or his correspondents. Seven of these he described as new. The following is a list of these 24 species:

Page.	Nominal species.	Identification.	Locality.
30	<i>Boleosoma phlox</i> .....	<i>Etheostoma phlox</i> .....	Trinity River at Fort Worth.
31	<i>Percina caprodes carbonaria</i> .....	<i>Etheostoma caprodes</i> .....	Trinity River near Dallas, and Llano River, Kimble County.
31	<i>Micropterus floridanus</i> .....	<i>Micropterus salmoides</i> .....	Trinity, Llano, Guadalupe, and Medina rivers, and Johnson Fork of Llano River in Kimble County.
33	<i>Apomotis cyaneilus</i> .....	<i>Lepomis cyaneilus</i> .....	Trinity River at Dallas and Fort Worth.
33	<i>Apomotis</i> sp .....		Llano River.
33	<i>Lepomis speciosus</i> .....	<i>Lepomis pallidus</i> .....	Do.
33	<i>Lepomis anagallinus</i> var .....	<i>Lepomis humilis</i> .....	Trinity River at Fort Worth.
33	<i>Xenotis megalotis</i> .....	<i>Lepomis megalotis</i> .....	Trinity River at Fort Worth and Dallas, Helotes Creek, Upper Medina River, and Johnson Fork of Llano River in Kimble County.
33	<i>Fundulus diaphanus</i> .....	<i>Zygonectes escambiae</i> .....	Comanche Creek in Mason County.
34	<i>Zygonectes notatus</i> .....	<i>Zygonectes notatus</i> .....	Trinity River at Fort Worth.
34	<i>Zygonectes brachypterus</i> .....	<i>Gambusia affinis</i> .....	Do.
34	<i>Ichthaelurus carulescens</i> .....	<i>Ictalurus punctatus</i> .....	Trinity River at Dallas and Fort Worth and Little Wichita River.
34	<i>Amiurus lupus</i> .....	<i>Ameiurus lupus</i> .....	Tributary of Medina River.
35	<i>Amiurus brachyacanthus</i> .....	<i>Ameiurus melas</i> .....	Wallace Creek, Bandera County.
35	<i>Amiurus catus</i> .....	<i>Ameiurus nebulosus catus</i> .....	Little Wichita River.
35	<i>Amiurus bollii</i> .....	<i>Ameiurus natalis bollii</i> .....	Do.
36	<i>Pelodichtyls olivaris</i> .....	<i>Leptops olivaris</i> .....	Trinity River at Dallas and Fort Worth.
36	<i>Myxostoma macrolepidotum</i> .....	<i>Moxostoma congestum</i> .....	Guadalupe and Llano Rivers.
36	<i>Campostoma anomalum pulum.</i>	<i>Campostoma anomalum</i> .....	At Helotes on the Upper Medina and in Comanche Creek, Mason County.
36	<i>Hybognathus flavipinnis</i> .....	<i>Dionda episcopa</i> .....	Johnson Fork of Llano River, in Kimble County.
37	<i>Hybognathus nigrotæniata</i> ..	<i>Dionda serena</i> .....	Wallace Creek.
37	<i>Cochlognathus biguttata</i> .....	<i>Cochlognathus ornatus</i> .....	Trinity River at Fort Worth.
38	<i>Cyprinella venusta</i> .....	<i>Notropis venustus</i> .....	Johnson Fork of Llano River.
39	<i>Montana jugalis, var?</i> .....	<i>Notropis lutrensis</i> .....	Trinity River at Dallas and Fort Worth.

1881a. SAMUEL GARMAN. New and little-known Reptiles and Fishes in the Museum Collections. Bull. 3, Mus. Comp. Zoöl., vol. VIII, pp. 85-93, February, 1881.

In this paper Prof. Garman gives descriptions of, or notes upon, 20 species of fishes. Of these 20 species, 2 are from Texan localities and 12 others are from the Mexican state of Coahuila. Some of these waters are at present without outlet to the sea, but zoölogically they belong to the Rio Grande Basin.

Page.	Nominal species.	Identification.	Locality.
89	<i>Noturus flavus</i> .....	<i>Ameiurus natalis</i> .....	San Antonio, Texas.
89	<i>Ichthyobus tumidus</i> .....	<i>Carpiodes velifer tumidus</i> .....	Nazas River at San Pedro, Coahuila.
89	<i>Catostomus nebuliferus</i> .....	<i>Pantosteus plebeius</i> .....	Nazas River.
89	<i>Hybognathus (Dionda) punctifer.</i>	<i>Dionda punctifer</i> .....	Parras and spring near Saltillo, Coahuila.
90	<i>Stypodon signifer</i> .....	<i>Stypodon signifer</i> .....	Parras, Coahuila.
91	<i>Cyprinella rubripinna</i> .....	<i>Notropis garmani</i> .....	Do.
91	<i>Gilia conspersa</i> .....	<i>Leuciscus conspersus</i> .....	Nazas River, Coahuila.
92	<i>Cheonda nigrescens</i> .....	<i>Leuciscus pulcher</i> .....	Parras, Coahuila.
92	<i>Cheonda modesta</i> .....	<i>Leuciscus pulcher?</i> .....	Saltillo, Coahuila.
92	<i>Astyanax argentatus</i> .....	<i>Tetragonopterus argentatus</i> .....	Tributaries of the Lago del Muerte and spring near Monclova.
92	<i>Cyprinodon latifasciatus</i> .....	<i>Cyprinodon latifasciatus</i> .....	Spring near Parras.
93	<i>Alburnellus megalops</i> .....	<i>Notropis swaini</i> .....	Sutherland Springs, Texas.
93	<i>Gambusia patruellis</i> .....	<i>Gambusia affinis</i> .....	Monclova, Coahuila.
93	<i>Heros pavonaceus</i> .....	<i>Heros pavonaceus</i> .....	Spring near Monclova.

1881b. SAMUEL GARMAN. North American Fresh-water Fishes. Science Observer, vol. III, No. 8, pp. 57-63; Boston, May 10, 1881.

This short paper is devoted to the genus *Rhinichthys*. Descriptions are given of what Professor Garman then regarded as 15 species belonging to this genus, 3 of which (*Rhinichthys ocella*, *R. badius*, and *R. simus*) were described as new. One of these 15 nominal species (*R. simus*, which equals *R. dulcis*) is based on specimens which came from Coahuila, Mexico.

1882. DAVID S. JORDAN and CHARLES H. GILBERT. Notes on Fishes observed about Pensacola, Florida, and Galveston, Texas, with Description of New Species. Proc. U. S. Nat. Mus. 1882, 241-307.

In March, 1882, Dr. Jordan made extensive collections of fishes at Pensacola and Galveston, the results of the study of which were given in the above-named paper. The number of species obtained at Galveston was 51, of which 3 were described as new. These 51 species were all obtained in Galveston Bay and the immediate vicinity, and are, of course, all salt-water fishes with the exception of a few brackish-water species. The following table contains the Texan species mentioned in this paper, with the present identification of each:

Page.	Nominal species.	Identification.	Page.	Nominal species.	Identification.
242	<i>Carcharias</i> sp. incert.	.....	278	<i>Lagodon rhomboides</i>	<i>Lagodon rhomboides</i> .
243	<i>Carcharias platyodon</i>	<i>Carcharhinus platyodon</i> .	278	<i>Diplodus probatocephalus</i>	<i>Archosargus probatocephalus</i> .
245	<i>Pristis pectinatus</i>	<i>Pristis pectinatus</i> .			
245	<i>Trygon sabina</i>	<i>Trigon sabina</i> .	280	<i>Chaetodipterus faber</i>	<i>Chaetodipterus faber</i> .
245	<i>Arius felis</i>	<i>Tachysurus felis</i> .	280	<i>Pogonias chromis</i>	<i>Pogonias chromis</i> .
246	<i>Elurichthys marinus</i>	<i>Felichthys marinus</i> .	280	<i>Sciæna punctata</i>	<i>Bairdiella chrysuræ</i> .
246	<i>Megalops atlanticus</i>	<i>Megalops atlanticus</i> .	281	<i>Sciæna ocellata</i>	<i>Sciæna ocellata</i> .
246	<i>Brevoortia patronus</i>	<i>Brevoortia tyrannus patronus</i> .	281	<i>Liostomus xanthurus</i>	<i>Liostomus xanthurus</i> .
			282	<i>Menticirrus alburnus</i>	<i>Menticirrus americanus</i> .
247	<i>Opisthonema thrissa</i>	<i>Opisthonema thrissa</i> .	282	<i>Micropogon undulatus</i>	<i>Micropogon undulatus</i> .
247	<i>Clupea chrysochloris</i>	<i>Clupea chrysochloris</i> .	283	<i>Menticirrus littoralis</i>	<i>Menticirrus littoralis</i> .
248	<i>Dorosoma cepedianum</i>	<i>Dorosoma cepedianum</i> .	285	<i>Cynoscion maculatum</i>	<i>Cynoscion nebulosus</i> .
248	<i>Stolephorus mitchilli</i>	<i>Stolephorus mitchilli</i> .	288	<i>Prionotus tribulus</i>	<i>Prionotus tribulus</i> .
250	<i>Cyprinodon variegatus</i>	<i>Cyprinodon variegatus</i> .	289	<i>Astroscopus anoplos</i>	<i>Astroscopus anoplos</i> .
252	<i>Fundulus similis</i>	<i>Fundulus similis</i> .	291	<i>Porichthys plectrodon</i>	<i>Porichthys porosissimus</i> .
253	<i>Fundulus grandis</i>	<i>Fundulus heteroclitus grandis</i> .	294	<i>Gobius lyricus</i>	<i>Gobius lyricus</i> .
			300	<i>Isesthes scrutator</i>	<i>Isesthes scrutator</i> .
257	<i>Gambusia patruelis</i>	<i>Gambusia affinis</i> .	302	<i>Paralichthys dentatus</i>	<i>Paralichthys lethostigma</i> .
259	<i>Mollienesis lineolata</i>	<i>Mollienesis latipinna</i> .			
261	<i>Myrophis lumbricus</i>	<i>Myrophis punctatus</i> .	305	<i>Etropus crossotus</i>	<i>Etropus crossotus</i> .
262	<i>Tylosurus longirostris</i>	<i>Tylosurus longirostris</i> .	305	<i>Achirus lineatus browni</i>	<i>Achirus fasciatus</i> .
262	<i>Hemirhamphus unifasciatus</i>	<i>Hemirhamphus unifasciatus</i> .	305	<i>Lagocephalus levigatus</i>	<i>Lagocephalus levigatus</i> .
			306	<i>Tetrodon turgidus nephelus</i>	<i>Tetrodon nephelus</i> .
266	<i>Mugil albula</i>	<i>Mugil cephalus</i> .			
267	<i>Menidia vagrans</i>	<i>Menidia vagrans</i> .	306	<i>Chilomycterus geometricus</i>	<i>Chilomycterus schæpffi</i> .
267	<i>Trichiurus lepturus</i>	<i>Trichiurus lepturus</i> .			
272	<i>Centropomus undecimalis</i>	<i>Centropomus undecimalis</i> .	306	<i>Alutera</i> sp. incog.	<i>Alutera schæpffi</i> .
			306	<i>Ostracion quadricorne</i>	<i>Ostracion tricorne</i> .
277	<i>Pomadasyis fulvomaculatus</i>	<i>Orthopristis chrysopterus</i> .	306	<i>Pterophrynoideus histrio</i>	<i>Pterophryne histrio</i> .
			306	<i>Malthe vespertilio</i>	<i>Malthe vespertilio</i> .

1883. DAVID S. JORDAN and CHARLES H. GILBERT. Synopsis of the Fishes of North America.

In the Synopsis only a few definite Texas localities are given, these being taken from the various preceding papers. There is, therefore, no additional information contained in the Synopsis regarding the geographic distribution of fishes in this region.

1884. DAVID S. JORDAN and SETH E. MEEK. Description of Four New Species of *Cyprinidae* in the United States National Museum. <Proc. U. S. Nat. Mus. 1884, 474-477.

One of these four minnows is *Notropis venustus*, described in this paper as *Otiola wrostitigma*, from specimens collected in Clear Creek near Hempstead, by Messrs. Ludwig Kunlein and R. Edward Earll, and others collected in the San Saba River by Mr. W. W. Anderson.

**1885a.** DAVID S. JORDAN. Identification of the Species of *Cyprinida* and *Catostomida* described by Dr. Charles Girard, in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1856. <Proc. U. S. Nat. Mus. 1885, 118-127.

In this is given, in the light of subsequent investigation, the identification of the species of Girard's paper which we have already summarized on page 69. Dr. Jordan's paper contains valuable notes upon many of the types of these species, and the identifications given by him are, in the main, accepted in the present paper.

**1885b.** DAVID STARR JORDAN. A Catalogue of the Fishes known to inhabit the waters of North America, north of the Tropic of Cancer, with notes on the Species discovered in 1883 and 1884. Report U. S. Fish. Comm., 1885.

In this catalogue the localities given are, with few exceptions, such as had already been given in other papers. The few exceptions are chiefly in connection with the species collected in 1884, as given in the next paper.

**1886.** DAVID S. JORDAN and CHARLES H. GILBERT. List of Fishes collected in Arkansas, Indian Territory, and Texas, in September, 1884, with notes and descriptions. <Proc. U. S. Nat. Mus. 1886, 1-25.

This is by far the most important contribution to our knowledge of the fresh-water fishes of Texas that has appeared in recent years. These collections enabled Girard's species to be more certainly identified than was before possible. The total number of species obtained from Texan localities during these explorations was 53, of which 4 were described as new.

*Fishes collected in Arkansas, Indian Territory, and Texas, in September, 1884.*

Page.	Species.	Locality.
14	<i>Scaphirhynchops platyrhynchus</i>	Red River at Fulton, Ark.
14, 18, 22	<i>Lepidosteus osseus</i>	Red River at Fulton; Lampasas River near Belton; San Marcos River at San Marcos.
14, 18, 20	<i>Ictalurus punctatus</i>	Red River at Fulton; Lampasas River near Belton; Colorado River at Austin.
14, 17, 18, 20	<i>Leptops olivaris</i>	Red River at Fulton; Trinity River at Dallas; Lampasas River near Belton; Colorado River at Austin.
6, 15, 17, 18	<i>Noturus nocturnus</i>	Poteau River at Slate Ford, Ind. T.; Trinity River at Dallas; Lampasas River near Belton; Sabine River at Longview.
20, 22	<i>Amiurus nebulosus catulus</i>	Colorado River (Barton Spring) at Austin; San Marcos River at San Marcos.
14	<i>Ictiobus bubalus</i>	Red River at Fulton.
14	<i>Ictiobus velifer</i>	Do.
18, 20	<i>Ictiobus velifer tumidus</i>	Lampasas River near Belton; Colorado River at Austin.
20	<i>Ictiobus carpio</i>	Colorado River at Austin.
15	<i>Moxostoma pecilurum</i>	Sabine River at Longview.
18, 20, 22, 23	<i>Moxostoma congestum</i>	Lampasas River near Belton; Colorado River at Austin; San Marcos River at San Marcos; Comal Creek at New Braunfels.
15, 17, 19, 20	<i>Camptostoma anomalum</i>	Trinity River at Dallas; Lampasas River at Belton; Colorado River at Austin.
23	<i>Dionda episcopa</i>	Comal Creek at New Braunfels.
14, 15, 17	<i>Hybognathus nuchalis</i>	Red River at Fulton; Sabine River at Longview; Trinity River at Dallas.
20	<i>Pimephales notatus</i>	Colorado River at Austin.
17, 19, 20, 22, 23	<i>Cliola vigilax</i>	Sabine River at Longview; Trinity River at Dallas; Lampasas River at Belton; Colorado River at Austin; San Marcos River at San Marcos; Comal Creek at New Braunfels.
14, 15	<i>Notropis dilectus</i>	Red River at Fulton; Sabine River at Longview.
14, 15, 19, 20	<i>Notropis venustus</i>	Red River at Fulton; Sabine River at Longview; Lampasas River at Belton; Colorado River at Austin.
15, 17, 19, 20	<i>Notropis lutrensis</i>	Sabine River at Longview; Trinity River at Dallas; Lampasas River at Belton; Colorado River at Austin; San Marcos River at San Marcos; Comal Creek at New Braunfels.
20, 21, 22, 24	<i>Notropis sabinae</i>	Sabine River at Longview.
15	<i>Notropis delicius</i>	Lampasas River at Belton; Comal Creek at New Braunfels; San Marcos River at San Marcos.
19, 22, 23	<i>Notropis venustus</i>	Lampasas River at Belton; Comal Creek at New Braunfels; San Marcos River at San Marcos.
17, 19	<i>Notropis texanus</i>	Trinity River at Dallas; Lampasas River at Belton.
20	<i>Notropis notatus</i>	Colorado River at Austin.
21, 22, 24	<i>Notropis swaini</i>	Colorado River at Austin; San Marcos River at San Marcos; Comal Creek at New Braunfels.
14	<i>Hybopsis storerianus</i>	Red River at Fulton.

Fishes collected in Arkansas, Indian Territory, and Texas, in September 1884—Continued.

Page.	Species.	Locality.
14, 21	<i>Hybopsis aestivalis</i> .....	Red River at Fulton; Colorado River at Austin.
22, 24	<i>Hybopsis aestivalis marconis</i> .....	San Marcos River at San Marcos; Comal Creek at New Braunfels.
15, 17	<i>Phenacobius mirabilis</i> .....	Sabine River at Longview; Trinity River at Dallas.
14	<i>Hiodon alosoides</i> .....	Red River at Fulton.
14	<i>Clupea chrysochloris</i> .....	Do.
14, 24	<i>Dorosoma cepedianum</i> .....	Red River at Fulton; Comal Creek at New Braunfels.
14, 16, 17,	<i>Gambusia patruelis</i> — <i>affinis</i> .....	Red River at Fulton; Sabine River at Longview; Trinity River
19, 21, 22,		at Dallas; Lampasas River near Belton; Colorado River at
24		Austin; San Marcos River at San Marcos; Comal Creek at New Braunfels.
14, 16, 17,	<i>Zygonectes notatus</i> .....	Red River at Fulton; Sabine River at Longview; Trinity River
19, 21		at Dallas; Lampasas River near Belton; Colorado River at Austin.
14, 16, 19,	<i>Micropterus salmoides</i> .....	Red River at Fulton; Sabine River at Longview; Lampasas
21, 22, 24		River near Belton; Colorado River at Austin; San Marcos
		River at San Marcos; Comal Creek at New Braunfels.
14, 17, 21,	<i>Lepomis pallidus</i> .....	Red River at Fulton; Trinity River at Dallas; Colorado River
24		at Austin; Comal Creek at New Braunfels.
16	<i>Lepomis humilis</i> .....	Sabine River at Longview.
19, 21	<i>Lepomis cyanellus</i> .....	Lampasas River near Belton; Colorado River at Austin.
19, 21, 23,	<i>Lepomis megalotis</i> .....	Lampasas River near Belton; Colorado River at Austin; San
24		Marcos River at San Marcos; Comal Creek at New Braunfels.
14	<i>Pomoxys sparoides</i> .....	Red River at Fulton.
19	<i>Channobryctus gulosus</i> .....	Leon River at Belton.
14	<i>Cottogaster shumardi</i> .....	Red River at Fulton.
14, 16	<i>Ammoerypta clara</i> .....	Red River at Fulton; Sabine River at Longview.
16	<i>Ammoerypta vivax</i> .....	Sabine River at Longview.
16, 17, 19,	<i>Hadropterus sclerurus serrula</i> .....	Sabine River at Longview; Trinity River at Dallas; Lampasas
23, 24		River near Belton; San Marcos and Comal rivers.
16	<i>Etheostoma jessiae</i> .....	Sabine River at Longview.
17	<i>Etheostoma fusiforme</i> .....	Trinity River at Dallas.
19, 21, 23,	<i>Etheostoma lepidum</i> .....	Lampasas River near Belton; Colorado River (Barton Spring)
24		at Austin; San Marcos River at San Marcos; Comal Creek at New Braunfels.
14	<i>Rocoxys chrysops</i> .....	Red River at Fulton.
14, 21	<i>Aplocheilichthys grunniens</i> .....	Red River at Fulton; Colorado River at Austin.
21	<i>Percina caprodes</i> .....	Colorado River at Austin.
23	<i>Alvarius fonticola</i> .....	San Marcos River at San Marcos.
21, 22	<i>Anguilla anguilla rostrata</i> .....	Barton Spring at Austin; San Marcos Spring.

1890. CHARLES H. GILBERT. Description of a new species of *Etheostoma* (*E. micropterus*) from Chihuahua, Mexico. <Proc. U. S. Nat. Mus. 1890, 289-290.

In this paper is given the description of *Etheostoma micropterus*. The type is a single specimen, 1½ inches long, collected at Chihuahua, Mexico, by Mr. E. Wilkinson, and is in the U. S. National Museum as No. 38245.

1891. DAVID STARR JORDAN. Report of Explorations in Colorado and Utah during the summer of 1889, with an account of the Fishes found in each of the river basins examined. <Bull. U. S. Fish Commission for 1889, 1-40, plates I-V, May 29, 1891.

During these explorations some work was done in the Rio Grande basin. The species obtained are given in the following table:

Page.	Species.	Locality.
19	<i>Pantosteus plebeius</i> .....	Rio Grande at Del Norte, Colo.; Rio Grande at Alamosa, Colo.;
		Rio Conejos near Alamosa, Colo.
20	<i>Leuciscus pulcher</i> .....	Rio Grande at Del Norte and Alamosa; Rio Conejos near Alamosa.
22	<i>Rhinichthys dulcis</i> .....	Do.
22	<i>Salmo mykiss spilurus</i> .....	Rio Grande at Del Norte; Rio Conejos near Alamosa.

1892. A. J. WOOLMAN. New Fishes from Chihuahua, Mexico. <American Naturalist, March, 1892, 259-261.

This paper contains descriptions of two new species of fishes (*Notropis chihuahua* and *Etheostoma scovellii*) collected by Mr. Woolman in the Rio de las Conchas, at Chihuahua, in the summer of 1891.

1892a. BARTON W. EVERMANN. Report on the Establishment of Fish-Cultural Stations in the Rocky Mountain region and Gulf States. Senate Mis. Doc. No. 65, Fifty-second Congress, first session, May 25, 1892. Pages I-IV and 1-88; plates I to xxxvi. [Also printed as Articles 1 and 2 of U. S. Fish Commission Bulletin for 1891.]

Part 2 of this report is "A report upon investigations made in Texas in 1891." Of the fishes collected during these investigations only the *Cyprinidæ* and *Cyprinodontidæ* were reported upon at that time. Thirty-one species of these two families were given, ten of which were described as new.

1892b. BARTON W. EVERMANN. Description of a new Sucker, *Pantosteus jordani*, from the upper Missouri Basin. < Bull. U. S. Fish Commission for 1892, 51-56, January 27, 1893.

This paper also contains a brief review of the species of the genus *Pantosteus*, together with a list of the specimens now contained in the National Museum and the localities from which they were obtained.

LIST SHOWING THE SPECIES OF EACH FAMILY OF FISHES REPRESENTED IN THE TEXAN AND RIO GRANDE FAUNA.

From the following list it appears that the fishes of this region represent 51 families, 137 genera, and 230 species. The family having the greatest number of species is, of course, the *Cyprinidæ*, the number being 55; the *Cyprinodontidæ* come next with 19 species, and then the *Percidæ* with 16 species. The genus *Notropis* is represented by 27 species, this being the greatest number of species found in this region belonging to a single genus. Of these 230 species, 100 (or 43 per cent) have been taken only in salt water or brackish water, 120 (or 52 per cent) have been recorded only from fresh water, while 10 species (4 per cent) have been taken in both salt and fresh water. The number of fresh-water species known from the Wabash River basin is 130, this being 10 more than the number now known from the vast area covered by this paper; but the Wabash basin is probably the richest in species and individuals of any river basin of similar size in North America. Many of the species of this list have been described as new species, the types of which came from this region. Under each recognized species we have given the various names under which it has been so described.

List showing the species of each family of fishes represented in the Texan and Rio Grande Fauna.

I. GALERONINIDÆ.

1. *Carcharhinus platyodon* (Poey).

II. PRISTIDIDÆ.

2. *Pristis pectinatus* Latham.

III. DASYATIDÆ.

3. *Dasabatis sayi* (Le Sueur).  
4. *Trigon sabina* (Le S.).

IV. AËTOBATIDÆ.

5. *Aëtobatis freminvillei* (Le S.).

V. ACIPENSERIDÆ.

6. *Scaphirhynchus platyrhynchus* (Raf.).

VI. LEPISTOIDEÆ.

7. *Lepisosteus ossens* (L.).  
8. *Lepisosteus platystomus* Raf.  
    *Lepisosteus (Cylindrosteus) latirostris* Grd.  
9. *Lepisosteus tristoechus* (Bloch & Schneider).  
    *Lepisosteus (Atractosteus) berlandieri* Grd.  
    *Lepisosteus leptorhynchus* Grd.

VII. SILURIDÆ.

10. *Noturus nocturnus* Jordan & Gilbert.  
11. *Leptops olivaris* (Raf.).  
12. *Ameiurus melas* (Raf.).  
    *Ameiurus brachyacanthus* Cope.  
13. *Ameiurus nebulosus catulus* (Grd.).  
14. *Ameiurus natalis* (Le S.).  
    *Pimelodus antoniensis* Grd.  
    *Pimelodus felis* Grd.  
15. *Ameiurus natalis bolli* Cope.  
16. *Ameiurus lupus* (Grd.).  
17. *Ictalurus punctatus* (Raf.).  
    *Pimelodus vulpes* Grd.  
18. *Ictalurus furcatus* (C. & V.).  
    *Pimelodus affinis* B. & G.  
19. *Tachysurus felis* (L.).  
    *Arius equestris* B. & G.  
20. *Felichthys marinus* (Mitchill).

VIII. CATOSTOMIDÆ.

21. *Ictiobus cyprinella* (C. & V.).  
22. *Ictiobus bubalus* (Raf.).  
23. *Carpiodes carpio* (Raf.).  
24. *Carpiodes velifer* (Raf.).  
25. *Carpiodes velifer tumidus* B. & G.  
    *Carpiodes grayi* Cope.

List showing the species of each family of fishes represented in the Texan and Rio Grande Fauna.—Continued.

## VIII. CATOSTOMIDÆ—Continued.

26. *Pantosteus plebeius* (B. & G.).  
*Catostomus guzmanensis* Grd.  
*Catostomus nebuliferus* Garman.
27. *Catostomus teres* (Mitchell).
28. *Erimyzon succetta* (Lac.).  
*Moxostoma kennerlyi* Grd.  
*Moxostoma campbelli* Grd.  
*Moxostoma claviformis* Grd.
29. *Minytrema melanops* (Raf.).  
*Moxostoma victoriae* Grd.
30. *Moxostoma congestum* (B. & G.).  
*Ptychostomus albidus* Grd.
31. *Moxostoma pœcilurum* Jordan.
- IX. CYPRINIDÆ.
32. *Campostoma ornatum* Grd.
33. *Campostoma anomalum* (Raf.).  
*Campostoma nasutum* Grd.  
*Campostoma anomalum pullum* Cope.
34. *Campostoma formosulum* Grd.
35. *Zophendum plumbeum* (Grd.).  
*Hyborhynchus puniceus* Grd.  
*Dionda grisea* Grd.
36. *Dionda melanops* Grd.  
*Dionda couchi* Grd.  
*Hybognathus melanops* Jordan.
37. *Dionda punctifer* Garman.
38. *Dionda fluviatilis* (Grd.).
39. *Dionda amara* (Grd.).
40. *Dionda episcopa* Grd.  
*Dionda texensis* Grd.  
*Dionda argentea* Grd.  
*Hybognathus flavipinnis* Cope.
41. *Dionda serena* Grd.  
*Dionda papalis* Grd.  
*Dionda chrysitis* Grd.  
*Hybognathus nigrotæniata* Cope.
42. *Hybognathus nuchalis* Agassiz.
43. *Pimephales promelas confertus* (Grd.).  
*Hybognathus nigellus* Cope.
44. *Pimephales notatus* (Raf.).  
*Hyborhynchus tenellus* Grd.
45. *Cochlognathus ornatus* B. & G.  
*Cochlognathus biguttata* Cope.
46. *Cliola vigilax* (B. & G.).  
*Cliola velox* Grd.  
*Cliola vivax* Grd.
47. *Notropis cayugaatrocaudalis* Evermann
48. *Notropis nitidus* (Grd.).
49. *Notropis nux* Evermann.
50. *Notropis deliciosus* (Grd.).  
*Alburnops missouriensis* Jordan.
51. *Notropis sabinæ* J. & G.
52. *Notropis nocomis* Evermann.
53. *Notropis sinus* (Cope).
54. *Notropis ornatus* (Grd.).
55. *Notropis chiliuahua* Woolman.
56. *Notropis leoninus* (Grd.).  
*Moniana frigida* Grd.  
*Moniana complanata* Grd.
57. *Notropis lutrensis* (B. & G.).  
*Moniana couchi* Grd.  
*Moniana rutila* Grd.  
*Moniana gracilis* Grd.  
*Moniana gibbosa* Grd.  
*Moniana lætabilis* Grd.  
*Cyprinella suavis* Grd.  
*Hypsilepis iris* Cope.  
*Moniana jugalis*, var., Cope.
58. *Notropis proserpina* (Grd.).
59. *Notropis formosus* (Grd.).
60. *Notropis bubalinus* (B. & G.).  
*Cyprinella umbrosa* Grd.
61. *Notropis lepidus* (Grd.).
62. *Notropis garmani* Jordan.  
*Cyprinella rubripinna* Garman.
63. *Notropis macrostomus* (Grd.).  
*Cyprinella luxilloides* Grd.
64. *Notropis venustus* (Grd.).  
*Cliola urostigma* Jordan & Meek.
65. *Notropis notatus* (Grd.).
66. *Notropis texanus* (Grd.).
67. *Notropis amabilis* (Grd.).
68. *Notropis socinus* (Grd.).
69. *Notropis swaini* J. & G.  
*Alburnus megalops* Grd.

## IX. CYPRINIDÆ—Continued.

70. *Notropis umbratilis* (Grd.).
71. *Notropis dilectus* (Grd.).  
*Alburnellus jemezianus* Cope.
72. *Notropis fumetus* Evermann.
73. *Notropis notemigonoides* Evermann.
74. *Phenacobius mirabilis* (Grd.).
75. *Rhinichthys dulcis* (Grd.).  
*Rhinichthys simus* Garman.
76. *Agosia oscula* (Grd.).  
*Apocope ventricosa* Cope.
77. *Agosia yarrowi* Jordan & Evermann.
78. *Hybopsis storerianus* (Kirtland).
79. *Hybopsis festivalis* (Grd.).  
*Coratichthys sterletus* Cope.
80. *Hybopsis festivalis marconis* J. & G.
81. *Semophilus atomaculatus* (Mitch.).  
*Leucosomus incrassatus* Grd.  
*Leucosomus pallidus* Grd.
82. *Stypodon signifer* Garman.
83. *Leuciscus nigrescens* (Grd.).  
*Gila pulchella* B. & G.  
*Clinostomus pandora* Cope.  
*Tigoma pulchra* Grd.  
*Cheonda modesta* Garman.
84. *Leuciscus conspersus* (Garman).
85. *Opsopoeodus oscula* Evermann.
86. *Notemigonus chrysoleucus* (Mitch.).  
*Luxilus leptosomus* Grd.
- X. CHARACINIDÆ.
87. *Tetragonopterus argentatus* (B. & G.).
- XI. HIODONTIDÆ.
88. *Hiodon alosoides* (Raf.).
- XII. ELOPIDÆ.
89. *Megalops atlanticus* C. & V.
- XIII. CLUPEIDÆ.
90. *Clupea chrysochloris* (Raf.).
91. *Harengula arcuata* (Jenyns).
92. *Opisthonema thrissa* (Osbeck).
93. *Brevoortia tyrannus patronus* Goode.
94. *Dorosoma cepedianum* (Le S.).
- XIV. ENGRAULIDÆ.
95. *Stolephorus browni* (Gmelin).
96. *Stolephorus mitchilli* (C. & V.).
- XV. SCOPELIDÆ.
97. *Synodus foetens* (L.).
- XVI. SALMONIDÆ.
98. *Salmo mykiss spilurus* Cope.  
*Salmo virginialis* Cope.
- XVII. CYPRINODONTIDÆ.
99. *Cyprinodon variegatus* Lac.  
*Cyprinodon gibbosus* B. & G.  
*Cyprinodon bovinus* B. & G.  
*Cyprinodon eximius* Grd.
100. *Cyprinodon latifasciatus* Garman.
101. *Cyprinodon elegans* B. & G.
102. *Adinia multifasciata* Grd.
103. *Fundulus pallidus* Evermann.
104. *Fundulus similis* (B. & G.).
105. *Fundulus zebrinus* J. & G.
106. *Fundulus diaphanus* (Le S.).
107. *Fundulus heteroclitus grandis* B. & G.
108. *Zygonectes funduloides* Evermann.
109. *Zygonectes pulvereus* Evermann.
110. *Zygonectes jenkinsi* Evermann.
111. *Zygonectes notatus* (Raf.).
112. *Zygonectes escambie* Bollman.
113. *Lucania venusta* (Grd.).
114. *Lucania parva* (B. & G.).
115. *Gambusia affinis* (B. & G.).  
*Heterandria nobilis* B. & G.  
*Heterandria patruelis* B. & G.  
*Gambusia gracilis* Grd.  
*Gambusia humilis* Günther.  
*Zygonectes brachypterus* Cope.  
*Gambusia speciosa* Grd.  
*Gambusia senilis* Grd.

List showing the species of each family of fishes represented in the Texan and Rio Grande Fauna—Continued.

## XVII. CYPRINODONTIDÆ—Continued.

116. *Mollienisia latipinna* Le S.  
*Pœcilia ineolata* Grd.  
*Limia pœcilooides* Grd.  
*Limia matamorensis* Grd.  
*Limia formosa* Grd.  
 117. *Pœcilia couchiana* (Grd.).

## XVIII. ESOCIDÆ.

118. *Lucius vermiculatus* (Le S.).

## XIX. MURÆNIDÆ.

119. *Gymnothorax ocellatus nigromarginatus* (Grd.).

## XX. ECHELIDÆ.

120. *Myrophis punctatus* Lutken.  
*Myrophis lumbricus* J. & G.

## XXI. MURÆNESOCIDÆ.

121. *Neoconger mucronatus* Grd.

## XXII. ANGUILLIDÆ.

122. *Anguilla chrysypa* Raf.

## XXIII. SCOMBERESOCIDÆ.

123. *Tylosurus longirostris* (Mitchell).  
*Belone scrutator* Grd.  
 124. *Hemirhamphus unifasciatus* Ranzani.

## XXIV. SYNGNATHIDÆ.

125. *Siphostoma florida* J. & G.  
 126. *Siphostoma louisiana* (Günther).  
 127. *Siphostoma fuscum* (Storer).

## XXV. MUGILIDÆ.

128. *Mugil cephalus* L.  
*Mugil berlandieri* Grd.

## XXVI. ATHERINIDÆ.

129. *Labidesthes sicculus* (Cope).  
 130. *Menidia vagrans* (Goode & Bean).  
 131. *Menidia peninsulæ* (Goode & Bean).

## XXVII. POLYNEMIDÆ.

132. *Polynemus octonemus* Grd.

## XXVIII. TRICHIURIDÆ.

133. *Trichiurus lepturus* L.

## XXIX. CARANGIDÆ.

134. *Caranx hippos* (L.).  
 135. *Vomer setipinnis* (Mitch.).  
 136. *Selene vomer* (L.).  
 137. *Chloroscombrus chrysurus* (L.).  
*Chloroscombrus caribbæus* Grd.  
 138. *Trachynotus carolinus* (L.).  
 139. *Oligoplites saurus* (Bloch & Schneider).  
*Chorinemus lanceolatus* Grd.

## XXX. APHREDODERIDÆ.

140. *Aphredoderus sayanus* (Gilliams).

## XXXI. CENTRARCHIDÆ.

141. *Pomoxis annularis* Raf.  
 142. *Pomoxis sparoides* (Lac.).  
 143. *Chænobryttus gulosus* (C. & V.).  
*Calliurus melanops* Grd.  
 144. *Lepomis cyanellus* Raf.  
*Calliurus formosus* Grd.  
*Calliurus diaphanus* Grd.  
*Pomotis longulus* B. & G.  
*Bryttus signifer* Grd.  
*Calliurus microps* Grd.  
*Calliurus murinus* Grd.  
 145. *Lepomis symmetricus* Forbes.  
 146. *Lepomis miniatus* Jordan,

## XXXI. CENTRARCHIDÆ—Continued.

147. *Lepomis megalotis* (Raf.).  
*Pomotis breviceps* B. & G.  
*Pomotis convexifrons* B. & G.  
*Pomotis fallax* B. & G.  
*Pomotis nefastus* B. & G.  
*Pomotis popei* Grd.  
 148. *Lepomis humilis* (Grd.).  
*Lepomis anagallinus* var. Cope.  
 149. *Lepomis pallidus* (Mitch.).  
*Pomotis aquilensis* B. & G.  
*Pomotis speciosus* B. & G.  
 150. *Lepomis heros* (B. & G.).  
 151. *Lepomis albus* (Grd.).  
 152. *Micropterus salmoides* (Lac.).  
*Grystes nuccensis* B. & G.

## XXXII. PERCIDÆ.

153. *Etheostoma pellucidum clarum* (Jordan & Meek).  
 154. *Etheostoma vivax* (Hay).  
 155. *Etheostoma phlox* (Cope).  
 156. *Etheostoma chlorosoma* (Hay).  
 157. *Etheostoma shumardi* (Grd.).  
 158. *Etheostoma caprodes* (Raf.).  
*Pileoma carbonaria* B. & G.  
 159. *Etheostoma fasciatus* (Grd.).  
 160. *Etheostoma scierum serrula* (J. & G.).  
 161. *Etheostoma lepidum* (B. & G.).  
 162. *Etheostoma lepidogenys* sp. nov.  
 163. *Etheostoma micropterus* Gilbert.  
 164. *Etheostoma australe* Jordan.  
*Etheostoma scovelli* Woolman.  
 165. *Etheostoma jessie* (Jordan & Brayton).  
 166. *Etheostoma fusiforme* (Grd.).  
*Boleosoma gracile* Grd.  
 167. *Etheostoma lateralis* (Grd.).  
 168. *Etheostoma fenticola* J. & G.

## XXXIII. SERRANIDÆ.

169. *Centropomus undecimalis* (Bloch).  
 170. *Roccus chrysoptus* (Raf.).  
 171. *Morone interrupta* Gill.

## XXXIV. SPARIDÆ.

172. *Lutjanus caxis* (Bloch & Schneider).  
 173. *Lutjanus aya* (Bloch).  
 174. *Rhomboplites aurorubens* (C. & V.).  
 175. *Orthopristis chrysopterus* (L.).  
*Orthopristis duplex* Grd.  
 176. *Lagodon rhomboides* (L.).  
 177. *Archosargus probatocephalus* (Walb.).

## XXXV. SCLENIDÆ.

178. *Aplodinotus grunniens* Raf.  
 179. *Pogonias chromis* (L.).  
 180. *Stelliferus lanceolatus* (Holbrook).  
 181. *Bairdiella chrysurus* (Lac.).  
 182. *Sciaena ocellata* (L.).  
 183. *Leiostomus xanthurus* Lac.  
 184. *Larimus fasciatus* Holbrook.  
 185. *Micropogon undulatus* (L.).  
 186. *Menticirrhus littoralis* (Holbrook).  
 187. *Menticirrhus americanus* (L.).  
*Umbrina phalena* Grd.  
 188. *Cynoscion nothus* (Holbrook).  
 189. *Cynoscion nebulosus* (C. & V.).

## XXXVI. GERRIDÆ.

190. *Gerres gula* (C. & V.).  
 191. *Gerres gracilis* (Gill).

## XXXVII. CICHLIDÆ.

192. *Heros cyanoguttatus* (B. & G.).  
 193. *Heros pavonaceus* Garman.

## XXXVIII. EPHIPPIDÆ.

194. *Chætodipterus faber* (Broussonet).

## XXXIX. GOBIIDÆ.

195. *Gobiomorus dormitator* (Bl. & Sch.).  
 196. *Dormitator maculatus* (Bloch).  
*Eleotris sumnulentus* Grd.  
 197. *Gobius lyricus* Grd.  
 198. *Gobius saporator* C. & V.  
*Gobius catulus* Grd.  
 199. *Gobius boleosoma* J. & G.



List showing the species of each family of fishes represented in the Texan and Rio Grande Fauna—Continued.

XXXIX. GOBIIDÆ—Continued.

- 200. *Gobius würdemanni* Grd.
- 201. *Gobionellus oceanicus* (Pallas).  
*Gobionellus hastatus* Grd.
- 202. *Lepidogobius gulosus* (Grd.).
- 203. *Gobiosoma bosci* (Lac.).
- 204. *Gobiosoma molestum* Grd.

XL. TRIGLIDÆ.

- 205. *Prionotus scitulus* J. & G.
- 206. *Prionotus tribulus* C. & V.

XLI. GOBIESOCIDÆ.

- 207. *Gobioxo virgatulus* J. & G.

XLII. BATRACHIDÆ.

- 208. *Batrachus tau* (L.).
- 209. *Porichthys porosissimus* (C. & V.).  
*Porichthys plectrodon* J. & G.

XLIII. URANOSCOPIDÆ.

- 210. *Upsilonphorus y-græcum* (C. & V.).
- 211. *Astroscopus anoplos* (C. & V.).

XLIV. BLENNIDÆ.

- 212. *Chasmodes bosquianus* (Lac.).
- 213. *Isesthes hentzi* (Le S.).
- 214. *Isesthes ionthas* J. & G.
- 215. *Isesthes scrutator* J. & G.
- 216. *Hypoleurochilus geminatus* (Wood).  
*Blennius multifilius* Grd.

XLV. OPHIDIIDÆ.

- 217. *Ophidion marginatum* De Kay.  
*Ophidion josephi* Grd.

XLVI. PLEURONECTIDÆ.

- 218. *Citharichthys spilopterus* Günther.
- 219. *Etropus crossotus* J. & G.
- 220. *Paralichthys lethostigma* J. & G.
- 221. *Ancylopsetta quadrocellata* Gill.
- 222. *Achirus fasciatus* Lac.
- 223. *Symphurus plagiusa* (L.).

XLVII. ANTENNARIIDÆ.

- 224. *Pterophryne histrio* (L.).

XLVIII. MALTHIDÆ.

- 225. *Maltho vespertilio* (L.).

XLIX. OSTRACIDÆ.

- 226. *Ostracion tricorne* L.

L. BALISTIDÆ.

- 227. *Alutera schœpffi* (Walb.).

LI. TETRODONTIDÆ.

- 228. *Lagocephalus levigatus* (L.).
- 229. *Tetrodon nephelus* Goode & Bean.
- 230. *Chilomycterus schœpffi* (Walb.).

LIST OF NOMINAL SPECIES WHICH HAVE BEEN DESCRIBED FROM TEXAN OR RIO GRANDE LOCALITIES.

Each of the 125 species of the following list has been described as new one or more times from this region. The total number of nominal species whose types came from this region is 194; of this number only 80 are now regarded as good species. In the following table we give, in the first column the tenable species, in the second the nominal species; the date of the specific name is given in the third column, while in the fourth column is given the locality from which the types came.

List of nominal species which have been described from Texan or Rio Grande localities.

Species now recognized.	Nominal species.	Date.	Type locality.
1. <i>Lepisosteus platystomus</i> Raf ..	1. <i>Lepidosteus</i> ( <i>Cylindrosteus</i> ) <i>latirostris</i> Grd.	1858	Pecos River.
2. <i>Lepisosteus tristoechus</i> (Bl. & Sch.).	2. <i>Lepidosteus</i> ( <i>Atractosteus</i> ) <i>berlandieri</i> Grd.	1858	Tamaulipas, Mexico.
3. <i>Noturus nocturnus</i> J. & G. ....	3. <i>Lepidosteus leptorhynchus</i> Grd.	1858	Devil River, Texas.
4. <i>Ameiurus melas</i> (Raf.) .....	4. <i>Noturus nocturnus</i> J. & G. ....	1884	Poteau River near Fort Smith, Ark.
5. <i>Ameiurus nebulosus catulus</i> (Grd.).	5. <i>Ameiurus brachyacanthus</i> Cope	1880	Wallace Creek, in Bandera County.
6. <i>Ameiurus natalis</i> (Le S.) .....	6. <i>Ameiurus nebulosus catulus</i> (Grd.).	1858	Fort Smith, Ark.
7. <i>Ameiurus natalis bolli</i> Cope ...	7. <i>Pimelodus antoniensis</i> Grd ....	1858	Near San Antonio.
8. <i>Ameiurus lupus</i> (Grd.) .....	8. <i>Pimelodus felinus</i> Grd .....	1858	Tributary of Gypsum Creek.
9. <i>Ictalurus punctatus</i> (Raf.) .....	9. <i>Ameiurus natalis bolli</i> Cope ...	1880	Little Wichita River, northern Texas.
10. <i>Ictalurus furcatus</i> (Cuv. & Val.)	10. <i>Pimelodus lupus</i> Grd .....	1856	Indianola to Nueces, and headwaters of Pecos River.
11. <i>Tachysaurus felis</i> (L.) .....	11. <i>Pimelodus vulpes</i> Grd. ....	1859	Salado River.
12. <i>Carpiodes velifer tumidus</i> B. & G.	12. <i>Icthmelurus carulescens</i> Cope.	1880	Little Wichita River.
13. <i>Pantosteus plebeius</i> (B. & G.) ..	13. <i>Pimelodus affinis</i> B. & G. ....	1854	Mouth of Rio Grande near Brownsville.
	14. <i>Arius equestris</i> B. & G. ....	1854	Indianola.
	15. <i>Carpiodes tumidus</i> B. & G. ....	1854	Near Fort Brown.
	16. <i>Carpiodes grayi</i> Cope .....	1870	San Ildefonso, N. Mex.
	17. <i>Catostomus plebeius</i> B. & G. ....	1854	Rio Mimbres, Chihuahua.
	18. <i>Catostomus</i> ( <i>Acomus</i> ) <i>guzman-</i> <i>iensis</i> Grd.	1856	Janos River.
	19. <i>Catostomus nebuliferus</i> Gar ...	1881	Nazas River, Coahuila.

List of nominal species which have been described from Texan or Rio Grande localities—Continued.

Species now recognized.	Nominal species.	Date.	Type locality.
14. <i>Erimyzon sucetta</i> (Lac.) .....	20. <i>Moxostoma kennerlii</i> Grd. ....	1856	Dry Creek near Victoria.
	21. <i>Moxostoma campbelli</i> Grd. ....	1856	Devil River, Live Oak Creek.
	22. <i>Moxostoma claviformis</i> Grd. ....	1856	Coal Creek (tributary of South Fork of Canadian River).
15. <i>Minytrema melanops</i> (Raf.) ....	23. <i>Moxostoma victoriae</i> Grd. ....	1856	Dry Creek near Victoria.
16. <i>Moxostoma congestum</i> (B. & G.) ..	24. <i>Catostomus congestus</i> B. & G. ....	1854	Rio Salado.
	25. <i>Ptychostomus albidus</i> Grd. ....	1856	Rio San Juan near Monterey, New Leon.
17. <i>Campostoma ornatum</i> Grd. ....	26. <i>Campostoma ornatum</i> Grd. ....	1856	Chihuahua River and a tributary only a few miles long.
18. <i>Campostoma anomalum</i> (Raf.) ..	27. <i>Campostoma nasutum</i> Grd. ....	1856	Cadereita and near Monterey, New Leon.
19. <i>Campostoma formosulum</i> Grd. ..	28. <i>Campostoma formosulum</i> Grd. ....	1856	Rio Sabinal, a tributary of the San Antonio.
20. <i>Zophendum plumbeum</i> (Grd.) ..	29. <i>Dionda plumbea</i> Grd. ....	1856	Headwaters of the Canadian River, Llano Estacado.
	30. <i>Dionda grisea</i> Grd. ....	1858	20 miles west of the Choctaw Agency.
	31. <i>Hyborhynchus puniceus</i> Grd. ....	1856	Llano Estacado.
21. <i>Dionda melanops</i> Grd. ....	32. <i>Dionda melanops</i> Grd. ....	1856	Buena Vista, Coahuila.
	33. <i>Dionda couchi</i> Grd. ....	1856	Cuajuco, Monterey, and Cadereita, New Leon, in the San Juan River.
22. <i>Dionda punctifer</i> Garman .....	34. <i>Hybognathus</i> ( <i>Dionda</i> ) <i>punctifer</i> Garman. ....	1881	Farras, and spring near Saltillo.
23. <i>Dionda fluviatilis</i> (Grd.) .....	35. <i>Algoma fluviatilis</i> Grd. ....	1856	Near Monterey, New Leon.
24. <i>Dionda amara</i> (Grd.) .....	36. <i>Algoma amara</i> Grd. ....	1856	Lagoon near Fort Brown on the Rio Grande.
25. <i>Dionda episcopa</i> Grd. ....	37. <i>Dionda episcopa</i> Grd. ....	1856	Headwaters of the Pecos River, and Comanche Spring.
	38. <i>Dionda texensis</i> Grd. ....	1856	Nueces River.
	39. <i>Dionda argentosa</i> Grd. ....	1856	San Felipe Creek and Devil Creek (tributaries of Rio Grande).
	40. <i>Hybognathus flavipinnis</i> Cope. ....	1880	Johnson Fork of Llano River, Kimble County.
26. <i>Dionda serena</i> Grd. ....	41. <i>Dionda serena</i> Grd. ....	1856	Sabinal River.
	42. <i>Dionda papalis</i> Grd. ....	1856	Delaware River (tributary of Pecos River).
	43. <i>Dionda chrysis</i> Grd. ....	1856	Live Oak Creek.
	44. <i>Hybognathus nigroteniata</i> Cope. ....	1880	Upper waters of Wallace Creek.
27. <i>Pimephales promelas confertus</i> (Grd.) ..	45. <i>Hybognathus nigellus</i> Cope. ....	1875	San Ildefonso, N. Mex.
28. <i>Pimephales notatus</i> (Raf.) .....	46. <i>Hyborhynchus tenellus</i> Grd. ....	1856	20 miles west of Choctaw Agency.
	47. <i>Cochlognathus</i> B. & G. ....	1854	Brownsville.
29. <i>Cochlognathus ornatus</i> B. & G. ....	48. <i>Cochlognathus ornatus</i> B. & G. ....	1854	Do.
	49. <i>Cochlognathus biguttata</i> Cope. ....	1880	Trinity River at Fort Worth.
30. <i>Cliola vigilax</i> (B. & G.) .....	49. <i>Ceratichthys vigilax</i> B. & G. ....	1853	Otter Creek, Arkansas.
	50. <i>Cliola velox</i> Grd. ....	1856	San Pedro Creek.
	51. <i>Cliola vivax</i> Grd. ....	1856	Leon River (tributary of San Antonio River).
31. <i>Notropis nitidus</i> (Grd.) .....	52. <i>Moniana nitida</i> Grd. ....	1856	Cadereita, New Leon.
32. <i>Notropis deliciosus</i> (Grd.) .....	53. <i>Moniana deliciosus</i> Grd. ....	1856	Leon River (tributary of San Antonio)
33. <i>Notropis sabinae</i> J. & G. ....	54. <i>Notropis sabinae</i> J. & G. ....	1886	Sabine River, Longview.
34. <i>Notropis simus</i> (Cope) .....	55. <i>Alburnellus simus</i> Cope. ....	1875	San Ildefonso, N. Mex.
35. <i>Notropis ornatus</i> (Grd.) .....	56. <i>Codoma ornata</i> Grd. ....	1856	Chihuahua River and tributaries.
36. <i>Notropis chihuahua</i> Woolman ..	57. <i>Notropis chihuahua</i> Woolman ..	1892	Rio de las Conchas, Chihuahua.
37. <i>Notropis leoninus</i> (Grd.) .....	58. <i>Moniana leonina</i> Grd. ....	1856	Leon River (tributary of San Antonio)
	59. <i>Moniana frigida</i> Grd. ....	1856	Rio Frio.
	60. <i>Moniana complanata</i> Grd. ....	1856	Brownsville.
38. <i>Notropis lutrensis</i> (B. & G.) .....	61. <i>Leuciscus lutrensis</i> B. & G. ....	1853	Otter Creek, Arkansas.
	62. <i>Moniana couchi</i> Grd. ....	1856	China, New Leon.
	63. <i>Moniana rutila</i> Grd. ....	1856	Cadereita, New Leon.
	64. <i>Moniana gracilis</i> Grd. ....	1856	Near Monterey, New Leon.
	65. <i>Moniana gibbosa</i> Grd. ....	1856	Brownsville.
	66. <i>Moniana laetabilis</i> Grd. ....	1856	Hurrah Creek.
	67. <i>Cyprinella suavis</i> Grd. ....	1856	Near San Antonio.
	68. <i>Hypsilopsis iris</i> Cope. ....	1875	San Ildefonso, N. Mex.
39. <i>Notropis proserpina</i> (Grd.) .....	69. <i>Notropis proserpina</i> Grd. ....	1856	Devil River.
	70. <i>Moniana aurata</i> Grd. ....	1856	Piedra Pointe, N. Mex.
40. <i>Notropis formosus</i> (Grd.) .....	71. <i>Moniana formosa</i> Grd. ....	1856	Rio Mimbres, Chihuahua.
41. <i>Notropis bubalinus</i> (B. & G.) ..	72. <i>Leuciscus bubalinus</i> B. & G. ....	1853	Otter Creek, Arkansas.
	73. <i>Cyprinella umbrosa</i> Grd. ....	1856	Coal Creek, and 20 miles west of Choctaw Agency.
42. <i>Notropis lepidus</i> (Grd.) .....	74. <i>Cyprinella lepidus</i> Grd. ....	1856	Rio Frio.
43. <i>Notropis garmani</i> Jor. ....	75. <i>Notropis garmani</i> Jor. ....	1885	Tributaries of Lago del Muerte, Coahuila.
	76. <i>Cyprinella rubripinna</i> Gar. ....	1881	Tributaries of Lago del Muerte.
44. <i>Notropis macrostomus</i> (Grd.) ..	77. <i>Cyprinella macrostoma</i> Grd. ....	1856	Devil River, and China, New Leon.
	78. <i>Cyprinella luxiloides</i> Grd. ....	1856	San Pedro Creek.
45. <i>Notropis notatus</i> (Grd.) .....	79. <i>Cyprinella notata</i> Grd. ....	1856	Rio Seco (tributary of Nueces River).
46. <i>Notropis texanus</i> (Grd.) .....	80. <i>Cyprinella texana</i> Grd. ....	1856	Rio Salado and Turkey Creek.
47. <i>Notropis venustus</i> (Grd.) .....	81. <i>Cyprinella venusta</i> Grd. ....	1856	Rio Sabinal.

List of nominal species which have been described from Texan or Rio Grande localities.—Continued.

Species now recognized.	Nominal species.	Date.	Type locality.
48. <i>Notropis amabilis</i> (Grd.).....	82. <i>Alburnus amabilis</i> Grd.....	1856	Leona River (tributary of Nueces River).
49. <i>Notropis socius</i> (Grd.).....	83. <i>Alburnus socius</i> Grd.....	1856	Live Oak Creek.
50. <i>Notropis swaini</i> J. & G.....	84. <i>Alburnus megalops</i> Grd.....	1856	San Felipe Creek.
51. <i>Notropis umbratilis</i> (Grd.).....	85. <i>Luxilus lucidus</i> Grd.....	1856	Coal Creek, and 20 miles west of Choctaw Agency.
52. <i>Notropis dilectus</i> (Grd.).....	86. <i>Alburnellus jemezianus</i> Cope...	1875	San Ildefonso, N. Mex.
53. <i>Notropis fumeus</i> Evermann.....	87. <i>Notropis fumeus</i> Evermann.....	1892	Hunter Creek, near Houston.
54. <i>Notropis notemigonoides</i> Ev...	88. <i>Notropis notemigonoides</i> Ev...	1892	Neches River east of Palestine and Sims Bayou near Houston.
55. <i>Rhinichthys dulcis</i> (Grd.).....	89. <i>Rhinichthys simus</i> Garman.....	1881	Coahuila, Mexico.
56. <i>Agosia oscula</i> (Grd.).....	90. <i>Apocope ventricosa</i> Cope.....	1875	"New Mexico" and "Rio Grande basin."
57. <i>Agosia yarrowi</i> Jor. & Ev.....	91. <i>Apocope oscula</i> Cope & Yar...	1875	Rio Grande, Colorado.
58. <i>Hybopsis aestivalis</i> (Grd.).....	92. <i>Gobio aestivalis</i> Grd.....	1856	Rio San Juan, near Cadereita, New Leon.
59. <i>Semotilus atromaculatus</i> (Mitch.).....	93. <i>Ceraticthys sterletus</i> Cope....	1875	Rio Grande at San Ildefonso, N. Mex.
60. <i>Stypodon signifer</i> Garman....	94. <i>Leucosomus incrassatus</i> Grd....	1856	20 miles west of Choctaw Agency.
61. <i>Leuciscus nigrescens</i> (Grd.)....	95. <i>Leucosomus pallidus</i> Grd.....	1856	Antelope Creek, Arkansas.
	96. <i>Stypodon signifer</i> Garman....	1881	Parras, Coahuila.
	97. <i>Gila pulchella</i> B. & G.....	1854	Rio Mimbres.
	98. <i>Tigoma pulchra</i> Grd.....	1856	Chihuahuana River and tributaries.
	99. <i>Clinostoma pandora</i> Cope.....	1877	Tributary of Rio Grande at Sangre de Cristo Pass.
	100. <i>Tigoma nigrescens</i> Grd.....	1856	Boca Grande and Janos River.
	101. <i>Gila gila</i> Cope & Yarrow.....	1875	Rio de Acama, N. Mex.
	102. <i>Gila egregia</i> C. & Y.....	1875	Rio Grande at Loma, Colorado.
62. <i>Leuciscus conspersus</i> (Gar.)...	103. <i>Gila conspersus</i> Garman.....	1881	Nazas River.
	104. <i>Cheonda modesta</i> Garman....	1881	Saltillo, Coahuila.
63. <i>Opsopocodus oscula</i> Evermann.	105. <i>Opsopocodus oscula</i> Evermann.	1892	Neches River and Long Lake near Palestine, Buffalo and Sims bayous, and Kilper's Pond near Houston, Dickinson Bayou at Nicholsonstone.
64. <i>Notemigonus chrysoleucus</i> (Mitch.).....	106. <i>Luxilus seco</i> Grd.....	1856	Rio Seco.
65. <i>Tetragonopterus argentatus</i> (B. & G.).....	107. <i>Luxilus leptosomus</i> Grd.....	1856	Dry Creek near Victoria.
66. <i>Brevoortia tyrannus patronus</i> Goode.	108. <i>Astyanax argentatus</i> B. & G....	1854	Upper tributaries of the Rio Nueces.
67. <i>Salmo mykiss spilurus</i> Cope...	109. <i>Brevoortia patronus</i> Goode....	1878	Brazos Santiago.
	110. <i>Salmo spilurus</i> Cope.....	1872	Tributary of Rio Grande at Sangre de Cristo Pass, Colorado.
	111. <i>Salar virginalis</i> Grd.....	1856	Utah Creek and Rio Grande at Sangre de Cristo Pass.
68. <i>Cyprinodon variegatus</i> B. & G.	112. <i>Cyprinodon gibbosus</i> B. & G....	1853	Indianola (brackish water).
69. <i>Cyprinodon latifasciatus</i> Gar...	113. <i>Cyprinodon bovinus</i> B. & G....	1853	Leon Springs.
70. <i>Cyprinodon elegans</i> B. & G. Adinia Grd.....	114. <i>Cyprinodon latifasciatus</i> Gar...	1881	Spring near Parras, Coahuila.
	115. <i>Cyprinodon elegans</i> B. & G. Adinia Grd.....	1859	Rio Grande.
71. <i>Adinia multifasciata</i> Grd.....	116. <i>Adinia multifasciata</i> Grd.....	1859	Galveston, St. Joseph Island, and Indianola.
	117. <i>Fundulus adinia</i> Jordan.....	1883	Do.
	118. <i>Fundulus xenicus</i> Jordan.....	1892	Do.
72. <i>Fundulus pallidus</i> Evermann..	119. <i>Fundulus pallidus</i> Evermann..	1892	Galveston.
73. <i>Fundulus similis</i> (B. & G.)....	120. <i>Hydrargyra similis</i> B. & G....	1853	Galveston Bay near Swan Lake.
74. <i>Fundulus heteroclitus grandis</i> B. & G.	121. <i>Fundulus grandis</i> B. & G....	1853	Indianola (brackish water).
		1853	Near Indianola (brackish water).
75. <i>Zygonectes funduloides</i> Ev....	122. <i>Zygonectes funduloides</i> Ev....	1892	Dickinson Bayou near Dickinson.
76. <i>Zygonectes pulvereus</i> Ev.....	123. <i>Zygonectes pulvereus</i> Ev.....	1892	Dickinson Bayou near Dickinson, Buffalo Bayou near Houston, and Oso Creek near Corpus Christi.
77. <i>Zygonectes jenkinsi</i> Evermann.	124. <i>Zygonectes jenkinsi</i> Evermann.	1892	Dickinson Bayou near Dickinson, and Galveston Bay.
	125. <i>Lucania</i> Grd.....	1859	Indianola.
78. <i>Lucania venusta</i> (Grd.).....	126. <i>Lucania venusta</i> Grd.....	1859	Do.
	127. <i>Heterandria patruelis</i> B. & G....	1853	Matamoras.
79. <i>Gambusia affinis</i> (B. & G.).....			Nueces basin, particularly Sabinal, Leona, and Nueces rivers, and Elm Creek.
	128. <i>Heterandria affinis</i> B. & G....	1853	Medina and Salado rivers.
	129. <i>Heterandria nobilis</i> B. & G....	1853	Leona and Comanche Springs.
	130. <i>Gambusia gracilis</i> Grd.....	1859	Matamoras.
	131. <i>Gambusia humilis</i> Günther....	1866	Do.
	132. <i>Zygonectes brachypterus</i> Cope...	1880	Trinity River at Fort Worth.
	133. <i>Gambusia speciosa</i> Grd.....	1859	Rio San Diego near Cadereita, New Leon.
80. <i>Mollinesia latipinna</i> LeS.....	134. <i>Gambusia senilis</i> Grd.....	1859	Chihuahuana River.
	135. <i>Poecilia lineolata</i> Grd.....	1859	Brownsville and Fort Brown.
	136. <i>Limia poeciloides</i> Grd.....	1859	Indianola.
	137. <i>Limia matamorensis</i> Grd.....	1859	Matamoras.
	138. <i>Limia formosa</i> Grd.....	1859	
81. <i>Poecilia couchiana</i> (Grd.).....	139. <i>Limia couchiana</i> Grd.....	1859	Rio San Juan at Cadereita and Monterey, New Leon.

List of nominal species which have been described from Texan or Rio Grande localities—Continued.

Species now recognized.	Nominal species.	Date.	Type locality.
82. <i>Gymnothorax ocellatus nigromarginatus</i> (Grd.)	140. <i>Neomuraena nigromarginata</i> Grd.	1859	St. Joseph Island.
83. <i>Myrophis punctatus</i> Lutken.	141. <i>Myrophis lumbricus</i> J. & G.	1882	Galveston.
84. <i>Neoconger mucronatus</i> Grd.	142. <i>Neoconger mucronatus</i> Grd.	1859	St. Joseph Island.
85. <i>Anguilla chryseypa</i> Raf.	143. <i>Anguilla tyrannus</i> Grd.	1859	Mouth of Rio Grande and Matamoras.
86. <i>Tylosurus longirostris</i> (Mitch.)	144. <i>Belone scrutator</i> Grd.	1859	Brazos and St. Joseph Island.
87. <i>Mugil cephalus</i> L.	145. <i>Mugil berlandieri</i> Grd.	1859	St. Joseph Island, Indianola, Brazos Santiago, Brazos, and Galveston.
88. <i>Polynemus octonemus</i> Grd.	146. <i>Polynemus octonemus</i> Grd.	1859	Brazos Santiago and Galveston.
89. <i>Caranx hippos</i> (L.)	147. <i>Carangus esculentus</i> Grd.	1859	Brazos Santiago, mouth of Rio Grande.
90. <i>Chloroscombrus chrysaurus</i> (L.)	148. <i>Chloroscombrus caribbeus</i> Grd.	1859	St. Joseph Island.
91. <i>Oligoplites saurus</i> (Bl. & Sch.)	149. <i>Chorinemus lanceolatus</i> Grd.	1859	Do.
92. <i>Chaenobryttus gulosus</i> (C. & V.)	150. <i>Calliurus melanops</i> Grd.	1857	Leon and Medina rivers, and Dry and San Pedro creeks.
93. <i>Lepomis cyanellus</i> Raf.	151. <i>Calliurus formosus</i> Grd.	1857	Tributary of Gypsum Creek, headwaters of the Brazos and Colorado rivers, Red River at Fort Washita, and the Brazos River.
	152. <i>Pomotis longulus</i> B. & G.	1853	Otter Creek, Arkansas.
	153. <i>Bryttus signifer</i> Grd.	1857	Medina River.
	154. <i>Calliurus microps</i> Grd.	1857	Red River at Fort Washita, and Brazos River.
	155. <i>Calliurus murinus</i> Grd.	1857	Indianola to Nueces, Delaware Creek, and headwaters of Brazos River.
94. <i>Lepomis megalotis</i> (Raf.)	156. <i>Pomotis convexifrons</i> B. & G.	1854	Cibolo River.
	157. <i>Pomotis breviceps</i> B. & G.	1853	Otter Creek, Arkansas.
	158. <i>Pomotis fallax</i> B. & G.	1854	Elm Creek.
	159. <i>Pomotis nefastus</i> B. & G.	1854	Cibolo and Salado rivers.
	160. <i>Pomotis popei</i> Grd.	1858	Headwaters of Colorado River.
95. <i>Lepomis humilis</i> (Grd.)	161. <i>Bryttus humilis</i> Grd.	1857	Brazos River.
96. <i>Lepomis pallidus</i> (Mitch.)	162. <i>Pomotis aquilensis</i> B. & G.	1853	Eagle Pass.
	163. <i>Pomotis speciosus</i> B. & G.	1854	Brownsville.
	164. <i>Pomotis heros</i> B. & G.	1854	
	165. <i>Pomotis heros</i> B. & G.	1854	Cibolo River.
97. <i>Lepomis albulus</i> (Grd.)	166. <i>Bryttus albulus</i> Grd.	1857	Blanco River.
98. <i>Micropterus salmoides</i> (Lac.)	167. <i>Gyrstes nuecensis</i> B. & G.	1854	Frio and Nueces rivers.
99. <i>Etheostoma phlox</i> (Cope)	168. <i>Boleosoma phlox</i> Cope	1880	Trinity River near Fort Worth.
100. <i>Etheostoma caprodes</i> (Raf.)	169. <i>Pileoma carbonaria</i> B. & G.	1853	Salado River.
101. <i>Etheostoma fasciatus</i> (Grd.)	170. <i>Dipleosion fasciatus</i> Grd.	1859b	Chihuahua River.
102. <i>Etheostoma scierum serrula</i> J. & G.	171. <i>Hadropterus scierum serrula</i> J. & G.	1886	Sabine River at Longview.
103. <i>Etheostoma lepidum</i> (B. & G.)	172. <i>Boleosoma lepida</i> B. & G.	1853	Nueces River (upper tributaries).
104. <i>Etheostoma micropterus</i> Gilb.	173. <i>Etheostoma micropterus</i> Gilb.	1890	Chihuahua, Mexico.
105. <i>Etheostoma australe</i> Jordan	174. <i>Etheostoma australe</i> Jordan	1892	Chihuahua River.
	175. <i>Etheostoma scovelli</i> Woolman	1892	Rio de las Conchas, Chihuahua.
106. <i>Etheostoma fusiforme</i> (Grd.)	176. <i>Boleosoma gracile</i> Grd.	1859b	Seco and Leona rivers.
107. <i>Etheostoma lepidogenys</i> Evermann & Kendall.	177. <i>Etheostoma epidogenys</i> Evermann & Kendall.	1893	Comal Springs, New Braunfels.
108. <i>Etheostoma lateralis</i> (Grd.)	178. <i>Alvarius lateralis</i> Grd.	1859b	Mouth of Rio Grande.
109. <i>Etheostoma fonticola</i> J. & G.	179. <i>Alvarius fonticola</i> J. & G.	1886	San Marcos River at San Marcos.
110. <i>Orthopristis chrysopterus</i> (L.)	180. <i>Orthopristis duplex</i> Grd.	1859	Indianola and Brazos Santiago.
111. <i>Aplodinotus grunniens</i> Raf.	181. <i>Ambledon neglectus</i> Grd.	1859	Mouth of Rio Grande and Matamoras.
112. <i>Menticirrhus americanus</i> (L.)	182. <i>Umbrina phalæna</i> Grd.	1859	Indianola and Brazos Santiago.
113. <i>Heros cyanoguttatus</i> (B. & G.)	183. <i>Heros cyanoguttatus</i> B. & G.	1854	Brownsville (fresh water).
114. <i>Heros pavonaceus</i> Garman	184. <i>Heros pavonaceus</i> Garman	1881	Spring near Monclova, Coahuila.
115. <i>Dormitor maculatus</i> (Bloch)	185. <i>Eleotris sumnulentus</i> Grd.	1859	Mouth of Rio Grande.
116. <i>Gobius lyricus</i> Grd.	186. <i>Gobius lyricus</i> Grd.	1858	Brazos Santiago.
117. <i>Gobius saporator</i> (Cuv. & Val.)	187. <i>Gobius catulus</i> Grd.	1859	St. Joseph Island.
118. <i>Gobius würdemanni</i> Grd.	188. <i>Gobius würdemanni</i> Grd.	1859	Brazos Santiago.
119. <i>Gobionellus oceanicus</i> (Pallas)	189. <i>Gobionellus hastatus</i> Grd.	1859	St. Joseph Island.
120. <i>Lepidogobius gulosus</i> Grd.	190. <i>Lepidogobius gulosus</i> Grd.	1858	Indianola.
121. <i>Gobiosoma molestum</i> Grd.	191. <i>Gobiosoma molestum</i> Grd.	1859	Do.
122. <i>Porichthys porosissimus</i> (C. & V.)	192. <i>Porichthys plectrodon</i> J. & G.	1882	Galveston.
123. <i>Isesthes scrutator</i> J. & G.	193. <i>Isesthes scrutator</i> J. & G.	1882	Do.
124. <i>Hyleurochilus geminatus</i> (Wood).	194. <i>Blennius multifluis</i> Grd.	1859	St. Joseph Island.
125. <i>Ophidion marginatum</i> DeKay.	195. <i>Ophidion josephi</i> Grd.	1859	Do.

## FISHES OF THE MEXICAN PORTION OF THE RIO GRANDE BASIN.

The number of species which have been reported from the Mexican portion of the Rio Grande basin is 54. Of this number, 16 species (indicated in the following list by an \*) have not as yet been collected from any United States locality. The remaining 38 species have been found either in the Rio Grande or on the Texan side of that stream. Those species which are regarded as belonging properly to the Mexican fauna, but which have extended their range into Texas (9 in number), are indicated by the †. Those species which belong to the fauna of the southwestern United States, but which have spread more or less into Mexico (29 in number), are indicated by the ‡.

In Dr. Eigenmann's recent list of the fresh-water fishes of Central America and southern Mexico,\* only 5 species are named which are also found in the Rio Grande basin. These five are *Gambusia gracilis* (= *affinis*), *Pecilia couchii* (*couchiana*), *Tetragonopterus argentatus*, *Gobiomorus dormitator*, and *Dormitator maculatus*. No Mexican locality is given for *Tetragonopterus argentatus*. We have not been able to find any Mexican reference nor the basis for the statement "Arkansas to Mexico" given in Jordan and Gilbert's Synopsis and repeated in this paper by Dr. Eigenmann.

1. <i>Lepisosteus tristœchus</i> . ‡	20. <i>Notropis formosus</i> . *	37. <i>Lucania venusta</i> . †
2. <i>Leptops olivaris</i> . †	21. <i>Notropis bubalinus</i> . ‡	38. <i>Gambusia affinis</i> . †
3. <i>Ictalurus punctatus</i> . †	22. <i>Notropis garmani</i> . *	39. <i>Mollienesia latipinna</i> . ‡
4. <i>Ictalurus furcatus</i> . †	23. <i>Phenacobius mirabilis</i> . ‡	40. <i>Pecilia couchiana</i> . *
5. <i>Carpiodes velifer tumidus</i> . †	24. <i>Rhinichthys dulcis</i> . †	41. <i>Lepomis pallidus</i> . †
6. <i>Pantosteus plebeius</i> . †	25. <i>Hybopsis œstivalis</i> . Occurrence in Mexico doubtful. †	42. <i>Lepomis heros</i> . ‡
7. <i>Campostoma ornatum</i> . *	26. <i>Stypodon signifer</i> . *	43. <i>Tetragonopterus salmoides</i> . ‡
8. <i>Campostoma anomalum</i> . †	27. <i>Leuciscus nigrescens</i> . †	44. <i>Etheostoma fasciatum</i> . *
9. <i>Campostoma formosulum</i> . †	28. <i>Leuciscus conspersus</i> . *	45. <i>Etheostoma lepidum</i> . †
10. <i>Dionda melanops</i> . †	29. <i>Tetragonopterus argentatus</i> . †	46. <i>Etheostoma micropterus</i> . *
11. <i>Dionda punctifer</i> . *	30. <i>Salmo mykiss spilurus</i> . †	47. <i>Etheostoma australe</i> . *
12. <i>Dionda fluviatilis</i> . *	31. <i>Cyprinodon variegatus</i> . †	48. <i>Etheostoma lateralis</i> . †
13. <i>Dionda amara</i> . †	32. <i>Cyprinodon latifasciatum</i> . *	49. <i>Aplodinotus grunniens</i> . †
14. <i>Cochlognathus ornatum</i> . †	33. <i>Afinia multifasciata</i> . †	50. <i>Heros cyanoguttatus</i> . †
15. <i>Notropis nitidus</i> . *	34. <i>Fundulus similis</i> . †	51. <i>Heros pavonaceus</i> . *
16. <i>Notropis chihuahuana</i> . *	35. <i>Fundulus zebrinus</i> . †	52. <i>Gobiomorus dormitator</i> . †
17. <i>Notropis ornatus</i> . *	36. <i>Fundulus heteroclitus grandis</i> . †	53. <i>Dormitator maculatus</i> . †
18. <i>Notropis leoninus</i> . †		54. <i>Gobius lyricus</i> . †
19. <i>Notropis lutrensis</i> . †		

## FISHES KNOWN ONLY FROM TEXAS AND THE RIO GRANDE BASIN.

The following 64 species (28 per cent) are thus far known only from the waters of Texas or the Rio Grande basin:

1. <i>Ameiurus nebulosus catulus</i> .	23. <i>Notropis ornatus</i> .	44. <i>Leuciscus nigrescens</i> .
2. <i>Ameiurus natalis bolli</i> .	24. <i>Notropis chihuahuana</i> .	45. <i>Leuciscus conspersus</i> .
3. <i>Ameiurus lupus</i> .	25. <i>Notropis leoninus</i> .	46. <i>Opsopœodus oscula</i> .
4. <i>Carpiodes velifer tumidus</i> .	26. <i>Notropis proserpina</i> .	47. <i>Tetragonopterus argentatus</i> .
5. <i>Pantosteus plebeius</i> .	27. <i>Notropis formosus</i> .	48. <i>Salmo mykiss spilurus</i> .
6. <i>Moxostoma congestum</i> .	28. <i>Notropis bubalinus</i> .	49. <i>Cyprinodon latifasciatum</i> .
7. <i>Campostoma ornatum</i> .	29. <i>Notropis lepidus</i> .	50. <i>Fundulus pallidus</i> .
8. <i>Campostoma formosulum</i> .	30. <i>Notropis garmani</i> .	51. <i>Zygonectes funduloides</i> .
9. <i>Zophendum plumbeum</i> .	31. <i>Notropis macrostomum</i> .	52. <i>Zygonectes pulvereus</i> .
10. <i>Dionda melanops</i> .	32. <i>Notropis venustus</i> .	53. <i>Zygonectes jenkinsi</i> .
11. <i>Dionda punctifer</i> .	33. <i>Notropis notatus</i> .	54. <i>Pecilia couchiana</i> .
12. <i>Dionda fluviatilis</i> .	34. <i>Notropis texanus</i> .	55. <i>Lepomis albus</i> .
13. <i>Dionda amara</i> .	35. <i>Notropis amabilis</i> .	56. <i>Etheostoma phlox</i> .
14. <i>Dionda episcopa</i> .	36. <i>Notropis socius</i> .	57. <i>Etheostoma fasciatum</i> .
15. <i>Dionda serena</i> .	37. <i>Notropis swaini</i> .	58. <i>Etheostoma lepidogenys</i> .
16. <i>Pimephales promelas confertus</i> .	38. <i>Notropis fumeus</i> .	59. <i>Etheostoma micropterus</i> .
17. <i>Cochlognathus ornatum</i> .	39. <i>Notropis notemigonoides</i> .	60. <i>Etheostoma australe</i> .
18. <i>Notropis cayuga atrocaudalis</i> .	40. <i>Agosia oscula</i> .	61. <i>Etheostoma lateralis</i> .
19. <i>Notropis nitidus</i> .	41. <i>Agosia yarrowi</i> .	62. <i>Etheostoma fonticola</i> .
20. <i>Notropis nux</i> .	42. <i>Hybopsis œstivalis marconis</i> .	63. <i>Heros cyanoguttatus</i> .
21. <i>Notropis nocomis</i> .	43. <i>Stypodon signifer</i> .	64. <i>Heros pavonaceus</i> .
22. <i>Notropis simus</i> .		

\* Catalogue of the Fresh-water Fishes of Central America and Southern Mexico. <Proc. U. S. Nat. Mus. 1893, 53-60.

The following 86 species (37 per cent) have been reported from only one locality in this region.

Species.	Locality from which reported.	Species.	Locality from which reported.
1. <i>Carcharhinus platyodon</i>	Galveston.	43. <i>Selene vomer</i> .....	Matamoras.
2. <i>Pristis pectinatus</i> .....	Do.	44. <i>Lepomis symmetricus</i> .....	Kilper's Pond, Houston.
3. <i>Dasalabatis sayi</i> .....	Corpus Christi.	45. <i>Lepomis albulus</i> .....	Rio Blanco.
4. <i>Triglo sabina</i> .....	Galveston.	46. <i>Etheostoma vivax</i> .....	Sabine River at Longview.
5. <i>Aëtolabatis freminvillei</i> ..	Do.	47. <i>Etheostoma phlox</i> .....	Trinity River at Ft. Worth.
6. <i>Ameiurus natalis bolli</i> .....	Little Wichita River.	48. <i>Etheostoma shumardi</i> .....	Red River at Fulton.
7. <i>Carioides velifer</i> .....	Red River at Fulton, Ark.	49. <i>Etheostoma fasciatum</i> .....	Chihuahua River.
8. <i>Catostomus teres</i> .....	Brownsville.	50. <i>Etheostoma lepidogenys</i> ...	Comal Springs, New Braunfels.
9. <i>Moxostoma pycilurum</i> .....	Sabine River at Longview.	51. <i>Etheostoma micropterus</i> .....	Chihuahua, Mexico.
10. <i>Campostoma ornatum</i> .....	Chihuahua River.	52. <i>Etheostoma australe</i> .....	Rio de las Conchas.
11. <i>Dionda punctiflar</i> .....	Spring near Saitilla.	53. <i>Etheostoma jessia</i> .....	Sabine River at Longview.
12. <i>Dionda fluviatilis</i> .....	Near Monterey, New Leon.	54. <i>Etheostoma lateralis</i> .....	Mouth of Rio Grande.
13. <i>Notropis nitidus</i> .....	Cadereta, New Leon	55. <i>Roccus chrysops</i> .....	Red River at Fulton.
14. <i>Notropis sabina</i> .....	Sabine River at Longview.	56. <i>Rhomboplites aurorubens</i> .....	Brazos Santiago.
15. <i>Notropis simus</i> .....	San Ildefonso, N. Mex.	57. <i>Stelliferus lanceolatus</i> .....	St. Joseph Island.
16. <i>Notropis ornatus</i> .....	Chihuahua River.	58. <i>Larimus fasciatus</i> .....	Galveston.
17. <i>Notropis chihuahua</i> .....	Do.	59. <i>Menticirrhus littoralis</i> .....	Do.
18. <i>Notropis formosus</i> .....	Rio Mimbres, Chihuahua.	60. <i>Cynoscion nothus</i> .....	Brazos Santiago.
19. <i>Notropis lepidus</i> .....	Rio Frio.	61. <i>Heros pavonaceus</i> .....	Mondova, Coahuila.
20. <i>Notropis garmani</i> .....	Lago del Muerte.	62. <i>Chaetodipterus faber</i> .....	Galveston.
21. <i>Notropis amabilis</i> .....	Rio Leona.	63. <i>Gobiomorus dormitator</i> .....	Mouth of Rio Grande.
22. <i>Notropis fumeus</i> .....	Hunter Creek near Houston.	64. <i>Gobius saporator</i> .....	St. Joseph Island.
23. <i>Agosia yarrowi</i> .....	Rio Grande, Colorado.	65. <i>Gobius wurdemanni</i> .....	Brazos Santiago.
24. <i>Hybopsis storerianus</i> .....	Red River at Fulton.	66. <i>Gobionellus oceanicus</i> .....	St. Joseph Island.
25. <i>Stypodon signifer</i> .....	Parras, Coahuila.	67. <i>Prionotus scitulus</i> .....	Galveston.
26. <i>Hiodon alosoides</i> .....	Red River at Fulton.	68. <i>Gobiesox virgatus</i> .....	Do.
27. <i>Megalops atlanticus</i> .....	Galveston.	69. <i>Porichthys porosissimus</i> .....	Do.
28. <i>Opisthonema thrissa</i> .....	Do.	70. <i>Upsilonphorus y-græcum</i> .....	Do.
29. <i>Stolephorus browni</i> .....	Do.	71. <i>Astroscopus anoplos</i> .....	Do.
30. <i>Cyprinodon latifasciatus</i> .....	Parras, Coahuila.	72. <i>Chasmodes bosquianus</i> .....	Corpus Christi.
31. <i>Fundulus pallidus</i> .....	Galveston Bay.	73. <i>Isesthes hentzi</i> .....	Do.
32. <i>Fundulus diaphanus</i> .....	Comanche Creek, Mason Co.	74. <i>Isesthes ionthas</i> .....	Galveston.
33. <i>Zygonecetes funduloides</i> .....	Dickinson Bayou.	75. <i>Isesthes scrutator</i> .....	Do.
34. <i>Zygonecetes escambie</i> .....	Trinity River, Magnolia Point.	76. <i>Hypoleurochilus geminatus</i> .....	St. Joseph Island.
35. <i>Gymnothorax ocellatus nigromarginatus</i> .....	St. Joseph Island.	77. <i>Ophidion marginatum</i> .....	Do.
36. <i>Neoconger mucronatus</i> .....	Do.	78. <i>Citharichthys spilopterus</i> .....	Galveston.
37. <i>Hemirhamphus unifasciatus</i> .....	Galveston.	79. <i>Etropus crossotus</i> .....	Do.
38. <i>Siphostoma floridae</i> .....	Corpus Christi.	80. <i>Ancylopsetta quadrocclata</i> .....	Do.
39. <i>Siphostoma fuscum</i> .....	Do.	81. <i>Pterophryne histrio</i> .....	Do.
40. <i>Labidesthes sicculus</i> .....	Long Lake, Magnolia Point.	82. <i>Malthe vespertilio</i> .....	Do.
41. <i>Menidia vagrans</i> .....	Galveston.	83. <i>Ostracion tricorne</i> .....	Do.
42. <i>Caranx hippos</i> .....	Mouth of Rio Grande.	84. <i>Aluter schœpffi</i> .....	Do.
		85. <i>Lagocephalus lævigatus</i> .....	Do.
		86. <i>Chilomycterus schœpffi</i> .....	Do.

#### SPECIES FOUND IN BOTH THE WABASH RIVER AND RIO GRANDE BASINS.

A comparison of the fish faunas of two such important and widely separated river basins as the Wabash and the Rio Grande is not without interest. The total number of fishes known from the Rio Grande basin is 80, while the number now known from the Wabash basin is 130. Of the 80 species from the Rio Grande basin 11 are brackish-water species, thus leaving only 69 true fresh-water species found in the Rio Grande basin, which is only about one-half as many as found in the Wabash basin. So far as known, only 23 species are common to both of these river basins. Of these there are 4 catfishes, 3 suckers, 4 minnows, and 5 sunfishes. Nearly all are fishes of lowland streams and ponds, and are species of wide distribution in the eastern and south-eastern United States.

1. <i>Scaphirhynchus platyrhynchus</i> .	9. <i>Erimyzon sucetta</i> .	17. <i>Anguilla chrysypa</i> .
2. <i>Lepisosteus osseus</i> .	10. <i>Minytrema melanops</i> .	18. <i>Lepomis cyanellus</i> .
3. <i>Lepisosteus platystomus</i> .	11. <i>Campostoma anomalum</i> .	19. <i>Lepomis megalotis</i> .
4. <i>Leptops olivaris</i> .	12. <i>Hybognathus nuchalis</i> .	20. <i>Lepomis pallidus</i> .
5. <i>Ameiurus natalis</i> .	13. <i>Notropis dilectus</i> .	21. <i>Lepomis heros</i> .
6. <i>Ictalurus punctatus</i> .	14. <i>Notemigonus chrysoleucus</i> .	22. <i>Micropterus salmoides</i> .
7. <i>Ictalurus furcatus</i> .	15. <i>Fundulus diaphanus</i> .	23. <i>Aplodinotus grunniens</i> .
8. <i>Catostomus teres?</i>	16. <i>Gambusia affinis</i> .	



Geographic distribution of fishes in principal river basins of Texas and the Rio Grande region—Continued.

Species.		Arkansas River Basin.	Red River Basin	Sabine River Basin.	Neches River Basin.	Trinity River Basin.	San Jacinto River and Buffalo and Dickinson Bayou.	Brazos River Basin.	Colorado River Basin.	San Antonio River Basin.	Nueces River Basin.	Rio Grande Basin.	Galveston.	Corpus Christi.	Indianola.	Brazos Santiago.	St. Joseph Island.
59	<i>Notropis formosa</i>																
60	<i>Notropis bubalinus</i>	X	X														
61	<i>Notropis lepidus</i>																
62	<i>Notropis garmani</i>																
63	<i>Notropis macrostomus</i>																
64	<i>Notropis venustus</i>		X	X	X	X	X	X									
65	<i>Notropis notatus</i>								X	X							
66	<i>Notropis texanus</i>							X		X							
67	<i>Notropis amabilis</i>										X	X					
68	<i>Notropis socius</i>										X	X					
69	<i>Notropis swaini</i>											X	X				
70	<i>Notropis umbratilis</i>	X	X						X								
71	<i>Notropis dilectus</i>	X	X	X	X	X						X					
72	<i>Notropis fumeus</i>						X	X									
73	<i>Notropis notemigonoides</i>						X	X									
74	<i>Phenacobius mirabilis</i>			X		X						X					
75	<i>Rhinichthys dulcis</i>						X					X					
76	<i>Agosia oscula</i>											X	X				
77	<i>Agosia yarrowi</i>											X	X				
78	<i>Hybopsis storerianus</i>		X	X													
79	<i>Hybopsis aestivalis</i>		X					X									
80	<i>Hybopsis aestivalis marconis</i>								X								
81	<i>Semotilus atromaculatus</i>	X	X														
82	<i>Stypodon signifer</i>											X	X				
83	<i>Leuciscus nigrescens</i>											X	X				
84	<i>Leuciscus conspersus</i>				X	X						X	X				
85	<i>Opsopæodus oscula</i>					X	X					X	X				
86	<i>Notemigonus chrysoleucus</i>	X			X	X	X			X		X					
87	<i>Tetragonopterus argentatus</i>										X	X					
88	<i>Hiodon alosoides</i>		X														
89	<i>Megalops atlanticus</i>												X				
90	<i>Clupea chrysochloris</i>		X														
91	<i>Harengula arcuata</i>														X		
92	<i>Opisthonema thrisse</i>												X	X			
93	<i>Brevoortia tyrannus patronus</i>												X	X			
94	<i>Dorosoma cepedianum</i>		X			X	X			X			X	X		X	
95	<i>Stolephorus browni</i>						X						X	X			
96	<i>Stolephorus mitchilli</i>						X						X	X			
97	<i>Synodus foetens</i>												X	X			
98	<i>Salmo mykiss spilurus</i>												X	X			
99	<i>Cyprinodon variegatus</i>						X						X	X		X	
100	<i>Cyprinodon latifasciatus</i>												X	X			
101	<i>Cyprinodon elegans</i>												X	X			
102	<i>Adinia multifasciata</i>											X	X	X			X
103	<i>Fundulus pallidus</i>														X		
104	<i>Fundulus similis</i>											X	X	X		X	
105	<i>Fundulus zebrinus</i>	X											X	X			
106	<i>Fundulus diaphanus</i>							X					X	X			
107	<i>Fundulus heteroclitus grandis</i>						X					X		X		X	
108	<i>Zygonectes funduloides</i>						X						X	X			
109	<i>Zygonectes pulvereus</i>						X						X	X			
110	<i>Zygonectes jenkinsi</i>		X	X			X						X	X			
111	<i>Zygonectes notatus</i>			X	X		X			X							
112	<i>Zygonectes escambia</i>				X	X	X										
113	<i>Lucania venusta</i>											X			X		
114	<i>Lucania parva</i>						X					X		X		X	
115	<i>Gambusia affinis</i>		X	X	X	X	X		X	X	X	X	X	X			
116	<i>Mollienesia latipinna</i>						X					X	X	X			
117	<i>Pœcilia cochiana</i>						X					X	X	X			
118	<i>Lucius vermiculatus</i>				X												
119	<i>Gymnothorax ocellatus nigromarginatus</i>												X	X			
120	<i>Myrophis punctatus</i>												X	X			
121	<i>Neoconger mucronatus</i>																X
122	<i>Anguilla chrysa</i>								X	X							X
123	<i>Tylosurus longirostris</i>												X	X			X
124	<i>Hemirhamphus unifasciatus</i>									X							
125	<i>Siphostoma floridae</i>												X	X			
126	<i>Siphostoma louisianæ</i>												X	X			
127	<i>Siphostoma fuscum</i>						X						X	X			X



Geographic distribution of fishes in principal river basins of Texas and the Rio Grande region—Continued.

Species.	Arkansas River Basin.	Red River Basin.	Sabine River Basin.	Neches River Basin.	Trinity River Basin.	San Jacinto River and Buffalo and Dickinson Bayous.	Brazos River Basin.	Colorado River Basin.	San Antonio River Basin.	Nueces River Basin.	Rio Grande Basin.	Galveston.	Corpus Christi.	Indianola.	Brazos Santiago.	St. Joseph Island.
128 Mugil cephalus.....					X							X	X			X
129 Labidesthes sicculus.....																
130 Menidia vagrans.....																
131 Menidia peninsula.....																
132 Polynemus octonemus.....						X										
133 Trichiurus lepturus.....																
134 Caranx hippos.....																
135 Vomer scotipinnis.....																
136 Selene vomer.....																
137 Chloroscombrus chrysurus.....											X					
138 Trachynotus carolinus.....												X	X			
139 Oligoplites saurus.....						X						X	X			X
140 Aphredoderus sayanus.....				X	X	X										
141 Pomoxis annularis.....				X	X	X									X	
142 Pomoxis sparoides.....				X	X	X									X	
143 Chaenobrytus gulosus.....				/	X	X										
144 Lepomis cynanellus.....	X	X			X	X	X									
145 Lepomis symmetricus.....						X	X									
146 Lepomis miniatus.....		X			X	X	X									
147 Lepomis megalotis.....		X		X	X	X	X		X							
148 Lepomis humilis.....		X	X		X	X	X		X							
149 Lepomis pallidus.....				X	X	X	X		X							
150 Lepomis heros.....	X	X		X	X	X	X		X							
151 Lepomis albulus.....						X	X		X							
152 Micropterus salmoides.....		X	X	X	X	X	X		X							
153 Etheostoma pellucidum clarum.....		X	X	X	X	X	X		X							
154 Etheostoma vivax.....			X	X	X	X	X		X							
155 Etheostoma phlox.....				X	X	X	X		X							
156 Etheostoma chlorosoma.....				X	X	X	X		X							
157 Etheostoma shumardi.....		X			X	X	X		X							
158 Etheostoma caprodes.....					X	X	X		X							
159 Etheostoma fasciatus.....					X	X	X		X							
160 Etheostoma scierum serrula.....			X	X	X	X	X		X							
161 Etheostoma lepidum.....					X	X	X		X							
162 Etheostoma lepidogenys.....					X	X	X		X							
163 Etheostoma micropterus.....					X	X	X		X							
164 Etheostoma australe.....					X	X	X		X							
165 Etheostoma jessiae.....			X		X	X	X		X							
166 Etheostoma fusiforme.....				X	X	X	X		X							
167 Etheostoma lateralis.....					X	X	X		X							
168 Etheostoma fonticola.....					X	X	X		X							
169 Centropomus undecimalis.....												X	X			
170 Roccus chrysops.....		X														
171 Morone interrupta.....					X	X										
172 Lutjanus caxis.....																
173 Lutjanus aya.....													X			
174 Rhomboplites aurorubens.....													X	X		
175 Orthopristis chrysopterus.....													X	X		
176 Lagodon rhomboides.....													X	X		
177 Archosargus probatocephalus.....													X	X		
178 Aplodinotus grunniens.....		X			X		X									
179 Pogonias chromis.....															X	
180 Stelliferus lanceolatus.....															X	
181 Bairdiella chrysura.....															X	
182 Sciaea ocellata.....						X							X	X		
183 Leiostomus xanthurus.....													X	X		
184 Larimus fasciatus.....													X	X		
185 Micropogon undulatus.....											X					
186 Menticirrhus littoralis.....											X					
187 Menticirrhus americanus.....											X					
188 Cynoscion nothus.....											X					
189 Cynoscion nebulosus.....						X					X					
190 Gerres gula.....											X	X	X			X
191 Gerres gracilis.....						X					X	X	X			X
192 Heros cyanoguttatus.....											X					
193 Heros pavonaceus.....											X					
194 Chaetodipterus faber.....											X					
195 Gobionomus dormitator.....											X					

## Geographic distribution of fishes in principal river basins of Texas and the Rio Grande region—Continued.

	Species.	Arkansas River Basin.	Red River Basin.	Sabine River Basin.	Neches River Basin.	Trinity River Basin.	San Jacinto River and Buffalo and Dickinson Bayous.	Brazos River Basin.	Colorado River Basin.	San Antonio River Basin.	Nueces River Basin.	Rio Grande Basin.	Galveston.	Corpus Christi.	Indianola.	Brazos Santiago.	St. Joseph Island.
196	<i>Dormitator maculatus</i> .....																
197	<i>Gobius lyricus</i> .....																
198	<i>Gobius saporator</i> .....																
199	<i>Gobius boleosoma</i> .....																
200	<i>Gobius wuermanni</i> .....																
201	<i>Gobionellus oceanicus</i> .....																
202	<i>Lepidogobius gulosus</i> .....																
203	<i>Gobiosoma bosci</i> .....																
204	<i>Gobiosoma molestum</i> .....																
205	<i>Prionotus scitulus</i> .....																
206	<i>Prionotus tribulus</i> .....																
207	<i>Gobiesox virgatus</i> .....																
208	<i>Batrachus tau</i> .....																
209	<i>Porichthys porosissimus</i> .....																
210	<i>Upsilonphorus y-græcum</i> .....																
211	<i>Astroscoptes anoplos</i> .....																
212	<i>Chasmodon bosquianus</i> .....																
213	<i>Isesthes hentzi</i> .....																
214	<i>Isesthes ionthas</i> .....																
215	<i>Isesthes scrutator</i> .....																
216	<i>Hypleurochilus geminatus</i> .....																
217	<i>Ophidion marginatum</i> .....																
218	<i>Citharichthys spilopterus</i> .....																
219	<i>Etropus crossotus</i> .....																
220	<i>Paralichthys lethostigma</i> .....																
221	<i>Ancylipsetta quadrocellata</i> .....																
222	<i>Achirus fasciatus</i> .....																
223	<i>Symphurus plagiata</i> .....																
224	<i>Pterophryne histrio</i> .....																
225	<i>Malthe vespertilio</i> .....																
226	<i>Ostracion tricorne</i> .....																
227	<i>Alutera schœpfl</i> .....																
228	<i>Lagocephalus javigatus</i> .....																
229	<i>Tetrodon nephelus</i> .....																
230	<i>Chilomycterus schœpfl</i> .....																
	Totals.....	18	32	17	26	30	52	24	25	44	20	80	78	30	21	22	18

## LIST OF FISHES KNOWN FROM TEXAS AND THE BASIN OF THE RIO GRANDE.

In the following pages we give a list of all the species so far known to occur in this region. In connection with each species are given all the Texas and Rio Grande localities from which it has been recorded, together with the name of the writer so recording it and the year in which the paper was published. Whenever the name under which it was recorded is not that which is now accepted as the tenable name for the species, it is given in parenthesis, with the authority for it. New species are indicated by the word *type* in connection with its specific name. Locality references have usually been given in the exact words of the original authority; when the exact words have not been used, the change made has not been such as to change the sense in the least. The types of most of these species (such as are described from that region) are in the U. S. National Museum. These have all been examined by us, and the species recognized in this paper are such as appear to us to be valid after having not only studied all the types available, but practically all the collections from that region now in the National Museum. A number of Girard's types can not now be found, and our identification of some of those species may be erroneous.

With regard to its fresh-water fishes, Texas is chiefly remarkable for the abundance of species in its lowland streams. A large proportion of its species are confined chiefly or almost wholly to the streams of the narrow strip known as the Coast Plain region. The lower portions of the larger streams crossing this teem with many species of valued food-fishes, such as the channel cat, chuckle-headed cat, mud cat, buffalo, large-mouthed black bass (the "trout" of the South), various species of sunfishes, and the fresh-water drum. The amount of fish of these kinds brought to the Houston market, principally from the San Jacinto and Trinity, is very great, and these, together with the salt-water species received from and about the mouth of these rivers, make the Houston fish-market one of the most important in the South. The coast of Texas is also remarkable for the number of brackish-water species, the single family of *Cyprinodontidae* being represented by at least 19 species, most of which are found only near the coast. Of the 230 species of fishes given in this paper, 46 were added to the known Texas fauna through the explorations of Jordan and Gilbert, and 42 were added by our own investigations in 1891. With few exceptions, the remaining species were first collected in this region during the Mexican Boundary and Pacific Railroad surveys.

## I.—GALEORHINIDÆ. THE TYPICAL SHARKS.

1. *Carcharhinus platyodon* (Poey). *Shovel-nosed Shark*. Galveston (Jordan & Gilbert, 1882). This is said to be the commonest of the large sharks on the coast of Texas in summer. The jaws of another species of *Carcharhinus* were gotten by Dr. Jordan at Galveston, which has not yet been identified with certainty.

## II.—PRISTIDIDÆ. THE SAWFISHES.

2. *Pristis pectinatus* Latham. *Sawfish*. Obtained by Dr. Jordan at Galveston.

## III.—DASYATIDÆ. THE STINGRAYS.

3. *Dasabatis sayi* (Le Sueur). *Southern Stingray; Whipparee; Whipray*. Two young specimens were obtained by me at Shamrock Point, Corpus Christi, November 28.
4. *Trigon sabina* (Le S.). *Stingray; Stingaree*. Galveston (Jordan & Gilbert, 1882).

IV.—*AĒTOBATIDÆ*. THE EAGLE RAYS.

5. *Aĕtobatis freminvillei* (Le S.). *Eagle Ray*. A tail  $5\frac{1}{2}$  feet long, obtained at Galveston, evidently of this species.

V.—*ACIPENSERIDÆ*. THE STURGEONS.

6. *Scaphirhynchus platyrhynchus* (Rafinesque). *Shovel-nosed Sturgeon*. Reported from Red River at Fulton, Ark., by Jordan & Gilbert, and by Cope & Yarrow from the Rio Grande, near Albuquerque, N. Mex., where two specimens were obtained by Dr. Oscar Loew.

VI.—*LEPISOSTEIDÆ*. THE GARFISHES.

7. *Lepisosteus osseus* (Linnæus). *Long-nosed Gar*. Taken by Jordan & Gilbert in Red River at Fulton, Ark., the Rio Lampasas at Belton, Tex., and the Rio San Marcos at San Marcos, Tex. Rio Grande (Synopsis).
8. *Lepisosteus platystomus* Raf. *Short-nosed Gar*. Specimens were taken in the Pecos River by the Pacific Railroad Survey, which are the types of Girard's *Lepidosteus (Cylindrosteus) latirostris* (Girard, 1858). One specimen, 14 inches long, was taken by us in Dickinson Bayou, near Nicholstone, Tex.
9. *Lepisosteus tristechus* (Blöch & Schneider). *Alligator Gar*. This species has been recorded from Tamaulipas, Mexico, and from Devil River, Tex., the first locality furnishing the type of Girard's *Lepidosteus (Atractosteus) berlandieri* (Girard, 1858), while his type of *Lepidosteus leptorhynchus* (Girard, 1858) came from the latter place.

VII.—*SILURIDÆ*. THE CATFISHES.

10. *Noturus nocturnus* Jordan & Gilbert. During the explorations of Professors Jordan and Gilbert in the Southwest, in 1884, the types of this catfish were obtained in the Poteau River, near Fort Smith, Ark. They also found it in the Rio Lampasas at Belton, Tex., the Sabine River at Longview, Tex., and in Trinity River at Dallas. I obtained 8 specimens in San Antonio Springs, at San Antonio, and 2 from Hunter Creek, near Houston.
11. *Leptops olivaris* (Raf.). "*Yellow Cat*"; "*Mud Cat*." Trinity River at Dallas and Fort Worth (Cope, 1880). Rio Colorado at Austin, Trinity River at Dallas, Rio Lampasas at Belton, and Red River at Fulton (Jordan & Gilbert, 1886). One specimen from the Trinity River at Magnolia Point and one from San Antonio Springs. Many large fish of this species were seen in the Houston market, where it is an important and valuable food-fish. They are caught in considerable numbers in the Trinity River, near its mouth, and sent to the Houston market. This species was collected also by Mr. A. J. Woolman at Juarez, Mexico, in 1891.
12. *Ameiurus melas* (Raf.). Wallace Creek, one of the heads of Medina River, in Bandera County, (as *Amiurus brachyacanthus* types, Cope, 1880, and Synopsis). Long Lake and Trinity River near Magnolia Point, and Neches River near Palestine. Spring Creek and Fulton Creek near Creswell (Coate).
13. *Ameiurus nebulosus catulus* (Girard). This variety, the distinctness of which from *nebulosus* is not easy to recognize, was described by Dr. Girard in the Pacific Railroad Report from specimens obtained at Fort Smith, Arkansas. It has also been found in the Little Wichita River (as *Amiurus catus*, Cope, 1880), in the Rio Colorado at Austin and Rio San Marcos at San Marcos (Jordan & Gilbert, 1886), and by us in the Rio San Marcos at San Marcos, Comal Springs at New Braunfels, and in San Antonio Springs at San Antonio. At San Marcos and New Braunfels it is quite numerous.
14. *Ameiurus natalis* (Le S.). Near San Antonio (as *Pimelodus antoniensis* types, Girard, 1858). Tributary of Gypsum Creek, of the Canadian River (as *Pimelodus felinus* types, Girard, 1858). Brownsville (Jordan, 1878), and Sims Bayou near Houston. San Antonio, Tex. (as *Noturus flavus*, Garman, 1881a). In the National Museum is a small specimen,  $2\frac{1}{4}$  inches long, labeled *Amiurus natalis antoniensis* (type?). It is from Leon River, and was collected by Dr. Kennerly. Anal 24,  $3\frac{1}{2}$  in length of body to base of caudal fin.

15. *Ameiurus natalis bolli* Cope. This subspecies was described by Cope in 1880, from specimens obtained in the Little Wichita, northern Texas. (Synopsis.)
16. *Ameiurus lupus* (Grd.). Indianola to Nueces and headwaters of Rio Pecos (and as *Pimelodus lupus* types, Girard, 1856 and 1858); and a tributary of the Medina River (Cope, 1880). The one specimen in the Museum marked as the type of this species (No. 916) is a young fish 10 inches long and in good condition. Anal, 22; tail forked; pectoral spine as long as from point of snout to pupil, or  $2\frac{1}{2}$  in head; upper jaw considerably projecting.
17. *Ictalurus punctatus* (Raf.). *Channel Cat*; "*Eel Cat*" of Houston Market. Live Oak Creek, Comanche Springs, Rio Leona, Nueces, Piedra Pointe, Devil River, and Rio Salado (as *Pimelodus vulpes* types, Girard, 1859, pl. xviii). Trinity River at Fort Worth and Dallas, Little Wichita River (as *Ichthalus carulescens*, Cope, 1880). Rio Colorado at Austin, Rio Lampasas at Belton, and Red River at Fulton, Ark. (Jordan & Gilbert, 1886). Rio San Marcos at San Marcos, Trinity River at Magnolia Point, Neches River near Palestine, San Antonio Springs at San Antonio, Trinity River at its mouth, and San Jacinto River at Lynchburg; from these places considerable quantities of this fish reach the Houston market, where it is held in high esteem. Also collected by Mr. Woolman in 1891 at Juarez, opposite El Paso, Tex. In the National Museum we find only one bottle of the types of *Pimelodus vulpes*; these are four very young specimens (No. 845) from the Leon River, collected by J. H. Clark. They are in fair condition and agree fully with the young of *Ictalurus punctatus*.
18. *Ictalurus furcatus* (Cuvier & Valenciennes). "*Channel Cat*" or "*Blue Cat*" of the Houston market. Mouth of Rio Grande near Brownsville (as *Pimelodus affinis* types, Baird & Girard, 1854, and Girard, 1859, pls. xvi and xvii). Trinity River near its mouth and San Jacinto River at Lynchburg. This is one of the most important fresh-water fishes of the Houston market, but it is not regarded as being as good a fish as the preceding. The largest individual of *I. furcatus* that I saw weighed 44 pounds; another weighed 25 pounds. The Houston market receives these fish from the lower Trinity and San Jacinto rivers.
19. *Tachysurus felis* (L.). Indianola (as *Arius equestris* types, Baird & Girard, 1854, and Girard, 1859, pl. xv). Galveston (Jordan & Gilbert, 1882). Galveston and Corpus Christi. It does not appear to be a very common fish on the Texas coast, as we obtained only two specimens at Galveston and one at Corpus Christi. Maxillary barbel longer than head, reaching a little beyond base of pectoral on the specimen from Corpus Christi and two-thirds the length of the pectoral spine in those from Galveston.
20. *Felichthys marinus* (Mitchill). *Salt-water Catfish*. Indianola (Baird & Girard, 1854, and Girard, 1859, pl. xiv). Galveston (Jordan & Gilbert, 1882). These are the only Texas references to this species.

#### VIII.—CATOSTOMIDAE. THE SUCKERS.

21. *Ictiobus cyprinella* (C. & V.). Three specimens of this species were obtained in Dickinson Bayou at Nicholstone, and numerous large individuals from San Jacinto River near Lynchburg were seen in the fish market at Houston.
22. *Ictiobus bubalus* (Raf.). Red River at Fulton, Ark. (Jordan & Gilbert, 1886). We have one specimen from near the mouth of Trinity River, which we obtained in the Houston market.
23. *Carpiodes carpio* (Raf.). Rio Colorado at Austin (Jordan & Gilbert, 1886). Our collection contains one specimen from Long Lake near Magnolia Point.
24. *Carpiodes velifer* (Raf.). The only record of this species from the region covered by this paper is that given by Jordan & Gilbert for the Red River at Fulton, Ark.
25. *Carpiodes velifer tumidus* B. & G. Near Fort Brown (as *Carpiodes tumidus* types, Baird & Girard, 1854, and Girard, 1859, pl. xix, figs. 1-4). Rio Grande (as *Ictiobus tumidus*, Girard, 1856). Several specimens from San Ildefonso, N. Mex. (as *Carpiodes grayi* types, Cope, 1870, and Cope & Yarrow, 1875). Brownsville (Jordan, 1878). Nazas River at San Pedro, Coahuila (as *Ichthyobus tumidus*, Garman, 1881). Rio Grande (Synopsis). Rio Lampasas at Belton and Rio Colorado at Austin (Jordan & Gilbert, 1886). Cope's types of *Carpiodes grayi* consist of 7 small specimens (U. S. N. M. No. 16761), 6 of which are less than 2 inches long, the other being about  $4\frac{1}{2}$  inches. They are in very poor condition.

26. *Pantosteus plebeius* (B. & G.). The types of this sucker were collected by Mr. John H. Clark in the Rio Mimbres, Chihuahua (as *Catostomus plebeius* types, Baird & Girard, 1854). Rio Mimbres, Lake Guzman, Mexico (as *Minomus plebeius*, Girard, 1856, and Girard, 1859, pl. xxii, figs. 1-4). Janos River, a tributary of Lake Guzman, Chihuahua (as *Catostomus (Acomus) guzmaniensis* types, Girard, 1856, and Girard, 1859, pl. xxiii, figs. 6-10). Lake Guzman (Synopsis). Nazas River, Coahuila (as *Catostomus nebuliferus* types, Garman, 1881, and Synopsis). Rio Grande at Del Norte and Alamosa, Colo., and the Rio Conejos near Alamosa, Colo. (Jordan, 1891); Rio Mimbres and Rio Janos, Lake Guzman, Chihuahua; Rio Grande, Ildefonso; Ojo de Gallo, N. Mex. (?); Rio Grande and Rio Conejos, Alamosa, Colo. (Evermann, 1893). There are in the Museum 2 specimens (No. 260) labeled as the types of *Acomus guzmaniensis*; they are 4½ and 5 inches long, respectively, and are pretty soft; lower lip broad and considerably incised; fontanelle entirely obliterated; cartilaginous sheath of lips less sharp than in *Pantosteus jordani*.
27. *Catostomus teres* (Mitchill). *Common White Sucker*. No. 20057, National Museum, is a fish of this species, 8 inches long. The locality given on the label is Brownsville, Tex. The name of the collector is not given, and it is not certain the specimen came from the alleged locality. Head, 4½; D. 1, 12; A. 1, 7; eye, 5; scales, 62.
28. *Erimyzon sucetta* (Lac.). Dry Creek near Victoria (as *Moxostoma kennerlyi* types, Girard, 1856 and 1859, pl. xx, figs. 7-9). Devil River and Live Oak Creek (as *Moxostoma campbelli* types, Girard, 1856 and 1859, pl. xx, figs. 4-6). Coal Creek, a tributary of South Fork of Canadian River (as *Moxostoma claviformis* types, Girard, 1856, and Girard, 1858, pl. XLVIII, figs. 5-9). The types of *Moxostoma claviformis* (U. S. N. M. No. 165) are 2 specimens 3 and 3½ inches long; they are in poor condition, but are evidently this species. The types of *Moxostoma kennerlyi* consist of 8 specimens, 2½ to 6 inches long (U. S. N. M. No. 161); they are faded and very soft; scales 36. We obtained 5 specimens from a pond near the Neches River, 14 miles east of Palestine.
29. *Minytrema melanops* (Raf.). Dry Creek near Victoria (as *Moxostoma victoria* types, Girard, 1856, and Girard, 1859, pl. xx, figs. 1-3). Obtained by us in Long Lake and Trinity River near Magnolia Point, Neches River east of Palestine, and Guadalupe River near New Braunfels.
30. *Moxostoma congestum* (B. & G.). Rio Salado (as *Catostomus congestus* types, Baird & Girard, 1854). Rio Salado (as *Ptychostomus congestus*, Girard, 1856, and Girard, 1859, pl. xxi, figs. 5-8). Rio San Juan near Monterey, New Leon (as *Ptychostomus albidus* types, Girard, 1856, and Girard, 1859, pl. xix, figs. 5-8). Guadalupe and Llano rivers (as *Myxostoma macrolepidotum duquesnei*, Cope, 1880). Rio Lampasas at Belton, Rio Colorado at Austin, and Rio San Marcos at San Marcos (Jordan & Gilbert, 1886). Two large specimens were obtained by us in the outlet of San Antonio Springs at San Antonio. The types of *Ptychostomus albidus* are 2 specimens 4 to 6 inches long (U. S. N. M. No. 170), and are in poor condition.
31. *Moxostoma pœcilurum* Jordan. Sabine River at Longview (Jordan & Gilbert, 1886).

#### IX.—CYPRINIDÆ. THE MINNOWS.

32. *Campostoma ornatum* Grd. Chihuahua River and a tributary only a few miles long (type, Girard, 1856, and Girard, 1859, pl. xxv, figs. 1-4). Chihuahua River (Synopsis). The type (U. S. N. M. No. 77) is about 5 inches long and is in fair condition. The dorsal fin is still quite black, having held its color remarkably well. There are about 82 scales in the lateral line.
33. *Campostoma anomalum* (Raf.). Cadereita and near Monterey, New Leon (as *Campostoma nasutum* types, Girard, 1856). Cadereita and Acapulco, New Leon (as *Campostoma nasutum*, Girard, 1859, pl. xxv, figs. 9-12). Helotes on the Upper Medina and Comanche Creek at Mason (as *Campostoma anomalum pullum*, Cope, 1880). Rio Lampasas at Belton, Rio Colorado at Austin, and Trinity River at Dallas (Jordan & Gilbert, 1886). We obtained one specimen in the Rio San Marcos near San Marcos.
34. *Campostoma formosulum* Grd. Rio Sabinal, a tributary of the Rio San Antonio (types, Girard, 1856, and Girard, 1859, pl. xxv, figs. 5-8). Brownsville (Jordan, 1878). San Antonio River (Synopsis). There are 16 specimens, 2½ to 4 inches long (U. S. N. M. No. 76), recorded as the types of this species. The scales in the lateral line vary from 45 to 48, and thus appear to be a trifle larger than in *C. anomalum*, from which it does not seem to differ otherwise.

35. *Zophendum plumbeum* (Grd.). Headwaters of the Canadian River, Llano Estacado (as *Dionda plumbea* types, Girard, 1856, and Girard, 1858, pl. LII, figs. 21-25). Antelope Creek, a tributary of the Canadian River, and from the Llano Estacado (as *Hyborhynchus puniceus* types, Girard, 1856, and Girard, 1858, pl. LII, figs. 1-5 and 11-15). Twenty miles west of Choctaw Agency (as *Dionda grisea* types, Girard, 1858, pl. LII, figs. 6-10).
36. *Dionda melanops* Grd. Buena Vista, Coahuila (types, Girard, 1856, and Girard, 1859, pl. xxvi, figs. 17-20). Cuajuco, Monterey, and Cadereita, New Leon, in the waters of the Rio San Juan (as *Dionda couchi* types, Girard, 1856, and Girard, 1859, pl. xxvi, figs. 1-4). Brownsville (as *Hybognathus melanops*, Jordan, 1878). The five types of this species in the National Museum (No. 41) very much resemble *Dionda episcopa*, but differ from it in being a much shorter, deeper species. Head,  $3\frac{1}{2}$ ; depth,  $3\frac{1}{2}$ ; eye,  $3\frac{1}{2}$ ; scales, 7-39-4. These specimens are in good condition.
37. *Dionda punctifer* Garman. Parras, and spring near Saltillo, Coahuila (as *Hybognathus (Dionda) punctifer* type, Garman, 1881).
38. *Dionda fluviatilis* (Grd.). Near Monterey, New Leon (as *Algoma fluviatilis* type, Girard, 1856, and Girard, 1859, pl. xxvii, figs. 13-16).
39. *Dionda amara* (Grd.). Lagoon near Fort Brown, on the Rio Grande (as *Algoma amara* type, Girard, 1856, and Girard, 1859, pl. xxvii, figs. 17-20). Brownsville (as *Hybognathus amarus*, Jordan, 1878). The type of this species is a single specimen (U. S. N. M. No. 149),  $2\frac{1}{2}$  inches long, now in very poor condition. Head, 4; eye,  $3\frac{1}{2}$ ; D. 1, 9; A. 1, 8; scales, 6-35-3. Apparently a good species.
40. *Dionda episcopa* Grd. Headwaters of the Rio Pecos, and Comanche Spring, a presumed tributary of the Rio Grande (types, Girard, 1856). Headwaters of the Rio Pecos (Girard, 1858). Rio Nueces (as *Dionda texensis* types, Girard, 1856, and Girard, 1859, pl. xxvi, figs. 21-24). San Felipe Creek and Devil Creek, two tributaries of the Rio Grande (as *Dionda argentosa* types, Girard, 1856, and Girard, 1859, pl. xxvi, figs. 5-8). Johnson Fork of Llano River, Kimble County (as *Hybognathus flavipinnis* types, Cope, 1880). Llano River (Synopsis). Rio Comal, New Braunfels (Jordan & Gilbert, 1886). We obtained a single specimen of this species in the Comal Spring at New Braunfels, which agrees perfectly with the types. The latter consist of 13 specimens (U. S. N. M. No. 45), varying in length from  $1\frac{1}{4}$  to  $3\frac{1}{2}$  inches, most of which are in good condition. Several of the types examined give the following: Head, 4; depth, 4; eye,  $3\frac{1}{2}$ , = snout; D. 1, 8; A. 1, 7 or 8; scales, 6-38-4. The types of *Dionda argentosa*, 2 specimens, 2 and 3 inches long respectively (U. S. N. M. No. 32), give the following: Head, 4; depth, 4; eye,  $3\frac{1}{2}$ ; D., 1, 8; A., 1, 7; scales, 6-38-4, thus agreeing fully with the types of *Dionda episcopa*. The color markings are also the same. In *Dionda amara* there is no trace of the plumbeous lateral band and the dark caudal spot to be seen in *Dionda episcopa*, but it is more silvery. In *Dionda serena* the band and spot are present, but very faint. Bottle No. 32, U. S. N. M., contains 12 specimens labeled as the types of *Dionda argentosa*; these are each about  $2\frac{1}{2}$  inches in length and agree well with the types of *D. episcopa*; they are all in a good state of preservation.
41. *Dionda serena* Grd. Rio Sabinal (types, Girard, 1856, and Girard, 1859, pl. xxvi, figs. 9-12). Delaware Creek, a tributary of the Rio Pecos (as *Dionda papalis* types, Girard, 1856, and Girard, 1858). Live Oak Creek, a tributary of the Rio Pecos (as *Dionda chrysis* types, Girard, 1856, and Girard, 1859, pl. xxvi, figs. 13-16). Brownsville (as *Hybognathus serenus*, Jordan, 1878). Upper waters of Wallace Creek, one of the heads of Medina River (as *Hybognathus nigrotaniata* types, Cope, 1880). Medina River (as *Hybognathus nigrotaniatus*, Synopsis). The types of *Dionda serena* are two specimens, 2 and 3 inches long (U. S. N. M. No. 43), in fair condition; head,  $4\frac{1}{2}$ ; depth,  $4\frac{1}{2}$ ; eye,  $3\frac{1}{2}$ . Two other specimens from Pecos River, collected by Capt. John Pope, are probably the types of *Dionda papalis*; these fully agree with the types of *D. serena*. This species differs from *D. episcopa* chiefly in the more slender body, more pointed nose, somewhat smaller eye, and larger scales.
42. *Hybognathus nuchalis* Agassiz. Rio Grande near San Idefonso, N. Mex. (Cope & Yarrow, 1875). Red River at Fulton, Ark., Sabine River at Longview, and Trinity River at Dallas (Jordan & Gilbert, 1886). We found this species very abundant in the Neches River east of Palestine, in Trinity River at Magnolia Point, and in Big White Oak Bayou at Houston. Fulton Creek, near Creswell (Coate).

43. *Pimephales promelas confertus* (Grd.). Hurrah Creek, a tributary of the Rio Pecos (as *Hyborhynchus confertus* types, Girard, 1856, and Girard, 1858, pl. LIX, figs. 11-15). San Ildefonso, N. Mex. (as *Hybognathus nigellus*, Cope, types, Cope & Yarrow, 1875). Brownsville (as *Pimephales nigellus* and *Pimephales promelas*, Jordan, 1878). Rio Grande (as *Hybognathus confertus*, Synopsis). Fulton Creek, near Creswell (Coate).
44. *Pimephales notatus* (Raf.). Twenty miles west of Choctaw Agency (as *Hyborhynchus tenellus* types, Girard, 1856, and Girard, 1858). Rio Colorado at Austin (Jordan & Gilbert, 1886).
45. *Cochlognathus ornatus* B. & G. Brownsville (types of genus and species, Baird & Girard, 1854). Brownsville (Girard, 1856 and 1859, pl. xxxv, figs. 12-17). Trinity River at Fort Worth (as *Cochlognathus biguttata* types, Cope, 1880). Rio Grande (Synopsis). Trinity River (as *Cochlognathus biguttatus*, Synopsis). The types of *Cochlognathus ornatus* (5 specimens, 2½ to 3 inches long, U. S. N. M. No. 150) are in fair condition. One of the five so labeled is in excellent condition, much fresher in appearance than the other four, and probably belongs in some other bottle.
46. *Cliola vigilax* (B. & G.). This species was described, as *Ceraticthys vigilax*, by Baird & Girard, in 1853, from specimens caught in Otter Creek, Arkansas, by Capts. R. B. Marcy and Geo. B. McClellan. San Pedro Creek, a tributary of San Antonio River (as *Cliola velox* types, Girard, 1856, and Girard, 1859, pl. xxxi, figs. 21-24). Leon River, a tributary of San Antonio River (as *Cliola vivax* types, Girard, 1856, and Girard, 1858). Otter Creek, tributary of Red River, Arkansas (Girard, 1856, and Girard, 1858). San Pedro Creek (as *Cliola velox*, Girard, 1858). Sabine River at Longview, Rio Lampasas at Belton, Trinity River at Dallas, Rio Colorado at Austin, Rio San Marcos at San Marcos, and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Long Lake, Trinity River, and Neches River near Palestine, Rio San Marcos at San Marcos, Guadalupe River at New Braunfels, Hunter Creek, Buffalo Bayou, and Big White Oak Bayou near Houston (Evermann, 1892).
47. *Notropis cayuga atrocaudalis* Evermann. Kilper's Pond, Big White Oak Bayou, Buffalo Bayou, and Hunter Creek near Houston; Rio San Marcos at San Marcos, Guadalupe River near New Braunfels, and Rio San Antonio at San Antonio (types, Evermann, 1892). There are in the National Museum (No. 17814) 31 specimens of this minnow that were collected by Messrs. Earl and Kumlein in Clear Creek, Waller County, Tex. They agree perfectly with the types.
48. *Notropis nitidus* (Grd.). Cadereita, New Leon (as *Moniana nitida* types, Girard, 1856, and Girard, 1859). The types of this species consist of two specimens, 2½ and 2¼ inches long, respectively (No. 39657, U. S. N. M.), and are in good condition except that the tails are considerably broken. Head, 4½; depth, 3½; eye, 3½, = snout; D. 1, 8; A. 1, 7; scales, 6-35-3. Larger mouth and eye than in *Notropis lutrensis*.
49. *Notropis nux* Evermann. Neches River, Trinity River, and Long Lake near Palestine (types, Evermann, 1892).
50. *Notropis deliciosus* (Grd.) Leon River, a tributary of the Rio San Antonio (as *Moniana deliciosa* types, Girard, 1856, and Girard, 1858). Brownsville (as *Alburnops missuriensis*, Jordan, 1878). Rio Grande (as *Cliola missuriensis*, Synopsis). Rio Lampasas at Belton, Rio San Marcos at San Marcos, and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Kilper's Pond, Big White Oak Bayou, Buffalo Bayou, and Hunter Creek at Houston; San Antonio River at San Antonio, Guadalupe River at New Braunfels, and Rio San Marcos at San Marcos (Evermann, 1892). Fulton Creek near Creswell (Coate). The types of *Moniana deliciosa* consist of 13 specimens (No. 119, U. S. N. M.) and are in rather bad condition. The variation in the size of the mouth among these specimens is noticeable, though it is not great.
51. *Notropis sabinæ* J. & G. Sabine River, Longview (type, Jordan & Gilbert, 1886). The five specimens in the Museum as the types of this species (No. 36484) are 1 to 2 inches long and are in good condition.
52. *Notropis nocomis* Evermann. Rio Comal at New Braunfels (as *Notropis deliciosus* in part, Jordan & Gilbert, 1886). Trinity River at Magnolia Point and San Marcos River at San Marcos (types, Evermann, 1892). There are two specimens in the National Museum from the Trinity River at Dallas, which were collected by Jordan & Gilbert in 1884.
53. *Notropis simus* (Cope). San Ildefonso, N. Mex. (as *Alburnellus simus* Cope, types, Cope & Yarrow, 1875, pl. xxxi, figs. 2, 2a, and Synopsis). There are in the Museum (No. 16982) about 75 specimens which appear to be the types of this species; they are 3½ inches long or less.



and are in fairly good condition. Head, 4; depth, 4; eye, 4; snout a little longer than eye. D. I, 8; A. II, 9; scales, 6-37-3, 20 before the dorsal. Origin of dorsal nearer snout than base of caudal; mouth rather large, little oblique, lower jaw not projecting; snout blunt. There are 6 other specimens of this species in the Museum (No. 36795), said to have been collected in the Pecos River by Capt. Pope.

54. *Notropis ornatus* (Grd.). Chihuahua River and tributaries (as *Codoma ornata* type, Girard, 1856, and Girard, 1859, pl. xxix, figs. 22-25). The types (U. S. N. M. No. 38247) are two fine specimens, 2½ inches long. The fins are still quite dark and the species is a well-marked one. Specimens were obtained in 1891 at Chihuahua by Mr. Woolman.
55. *Notropis chihuahua* Woolman. Rio de las Conchas, Chihuahua, Mexico (types, Woolman, 1892). Numerous specimens of this minnow were obtained by Mr. Woolman, ten of which are deposited in the National Museum (No. 44151); from these the following description has been drawn up: Head, 3½ to 4; depth, 4 to 4½; eye, 3 to 3½; snout, 3½ to 4; interorbital width = eye. Body moderately slender, back but little elevated; head heavy, bluntly conic, snout decurved; mouth small, somewhat oblique, upper lip on a level with the pupil, maxillary scarcely reaching front of eye; lower jaw not projecting, broadly rounded, the dentary bones being widely separated; teeth, 4-4, hooked, the grinding surface narrow. Dorsal, 11, 8, the first of the two rudimentary spines very short, origin of dorsal fin directly over the ventrals and midway between tip of snout and base of caudal, its height 1½ in head; anal, 1, 7, its base 1½ in head; pectorals short, not reaching the ventrals; ventrals quite short, not reaching vent; scales, 5-34-3, 15 before the dorsal; lateral line complete and but little decurved. Color, as given by Mr. Woolman, light brown above; edges of scales above lateral line with small but closely placed black dots; body also above lateral line thickly but irregularly sprinkled with dark-brown spots, these gradually becoming more numerous toward the median line of the back where they form a vertebral line; the sides with a plumbeous stripe as wide as eye, which extends forward through the eye and around the snout, thickly sprinkling the upper lip with small dots, but not touching the lower lip; an irregular dark spot at base of tail; sides below lateral line silvery; fins all plain except dorsal and caudal, which are dusky but without distinct marking; peritoneum silvery.
56. *Notropis leoninus* (Grd.). Leon River, tributary of the Rio San Antonio (as *Moniana leonina* types, Girard, 1856, and Girard, 1858, pl. LIX, figs. 6-10). Rio Salado, Rio Sabinal, and Rio Medina, all tributaries of the Rio San Antonio; also in the Rio Nueces and the Rio Frio, a tributary of the Rio Nueces (as *Moniana frigida* types, Girard, 1856). Rio Frio, a tributary of the Nueces (as *Moniana frigida*, Girard, 1858, pl. LIX, figs. 16-20). Rio Sabinal, Rio Salado, and Rio Medina (as *Moniana frigida*, Girard, 1859, pl. xxx, figs. 17-20). Brownsville (as *Moniana complanata* types, Girard, 1856, and Girard, 1859, pl. xxxi, figs. 17-20). Brownsville (as *Cyprinella complanata*, Jordan, 1878). The types *Moniana frigida* (U. S. N. M. No. 124) are 51 specimens, 3½ inches long or less, and are still in excellent condition. Head, 4½; depth, 3½; eye 3½, less than snout; D. I, 8; A. I, 9; scales, 7-35-3. Not greatly different from *Notropis lutrensis*.
57. *Notropis lutrensis* (B. & G.). Otter Creek, Arkansas (as *Leuciscus lutrensis* types, Baird & Girard, 1853). Otter Creek, a tributary of the northern fork of Red River, Arkansas, also Gypsum Creek, a tributary of the False Washita (as *Moniana lutrensis*, Girard, 1856, and Girard, 1858). China, New Leon (as *Moniana couchi* types, Girard, 1856, and Girard, 1859, pl. xxx, figs. 21-24). Cadereita, New Leon, Mexico, (as *Moniana rutila* types, Girard, 1856, and Girard, 1859, pl. xxx, figs. 1-4). Near Monterey, New Leon, Mexico (as *Moniana gracilis* types, Girard, 1856, and Girard, 1859). Brownsville (as *Moniana gibbosa* types, Girard, 1856, and Girard, 1859, pl. xxx, figs. 9-12). Hurrah Creek, a tributary of the Rio Pecos (as *Moniana latabilis* types, Girard, 1856, and Girard, 1858). Near San Antonio (as *Cyprinella suavis* types, Girard, 1856, and Girard, 1858). San Ildefonso, N. Mex. (as *Hypsi-lepis iris* Cope, types, Cope & Yarrow, 1875, pl. xxxi, figs. 4, 4a, 5, 5a). Upper Rio Grande (as *Chiola iris*, Synopsis). Rio Grande (as *Chiola gibbosa*, Synopsis). Trinity River at Fort Worth and Dallas (as *Moniana jugalis*, var., Cope, 1880). Sabine River at Longview, Rio Lampasas at Belton, Trinity River at Dallas, Rio Colorado at Austin, Rio Blanco at San Marcos, and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Neches River and Trinity River near Palestine, Guadalupe River at New Braunfels, and San Antonio River at San Antonio (Evermann, 1892). Fulton Creek near Creswell (Coate).

The following notes have been made upon the type specimens of these various nominal species, all of which are now in the National Museum:

*Moniana lutrensis* (No. 104). Four specimens,  $1\frac{1}{2}$  to  $1\frac{1}{2}$  inches long, in fair condition. Head,  $3\frac{1}{2}$ ; depth,  $3\frac{1}{2}$ ; eye, 4; D. 1, 8; A. 1, 9; scales, 7-34-3. These specimens are very dark and look as though they had been taken in muddy water or water containing staining matter. These were collected by Capt. George B. McClellan in 1853.

*Moniana gracilis* (No. 116). Four specimens,  $1\frac{1}{2}$  inches long. These are all males, in good condition. Head,  $3\frac{1}{2}$ ; depth,  $3\frac{1}{2}$ ; eye,  $3\frac{1}{2}$ ; D. 1, 7; A. 1, 8; scales, 7-35-3.

*Montana couchi* (No. 103 or, new series, 20227). Two specimens,  $1\frac{1}{2}$  and  $2\frac{1}{2}$  inches, respectively, in good condition. Head,  $3\frac{1}{2}$ ; depth,  $3\frac{1}{2}$ ; eye,  $3\frac{1}{2}$ ; snout,  $3\frac{1}{2}$ ; D. 1, 8; A. 1, 8; scales, 7-35-3. One of the two has the head a little longer ( $3\frac{1}{2}$ ) and the depth a trifle less ( $3\frac{1}{2}$ ). There are in another bottle 32 small specimens, 14 of them under  $1\frac{1}{2}$  inches each, that are a part of the types of *M. couchi*. They are all in very good condition and agree perfectly with the types of *M. lutrensis*.

*Hypsilepis iris* (No. 16976). One specimen,  $2\frac{1}{2}$  inches long, in fair condition. Head,  $3\frac{1}{2}$ ; depth,  $3\frac{1}{2}$ ; eye,  $4\frac{1}{2}$ ,=snout; D. 1, 8; A. 1, 9; scales 7-33-2; height of dorsal fin  $1\frac{1}{2}$  in length of head,  $1\frac{1}{2}$  in base of fin. Three other bottles (Nos. 16976, 16977, and 16980) contain several dozen small minnows in poor condition. They are all from San Ildefonso, N. Mex., and are labeled as the types of *Hypsilepis iris*. Most of them are that species, but each bottle contains also a number of specimens of *Rhinichthys dulcis*, *Leuciscus pulchellus*, and perhaps still other species.

58. *Notropis proserpina* (Grd.). Devil River (as *Moniana proserpina* types, Girard, 1856, and Girard, 1859). Piedra Pointe, N. Mex. (as *Moniana aurata* types, Girard, 1856, and Girard, 1859, pl. xxx, figs. 13-16). There are in the Museum 8 specimens (117=2702) marked as the types of this species; the largest is  $2\frac{1}{2}$  inches long, and all are in fairly good condition. Head,  $4\frac{1}{2}$ ; depth, 4; eye,  $3\frac{1}{2}$ ; D. 1, 8; A. 1, 7; scales, 6-36-3, the lateral line interrupted; snout blunt and decurved, the lower jaw included, and the mouth small; side with a broad greenish, plumbeous band.
59. *Notropis formosus* (Grd.). Rio Mimbres, Chihuahua (as *Moniana formosa* types, Girard, 1856, and Girard, 1859, pl. xxx, figs. 5-8). Rio Mimbres (as *Cliola formosa*, Synopsis).
60. *Notropis bubalinus* (Baird & Girard). Otter Creek, Arkansas (as *Leuciscus bubalinus* types, Baird & Girard, 1853). Coal Creek, a southern tributary of Canadian River, Arkansas, and 20 miles west of Choctaw Agency (as *Cyprinella umbrosa* types, Girard, 1856, and Girard, 1858, pl. LVII, figs. 1-5). Otter Creek, a tributary of the north fork of Red River, Arkansas (as *Cyprinella bubalina*, Girard, 1856, and Girard, 1858). Brownsville (as *Cyprinella bubalina*, Jordan, 1878). The types of *C. umbrosa* are in excellent condition; they consist of 4 specimens, each about 3 inches long, and were collected by H. B. Möllhausen. They give the following measurements: Head,  $3\frac{1}{2}$ ; depth,  $2\frac{1}{2}$ ; eye,  $3\frac{1}{2}$ ; D. 1, 8; A. 1, 9; scales, 7-35-3, 13 before the dorsal. This species is chiefly distinguished by the great depth of the body.
61. *Notropis lepidus* (Grd.). Rio Frio, a tributary of the Rio Nueces (as *Cyprinella lepida* types, Girard, 1856, and Girard, 1858, pl. LVIII, figs. 21-25). Rio Frio (as *Cliola lepida*, Synopsis).
62. *Notropis garmani* Jordan. Tributaries of Lago del Muerte, Parras, Coahuila, Mexico (as *Cyprinella rubripinna* types, Garman, 1881), and same locality (as *Cliola rubripinna*, Synopsis, and as *Notropis garmani* nom. sp. nov., Jordan, 1885).
63. *Notropis macrostomus* (Grd.). Devil River, Texas, and China, New Leon, Mexico (as *Cyprinella macrostoma* types, Girard, 1856, and Girard, 1859, pl. xxxi, figs. 5-8). San Pedro Creek, tributary of Rio San Antonio (as *Cyprinella luxiloides* types, Girard, 1856, and Girard, 1859, pl. xxxi, figs. 13-16). The types of this species are three specimens (U. S. N. M. No. 129), the largest  $2\frac{1}{2}$  inches long, the other two  $1\frac{1}{2}$  inches each, in fair condition. Head,  $3\frac{1}{2}$ ; depth,  $3\frac{1}{2}$ ; eye 3, greater than snout; mouth large, maxillary reaching pupil. D. 1, 8; A. 1, 8; scales, 5-36-3; origin of dorsal fin nearer snout than base of caudal.
64. *Notropis venustus* (Grd.). Rio Sabinal (as *Cyprinella venusta* types, Girard, 1856, and Girard, 1859, pl. xxxi, figs. 1-4). Johnson Fork of Llano River (*Cyprinella venusta*, Cope, 1880). San Saba River and Clear Creek (as *Cliola urostigma* types, Jordan & Meek, 1884). Red River at Fulton, Ark., Sabine River at Longview, Rio Lampasas at Belton, and Rio Colorado at Austin (Jordan & Gilbert, 1886). Neches River and Trinity River near Palestine,

Buffalo Bayou and Big White Oak Bayou at Houston, and Hunter Creek near Houston (Evermann, 1892). The types of *Cliola urostigma* now in the National Museum are 10 specimens (No. 20446) from the San Saba near Fort McKavett, and 8 (No. 17812) from Clear Creek near Hempstead, the latter being in good condition. All of these agree perfectly with the numerous specimens collected by us in 1891, and with Girard's plate.

65. *Notropis notatus* (Grd.). Rio Seco, a tributary of the Rio Nueces (as *Cyprinella notata* types, Girard, 1856, and Girard, 1858, pl. LVIII, figs. 16-20). Rio Seco (as *Cliola notata*, Synopsis). Rio Colorado at Austin (Jordan & Gilbert, 1886). The types (U. S. N. M. No. 136) are two small specimens in fair condition.
66. *Notropis texanus* (Grd.). Rio Salado and Turkey Creek (as *Cyprinella texana* type, Girard, 1856, and Girard, 1859, pl. XXXI, figs. 9-12). Rio Lampasas at Belton, and Trinity River at Dallas (Jordan & Gilbert, 1886). Six of the types of this species are in the National Museum (No. 182), but are in very bad condition; they are each about  $2\frac{1}{2}$  inches long, and present the following characters: Head, 4; depth, 4; eye, a little more than 3; D. 1, 8; A. 1, 7; scales, 6-37-4, 15 before the dorsal. The mouth is rather large, not greatly oblique, lower jaw barely included, the maxillary reaching the front of the orbit. Lateral line slightly decurved. Silvery, the caudal spot small and indistinct. Compared with specimens of *Notropis venustus* of the same size, the mouth is larger, the snout longer and more pointed, and the caudal spot is much less distinct. There is one specimen of this same lot in the Philadelphia Academy's Museum, which was examined by Prof. Meek a few years ago.
67. *Notropis amabilis* (Grd.). Rio Leona, an affluent of the Rio Nueces (as *Alburnus amabilis* types, Girard, 1856, and Girard, 1859, pl. XXIX, figs. 10-13). Rio Leona (as *Minnilus amabilis*, Synopsis).
68. *Notropis socius* (Grd.). Live Oak Creek (as *Alburnus socius* types, Girard, 1856, and as *Alburnellus socius*, Girard, 1859, pl. XXIX, figs. 14-17). Pecos River (U. S. N. M., Capt. Pope). There are 20 specimens in the Museum, the types of this species (No. 70, or 39654 new series); they are  $2\frac{1}{2}$  inches or less in length and are in very poor condition; teeth 1, 4-4, 1; head,  $3\frac{3}{4}$ ; depth,  $3\frac{3}{4}$ ; eye 3, = distance from tip of snout to pupil; mouth large and oblique. Besides these 20 types there are 151 other specimens of this species (U. S. N. M. No. 3394) from the Pecos River, collected by Capt. John Pope.
69. *Notropis swaini* J. & G. San Felipe Creek (as *Alburnus megalops* types, Girard, 1856, and as *Alburnellus megalops*, Girard, 1859, pl. XXIX, figs. 1-4). Rio Comal at New Braunfels, Rio San Marcos at San Marcos, and Rio Colorado at Austin (Jordan & Gilbert, 1886). Comal Creek at New Braunfels and San Marcos River at San Marcos (Evermann, 1892).
70. *Notropis umbratilis* (Grd.). Coal Creek, a tributary of the south fork of Canadian River, and 20 miles west of the Choctaw Agency (as *Luxilus lucidus* types, Girard, 1856, and Girard, 1858, pl. LX, figs. 9-12). The types of this species, described by Girard as *Alburnellus umbratilis*, were obtained by H. B. Möllhausen in Sugar Loaf Creek, Arkansas. They are 47 in number (U. S. N. M. No. 73), each about  $2\frac{1}{2}$  inches or less in length, and in good condition. Head,  $4\frac{1}{2}$ ; depth,  $4\frac{1}{2}$ ; eye, 4; mouth large, considerably oblique; lower jaw projecting; head, pointed. D. 1, 8; A. 1, 11; scales, 9-44- $2\frac{1}{2}$ , 26 before the dorsal.
71. *Notropis dilectus* (Grd.). San Ildefonso, N. Mex. (as *Alburnellus jemezianus* Cope, types, Cope & Yarrow, 1875). Red River at Fulton, Ark., and Sabine River at Longview (Jordan & Gilbert, 1886). Long Lake near Magnolia Point, Neches River east of Palestine, and Trinity River at Magnolia Point (Evermann, 1892). Fulton Creek near Creswell (Coate).
72. *Notropis fumeus* Evermann. Hunter Creek near Houston (types, Evermann, 1892).
73. *Notropis notemigonoides* Evermann. Neches River east of Palestine and Sims Bayou near Houston (types, Evermann, 1892).
74. *Phenacobius mirabilis* (Grd.). Brownsville (as *Phenacobius scopiferus*, Jordan, 1878). Sabine River at Longview, and Trinity River at Dallas (Jordan & Gilbert, 1886). Trinity River at Magnolia Point near Palestine (Evermann, 1892).
75. *Rhinichthys dulcis* (Grd.). Rio Grande at Del Norte and Alamosa, Colo., and Rio Conejos near Alamosa, Colo. (Jordan, 1889). Abiquiu, Costilla Creek, Taos, and San Ildefonso, N. Mex. (as *Rhinichthys maxillosus*, Cope & Yarrow, 1875). Coahuila, Mexico (as *Rhinichthys simus* types, Garman, 1881).

- 76. *Agosia oscula* (Grd.). "New Mexico" and "Rio Grande basin" (as *Apocope ventricosa* Cope, types, Cope & Yarrow, 1875, pl. xxviii, figs. 1, 1a). The occurrence of this species in the Rio Grande basin is doubtful.
- 77. *Agosia yarrowi* Jordan & Evermann. Rio Grande, Colorado (as *Apocope oscula* types, Cope & Yarrow, 1875, not *Argyreus oscula* of Girard). The occurrence of this minnow in the Rio Grande basin is also doubtful.
- 78. *Hybopsis storerianus* (Kirtland). Red River at Fulton, Ark. (Jordan & Gilbert, 1886).
- 79. *Hybopsis æstivalis* (Grd.). Rio San Juan near Cadereita, New Leon (as *Gobio æstivalis* types, Girard, 1856, pl. LVII, figs. 17-20; and Girard, 1859). Rio Grande at San Ildefonso, N. Mex. (*Ceraticthys sterletus* Cope, types, Cope & Yarrow, 1875, pl. xxvii, figs. 3, 3a). Red River at Fulton, Ark., and Rio Colorado at Austin (Jordan & Gilbert, 1886). Rio Grande in New Mexico (as *Ceraticthys sterletus*, Synopsis). Rio San Juan, Cadereita, New Leon (as *Ceraticthys æstivalis*, Synopsis). The type of *C. sterletus* (U. S. N. M. No. 16973) is a single specimen about 3 inches long and in good condition. Head, 4; depth, 5; eye, 4½; snout, 2½.
- 80. *Hybopsis æstivalis marconis* J. & G. Rio San Marcos at San Marcos (types) and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). San Marcos River at San Marcos and Guadalupe River at New Braunfels (Evermann, 1892). Probably identical with *H. æstivalis*.
- 81. *Semotilus atromaculatus* (Mitch.). Twenty miles west of the Choctaw Agency (as *Leucosomus incrasatus* types, Girard, 1856, and Girard, 1858, pl. LXI, figs. 1-6). Antelope Creek, Arkansas (as *Leucosomus pallidus* types, Girard, 1856, and Girard, 1858, pl. LXI, figs. 6-10).
- 82. *Stypoödon signifer* Garman. Parras, Coahuila (type, Garman, 1881).
- 83. *Leuciscus nigrescens* (Grd.). Rio Mimbres, tributary of Lake Guzman (not the Gila) (as *Gila pulchella* types, Baird & Girard, 1854). Chihuahua River and tributaries (as *Tigoma pulchra* types, Girard, 1856, and Girard, 1859, pl. xxxii, figs. 5-8). Rio Mimbres, tributary of Lake Guzman, Mexico (as *Tigoma pulchella*, Girard, 1856, and Girard, 1859, pl. xxxi, figs. 5-8). Sangre de Christo Pass, from a tributary of the Rio Grande (as *Clinostomus pandora* types, Cope, 1872). Rio Grande, mouth of the Rio Hondo, and Rio Grande near San Ildefonso, N. Mex. (as *Gila pandora*, Cope & Yarrow, 1875). Chihuahua River (as *Squalius pulcher*, Synopsis). Lake Guzman (as *Squalius pulchellus*, Synopsis). Rio Grande at Del Norte and Alamosa, Colo., and Rio Conejos near Alamosa (as *Leuciscus pulcher*, Jordan, 1891). Rio de Acama, N. Mex. (as *Gila gila* types, Cope & Yarrow, 1875). Rio Grande at Loma, Colo. (as *Gila egregia*, Cope & Yarrow, 1875). Boca Grande and Janos River (as *Tigoma nigrescens* types, Girard, 1856, and Girard, 1859, pl. xxxii, figs. 1-4). Parras, Coahuila (as *Cheonda nigrescens*, Garman, 1881). An examination of the original description and a study and comparison of the types of these various nominal species named above convinces us that the synonymy should stand as here given. In the following table we give measurements and other data drawn from the material now in the National Museum.

Nominal species.	U. S. N. M. No.	Total length.	Head in length.	Depth in length.	Eye in head.	Snout in head.	Dorsal.	Anal.	Scales.	Locality.
		<i>Inches.</i>								
<i>Gila pulchella</i> , types.....	233	6½	4	4½	5½	3½	I, 9	I, 8	16-67-7	Rio Mimbres.
	233	3½	3½	4½	4½	4	I, 9	I, 8	16-73-9	Do.
<i>Tigoma pulchra</i> , types....	227	5½	3½	3½	4½	3½	I, 8	I, 8	.....	Rio Chihuahua.
	227	4½	3½	4½	4	4	I, 8	I, 8	20-70-9	Do.
	228	5½	4	4	4½	3½	I, 8	I, 8	.....	Do.
	228	5	4	4	4½	3½	I, 8	I, 8	17-63-10	Do.
	228	3½	3½	3½	3½	3½	I, 8	I, 8	.....	Do.
<i>Tigoma nigrescens</i> , types.	219	3½	3½	4	4	4	I, 9	I, 8	17-67-5	Rio Janos.
	220	5½	3½	4	5½	3½	I, 9	I, 8	17-67-8	Boca Grande.
	220	3	3½	4½	4	4	I, 9	I, 8	17-65-9	Do.
<i>Gila egregia</i> .....	15800	5½	4	4½	4½	3½	I, 8	I, 8	16-64-8	San Ildefonso.
	15800	3½	3½	3½	4	3½	I, 8	I, 8	16-60-8	Do.
<i>Gila pandora</i> , types.....	15984	6½	4	4	4½	3½	I, 8	.....	17-67-10	Rio Hondo, N. Mex.
	15984	6	4	4	4½	3½	.....	.....	17-63-10	Do.
	15984	5½	4½	4½	4½	4½	.....	.....	16-63-10	Do.
	15984	4	4	4	4	4	I, 8	I, 8	16-60-8	Do.
	41628	8	4½	4½	5½	3½	I, 8	I, 8	17-65-8	Rio Grande at Del Norte, Colo.
	41628	5½	4	4	5	3½	I, 8	I, 8	17-64-11	Do.

This is a very variable species, a fact shown not only by the several nominal species which we have united in the above synonymy, but as well by the different individuals of any one of the types. However, as shown in the table, the variations are, chiefly a least, in parts which in this group are not of value for purposes of classification. The size and number of the scales have heretofore been used for this purpose, but, as may be seen, the variation in squamation among the individuals of any one of the types, for example, *Tigoma pulchra*, is as great as among the types of the several nominal species. We have not been able to find the types of *Gila gula*, which probably also belongs here.

84. *Leuciscus conspersus* (Garman). Nazas River, Coahuila (as *Gila conspersa* type, Garman, 1881), Saltillo, Coahuila (as ? *Cheonda modesta* types, Garman, 1881).
85. *Opsopceodus oscula* Evermann. Neches River and Long Lake near Palestine. Buffalo Bayou, Sims Bayou, and Kilper's Pond near Houston. Dickinson Bayou at Nicholstone (types, Evermann, 1892).
86. *Notemigonus chrysoleucus* (Mitchill). Rio Seco, a tributary of the Rio Nueces (as *Luxilus seco* types, Girard, 1856, and Girard, 1858). Dry Creek near Victoria (as *Luxilus leptosomus* types, Girard, 1856, and Girard, 1859, pl. XIX, figs. 9-12). Brownsville (Jordan, 1878). Neches River, Long Lake, and Trinity River near Palestine. Sims Bayou, Kilper's Ponds and Big White Oak Bayou near Houston. Dickinson Bayou near Dickinson (Evermann, 1892). Fulton Creek near Creswell (Coate). The type of *Luxilus leptosomus* is 4½ inches long (U. S. N. M. No. 61) and is very mellow. It does not differ from *Notemigonus chrysoleucus*.

#### X.—CHARACINIDÆ. THE CHARACINS.

87. *Tetragonopterus argentatus* (B. & G.). Upper tributaries of the Rio Nueces (as *Astyanax argentatus* types, Baird & Girard, 1854). Rio Nueces, Rio Leona, Rio Sabinal, mouth of the Rio Grande, Zoquito, Comanche Springs, Elm Creek, Turkey Creek, San Felipe, Devil River, and Brownsville (as *Astyanax argentatus*, Girard, 1859, pl. VIII, figs. 5-9).

#### XI.—HIODONTIDÆ. THE MOON-EYES.

88. *Hiodon alosoides* (Raf.). Red River at Fulton, Ark. (Jordan & Gilbert, 1886).

#### XII.—ELOPIDÆ. THE BIG-EYED HERRINGS.

89. *Megalops atlanticus* C. & V. Galveston (Jordan & Gilbert, 1882).

#### XIII.—CLUPEIDÆ. THE HERRINGS.

90. *Clupea chrysochloris* (Raf.). Red River at Fulton, Ark., and Galveston (Jordan & Gilbert, 1882 and 1886).
91. *Harengula arcuata* (Jenyns). Nine specimens from Galveston and Corpus Christi. *Clupea humeralis* Cuv. & Val. and *Harengula pensacola* Goode & Bean seem to be identical with this species.
92. *Opisthonema thrissa* (Osbeck). Galveston (Jordan & Gilbert, 1882).
93. *Brevoortia tyrannus patronus* Goode. Brazos Santiago (as *Brevoortia patronus* types, Goode, 1878). Galveston (Jordan & Gilbert, 1882). One young specimen obtained by us at Galveston. The differences said to distinguish the Gulf menhaden from the common form are not of great value. Our specimen shows no differences in the scales, but the fins are a trifle larger or longer than in specimens of the same size from further north.
94. *Dorosoma cepedianum* (Le S.). Galveston (Jordan & Gilbert, 1882). Red River at Fulton, Ark., and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). This worthless fish was very abundant in Long Lake near Magnolia Point and in Kilper's Ponds at Houston.

#### XIV.—ENGRAULIDÆ. THE ANCHOVIES.

95. *Stolephorus browni* (Gmelin). *Anchovy*. The collection made at Galveston contains seven specimens of this species.
96. *Stolephorus mitchilli* (C. & V.). Galveston (Jordan & Gilbert, 1882). A few specimens taken at Galveston, Corpus Christi, and in Dickinson Bayou.

## XV.—SCOPELIDÆ. THE SCOPELIDS.

97. *Synodus fœtens* (L.). Texas coast (as *Saurus mexicanus*, Girard, 1859). Two specimens from Galveston—one 4 inches long, which does not fully agree with the description of *S. fœtens*. Head,  $4\frac{1}{2}$ ; depth,  $7\frac{1}{2}$ ; eye,  $4\frac{1}{2}$ ; dorsal, 11; anal, 14. Scales before dorsal about 25; lateral line, 64; oblique series between lateral line and origin of dorsal, 5.

## XVI.—SALMONIDÆ. THE SALMON FAMILY.

98. *Salmo mykiss spilurus* Cope. Sangre de Christo Pass, in Colorado, from one of the sources of the Rio Grande (as *Salmo spilurus* types, Cope, 1872). Utah Creek, and at Sangre de Christo Pass, a tributary to the Rio Grande (as *Salar virginialis* types, Girard, 1856, and Girard, 1858, pl. LXXIII, figs. 1-4). Brazos River, one of the principal tributaries of the Chama (as *Salmo spilurus*, Cope & Yarrow, 1875). Fort Garland, Colorado; Rio Grande, Colorado; Costilla, Rio Taos, Rio Chama, and near San Ildefonso, New Mexico (as *Salmo pleuriticus*, Cope & Yarrow, 1875). Rio Grande (as *Salmo spilurus* and *Salmo spilurus pleuriticus*, Synopsis). Brazos River, New Mexico, (as *Salmo spilurus*, Bean, 1883). Mountain streams of the Upper Rio Grande basin (Jordan & Gilbert, 1883). Streams of the Sierra Madre of Mexico at an elevation of between 7,000 and 8,000 feet, in the southern part of Chihuahua, near the southern boundaries of Durango and Sinaloa (as *Salmo purpuratus*, Cope, 1888, and Bean, 1888). Rio Grande (Forest and Stream, 1877). Limpia, Devil River, San Felipe Springs, and headwaters of the Canadian River, Texas, and Rio Bonito, New Mexico (as *Salmo fontinalis*, Forest and Stream, 1878). Cope's type of *Salmo spilurus* (U. S. N. M. No. 17067) is about 18 inches long and in good condition. It is labeled as from the Rio Brazos, New Mexico, which is probably incorrect, as Cope states the types came from Sangre de Christo Pass, Colorado. The trout mentioned in the Pacific Railroad Reports by Lieut. Marshall as occurring in the upper waters of the Sacramento (a tributary of the Pecos) and in the upper waters of the Colorado and Brazos rivers was of course this trout if trout at all. As no collecting has been done in that region since 1854, these early reports have not been verified. The distribution of the trout of the Rio Grande basin furnishes a very interesting and proper subject for investigation.

## XVII.—CYPRINODONTIDÆ. THE CYPRINODONTS.

99. *Cyprinodon variegatus* Lacépède. Brackish waters of Indianola (as *Cyprinodon gibbosus* types, Baird & Girard, 1853, and Girard, 1859, pl. xxxviii, figs. 1-7). Leon Springs, Rio Grande del Norte (as *Cyprinodon bovinus* types, Baird & Girard, 1853, Girard, 1859, pl. xxxvii, figs. 12-18, and Synopsis). Chihuahua River (as *Cyprinodon eximius* types, Girard, 1859, and Synopsis). Brownsville (Jordan, 1878). Indianola (as *Cyprinodon gibbosus*, Synopsis). Galveston Bay, Dickinson Bayou, and Corpus Christi (Evermann, 1892).
100. *Cyprinodon latifasciatus* Garman. Spring near Parras, Coahuila (type, Garman, 1881).
101. *Cyprinodon elegans* B. & G. Rio Grande del Norte (types, Baird & Girard, 1853), and Comanche Springs, Rio Grande del Norte (Girard, 1859, pl. xxxviii, figs. 1-7). These two references are evidently to one and the same locality, and to the same specimens.
102. *Adinia multifasciata* Grd. Galveston, St. Joseph Island, and Indianola (types of genus and species, Girard, 1859b, and pl. xxxviii, figs. 12-14, Girard, 1859, as the female of *Limia paxiloides*). Coast of Texas, ascending streams; our specimens from the Rio Grande (as *Fundulus adinia*, nom. sp. nov., Synopsis). Galveston (as *Fundulus xenicus*, Evermann, 1892).
103. *Fundulus pallidus* Evermann. Galveston Bay, near Swau Lake (type, Evermann, 1892, pl. xxxv, fig. 2).
104. *Fundulus similis* (B. & G.). Brackish waters in the vicinity of Indianola (as *Hydrargyra similis* types, Baird & Girard, 1853, and Girard, 1859, pl. xxxv, figs. 1-8). Brownsville (as *Hydrargyra similis*, Jordan, 1878). Galveston (Jordan & Gilbert, 1882). Galveston and Corpus Christi (Evermann, 1892).
105. *Fundulus zebrius* J. & G. "Between Fort Defiance and Fort Union, New Mexico" (as *Hydrargyra zebra*, Girard, 1859b). Brownsville (as *Fundulus zebra*, Jordan, 1878). Fulton and Spring creeks near Creswell (Coate).
106. *Fundulus diaphanus* (Le S.). Comanche Creek, Mason County (Cope, 1880).

107. *Fundulus heteroclitus grandis* B. & G. Brackish waters in the vicinity of Indianola (as *Fundulus grandis* types, Baird & Girard, 1853, and Girard 1859, pl. xxxvi). Brownsville (Jordan, 1878). Dickinson Bayou at Nicholstone, Galveston Bay, and Corpus Christi (Evermann, 1892).
108. *Zygonectes funduloides* Evermann. Dickinson Bayou near Dickinson (types, Evermann, 1892, pl. xxxv, fig. 3).
109. *Zygonectes pulvereus* Evermann. Dickinson Bayou near Dickinson, Buffalo Bayou near Houston, and Oso Creek near Corpus Christi (types, Evermann, 1892, pl. xxxvi, fig. 1).
110. *Zygonectes jenkinsi* Evermann. Dickinson Bayou near Dickinson and Galveston Bay (types, Evermann, 1892, pl. xxxvi, fig. 2).
111. *Zygonectes notatus* (Raf.). Trinity River at Fort Worth (Cope, 1880). Red River at Fulton, Ark., Sabine River at Longview, Rio Lampasas at Belton, Trinity River at Dallas, and Rio Colorado at Austin (Jordan & Gilbert, 1886). Neches River east of Palestine, Long Lake and Trinity River at Magnolia Point, Buffalo and Big White Oak bayous at Houston, and San Antonio Springs at San Antonio (Evermann, 1892).
112. *Zygonectes escambiae* Bollman. Pond on bank of Trinity River at Magnolia Point (Evermann, 1892).
113. *Lucania venusta* (Grd.). Indianola (as *Limia venusta* type, Girard, 1859, pl. xxxix, figs. 20-23; and as *Lucania venusta*, gen. nov., 1859b). Matamoras (as *Lucania affinis* types, Girard, 1859b). Indianola (Synopsis).
114. *Lucania parva* (B. & G.). Sims Bayou near Houston, Dickinson Bayou near Dickinson, San Antonio Springs at San Antonio, and Corpus Christi (Evermann, 1892).
115. *Gambusia affinis* (B. & G.). Rio Medina and Rio Salado (as *Heterandria affinis* types, Baird & Girard, 1853, and as *Gambusia affinis*, Girard, 1859, pl. xxxix, figs. 12-15). "Inhabits the hydrographic basin of the Rio Nueces; specimens were collected in the Rio Sabinal, Rio Leona, Rio Nueces, and Elm Creek" (as *Heterandria patruelis* types, Baird & Girard, 1853). Rio Sabinal, Rio Leona, Rio Nueces, Elm Creek, and Turkey Creek (as *Gambusia patruelis*, Girard, 1859, pl. xxxix, figs. 1-7). Leona and Comanche Springs, valley of the Rio Grande del Norte (as *Heterandria nobilis* types, Baird & Girard, 1853), and Leon's Spring, Comanche Spring, and Zoquito (Girard, 1859, pl. xxxix, figs. 8-11). Upper affluents of the Rio Nueces, Rio Leona, Rio Blanco, and Rio Seco (Girard, 1859b). Matamoras (as *Gambusia gracilis* types, Girard, 1859b, and as *Gambusia humilis*, nom. sp. nov. Günther, 1866). Trinity River at Fort Worth (as *Zygonectes brachypterus* types, Cope, 1880). Trinity River (as *Zygonectes brachypterus*, Synopsis). Galveston (Jordan & Gilbert, 1882). Red River at Fulton, Ark., Sabine River at Longview, Trinity River at Dallas, Rio Lampasas at Belton, Rio Colorado at Austin, Rio San Marcos at San Marcos, and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Rio San Diego, one of the affluents of the Rio San Juan, near Cadereita, New Leon (as *Gambusia speciosa* types, Girard, 1859b). Chihuahua River (as *Gambusia senilis* types, Girard, 1859b, and Synopsis). Upper affluents of the Rio Nueces, Rio Leona, Rio Blanco, and Rio Seco (Girard, 1859b). San Pedro Creek and Dry Creek near Victoria (as *Gambusia affinis*, Girard, 1859b). Comanche Spring (as *Gambusia nobilis*, Girard, 1859b). Neches River east of Palestine, Trinity River and Long Lake at Magnolia Point, Buffalo Bayou, Hunter Creek, Kilper's Ponds, Big White Oak Bayou, and Sims Bayou near Houston, Dickinson Bayou near Dickinson, San Antonio Springs at San Antonio, Comal Creek at New Braunfels, and Rio San Marcos at San Marcos (Evermann, 1892). Strict adherence to the A. O. U. rule of priority requires that the specific name *affinis* be applied to this fish.
116. *Mollienesia latipinna* Le S. Brownsville and Fort Brown (as *Pacilia lineolata* types, Girard, 1859, pl. xxxv, figs. 9-11, and Girard, 1859b). Indianola (as *Limia paciloides* types, Girard, 1859, pl. xxxviii, figs. 8-14, and Girard, 1859b). "Common about Matamoras, where it was collected by the late L. Berlandier, whose collection has since been purchased by Lieut. D. N. Couch, a lover and cultivator of natural sciences" (as *Limia matamorensis* types, Girard, 1859b). Lagoon at Palo Alto, Mexico (as *Limia formosa* types, Girard, 1859b). Galveston (Girard, 1859b, and Jordan & Gilbert, 1882). Corpus Christi, Galveston, Dickinson Bayou at Nicholstone, and Hunter Creek near Houston (Evermann, 1892). Hunter Creek is a clear, cold fresh-water stream, and the occurrence of this brackish-water species there must be regarded as very unusual.

117. *Pœcilia couchiana* (Grd.). Rio San Juan at Cadereta [Cadereita] and Monterey, in the province of New Leon (as *Limia couchiana* types, Girard, 1859b).

XVIII.—ESOCIDÆ. THE PIKES.

118. *Lucius vermiculatus* (Le S.). Six specimens from the Neches River, 14 miles east of Palestine, and one from the Trinity River at Magnolia Point.

XIX.—MURÆNIDÆ. THE MURÆNAS.

119. *Gymnothorax ocellatus nigromarginatus* (Grd.). St. Joseph Island (as *Neomuræna nigromarginata* type, Girard, 1859, pl. xli).

XX.—ECHELIDÆ.

120. *Myrophis punctatus* Lutken. Galveston (as *Myrophis lumbricus* types, Jordan & Gilbert, 1882). We obtained one very young specimen of this species at Galveston and another at Corpus Christi.

XXI.—MURÆNESOCIDÆ.

121. *Neoconger mucronatus* Grd. St. Joseph Island (type, Girard, 1859).

XXII.—ANGUILLIDÆ. THE TRUE EELS.

122. *Anguilla chrysypa* Raf. Mouth of the Rio Grande and Matamoras (as *Anguilla tyrannus* type, Girard, 1859, pl. xl). "Three specimens from near Santa Fe, N. Mex." (as *Anguilla tyrannus*, Cope & Yarrow, 1875). Rio Colorado at Austin and Rio San Marcos at San Marcos (as *Anguilla anguilla rostrata*, Jordan & Gilbert, 1886). The specimen obtained by Jordan & Gilbert at San Marcos is a large individual, 32 inches long (U. S. N. M. No. 36512).

XXIII.—SCOMBERESOCIDÆ.

123. *Tylosurus longirostris* (Mitchill). Brazos and St. Joseph Island (as *Belone scrutator* types, Girard, 1859, pl. xiii). Galveston (Jordan & Gilbert, 1882). Also obtained by us at Galveston.
124. *Hemirhamphus unifasciatus* Ranzani. *Halfbeak*. Galveston (Jordan & Gilbert, 1882).

XXIV.—SYNGNATHIDÆ. THE PIPEFISHES.

125. *Siphostoma floridae* J. & G. *Florida Pipefish*. This appears to be an abundant species at Corpus Christi, and the collection contains numerous specimens from that part of the bay near Shamrock Point on Mustang Island. Measurements of 12 specimens, all from this place, are given in the following table:

Dorsal rings.	Body rings.	Dorsal rays.	Head.	Snout in head.	Sex
1+6	17+32	32	6	1½	Female.
1+6	17+32	30	6	1½	Male.
1+6	17+32	30	6	1½	Female.
1+6	17+32	30	5½	1½	Female.
1+5½	17+32	30	6	1½	Male.
1+6	17+32	30	6	1½	Female.
1+6	17+32	30	6	1½	Male.
1+6	17+32	32	6	1½	Male.
1+6	17+32	32	6	1½	Male.
1+6	17+32	30	6½	1½	Male.
1+6	17+32	33	6	1½	Female.
1+6	17+32	32	6	1½	Female.

It will be seen that these agree perfectly with Prof. Swain's description of this species (Proc. U. S. N. M. 1882, 312), except that the number of dorsal rays is three to five greater in every case.



126. *Siphostoma louisianæ* (Günther). *Louisiana Pipefish*. A specimen 6 inches long from Galveston Bay, a smaller one from Dickinson Bayou in brackish water, and another small one from Corpus Christi.
127. *Siphostoma fuscum* (Storer). *Common Pipefish*. Eleven specimens from Corpus Christi, measurements and other data of which are given in the following table. If this identification be correct the known range of this common species of pipefish is considerably extended to the southward.

Body rings.	Dorsal rings.	Rays.	Head.	Depth.	Height of fin in length.	Sex.
16-31	3-4	31	7	13	2½	Female.
16-31	3-5	34	7	14	2½	Do.
16-31	4-4	32	7	17	3	Do.
16-31	4-3	30	7½	13½	2½	Do.
16-31	4-4	33	7	17	3	Do.
16-31	4-4	34	7	13	2½	Do.
16-34	4-4	34	7½	10½	3	Do.
16-31	4-4	31	7½	10	2	Do.
16-31	4-4	31	7½	17	2½	Do.
16-31	5-3	31	7	1½	2½	Do.
16-32	4-4	31	7½	15½	2	Do.

XXV.—MUGILIDÆ. THE MULLET.

128. *Mugil cephalus* L., *Striped Mullet*. St. Joseph Island, Indianola, Brazos Santiago, Brazos, and Galveston (as *Mugil berlandieri* types, Girard, 1859, pl. x, figs. 1-4). Galveston (as *Mugil albulæ*, Jordan & Gilbert, 1882). Common both at Galveston and Corpus Christi.

XXVI.—ATHERINIDÆ. THE SILVERSIDES.

129. *Labidesthes sicculus* (Cope). *Skipjack*. This fish has been found in Texas only in Long Lake near Magnolia Point, where we found seven specimens.
130. *Menidia vagrans* (Goode & Bean). *Silverside*. Galveston (Jordan & Gilbert, 1882).
131. *Menidia peninsulæ* (Goode & Bean). *Silverside*. This species was obtained by us at Corpus Christi, Galveston, and Dickinson Bayou. Seventeen specimens from Corpus Christi give the following measurements:

Head.	Depth.	Eye.	Dorsal.	Annl.	Scales.
4½	5	3	IV-1, 8	1-16	38
4	5	3	IV-1, 8	1-16	38
4	5	3	V-1, 8	1-15	.....
4	5	3	IV-1, 9	1-15	38
4	5	3	IV-1, 9	1-17	38
4	5½	3	IV-1, 9	1-17	38
4	5	3	?-1, 8	1-16	38
4	5	3	IV-1, 9	1-17	38
4	5	3	IV-1, 9	1-17	38
4	5	3	IV-1, 9	1-15	38
4	5	3	?-1, 9	1-15	36
4	5	3	V-1, 8	1-15	38
4	5½	3	V-1, 8	1-12?	38
4	5	3	V-1, 9	1-15	35
4½	4½	3	V-1, 8	1-15	36 or 37
4	4½	3	V-1, 8	1-10	39
4	5	3	V-1, 9	1-17	38

Eleven specimens from Galveston give the following measurements:

Head.	Depth.	Eye.	Dorsal.	Anal.	Scales.
4	5½	3	V-I, 8	1-15	38
4	5½	3	V-I, 8	1-16	35
4	4½	3	V-I, 8	1-16	38
4	5½	3	V-I, 8	1-18	38
4	5	3	V-I, 9	1-16	38
4½	5	3	V-I, 9	1-16	38
4	5½	3	IV-I, 9	1-15	35
4	5	3	V-I, 10	1-17	37
4	5½	3	IV-I, 8	1-15	32 or 33
4	5½	3	IV-I, 8	1-15	35
4	5	3	IV-I, 8	1-15	38

Nine specimens from Dickinson Bayou give the following measurements:

Head.	Depth.	Eye.	Dorsal.	Anal.	Scales.
4	5	3	?-I, 8	1-17	38
4	5	3	IV-I, 8	1-17	35
4	6	3	IV-I, 8	1-16	35
4	5½	3	IV-I, 9	1-16	38?
4	5½	3	IV-I, 9	1-17	38?
4	5½	3	IV-I, 8	1-17	38
4	5	3	IV-I, 9	1-17	38
4	5	3	IV-I, 8	1-17	38
4	5	3	IV-I, 8	1-17	38

From this table it will be seen that the dorsal-fin formula is usually IV-I, 8 or 9; or V-I, 8 or 9; never VI-I, 8 or 9, as given in the original description of this species.

#### XXVII.—POLYNEMIDÆ. THE THREADFINS.

132. *Polynemus octonemus* Grd. *Threadfin*. Brazos Santiago and Galveston (types, Girard, 1859, pl. x, figs. 5-9).

#### XXVIII.—TRICHIURIDÆ. THE HAIRTAILS.

133. *Trichiurus lepturus* L. *Silver Eel*; *Hairtail*. St. Joseph Island and Brazos Santiago (Girard, 1859). Galveston (Jordan & Gilbert, 1882). One specimen seen by us at Galveston.

#### XXIX.—CARANGIDÆ. THE PILOT-FISHES.

134. *Caranx hippos* (L.). *Horse Crevallé*. Brazos Santiago, mouth of Rio Grande (as *Carangus esculentus* types, Girard, 1859, pl. xi, figs. 1-3).
135. *Vomer setipinnis* (Mitchill). *Horsefish*. Brazos Santiago (Girard, 1859, pl. xi, fig. 8). Obtained by us at Galveston, where it does not appear to be uncommon.
136. *Selene vomer* (L.). *Moonfish*. Matamoras (as *Argyreiosus capillaris*, Girard, 1859, pl. xi, fig. 7).
137. *Chloroscombrus chrysurus* (L.). St. Joseph Island (as *Chloroscombrus caribbaeus* types, Girard, 1859, pl. xi, fig. 6). Found by us at Galveston and Corpus Christi.
138. *Trachynotus carolinus* (L.). *Common Pompano*. St. Joseph Island (as *Doliodon carolinus*, Girard, 1859, pl. xi, fig. 4). Several small specimens from Galveston, the largest about 7 inches long. Head, 3½; depth, 2½; D. VI-I, 24; A. II-I, 23.
139. *Oligoplites saurus* (Bloch & Schneider). *Leather-jacket*; *Runner*. St. Joseph Island (as *Chorinemus lanceolatus* types, Girard, 1859, pl. xi, fig. 5). Taken by us at Dickinson Bayou, Galveston, and Corpus Christi.

#### XXX.—APHREDODERIDÆ. THE PIRATE PERCHES.

140. *Aphredoderus sayanus* (Gilliams). *Pirate Perch*. One specimen from Neches River near Palestine, 47 from Sims Bayou near Houston, 1 from Hunter Creek, and 5 from Buffalo Bayou at Houston. The examples from Sims Bayou are unusually large, many of them being not less than 3½ inches long.

## XXXI.—CENTRARCHIDÆ. THE SUNFISHES.

141. *Pomoxis annularis* Raf. *Crappie*; "Sac-a-lait." Long Lake and Trinity River at Magnolia Point, Neches River east of Palestine, Buffalo Bayou at Houston, and Duncan Lake and other ponds near the mouth of the Trinity River, from which it is brought to the Houston market.
142. *Pomoxis sparoides* (Lac.). *Calico Bass*; "Sac-a-lait." This species is brought to the Houston market in considerable numbers from San Jacinto River at Lynchburg. Both this and the crappie are known here as "sac-a-lait." Taken also by Jordan & Gilbert in Red River at Fulton, Ark.
143. *Chænobryttus gulosus* (C. & V.). *Warmouth*; "Goggle-eye." Leon River, Rio Medina, Dry Creek, and San Pedro Creek (as *Calliurus melanops* types, Girard, 1857, and Girard, 1858, pl. III). Rio Lampasas at Belton (Jordan & Gilbert, 1886). Long Lake, Trinity River, and Neches River near Palestine. Big White Oak Bayou, Sims Bayou, Kilper's Ponds, Hunter Creek, and Buffalo Bayou near Houston. San Jacinto River at Lynchburg, from which it is brought to the Houston market. Dickinson Bayou near Dickinson.
144. *Lepomis cyanellus* Raf. *Blue-spotted Sunfish*. Tributary of Gypsum Creek, headwaters of the Brazos River, headwaters of Colorado River, Red River at Fort Washita, and Rio Brazos (as *Calliurus formosus* types, Girard, 1857, and Girard, 1858, pl. v, figs. 1-4). Otter Creek, Arkansas, Rio Blanco (as *Calliurus diaphanus* types, Girard, 1857, and Girard, 1858), (as *Pomotis longulus* types, Baird & Girard, 1853, pl. XII). Rio Cibolo, a tributary of the Rio San Antonio (as *Bryttus longulus*, Baird & Girard, 1854). Rio Medina (as *Bryttus signifer* types, Girard, 1857, and Girard, 1858, pl. VII, figs. 5-8). Rio Cibolo, Mineville, Rio Seco, and the Rio Pecos (as *Calliurus longulus*, Girard, 1858, pl. v, figs. 5-8, and pl. VI, figs. 5-8). Rio Cibolo and the Mineville River (as *Calliurus longulus*, Girard, 1859, pl. IV, figs. 1-4). Red River at Fort Washita and the Rio Brazos (as *Calliurus microps* types, Girard, 1857, and Girard, 1858, pl. IV, figs. 1-4). Indianola to Nueces, Delaware Creek, and headwaters of Rio Brazos (as *Calliurus murinus* types, Girard, 1857, and Girard, 1858, pl. VII, figs. 1-4). Brownsville (as *Apomotis cyanellus*, Jordan, 1878). Trinity River at Dallas and Fort Worth (as *Apomotis cyanellus*, Cope, 1880). Rio Lampasas at Belton and Rio Colorado at Austin (Jordan & Gilbert, 1886). In the collection made by Mr. Orland Coate there are 19 specimens of this species from Spring Creek and 12 from Fulton Creek. The type of *Calliurus murinus* (U. S. N. M. No. 415) is a single specimen 6 inches long, in good condition, and labeled as coming from "near Indianola, Tex."
145. *Lepomis symmetricus* Forbes. Head,  $2\frac{3}{4}$ ; depth,  $2\frac{1}{4}$ ; eye,  $3\frac{3}{8}$ ; snout,  $4\frac{1}{2}$ ; D. x-10; A. III-9; scales, 6-35-10. Body rather short and deep, the back evenly arched, a slight depression above eye; caudal peduncle stout, its least depth nearly one-half length of head. Mouth small, oblique, the maxillary reaching to vertical of eye; supplemental maxillary bone not present; 5 rows of scales on cheek; opercular process two-thirds diameter of eye, flexible margin narrow, the black not confined to the bony part. Lower pharyngeals broad, broader than in somewhat larger specimens of *L. gibbosus*, the teeth bluntly conic; gill-rakers long and slender, the longest more than half diameter of eye. Lateral line gently arched, incomplete, developed on about 14 scales only. Fins moderate, longest dorsal spine equal to distance from tip of snout to posterior edge of pupil; soft dorsal higher, its longest ray half length of head; pectorals long,  $1\frac{1}{2}$  in head, reaching third anal spine; ventrals short, scarcely reaching anal, or nearly twice in head; anal, size of soft dorsal. Coloration in alcohol: Base of each scale on upper parts of body and along sides brown, outer margin pale, the general appearance resulting being that of 12 or 13 longitudinal rows of brown spots, 4 of which lie above the lateral line; on the caudal peduncle the spots are less regular; all parts of the body, including fins as well, covered thickly with small coffee-colored specks, the head and breast being especially thickly covered; tips of the ventral fins black; no black spot on dorsal or anal, and no blue lines on cheek. Compared with specimens of *Lepomis symmetricus* from New Orleans, collected by Dr. R. W. Shufeldt (U. S. N. M. No. 35213), the pharyngeal bones are somewhat narrower, the lateral line is less developed and the anal spines are longer. One specimen (U. S. N. M. No. 44830), 3 inches long, from Kilper's Pond, Houston, Tex., November 21, 1891.

146. *Lepomis miniatus* Jordan. "Red Perch." Brought to the Houston market from the San Jacinto River at Lynchburg. It was also found by us in San Antonio Springs. Sides of male with about 14 rows of red spots, those of the lower rows very bright; middle of side with a few scales with black spots, and some black on scales under the pectorals; opercular flap large, broad, and dark green in color; belly orange, with red spots. Gill-rakers stout and not very short. Scales, 6-36-11; 5 rows on cheek. We have compared this species with specimens of *L. auritus* from Raleigh, N. C., and can not agree with Bollman in regarding them as being the same. It is doubtful if *L. garmani* can be separated from this species.
147. *Lepomis megalotis* (Raf.). Long-eared Sunfish. Rio Cibolo, tributary of the Rio San Antonio (as *Pomotis convexifrons* types, Baird & Girard, 1854). Otter Creek, Arkansas (as *Pomotis breviceps* types, Baird & Girard, 1853). Elm Creek (as *Pomotis fallax* types, Baird & Girard, 1854). Rio Cibolo and Rio Salado (as *Pomotis nefastus* types, Baird & Girard, 1854). Headwaters of Colorado River (as *Pomotis popeii* types, Girard, 1858). Headwaters of Colorado River, tributary of Red River at Fort Wachita, headwaters of Rio Brazos, and Rio Brazos (as *Pomotis breviceps*, Girard, 1858). Comanche Spring, Sans Bois Creek, tributary of Gypsum Creek, Rio Seco, Rio Medina, Rio Cibolo, Elm Creek, Rio Salado, Live Oak Creek, San Pedro Creek, and Delaware Creek (as *Pomotis fallax*, Girard, 1858, pl. viii, figs. 9-12, pl. ix, figs. 5-12, and pl. x, figs. 1-7). Rio Cibolo, Elm Creek, Rio Salado, Live Oak Creek, and San Pedro Creek (as *Pomotis fallax*, Girard, 1859, pl. ii, figs. 5-8, and pl. iii, figs. 9-12). Brownsville (as *Xenotis breviceps*, Jordan, 1878.) Trinity River at Dallas and Fort Worth, Helotes Creek, Upper Medina River, and Johnson Fork of the Llano River (as *Xenotis megalotis*, Cope, 1880). Rio Lampasas at Belton, Rio Colorado, at Austin, Rio San Marcos at San Marcos, and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Long Lake, Trinity River, and Neches River near Palestine; Comal Creek and Guadalupe River at New Braunfels. San Antonio Springs at San Antonio; Big White Oak Bayou, Sims Bayou, and Buffalo Bayou near Houston; Dickinson Bayou near Dickinson; San Marcos River at San Marcos and Hunter Creek near Houston.
148. *Lepomis humilis* (Grd.). Red-spotted Sunfish. Brazos River (as *Bryttus humilis* types, Girard, 1857, and Girard, 1858, pl. vii, figs. 9-24). Trinity River at Fort Worth (as *Lepomis anagallinus* var., Cope, 1880). Sabine River at Longview (Jordan & Gilbert, 1886).
149. *Lepomis pallidus* (Mithill). Blue Sunfish. Eagle Pass (as *Pomotis aquilensis* types, Baird & Girard, 1853). Brownsville (as *Pomotis speciosus* types, Baird & Girard, 1854). Brownsville, near Indianola, Devil River, Rio Medina, Rio Seco, New Braunfels, and Cadereita, New Leon (as *Pomotis speciosus*, Girard, 1858, pl. viii, figs. 5-8). Brownsville and Devil River, and Cadereita, New Leon (as *Pomotis speciosus*, Girard, 1859, pl. iv, figs. 5-9). Eagle Pass, San Felipe, Rio Cibolo, Rio Nueces, Rio Sabinal, Rio Blanco, Leon River, and San Pedro near San Antonio (as *Pomotis aquilensis*, Girard, 1858, pl. ix, figs. 1-4, and pl. x, figs. 8-11). Eagle Pass, San Felipe, Rio Cibolo, Rio Nueces, and Rio Sabinal (as *Pomotis aquilensis*, Girard, 1859, pl. iii, figs. 1-8). Brownsville (as *Lepiopomus pallidus*, Jordan, 1878). Llano River (as *Lepomis speciosus*, Cope, 1880). Red River at Fulton, Ark., Trinity River at Dallas, Rio Colorado at Austin, Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Fulton Creek near Creswell (Coate). Long Lake, Trinity River, and Neches River near Palestine. Kilper's Ponds and Buffalo Bayou at Houston. Dickinson Bayou near Dickinson. The type of *Pomotis aquilensis* (U. S. N. M. No. 446) is 4½ inches, and in poor condition.
150. *Lepomis heros* (B. & G.). "Brim." Rio Cibolo, a tributary of the Rio San Antonio (as *Pomotis heros* types, Baird & Girard, 1854). Rio Cibolo, Rio Nueces, Dry Creek near Victoria, Rio Blanco, Fort Bliss, N. Mex., Rio San Juan, New Leon, and near Cadereita, New Leon (as *Pomotis heros*, Girard, 1858, pl. ix, figs. 13-16). Rio Cibolo, Dry Creek near Victoria, Rio San Juan, and near Cadereita, New Leon (as *Pomotis heros*, Girard, 1859, pl. ii, figs. 1-4). Specimens were obtained by us in the Houston market which had come from the San Jacinto River at Lynchburg. Life colors, dark-greenish above, gradually becoming brassy toward the belly, which is light-brassy; opercular spot greenish-black; the flap with a broad blood-red border in the male, but without it in the female; no spot on dorsal or anal. Three of the five specimens obtained from the San Jacinto River are each 7 inches in total length, and the other two are 6 inches each. The figure of this species in the report of the Mexican Boundary Survey is very poor, the depth being too great and the back too greatly arched.

151. *Lepomis albus* (Girard). Rio Blanco (as *Bryttus albus* types, Girard, 1857, and Girard, 1858, pl. VI, figs. 1-4). The type (U. S. N. M. No. 421) is 7 inches long and in excellent condition. Head, 2½; depth, 2½; eye, 4½; snout, 3½; scales, 7-42-12, 5 rows on cheek.
152. *Micropterus salmoides* (Lac.). *Big-mouthed Black Bass*; "Trout." Rio Frio and Rio Nueces (as *Grystes nuccensis* types, Baird & Girard, 1854). Rio Blanco, Rio Frio, Rio Leon, Rio Seco, Rio Medina, Rio Brazos, Rio Nueces, Rio Leona, Rio Sabinal, Minneville River, Delaware Creek, Live Oak Creek, Dry Creek, Turkey Creek, Elm Creek, and San Pedro Creek; San Juan River, New Leon (as *Dioplites nuccensis*, Girard, 1858). Rio Frio, Rio Nueces, Live Oak Creek, Turkey Creek, Rio Leona, Elm Creek, Rio Sabinal, Dry Creek, San Pedro Creek, Minneville River, and San Juan River, New Leon (as *Dioplites nuccensis*, Girard, 1859, pl. I). Trinity, Llano, Guadalupe, and Medina rivers, and Johnson Fork of Llano River in Kimble County (as *Micropterus floridanus*, Cope, 1880). Red River at Fulton, Ark., Sabine River at Longview, Rio Lampasas at Belton, Rio Colorado at Austin, Rio San Marcos at San Marcos, and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Neches River east of Palestine, Trinity River and Long Lake at Magnolia Point, San Jacinto River at Lynchburg, Dickinson Bayou near Dickinson, Buffalo Bayou, Hunter Creek, Big White Oak Bayou near Houston, San Marcos River at San Marcos, and San Antonio River at San Antonio. The big-mouthed black bass is, as the above list of localities shows, an abundant and widely distributed fish in Texan waters. It is not confined to the fresh-water streams, but is also found in brackish-water bayous. In Dickinson Bayou we found it associated with such salt or brackish water forms as oysters, shrimps, flounders, and *Soiana ocellata*. With these were also found *Lepomis pallidus*, *Iotibius cyprinella*, *Notemigonus chrysoleucus*, *Lepisosteus platystomus*, and *Gerris gracilis*.

## XXXII.—PERCIDÆ. THE DARTERS.

153. *Etheostoma pellucidum clarum* (Jordan & Meek). *Sand Darter*. Red River at Fulton, Ark., and Sabine River at Longview (as *Ammocrypta clara*, Jordan & Gilbert, 1886).
154. *Etheostoma vivax* (Hay). Sabine River at Longview (as *Ammocrypta vivax*, Jordan & Gilbert, 1886).
155. *Etheostoma phlox* (Cope). Trinity River near Fort Worth (as *Boleosoma phlox* types, Cope, 1880). Trinity River (as *Ulocentra phlox*, Synopsis).
156. *Etheostoma chlorosoma* (Hay). Three specimens of this little darter were taken in a pond on the bank of the Neches River east of Palestine, and one each in Kilper's Pond and Buffalo Bayou at Houston.
157. *Etheostoma shumardi* (Grd.). Red River, Fulton, Ark. (as *Cottogaster shumardi*, Jordan & Gilbert, 1886).
158. *Etheostoma caprodes* (Raf.). *Log Perch*. Rio Salado (as *Pileoma carbonaria* types, Baird & Girard, 1853). Rio Salado, Rio Medina, and San Pedro Creek (as *Pileoma carbonaria*, Girard, 1859, pl. VIII, figs. 10-13). Trinity River near Dallas and Llano River, Kimble County (as *Percina caprodes carbonaria*, Cope, 1880). Rio Colorado at Austin (as *Percina caprodes*, Jordan & Gilbert, 1886). Three specimens from Long Lake near Magnolia Point and one from the Neches River east of Palestine. The Long Lake specimens are quite thickly covered with larval trematodes occurring as small black specks scattered over the body with no apparent regularity, or, in other words, no one portion of the fish seems much more vulnerable than another to the attacks of this parasite. This darter is a species which frequents clear running water or clear lakes and its occurrence in such stagnant bodies of water as that of Long Lake is unusual; its being attacked by trematodes well illustrates one of the dangers which result from the transfer of any fish from clear, cool, running water to water which is more or less stagnant and impure. Active species transferred to such a pond or bayou are almost certain to suffer from the attacks of trematodes and other parasites, while those fishes which live habitually in such waters are less liable to be affected.
159. *Etheostoma fasciatus* (Grd.). Chihuahu River (as *Dipleston fasciatus* types, Girard, 1859b).
160. *Etheostoma scierum serrula* (J. & G.). Sabine River at Longview (as *Hadropterus scierus serrula* var. nov. types, Jordan & Gilbert, 1886). Trinity River at Dallas, Rio Lampasas at Belton, Rio San Marcos at San Marcos, and Rio Comal at New Braunfels (as *Hadropterus scierus serrula*, Jordan & Gilbert, 1886). The recent collection contains 42 specimens from

San Marcos River at San Marcos, 76 from Guadalupe River near New Braunfels, 2 from Big White Oak Bayou, 17 from Buffalo Bayou, 5 from Hunter Creek at Houston, 12 from Trinity River, and 3 from Neches River near Palestine.

161. *Etheostoma lepidum* (B. & G.). Upper tributaries of the Rio Nueces (as *Boleosoma lepidum* types, Baird & Girard, 1853). Rio Leona (as *Pecilichthys lepidus*, Girard, 1859, pl. VIII, figs. 14-17). Brownsville (as *Pecilichthys lepidus*, Jordan, 1878). Rio Lampasas at Belton, Rio Colorado at Austin, Rio San Marcos at San Marcos, and Rio Comal at New Braunfels (Jordan & Gilbert, 1886). Our own collection contains 13 specimens of this darter from San Marcos River at San Marcos and 9 from Comal Creek at New Braunfels. In all of these the cheeks and opercles are entirely naked. Examination shows considerable variation in the development of the lateral line and in the number of scales on the two sides of the body. The number of scales in a longitudinal series varies from 48 to 54, and the difference between the two sides is usually 2 or 3 scales. The following tabular statement shows the variation in the 9 specimens from New Braunfels. In this table the series composing the lateral line itself is included with those designated "above the lateral line."

Series above lateral line.		Series below lateral line.		Scales in longitudinal series.			
Right side.	Left side.	Right side.	Left side.	Right side.		Left side.	
				With pores.	Without pores.	With pores.	Without pores.
7	7	9	9	36	15	35	15
7	7	9	7	32	21	31	19
7	7	7	8	34	17	35	17
7	7	8	7	32	19	32	19
7	7	8	8	20	28	27	23
7	7	8	9	32	19	35	19
7	7	8	8	32	19	33	19
6	6	7	7	34	17	34	18
7	7	8	8	32	18	31	17

162. *Etheostoma lepidogenys* sp. nov. Allied to *Etheostoma lepidum*. Head (including opercular flap), 4; depth, 5; eye, 4; snout, 4; dorsal, x-12; anal, 11-7 or 8. Scales, 7-54 to 61-9, lateral line straight and incomplete, 32 to 38 pores. Body moderately stout, head heavy, snout short, blunt and decurved, back little elevated, caudal peduncle deep, its least depth 2 in head. Mouth rather small, but little oblique, lower jaw slightly included, premaxillary just reaching front of orbit, not protractile (*i. e.*, frenum present). Gill-membranes scarcely united. Fins moderate, soft dorsal higher than spinous portion, pectoral short, only as long as head, not reaching beyond tips of ventrals; ventrals short, distance from their tips to origin of anal equals half length of head; anal rather small, scarcely reaching tips of soft dorsal when depressed. Scales strongly ctenoid, cheeks densely scaled, opercles and breast entirely naked, nape scaled; median line of belly with ordinary scales, not deciduous. In the larger specimen, which is 2 inches long, there are on the right side 57 scales in a longitudinal series, upon 38 of which pores are developed, while upon the left side there are but 54 scales, upon 35 of which pores are developed. The second specimen, 1½ inches long, has 61 scales upon the right side with pores in 38 of them, and 55 upon the left with only 35 developed pores. This shows a considerable variation, not only among individuals, but between the two sides of the same individual. Color in alcohol: Head dark above, sides pale, a dark line forward from eye to tip of snout and another broader one straight downward from the eye, broadest at lower end; a dark postocular spot followed by a fainter one on the opercle; dark humeral scale present; side of body with about 13 dark vertical bars, the first crossing over the back just in front of the spinous dorsal, the next four indistinct except on back where they widen into large blotches, the sixth crossing the back between the two dorsals; the seventh to tenth, inclusive, are under the soft dorsal; the eleventh crosses just back of it, while the thirteenth is at the base of the caudal fin; spinous dorsal pale at base, next a broad dark band, then a narrow pale one which is followed by a pale blue one, probably blue in life, and lastly the fin is tipped with a very narrow margin of white; soft dorsal marbled or vermiculated with brown, the largest,

plainest markings being at about one-third the distance from the tips of the fin; caudal like the soft dorsal, but the colors deeper; all the other fins unmarked.

From *Etheostoma lepidum*, which this species most resembles and which we at first supposed it to be, it differs chiefly in the squamation of the cheeks. In that species the cheeks, as well as the opercles, are scaleless, while in this the cheeks are densely scaled. It also differs from *E. lepidum* in having smaller mouth, shorter, blunter, more decurved snout, and in the slightly smaller scales. In *lepidum* the number of scales in a longitudinal series, in 9 specimens from Comal Creek, varies from 48 to 54, while in this species the variation is from 54 to 61. This species resembles *Etheostoma caruleum* also, but in that species the opercles are more or less scaled and the cheeks naked or very nearly so; the scales are also larger in *caruleum* and the color is different. The types of this species consist of two specimens, 1½ and 2 inches long, respectively, obtained in Comal Creek at its beginning in the largest of the Comal Springs, at New Braunfels, Tex., December 3, 1891. (U. S. N. M. No. 44840).

163. *Etheostoma micropterus* Gilbert. "A single specimen 1¼ inches long; collected by Mr. E. Wilkinson, at Chihuahua, Mexico. U. S. N. M. No. 38245." (Type, Gilbert, 1890.)
164. *Etheostoma australe* Jordan. Chihuahua River (as *Diplesion fasciatus* types, perhaps only in part, Girard, 1859b, and as *Etheostoma australe* types, Jordan, 1888). Rio de las Conchas, Chihuahua (as *Etheostoma scovelli* types, Woolman, 1892). The types of *E. australe* were found among the original types of *D. fasciatus* (No. 24625, M. C. Z.).
165. *Etheostoma jessiae* (Jordan & Brayton). Sabine River at Longview (Jordan & Gilbert, 1886).
166. *Etheostoma fusiforme* (Grd.). Rio Seco and Rio Leona at Uvalde (as *Boleosoma gracile* types, Girard, 1859b), and (as *Paciliothys gracilis*, Synopsis). Trinity River at Dallas (Jordan & Gilbert, 1886). We have 3 specimens from Buffalo Bayou at Houston, 42 from Sims Bayou near Houston, 12 from Hunter Creek near Houston, and 1 from Neches River east of Palestine. The cheeks and opercles on all of these specimens are densely scaled, and the lateral line is developed on 20 to 22 scales.
167. *Etheostoma lateralis* (Grd.). Mouth of the Rio Grande del Norte (as *Alvarius lateralis* types of genus and species, Girard, 1859b). Rio Grande (as *Paciliothys lateralis*, Synopsis).
168. *Etheostoma fonticola* J. & G. Rio San Marcos (as *Alvarius fonticola* types, Jordan & Gilbert, 1886). This interesting little darter was found in abundance in Comal River at New Braunfels and the collection contains 43 specimens taken there. One specimen was found in Dickinson Bayou very close to brackish water. This is one of the smallest of darters, the largest specimens scarcely exceeding 1¼ inches in total length.

### XXXIII.—SERRANIDÆ. THE SEA BASS.

169. *Centropomus undecimalis* (Bloch). *Robalo*. Galveston (Jordan & Gilbert, 1882). A few fish of this species were examined in the market at Corpus Christi, but we saw none at Galveston.
170. *Roccus chrysops* (Raf.). *White Bass*. Red River at Fulton, Ark. (Jordan & Gilbert, 1886).
171. *Morone interrupta* Gill. *Yellow Bass*. Common in the lower portions of the San Jacinto and Trinity rivers, from which it is brought in considerable numbers to the Houston market.

### XXXIV.—SPARIDÆ. THE SPAROID FISHES.

172. *Lutjanus oaxis* (Bloch & Schneider). *Gray Snapper*. Brazos Santiago and mouth of Rio Grande (as *Noomansis emarginatus*, Girard, 1859, pl. ix, figs. 5-8).
173. *Lutjanus aya* (Bloch). *Red Snapper*. This important food-fish is brought to the Galveston market from banks not far distant.
174. *Rhomboplites aurorubens* (C. & V.). Brazos Santiago (as *Conodon antillanus*, Girard, 1859).
175. *Orthopristis chrysopterus* (L.). *Pigfish*; *Sailor's Choice*. Indianola and Brazos Santiago (as *Orthopristis duplex* types, Girard, 1859, pl. ix, figs. 1-4). Galveston (as *Pomadasyx fulvomaculatus*, Jordan & Gilbert, 1882). Three specimens of this were gotten at Corpus Christi, where it is of some value as a food-fish. An example 9 inches long gives the following measurements: Head, 3½; depth, 2½; eye, 5½; D. XII-15; A. III-13; scales, about 55 in length of

lateral line. A young specimen, 4½ inches long, has the head, 3; depth, 2½; D. XIII-13; A. III-12; scales, about 55 with pores; eye large, 3½ in head, and greater than the interorbital width.

176. *Lagodon rhomboides* (L.). *Pinfish; Chopa Spina*. Brazos, Indianola, St. Joseph Island, and Brazos Santiago (Girard, 1859, pl. ix, figs. 13-16). Galveston (Jordan & Gilbert, 1882). Galveston and Corpus Christi, at both of which places it is an abundant species.
177. *Archosargus probatocephalus* (Walb.). *Sheepshead*. Indianola and Brazos Santiago (as *Sargus ovis*, Girard, 1859). Galveston and Corpus Christi.

#### XXXV.—SCIÆNIDÆ. THE CROAKERS.

178. *Aplodinotus grunniens* Raf. *Fresh-water Drum*. Mouth of Rio Grande and Matamoras (as *Ambledon neglectus* types, Girard, 1859, pl. v, figs. 6-10). Red River at Fulton, Ark., and Rio Colorado at Austin (Jordan & Gilbert, 1886). Numerous specimens seen in the Houston market, from the mouth of the Trinity River.
179. *Pogonias chromis* (L.). *Salt-water Drum*. Galveston (Jordan & Gilbert, 1882). Found by us at Galveston, but not seen at Corpus Christi. Brazos Santiago (as *Pogonias fasciatus*, Girard, 1859).
180. *Stelliferus lanceolatus* (Holbrook). St. Joseph Island (as *Homoprion lanceolatus*, Girard, 1859).
181. *Bairdiella chrysur*a (Lac.). *Yellow-tail*. Galveston (as *Sciæna punctata*, Jordan & Gilbert, 1882). A dozen specimens were obtained by us at Corpus Christi, where it is an abundant fish.
182. *Sciæna ocellata* (L.). *Redfish; Channel Bass*. Indianola (as *Johnius ocellatus*, Girard, 1859, pl. VII, figs. 1-4). Galveston (Jordan & Gilbert, 1882). An abundant and important food-fish at Galveston and Corpus Christi. Specimens 38 and 39 inches in length at Galveston weighed 46 pounds each. In the Houston market this fish was selling at 10 cents a pound. Dickinson Bayou.
183. *Leiostomus xanthurus* Lac. *Spot; Goody*. Brazos Santiago and Indianola (as *Leiostomus obliquus*, Girard, 1859). St. Joseph Island (as *Homoprion lanceolatus*, Girard, 1859). Brazos Santiago and St. Joseph Island (as *Homoprion xanthurus*, Girard, 1859). Galveston (Jordan & Gilbert, 1882). Found by us both at Galveston and Corpus Christi.
184. *Larimus fasciatus* (Holbrook). Eleven small examples, 2 to 4½ inches long, were obtained at Galveston.
185. *Micropogon undulatus* (L.). *Croaker*. Mouth of the Rio Grande, Indianola, St. Joseph Island, and Galveston (Girard, 1859, pl. VII). Galveston (Jordan & Gilbert, 1882). Taken by us only at Galveston.
186. *Menticirrhus littoralis* (Holbrook). *Surf Whiting*. Galveston (Jordan & Gilbert, 1882). A single small specimen gotten by us at Galveston.
187. *Menticirrhus americanus* (L.). *Whiting*. Indianola and Brazos Santiago (as *Umbrina phalæna* types, Girard, 1859, pl. v, figs. 1-5). Galveston (as *Menticirrus alburnus*, Jordan & Gilbert, 1882). One specimen in the collection from Galveston. Each of these two species is common, however, at Galveston, and will doubtless be found all along the Texas coast.
188. *Cynoscion nothus* (Holbrook). Brazos Santiago (as *Otolithus nothus*, Girard, 1859).
189. *Cynoscion nebulosus* (C. & V.). *Spotted Sea Trout*. Brazos Santiago, Brazos, and Indianola (as *Otolithus drummondi*, Girard, 1859, pl. VI). Galveston (Jordan & Gilbert, 1882). Corpus Christi and Galveston. Also seen in the Houston market from the mouth of Trinity River.

#### XXXVI.—GERRIDÆ. THE GERROIDS.

190. *Gerres gula* (C. & V.). Brazos Santiago, Brazos, Indianola, and St. Joseph Island (as *Encinostomus argenteus*, Girard, 1859, pl. ix, figs. 9-12). Taken by us only at Corpus Christi.
191. *Gerres graciliis* (Gill). There are in the present collection fourteen specimens representing Corpus Christi, Galveston, Dickinson Bayou, and Buffalo Bayou at Houston. This last locality is 60 miles from salt water.



## XXXVII.—CICHLIDÆ. THE CICHLIDS.

192. *Heros cyanoguttatus* (B. & G.). Fresh water at Brownsville (as *Heros cyanoguttatus* types, Baird & Girard, 1854). Lagoon at Fort Brown, Brownsville, Matamoros, San Juan River, and Cadereita, New Leon, and Devil River (as *Herichthys cyanoguttatus*, Girard, 1859, pl. iv, figs. 9-12). The type of this species (U. S. N. M. No. 851) is about 6 inches in total length and is in excellent condition. It is well described in Jordan & Gilbert's Synopsis.
193. *Heros pavonaceus* Garman. Mondova, Coahuila (types, Garman, 1881, and Synopsis). This and the preceding species are the most northern representatives of the *Cichlida*, a family represented in Central and South America by many species.

## XXXVIII.—EPHIPPIDÆ. THE ANGEL-FISHES.

194. *Chaetodipterus faber* (Broussonet). *Angel-fish*. Galveston (Jordan & Gilbert, 1882). Two small specimens obtained by us at Galveston.

## XXXIX.—GOBIIDÆ. THE GOBIES.

195. *Gobiomorus dormitator* (Bl. & Sch.). Near mouth of the Rio Grande (as *Philipnus dormitator*, Girard, 1859, pl. xii, fig. 13).
196. *Dormitator maculatus* (Bloch). Near mouth of the Rio Grande (as *Eleotris gyrrinus*, Girard, 1859, pl. xii, figs. 11 and 12, and *Eleotris sumnulentus* types, Girard, 1859, pl. xii, figs. 1-3). We obtained two small specimens at Galveston in Galveston Bay.
197. *Gobius lyricus* Girard. Brazos Santiago (types, Girard, 1858 and 1859, pl. xii, figs. 4 and 5). Galveston (Jordan & Gilbert, 1882). Rio Grande (as *Euctenogobius lyricus*, Synopsis). Taken by us at Galveston.
198. *Gobius soporator* C. & V. *Goby*. St. Joseph Island (as *Gobius catulus* types, Girard, 1859, pl. xii, figs. 9 and 10). St. Joseph Island (as *Evorthodus catulus*, Synopsis).
199. *Gobius boleosoma* J. & G. *Goby*. Several specimens obtained by us at Galveston, Dickinson Bayou, and at Corpus Christi, from which the following description is taken: Head, 4 to 4½; depth, 3 to 4; D. vi-11 or 12 to vi-13 or 14; A. 11 to 13 or 14. Scales 26 to 31. Body slender, compressed. Head moderate; snout evenly decurved, equal to eye. Eye, 3 to 4 in head, its diameter about equal to the interorbital space. Mouth moderate; maxillary extending slightly beyond point of orbit. Teeth slender in several rows. Scales moderate, ctenoid, those in front somewhat reduced. Vertical fins low, caudal pointed, nearly as long as head; pectoral shorter than caudal; ventral shorter than caudal. Region before dorsal and breast naked; belly scaly. Color, light olivaceous, faintly mottled with darker; along the middle of side are four or five oblong dark blotches, the last being at base of caudal; a jet-black spot above gill-opening on side of back; head faintly marked above with darker; a dark bar extending from near angle of mouth nearly to edge of preopercle; also a dark bar from maxillary to lower front of eye; opercle dusky with silvery edge; vertical fins and caudal barred with darker; ventral pale, with two dark lines through the middle; in some cases dark with pale margin; head and naked areas punctulate with darker. Other specimens with no shoulder spots, no dark punctulations on breast, and ventrals with no dark markings. Spots on the sides of all the specimens range from linear to nearly round. In their review of the *Gobiida*, Jordan & Eigenmann, Proc. U. S. Nat. Mus. 1886, 490, state that the breast, nape, and belly of this species are naked, but in our specimens, as well as in some other specimens identified by Dr. Jordan, and with which our specimens were compared, the belly is always evidently scaly, as also the belly of *G. stigmaticus*, which was said to be naked. The thinness and transparency of the scales on the belly cause it to appear naked in some specimens.

The following table gives measurements of 14 specimens:

Head.	Depth.	Eye.	Dorsal.	Anal.	Scales.
4½	5½	4	VI-11 or 12	11	30
4	5½	4	VI-11	11	30 or 31
4	4½	3½	VI-12 or 13	13 or 14	30 or 31
4	5½	4	VI-11 or 12	12	30 or 31
4½	5½	4	VI-11 or 12	11 or 12	30 or 31
4½	5½	3½	VI-11 or 12	13 or 14	-----
4½	5	4	VI-11	11	30 or 31
4½	4½	4, nearly.	VI-11	11	29 or 30
4½	5½	3½	VI-11	12	30, about.
4+	5½	4	VI-11	11	28 or 29
4	5½	4+	VI-11	11	28 or 29
4	5+	4	VI-11	12	26, about.
4+	5½	3½	VI-11	11	28
4	5½	3+	VI-?	11	29 or 30

200. *Gobius würdemanni* Grd. Brazos Santiago (types, Girard, 1859, and Synopsis).  
 201. *Gobionellus oceanicus* (Pallas). *Emerald Fish*. St. Joseph Island (as *Gobionellus hastatus* types, Girard, 1859, pl. xii, figs. 7 and 8).  
 202. *Lepidogobius gulosus* (Grd.). *Goby*. Indianola (as *Gobius gulosus* types, Girard, 1858 and 1859, and Synopsis). Taken by us at Corpus Christi and in Dickinson Bayou near Dickinson.  
 203. *Gobiosoma bosci* (Lac.). *Goby*. Five specimens from Galveston and nineteen from Corpus Christi.  
 204. *Gobiosoma molestum* Grd. *Goby*. Indianola (type, Girard, 1859, pl. xii, fig. 14). Six specimens are in our collection from Corpus Christi.

#### XL.—TRIGLIDÆ. THE GURNARDS.

205. *Prionotus scitulus* J. & G. *Sea Robin*. Taken by us only at Galveston.  
 206. *Prionotus tribulus* C. & V. *Sea Robin*. Galveston (Jordan & Gilbert, 1882). Taken by us at Galveston and Corpus Christi.

#### XLI.—GOBIESOCIDÆ.

207. *Gobiesox virgatus* J. & G. One specimen, 1½ inches long to tip of caudal, taken at Galveston. Head (from tip of snout to edge of gill-cover), about 2½; width of head, 3½; depth, 7½; D. 10; A. 6. Body slender, head low and broad. Eye small, 4½ in head or 2 in interorbital width. Cheeks not prominent; opercle ending in a sharp spine; cleft of mouth extending below front of orbit; teeth of upper jaw in two series, the outer series short, those occupying front of jaw enlarged, four of which are canine-like. Eight middle teeth of lower jaw incisor-like, edges entire. Color, dark olivaceous, indistinctly mottled and finely punctate; under part of head, disk, and ventrals pale and yellowish; dorsal, caudal, and anal dark, barred with paler; belly yellowish brown. This specimen seems to be *G. virgatus*, but the fin rays are fewer than in that species.

#### XLII.—BATRACHIDÆ. THE TOADFISHES.

208. *Batrachus tau* (L.). *Toadfish*; *Oyster-fish*. Indianola (Girard, 1859). One example obtained by us at Corpus Christi.  
 209. *Porichthys porosissimus* (C. & V.). Galveston (as *Porichthys plectrodon* types, Jordan & Gilbert, 1882).

#### XLIII.—URANOSCOPIDÆ. THE STAR-GAZERS.

210. *Upsilonphorus y-græcum* (C. & V.). *Star-gazer*. One specimen of this species was secured by us at Galveston.  
 211. *Astroscopus anoplos* (C. & V.). *Dogfish*. *Electric Dogfish*. Galveston (Jordan & Gilbert, 1882), where they report it as being rather common.

## XLIV.—BLENNIIDÆ. THE BLENNIES.

212. *Chasmodes bosquianus* (Lac.). *Blenny*. Three specimens obtained by us at Corpus Christi.  
 213. *Isesthes hentzi* (Lo S.). *Blenny*. We collected two specimens at Corpus Christi.  
 214. *Isesthes ionthas* J. & G. *Blenny*. Apparently not common on the Texas coast, as it has not hitherto been reported from that coast and we obtained but a single specimen at Galveston.  
 215. *Isesthes scrutator* J. & G. *Blenny*. Galveston (types, Jordan & Gilbert, 1882).  
 216. *Hypleurochilus geminatus* (Wood). *Blenny*. St. Joseph Island (as *Blennius multifilius* types, Girard, 1859, pl. XII, fig. 6).

## XLV.—OPHIDIIDÆ. THE OPHIDIIDS.

217. *Ophidion marginatum* DeKay. St. Joseph Island (as *Ophidion josephi* types, Girard, 1859, and Synopsis).

## XLVI.—PLEURONECTIDÆ. THE FLOUNDERS.

218. *Citharichthys spilopterus* Günther. *Flounder*. Taken by us at Galveston.  
 219. *Etropus crossotus* J. & G. Galveston (Jordan & Gilbert, 1882). Ten specimens obtained by us at Galveston.  
 220. *Paralichthys lethostigma* J. & G. *Flounder*. A common market fish at Galveston (as *Paralichthys dentatus*, Jordan & Gilbert, 1882). Found by us at Galveston, Dickinson Bayou, and Corpus Christi.  
 221. *Ancypsetta quadrocellata* Gill. We have two small specimens taken at Galveston.  
 222. *Achirus fasciatus* Lac. Galveston (as *Achirus lineatus browni*, Jordan & Gilbert, 1882). One young individual from Galveston and another from Dickinson Bayou near Dickinson.  
 223. *Symphurus plagiosa* (L.). Found by us at Galveston, Dickinson Bayou, and Corpus Christi. It does not appear at all abundant, as we obtained but four specimens.

## XLVII.—ANTENNARIIDÆ. THE FROGFISHES.

224. *Pterophryne histrio* (L.). Galveston (as *Pterophrynoides histrio*, Jordan & Gilbert, 1882). One specimen from Galveston, presented to us by Dr. A. Galny.

## XLVIII.—MALTHIDÆ. THE BATFISHES.

225. *Malthe vespertilio* (L.). A specimen of this fish was given to Dr. Jordan by Dr. A. Galny, of Galveston (Jordan & Gilbert, 1882).

## XLIX.—OSTRACIIDÆ. THE TRUNKFISHES.

226. *Ostracion tricornis* L. *Cowfish*. Galveston, one specimen (as *Ostracium quadricorne*, Jordan & Gilbert, 1882).

## L.—BALISTIDÆ. THE TRIGGER-FISHES.

227. *Alutera schœpffi* (Walb.). *Orange Filefish*. Through the kindness of Mr. J. A. Singley, of the Texas Geological Survey, we have received a dry skin of this species. Mr. Singley obtained the specimen at Galveston, where it is known as the "orange filefish." A young fish, probably of this species, was seen by Dr. Jordan at Galveston (as *Alutera* sp. incog., Jordan & Gilbert, 1882).

## LI.—TETRODONTIDÆ. THE PUFFERS.

228. *Lagocephalus lævigatus* (L.). One specimen obtained by Dr. Jordan at Galveston (Jordan & Gilbert, 1882).  
 229. *Tetrodon nephelus* (Goode & Bean). *Swallowfish; Puffer*. Abundant at Galveston (as *Tetrodon turgidus nephelus*, Jordan & Gilbert, 1882). One specimen taken by us at Galveston and one at Corpus Christi.  
 230. *Chilomycterus schœpffi* (Walb.). Common about Galveston (Jordan & Gilbert, 1882).

## CLASSIFIED LIST OF LOCALITIES MENTIONED.

In the following classified list of streams and localities an attempt has been made to arrange in order all the localities in Texas and the Rio Grande Basin from which any fish has ever been reported, as shown by the literature at our command. Some of the small creeks and springs mentioned in the earlier papers are quite difficult to locate definitely, but it is believed the classification here given is approximately, if not exactly, correct. It has been thought best to include, in a few cases, localities not in the actual limits of this paper, the object of which will be apparent upon an examination of the preceding detailed list of species. Isolated waters south of the Rio Grande, but which geographically belong in the Rio Grande Basin, have been included:

## Arkansas River:

- Canadian River.
  - Spring Creek near Creswell.
  - Fulton Creek near Creswell.
  - Coal Creek.
  - Headwaters of Canadian River in the Llano Estacado.
  - Elm Creek.
  - Antelope Creek.

Poteau River near Fort Smith, Arkansas.

## Red River at Fulton, Arkansas.

Tributary of Red River at Fort Washita, Indian Territory.

Otter Creek, tributary of North Fork.

Gypsum Creek.

Sans Bois Creek.

Little Wichita River.

Turkey Creek.

## Sabine River at Longview.

Neches River near Palestine.

## Trinity River at Fort Worth, Dallas, Magnolia Point, and at mouth.

Long Lake near Magnolia Point.

Elm Creek.

## San Jacinto River at Lynchburg.

Buffalo Bayou near Houston.

Hunter Creek near Houston.

Big White Oak Bayou near Houston.

Sims Bayou near Houston.

Kilper's Pond near Houston.

## Dickinson Bayou at Nicholstone.

## Brazos River.

Clear Creek near Hempstead.

Leon River.

Lampasas River near Belton.

## Colorado River, headwaters of.

San Saba River at Fort McKavett.

Llano River in Kimble County.

Johnson Fork, in Kimble County.

Comanche Creek in Mason County.

## San Antonio River at San Antonio.

Guadalupe River at New Braunfels.

Comal Creek at New Braunfels.

Blanco River at San Marcos.

San Marcos River at San Marcos.

Dry Creek near Victoria.

Cibolo Creek.

Sutherland Springs.

## Medina River at Helotes.

Tributary of Medina River.

Helotes Creek.

Wallace Creek in Bandera County, and the upper waters of Medina River.

## Salado River.

San Antonio Springs, San Antonio.

San Pedro Creek, San Antonio.

## Nueces River.

Frio River.

Sabinal, Leona, and Seco rivers.

Upper tributaries of Nueces River.

Elm Creek.

Turkey Creek.

## Rio Grande at Alamosa, Loma, Sangre de Cristo

Pass, and (tributary) at Fort Garland in Colorado; San Ildefonso, at the mouth of the Hondo River, Albuquerque, Piedra Pointe; (tributary) at Ojo de Gallo, (tributary) between Fort Defiance and Fort Union, (tributary) at Zoquito, and Fort Bliss in New Mexico; (tributaries) at Buena Vista, Acapulco, and Cuajucu, New Leon; Parras, and spring near Saltillo, Coahuila; (lagoon) at Palo Alto, Matamoros, and Boca Grande in Tamaulipas; Eagle Pass (lagoon), Fort Brown, and Brownsville in Texas.

## San Felipe Creek.

San Felipe Springs.

## Devil River.

## Pecos River.

Live Oak Creek.

Headwaters of Pecos River.

Bonito River, New Mexico.

Delaware Creek.

Limpia River and Springs.

Comanche Springs.

Leon Springs.

Hurrah Creek.

## Taos River, New Mexico.

Costilla Creek, New Mexico.

Rio Conejos at Alamosa, Colorado.

## Chama River.

Tributary, at Abiquiu, New Mexico.

Brazos River, New Mexico.

## (?) Rio de Acama, New Mexico.

## Utah Creek.

## Lake Guzman.

Tributaries.

Rio Mimbres in Chihuahua.

Janos River.

Streams of the Sierra Madre.

## Chihuahua River and tributaries.

Rio de las Conchas, Chihuahua.

Chihuahua near northern boundaries of Durango and Sinaloa.

Lago del Muerte, tributaries and springs near

Monclova, Coahuila.

Nazas River at San Pedro.

Rio San Juan at China, and near Monterey, New Leon.

Rio San Diego near Cadereita, New Leon.

## APPENDIX.

While carrying on the investigations for the purpose of selecting a site for a fish-cultural station in Texas in November and December, 1891, a considerable collection of mollusks and a small collection of reptiles and batrachians were made. The mollusks were collected almost wholly by Dr. R. R. Gurley, of the U. S. Fish Commission, and Mr. J. A. Singley, of the Texas geological survey, who accompanied our party during most of the time spent by us in the State. The large number of species found in the accompanying list attests their skill and enthusiasm as collectors. As many of these mollusks sustain an important relation to the fishes of the region in which they are found, the list may very properly be published here. No special search was made for reptiles and batrachians, but such as we chanced to see were collected and preserved. These were turned over to the National Museum, where they have been studied by Mr. F. C. Test, whose report is herewith presented.

ANNOTATED LIST OF THE REPTILES AND BATRACHIANS COLLECTED IN MISSOURI AND TEXAS IN THE FALL OF 1891.

[By Frederick C. Test, Aid, Reptile Department, U. S. National Museum.]

Texas is well known to abound in reptiles, but nearly all the species had gone into hibernation at the time of this expedition (November and December) and few were therefore seen. The list is of value, however, in that it shows what species of reptiles and batrachians of that region are to be seen so late in the fall. The four turtles collected are very interesting, and, taking everything into consideration, the entire collection, though small, is one of some importance.

1. *Malaclemmys kohnii* Baur. Four young turtles were captured, and are of especial note. They are different from any other species of this group, even differing in some of the markings on the head from this recently described species to which I have referred them. The slight differences, however, seem to me due to immaturity, and I therefore refer these four specimens to *M. kohnii*. The find extends the range of the species some little distance to the west of the type locality in southern Louisiana.

Museum No.	Collector's No.	Locality.	Date.
17892	11	Long Lake, near Trinity River, 12 miles south-west of Palestine, Tex.	Nov. 25
17893	12		
17894	13		
17895	14		

2. *Anolis principalis* L. One adult female of this so-called "chameleon," found in abundance in several Southern States, especially the adjoining one of Louisiana, was collected.

Museum No.	Collector's No.	Locality.	Date.
17896	4	Neches River, 14 miles east of Palestine, Tex.....	Nov. 24

3. *Sceloporus undulatus* Daudin. This widely spread lizard is represented in the collection by one young individual.

Museum No.	Collector's No.	Locality.	Date.
17897	5	Neches River, 14 miles east of Palestine, Tex....	Nov. 24

4. *Carphophiops vermis* Kenn. One half-grown specimen of this retiring ground snake was obtained in southwestern Missouri. The salmon color of the under surface is particularly bright.

Museum No.	Collector's No.	Locality.	Date.
17698	2	U. S. Fish Commission Station, Neosho, Mo . . . .	Oct. 30

5. *Storeria dekayi* Holbrook. One specimen of this little snake, which seems to be quite commonly found at this time of year about water-courses, in the bottoms of ditches, and similar places, sometimes occurring dozens together, of all ages and sizes. In this individual the ground color is a shade lighter than usual, bringing out clearly the dark spots and markings, noticeably those about the head.

Museum No.	Collector's No.	Locality.	Date.
17699	3	New Braunfels, Tex. . . . .	Dec. 2

6. *Spelerpes bilineatus* Green. One very small specimen was secured, still possessing gills and cirri. It is quite dark. This is the only salamander found.

Museum No.	Collector's No.	Locality.	Date.
17700	6	Neches River, 14 miles east of Palestine, Tex . . .	Nov. 24

7. *Acris gryllus crepitans* Baird. Of this common little frog, or "peep," five specimens were collected. Nos. 17701, 17704, and 17705 are very typically and finely marked, but Nos. 17702 and 17703, in addition to the usual markings, have several small, circular, light spots on the back, giving them an odd, mottled appearance.

Museum No.	Collector's No.	Locality.	Date.
17701	7	Sims Bayou, 10 miles south of Houston, Tex. . . .	Nov. 18
17702	8 }	Big White Oak Bayou, 2 miles northwest of Houston, Tex.	Nov. 17
17703	9 }		
17704	10	New Braunfels, Tex. . . . .	Dec. 3
17705	19	.....do . . . . .	Do.

8. *Rana pipiens pipiens* Schreber. One large specimen of typical proportions, but with unusually dark coloration. The ground color is quite dusky, and the posterior surfaces of the thighs are broadly mottled with black. The throat and front of femurs are flecked with brownish. This phase of coloring, though apparently not common, is paralleled by U. S. N. M. No. 3293, from Brownsville, Tex., collected by Capt. Van Vliet.

Museum No.	Collector's No.	Locality.	Date.
17706	18	New Braunfels, Tex . . . . .	Dec. 3

9. *Rana catesbiana* Shaw. One medium-sized, quite dark specimen, with the under surface thoroughly marbled with dark brown, and nine tadpoles of this species were collected.

Museum No.	Collector's No.	Locality.	Date.
17707	15	Neches River, 14 miles east of Palestine, Tex. . . . .	Nov. 24
17708-13	16	Trinity River, at Magnolia Point, 10 miles south-west of Palestine, Tex.	Nov. 23
17714-16	17	New Braunfels, Tex. . . . .	Dec. 3

## LIST OF MOLLUSCA COLLECTED IN TEXAS IN 1891.

[By J. A. Singley, Geological Survey of Texas.]

The collection of mollusca, of which a list is given below, was made by Dr. R. R. Gurley and the writer, while engaged in investigating the waters of Texas with the view of establishing a fish-cultural station in that State. No new species are described, but a new *Cytherea* (*C. texasiana*) has been described by Dr. W. H. Dall from material collected at Galveston during the investigation. The list also includes a number of marine species not heretofore recorded from the State, and gives new localities for several terrestrial and fluviatile species. The arrangement is that of Tryon's "Structural and Systematic Conchology."

1. *Spirula peronii* Lam. Galveston and Corpus Christi.
2. *Purpura hæmastoma* L. Galveston and Corpus Christi. It is abundant on the rocks at the Galveston jetty.
3. *Fasciolaria gigantea* Kien. Corpus Christi. Given on the authority of Dr. Gurley. I have not seen the species.
4. *Fulgur perversa* L. Corpus Christi and Galveston. Common at both places.
5. *Fulgur pyrum* Dillwyn. Galveston and Corpus Christi. Not common.
6. *Nassa vibex* Say. Galveston; beach-worn examples. Abundant, living at Corpus Christi, in Corpus Christi Bay and Laguna Madre. The Texas examples are dwarfed.
7. *Nassa acuta* Say. Common on Galveston Beach the latter part of November. A few beach-worn examples were found at Corpus Christi.
8. *Olivella mutica* Say. Beach-worn examples were found at Galveston.
9. *Oliva literata* Lam. A few broken shells found on Galveston Beach.
10. *Anachis obesa* C. B. Ad. Galveston and Corpus Christi; dead shells, not rare.
11. *Astyris lunata* Say. Dead and worn shells common on Galveston Beach, abundant living at Shamrock Cove, Corpus Christi Bay.
12. *Terebra concava* Say. Galveston Beach; not common; dead and worn shells only.
13. *Terebra dislocata* Say. Galveston Beach; commoner than the preceding and better preserved.
14. *Mangilia cerinella* Dall. Common at Galveston and Corpus Christi.
15. *Natica duplicata* Say. Galveston and Corpus Christi. An elevated and a depressed form are found. Common.
16. *Natica pusilla* Say. Galveston; beach-worn examples only. Not common.
17. *Sigaretus perspectivus* Say. Common on Galveston Beach.
18. *Crepidula fornicata* L. Abundant at Corpus Christi. A few found on Galveston Beach.
19. *Crepidula plana* Say. Galveston and Corpus Christi. Common.
20. *Crepidula convexa* Say. Corpus Christi. The species is given on the authority of Dr. Gurley.
21. *Solarium verrucosum* Phil. Galveston Beach, rare. Padre Island, Corpus Christi Bay, common.
22. *Scala contorquata* Dall. Galveston. Given on the authority of Dr. Gurley.
23. *Turbonilla interrupta* Totten. Galveston Beach. Not common.
24. *Litorina irrorata* Say. Abundant along the shore of Galveston Bay near Swan Lake.
25. *Modulus lenticularis* Chem. Corpus Christi. Given on the authority of Dr. Gurley.
26. *Cerithium variabile* C. B. Ad. Abundant in Shamrock Cove, Corpus Christi Bay.
27. *Bittium varium* Pfr. Galveston and Corpus Christi; abundant.
28. *Bittium cerithioides* Dall. Galveston (Dr. Gurley).
29. *Seila terebralis* C. B. Ad. Dead shells found on the beach near Corpus Christi.
30. *Goniobasis pleuristriata* Say. Comal Creek, New Braunfels. The species is not common.
31. *Goniobasis comalensis* Pilsbry. Comal Springs and Guadalupe River, New Braunfels; San Marcos Springs and River, San Marcos. Abundant.
32. *Hydrobia texana* Pilsbry. Comal Creek, New Braunfels. Not common.
33. *Pyrgula spinosa* Call & Pilsbry. Comal Creek, New Braunfels. Rare.
34. *Amicola peracuta* Pilsbry & Walker. Comal Creek, New Braunfels; Long Lake, Anderson County. Abundant.
35. *Truncatella caribbaënsis* Sowb. Galveston.

36. *Truncatella pulchella* Pfr. Galveston. These two species of *Truncatella* are listed on the authority of Dr. Gurley. I have not found them in my Galveston material.
37. *Helicina orbiculata* Say. This species was found abundant at every point visited with the exception of Galveston Island.
38. *Fissurella alternata* Say. A few bleached and broken examples were found on the beach near Corpus Christi.
39. *Actæon punctostriatus* C. B. Ad. Galveston and Corpus Christi. Not common.
40. *Utriculus canaliculatus* Say. Galveston and Corpus Christi. Common.
41. *Bulla occidentalis* A. Ad. Corpus Christi. Dead shells abundant.
42. *Glandina decussata* Desh. var. *singleyana* W. G. Binney. One example found at New Braunfels.
43. *Zonites indentatus* Say. var. *umbilicata*. San Marcos, San Antonio, New Braunfels, and Palestine. Common.
44. *Zonites arboreus* Say. Found at same localities as the above, but much more abundant.
45. *Zonites fulvus* Drap. New Braunfels. Common.
46. *Zonites minusculus* Binn. New Braunfels. Common.
47. *Zonites singleyanus* Pilsbry. New Braunfels. Not common.
48. *Helix berlandieriana* Mor. Houston and Palestine. Common.
49. *Helix griseola* Pfr. Corpus Christi, San Antonio, and Austin. Abundant.
50. *Helix roemeri* Pfr. Austin. Abundant.
51. *Helix monodon* Raek. var. *fraterna* Say. New Braunfels. Common.
52. *Helix texasiana* Mor. Palestine, Austin, San Marcos, San Antonio, and Corpus Christi. Abundant.
53. *Helix mooreana* W. G. Binn. New Braunfels. Abundant.
54. *Helix hippocrepeis* Pfr. New Braunfels. Rare.
55. *Helicodiscus lineatus* Say. New Braunfels. Not common.
56. *Bulimulus alternatus* Say. Corpus Christi. Typical *alternatus* was found west of Corpus Christi; while a variety intermediate between *alternatus* and *schiedeanus* was found along the bluffs bordering on Corpus Christi Bay.
57. *Bulimulus dealbatus* Say. Palestine. Two examples.
58. *Bulimulus schiedeanus* Pfr. New Braunfels and San Antonio. Common.
59. *Bulimulus schiedeanus mooreanus* W. G. Binn. San Antonio, New Braunfels, San Marcos, and Austin. Abundant. These so-called "species" of *Bulimulus* are simply variations of one species. At each of the given localities examples were found that connected two or more forms and could not be satisfactorily referred to any one "species."
60. *Holospira roemeri* Pfr. New Braunfels. Very rare.
61. *Holospira goldfussi* Menke. New Braunfels. Common.
62. *Macroceramus gossei* Pfr. New Braunfels. Common.
63. *Pupa fallax* Say. New Braunfels. Abundant.
64. *Pupa procera* Gould. New Braunfels. Common.
65. *Pupa contracta* Say. Palestine, New Braunfels. Common.
66. *Pupa pentodon* Say. New Braunfels. Common.
67. *Pupa curvidens* Gould. New Braunfels. Not common.
68. *Pupa armifera* Say. New Braunfels. Two examples.
69. *Succinea grosvenori* Lea. Palestine. Rare.
70. *Physa forsheyi* Lea. Long Lake, Anderson County. Not common.
71. *Physa halei* Lea. San Antonio Springs and San Marcos springs and river; also in Comal Creek, New Braunfels. Abundant.
72. *Limnæa humilis* Say. Long Lake, Anderson County. Not common.
73. *Limnæa desidiosa* Say. San Antonio Springs, San Antonio; San Marcos Springs and River, San Marcos. Not common.
74. *Planorbis liebmanni* Dunker. Comal Creek, New Braunfels. Common.
75. *Planorbis lentus* Say. Long Lake, Anderson County; Comal Creek, New Braunfels. Common.
76. *Planorbis bicarinatus* Say. San Marcos River, San Marcos. Not common.
77. *Ancylus excentricus* Morelet. Comal Creek, New Braunfels. Very rare.
78. *Pholas truncata* Say. Corpus Christi. Not common.
79. *Pholas costata* L. Single valves abundant at Galveston and Corpus Christi.
80. *Solen directus* Conrad. Corpus Christi. Young shells abundant. No adults were found.
81. *Tagelus gibbus* Spengler. Galveston and Corpus Christi. Common.
82. *Mactra lateralis* Say. Corpus Christi and Galveston. Abundant.



83. *Maetra brazilliana* Lam. Corpus Christi (Dr. Gurley).
84. *Gnathodon cuneata* Con. Corpus Christi and Galveston. Abundant. The Givens Oyster Company, at Corpus Christi, were canning this species and putting it on the market labeled "Little Neck Clams."
85. *Gnathodon rostrata* Petit. Galveston (Dr. Gurley).
86. *Labiosa canaliculata* Say. Single valves are abundant at Corpus Christi and Galveston.
87. *Semele reticulata* Gmel. Galveston (Dr. Gurley).
88. *Abra æqualis* Say. Galveston. Not common.
89. *Cumingia tellinoides* Con. Corpus Christi. Not common.
90. *Tellina alternata* Say. Galveston and Corpus Christi. Abundant.
91. *Tellina polita* Say. Corpus Christi (Dr. Gurley).
92. *Macoma constricta* Brug. Galveston and Corpus Christi. Not common.
93. *Macoma brevifrons* Say. Galveston (Dr. Gurley).
94. *Donax tumida* Retz. Galveston and Corpus Christi. Abundant.
95. *Donax roemeri* Pfr. Galveston and Corpus Christi. Not common.
96. *Petricola pholidiformis* Lam. Single valves were found at Galveston and Corpus Christi.
97. *Venus cancellata* L. Dead shells are very abundant on the beach at Corpus Christi. A few beach-worn shells found at Galveston.
98. *Venus mercenaria* L. Corpus Christi (Dr. Gurley).
99. *Venus mercenaria* L. var. *mortoni* Con. Galveston and Corpus Christi. Common.
100. *Venus rostrata* Sowb. Corpus Christi. Common.
101. *Cytherea texasiana* Dall. Galveston. Single valves are not uncommon on Galveston beach.
102. *Cytherea gigantea* Gmel. Galveston and Corpus Christi. Common.
103. *Dosinia discus* Reeve. Galveston and Corpus Christi. Common.
104. *Pisidium compressum* Prime. Comal Creek, New Braunfels. Common.
105. *Sphærium singleyi* Pilsbry. White Oak Bayou, Houston; Guadalupe River, New Braunfels. Not common.
106. *Cardium musicatum* L. Galveston and Corpus Christi. Single valves are common.
107. *Cardium magnum* Born. Galveston and Corpus Christi. Abundant.
108. *Lævicardium mortoni* Con. Abundant, living in Corpus Christi Bay. Single valves only found at Galveston.
109. *Lucina crenulata* Con. Single valves abundant in the beach drift at Corpus Christi.
110. *Unio undulatus* Barnes. San Antonio River at the waterworks station, San Antonio. Two odd valves only were found.
111. *Unio asper* Lea. Long Lake, Anderson County. Abundant.
112. *Unio texasensis* Lea. Long Lake, Anderson County. Common.
113. *Anodonta stewartiana* Lea. Long Lake, Anderson County. A number of fine examples of this species were taken.
114. *Leda concentrica* Say. Single valves common at Galveston and Corpus Christi.
115. *Arca ponderosa* Say. Beach-worn valves are common at Galveston and Corpus Christi.
116. *Arca transversa* Say. Single valves common at Galveston and Corpus Christi.
117. *Arca incongrua* Say. Galveston and Corpus Christi. Abundant.
118. *Arca pexata* Say. A few valves found at Galveston.
119. *Arca americana* Gray. Corpus Christi (Dr. Gurley).
120. *Mytilus cubitus* Say. Corpus Christi. Common on oysters.
121. *Mytilus hamatus* Say. Galveston and Corpus Christi. Very abundant on oyster reefs.
122. *Modiola plicatula semicostata* Conrad. A fine large example was taken in Galveston Bay (near the bayou connecting Swan Lake with the bay) while seining in shallow water there.
123. *Pinna muricata* L. A few valves found at Corpus Christi.
124. *Plicatula ramosa* Lam. Galveston (Dr. Gurley).
125. *Pecten irradians* Lam. Beach-worn valves are common at Galveston and Corpus Christi.
126. *Pecten irradians dislocatus* Say. Same distribution and abundance as *P. irradians*. I found it living in Corpus Christi Bay.
127. *Anomia simplex* Orbigny. Single valves are washed up on the beach at Galveston. A number were found living at Corpus Christi.
128. *Ostrea virginica* Gmel. The most common mollusk on the Texas coast. For a discussion of the commercial phase of the oyster industry on the Texas coast, see Mr. C. H. Stevenson's paper in the report of the U. S. Commissioner of Fish and Fisheries for 1889-91.

## EXPLANATION OF PLATES.

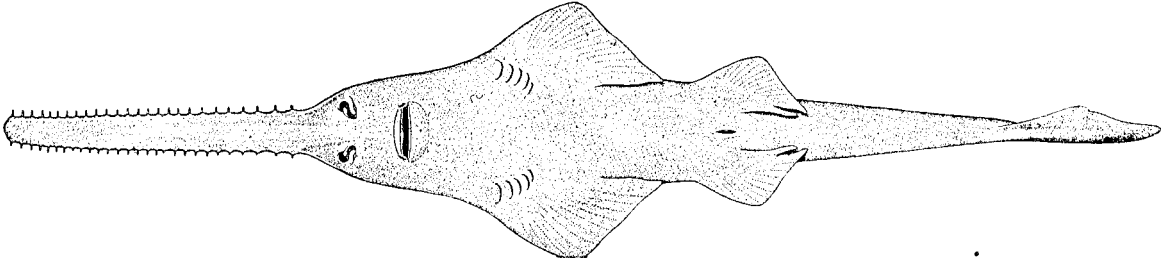
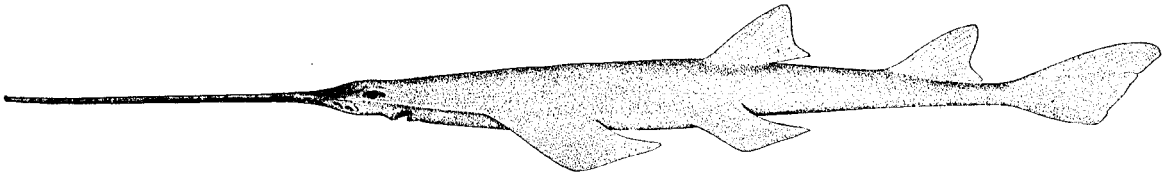
The 50 plates which follow give illustrations of 107 of the 230 species of fishes now known to occur in the waters of Texas and the Rio Grande basin. The species are arranged substantially in the order in which they come in the text. Under each illustration are given: (1) the scientific name; (2) the common name, the more generally accepted in italics, those of local use in roman; (3) the locality, when known, from which the specimen drawn was obtained; (4) the name of the artist who made the original drawing. Many of these drawings were made several years ago by Mr. H. L. Todd. A few others were made by Mr. William Haines, Miss M. Smith, and Mr. S. F. Denton. The remaining 17 species were drawn by Mr. A. H. Baldwin especially for this paper.

## Plate No.

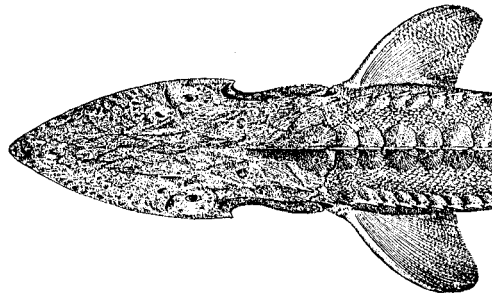
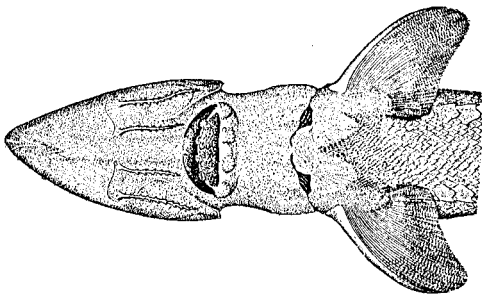
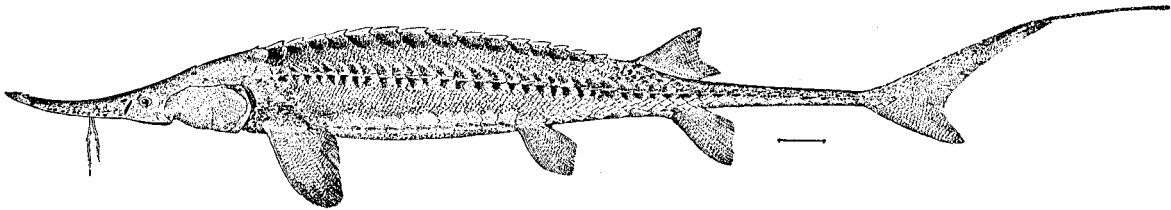
- X. *Pristis pectinatus*. Sawfish.  
*Scaphirhynchus platyrhynchus*. Shovel-nosed Sturgeon.  
*Leptosteus platystomus*. Short-nosed Gar.
- XI. *Noturus nocturnus*.  
*Leptops olivaris*. Yellow Cat; Mud Cat.  
*Ameiurus melas*. Bullhead.
- XII. *Ameiurus nebulosus catulus*.  
*Ameiurus natalis*. Yellow Cat.  
*Ameiurus lupus*.
- XIII. *Ictalurus fureatus*. (From type of *Pimelodus affinis* Grd.) Chuckle-head Cat; Blue Cat.  
*Ictalurus punctatus*. Channel Cat; Eel Cat.  
*Tachyurus felis*. Sea Catfish.
- XIV. *Fetichthys marinus*. Gaff-topsail.  
*Ictiobus cyprinella*. Common Buffalo-fish.  
*Carpiodes carpio*. Carp Sucker.
- XV. *Catostomus teres*. Common White Sucker.  
*Erimyzon succetta*. Chub Sucker; Creek Sucker.  
*Minytrema melanops*. Striped Sucker.
- XVI. *Moxostoma congestum*.  
*Campostoma anomalum*. Stone-roller.  
*Notropis cayuga atrocaudalis*. Type.
- XVII. *Notropis nua*. Type.  
*Notropis nocomis*. Type.  
*Notropis swaini*.
- XVIII. *Notropis fumeus*. Type.  
*Notropis notemigonoides*. Type.  
*Rhinichthys dulcis*. Dace.
- XIX. *Hypopsis aestivalis marconis*.  
*Semotilus atromaculatus*. Horned Dace.  
*Opsopoeodus oscula*. Type.
- XX. *Notemigonis chrysoleucus*. Bream.  
*Megalops atlanticus*. Tarpon.  
*Chupea chrysochloris*. Skipjack.
- XXI. *Brevoortia tyrannus patronus*. Gulf Menhaden.  
*Dorosoma cepedianum*. Gizzard Shad.  
*Synodus foetens*. Lizard-fish.
- XXII. *Salmo mykiss spilurus*. Rio Grande Trout.  
*Cyprinodon variegatus*. Variegated Minnows.
- XXIII. *Fundulus pallidus*. Type.  
*Fundulus zebrinus*.  
*Fundulus diaphanus*. Spring Minnow.
- XXIV. *Zygonectes funduloides*. Type.  
*Zygonectes pulvereus*. Type.  
*Zygonectes jenkinsi*. Type.  
*Zygonectes notatus*. Top Minnow.
- XXV. *Lucania parva*.  
*Gambusia affinis*.  
*Lucius vermiculatus*. Little Pickerel.
- XXVI. *Gymnothorax ocellatus nigromarginatus*. Type.  
*Anguilla chrysypa*. Common Eel.
- XXVII. *Hemirhamphus unifasciatus*. Half-beak.  
*Mugil cephalus*. Common Mullet.  
*Polynemus octonemus*. Threadfin.

## Plate No.

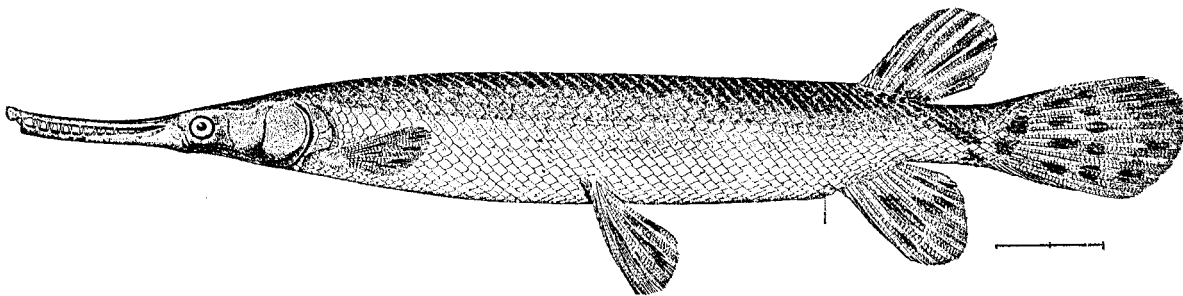
- XXVIII. *Vomer setipinnis*. Moonfish.  
*Scelene vomer*. Silver Moonfish.
- XXIX. *Caranx hippos*. Horse Crevallé.  
*Chloroscombrus chrysurus*. Bumper.
- XXX. *Trachynotus carolinus*. Pompano.  
*Aphredoderus sayanus*. Pirate Perch.
- XXXI. *Pomoxis annularis*. Crappie.  
*Pomoxis sparoides*. Calico Bass.
- XXXII. *Chenobryttus gulosus*. Warmouth.  
*Lepomis symmetricus*.
- XXXIII. *Lepomis megalotis*. Large-eared Sunfish.  
*Lepomis pallidus*. Blue Sunfish; Blue-gill.
- XXXIV. *Micropterus salmoides*. Large-mouthed Black Bass.  
*Etheostoma pellucidum clarum*. Sand Darter.  
*Etheostoma chlorosoma*.
- XXXV. *Etheostoma micropterus*.  
*Etheostoma caprodes*. Log Perch.  
*Etheostoma lepidogenys*. Type.
- XXXVI. *Etheostoma shumardi*.  
*Etheostoma jessie*.  
*Etheostoma fusiforme*.  
*Etheostoma fonticola*.
- XXXVII. *Centropomus undecimalis*. Robalo.  
*Morone interrupta*. Yellow Bass.  
*Roccus chrysops*. White Bass.
- XXXVIII. *Lutjanus caxix*. Gray Snapper.  
*Lutjanus aya*. Red Snapper.
- XXXIX. *Rhombopites aurorubens*. Mangrove Snapper.  
*Orthopristis chrysopterus*. Hogfish.
- XL. *Archosargus probatocephalus*. Sheepshead.
- XLI. *LAGODON rhomboides*. Pinfish.  
*Aplodinotus grunniens*. Fresh-water Drum.
- XLII. *Pogonias chromis*. Drum.  
*Bairdiella chrysura*. Yellow-tail.
- XLIII. *Sciaenella ocellata*. Red Drum; Redfish.  
*Microgogon undulatus*. Croaker.  
*Menticirrhus americanus*. Whiting.
- XLIV. *Leiostomus xanthurus*. Spot.  
*Cynoscion nothus*.  
*Cynoscion nebulosus*. Spotted Sea Trout.
- XLV. *Chaetodipterus faber*. Angol-fish.  
*Gobionellus oceanicus*. Emerald-fish.
- XLVI. *Priionotus scitulus*. Sea Robin.  
*Upsilonphorus y-graecum*. Star-gazer.  
*Astroscopus anoplos*. Electric Dogfish.
- XLVII. *Isoetes ionthas*. Blenny.  
*Ophidion marginatum*.  
*Etopus crossotus*.
- XLVIII. *Paralichthys lethostigma*. Southern Flounder  
*Aneylopssetta quadrocellata*.
- XLIX. *Ostracion tricorne*. Cowfish.  
*Atufera schaeppi*. Orange Filefish.  
*Lagocephalus laevigatus*. Smooth Puffer.  
L. *Tetraodon nephelus*. Swellfish; Puffer.  
*Chilomycterus schaeppi*. Swelltoad; Burrfish.



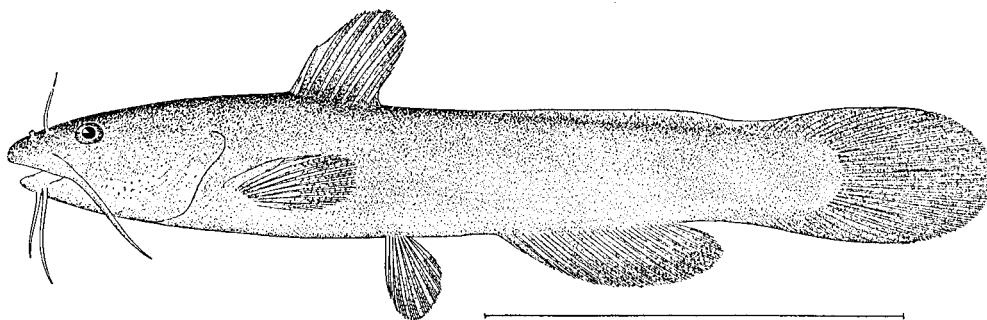
PRISTIS PECTINATUS Latham. *Sawfish*. Side and ventral views. Pensacola, Florida. H. L. Todd del.



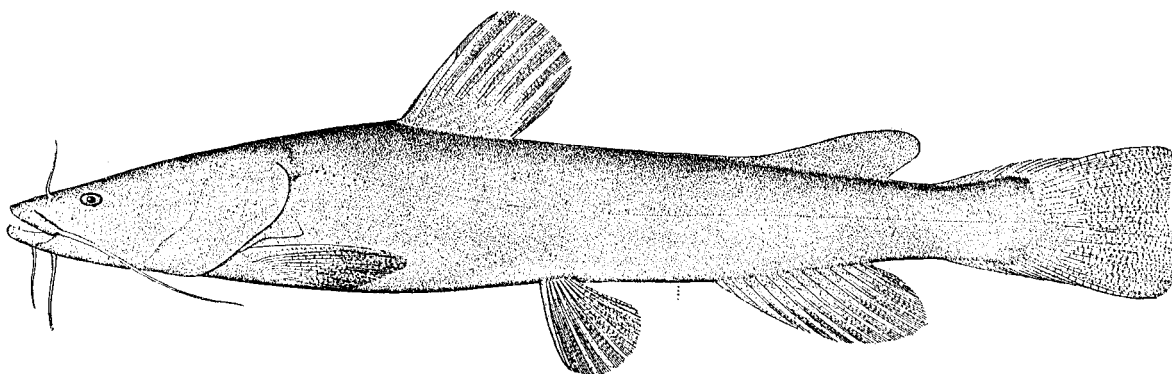
SCAPHIRHYNCHUS PLATYRHYNCHUS (Rafinesque). *Shovel-nosed Sturgeon*. Mount Carmel, Illinois. H. L. Todd del.



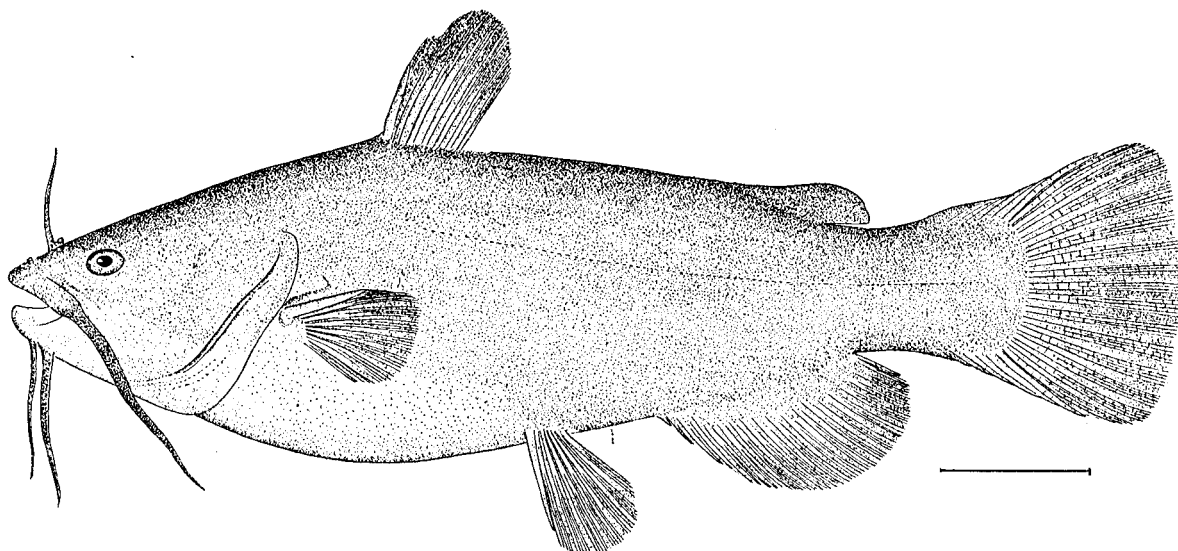
LEPISOSTEUS PLATYSTOMUS Rafinesque. *Short-nosed Gar*. Cleveland, Ohio. H. L. Todd del.



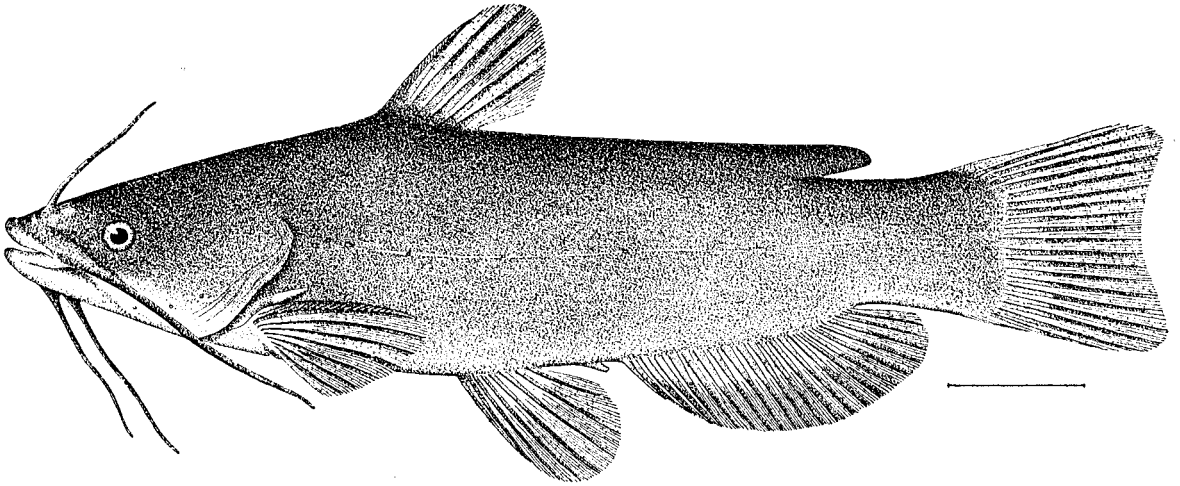
NOTURUS NOCTURNUS Jordan & Gilbert. Type. Sabine River, Belton, Arkansas. H. L. Todd del.



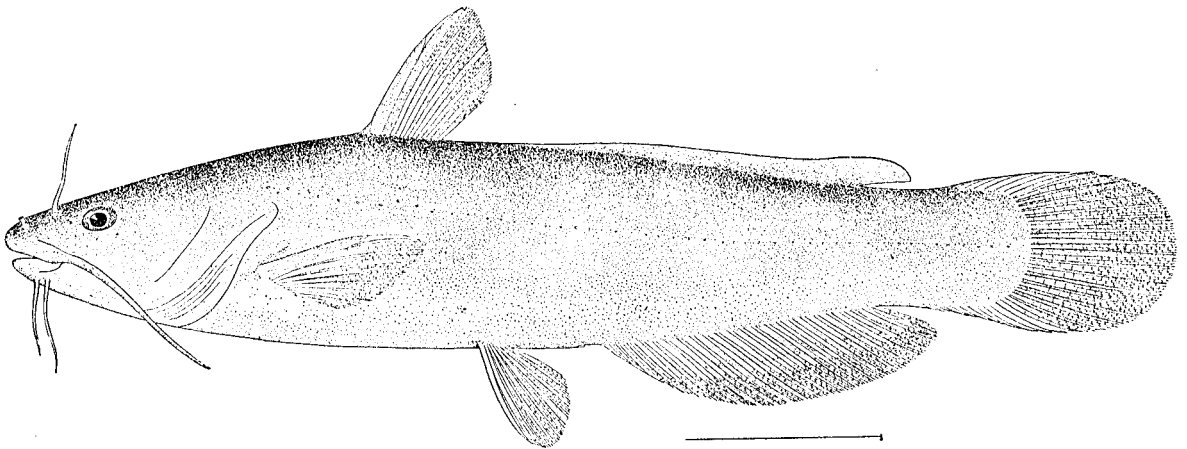
LEPTOPS OLIVARIS (Rafinesque). *Yellow Cat; Mud Cat.* Illinois River. H. L. Todd del.



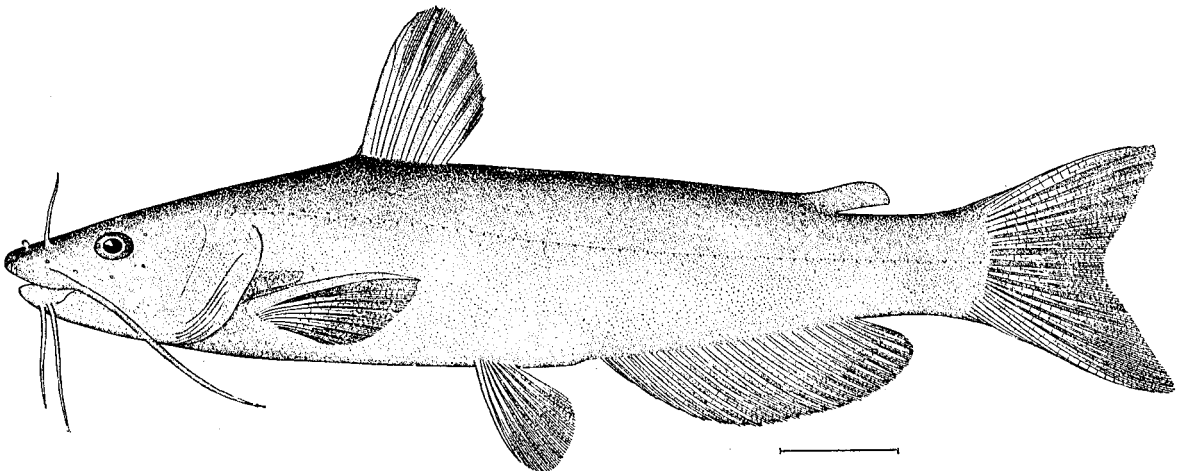
AMEIURUS MELAS (Rafinesque). *Bullhead.* Aux Plaines River, Illinois. H. L. Todd del.



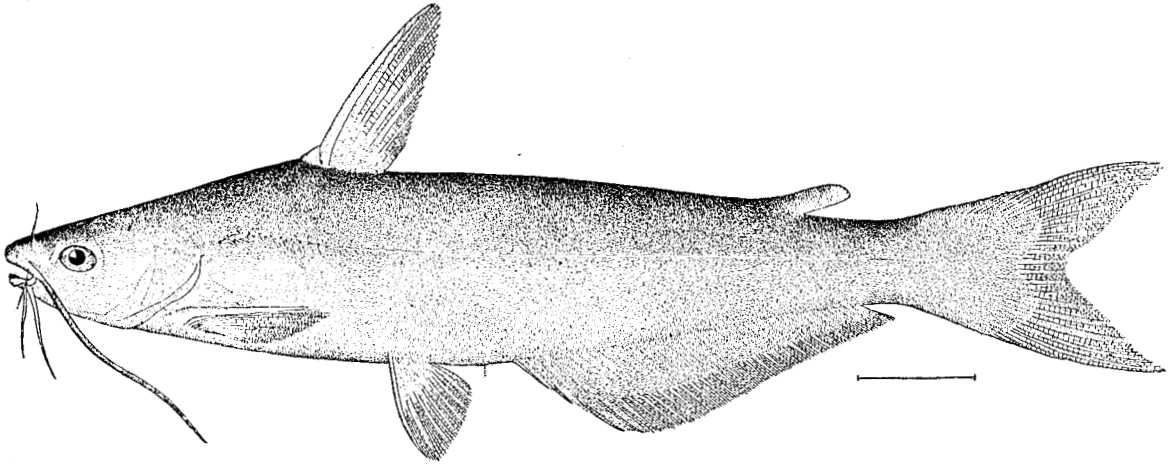
AMEIURUS NEBULOSUS CATULUS (Girard). Barton Spring, Austin, Texas. Wm. Haines del.



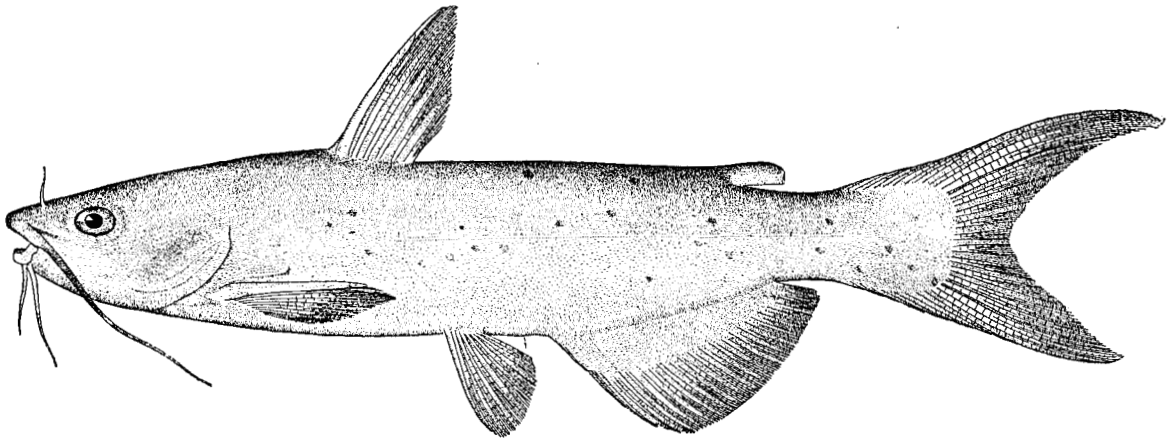
AMEIURUS NATALIS (Le Sueur). Yellow Cat. Huntsville, Alabama. H. L. Todd del.



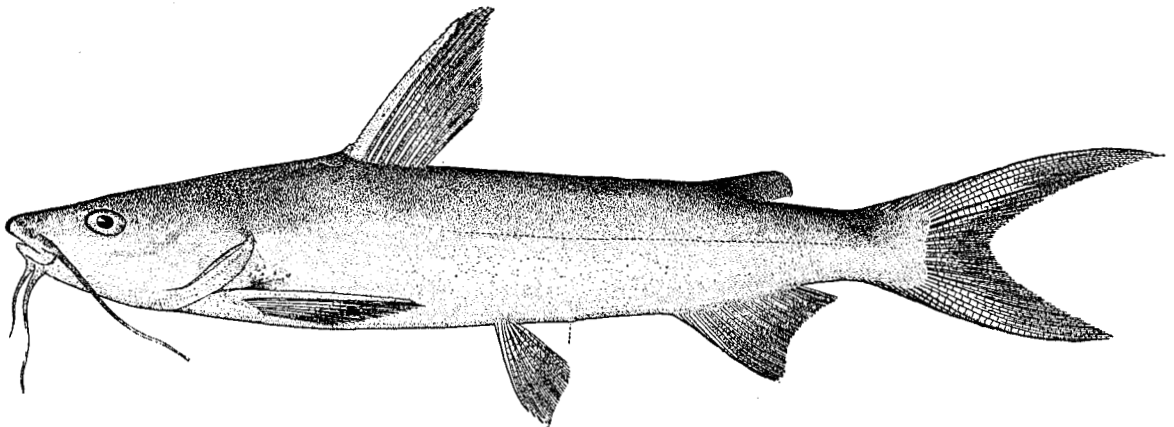
AMEIURUS LUPUS (Girard). Pecos River, Texas. H. L. Todd del.



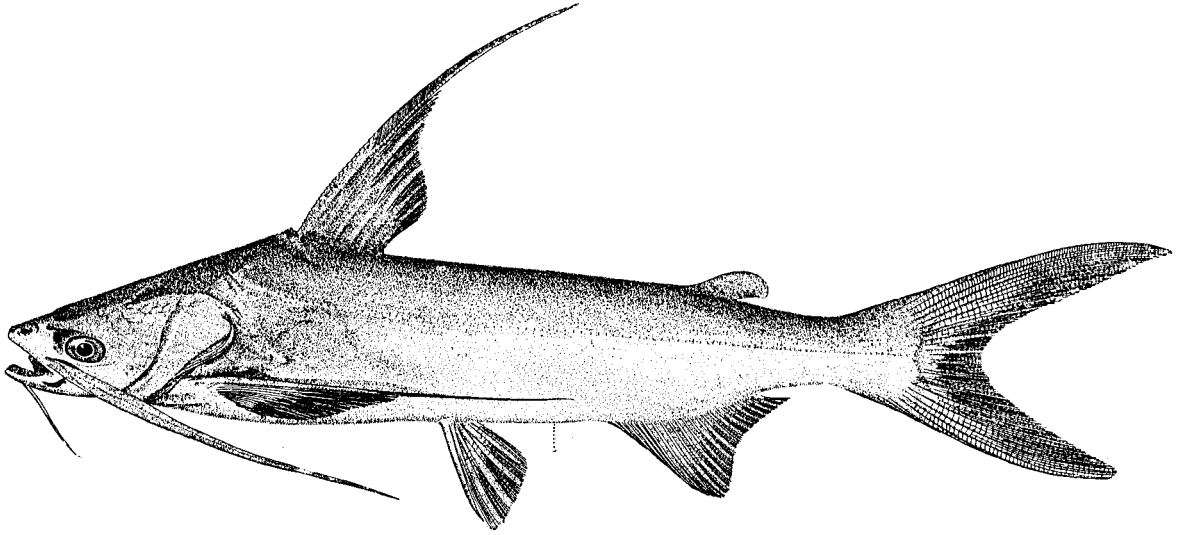
ICTALURUS FURCATUS (Cuvier & Valenciennes). *Chuck-head Cat; Channel Cat; Blue Cat.* Brownsville, Texas. Miss M. Smith del.



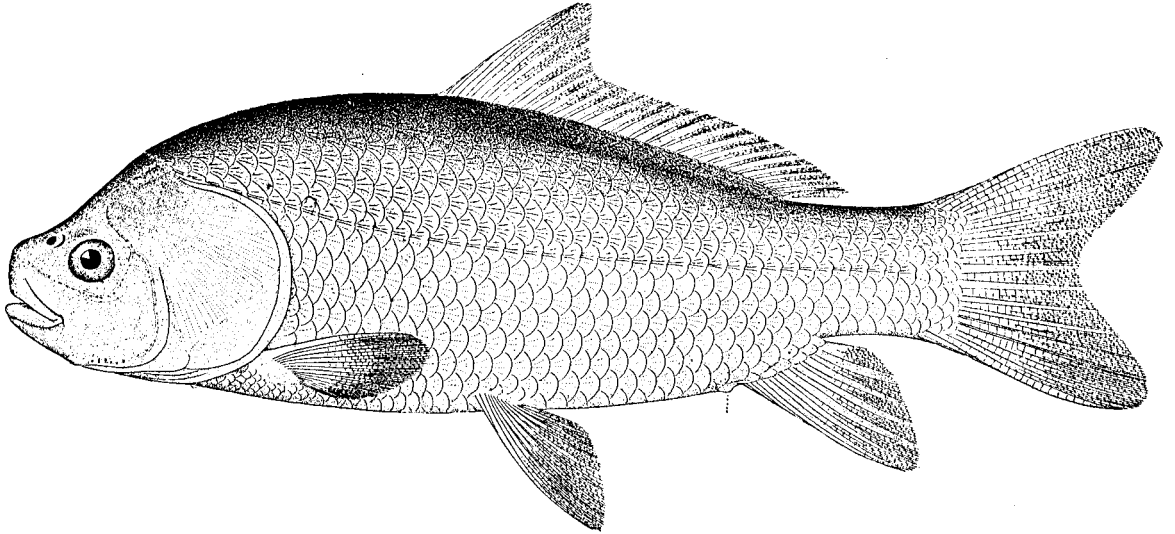
ICTALURUS PUNCTATUS (Rafinesque). *Channel Cat; Eel Cat.* H. L. Todd del.



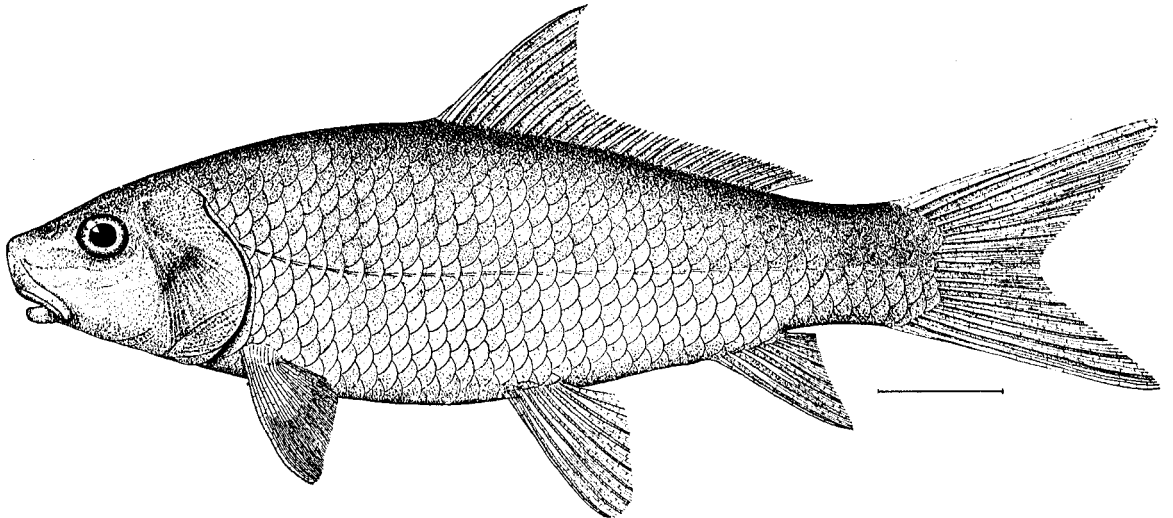
TACHYSURUS FELIS (Linnæus). *Sea Catfish.* H. L. Todd del.



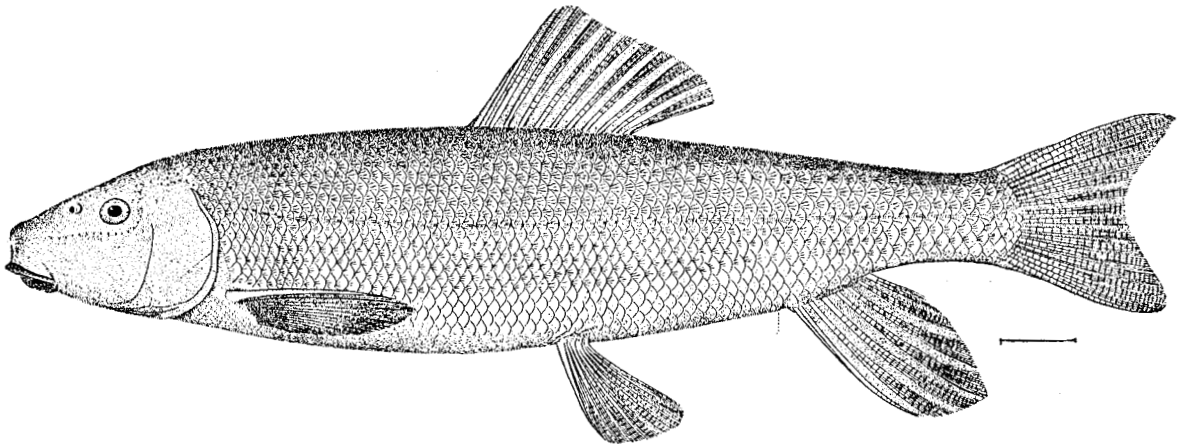
FELICHTHYS MARINUS (Mitchill). *Gaff-top sail*. H. L. Todd del.



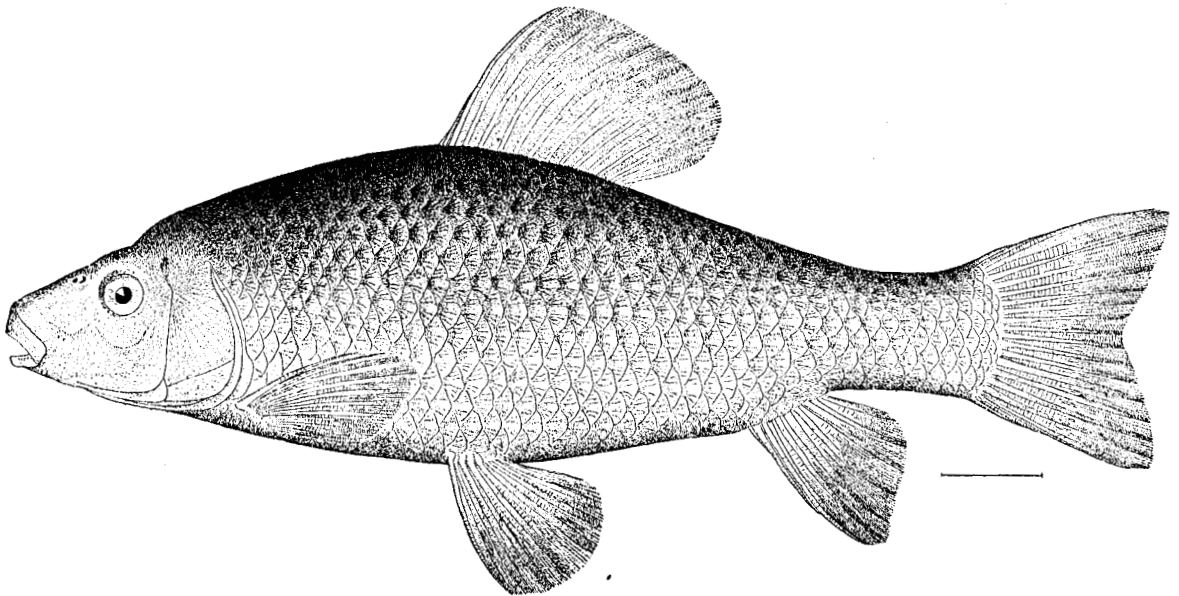
ICTIOBUS CYPRINELLA (Cuvier & Valenciennes). *Common Buffalo fish*. Missouri River. H. L. Todd del.



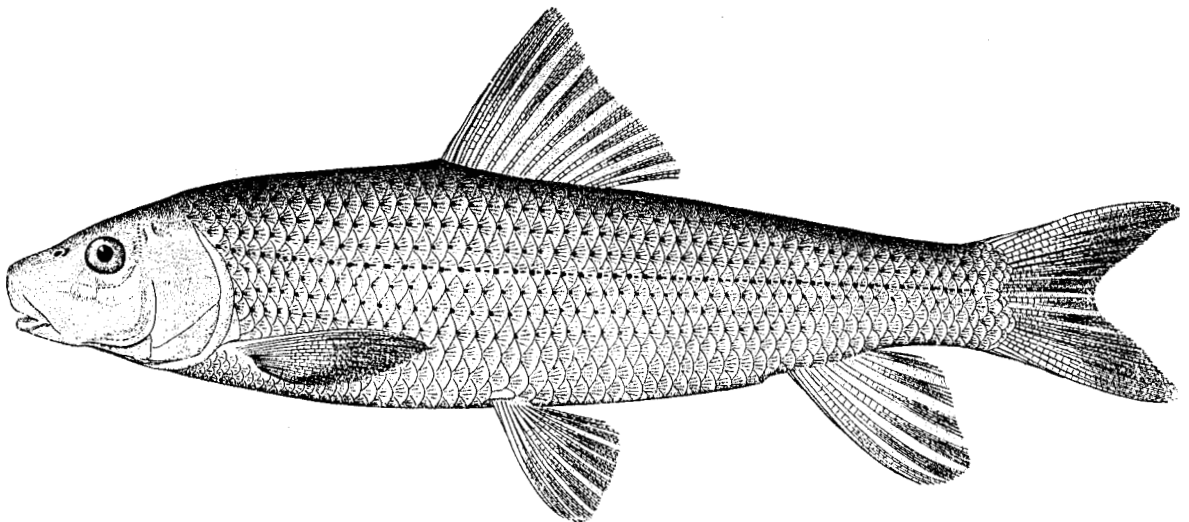
CARPIODES CARPIO (Rafinesque). *Carp Sucker*.



CATOSTOMUS TERES (Mitchill). *Common White Sucker*. Ecorse, Michigan. H. L. Todd del.

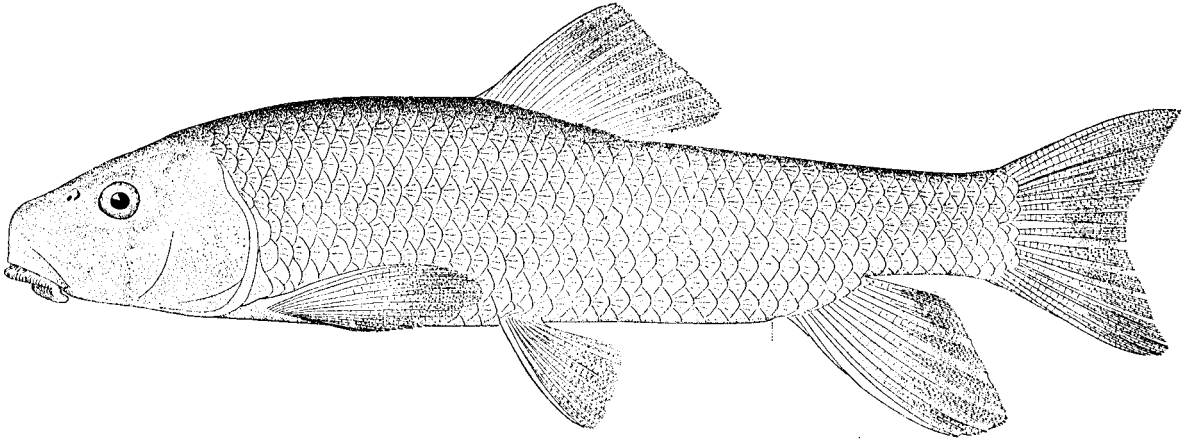


ERIMYZON SUCETTA (Lacépède). *Chub Sucker; Creek Sucker*. Ogechee Ponds, Savannah, Georgia. Miss M. Smith del.

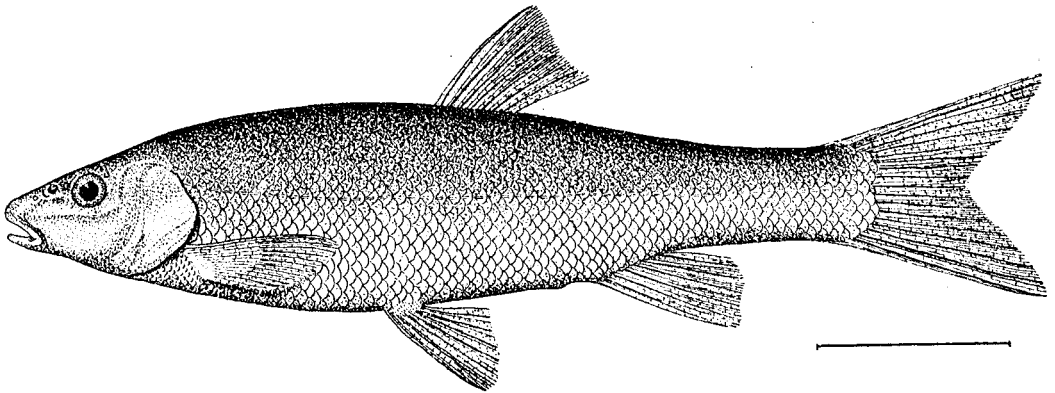


MINYTREMA MELANOPS (Rafinesque). *Striped Sucker*. H. L. Todd del.

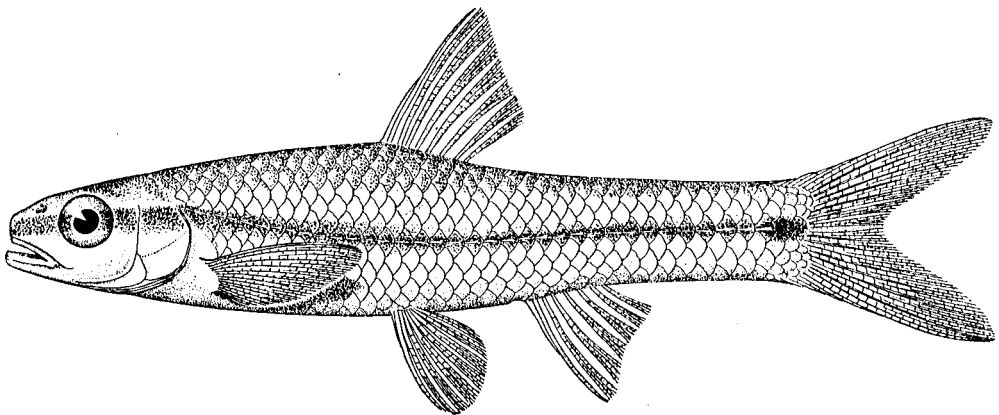




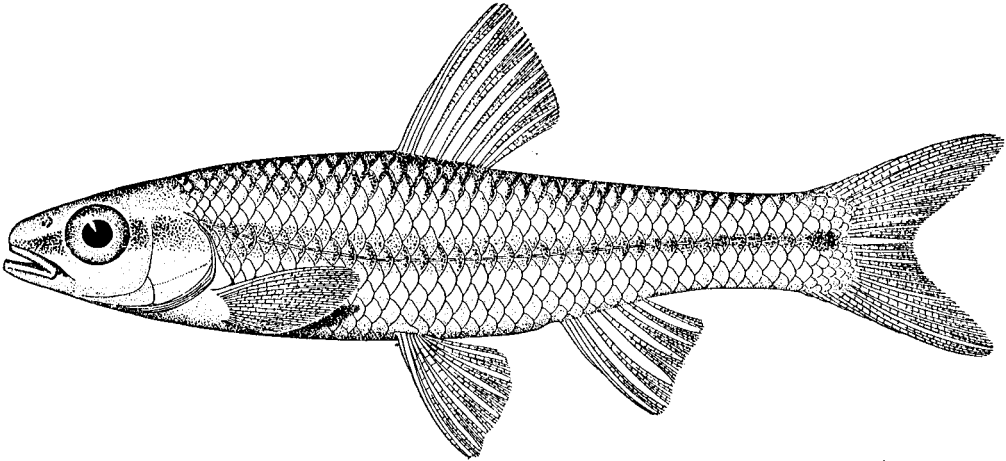
MOXOSTOMA CONGESTUM (Baird & Girard). Lampasas River, Belton, Texas. H. L. Todd del.



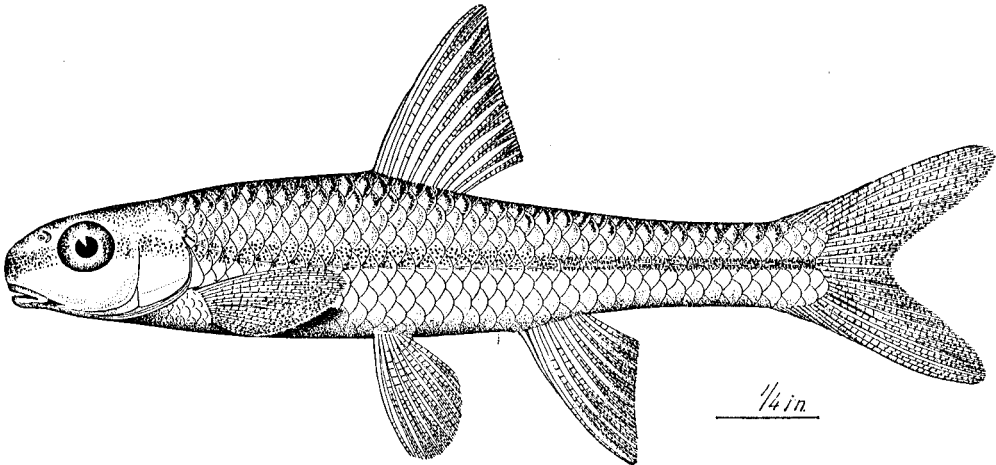
CAMPOSTOMA ANOMALUM (Rafinesque). Stone-roller. White River, Eureka Springs, Arkansas. Wm. Haines del.



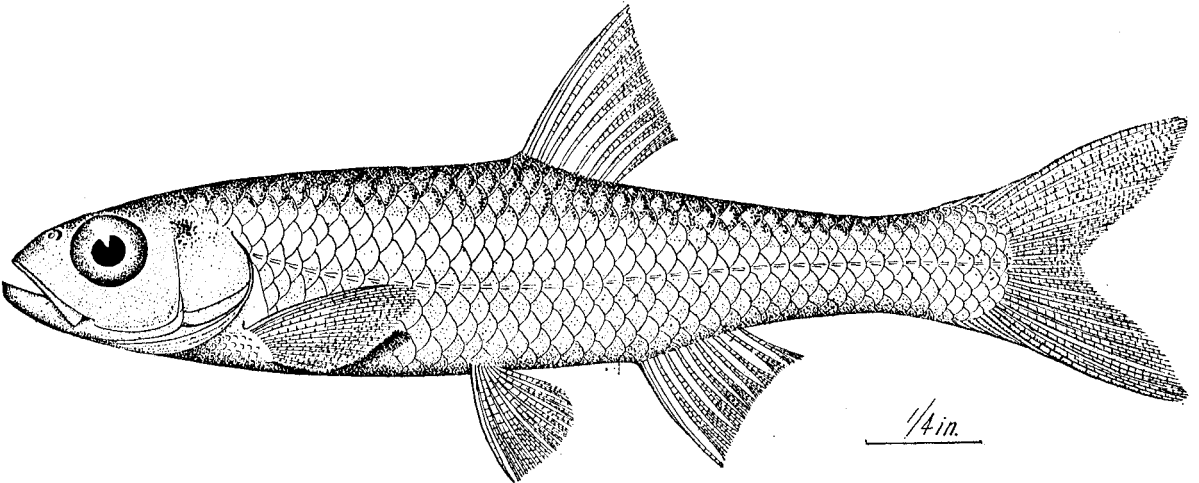
NOTROPIS CAYUGA ATROCAUDALIS Evermann. Type. Neches River, Palestine, Texas. A. H. Baldwin del.



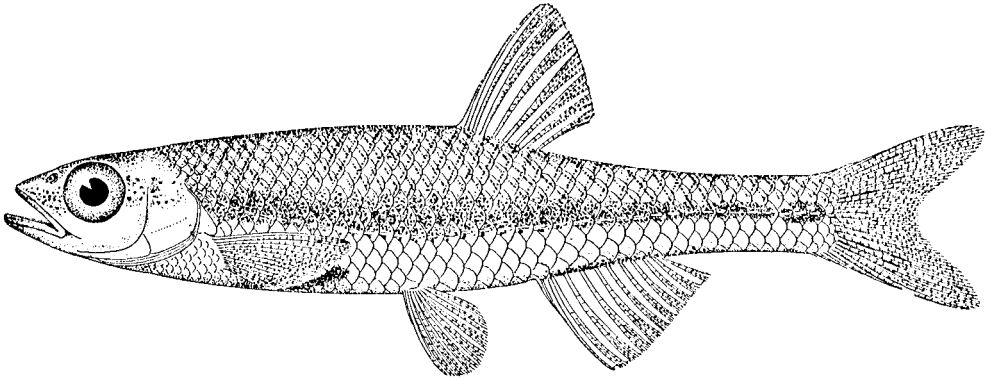
NOTROPIS NUX Evermann. Type. Neches River, Palestine, Texas. A. H. Baldwin del.



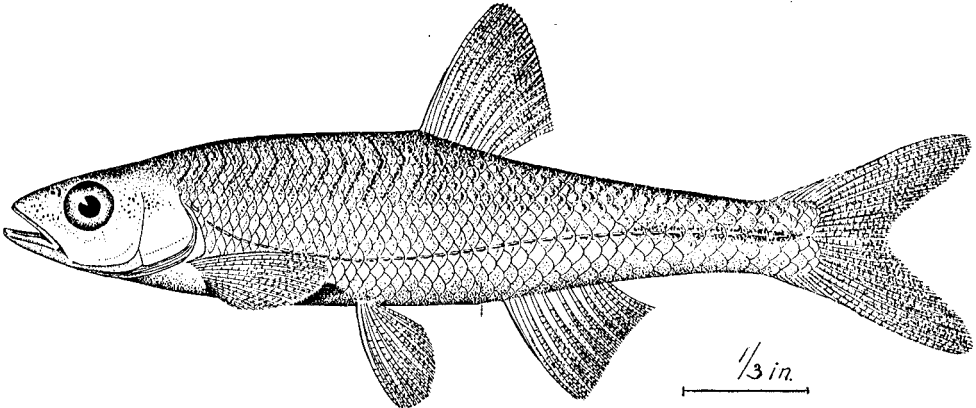
NOTROPIS NOCOMIS Evermann. Type. Trinity River, Magnolia Point, Texas. A. H. Baldwin del.



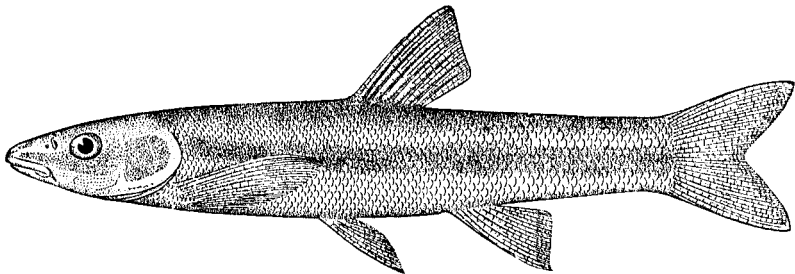
NOTROPIS SWAINI Jordan & Gilbert. San Marcos River, San Marcos, Texas. A. H. Baldwin del.



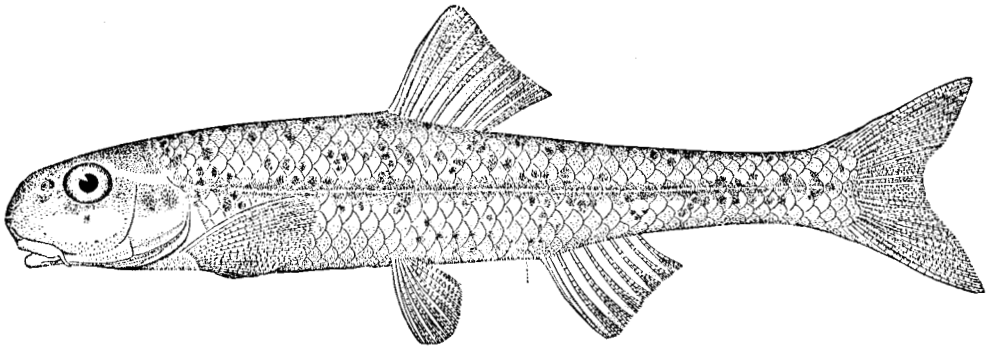
NOTROPIS FUMEUS Evermann. Type. Hunter Creek, Houston, Texas. A. H. Baldwin del.



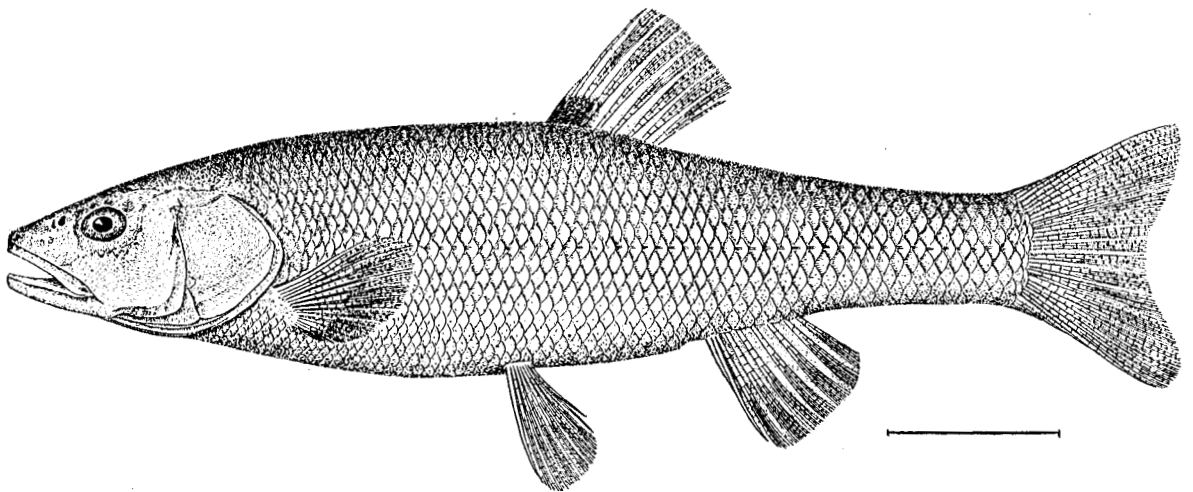
NOTROPIS NOTEMIGONOIDES Evermann. Type. Neches River, Palestine, Texas. A. H. Baldwin del.



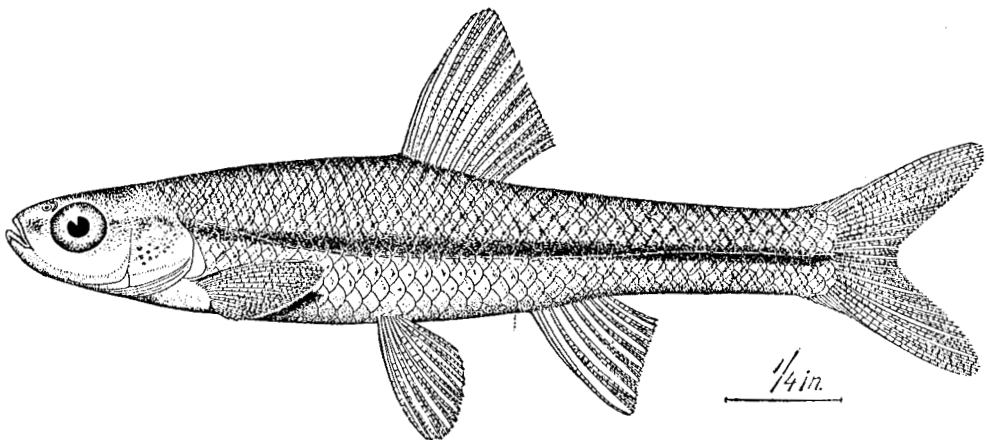
RHINICHTHYS DULCIS (Girard). Dace. S. F. Denton del.



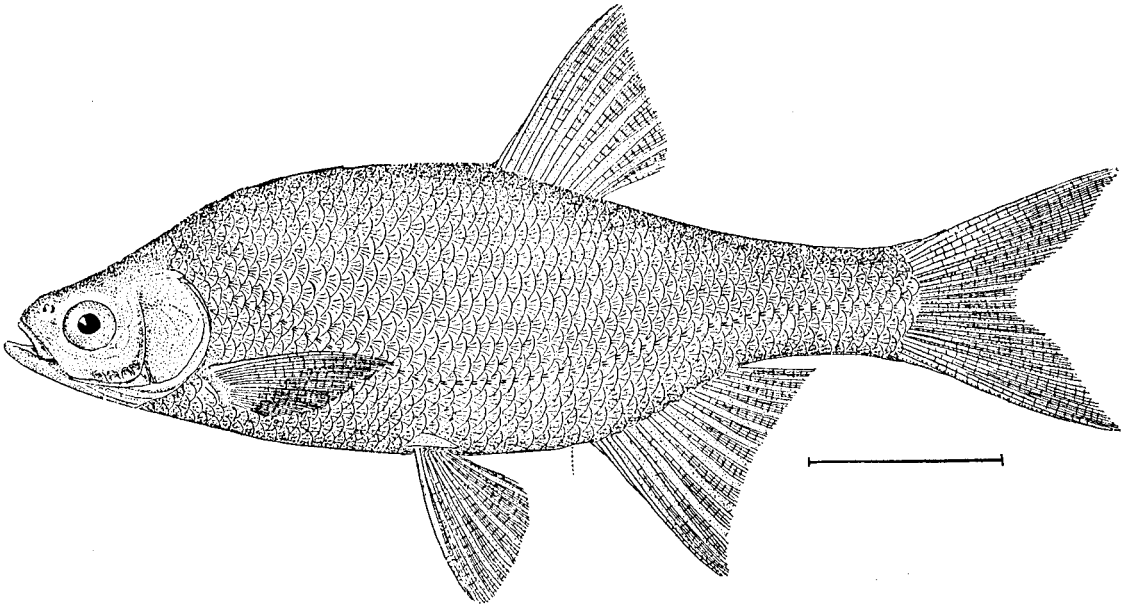
*HYBOPSIS AESTIVALIS MARCONIS* Jordan & Gilbert. About twice natural size. San Marcos River, San Marcos, Texas. A. H. Baldwin del.



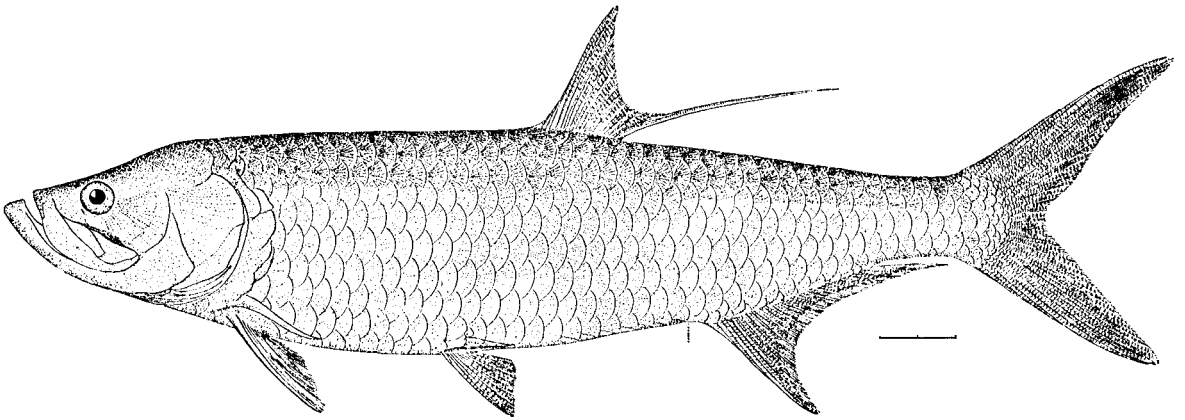
*SEMOTILUS ATROMACULATUS* (Mitchill). *Horned Dace; Creek Chub*. Aux Plaines River, Illinois. H. L. Todd del.



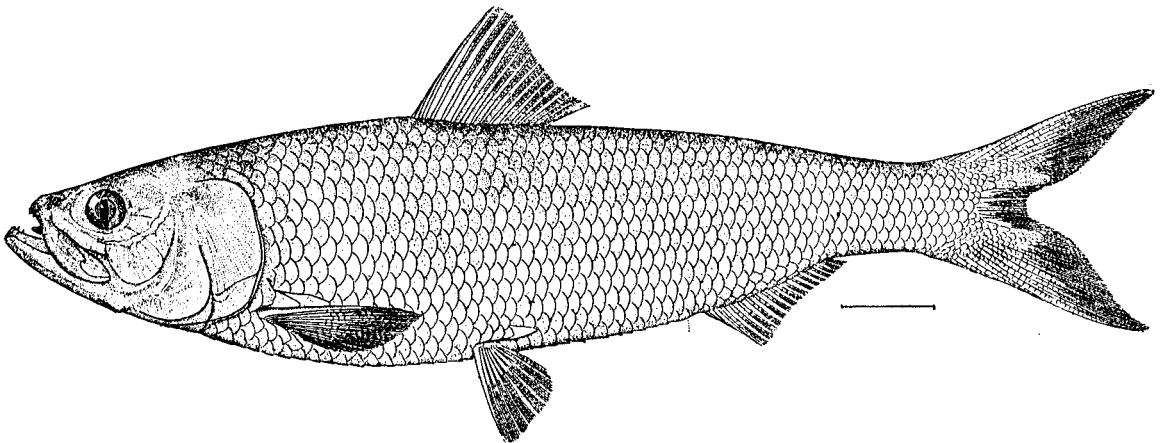
*OPSOPÆODUS OSCULA* Evermann. Type. Buffalo Bayou, Houston, Texas. A. H. Baldwin del.



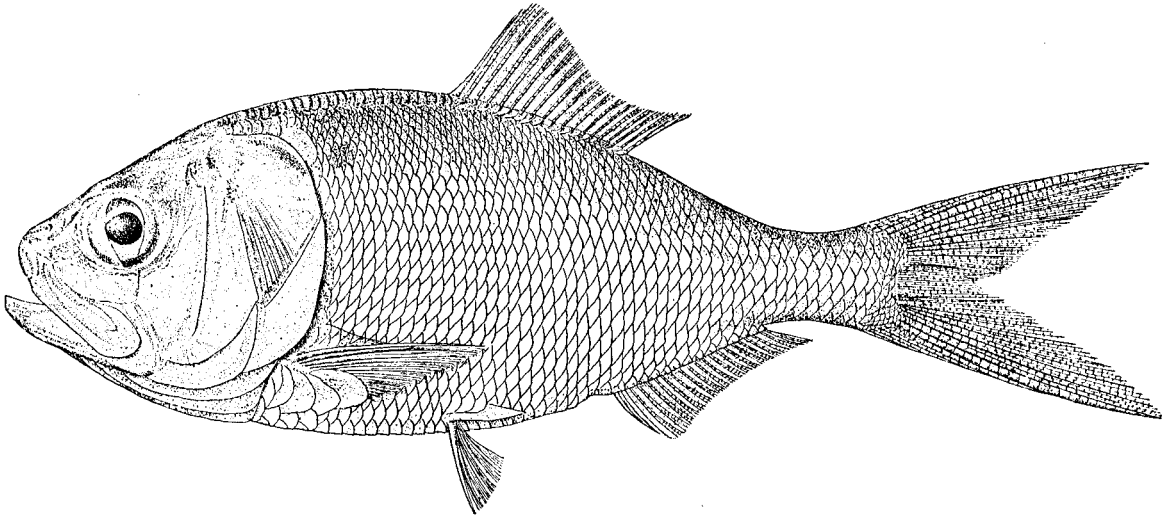
NOTEMIGONUS CHRYSOLEUCUS (Mitchill). *Bream*. Hackensack River, New Jersey. H. L. Todd del.



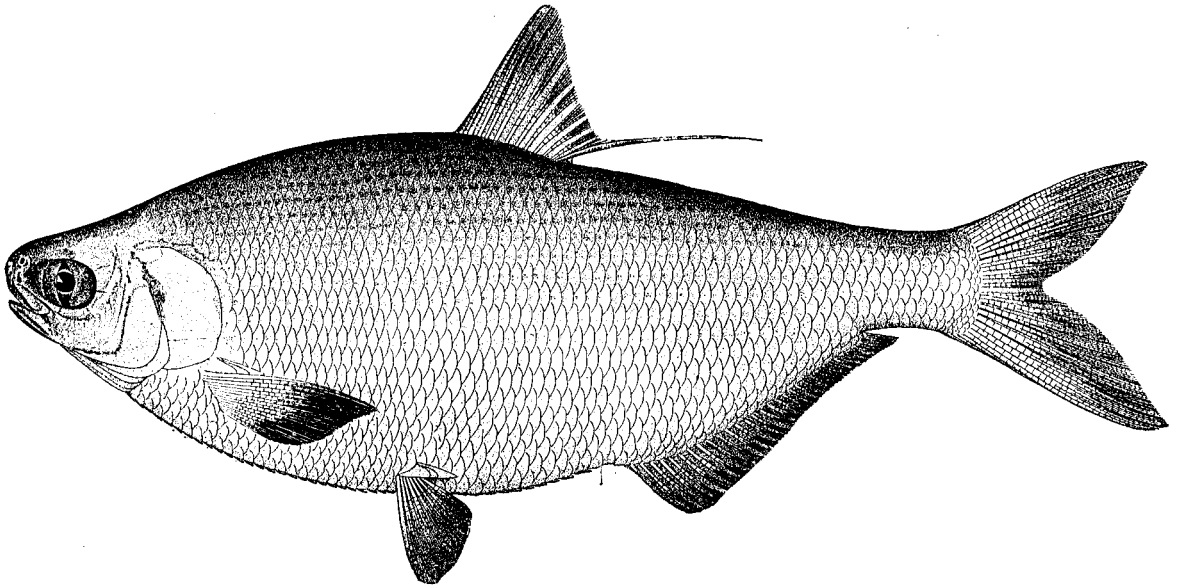
MEGALOPS ATLANTICUS (Cuvier & Valenciennes). *Tarpon; Tarpon*. H. L. Todd del.



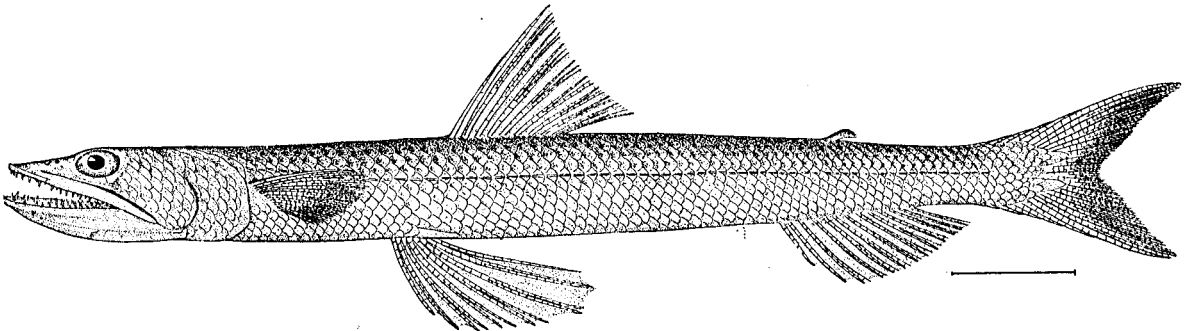
CLUPEA CHRYSOCHLORIS (Rafinesque). *Skipjack*. Pensacola, Florida. H. L. Todd del.



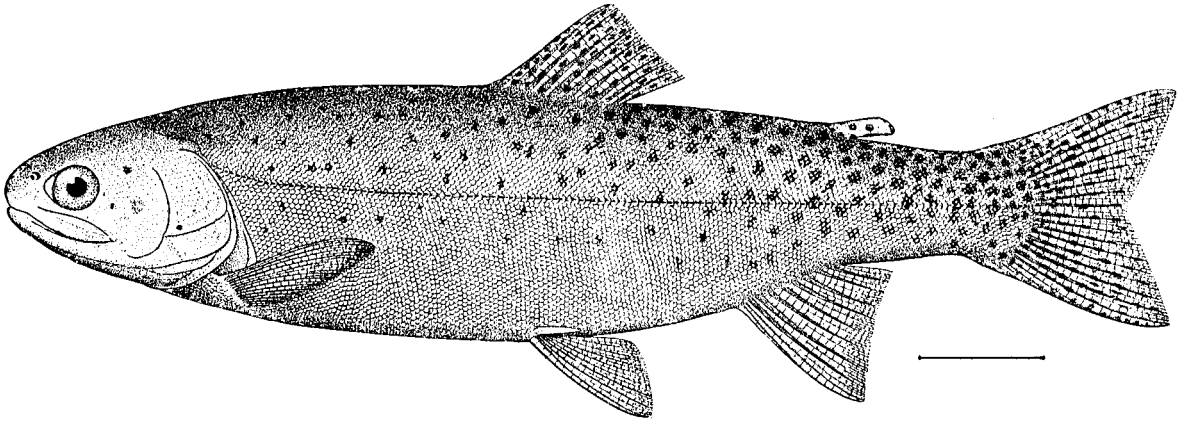
BREVOORTIA TYRANNUS PATRONUS Goode. *Gulf Menhaden*. Brazos Santiago, Texas. H. L. Todd del.



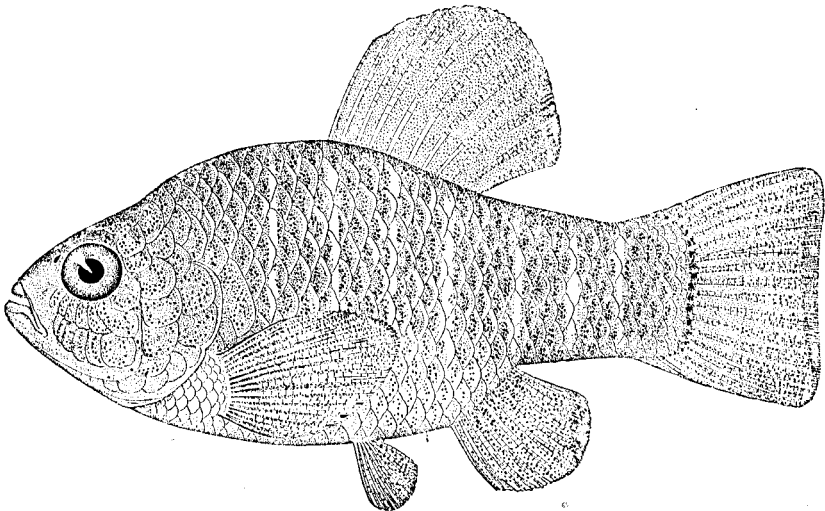
DOROSOMA CEPEDIANUM (Le Sueur). *Gizzard Shad; Hickory Shad*. H. L. Todd del.



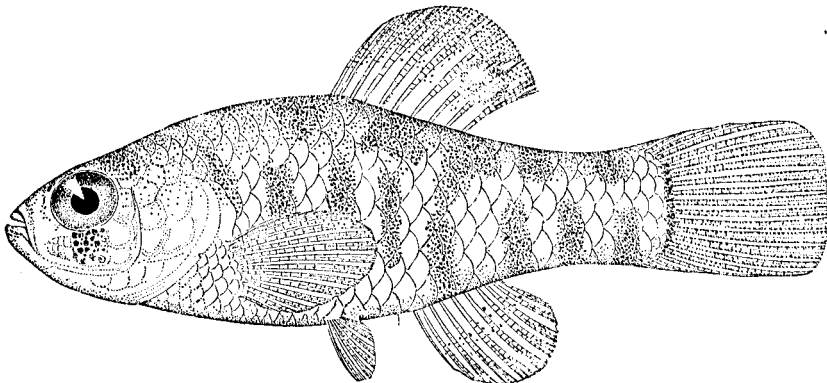
SYNODUS FŒTENS (Linnæus). *Lizard-fish*. Charleston, South Carolina. H. L. Todd del.



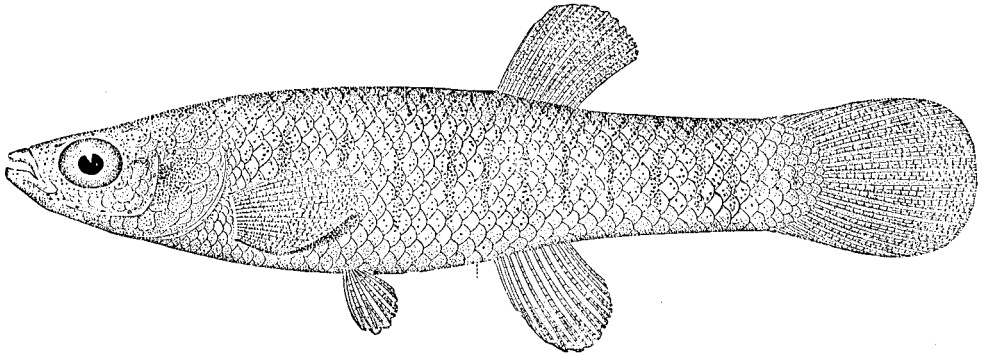
SALMO MYKISS SPILURUS Cope. *Rio Grande Trout*. Rio Grande Del Norte, Colorado. S. F. Denton del.



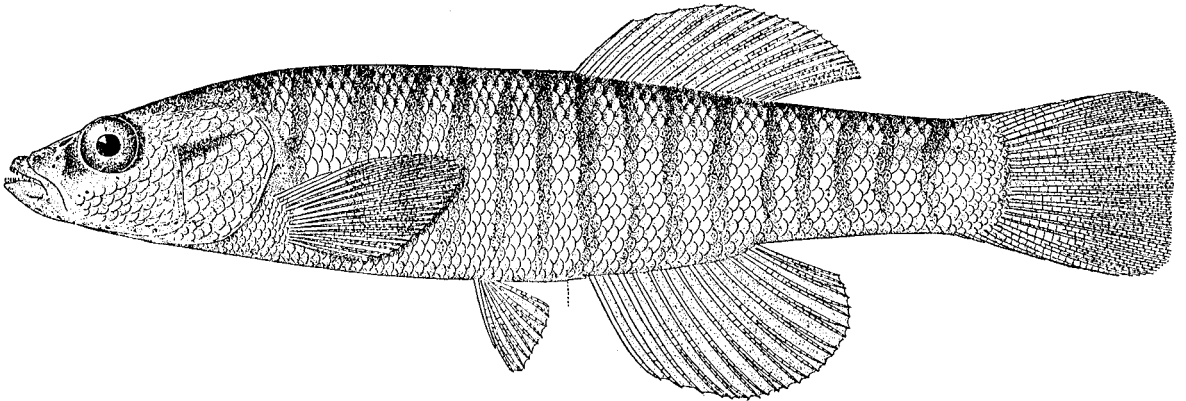
CYPRINODON VARIEGATUS Lacépède. *Variegated Minnow*. Male. Twice natural size. A. H. Baldwin del.



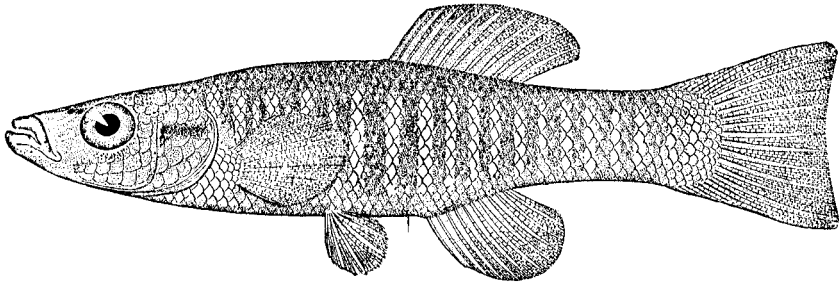
CYPRINODON VARIEGATUS Lacépède. *Variegated Minnow*. Young. Six times natural size. A. H. Baldwin del.



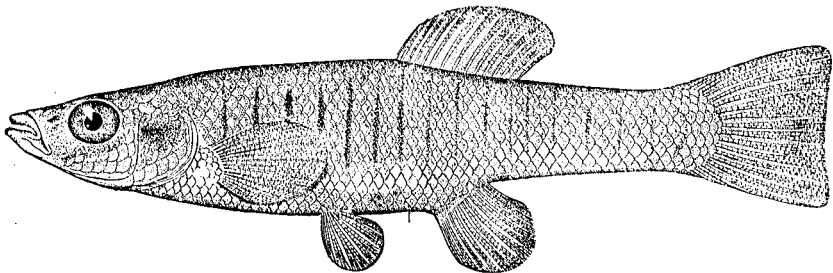
FUNDULUS PALLIDUS Evermann. Type. About three times natural size. Galveston Bay, Texas. A. H. Baldwin del.



FUNDULUS ZEBRINUS Jordan & Gilbert. Ellis, Kansas. H. L. Todd del.

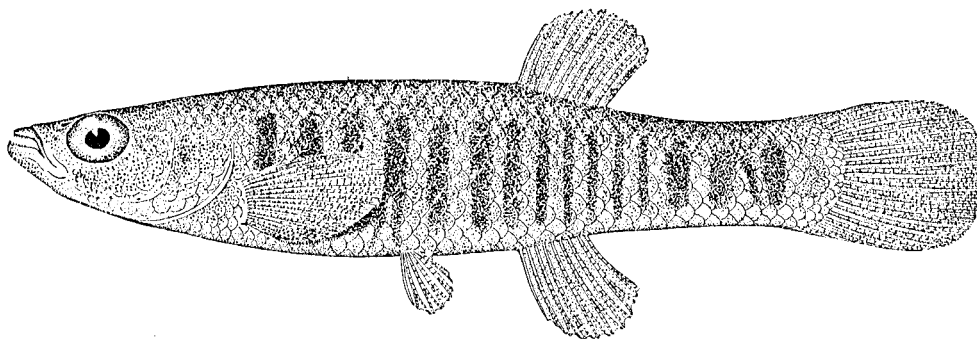


FUNDULUS DIAPHANUS Le Sueur. *Spring Minnow*. Male. One and one-fifth times natural size. A. H. Baldwin del.

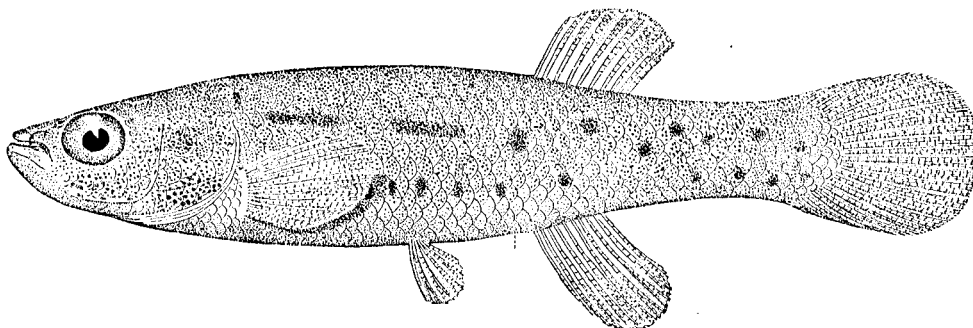


FUNDULUS DIAPHANUS Le Sueur. *Spring Minnow*. Female. One and one-fifth times natural size. A. H. Baldwin del.

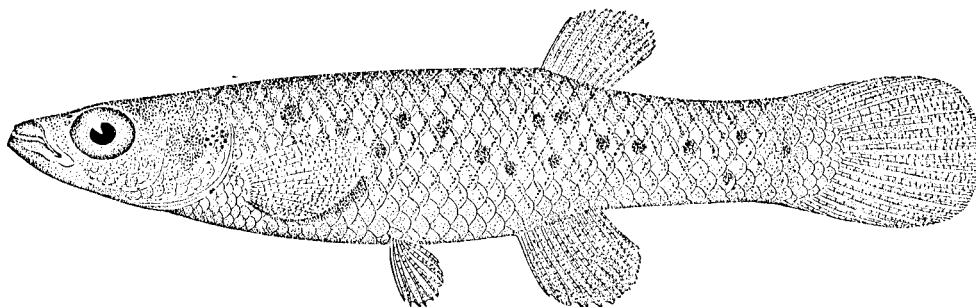




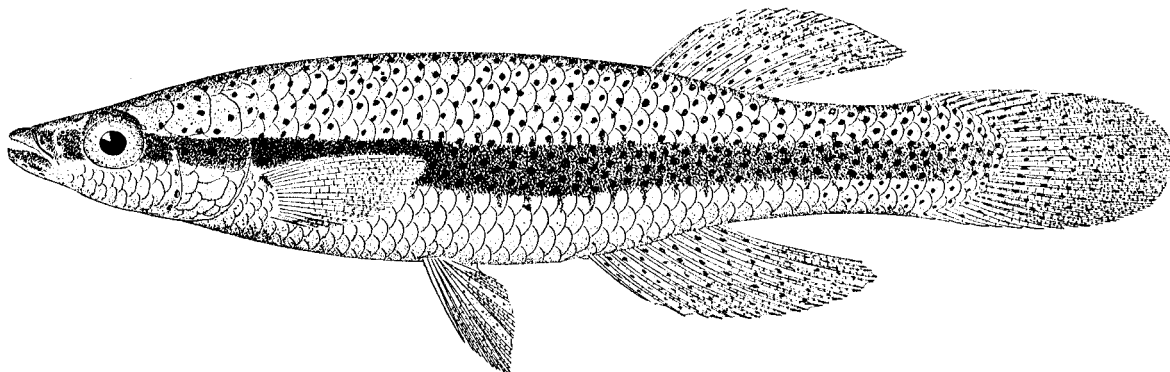
ZYGONECTES FUNDULOIDES Evermann. About three and a half times natural size. Dickinson Bayou, Dickinson, Texas. A. H. Baldwin del.



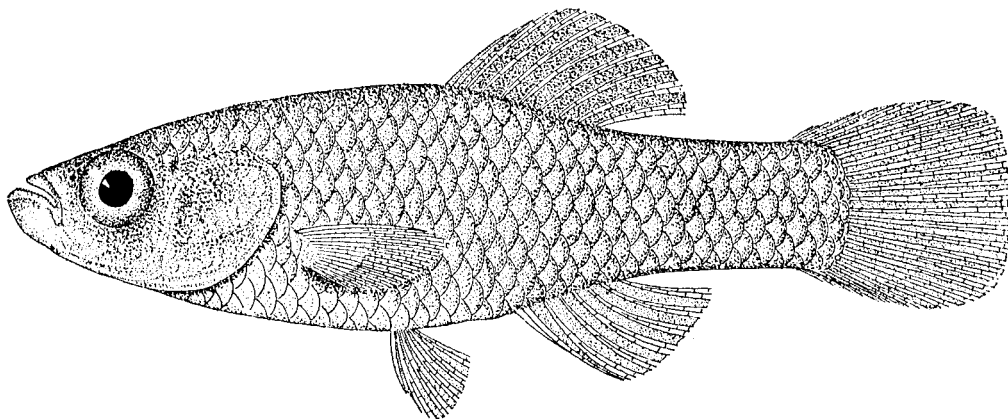
ZYGONECTES PULVEREUS Evermann. About three times natural size. Dickinson Bayou, Dickinson, Texas. A. H. Baldwin del.



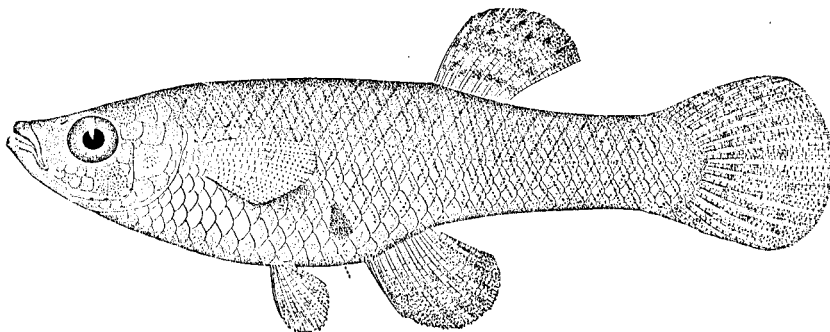
ZYGONECTES JENKINSI Evermann. About three times natural size. Galveston Bay, Galveston, Texas. A. H. Baldwin del.



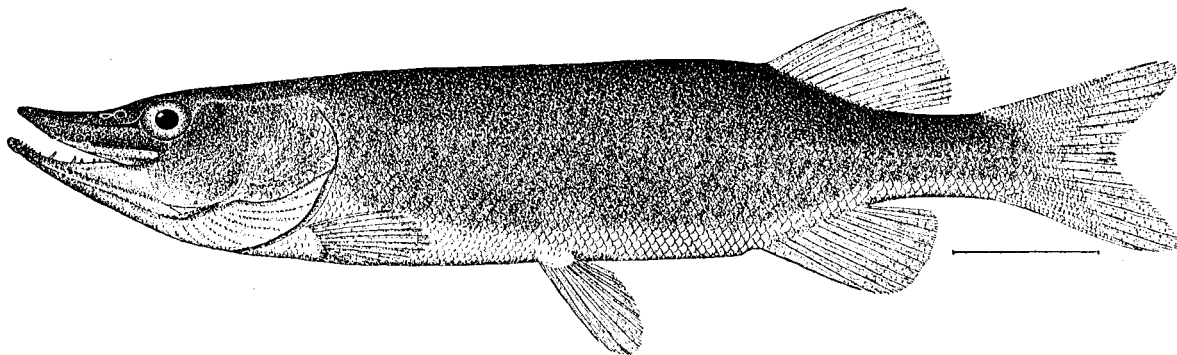
ZYGONECTES NOTATUS (Rafinesque). *Top Minnow*. White River, Eureka Springs, Arkansas. H. L. Todd del.



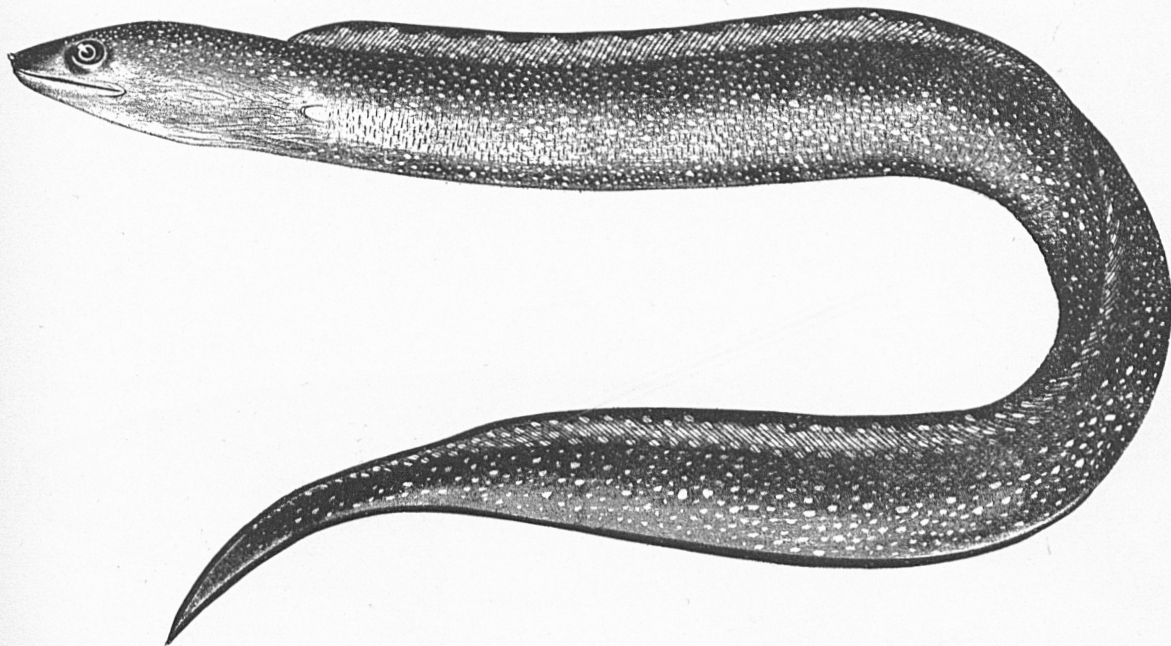
LUCANIA PARVA (Baird & Girard). Wm. Haines del.



GAMBUSIA AFFINIS (Baird & Girard). Female. Two and one half times natural size. A. H. Baldwin del.



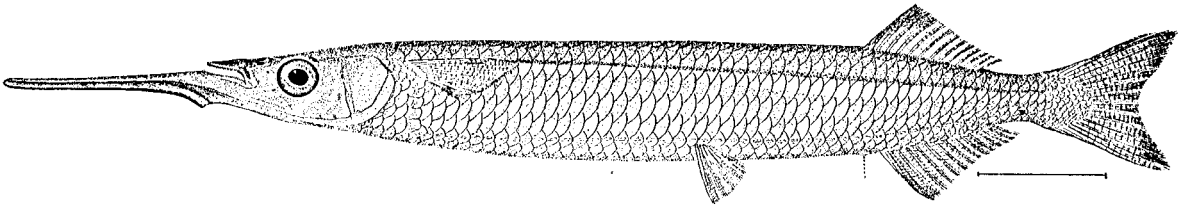
LUCIUS VERMICULATUS (Le Sueur). *Little Pickerel*. New Orleans, Louisiana. Wm. Haines del.



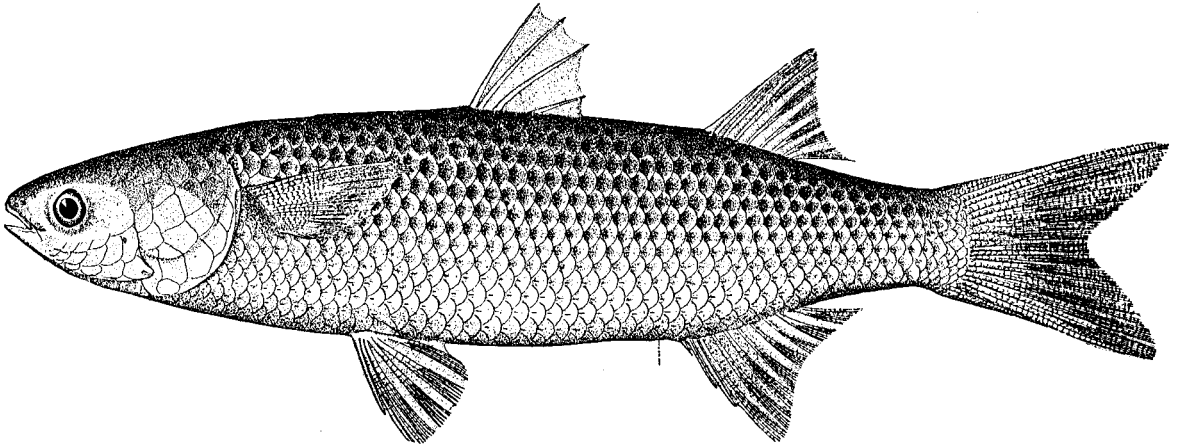
GYMNOTHORAX OCELLATUS NIGROMARGINATUS (Girard). From type. St. Joseph Island, Texas.



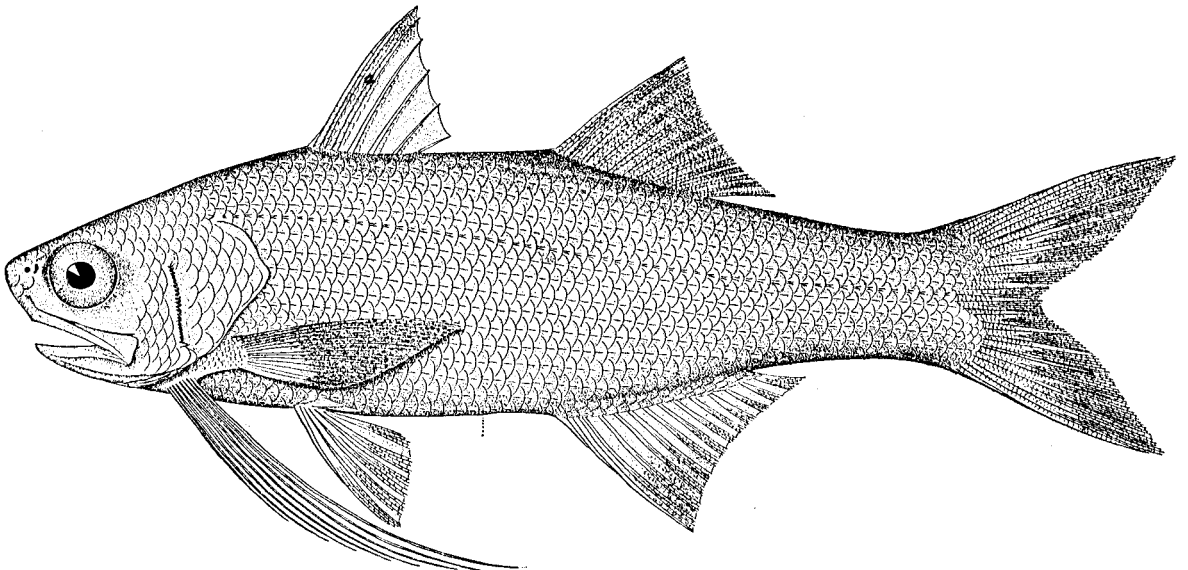
ANGUILLA CHRYSYPA Rafinesque. *Common Eel*. Holyoke, Massachusetts. H. L. Todd del.



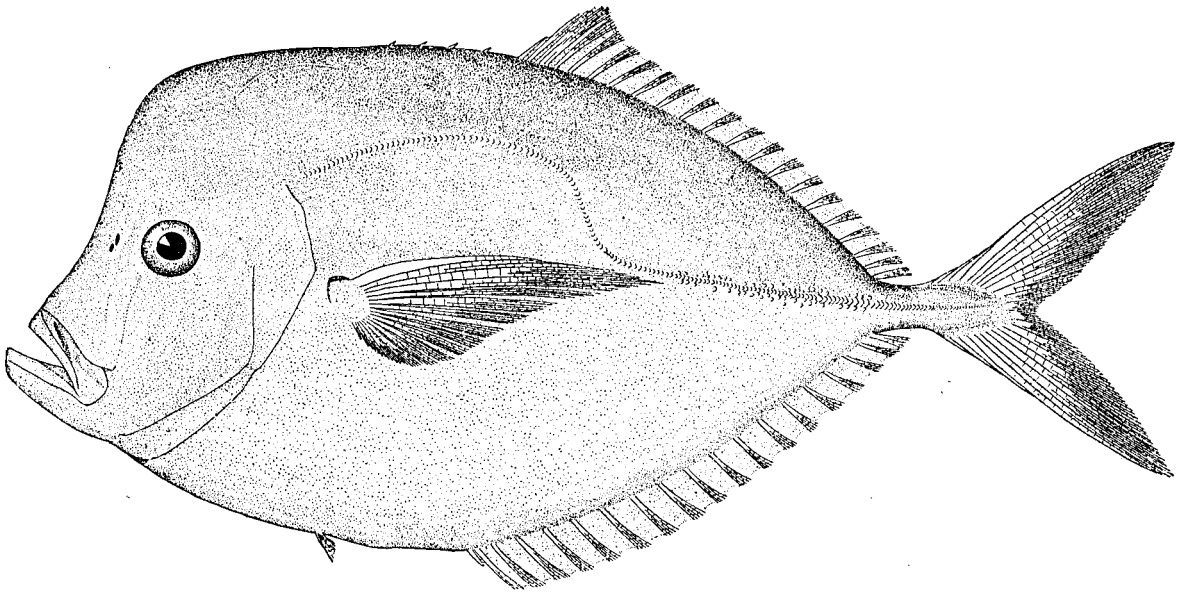
HEMIRHAMPHUS UNIFASCIATUS Ranzani. *Half-beak*. Chesapeake Bay. H. L. Todd del.



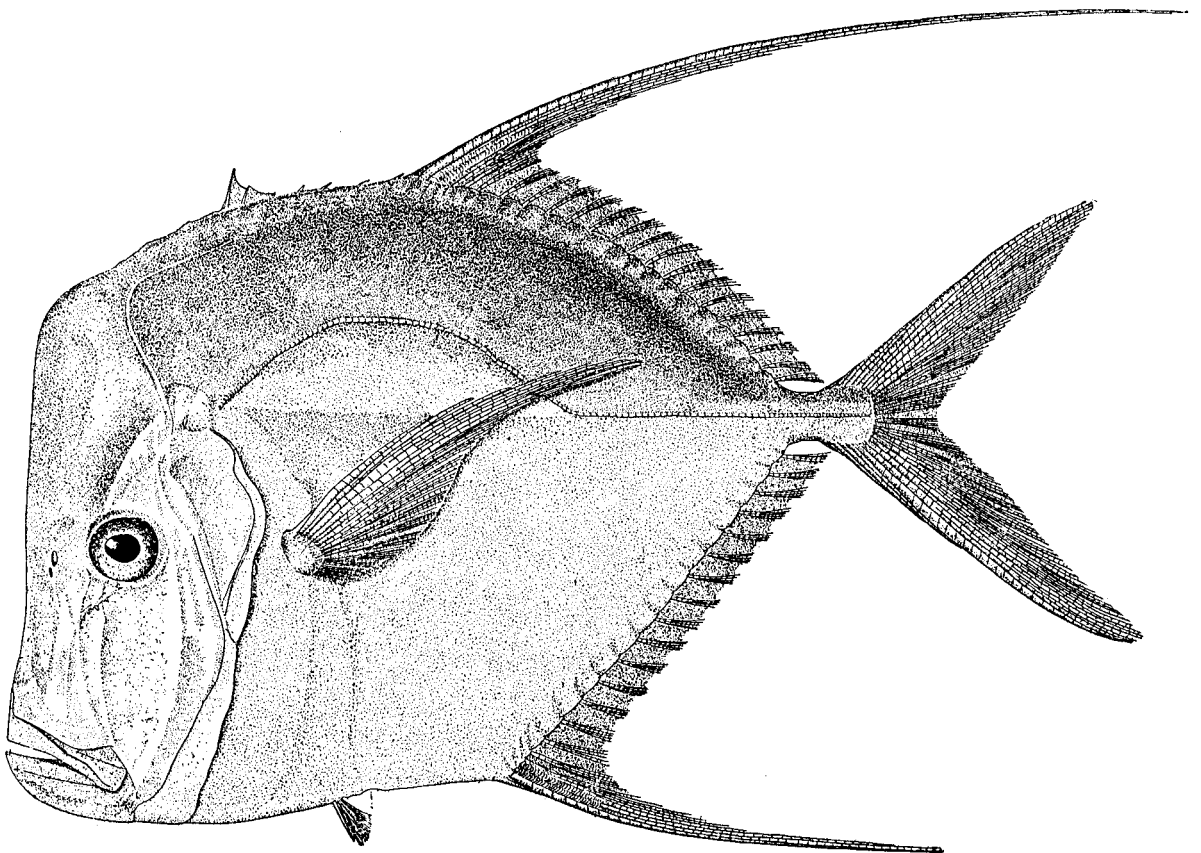
MUGIL CEPHALUS Linnæus. *Common Mullet; Striped Mullet*. H. L. Todd del.



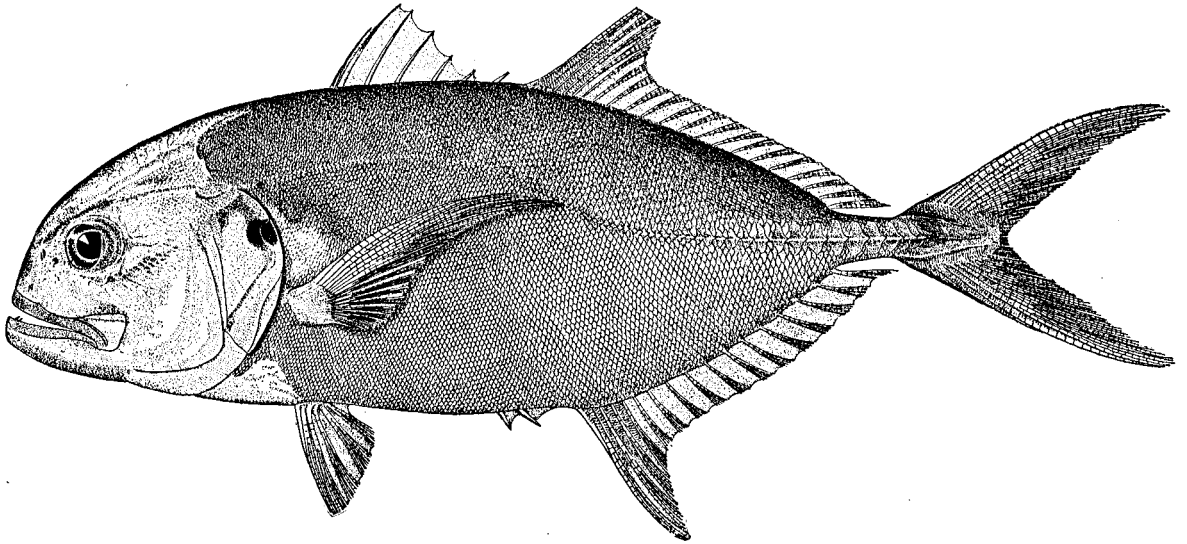
POLYNEMUS OCTONEMUS Girard. *Threadfin*. H. L. Todd del.



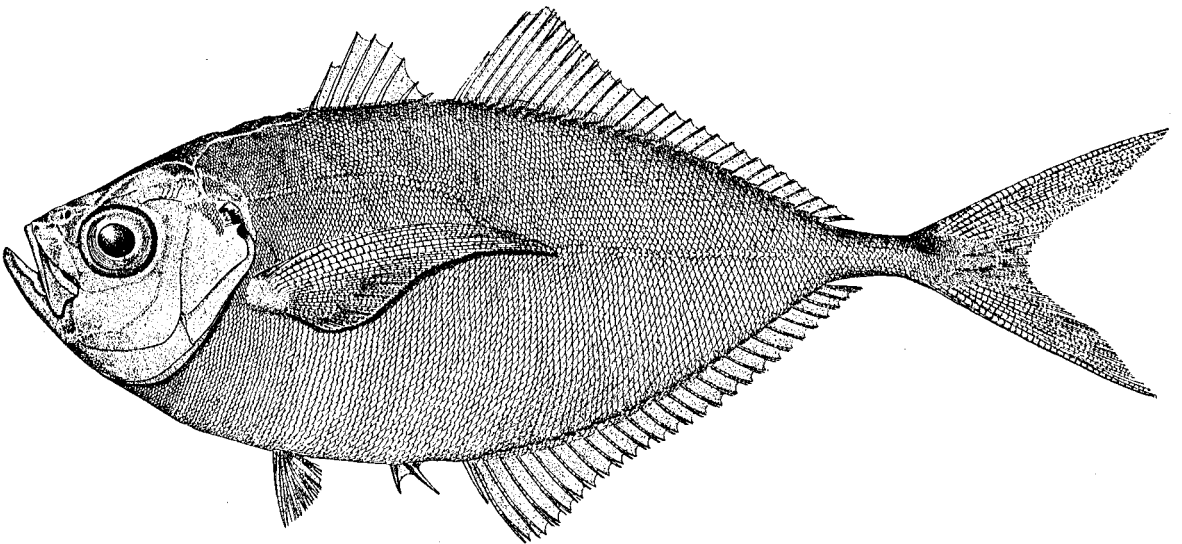
VOMER SETIPINNIS (Mitchill). *Blunt-nosed Shiner; Moonfish.* H. L. Todd del.



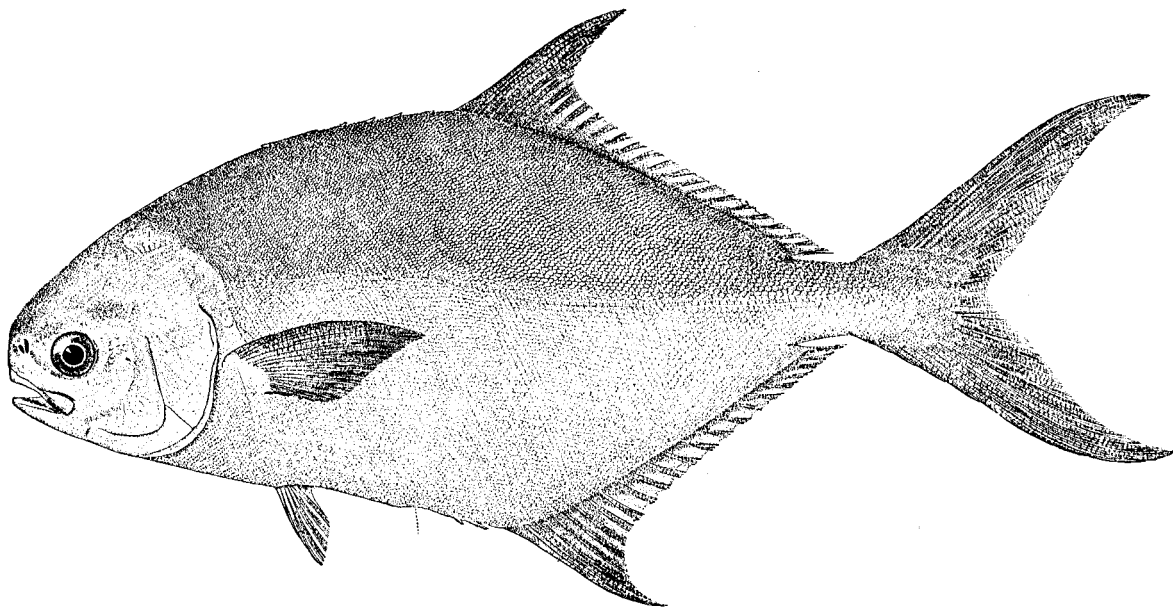
SELENE VOMER (Linnæus). *Silver Moonfish.* H. L. Todd del.



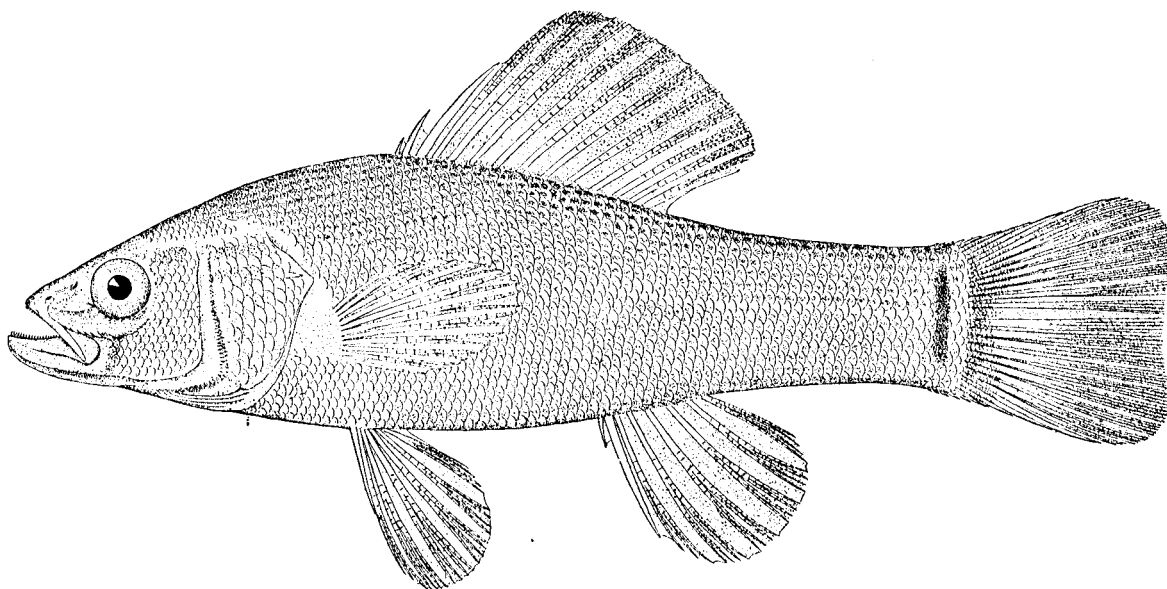
CARANX HIPPOS (Linnæus). *Horse Crevallé*. H. L. Todd del.



CHLOROSCOMBRUS CHRYSURUS (Linnæus). *Bumper*. St. Johns River, Florida. H. L. Todd del.

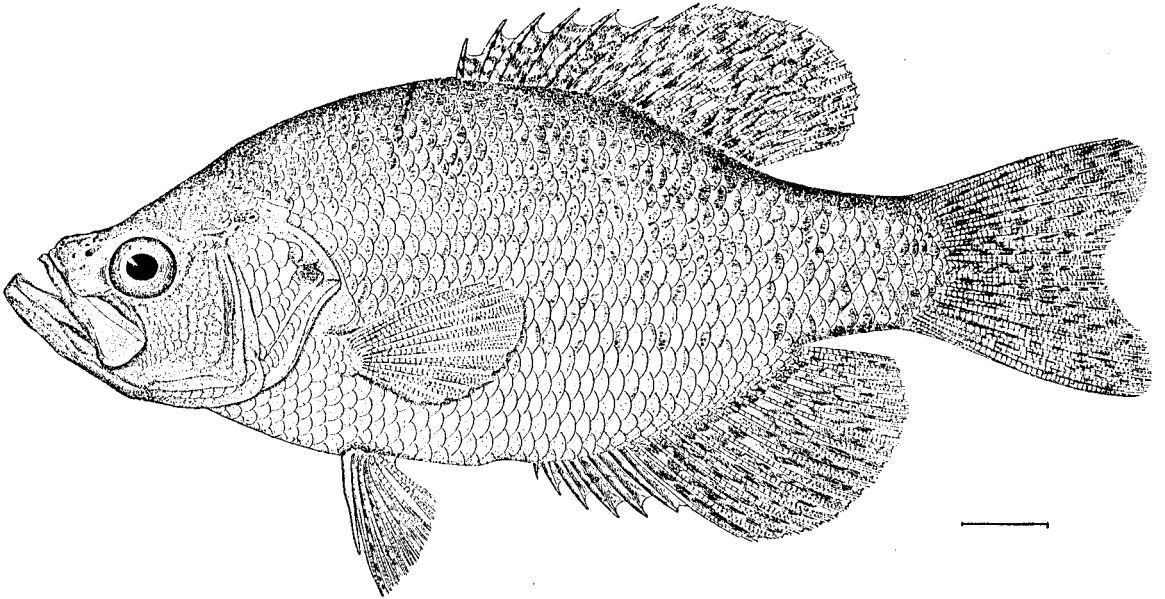


TRACHYNOTUS CAROLINUS (Linnæus). *Common Pompano.* H. L. Todd del.

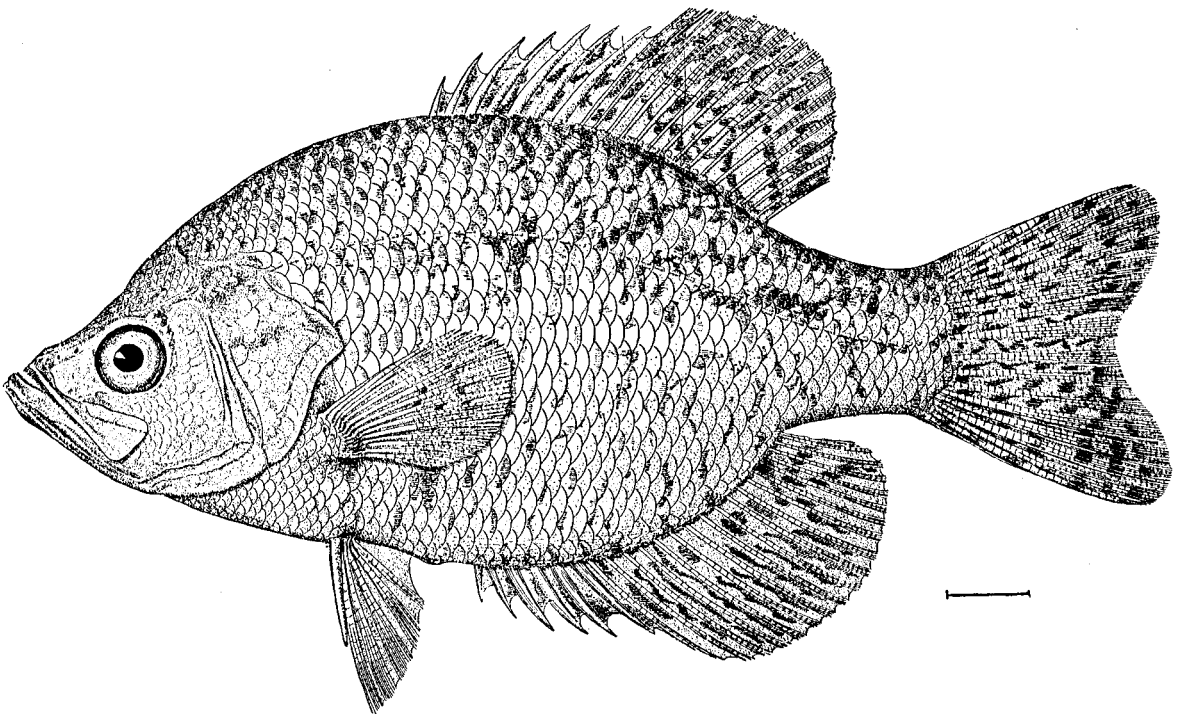


APHREDODERUS SAYANUS (Gilliams). *Pirate Perch.* Illinois River. H. L. Todd del.



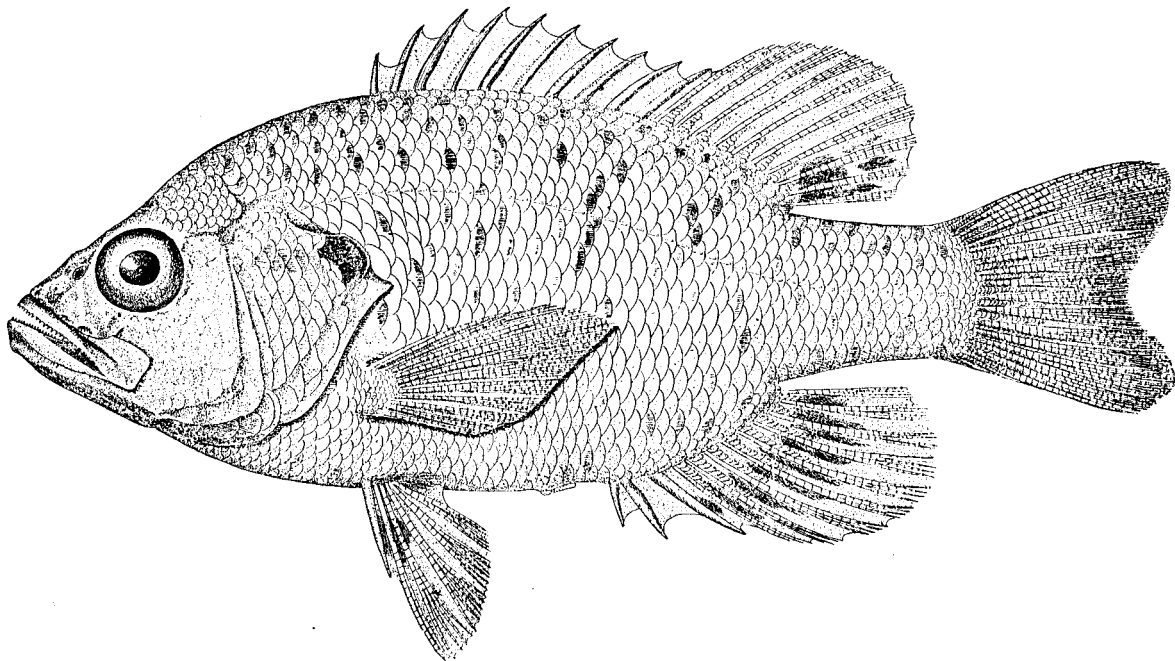


POMOXIS ANNULARIS Rafinesque. *Crappie; Sac-a-lait.* H. L. Todd del.

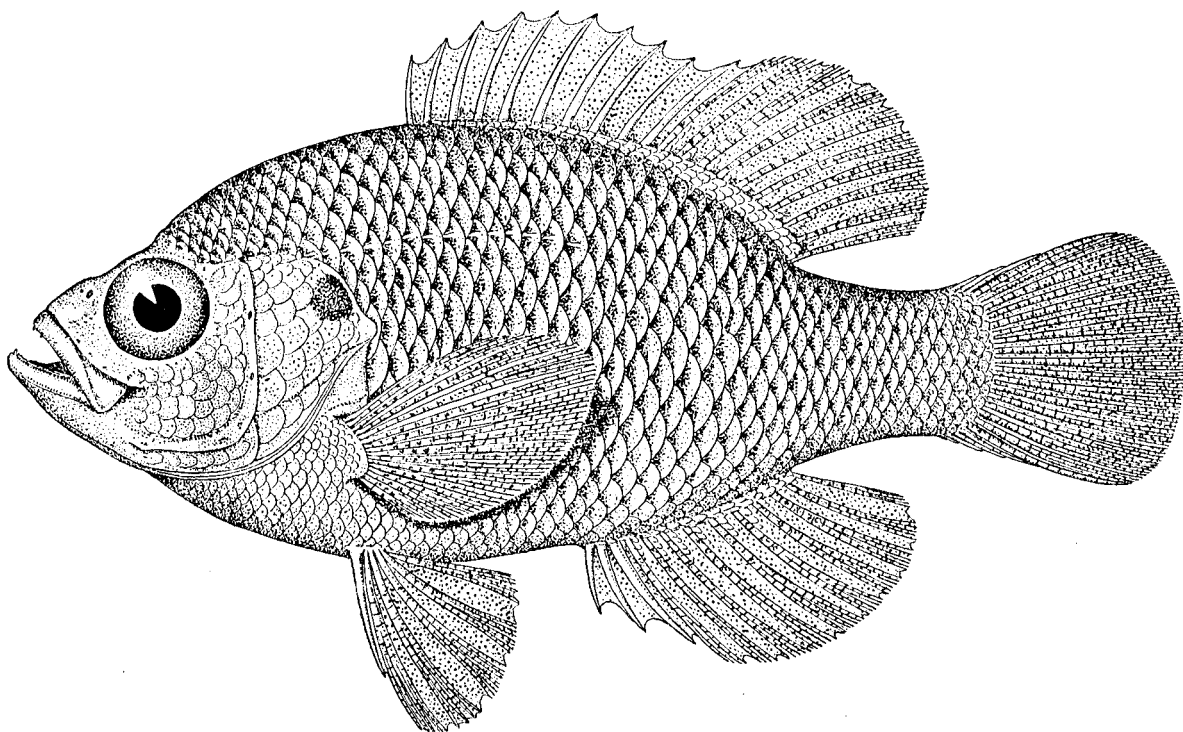


POMOXIS SPAROIDES (Lacépède). *Calico Bass; Sac-a-lait.* H. L. Todd del.

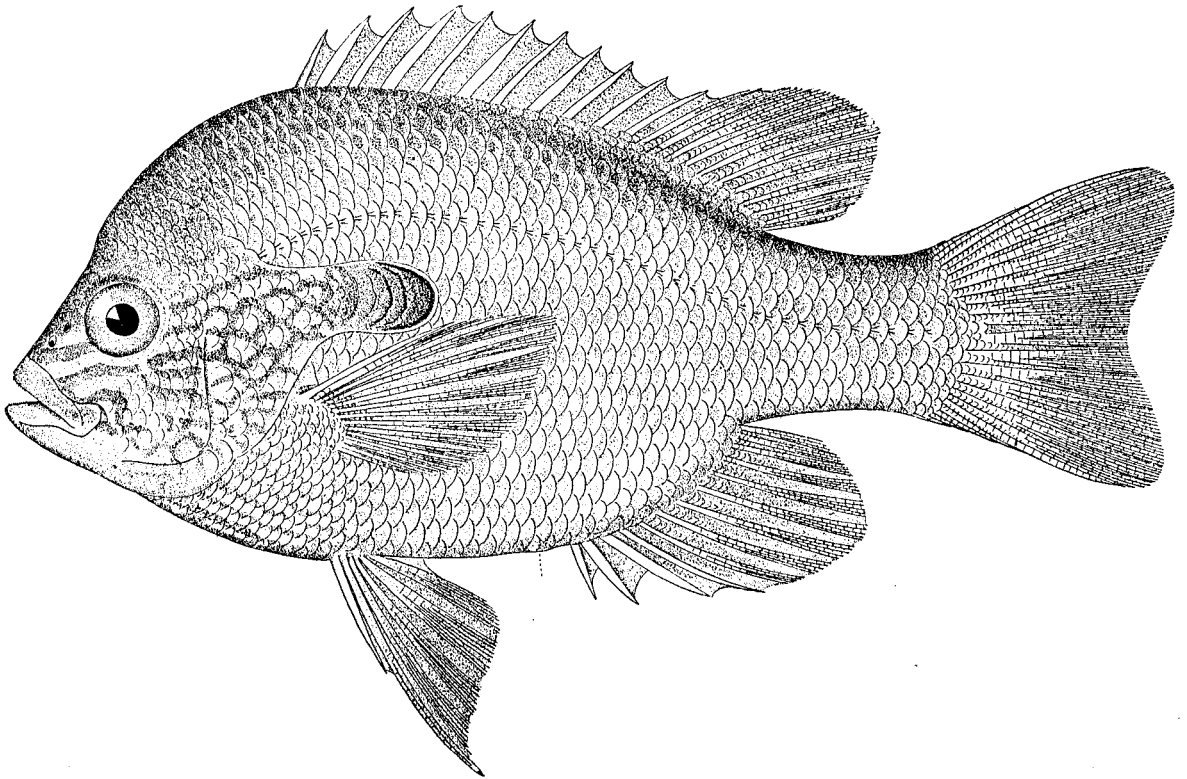




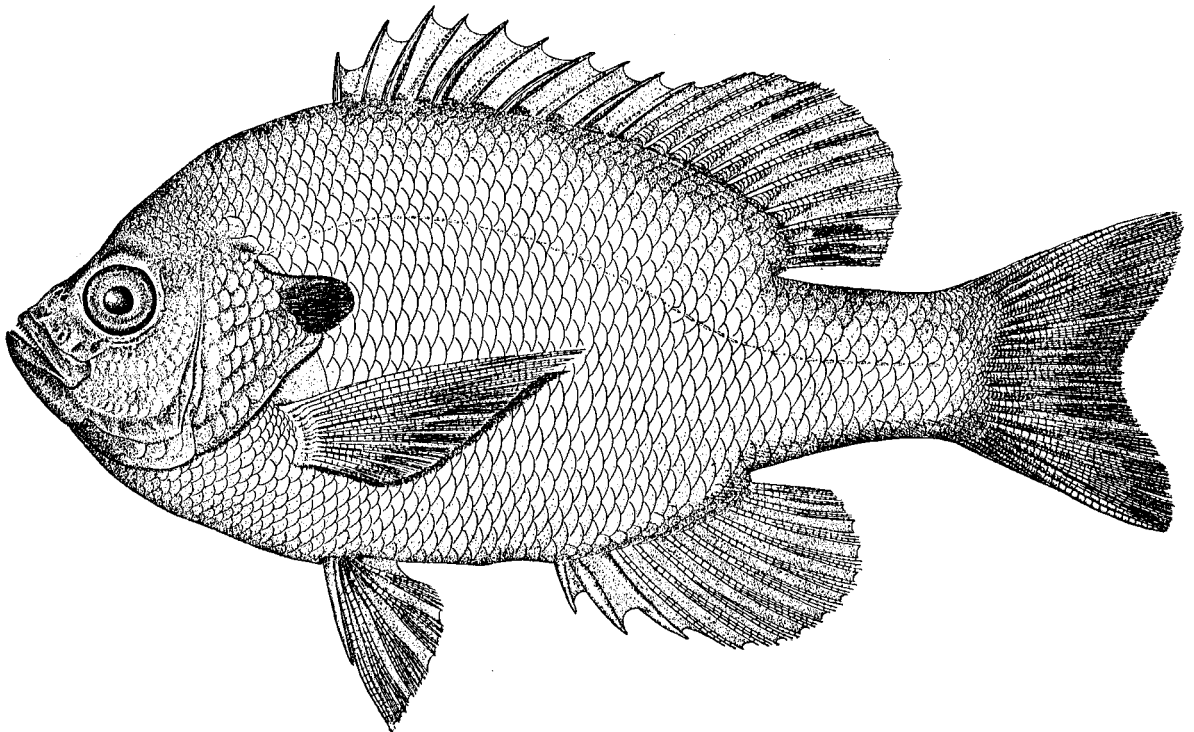
CHÆNOBRYTTUS GULOSUS (Cuvier & Valenciennes), Warmouth. H. L. Todd del.



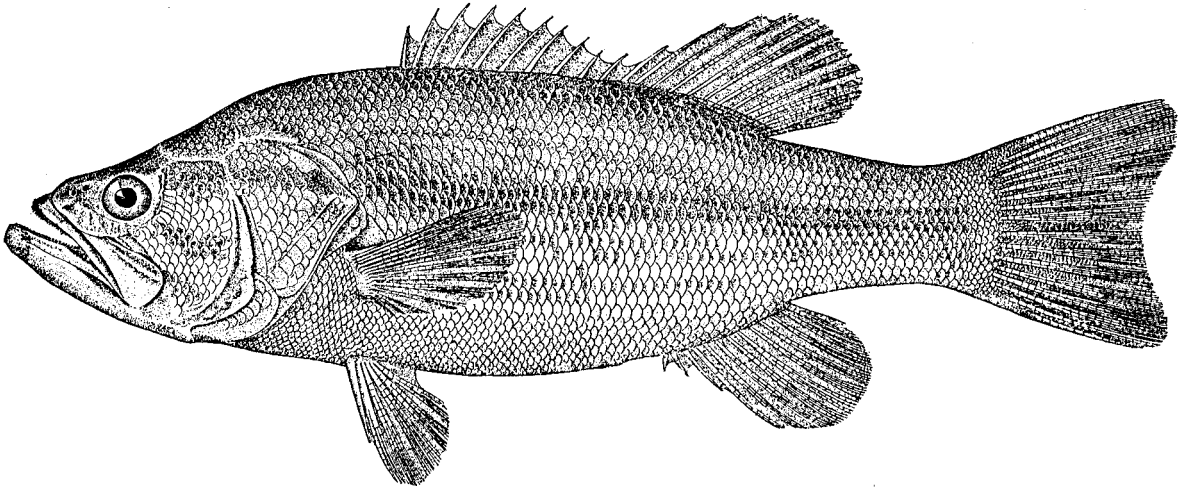
LEPOMIS SYMMETRICUS Forbes. Kilper's Pond, Houston, Texas. A. H. Baldwin del.



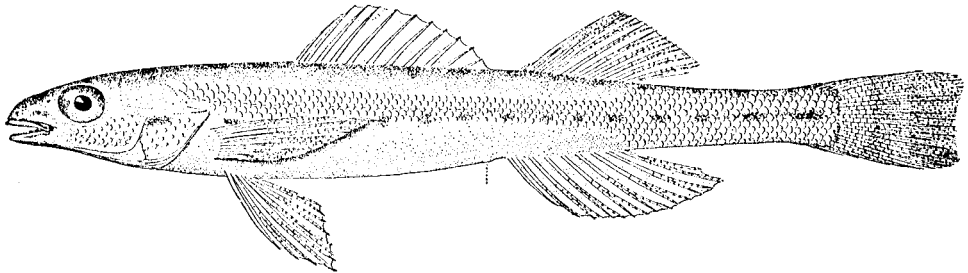
LEPOMIS MEGALOTIS (Rafinesque). *Large-eared Sunfish*. H. L. Todd del.



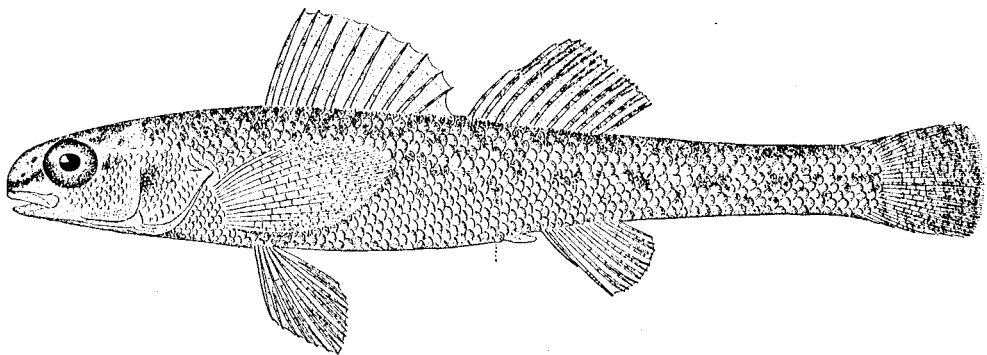
LEPOMIS PALLIDUS (Mitchill). *Blue Sunfish; Blue-gill*. H. L. Todd del.



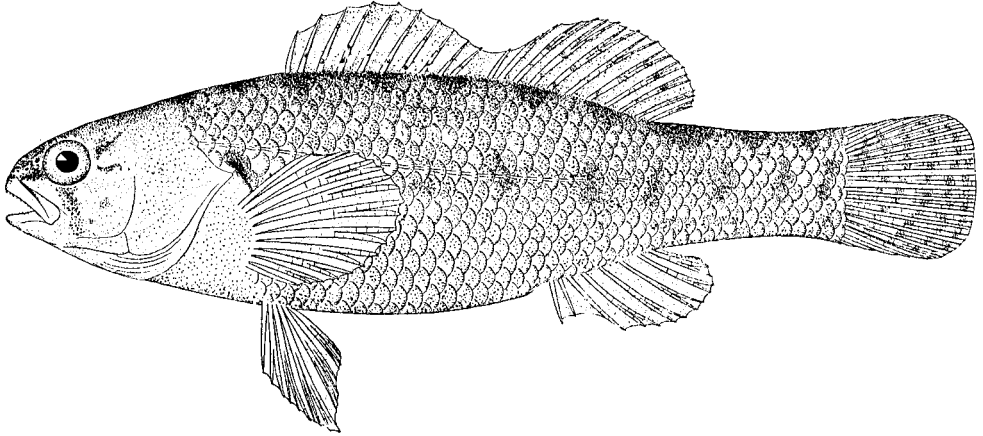
MICROPTERUS SALMOIDES (Lacépède). *Large-mouthed Black Bass*. Trout. H. L. Todd del.



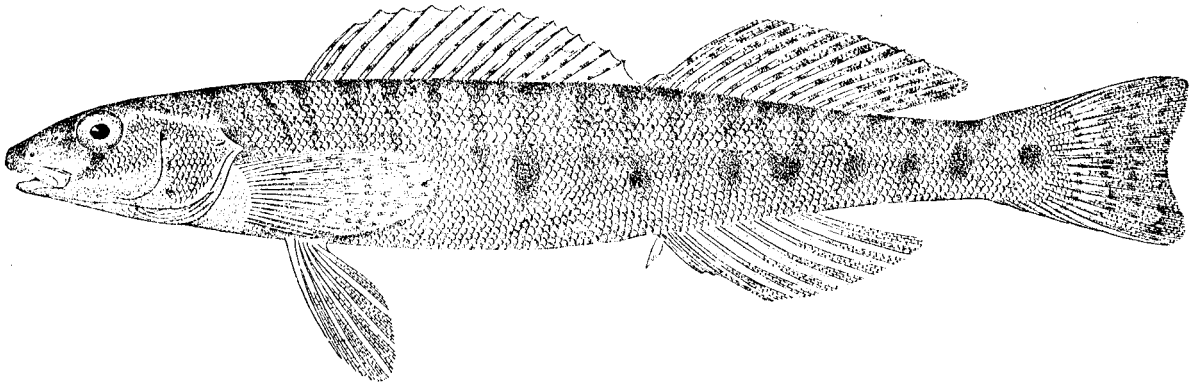
ETHEOSTOMA PELLUCIDUM CLARUM (Jordan & Meek). *Sand Darter*. Des Moines River, Ottumwa, Iowa. H. L. Todd del.



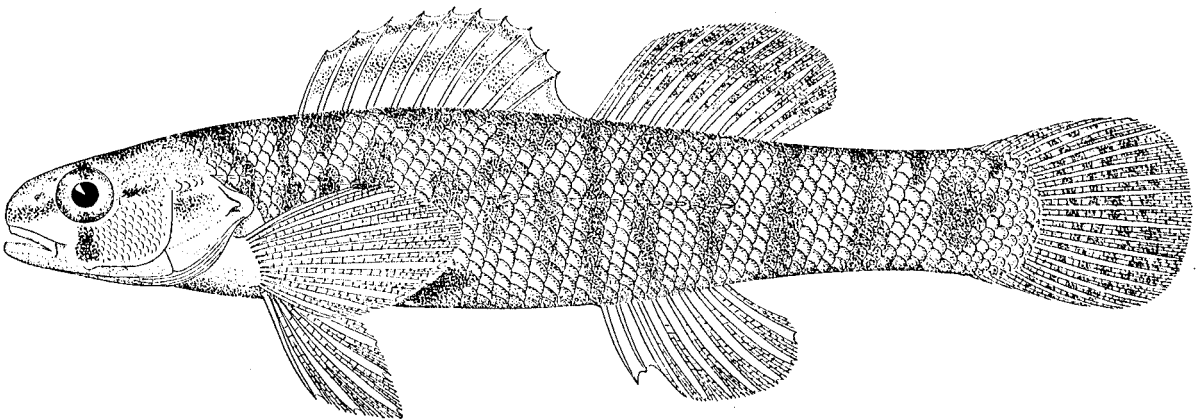
ETHEOSTOMA CHLOROSOMA Hay. Illinois River. H. L. Todd del.



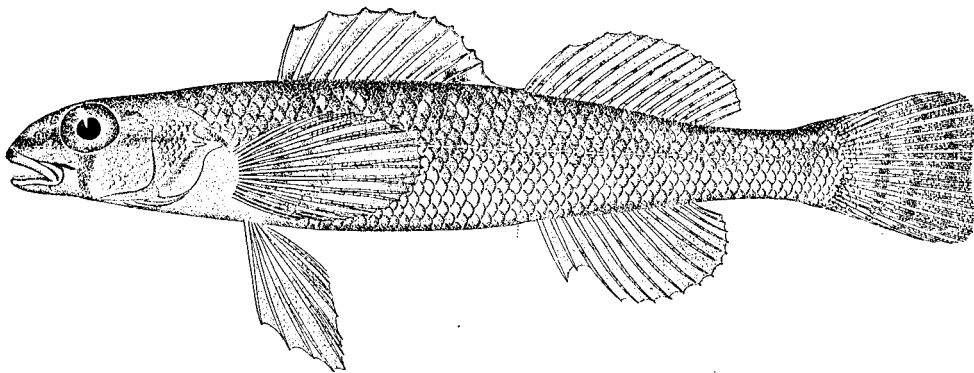
ETHEOSTOMA MICROPTERUS Gilbert. Chihuahua, Mexico. H. L. Todd del.



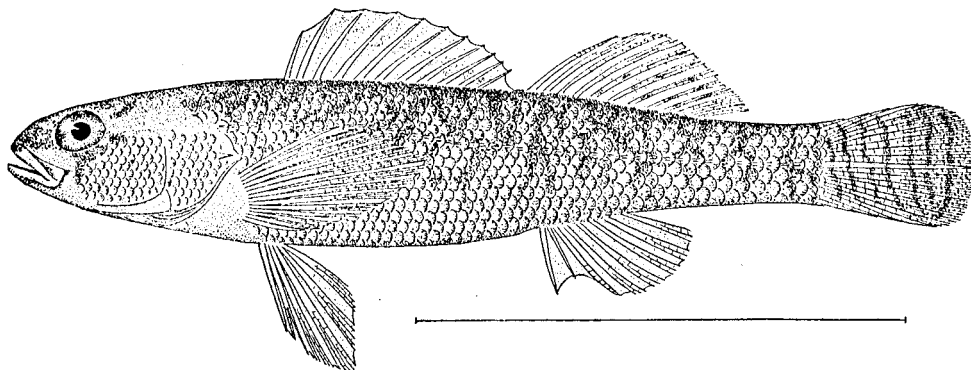
ETHEOSTOMA CAPRODES (Rafinesque). Log Perch. Licking River Reservoir, Ohio. H. L. Todd del.



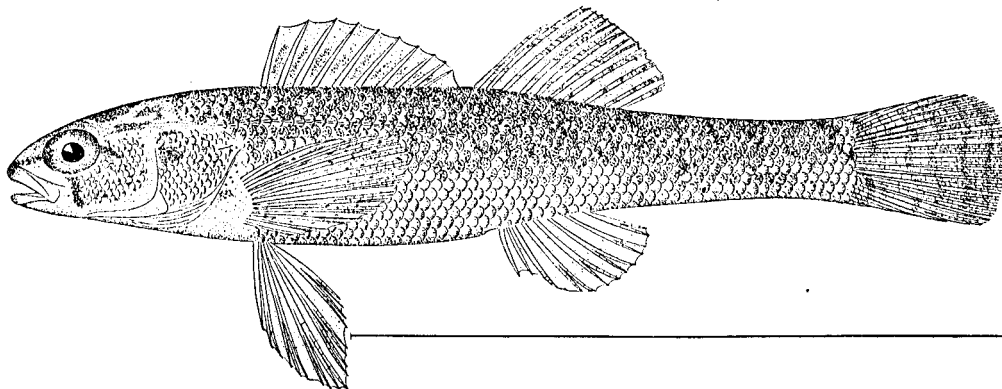
ETHEOSTOMA LEPIDOGENYS sp. nov. Type. Comal Spring, New Braunfels, Texas. A. H. Baldwin del.



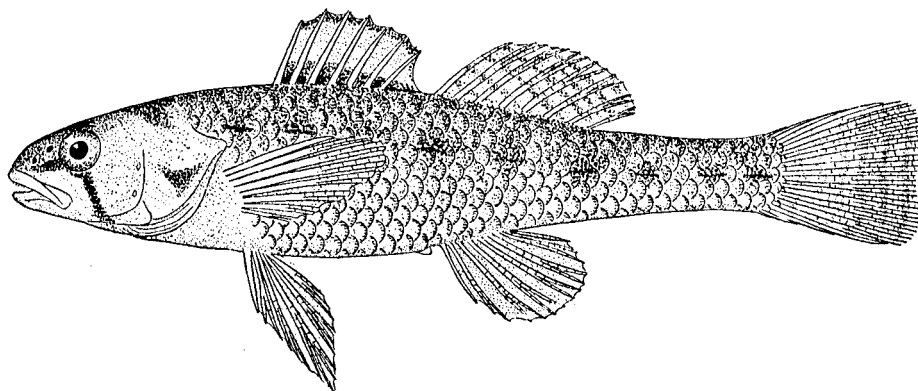
ETHEOSTOMA SHUMARDI (Girard). Wabash River. H. L. Todd del.



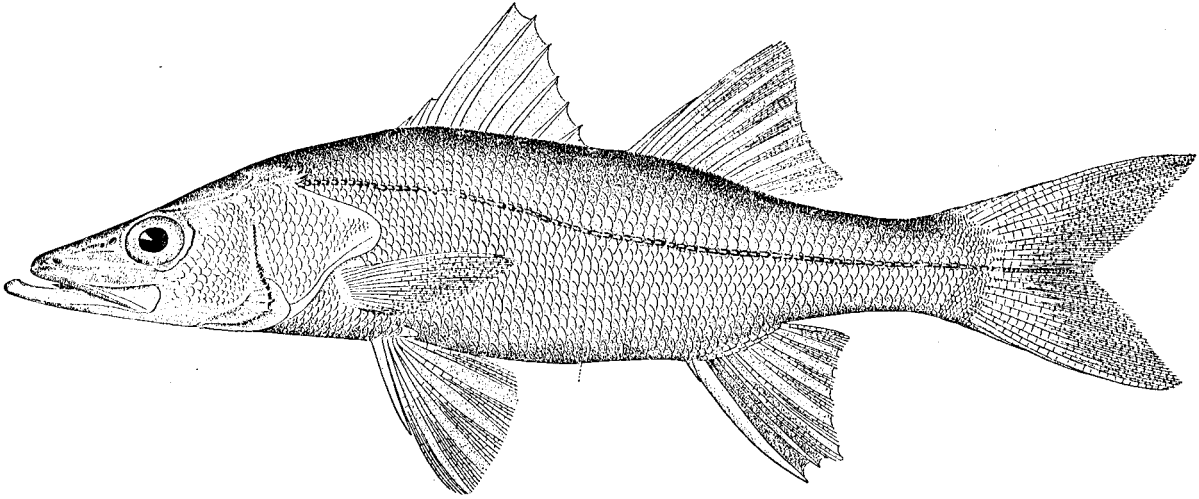
ETHEOSTOMA JESSIÆ Jordan & Brayton. Lake Peoria, Illinois. H. L. Todd del.



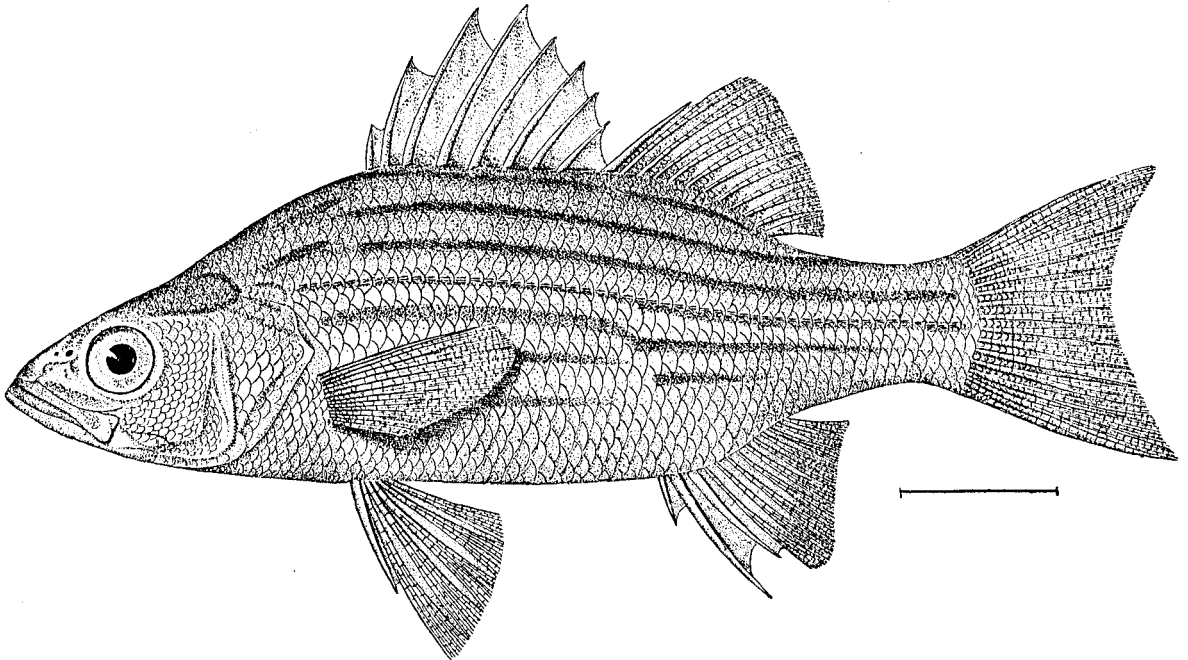
ETHEOSTOMA FUSIFORME (Girard). Washita River, Arkadelphia, Arkansas. H. L. Todd del.



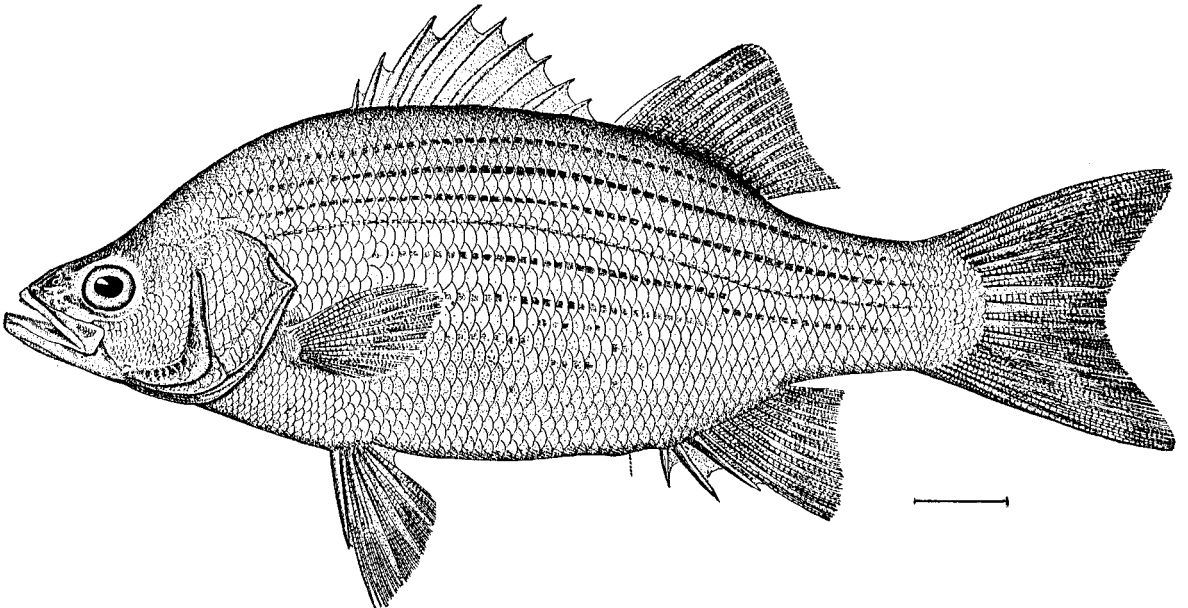
ETHEOSTOMA FONTICOLA Jordan & Gilbert. San Marcos Spring, San Marcos, Texas. H. L. Todd del.



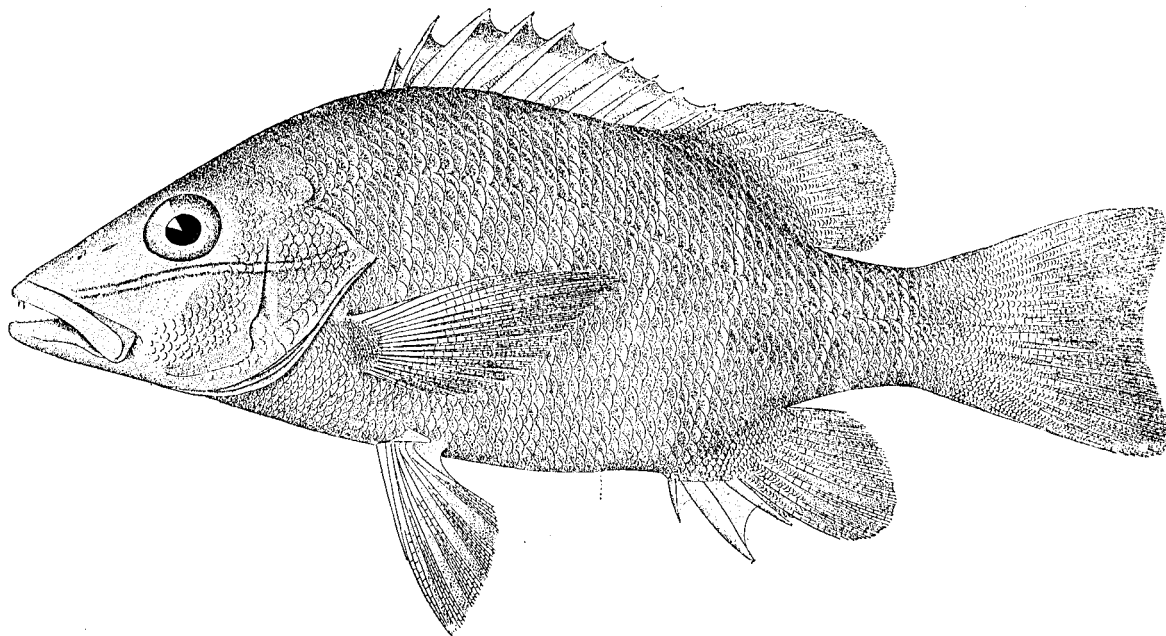
CENTROPOMUS UNDECIMALIS (Bloch). Robalo. H. L. Todd del.



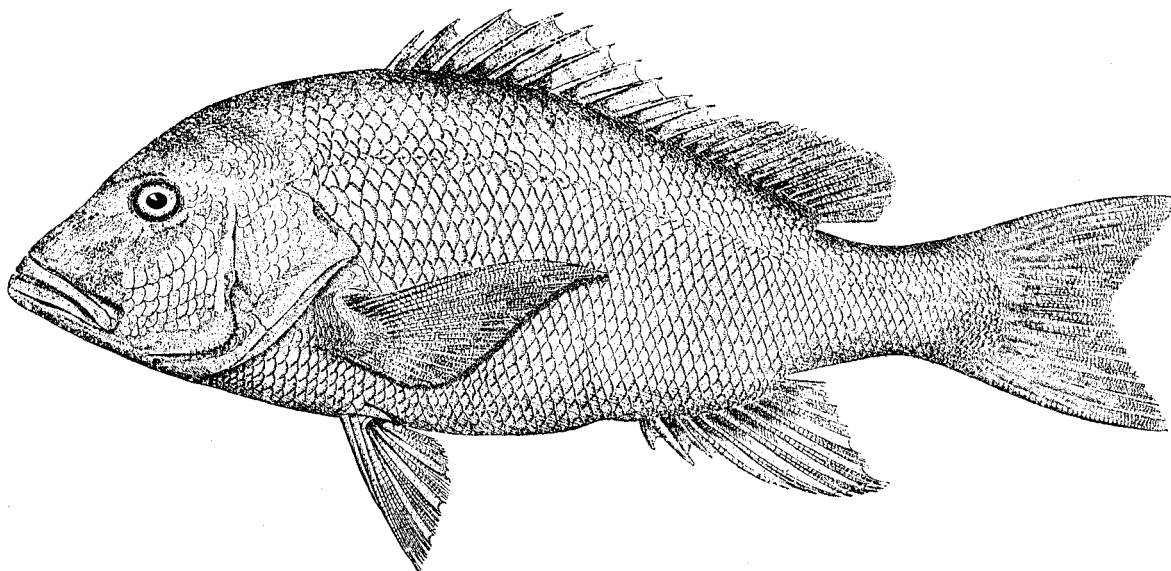
MORONE INTERRUPTA Gill. Yellow Bass. St. Louis, Missouri. H. L. Todd del.



ROCCUS CHRYSOPS (Rafinesque.) White Bass. H. L. Todd del.

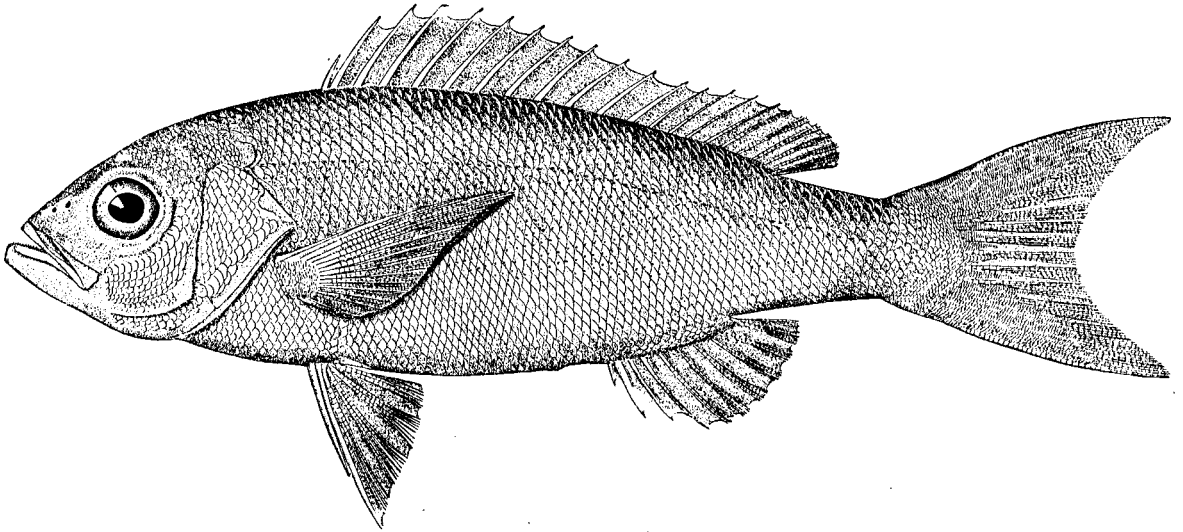


LUTJANUS CAXIS (Bloch & Schneider). *The Schoolmaster; Gray Snapper.* H. I. Todd del.

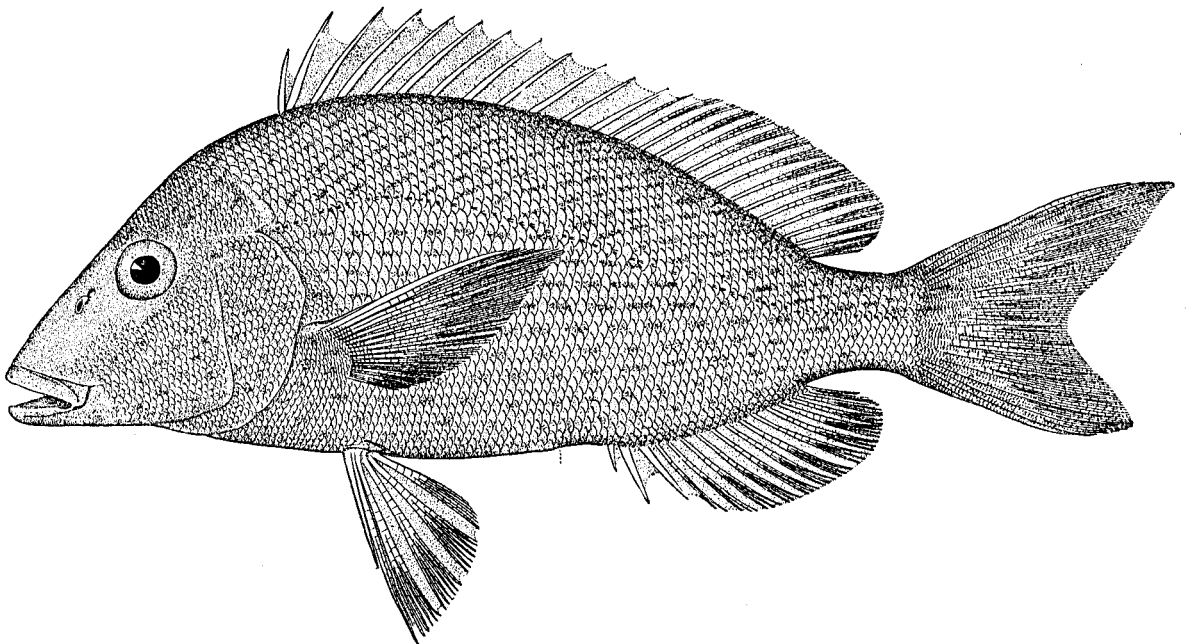


LUTJANUS AYA (Bloch). *Red Snapper.* H. I. Todd del.



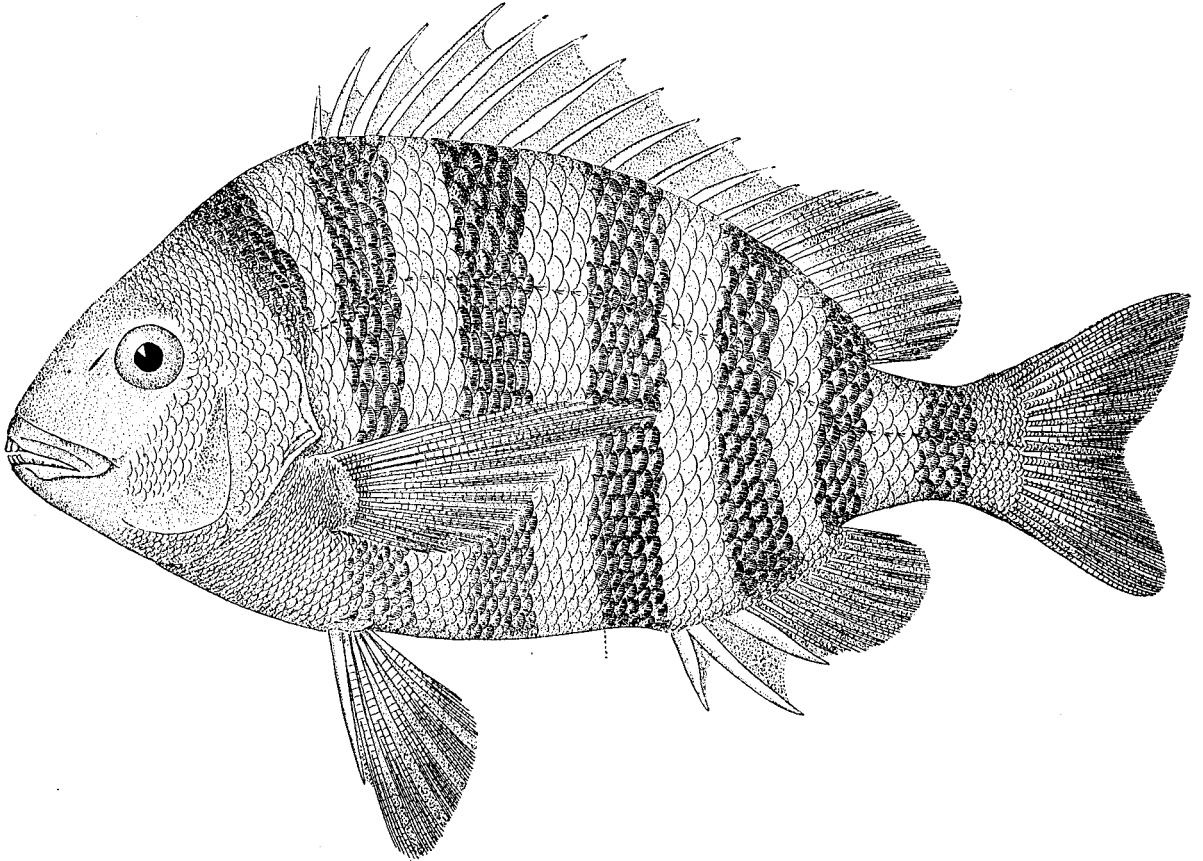


RHOMBOPLITES AURORUBENS Cuvier & Valenciennes. *Mangrove Snapper.* H. L. Todd del.

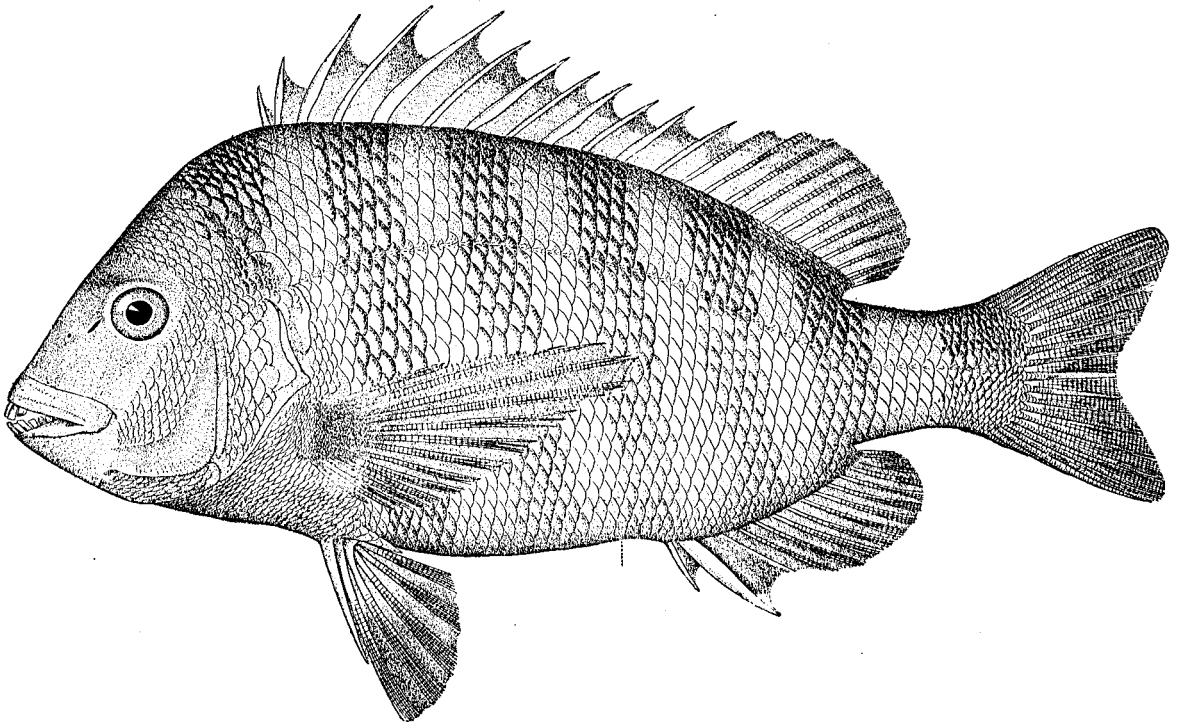


ORTHOPRISTIS CHRYSOPTERUS (Linnæus), *Hogfish; Grunt; Pigfish.* H. L. Todd del.

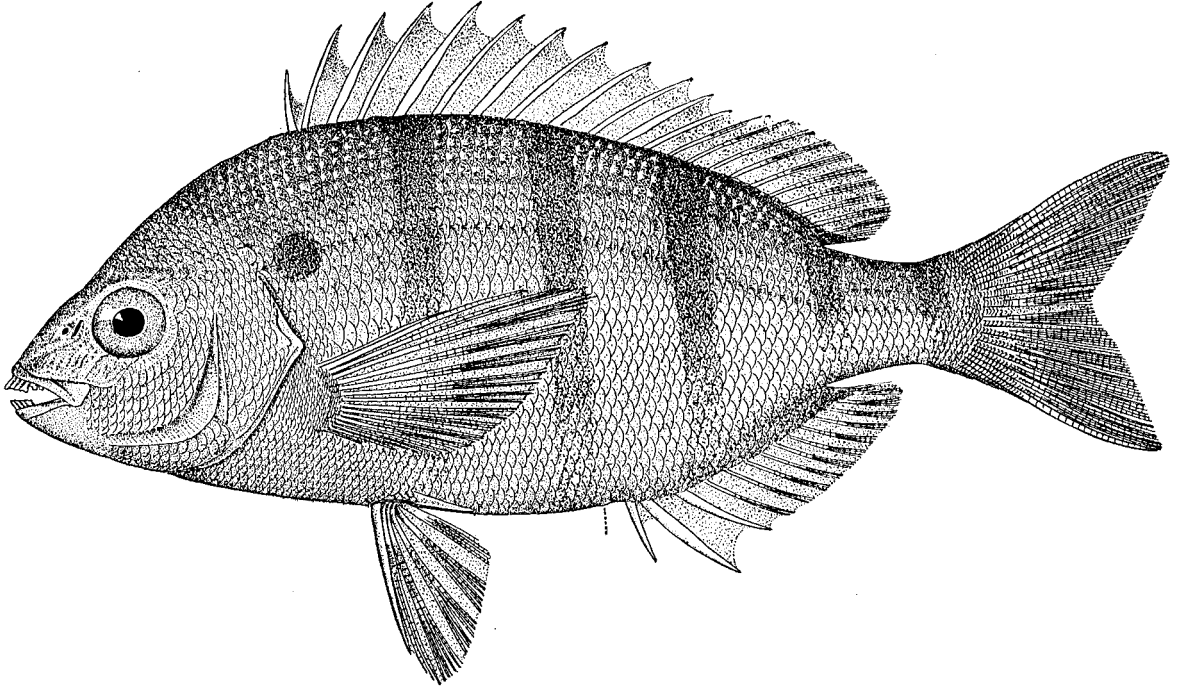




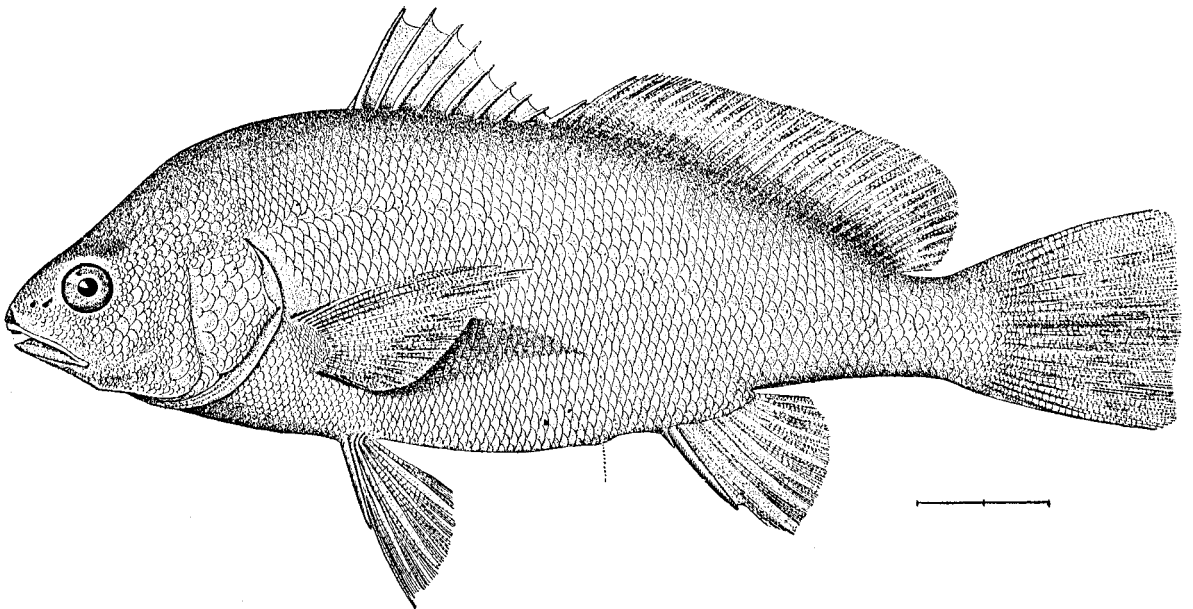
ARCHOSARGUS PROBATOCEPHALUS (Walbaum). *Sheepshead*. Young. H. L. Todd del.



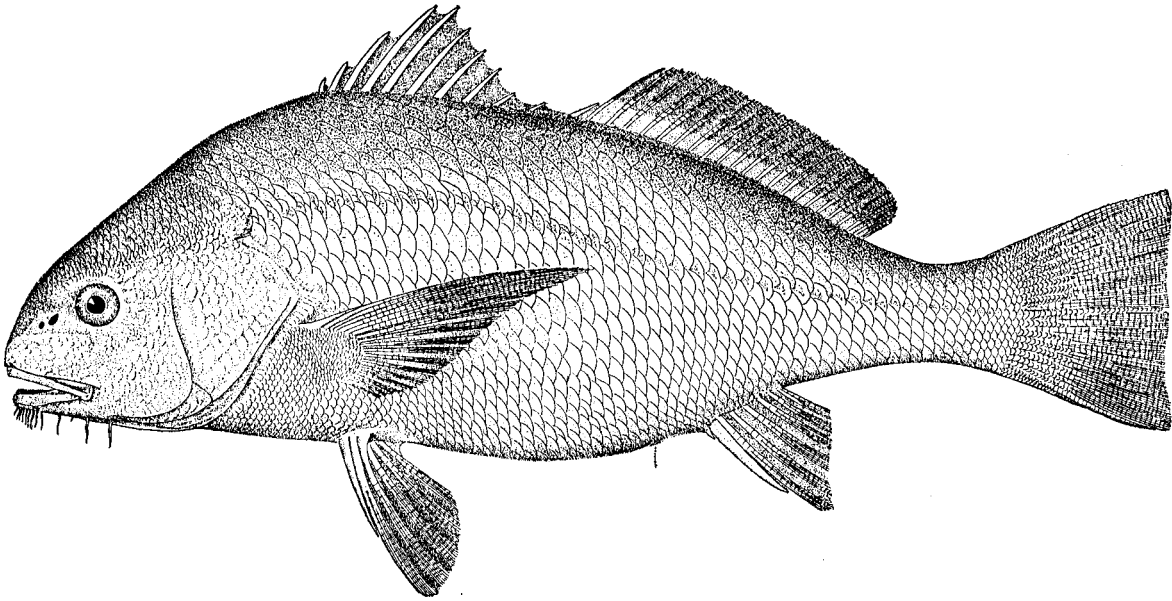
ARCHOSARGUS PROBATOCEPHALUS (Walbaum). *Sheepshead*. Adult. H. L. Todd del.



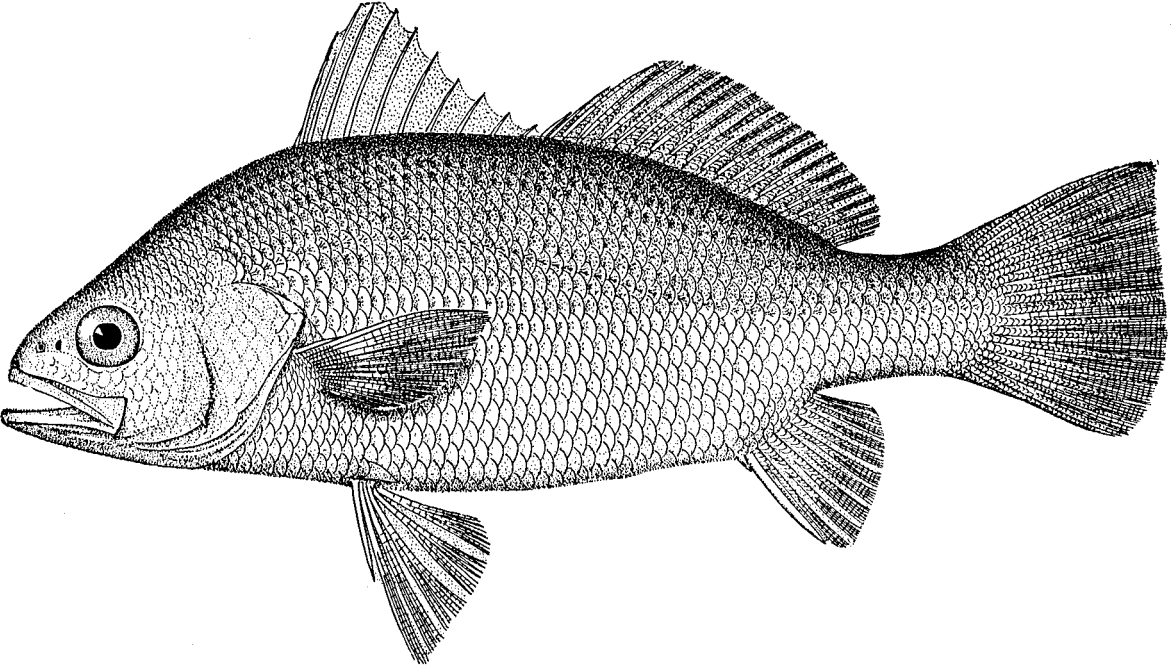
LAGODON RHOMBOIDES (Linnæus). *Sailor's Choice; Bream; Pinfish.* H. L. Todd del.



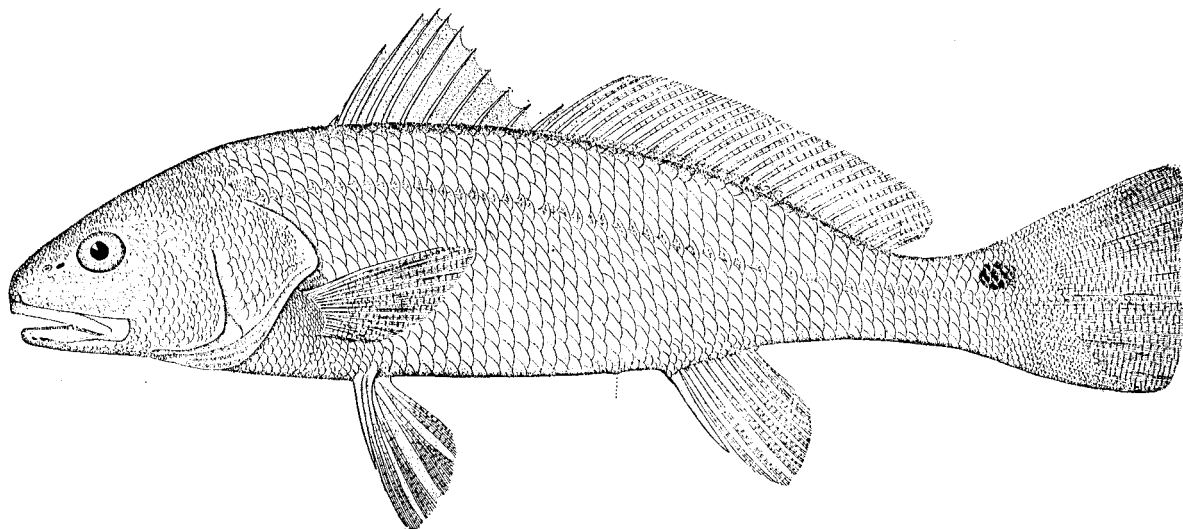
APLODINOTUS GRUNNIENS Rafinesque. *Fresh-water Drum.* H. L. Todd del.



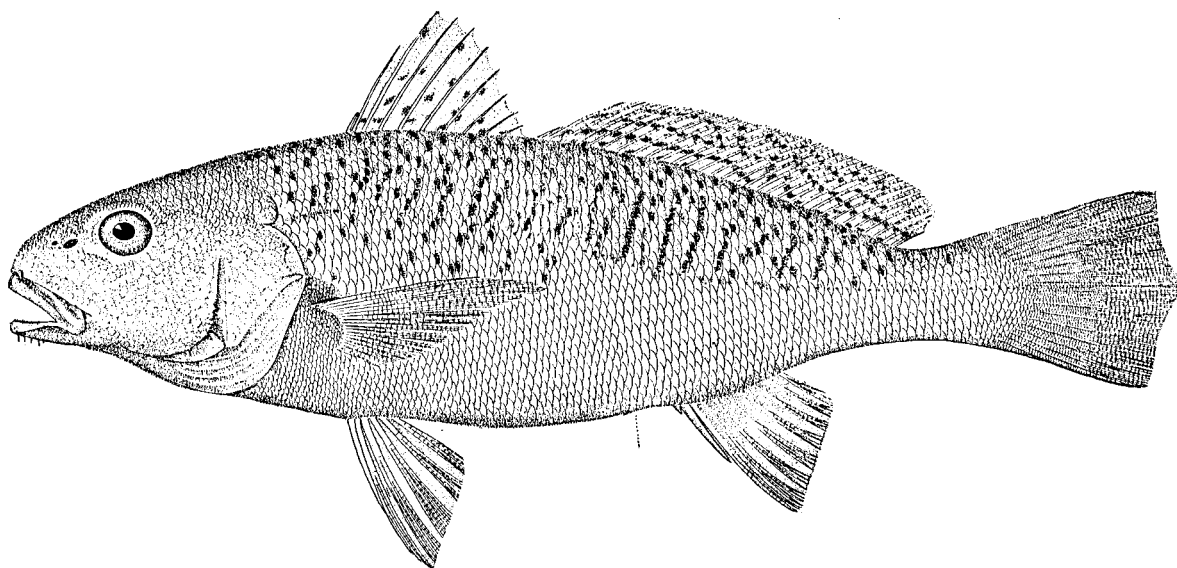
POGONIAS CROMIS (Linnæus). *Drum*. H. L. Todd del.



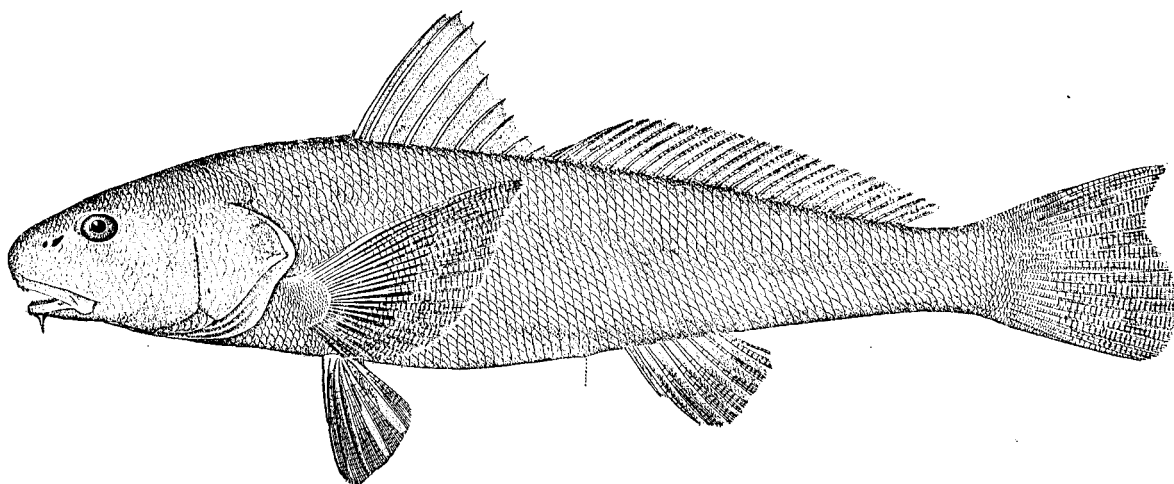
BAIRDIELLA CHRYSURA (Lacépède). *Yellow-tail*. H. L. Todd del.



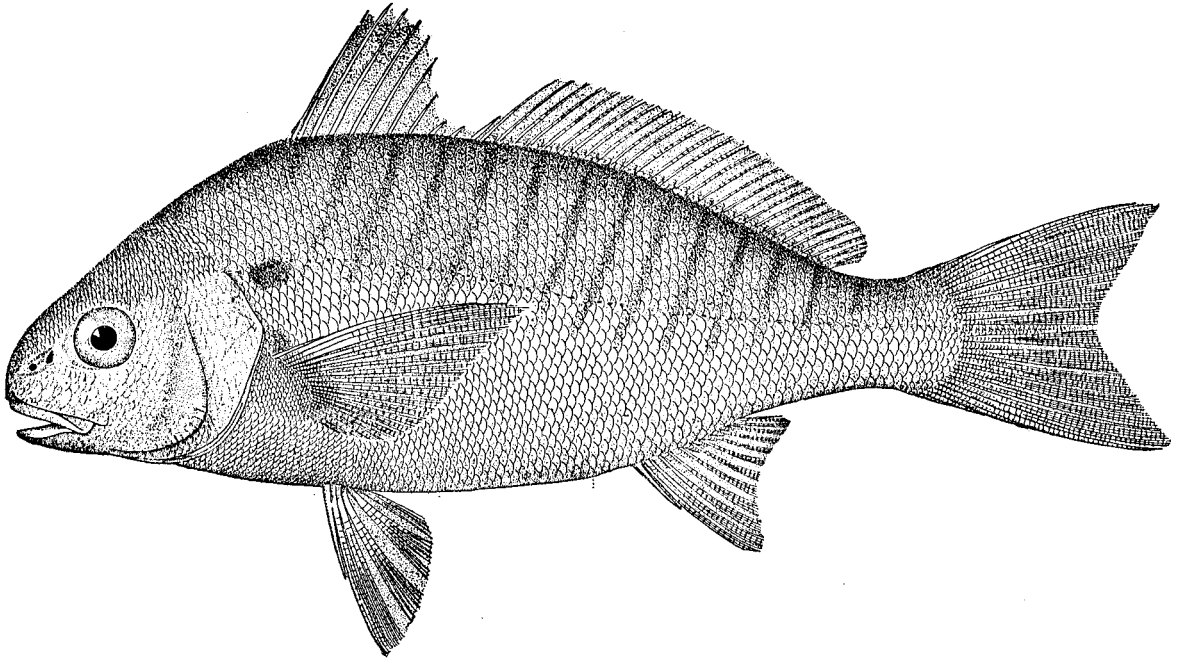
SCIÆNA OCELLATA (Linnæus). *Red Drum; Redfish.* H. L. Todd del.



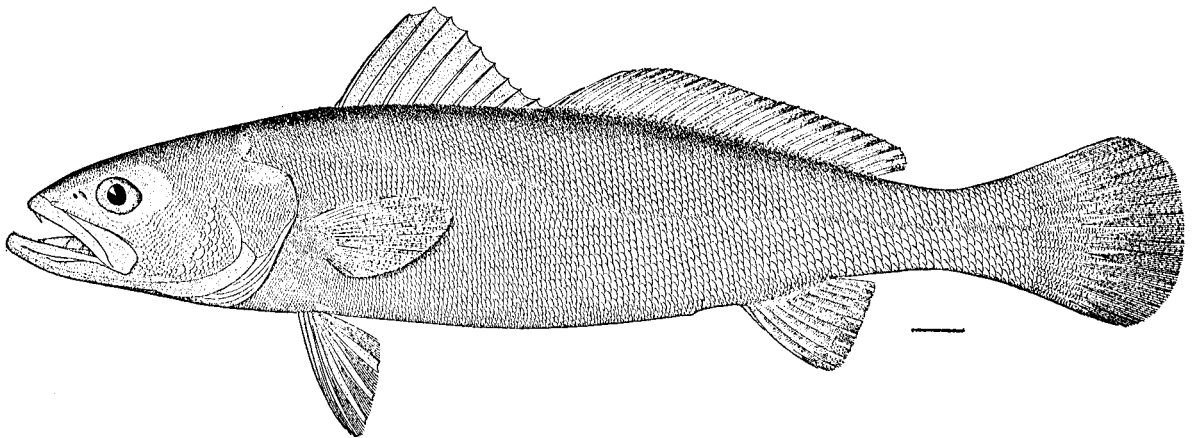
MICROPOGON UNDULATUS (Linnæus). *Croaker.* H. L. Todd del.



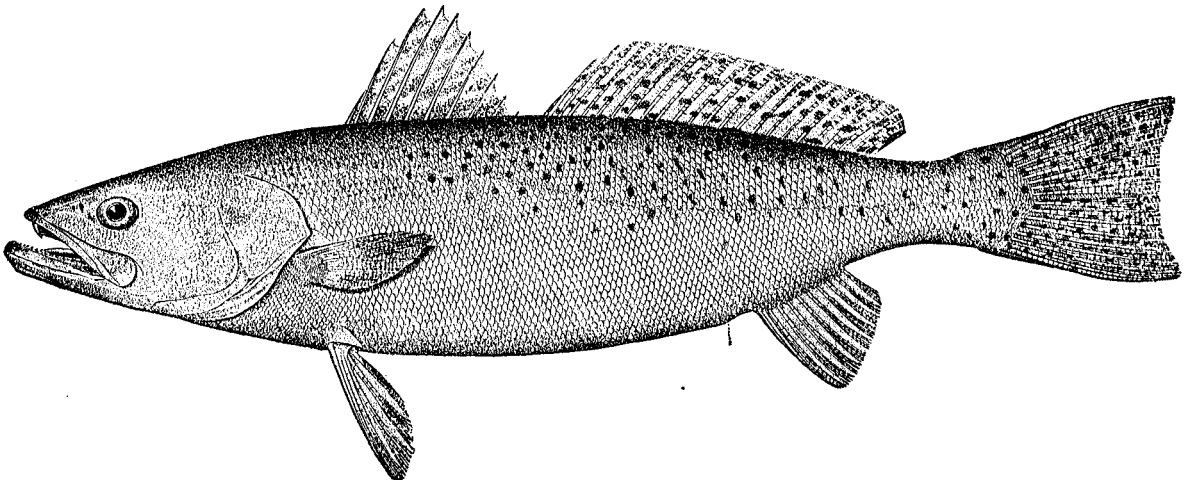
MENTICIRRHUS AMERICANUS (Linnæus). *Whiting.* H. L. Todd del.



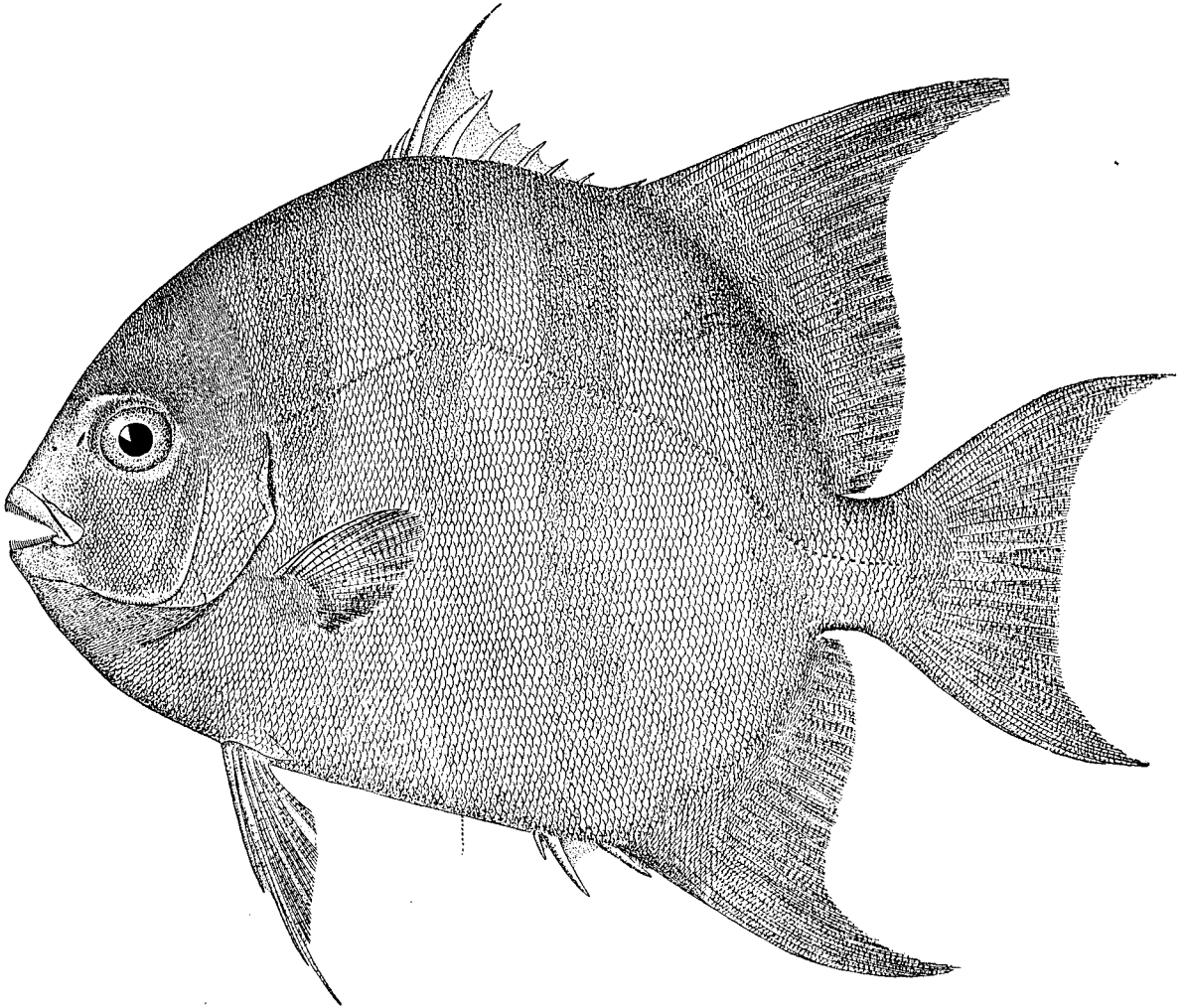
LEIOSTOMUS XANTHURUS Lacépède. *Spot*. H. L. Todd del.



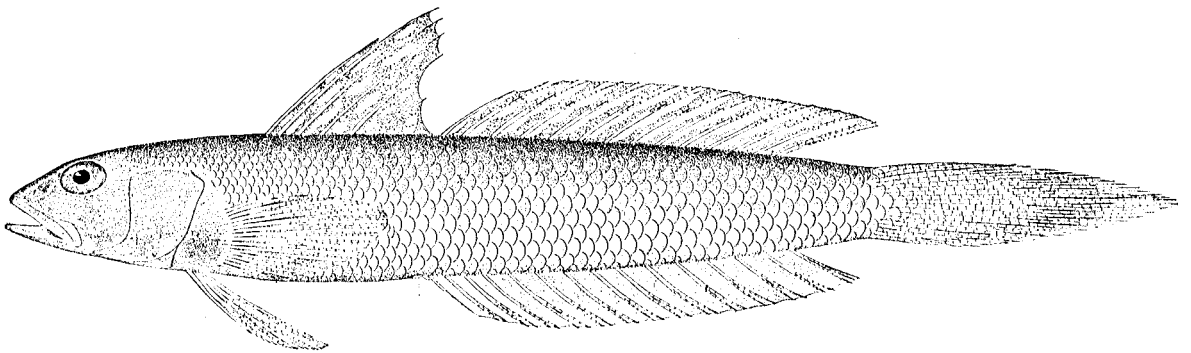
CYNOSCION NOTHUS (Holbrook). *Trinidad, West Indies*. H. L. Todd del.



CYNOSCION NEBULOSUS (Cuvier & Valenciennes). *Spotted Sea Trout*. H. L. Todd del.

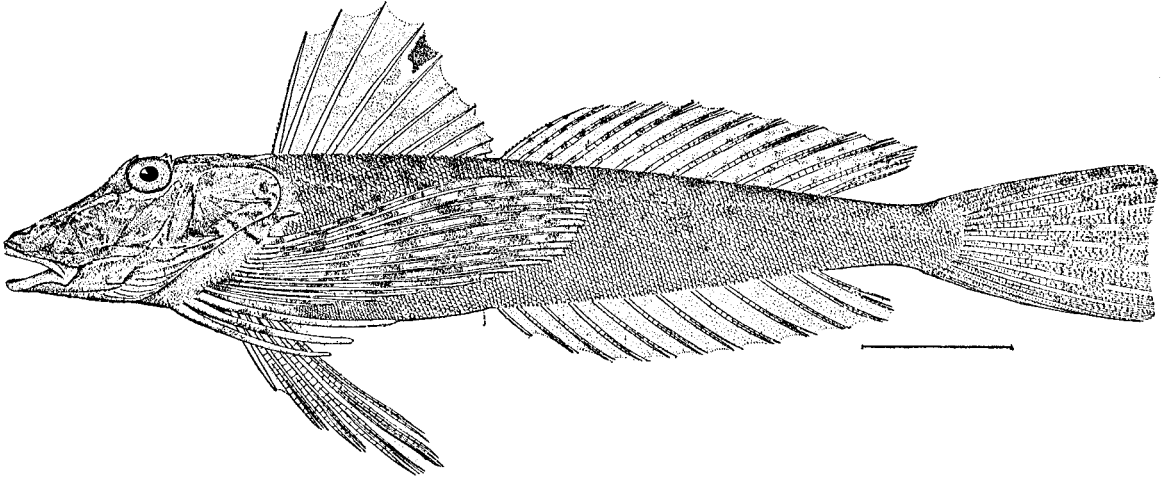


CHÆTODIPTERUS FABER (Broussonet). *Angel-fish; Moonfish.* H. L. Todd del.

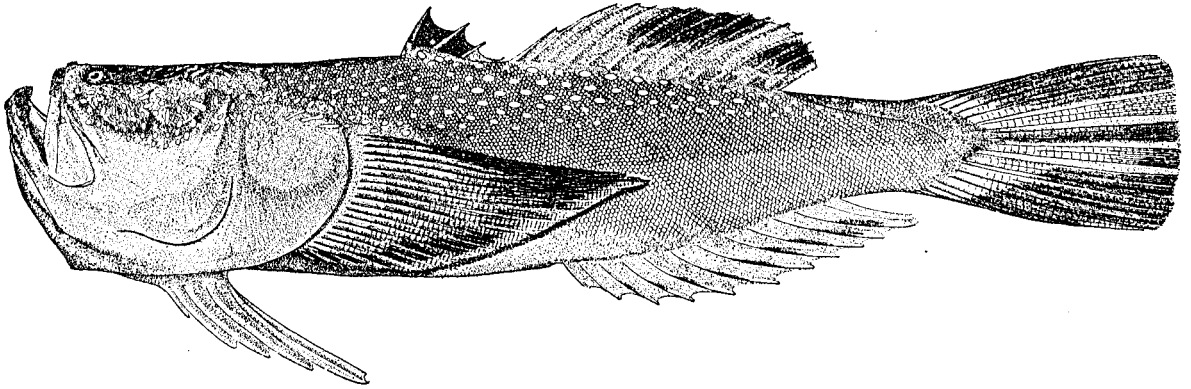


GOBIONELLUS OCEANICUS (Pallas). *Emerald Fish.* Key West, Florida. H. L. Todd del.

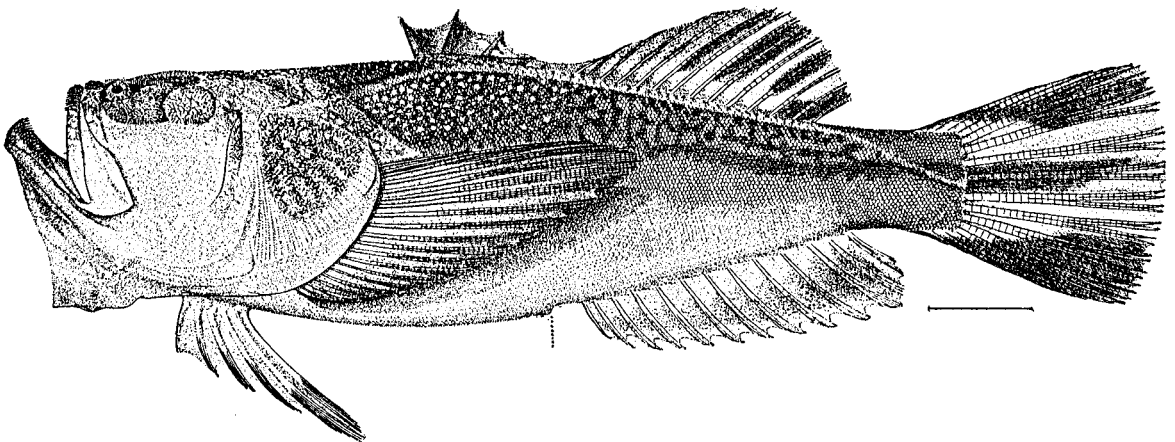




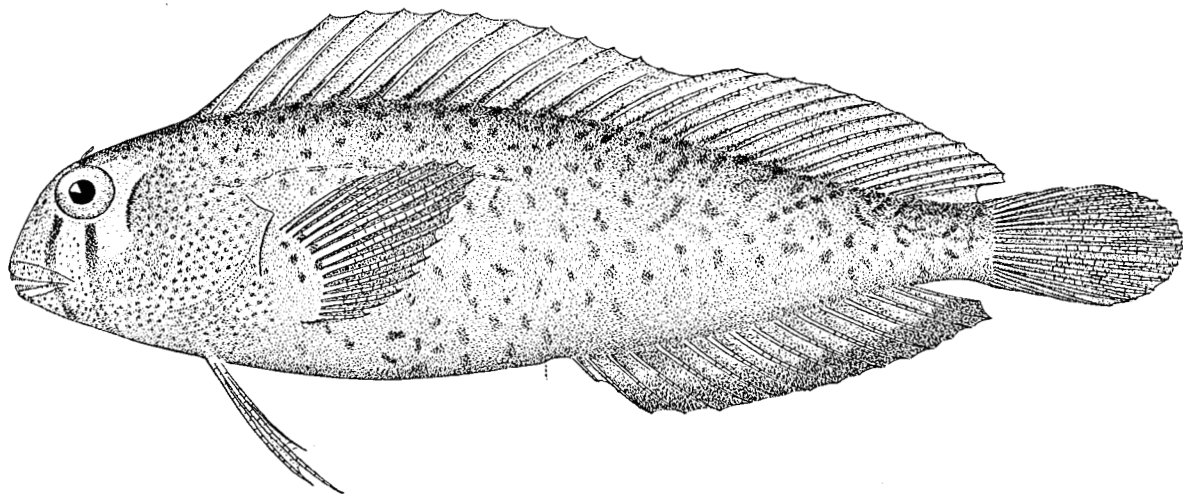
PRIONOTUS SCITULUS Jordan & Gilbert. *Sea Robin*. Florida. H. L. Todd del.



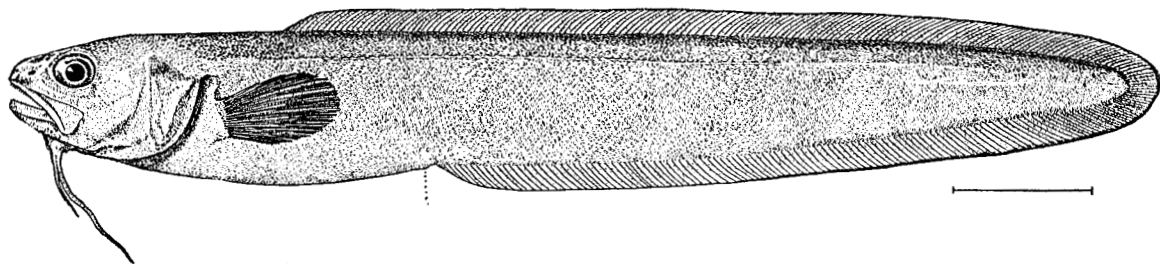
UPSILONPHORUS Y-GRÆCUM (Cuvier & Valenciennes). *Star-gazer*. Matanzas River Inlet, Florida. H. L. Todd del.



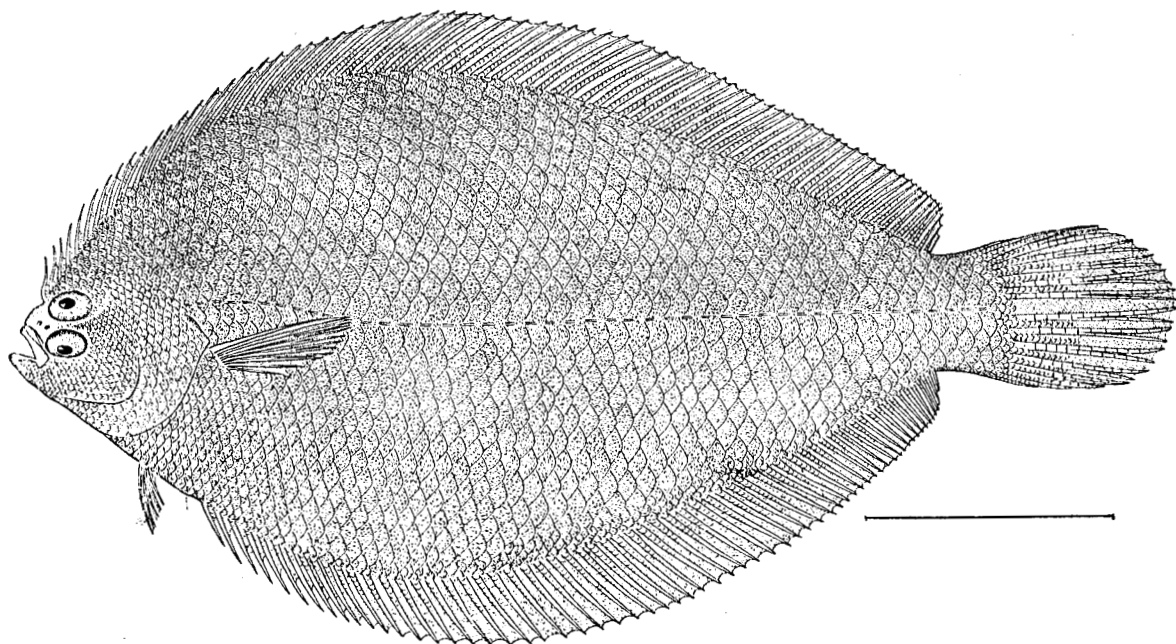
ASTROSCOPUS ANOPLUS (Cuvier & Valenciennes). *Electric Dog-fish*. Norfolk, Virginia. H. L. Todd del.



ISESTHES IONTHAS Jordan & Gilbert. *Blenny*. Pensacola, Florida. H. L. Todd del.

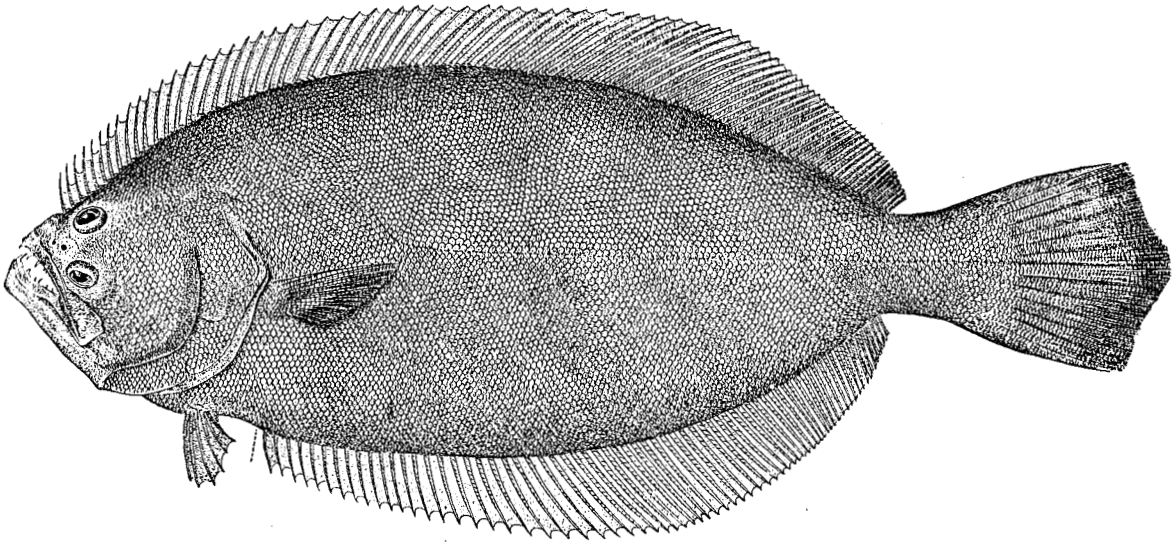


OPHIDION MARGINATUM De Kay. Tompkinsville, New York. H. L. Todd del.

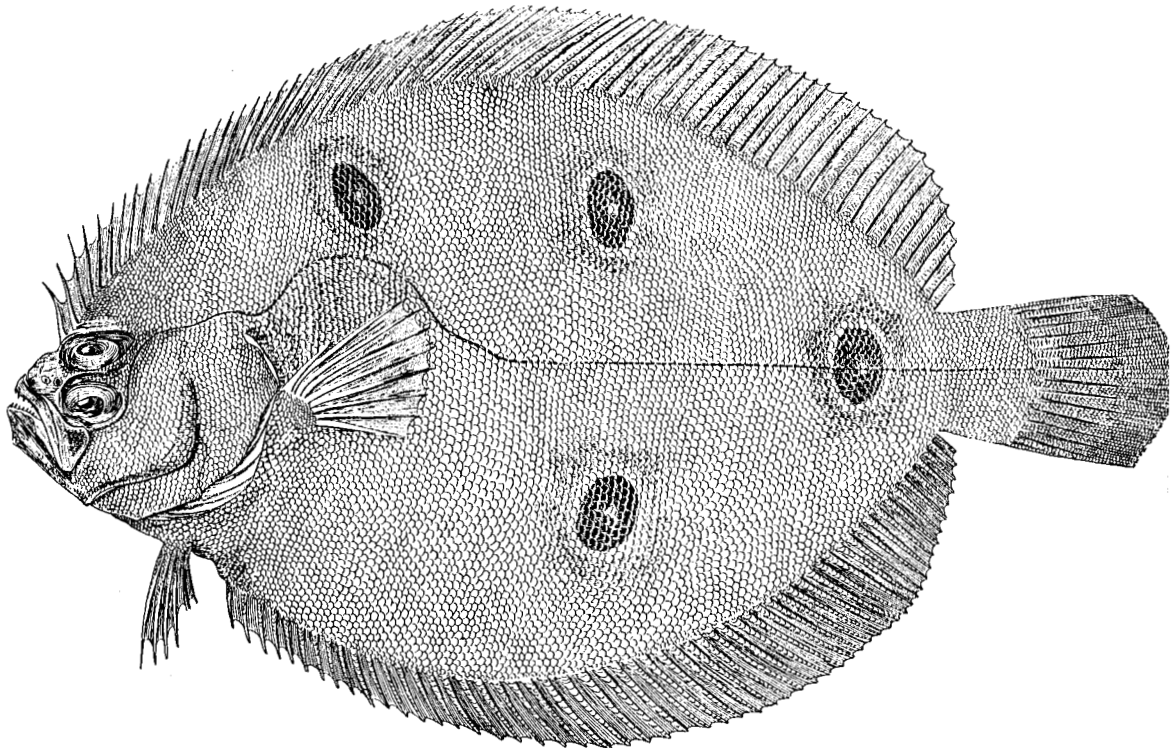


ETROPUS CROSSOTUS Jordan & Gilbert. Cedar Keys, Florida. H. L. Todd del.

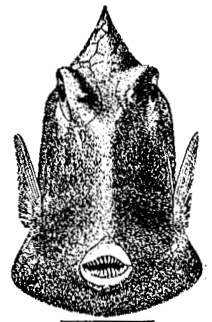
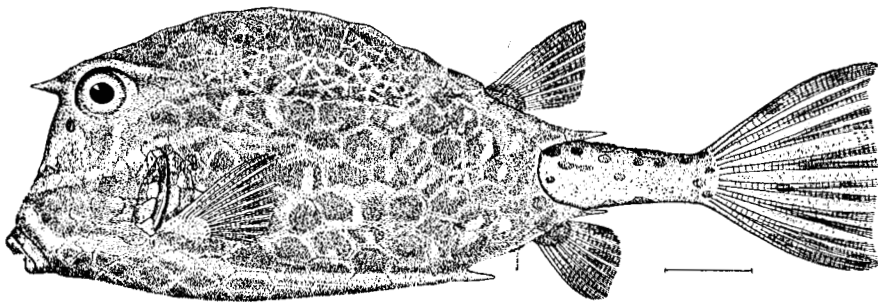




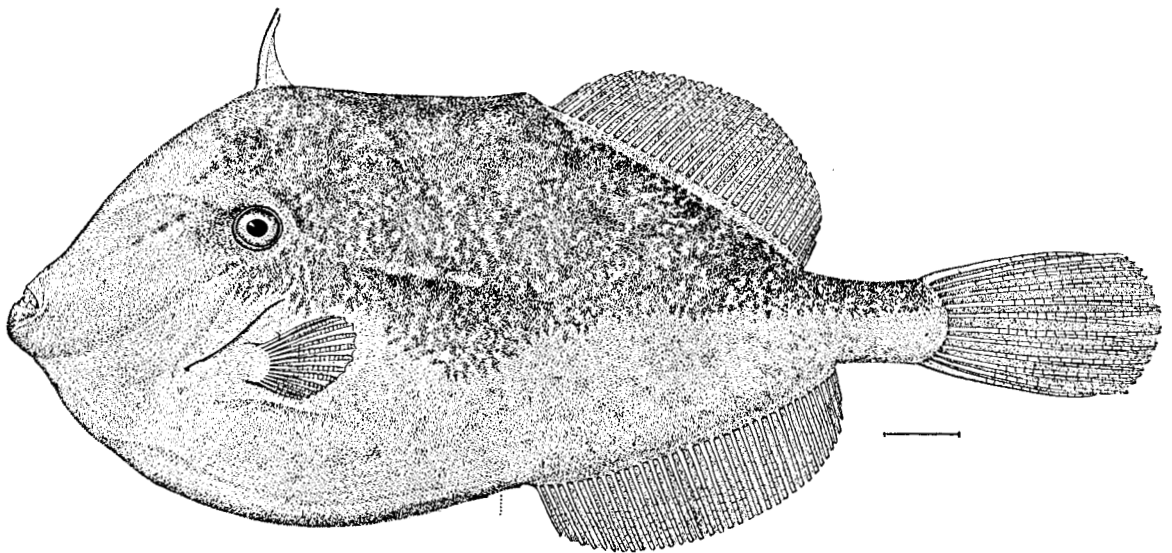
PARALICHTHYS LETHOSTIGMA Jordan & Gilbert, *Southern Flounder*. H. L. Todd del.



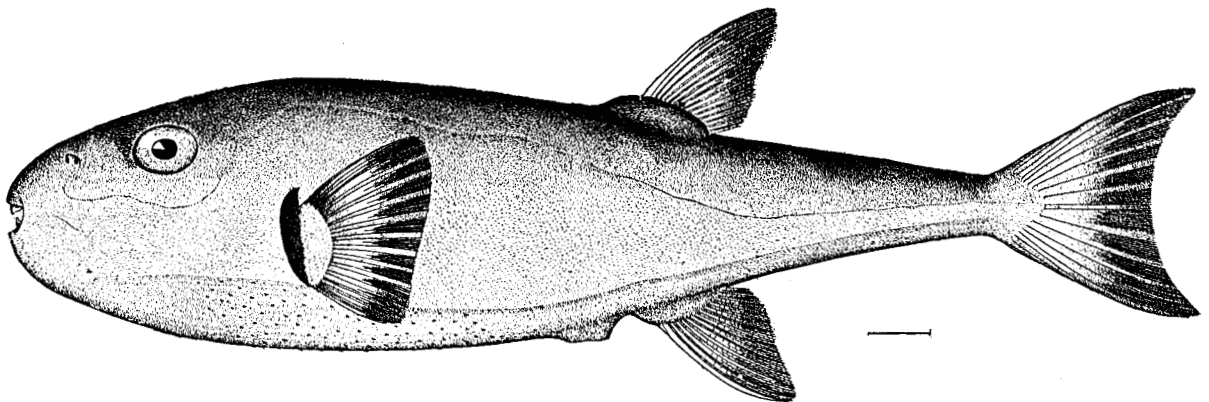
ANCYLOPSETTA QUADROCELLATA Gill. H. L. Todd del.



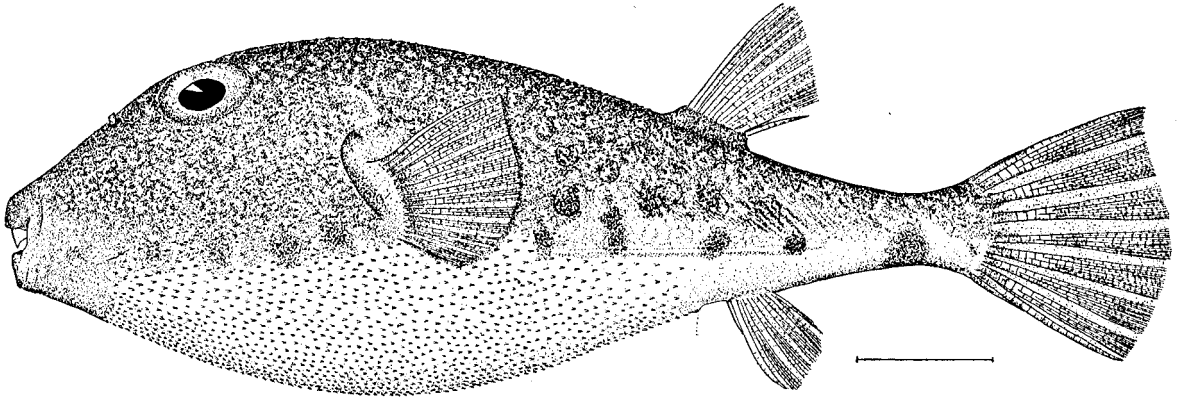
OSTRACION TRICORNE Linnæus. *Cowfish*. Charleston, South Carolina. H. L. Todd del.



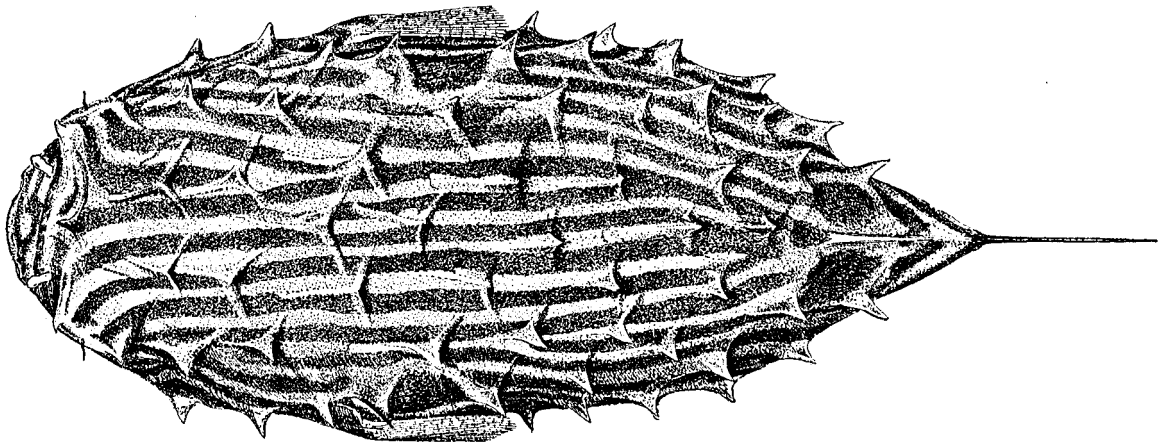
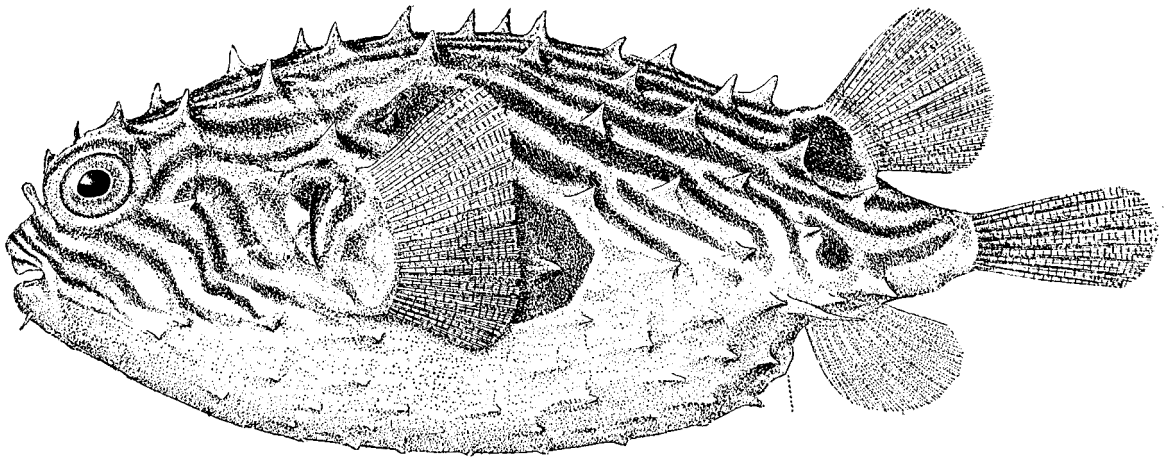
ALUTERA SCHŒPFFI (Walbaum). *Orange Filefish*. Cedar Keys, Florida. H. L. Todd del.



LAGOCEPHALUS LÆVIGATUS (Linnæus). *Smooth Puffer*. H. L. Todd del.



TETRODON NEPHELUS (Goode & Bean). *Swellfish; Puffer.* Indian River, Florida. H. L. Todd del.



CHILOMYCTERUS SCHœPFFI (Walbaum). *Swell-toad; Burrfish.* Side and dorsal views. Noank, Connecticut. H. L. Todd del.