REPORT

ON

INVESTIGATIONS BY THE UNITED STATES FISH COMMISSION IN MISSISSIPPI, LOUISIANA, AND TEXAS, IN 1897.

By Barton Warren Evermann, Ph. D.,
Ichthyologist of the United States Fish Commission.

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INTRODUCTION.

In the present paper are embodied reports upon three distinct investigations, viz:

1. An examination of the waters in southwestern Mississippi in the vicinity of the mouths of Pearl River, for the purpose of determining their general character, what fishes they already contain, and whether additional species may be advantageously introduced into them. This investigation was made at the instance of Hon. Robert C. Davey, Representative in Congress from the second district of Louisiana, Hon. A. Baldwin, of New Orleans, and other gentlemen of that city, who take an interest in keeping up the supply of game and food-fishes of that region.

2. An investigation of the catfish industry of the Atchafalaya River, Louisiana. Representations had been made to the Commission by the fishing firms of Morgan City, through Hon. Robert F. Broussard, Representative in Congress from the third district of Louisiana, that the catch of catfish had greatly decreased within the last few years. It was requested that an investigation be made as to the fact and cause of the decrease, and that recommendations be made as to the remedy.

3. Upon the recommendation of Hon. S. B. Cooper, Representative in Congress from the second district of Texas, an examination was made of the Sabine and Neches rivers with reference to their fitness for shad.

These various investigations were carried on under the immediate direction of Professor Evermann, who was assisted in the field work by Mr. Fred. M. Chamberlain and Mr. H. R. Center, both of the division of scientific inquiry of the U. S. Fish Commission. The party left Washington April 13, 1897, arriving at New Orleans the next day. On the 15th they went to Baldwin Lodge, Mississippi, at the mouth of Pearl River, where investigations were carried on by the entire party until April 18, and by Messrs. Chamberlain and Center for one day longer. On the 19th Professor Evermann went to Morgan City, and at once went on board the fishing tug *Shamrock* for a trip through those portions of the Atchafalaya River and its connecting lakes and bayous

in which catfish fishing is carried on, returning to Morgan City on the 21st, where he remained until the 24th. Messrs. Chamberlain and Center reached Morgan City on April 20, and the next four days were devoted to examining the fish which were being prepared for shipment in the three fish-houses of that place. Collections were also made in the waters about Morgan City.

On April 24 Professor Evermann went to New Iberia, at Mr. Broussard's request, to examine Lakes Tasse and Peigneur, in that vicinity. Mr. Chamberlain joined him on the evening of the 25th, when both proceeded to Beaumont, Tex., where they spent one day, and then proceeded to Lufkin, Tex. After spending one day at Lufkin, examining the Neches and Angelina rivers, they went to Logansport, where the Sabine River was examined April 29. From Logansport Mr. Chamberlain went to Melville, La., where he spent four days examining the catfish handled there, while Professor Evermann went to Athens, Ga., to examine a site for a proposed fish-hatchery at that place. Mr. Center remained at Morgan City compiling the statistics of the catfish fishery at that place until April 27, when he returned to Washington. Professor Evermann returned to Washington May 4. On May 7, Mr. Chamberlain completed his inquiries at Melville and the investigation was brought to a close.

During the conduct of these investigations we were the recipients of numerous courtesies from various gentlemen, who by their kindly and intelligent interest contributed in no small degree to the successful completion of the work. Thanks are especially due Hon. Robert F. Broussard, Hon. A. Baldwin, and Mr. Edward G. Schlieder, of New Orleans; Messrs. Edgar Bass, John Dalton, and Manuel Coguenhem, of Morgan City, and Mr. Charles Larson, of Bayou Chêne, La.

SOUTHWESTERN MISSISSIPPI.

The object of the investigations in this region was to determine the general character of the waters, the species of fishes inhabiting them, their abundance and habits, and the desirability of introducing other species of food or game fishes.

Baldwin Lodge, on the Louisville and Nashville Railroad, 39 miles northeast of New Orleans, was the center of our operations. This place is within a short distance of the mouth of the Pearl River, where it empties into Lake Borgne. The surrounding country is, in the main, low, level, and subject to overflow; much of it is tide marshes and bayous, narrow channels or creeks; ponds and lakes are numerous. Bayou Isle aux Pois (or Campbell Bayou) runs immediately in the rear of Baldwin Lodge, opening into Pearl River on the west and into Grand Plains Bayou at the other end. It is about 90 feet wide and 12 feet deep. Its shores, except at Baldwin Lodge, are low and marshy, and overgrown with marsh grass and a few bushes. Grand Plains Bayou connects with this bayou to the eastward and extends several miles to the north and east. It is of the same general character and of about

the same size. Several other bayous connect with it, one of them being known as Lagoon Bayou, which is the outlet of two small lagoons. Its shores and those of the upper portion of Grand Plains Bayou are higher and more liberally supplied with water willows and other woody vegetation. Near its mouth Pearl River divides into several branches, known as West Pearl River, Middle Pearl River, etc. Opening into West Pearl River is Black Bayou, which is much frequented by anglers. It is about 40 feet wide, 5 to 15 feet deep, and several miles long. Its shores are low and marshy and covered with a dense growth of marsh grass. In the water was a rank growth of water vegetation, consisting of *Ranunculus*, *Myriophyllum*, *Anacharis*, *Potamogeton*, *Nymphæa*, and *Nuphar*, both of the latter in bloom.

Another bayou opening into Pearl River is known as Mulatto Bayou, which flows through the Sea Glen plantation, several miles north of Baldwin Lodge. The land along the greater length of this bayou is considerably higher than along the other bayous mentioned. At Sea Glen the ground is 5 to 15 feet above the water, and is covered with groves of magnificent pecans and a few magnolias. Many of these trees are of immense size, and the oaks are rendered unusually beautiful by the great mats of *Polypodium* growing upon their trunks and larger branches; and the masses of *Tillandsia usneoides*, or long moss, hanging in long, graceful festoons, form a rich drapery to the branches.

Pearl River has several outlets or mouths, all opening finally into Lake Borgne. This lake is approximately 25 miles long by 10 to 12 miles wide, the greatest length extending in a northeast and southwest direction. It is a very shallow body of water, the average depth probably not exceeding 8 feet. South of Baldwin Lodge a depth of 18 to 20 feet is found, but it rarely exceeds 9 feet.

The country surrounding Lake Borgne consists almost entirely of low tide marshes, with rank growths of marsh vegetation, but scarcely any bushes or trees, and is intersected and cut up by numerous narrow channels or bayous. Our visit to this region was at the time of the great flood of the Lower Mississippi, and the basin of the Pearl River was also somewhat affected. The water in all the bayous visited was deeper than usual, owing to backwater from Pearl River. Southern winds continuing for several days frequently have the same effect.

At this time the water in all these bayous was practically fresh, and even Lake Borgne was not strongly brackish. In the late summer and fall, however, the water is much shallower. Ordinarily it begins to grow brackish late in April or May, and gradually increases until the fall rains set in, when it becomes gradually less brackish, and during a portion of the winter and early spring it is comparatively fresh. At this time various fresh-water species of fishes extend their range even down to Lake Borgne and its connecting bayous. Among them are large-mouthed black bass, catfish, warmouth or "goggle-eye" perch, gaspergou, buffalo, gar, and sunfish. During the drier season the opposite result is noticed. The fresh-water species are driven farther

toward the interior, while the lower portions of the bayous are invaded by many species of salt-water and brackish-water fishes, such as red drum, sheepshead, mullet, flounder, croaker, needlefish, black drum, speckled sea-trout, porpoise, dogfish, pipefish, and the like.

That portion of Mulatto Bayou lying above Sea Glen usually remains practically fresh throughout the year. A short distance above Sea Glen such fresh-water species as large-mouthed black bass, "goggle-eye," and crappie may be found at any time. At the time of our visit the fresh-water species mentioned above were found in all of the bayous named. The brackish-water species were not common anywhere, and were not found at all at any considerable distance from Lake Borgne. Even in that lake they were very rare. The water in all the bayous was dark in color on account of mud and other impurities brought down by Pearl River. The temperature of the water at the surface was usually a few degrees warmer than that of the air. In Bayou Isle aux Pois, when the air was 64° the surface of the water was 67° to 68°, and at the bottom (10 feet) it was 65°. The surface in Pearl River at 11 a. m. was 68°, that of Black Bayou was 70°. On April 17 the surface temperature of Lake Borgne was 69° when the air was 62.5°.

Considerable collecting was done in the several bayous and specimens of most of the fishes to be found there at that season were secured. These were, of course, principally fresh-water species. The anglers who resort to this region during the spring depend upon these fresh-water species, or else go farther out, where they can get sheepshead, red drum, and other salt-water species. During summer and fall only the salt-water species can be obtained, except in the upper portions of the bayous. Most of the fresh-water fishes seem to be quite abundant. The crappie (*Pomoxis annularis*), however, seems far scarcer than it should be under the favorable environment which obtains in the upper portion of Mulatto Bayou and neighboring bayous, and it is recommended that a large plant of that species be made in those waters.

ATCHAFALAYA RIVER, LOUISIANA.

The investigations on this river were for the purpose of determining the character and extent of the catfish fishery, the fact and cause or causes of the alleged decrease in the catch during the last three or four years, and to determine what remedial measures, if any, should be recommended.

As this business centers chiefly at Morgan City, most of our investigations were made at that point. We were able at this place to examine the fish brought in by the fishing-tugs and to obtain the statistics of the fishery. Mr. Chamberlain spent several days at Melville making similar inquiries. A three days' trip which Professor Evermann took on one of the tugboats, while on its regular trip collecting the catches of the individual fishermen, afforded an excellent opportunity to observe the method of the fishery. The Atchafalaya River

is, in some respects, a peculiar stream. It has its sources in Avoyelles and Pointe Coupee parishes, near where the Red River joins the Mississippi, and is at all seasons more or less connected with both of those rivers by a number of anastomosing channels and bayous. The Atchafalaya River is, in fact as well as historically, one of the mouths of the Mississippi River, and during the floods which come periodically to that region a vast amount of the surplus water of the Mississippi and Red rivers is carried to the Gulf by the Atchafalaya.

The distance from the sources of the Atchafalaya River in a straight line to its mouth (about 90 miles southwest of New Orleans) is about 125 miles. The river is, however, very sinuous in its course, and its actual length is therefore many miles greater. The general course is a few degrees east of south, and forms a narrow angle with that of the Mississippi. The country through which the river flows is very low and level, often lower than the river itself, and made up for the most part of cypress swamps. The highest land is in many places the immediate banks of the river. These swamps are reticulated and intersected by a very complex and intricate network of bayous and lakes, all comparatively shallow except during the time of floods, when they become passable for the pirogue of the fisherman and the swamper, and the tugboats of the fish companies at Morgan City and Melville. During excessive floods, such as that of April and May, 1897, practically the entire country north of Morgan City is inundated. To provide against such conditions many of the natives live in house-boats. All of the residences built upon the ground are two stories high, and the people hold themselves in readiness to vacate the ground floor and betake themselves and remove their household goods to the second story whenever the flood comes. Every family possesses one or more boats, which are an absolute essential in that country. Bee-culture is of some importance in this part of Louisiana, and it was noticed that the bee-hives in all the apiaries seen were placed upon scaffolding or posts which raised them several feet above the surface of the ground. Such live-stock as chickens, pigs, and goats are also protected from the flood by placing them upon similar platforms. Ducks and geese are the only possessions which do not cause some trouble or anxiety during the times of flood.

The majority of the people of this region are either swampers or fishermen, or both. The cutting of the cypress timber for commercial purposes and getting the logs out into the river, so that they may be gotten to the mills, is called "swamping," and those who engage in it are termed "swampers." The cypress trees are cut into logs, which are dragged over the ground or pulled through the water to the nearest float road, by means of which it is easy to float them to the river, in which they may be rafted or otherwise taken to the sawmills. A "float road" is made by cutting away all the trees and bushes in various places through the swamps where roads are desired, and when the flood comes these become open waterways, through which the

pirogue finds easy passage. These float roads also have an important relation to the fishing industry, as will appear later on in this report.

There are four species of commercial catfishes handled by the firms at Morgan City and Melville, viz: The blue cat or poisson bleu (*Ictalurus furcatus*), the yellow cat or goujon (*Leptops olivaris*), the eel cat (*Ictalurus anguilla*), and the spotted cat (*Ictalurus punctatus*). The blue cat and the goujon are by far the most important species, and probably constitute 98 per cent of the entire catch.

The methods employed in this industry are very interesting. Ordinarily the fishing season extends from September to May, little being done during the summer months. In some cases, however, the fishing has continued throughout the year. Practically all the fishing is done with "trot lines" and "brush lines," though a few catfish are sometimes taken in hoop nets, which are set primarily for buffalo. The standard length of a single trot line is 25 feet, which equals 1 bale of line, but a number of lines are always tied together. There is no definite length of the string, this depending upon the width and character of the body of water in which it is set. The length may vary from a few rods to over a mile. The longest line of which we heard was one 12 miles long, which has been used in Grand Lake. The twine used is usually what is known as Woodbury 96 or Banner Mills 96, which is somewhat smaller than an ordinary lead pencil. The snoods are usually 18 inches long, and they are placed 3 feet apart. The hooks are fastened on by a double staging and various sizes are used, such as Virginia, Limerick (Nos. 6, 7, 8, and 9 0), and Millwood (Nos. 5 and 6.)

All river fishing during the fall and winter is done on the bottom, while all lake fishing is at the surface. During the spring, when the country is flooded, the fish betake themselves to the woods, and the fishing is then carried on chiefly along the edges of the float roads. The old tackle, which had been previously used in the river and lakes, is now cut up into short lengths and tied, as single lines, called brush lines, to the limbs of trees in such a way as to allow the single hook to hang about 6 inches under the water. Each fisherman ties his lines to trees along the edges of the float roads if he can find such territory not already preempted by some one else. The fishing is thought to be better in such places; besides, it is easier to visit the lines when so located. Any fisherman who is unable to find unoccupied space along the float roads selects the best places he can find at various points around through the woods. In order that he may readily find his lines when he wishes to visit them, the limbs to which they are tied are marked with a white rag or the tree is blazed.

The different kinds of bait used are classed as "live bait" or "cut bait." The live bait consists chiefly of "shad" (*Dorosoma cepedianum exile*, *Hiodon alosoides*, and *Signalosa atchafalayæ*), perch, and crawfish. The "shad" are regarded as the best bait, and 100 shad are said to be worth 200 or 300 crawfish. The crawfish will live on the hook three or four days, while the shad will live only a day or two, but the shad

is a more tempting bait. Cut bait consists of larger examples of these and other fishes cut up into the proper size. Eels are said to make an excellent cut bait, but they are very scarce. Live bait is most used from September to November, inclusive, November being the best month. It is preferred to cut bait at any time, but can not be obtained in quantity except in the fall. Live bait is used, however, whenever it can be gotten, and occasionally a fisherman is fortunate enough to secure good supplies during the spring fishing.

These fish are influenced in their movements by the temperature of the water. During the winter they come farther down the river where the water is warmest, and in the summer they run farther upstream or retire to the deeper waters.

The goujon is said to be most abundant from September to November, or until the fall floods begin, when it gradually disappears. This is the best season for catching it, although a few may be found at any season. The goujon is most easily and usually taken with live bait. It is by no means a handsome fish, but its great size, the excellence of its flesh, and its superior keeping qualities render it a very important food-fish. It rarely reaches a weight of 100 pounds; but examples of 50 to 60 pounds weight are said to be not at all unusual. The largest individual seen by us was a ripe female 41 inches long and weighing 48 pounds. It dressed 27 pounds. One 38 inches long weighed 37 pounds, and another 37 inches long weighed 36½ pounds. The goujon is more voracious than the blue cat, and large individuals are apt to feed on smaller examples of the latter when confined in the same live-box. To prevent this, it is said that the fishermen sometimes sew up with wire the mouth of the very large goujon.

The blue cat has the same general habits as the goujon, but the best fishing for this species is said to be during the high water in the spring. Then the fish leave the river, lakes, and bayous and take to the woods. Good "woods or "swamp" fishing is sometimes had as early as March. The impression among the fishermen is that the fish run out over the flooded districts on account of the more abundant food supply to be found there. This consists chiefly of crawfish inhabiting the shallow pools and ponds made accessible to the catfish through the agency of the floods.

The maximum size of the blue cat is about the same as that of the goujon. The largest of which we heard weighed 100 pounds. The largest seen by us was a ripe female weighing 35 pounds. A spent female 31 inches long weighed 22 pounds and dressed 13 pounds. Another spent female 30 inches long weighed 17 pounds. It is claimed that large fish were far more numerous a few years ago than now.

The eel cat (*Ictalurus anguilla*) is comparatively rare, and not until these investigations was it discovered to be a distinct species. During the several days spent at Morgan City and Melville not more than 35 or 40 examples of this species were seen. It does not attain a greater length than 18 or 20 inches nor a greater weight than 8 pounds. The

average weight of those seen was under 5 pounds. The habits of the species do not seem to differ from those of the blue cat. They are said to be taken chiefly in the spring and in the flooded districts.

The last and least important of the four species of commercial catfishes found in the Atchafalaya River is the spotted cat (*Ictalurus punctatus*). Only three or four were seen at Morgan City during our visit, and the fishermen report that it is rarely taken. The few seen did not exceed 18 inches in length.

Table showing size, sex, and spawning condition of blue catfish examined at Morgan City, La., April 22–24, 1897.

Length.	Weight, pounds.	Sex.	Spawning condition.	Length.	Weight, pounds.	Sex.	Spawning condition.
14 inches		(?)	Immature?	21½ inches		Female	Spent.
16 inches		Female	Spent.	22 inches		Female	Do.
13½ inches		Male	Immature.	13½ inches		Female	Do.
15 inches		(?)	Immature?	16 inches		Male	Do.
13 inches		(?)	Immature?	13 inches		Female	Do.
14½ inches		Male	Immature.	20 inches		Female	Not nearly ripe.
16 inches		Male	Do.				
14 inches		Male	Do.	20 inches		Male	Ripe.
17 inches		(?)	Spent?	11½ inches		Male	Spent.
16½ inches		Male	Immature.	13½ inches		Female	Do.
16 inches		Female?	Immature?	12 inches		Female	Do.
14½ inches		Male	Immature.	16 inches		Female	Do.
15 inches		Male	Do.	16 inches		Female	Do.
16 inches		Male	Do.	18½ inches		Female	Do.
14½ inches		(?)	Immature?	19½ inches		Female	Ripe.
16 inches		Male	Immature?	13 inches		Male	Spent.
15½ inches		(?)	Immature?	14 inches		Female	Slightly developed.
21½ inches		Male	Spent.				
20 inches		Female	Do.	19 inches		Male	Spent.
19 inches		Female	Large roe.	15½ inches		Female	Do.
14 inches		(?)	Immature?	18 inches		Female	Do.
19 inches		(?)	Immature.	14½ inches		Male	Slightly developed.
14 inches		(?)	Do.				
20 inches		Female	Ripe.	14 inches		Male	Spent.
23 inches		Female	Spent.	14 inches		Male	Do.
16 inches		Female	Ripe.	14½ inches		Female	Do.
12 inches		(?)	(?)	16 inches		Male	Do.
10 inches		Male	Immature.	10 inches		Male?	Spent?
13 inches		(?)	Spent.	13 inches		Male?	Spent?
13 inches		Male	Do.	19 inches		Male	Spent.
17½ inches		Female	Do.	27½ inches		Female	Ripe.
14½ inches		Female?	Do.	10½ inches		Female?	Spent.
14½ inches		Female	Do.	12 inches		Male	Do.
18 inches		Female	Do.	13 inches		Male	Do.
20 inches		Female	Do.	13 inches		Male	Do.
17½ inches		Female	Do.	12 inches		Male	Do.
23 inches		Female	Do.	11½ inches		Male	Do.
16 inches		Female	Do.	12 inches		Female	Do.
25 inches		Female	Do.	13½ inches		Male	Do.
12 inches		Female	Ripe.	14 inches		Male	Do.
13 inches		Male	Spent.	12 inches		Male	Do.
17½ inches		Male	Do.	9½ inches		Male	Do.
14 inches		Female	Do.	15 inches		Female	Do.
24 inches		Female	Do.	11 inches		Male	Do.
20 inches		Male	Do.	12½ inches		Female	Do.
18 inches		Female	Nearly ripe.	10½ inches		Male	Do.
21 inches		Female	Do.	12½ inches		Male	Do.
27 inches		Female	Spent.	13 inches		Female	Do.
21 inches		Female	Do.	11 inches		Male	Do.
25½ inches		Female	Not ripe.	10½ inches		Male	Do.
27 inches		Female	Spent.	12 inches		Male	Do.
23 inches		Female	Do.	10½ inches		Female	Do.
13 inches		Female	Do.	12½ inches		Male	Do.
15 inches		Male	Do.	12 inches		Female	Do.
25 inches		Female	Do.	12½ inches		Male	Do.
15½ inches		Female	Not quite ripe.	12½ inches		Male	Do.
				13½ inches		Female	Do.
14 inches		Male	Spent.	13½ inches		Female	Slightly developed.
30 inches		Female	Ripe.				
16½ inches		Female	Spent.	14 inches		Male	Spent.
20½ inches		Female	Do.	15 inches		Male	Do.
16½ inches		Female	Do.	13 inches		Female	Half ripe
17 inches		Female	Do.	13½ inches		Female	Spent.
25½ inches		Female	Do.	14 inches		Female	Do.
18 inches		Male	Do.	9½ inches		Male	Do.

Table showing size, sex, and spawning condition of blue catfish, etc.—Continued

Length.	Weight, pounds.	Sex.	Spawning condition.
12⅛ inches		Female	Partially developed.
14 inches		Male	Spent.
11⅛ inches		Male	Do.
10⅛ inches		Male	Do.
15⅛ inches		Male	Do.
14 inches		Male	Do.
13⅛ inches		Male	Do.
14 inches		Female	Do.
14 inches		Male	Do.
11 inches		Male	Do.
10 inches		Female	Do.
12 inches		Male	Do.
15⅛ inches		Female	Do.
13⅛ inches		Female	Do.
14⅛ inches		Male	Do.
12⅛ inches		Male	Do.
12⅛ inches		Male	Do.
13 inches		Female	Do.
13 inches		Female	Do.
11 inches		Female	Ripe.
17 inches		Female	Spent.
20⅛ inches		Female	Do.
14⅛ inches		Female	Do.
19 inches		Female	Do.
21 inches		Female	Ripe.
19⅛ inches		Female	Spent.
17 inches		Female	Ripe.
16⅛ inches		Female	Spent.
23 inches		Female	Do.
15 inches		Female	Do.
17 inches		Male?	Spent?
13⅛ inches		Female	Spent.
15⅛ inches		Female	Do.
10⅛ inches		Male	Do.
22 inches		Female	Slightly developed.
20 inches		Female	Spent.
19 inches		Female	Do.
16 inches		Female	Do.
10 inches		(?)	Do.
21⅛ inches		Female	Do.
15 inches		Female	Do.
13 inches		Female	Do.
26⅛ inches		Female	Do.
16 inches		Female	Ripe.
16⅛ inches		Female	Spent.
21 inches		Male	Do.
16⅛ inches		Female	Do.
19 inches		Female	Do.
20⅛ inches		Female	Do.
19 inches		Female	Do.
9⅛ inches		Male	Immature.
12⅛ inches		Female	Spent.
18 inches		Male?	Spent?
16 inches		Female	Spent.
13⅛ inches		Male	Do.
19 inches		Female	Spent.
16⅛ inches		Female	Do.
15 inches		Female	Half ripe.
18⅛ inches		Male	Spent.
17⅛ inches		Male	Do.
22⅛ inches		Female	Do.
27 inches		Female	Ripe.
20 inches		Female	Spent.
20 inches		Female	Do.
16⅛ inches		Female	Do.
15 inches		Female	Do.
18 inches		Female	Do.
18 inches		Female	Do.
13 inches		Female	Half ripe.
24⅛ inches		Female	Spent.
15⅛ inches		Female	Do.
15 inches		Female	Do.
17 inches		Male	Spent.
14⅛ inches		Female	Do.
16⅛ inches		Male	Do.
26⅛ inches		Female	Ripe.
31 inches		Female	Do.
12⅛ inches		Female	Spent.
12⅛ inches		Female	Do.
14 inches		Female	Do.
11 inches		(?)	(?)
21 inches		Female	Spent.
20 inches		Female	Do.
14⅛ inches		Female	Do.
14 inches		Female	Do.
15 inches		Female	Do.
16 inches		Male	Do.
16 inches		Female	Do.
15⅛ inches		Female	Do.
10 inches		Female	Immature.
14⅛ inches		Male	Spent.
14⅛ inches		Female	Do.
16 inches		Female	Do.
17 inches		Male	Do.
21⅛ inches		Female	Do.
13⅛ inches		Female	Do.
14⅛ inches		Male	Do.
15⅛ inches		Female	Do.
14 inches		Male	Do.
13 inches		Female	Do.
17 inches		Female	Do.
14 inches		Female	Do.
16 inches		Male	Do.
18⅛ inches		Female	Do.
13 inches		Female	Do.
13⅛ inches		Female	Do.
13⅛ inches		Male	Do.
12⅛ inches		Female	Do.
13 inches		Male	Do.
16 inches		Male	Do.
13⅛ inches		Male	Do.
26⅛ inches		Female	Do.
16⅛ inches		Male	Do.
22 inches		Female	Ripe.
13⅛ inches		Female	Spent.
12⅛ inches		Male	Do.
11 inches		Female	Do.
14⅛ inches		Female	Do.
11⅛ inches		Male	Do.
16⅛ inches		Female	Do.
16 inches		Female	Half developed.
16 inches		Male	Spent.
15 inches		Female	Do.
15⅛ inches		Female	Do.
11⅛ inches		Female	Do.
18 inches	3.50	Male	Do.
17 inches	3.25	Female	Do.
16 inches	3	Male	Do.
41 inches	48	Female	Ripe.
30 inches	17	Female	Spent.
31 inches	22	Female	Do.
31 inches		Female	Ripe.
20⅛ inches	6.50	Female	Do.
24 inches	10.50	Female	Half ripe.
29 inches	14.25	Female	Spent.
22⅛ inches	8.13	Female	Ripe.
20⅛ inches	6.5	Female	Do.
17 inches	3.13	Male	Spent.
20 inches	5.75	Female	Ripe.
28 inches	13.25	Female	Spent.
25 inches	10.50	Female	Half ripe.
31 inches	19.88	Female	Spent.
17 inches	2.13	Male	Do.
15 inches	2	Female	Do.

Table showing size, sex, and spawning condition of blue catfish examined at Melville, La., May 2 and 3, 1897.

Length.	Weight, pounds.	Sex.	Spawning condition.
16 inches	2.25	Male	(?)
15 inches	1.75	Male	(?)
20 inches	5.25	Male	Ripe.
15 inches	1.75	Female	Spent.
17 inches	3	Female	Do.
18½ inches	3.50	Male	
15 inches	2.50	Male	(?)
23 inches	7	Female	Spent.
21 inches	6.50	Female	Ripe.
22½ inches	6.50	Male	Do.
15 inches	2	Male	(?)
20½ inches	5	Female	Spent.
19 inches	4	Female	Do.
17½ inches	2.75	Male	(?)
17 inches	2.75	Female	Spent.
18 inches	3.50	Female	Do.
15 inches	2	Female	Do.
15 inches	2	Female	Partly developed.
18 inches	3.50	Male	(?)
16 inches	2.25	Female	Spent.
16½ inches	2.25	Male	(?)
17 inches	2.75	Male	(?)
15 inches	2	Male	(?)
20 inches	5	Male	(?)
26 inches		Female	Spent.
19½ inches		Female	Do.
31 inches		Female	Do.
21½ inches		Female	Do.
22 inches		Female	Do.
30 inches		Female	Do.
18 inches		Female	Do.
17 inches		Male	Do.
18½ inches		Female	Do.
17 inches		Female	Do.
26 inches		Female	Do.
19 inches		Female	Ripe.
21 inches		Female	Spent.
30 inches		Female	Do.
22 inches		Male	(?)
19 inches		Female	Spent.
22 inches		Female	Do.
17 inches		Female	Do.
16 inches		Female	Do.
23 inches		Female	Do.
18 inches		Female	Do.
15½ inches		Female	Do.
17 inches		Male	(?)
25 inches		(?)	(?)
18 inches		Female	Spent.
21 inches		Female	Do.
22 inches		Female	Do.
16 inches		Male	(?)
19 inches		Male	(?)
15½ inches		Male	(?)
14½ inches		Male	(?)
16½ inches		Female	Spent.
16½ inches		Female	Do.
16 inches		Male	(?)
23 inches		Male	(?)
15 inches		Female	Spent.
18 inches		Male	(?)
15 inches		Male	(?)
15 inches		Female	Spent.
18 inches		Male	(?)
17 inches		Female	Ripe.
19 inches		Female	Spent.
15 inches		Female	Do.
16 inches		Female	Do.
17 inches		Male	(?)
14½ inches		Male	(?)
25 inches		Male	(?)
13½ inches		Female	Spent.
17 inches		Female	Do.
15 inches		Female	Do.
13½ inches		Male	(?)
14½ inches		Female	Ripe.
14½ inches		Male	(?)
13 inches		Female	Spent.
15½ inches		Female	Do.
13½ inches		Male	(?)
13 inches		Male	(?)
16½ inches		Male	(?)
14 inches		Male	(?)
15½ inches		Female	Not ripe.
16½ inches		Female	Do.
18 inches		Female	Do.
21½ inches		Male	(?)
19 inches		Female	Spent.
19 inches		Female	Do.
13½ inches		Female	Do.
14½ inches		Female	Not ripe.
16 inches		Male	(?)
15½ inches		Female	Spent.
14½ inches		Male	(?)
14 inches		Female	Spent.
18 inches		Male	Not ripe.
20 inches		Female	Spent.
17½ inches		Female	Do.
18 inches		Female	Ripe.
16 inches		Male	(?)
18 inches		Female	Spent.
18 inches		Female	Do.
23½ inches		Female	Ripe.
19 inches		Female	Spent.
18½ inches		Female	Do.

Table showing size, sex, and condition of goujon examined at Morgan City, La., April 22–24, 1897.

Length.	Weight, pounds.	Sex.	Spawning condition.
23 inches		Female	Ripe.
24 inches		Female	Spent.
30 inches		Female	Do.
28 inches		Female	Do.
28 inches		Female	Do.
26 inches		Female	Half developed.
24 inches		Male	Ripe.
37 inches		Female	Spent.
27¾ inches		Female	Do.
25 inches	9	Female	Do.
29 inches	14	Female	Spent.
22½ inches	7⅛	Female	Ripe.
25 inches	10	Female	Do.
15 inches		Male	Immature.
28 inches	44	Female	Spent.
30 inches		Female	Ripe.
28 inches		Female	Do.
34 inches	69½	Female	Spent.
34 inches		Female	Ripe.
18 inches		Female	Spent.

Table showing size, sex, and condition of eel catfish examined at Morgan City and Melville, La., April 22 to May 6, 1897.

Length.	Sex.	Spawning condition.	Length.	Sex.	Spawning condition.
13½ inches...	Female	Ripe.	18 inches...	Female	Ripe.
11½ inches...	Female	Spent.	14 inches...	Female	Do.
17 inches...	Female	Do.	14 inches...	Male	Do.
13½ inches...	Female	Do.	16 inches...	Female	Do.

Summary.

Species.	Total number examined.	Sex.			Spawning condition.				
		Male.	Female.	Sex not determined.	Spent.	Ripe.	Partially developed.	Immature.	Condition not evident.
Blue cat	374	126	227	21	257	32	17	18	50
Goujon	42	2	40	0	18	22	1	1	0
Eel cat	8	1	7	0	3	5	0	0	0

While exact measurements were made of only about 424 fish, several hundred more (perhaps 2,000) were examined more or less carefully, particularly with reference to their size. From these observations, as well as from the measurements recorded in the preceding tables, it is evident that a very large proportion of the fish now handled are comparatively small and young fish which have not yet attained that size which puts them at their maximum value. A few specific instances may be noted. Ten yellow cats dressed 83 pounds; one lot of 48 and another lot of 49 blue cats dressed 100 pounds, while another lot of 40 dressed only 50 pounds; in another case 70 blue cats were required to dress 100 pounds. According to one of the dealers, in 1884 from 14 to 20 of the smallest fish were sufficient to dress 100 pounds, while the larger fish were much more abundant than now and weighed each from 60 to over 100 pounds rough. He says the size began to decrease four years ago, but the greatest decrease has been during the last two years.

It is evident from these facts that these fish are being caught before they have reached that size which would render them of the greatest commercial value, and that some restriction should be placed upon the fishery with a view to regulate this matter.

At Melville the yellow cat or goujon was less common than at Morgan City. Mr. Chamberlain saw only about a dozen examples, all of which were ripe females.

From the above tables it will be seen that we examined and made notes upon 374 blue catfish, of which there were 227 females, 126 males, and 21 indeterminate. Of the total 374, 32 were in full roe and ripe, 17 contained roe partially developed, 18 were immature, 50 indeterminate, and 257 were spent fish. Omitting the 18 immature and the 50 indeterminate, we have 306 fish of which 257 (or 84 per cent) were spent fish, 32 (or about 10 per cent) were ready to spawn, while 17 (or about 5½ per cent) were not quite ready for spawning.

So far as the investigations of a single season may be relied upon, these results indicate that the spawning season of the blue catfish in the Atchafalaya River is a prolonged one, but that the majority of the fish spawn in March and April. The testimony given by the fishermen agrees closely with these results. They report finding fish in full roe as early as the last of February and as late as the first of June, though all admit that the majority of ripe fish are taken in March or April.

The total number of goujon examined was 42, of which all but 2 were females. Of the 2 males, one was an immature fish and the other was fully ripe. Of the 40 females, 18 (or 45 per cent) were spent fish, 1 was about half developed, 1 was immature, while 22 (or 55 per cent) were ready to spawn. This indicates for the goujon a somewhat later spawning season than for the blue cat, of which about 84 per cent were done spawning. The few eel cats examined showed that about 38 per cent had already spawned and that 62 per cent were ready to spawn.

The number of spotted cats examined was not sufficient to enable any conclusion to be drawn as to its time of spawning.

Basing conclusions as to the time of spawning period upon investigations extending over only a brief portion of a single season is not altogether safe. Accurate results can only be obtained from observations extending over two or more seasons. All that can be said, therefore, in this report, is that the strong probability is that the great majority of catfish in Atchafalaya River spawn in March and April, the period from March 15 to April 30 being the most important.

Method of handling the fish.—Each fisherman visits his lines daily, or twice a day if possible, passing from hook to hook in his pirogue, taking off the fish and putting them in live-boxes where they are retained until the tugboat arrives on its regular collection trip. Each of the three companies at Morgan City has a tugboat for this purpose, valued at $2,000 to $3,000. Each tug carries in tow a large live-box called a live-car or fish-car, into which the fish are put when received from the individual fisherman and in which they are retained until they are needed for dressing. The car is usually 25 to 30 feet long, 6 feet beam, and is divided into several compartments. The maximum capacity is 40 to 50 boxes of 300 pounds each. The captain of the tug, as agent for the company, buys the fish from the fishermen. The fish are measured in a box 1½ by 1½ by 3 feet. This measuring-box rests upon the live-car over the particular compartment into which the fish are to be put, and when the box is full the hinged bottom is released and the fish fall into the car. A "box" of fish is 300 pounds, and the price paid during the time of our visit was $7 per box or about 2⅓ cents per pound. If any fisherman is not satisfied with the measured or estimated weight, the actual weight is determined. The highest price recently paid was $8 per box. Each firm's tug usually makes one trip, sometimes two, per week, the time required varying from three to five days.

A brief account of a trip which we took on the *Shamrock*, Captain Hanson, belonging to Mr. John Dalton, will be useful in conveying a proper conception of the fishery. We left Morgan City at noon, April 19, passing up the Atchafalaya River, through Grand Lake, Chicot Pass, Lake Chicot, and into Bayou Chêne, where we tied up for the night at Mr. Charles Larson's, about the only house on dry land that was seen during the entire trip. Next morning we passed out of Bayou Chêne into Lake Mangoulois, then through Bayou Tensas, Upper Grand River, Whisky Bayou, Bayou de Glaise, Bayou Alabam (Alabama Bayou), to Bayou des Ourse, where we tied up in the woods alongside the house-boat of William Kleinpeter. The next morning we went from Bayou des Ourse by another route into Whisky Bayou, then through Bayou la Rompe, Bayou la Rose, Butte à la Rose, Little Atchafalaya River, Upper Grand River, Bloody Bayou, Bayou Sorrel, and Jakes Bayou, thence back to Morgan City through Lake Chicot, Chicot Pass, Grand Lake and Atchafalaya River.

During this trip of about 180 miles fish were purchased from 25 fishermen. The amounts paid each fisherman varied from 70 cents to $18, the average being $6.84. The total fare collected on this trip was therefore about 25 boxes. The fares of two other tugs the same week were respectively 13 and 16 boxes. It was noticed on this trip that a good many fish die before reaching Morgan City. Some die even in the fishermen's live-boxes. The goujon seems much more hardy than the blue cat, as none of that species died on this trip, while more than 100 of the blue cats died. The goujon is said also to be a better shipper than the other species. When the tug returns to Morgan City it leaves its car alongside its company's fish-house. The fish are then taken out and dressed and barreled for shipment. The dressing consists in cutting off the head, removing the viscera, and skinning the fish, after which it is washed, and then barreled with ice for shipment. The principal shipments are made to Texas, Oklahoma, Kansas, Missouri, Colorado, and New Mexico.

During the summer months the loss from the fish dying in the live-cars and the difficulty of shipping them in good condition usually cause the tugs to stop running or to make fewer trips between June 1 and September 1. While some fishing is carried on during summer, the season may properly be regarded as extending from September 1 to June 1.

The catfish industry at Morgan City had its beginning about 1873. Not much was done, however, for several years. Complete statistics are not obtainable for any year previous to 1892, but we have been able to obtain complete statistics for the years 1892 to 1897, inclusive, of the catfish shipped from Morgan City. These are exhibited in the following table. The fish shipped from Morgan City are caught chiefly at various places above that town. Indeed, the Morgan City boats go within a few miles of Melville.

Table showing by months the gross weight and value of catfish handled at Morgan City, La., during the years 1892 to 1897, inclusive.

Year.	January.		February.		March.		April.	
	Pounds	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1892	117,908	$2,947.70	120,108	$3,002.70	196,591	$4,914.77	110,820	$2,770.50
1893	89,976	2,249.40	115,825	2,895.62	168,870	4,221.75	117,204	2,930.10
1894	133,520	3,338.00	109,675	2,741.87	107,182	2,679.55	120,051	3,001.27
1895	124,152	3,724.56	118,228	3,546.84	262,920	7,887.60	256,384	7,691.52
1896	93,718	2,811.54	97,820	2,934.60	179,236	5,377.08	150,994	4,529.82
1897	66,565	1,996.95	49,370	1,481.10	140,359	4,210.77	80,706	2,421.18

Year.	May.		June.		July.		August.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1892	43,776	$1,094.40	8,535	$213.37	1,272	$31.80	446	$11.15
1893	63,307	1,582.67	6,592	164.80	1,351	33.77	14,213	355.32
1894	65,323	1,633.07	12,701	317.52	11,804	295.10	26,175	654.37
1895	269,513	8,085.39	68,593	2,057.79	15,281	458.43	10,880	328.40
1896	145,144	4,354.32	31,124	933.72	32,186	965.58	13,077	392.31
1897	57,488	1,865.65	50,528	1,629.85	47,159	1,509.28	33,323	1,082.19

Year.	September.		October.		November.		December.	
	Pounds	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1892	36,128	$903.20	48,468	$1,211.70	196,933	$4,923.32	134,430	$3,360.75
1893	59,967	1,499.17	38,778	969.45	200,624	5,015.60	134,475	3,361.87
1894	35,501	919.36	125,562	3,265.06	193,132	5,453.93	153,827	4,337.44
1895	83,121	2,493.63	98,523	2,955.69	180,089	5,402.67	133,558	4,006.74
1896	22,533	675.99	86,300	2,589.00	103,762	3,112.86	89,518	2,685.54
1897	26,675	849.76	(*)	(*)	75,475	2,264.25	147,341	4,420.24

* On account of the yellow fever quarantine from September 21 to November 13 no fish were shipped from Morgan City between those dates.

CONCLUSIONS.

That the fishery industry of the Atchafalya River has seriously decreased in importance during the last few years is evidenced by the foregoing statistical table, though the actual decrease in abundance of these valuable fishes is only partially shown. The great falling-off in the catch of 1896 and 1897 over that of 1895 is such as to seriously threaten the industry. Until recently only the larger fish were accepted by the dealers. The fishermen liberated and returned to the water all the individuals of small size. But during the last two years the great difficulty of getting a sufficient number of large fish to supply the demand has induced both the fishermen and the dealers to utilize the smaller fish. The tendency has been to accept smaller and smaller fish each succeeding season until now a great many are used which dress scarcely more than a pound each. When it is remembered that these small fish, if allowed to escape for a few years, would attain a weight of 20 to 100 pounds, the improvidence of the methods now in vogue becomes apparent.

The injury to the fishery resulting from the catching of undersized fish is not the only one from which the industry is suffering. The continuance of fishing throughout the spawning season must result disastrously to the business. The destruction of the fish when nearly ready to spawn can not be defended on business grounds. Every large female, if permitted to live through the spawning season, will produce from

50,000 to 250,000 young; 1,000 such fish would produce from 50,000,000 to 250,000,000 young. It is, of course, impossible to say how many would live and grow to maturity, but that the number would be quite adequate to greatly improve the fishery can not be doubted.

The importance of these facts has already impressed the dealers. They realize that something must be speedily done to prevent the practical extinction of the business in which they are engaged. The fishermen are also beginning to realize that the methods in vogue are destructive and detrimental to any permanent fishery interests. So strongly impressed are both dealers and fishermen with the threatened destruction of the fishing interests of the Atchafalaya River that they are anxious that the State enact legislation for their preservation. In the absence of any law regulating the fishery it is scarcely possible to secure any united action among the various ones interested looking toward the conservation of the supply.

While the investigations were limited to the Atchafalaya River, and chiefly to that portion of the river tributary to Morgan City, there is every reason to believe that the catfish supply is diminishing throughout the State. The brief investigations made at Melville and reports received from Plaquemine agree fully with the results obtained at Morgan City.

RECOMMENDATIONS.

In the light of the foregoing facts, it is evident that State legislation is essential to the preservation of the catfish fishery of the Atchafalaya River and in the other waters of the State. The State legislature should, at its first opportunity, enact a law regulating fishing in the State, which should be reasonable and fair to all the interests concerned. This law should provide (1) for a close season extending from March 15 to May 15, which period covers the principal spawning season of the two important species of catfish, and (2) it should be made unlawful to catch catfish of less than 4 pounds gross weight.

SABINE AND NECHES RIVERS.

The investigations and inquiries in eastern Texas and western Louisiana were made primarily for the purpose of determining the advisability of making plants of shad in the Sabine and Neches rivers. The time was insufficient for making a satisfactory series of observations, therefore such conclusions as have been reached are purely tentative and may be materially modified when more thorough investigations shall have been made.

The only places visited were Beaumont, Lufkin, Michelli, and Logansport. The Neches River was examined at Beaumont and at Bonners Ferry, 10 miles west of Lufkin. The Angelina River, a tributary of the Neches, was examined at Michelli, 9 miles north of Lufkin. The Sabine River was inspected at Logansport.

While at Beaumont a visit was made to some ponds and a small creek near town, from which were obtained specimens of a number of

the native fishes. All of these rivers at the time of our visit were considerably above their ordinary stage of water. At the railroad bridge across the Neches at Beaumont the river was about 300 feet wide and 30 feet deep, being at least 2 feet higher than usual at that season. The water was very muddy and the banks were covered with soft mud. We were told that the water of this river never becomes clear, but always remains nearly or quite as muddy as it then was.

There is usually a rise in the river early each spring and another later, which is known as the "June rise." In June, 1884, it was said to have been about 15 feet higher than when seen by us.

Lake Sabine, into which flow both the Neches and Sabine rivers, is some 28 or 30 miles long and 2 or 3 miles wide, and is always salt or brackish. Such fishes as red drum, sheepshead, and sea trout are caught in large numbers in this lake and about Sabine Pass.

The principal fishes found in the two rivers near Beaumont are blue cat, yellow cat, bufialo, gaspergou, and gar.

At Bonners Ferry the Neches River was several feet above low-water mark and had been higher recently. The banks had been overflowed and were still very muddy. The soil of the region consists of yellow clay, with some sand. The river at this place was about 40 feet wide and was flowing with a strong current. The water was red with clay mud carried in suspension. The temperature of the water, at 10 a. m. April 28, was 70°.

Among the fishes occurring in this portion of the river are the blue cat, said to reach a weight of 85 pounds; goujon, or "Opelousas cat" (*Leptops olivaris*), reaching a weight of 100 pounds; black and white buffalo, each attaining a weight of 20 to 35 pounds; gaspergou, which grow to 20 pounds; alligator gar, reaching a length of 7 or 8 feet; sun perch; large-mouth black bass (locally called green trout), common in the ponds; hickory shad or "scissor belly" (*Dorosoma cepedianum*); spoonbill cat; and grindle (*Amia calva*) in the ponds. Carp, which were planted in this river several years ago, are said to be rather common now and are regarded as a good food-fish.

The Angelina River at Michelli was at the time of our visit 40 to 50 feet wide and 10 to 14 feet deep. It was said to be 5 or 6 feet higher than usual and was overflowing its banks. The water was very muddy and full of floating débris. The temperature of the water at 3 p. m., April 28, was 72.5°, when the air was 80.5°. Some collecting was done in a small bayou and in some overflow ponds, and the following species obtained: Large-mouth black bass, 1 species of sunfish (*Lepomis garmani*), calico bass, 3 species of darters (*Percina caprodes*, *Boleosoma camurum*, and *Etheostoma jessiæ*), pirate perch, skipjack, top minnow (*Fundulus notatus*), *Fundulus pallidus*, *Gambusia affinis*, little pickerel, *Notropis notemigonoides*, *Notropis venustus*, *Cliola vigilax*, roach (*Abramis crysoleucas*), *Opsopœodus emiliæ*, and *Hybognathus nuchale*. The following additional species are reported by fishermen to occur there: Goujon or "abaloosie," blue cat, white buffalo, black buffalo, "shovel-bill" cat, gaspergou, alli-

gator gar, white gar, hickory shad, red perch, and white perch. The goujon is said to reach a weight in this river of 50 to 75 pounds. The blue cat reaches about the same size, and is more abundant.

The Sabine River at Logansport is quite a large river, which, like all other streams in that region, was considerably above its usual stage at the time of our visit, and, like the other streams, was red with mud which it was carrying. The temperature of the water was 70° at 10 a. m. April 29, when the air was 65°.

The more abundant fishes seen by us or reported by the fishermen are yellow cat and blue cat, said to spawn in the summer, which is probably an error; drum or gaspergou, reaching a weight of 20 pounds and said to spawn in April and May; white buffalo, reaching a weight of 35 pounds, and black buffalo, reaching about the same size, both species spawning in March. The very large goujon are here called "Opiloosa" (Opelousas), and are described as having a flat head and reaching a great size. The head of one large example recently taken weighed 20 pounds.

The fishermen speak of the carp as the "Government fish," and say that they are regarded as a good fish and find a ready sale.

Fishing here is not of much commercial importance and is almost wholly for local trade. It is carried on with hoop nets baited with dough, etc. A hoop net lifted during our visit contained one small gaspergou and two white buffalo, one of which weighed 11 pounds.

No evidence of the existence of any species of the true shad (*Alosa*) in either of these rivers could be secured. The commercial fishermen know nothing about such fish. It must be borne in mind, however, that the methods employed by the fisherman are not such as would result in the capture of such fish as the shad. The apparatus used in this region consists simply of set lines and a few hoop nets, which are, of course, useless in a shad fishery. Shad may be common in these rivers and entirely escape observation until they are fished for with suitable apparatus and at the proper season.

LAKES TASSE AND PEIGNEUR.

Lake Tasse, or Spanish Lake, is a small and shallow body of water about 7 miles northwest of New Iberia, La. It is about 2 miles long and 1 mile wide. It has no inlets, but is supplied entirely by rains. Two artificial outlets connect it with Bayou Têche. The water is necessarily quite warm in the summer, and is full of *Nelumbo*, *Nuphar*, *Nymphæa*, *Myriophyllum*, and other aquatic vegetation. The following fishes are said to occur in this lake: Large-mouthed black bass, or "green trout," reaching a weight of 6 to 10 pounds; sac-a-lait, goggle-eye, bream, sunfish, barfish (*Roccus chrysops*), pike (*Lucius vermiculatus*), gar, grindle, goujon, blue cat, gaspergou, and buffalo. Alligators are also very abundant.

Lake Peigneur is situated 10 miles west of New Iberia, on the country place of Mr. Joseph Jefferson. It is a beautiful lake about 1½ miles

wide and 3 miles long. The greatest depth is said to be 10 feet, and the water is much freer from vegetation than Lake Tasse. The shores are also much higher and more picturesque. The fishes are essentially the same as those of Lake Tasse.

LIST OF FISHES.

The following list includes all the species of fishes collected or seen at the various places visited and such additional species as were reported upon authority considered reliable. The nomenclature and sequence of species agree with Jordan & Evermann's Check-List of Fishes and Fish-Like Vertebrates of North and Middle America.

The localities and waters represented are:

1. Various waters in the vicinity of Baldwin Lodge, Mississippi, including Pearl River, Lake Borgne, Bayou Isle aux Pois (or Campbell Bayou), Grand Plains Bayou, Lagoon Bayou, Black Bayou, and Mulatto Bayou.
2. Atchafalaya River at Morgan City and Melville, La., and intermediate points.
3. Lake Tasse, or Spanish Lake, 7 miles from New Iberia, La.
4. Lake Peigneur, 10 miles west of New Iberia, La.
5. Neches and Trinity rivers and some small ponds near Beaumont, Tex.
6. Neches River at Bonners Ferry, 10 miles west of Lufkin, Tex.
7. Angelina River at Michelli, Tex., 9 miles north of Lufkin, Tex.
8. Sabine River at Logansport, Tex.

Common names used locally are inclosed in quotation marks.

1. **Polyodon spathula** (Walbaum). *Spoonbill Cat*; *"Shovel-nose Cat"*; *"Shovel-bill Cat."* Reported from the Neches, Angelina, and Sabine rivers by fishermen at Bonners Ferry and Michelli.
2. **Lepisosteus osseus** (Linnæus). *Long-nosed Gar*; *"Gar"*; *"Garfish"*; *"Poisson armé."* This species was seen at Morgan City and reported from Baldwin Lodge, Melville, Lake Tasse, Lake Peigneur, Beaumont, Bonners Ferry, Michelli, and Logansport. On April 23, the following notes were taken on a spawning female gar at Morgan City: Standard length, 40 inches; weight, 9 pounds; length of snout, 8.5 inches; weight of ovaries, 19 ounces; total number of eggs by actual count, 36,450.
3. **Lepisosteus platostomus** Rafinesque. *Short-nosed Gar.* Seen only at Beaumont, when several specimens were seined in a pond.
4. **Lepisosteus tristœchus** (Bloch & Schneider). *"Alligator Gar"*; *"Mississippi Gar."* Seen in Lake Borgne, at Morgan City, and at New Iberia (a specimen from Bayou Têche); reported from Bonners Ferry, Logansport, and Beaumont.
5. **Amia calva** Linnæus. *Bowfin*; *Grindle*; *"Grinnel"*; *"Poisson de Marais."* Reported from Lakes Tasse and Peigneur, and from the Neches River.
6. **Felichthys marinus** (Mitchill). *Gaff-topsail*; *"Sea Cat."* Seen at Morgan City. The larger ones are sometimes dressed and shipped with the fresh-water species.
7. **Galeichthys felis** (Linnæus.) *Sea Catfish*; *"Sea Cat."* Seen with the preceding at Morgan City; where it is sometimes utilized in the same way.

8. Ictalurus furcatus (LeSueur). *"Blue Cat"*; *"Poisson Bleu."*

This is by far the most important of all the catfishes of the region covered by this report. It attains a weight of 100 pounds, and the importance of the species is shown in the earlier portions of this paper. Its abundance, distribution, and habits have already been fully discussed. Until these investigations were made the large catfish of the Lower Mississippi Valley had been identified by most ichthyologists as the *Gadus lacustris* of Walbaum. *Pimelodus nigricans* LeSueur and *Amiurus ponderosus* Bean were thought to belong to the same species as Walbaum's *Gadus lacustris*, and the species stood as *Ameiurus lacustris* (Walbaum). The type of *Gadus lacustris* came from Arctic America, and we have no certain means of knowing whether it was an *Ameiurus* or an *Ictalurus*. LeSueur's *Pimelodus nigricans* came from Lakes Erie and Ontario, and was probably an *Ameiurus*, though a reexamination of specimens from those lakes must be made before we can feel certain that such is the case. An examination of the skeleton of the type of *Amiurus ponderosus*, which is preserved in the U. S. National Museum, shows that it belongs to the genus *Ictalurus*, as is evidenced by the notched supraoccipital which forms a continuous bony ridge with the first interspinal of the dorsal. LeSueur's *Pimelodus furcatus* came from New Orleans and was unquestionably the same as the blue cat of the Atchafalaya River. At least until the large catfish of the Great Lakes can be carefully studied, the blue cat of the Lower Mississippi Valley must stand as *Ictalurus furcatus*, and *Amiurus ponderosus* goes in its synonymy.

The number of anal rays in numerous specimens counted varies from 31 to 33. A spent female, 30 inches long and weighing 17 pounds, gave the following measurements: Head 4; depth 4.34; D. I, 6; P. I, 9; A. 32; distance from tip of snout to origin of dorsal fin 2.64 in body; greatest width of head 1.34 in its length; interorbital width 2; width of mouth equals interorbital width; maxillary barbel not reaching beyond head; humeral process about 3 in pectoral spine; anal base nearly ½ longer than head. Barbels usually color of fish, rarely black. In other respects the description of *Ameiurus lacustris* in Jordan & Evermann's Fishes of North and Middle America agreed perfectly with this specimen. The color of this species, as found in the Atchafalaya River, is a dull or olivaceous blue, pale or whitish below, without spots anywhere.

9. Ictalurus anguilla Evermann & Kendall. *"Eel Cat"*; *"Willow Cat."*

The following is the original description of this species: Head 4; depth 4.5; eye 7 in head; snout 2.8; maxillary (without barbel) 3; free portion of maxillary barbel longer than head; dorsal spine 2 in head; pectoral spine 2; width of mouth 2. D. I, 6; A. 24; vertebræ 42. Head large, broad, and heavy; mouth unusually broad; cheeks and postocular portion of top of head very prominent; interorbital space flat, a broad, deep groove extending backward to origin of dorsal fin; body stout, compressed posteriorly; back scarcely elevated. Eye small; maxillary barbel long, reaching considerably past gill-opening; other barbels short. Origin of dorsal fin equidistant between snout and origin of adipose fin, its distance from snout 2.6 in length of body; base of dorsal fin 3.5 in head; longest dorsal ray 1.75 in head; dorsal spine strong, entire both before and behind; pectoral spine strong, entire in front, a series of strong retrorse serræ behind; humeral process 2.2 in pectoral spine; ventrals barely reaching origin of anal, their length 2 in head; anal fin long and low, the longest rays about 2.2 in head; base of fin greater than head, 3.2 in body; caudal moderately forked, the middle rays about 2.2 in outer rays, which are about 1.4 in head.

Color, uniform pale-yellowish or olivaceous; no spots anywhere.

A comparison of the skull with that of *I. furcatus* and *I. punctatus* of the same size shows a number of very marked differences. Nearly all the bones

in *I. anguilla* are heavier than in the other species; the supraoccipital is broadly triangular and its upper surface finely grooved, while in each of the other species it is much longer and narrower and the upper surface is nearly smooth.

An examination of the 6 cotypes shows that there is not much variation, all the important characters remaining quite constant. The maxillary barbel varies somewhat in length, in some individuals scarcely reaching the gill-opening, and the number of anal rays varies from 24 to 26.

From the blue cat (*I. furcatus*) this species differs chiefly in the fewer rays in anal fin, the wider mouth, shorter, heavier head, much longer maxillary barbel, and in the cranial characters already given. From the spotted cat (*I. punctatus*) it may be distinguished by its wider mouth, more blunt snout, heavier head, the color, and the cranial characters already mentioned.

This species is well known to the fishermen of the Atchafalaya River, by whom it is usually called the "eel cat," though the name "willow cat" is sometimes applied to it. It was explained by the fishermen that the name "eel cat" was given on account of the long feelers (i. e., barbels), and the name "willow cat" because it is most frequently found about the roots of willow trees. The eel cat is not an abundant species in the Atchafalaya River. During six days spent at Morgan City (April 19-24) several hundred catfish were examined at the three fish-houses, and the total number of eel cats seen was fewer than twenty-five. The fishermen report that this proportion is about as great at any time of the year. Of four commercial species of catfishes handled on this river, the most abundant one is the blue cat (*Ictalurus furcatus*), and the next is the yellow cat or goujon (*Leptops olivaris*). The eel cat comes next and the spotted cat (*Ictalurus punctatus*) last. The blue cat and the yellow cat probably constitute 98 per cent of the entire catch.

The eel cat rarely weighs over 5 pounds, and usually not over 3 pounds. Its flesh is firm and of excellent flavor. The spawning season appears to be during the spring, as several individuals examined were in mature spawning condition. In May, 1898, the writer found a few specimens of this species in the Ohio River at Louisville, Ky.

One of the species of large catfish seen in the market at Houston, Tex., in 1891, was called "eel cat" by some of the dealers. The specimens came from the lower Trinity and San Jacinto rivers, and were identified as *Ictalurus furcatus*, which they undoubtedly were. The name "eel cat" was also heard at the mouth of Pearl River, but no specimens were obtained. This name is probably applied in different localities to different species.

10. **Ictalurus punctatus** (Rafinesque). *"Spotted Cat"; Channel Cat.* This species is very rare in the Atchafalaya River. Only one adult was seen among several hundred fish examined at Morgan City. Four young were seined in Lake Lapourde, near that town. Apparently this species is much less common in Louisiana than has usually been supposed.

11. **Ameiurus nebulosus** (LeSueur). *Common Bullhead.* Three small specimens were obtained in a pond near Beaumont.

12. **Ameiurus melas** (Rafinesque). *Black Bullhead.* One specimen 7 inches long and 2 smaller ones from Angelina River at Michelli.

13. **Leptops olivaris** (Rafinesque). *"Goujon"; "Yellow Cat"; "Peided Cat"; "Mud Cat"; "Opelousas Cat."* Next to the blue cat this is the most abundant and important food-fish in the Atchafalaya River. It was also seen by us at Baldwin Lodge, and it was reported at Beaumont, Bonners Ferry, Michelli, Logansport, and Lakes Tasse and Peigneur.

14. **Schilbeodes gyrinus** (Mitchill). *Small Poison Cat.* Two good specimens of this species were obtained, one from Black Bayou near Baldwin Lodge and one from Lake Lapourde at Morgan City.

15. **Ictiobus cyprinella** (Cuvier & Valenciennes). *Common Buffalo-fish*; "*Gourd-head Buffalo.*" This species is common in all the larger waters of the region visited, and is a food-fish of considerable importance, especially at Morgan City, Melville, Beaumont, and Logansport. It is described by the fishermen as having the mouth larger than any other species and "straight out," and feeding more at the top of the water.

16. **Ictiobus urus** (Agassiz). "*Black Buffalo*"; "*Chopper.*" Occurs in the Atchafalaya, Neches, and Sabine rivers. Reaches a weight of 35 pounds or more. Head and mouth larger than in *I. bubalus*. Said to spawn in March and April.

17. **Ictiobus bubalus** (Rafinesque). *Small-mouthed Buffalo*; "*White Buffalo*"; "*Rooter.*" Common in the Atchafalaya River and all bayous, rivers, and lakes of this region; seen by us at Morgan City, Beaumont, Melville, and Logansport. Reaches a weight of 35 pounds or more. Spawns in March and April. Described by the fishermen as having a smaller, more inferior mouth than any other species, and as being more of a bottom feeder. All three of these species are used as food. A specimen 16 inches in total length from the Sabine River at Logansport, La., taken April 29, exhibits the following characters: Head 4; depth 2.5; snout 3.34 in head; eye 5. D. 28; A. 11. Scales 9–35–5, 12 or 13 before the dorsal. Body short, compressed, the dorsal profile strongly arched and subcarinate from occiput to origin of dorsal fin; ventral outline only slightly convex. Head small; mouth small, subinferior, protactile downward; lips papillose; opercles striate; caudal peduncle deep and compressed, its least depth 1.75 in head. Fins moderate, first 7 or 8 dorsal rays lengthened, as long as head, rays of the short portions 3.5 in head; longest anal rays 1.17 in head; pectoral short, not reaching base of ventral, 1.4 in head; ventrals longer, 1.1 in head; caudal deeply lunate, the lobes longer than head.

18. **Hybognathus nuchale** Agassiz. *Silvery Minnow.* Two specimens in the collection from the Angelina River. Others were examined on the Atchafalaya River 70 miles above Morgan City.

19. **Hybognathus hayi** Jordan. Two specimens from Melville.

20. **Opsopœodus emiliæ** Hay. Sixteen from Angelina River at Michelli and 6 from Beaumont. Lateral line complete in all. In many there are two black areas on dorsal fin; the anterior four rays and their membranes are black, then comes a white streak covering one or two rays, then another black streak on the last three rays. In a few of the smaller specimens there is no black on the dorsal; where there is any black, it is in two spots or bands.

21. **Abramis chrysoleucas bosci** (Cuvier & Valenciennes). *Roach.* Three examples from Michelli. Not seen elsewhere, though it doubtless occurs in most of the waters examined.

22. **Cliola vigilax** (Baird & Girard). Three specimens from Michelli, the largest of which (3 inches long) has the head 4.13; depth 4; eye 3.75 in head; snout 3; scales 8–45–5, 26 before the dorsal; D. 1, 8; A. 7.

23. **Notropis nux** Evermann. Eight examples from Beaumont, Tex. Head 4; depth 3.75; eye 3; snout 4; D. 8; A. 7; scales 7–35–3, 13 before dorsal. Teeth 1, 4–4, 1, hooked, and with slight grinding surface. Mouth rather small, lower jaw somewhat included; origin of dorsal over insertion of ventrals. A small spot at base of caudal. Scales rather deeper than long. These specimens agree in the main with cotypes of *N. nux*, but the depth is greater. This last is due to the fact that all these specimens are well fed and many of them full of spawn.

24. **Notropis chamberlaini** Evermann.

Type, No. 48901, U. S. Nat. Mus.; cotypes, No. 707, U. S. F. C. Length of type, 3 inches to base of caudal. Type locality, Atchafalaya River, Melville, La. Collector, Fred. M. Chamberlain, May 5, 1897.

Head 4.34; depth 4.2; eye 4; snout 4; D. 8; A. 10; scales 7-39-4, about 15 before dorsal. General form much like that of *Hybognathus;* body only moderately compressed, dorsal and ventral outlines slightly arched; head rather small, pointed; mouth small, a little oblique, the maxillary scarcely reaching anterior border of orbit, lower jaw slightly included; snout equal to eye; eye in axis of body. Fins all rather small; origin of dorsal slightly behind vertical at insertion of ventrals; free edge of dorsal fin somewhat concave, the anterior rays about equal to length of head; pectoral short, slightly falcate, the longest rays about 1.4 in head; ventrals shorter than pectoral, barely reaching vent; anal similar to dorsal, the rays shorter; caudal widely forked, the middle rays 2.5 in the outer, the lobes as long as head, the lower lobe slightly longer than the upper; scales moderately imbricated, the exposed portions not deeper than long; lateral line complete, somewhat decurved. Teeth 2, 4-4, 2 or 1, rather weak, hooked, and with small grinding surface. Intestine short; peritoneum silvery.

General color light straw; middle of side with a broad, well-defined silvery band from upper end of gill-opening to middle of base of caudal fin, the anterior half lying wholly above the lateral line, the posterior portion lying partly below it; this silvery band bounded above by a narrow dark border; cheeks and opercles silvery; a darkish band along median line of back; fins all plain straw-color or pale lemon.

Fourteen examples of this species, 2 to 3 inches in length, were obtained from the Atchafalaya River at Melville, La., by Mr. Fred. M. Chamberlain, for whom the species is named.

25. Notropis louisianæ Evermann.

Type, No. 48902, U. S. Nat. Mus.; cotype, No. 708, U. S. F. C. Type locality, Atchafalaya River, Melville, La. Collector, Fred. M. Chamberlain.

Head 4.5; depth 5.6; eye 3; snout 3; D. 8; A. 11; scales 7-37-3, 19 or 20 before the dorsal. Teeth 1, 4–4, 2, little hooked; peritoneum silvery, with numerous minute round black specks. Body long and slender, back not arched; head short but pointed; mouth rather large, oblique, maxillary scarcely reaching orbit; lower jaw somewhat included; eye large, equal to or greater than snout. Fins rather small; origin of dorsal far behind insertion of ventrals, its longest rays 1.4 in head; pectorals short, their length equal to height of anal; ventrals very short, 2 in head, caudal deeply forked; scales firm, moderately imbricated; lateral line complete, gently decurved. Color pale; side with a faint plumbeous band; back and upper part of sides with numerous dark specks chiefly on the margins of the scales, thus forming cross-hatchings; a narrow dark vertebral band on caudal peduncle. Length 2.5 inches. Known only from the Atchafalaya River, Louisiana.

This species resembles *Notropis dilectus*, but has a much smaller mouth, blunter snout, and is less silvery along the side.

26. Notropis venustus (Girard). Two specimens from Michelli.

27. Notropis notemigonoides Evermann. Two specimens from Michelli and 11 from ponds near Beaumont.

28. Anguilla chrysypa Rafinesque. Baldwin Lodge and Atchafalaya River, though not abundant. Considered excellent catfish bait by the Atchafalaya River fishermen.

29. Hiodon alosoides (Rafinesque). *Toothed Herring*; *La Quesche*; *"Slicker."* One specimen from Melville; seen at other places along the Atchafalaya River, where it is used as bait in the catfish fishery. The specimen from Melville agrees exactly with more northern examples.

30. Dorosoma cepedianum exile Jordan & Gilbert. *Hickory Shad*; *"Shad."* Rather common in the Atchafalaya River, where it is of considerable importance as bait. Four specimens from Melville. Doubtless occurs in most waters of this region.

31. **Signalosa atchafalayæ** Evermann & Kendall. *"Shad."* Specimens of this interesting species were obtained at Melville and from Grand Plains and Black bayous. It is not rare in the Atchafalaya River, and is of some importance as bait in the catfish fishery.
32. **Brevoortia tyrannus patronus** Goode. *Gulf Menhaden.* Many very young examples obtained from Grand Plains Bayou.
33. **Stolephorus mitchilli** (Cuvier & Valenciennes). Numerous specimens from Baldwin Lodge and Lake Lapourde.
34. **Lucius vermiculatus** (LeSueur). *Little Pickerel.* Four small specimens from Michelli and 4 from Beaumont.
35. **Fundulus pallidus** Evermann. One example from Michelli.
36. **Fundulus grandis** Baird & Girard. Three from Baldwin Lodge.
37. **Fundulus pulvereus** (Evermann). Found only at Baldwin Lodge, where 4 specimens were collected.
38. **Fundulus chrysotus** Holbrook. Five specimens from Beaumont and 3 from Lake Lapourde.
39. **Fundulus notatus** (Rafinesque). Numerous fine examples from Michelli.
40. **Lucania venusta** (Girard). Common in Grand Plains Bayou and Lake Lapourde.
41. **Cyprinodon variegatus** Lacépède. Five examples from Baldwin Lodge.
42. **Gambusia affinis** (Baird & Girard). Numerous specimens from Grand Plains Bayou, Lake Lapourde, Beaumont, and Michelli. Four females from Michelli contained 60, 70, 73, and 114 well-developed embryos, respectively; the eyes were beginning to show. Six well-advanced examples from Lake Lapourde contained 8, 51, 18, 13, 16, and 20 embryos each. Five others from Lake Lapourde were less advanced. Numerous specimens from Michelli, Baldwin Lodge, and Beaumont were well advanced. The number of young seems to vary with the size of the fish. Very few males were collected.
43. **Mollienisia latipinna** (LeSueur). Numerous fine specimens from Baldwin Lodge.
44. **Siphostoma scovelli** Evermann & Kendall. *Pipefish.* Six from Lake Lapourde and 4 from Grand Plains Bayou. These specimens present the following characters:

Sex.	Head.	Depth.	Snout.	Rings.	Position of dorsal.	No. of dorsal rays.	Location.
Female ..	7+	14	2	17+28	3.5+4	31	Grand Plains Bayou.
Do....	7+	17+	2+	17+33	4 +4	33	Do.
Do....	6.4	14	2	17+30	4 +4	31	Do.
Do....	7+	.....	2+	17+31	4 +5	34	Do.
Do....	7	15.85	2	16+34	4 +4	36	Lake Lapourde.
Do....	7.75	16.4	2	17+34	4 +4	33	Do.
Male	8	26	2	17+34	4 +4	33	Do.
Do....	8	28	2+	17+35	4 +4	33	Do.
Do....	7.84	25	2+	17+36?	4 +4	34	Do.
Do....	8	28	2.25	17+36	4 +4	33?	Do.

45. **Aphredoderus sayanus** (Gilliams). *Pirate Perch.* Several specimens from Michelli, 3 from Beaumont, and 1 from Lake Lapourde.
46. **Menidia peninsulæ** (Goode & Bean). Many specimens from Grand Plains Bayou and Lake Lapourde.
47. **Labidesthes sicculus** (Cope). *Skipjack.* Five specimens from Black Bayou and 9 from Michelli.
48. **Mugil cephalus** Linnæus. *Common Mullet.* Common about Baldwin Lodge; runs up the Atchafalaya at least to Morgan City.

49. **Querimana gyrans** Jordan & Gilbert. One taken in Grand Plains Bayou.
50. **Elassoma zonatum** Jordan. *Pigmy Sunfish.* One taken in Lake Lapourde.
51. **Pomoxis annularis** Rafinesque. *Crappie.* Said to occur in Mulatto Bayou, near Sea Glen, Mississippi.
52. **Pomoxis sparoides** (Lacépède). *Calico Bass.* Two small examples from Beaumont and 3 from Michelli.
53. **Centrarchus macropterus** (Lacépède). *Round Sunfish*; *Flier.* Two young examples from Lake Lapourde. Color in alcohol: Body crossed by five broad olive bands separated by very narrow pale ones. Dorsal ocellus very plain.
54. **Chænobryttus gulosus** (Cuvier & Valenciennes). *Warmouth*; *"Goggle-eye."* Common everywhere; specimens from Grand Plains Bayou, Black Bayou, Lake Lapourde, and Beaumont; reported from Lakes Tasse and Peigneur.
55. **Apomotis symmetricus** (Forbes). Three young from Lake Lapourde, each showing a very distinct dorsal ocellus.
56. **Lepomis miniatus** Jordan. One from Black Bayou and 5 from Lake Lapourde.
57. **Lepomis garmani** Forbes. Eleven specimens from Beaumont and 1 from Michelli, upon which we have the following notes: Head (without flap) 3; depth 2; eye 4; snout 3.5. D. x, 11; A. iii, 9; scales 6–38–12, 5 rows on cheek. Teeth sharp; gillrakers very short.
58. **Lepomis pallidus** (Mitchill). *Blue-gill Sunfish.* One from Black Bayou and 6 from Beaumont.
59. **Eupomotis heros** (Baird & Girard). Two specimens obtained at Beaumont.
60. **Micropterus salmoides** (Lacépède). *Large-mouth Black Bass*; *"Green Trout."* Abundant about Baldwin Lodge and all other waters examined. Specimens from Michelli, Baldwin Lodge, and Beaumont.
61. **Percina caprodes** (Rafinesque). *Log Perch.* One fine specimen from Angelina River, Michelli. Head 4.25; depth 4.84; eye 4.75; snout 3.8. D. xvi–13; A. ii, 9; scales 11–89–10; nape well scaled. About 17 dark vertical bars, with shorter ones above lateral line.
62. **Boleosoma camurum** Forbes. *Darter.* One from Lake Lapourde and 7 from Michelli.
63. **Etheostoma jessiæ** (Jordan & Brayton). *Darter* Three from Michelli.
64. **Roccus chrysops** (Rafinesque). *White Bass*; *"Barfish."* One obtained at Melville; reported from Baldwin Lodge, Lake Tasse, and Lake Peigneur.
65. **Lagodon rhomboides** (Linnæus). *Pinfish*; *Bream.* Specimens from Baldwin Lodge, where it is common.
66. **Archosargus probatocephalus** (Walbaum). *Sheepshead.* Common about Baldwin Lodge and elsewhere on the coast.
67. **Cynoscion nebulosus** (Cuvier & Valenciennes). *Spotted Sea Trout.* One example 8.5 inches long from Lake Borgne.
68. **Sciænops ocellatus** (Linnæus). *Red Drum.* Common about Baldwin Lodge and the mouth of the Atchafalaya River.
69. **Leiostomus xanthurus** Lacépède. *Spot.* Common about Baldwin Lodge, numerous specimens having been obtained there.
70. **Micropogon undulatus** (Linnæus). *Croaker.* Specimens from Baldwin Lodge and Lake Lapourde.
71. **Aplodinotus grunniens** Rafinesque. *"Gaspergou."* Reported from Neches and Angelina rivers and Lakes Tasse and Peigneur.
72. **Microgobius gulosus** (Girard). *Goby.* Five from Grand Plains Bayou.
73. **Gobiosoma bosci** (Lacépède). *Goby.* Common; specimens obtained at Baldwin Lodge, Grand Plains Bayou, and Lake Lapourde.
74. **Achirus fasciatus** Lacépède. *Sole.* One small example from Grand Plains Bayou and 4 from Flat Lake, Morgan City.

POLYODON SPATHULA (Walbaum). *Spoonbill Cat.*

LEPISOSTEUS PLATOSTOMUS Rafinesque. *Short-nosed Gar.*

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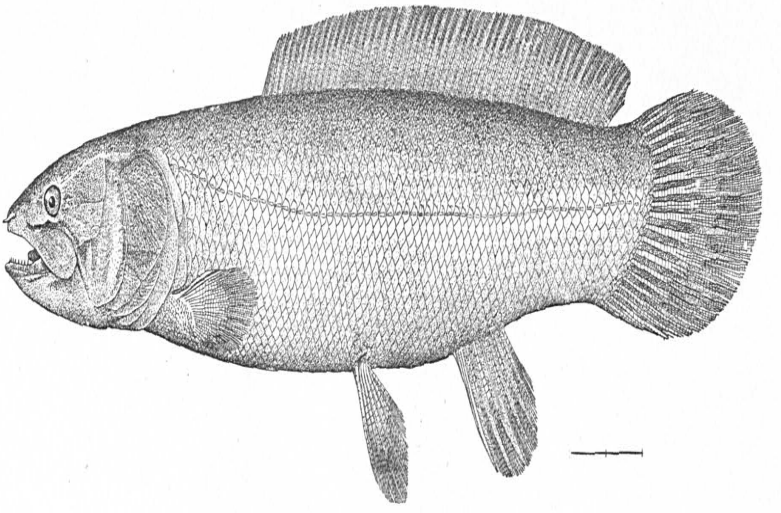
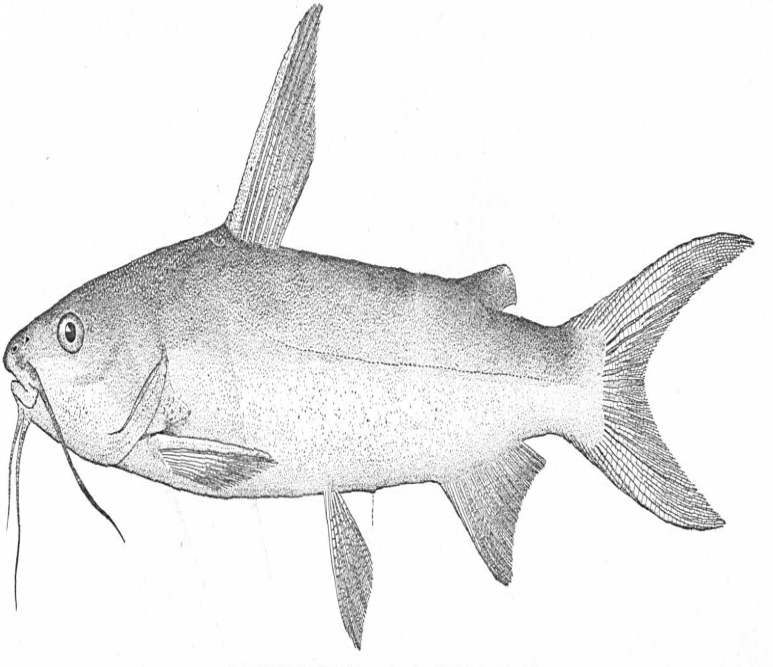


AMIA CALVA Linnæus. *Bowfin; "Grinnel."*



GALEICHTHYS FELIS (Linnæus). *Sea Catfish; "Catfish."*

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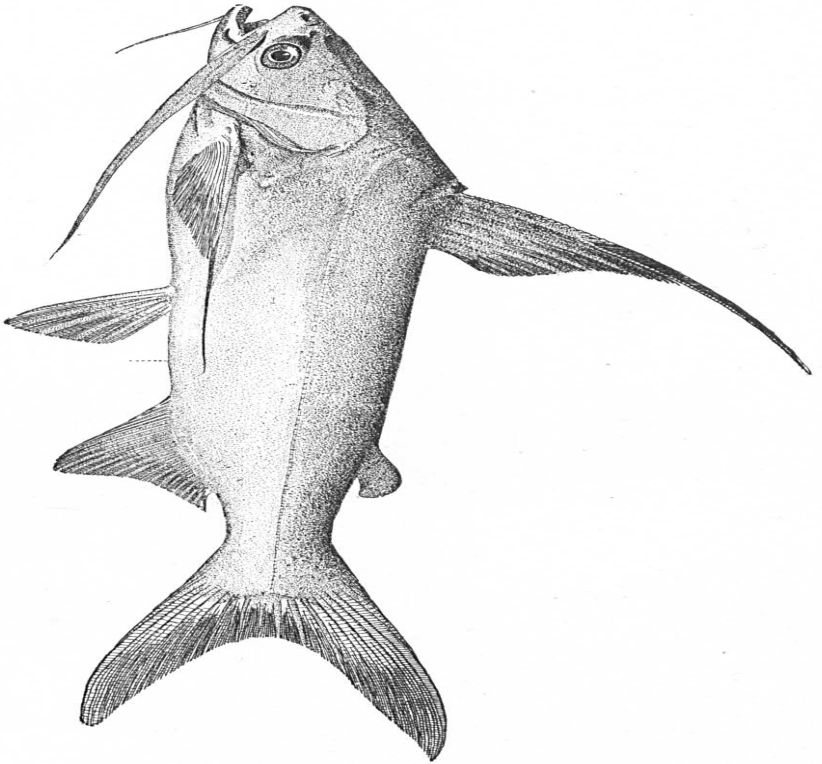
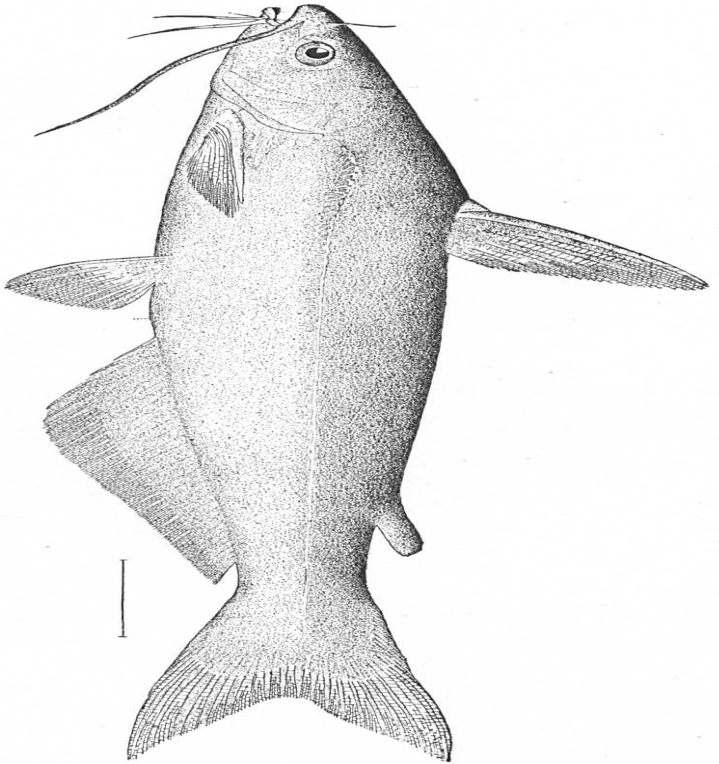
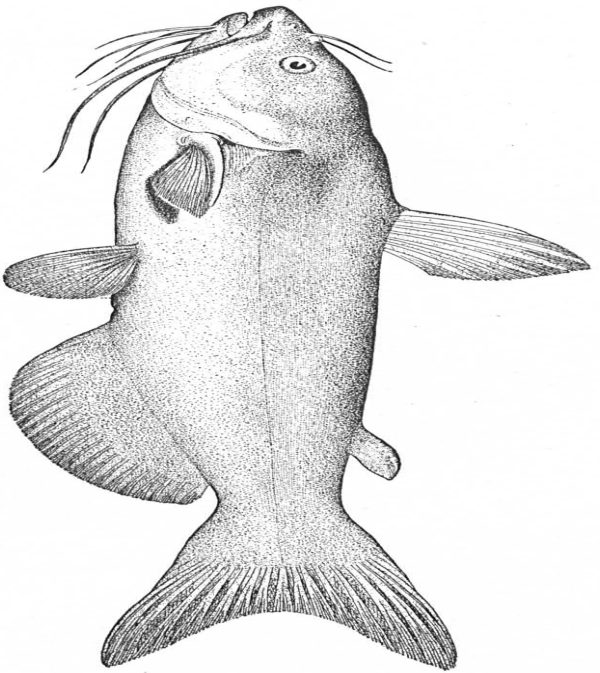


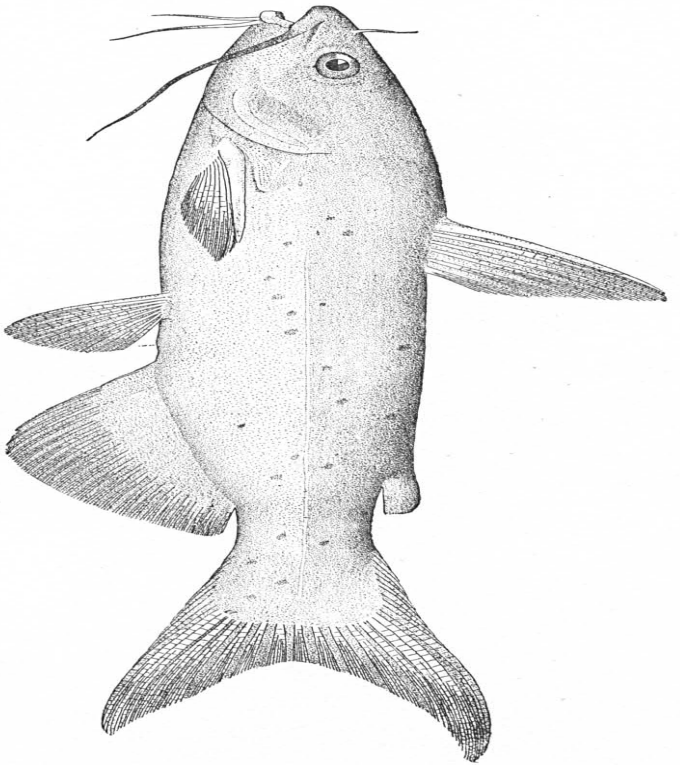
FELICHTHYS MARINUS (Mitchill). *Gaff-topsail*, "Catfish."



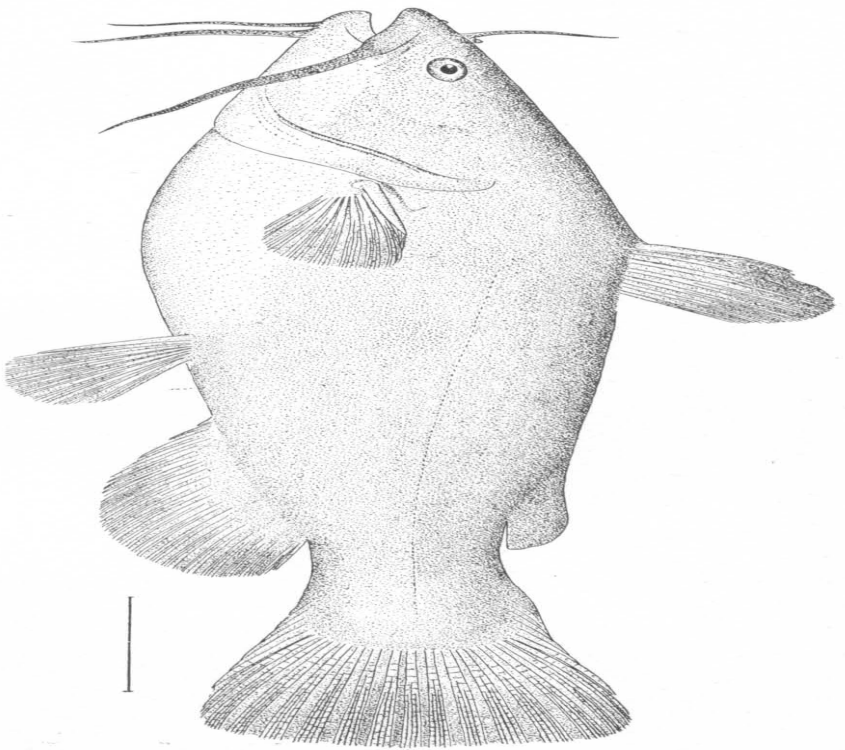
ICTALURUS FURCATUS (LeSueur). *Blue Cat.*



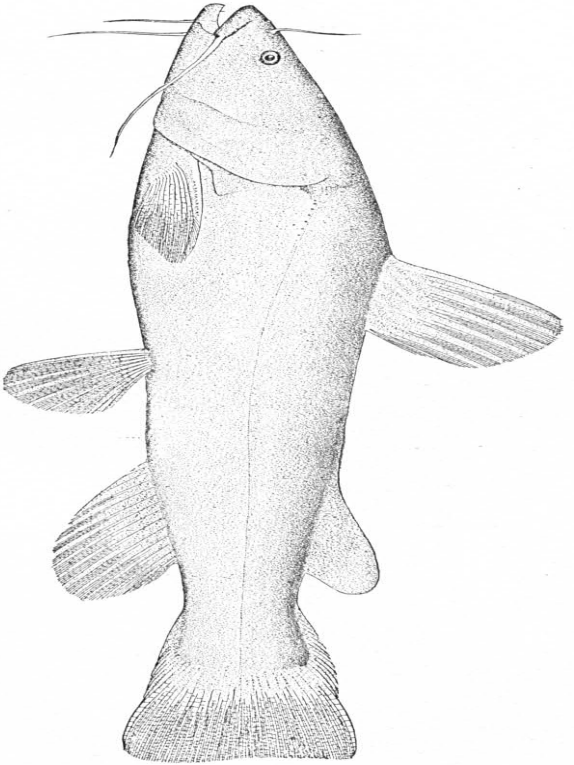
ICTALURUS ANGUILLA Evermann & Kendall. *Bul. Oak.*



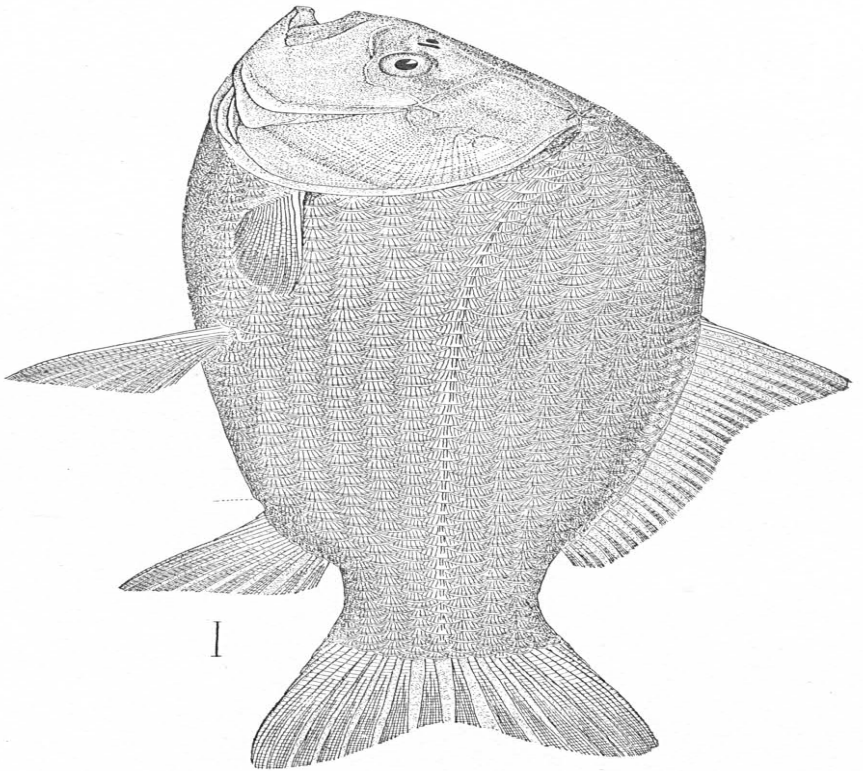
ICTALURUS PUNCTATUS (Rafinesque) *Spotted Cat.*



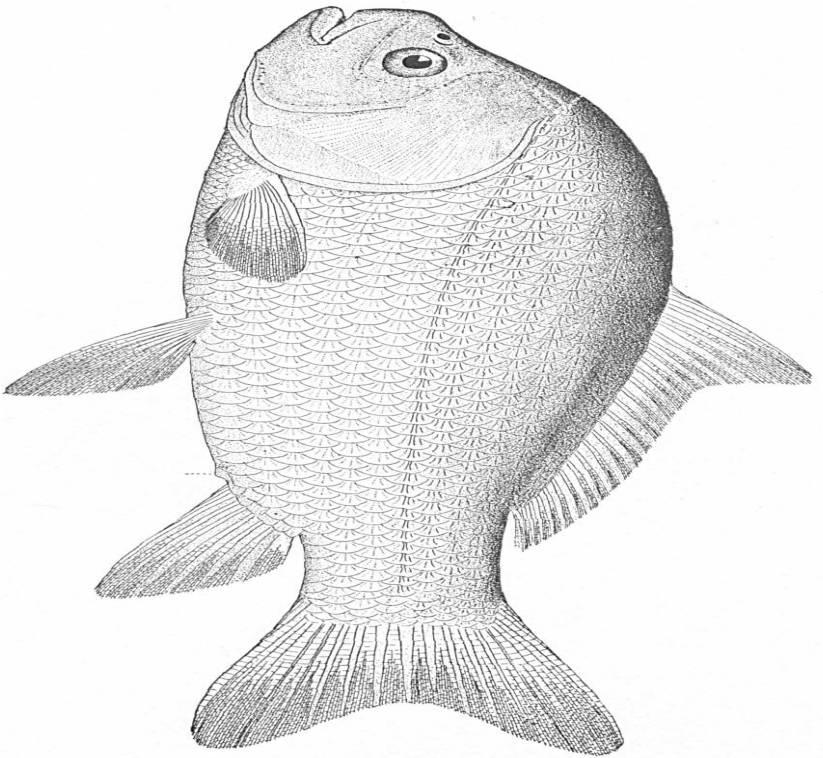
AMEIURUS MELAS (Rafinesque), *Black Bullhead.*



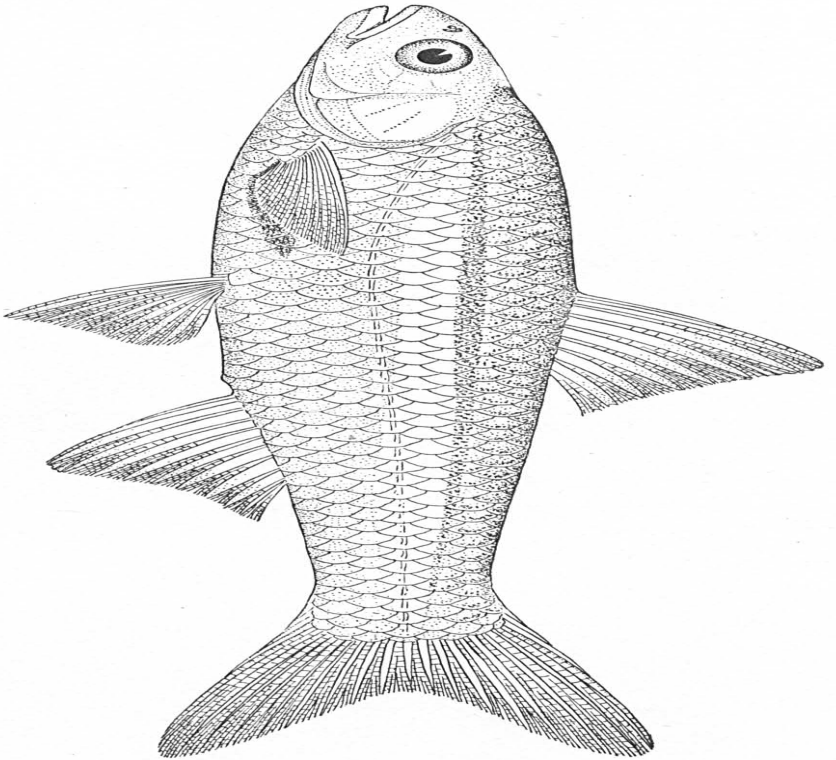
LEPTOPS OLIVARIS (Ratinesque). *Yellow Cat*, "*Goujon.*"



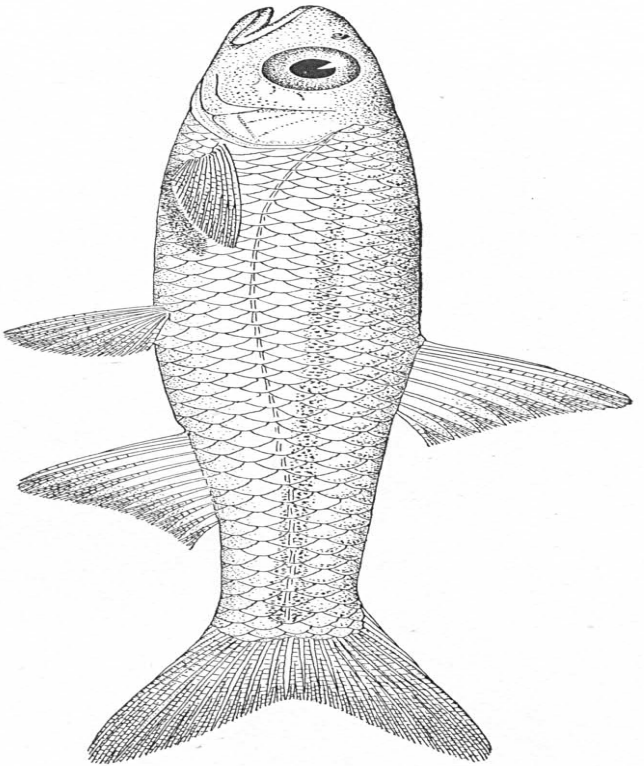
ICTIOBUS CYPRINELLA (Cuvier & Valenciennes). *Common Buffalo-fish*; "*Gourd-head Buffalo.*"



ICTIOBUS BUBALUS (Rafinesque), *Smallmouthed Buffalo*; "*White Buffalo*"

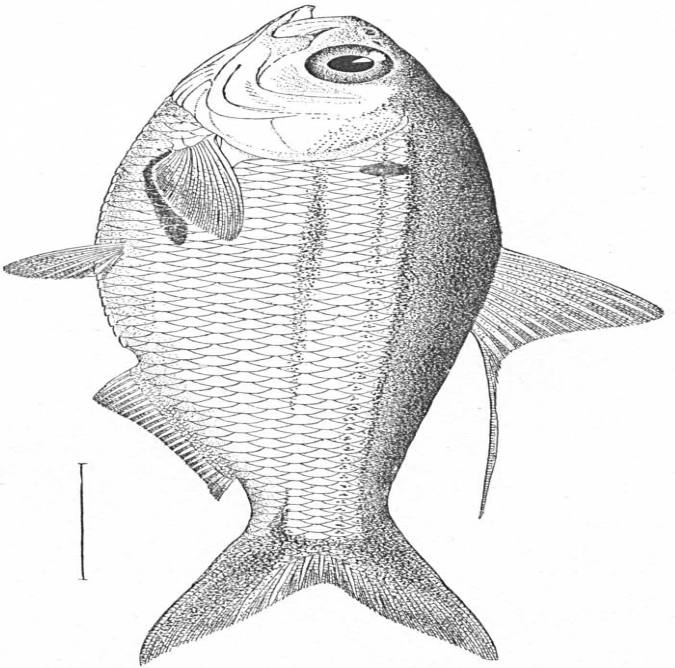


NOTROPIS CHAMBERLAINI Evermann.

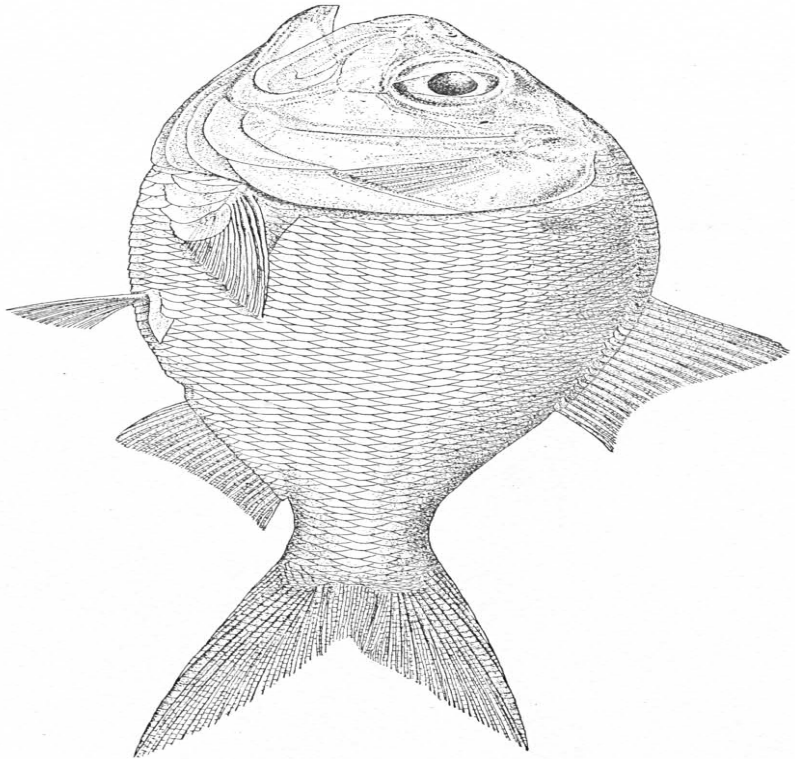


NOTROPIS LOUISIANÆ Evermann.

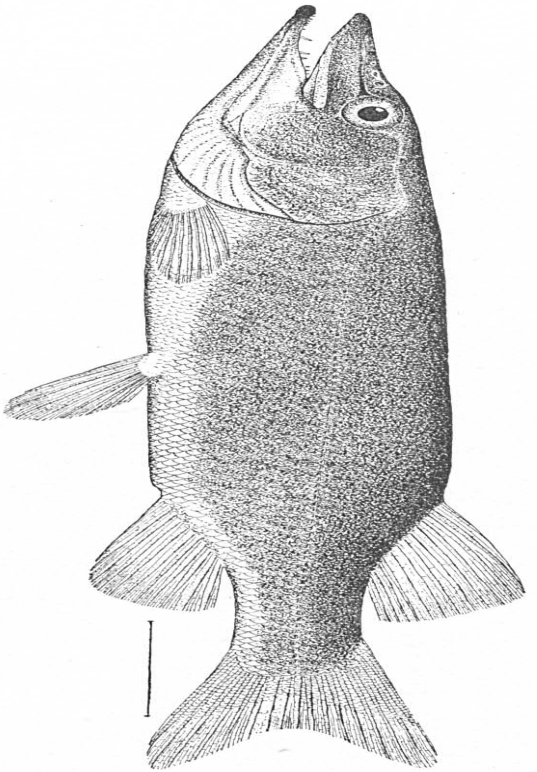
DOROSOMA CEPEDIANUM EXILE Jordan & Gilbert. *Hickory Shad.*



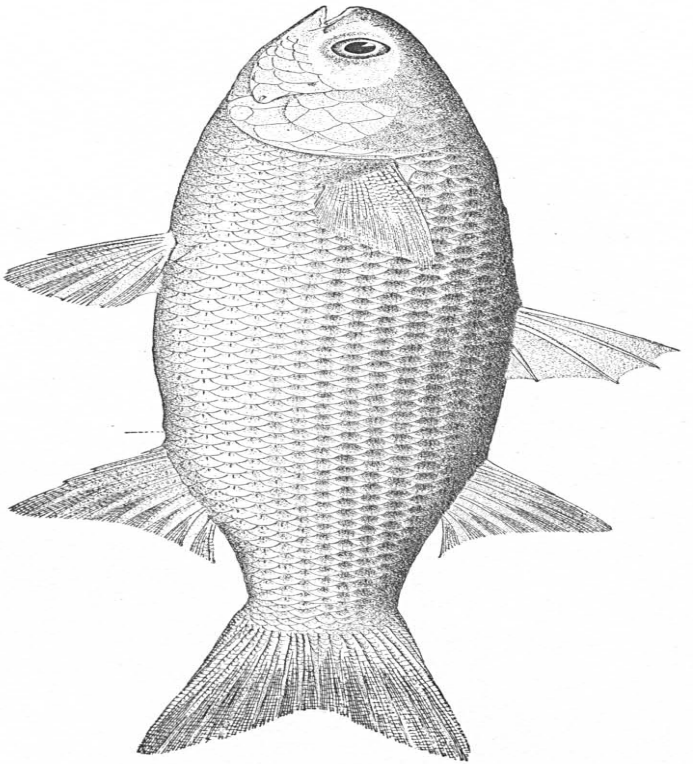
SIGNALOSA ATCHAFALAYÆ Evermann & Kendall.



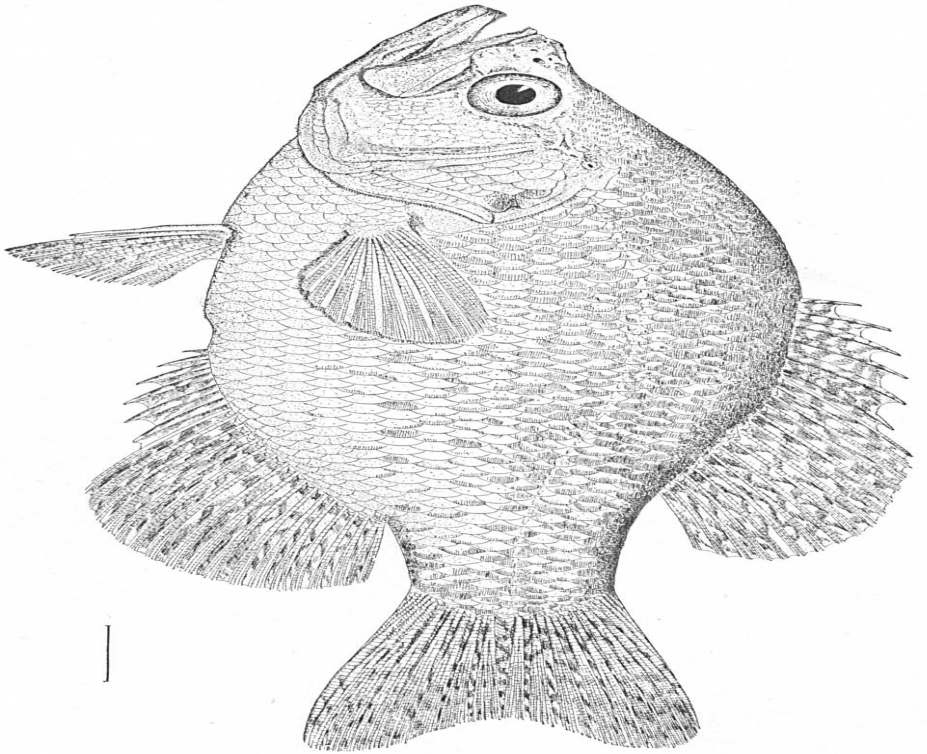
BREVOORTIA TYRANNUS PATRONUS Goode. *Gulf Menhaden.*



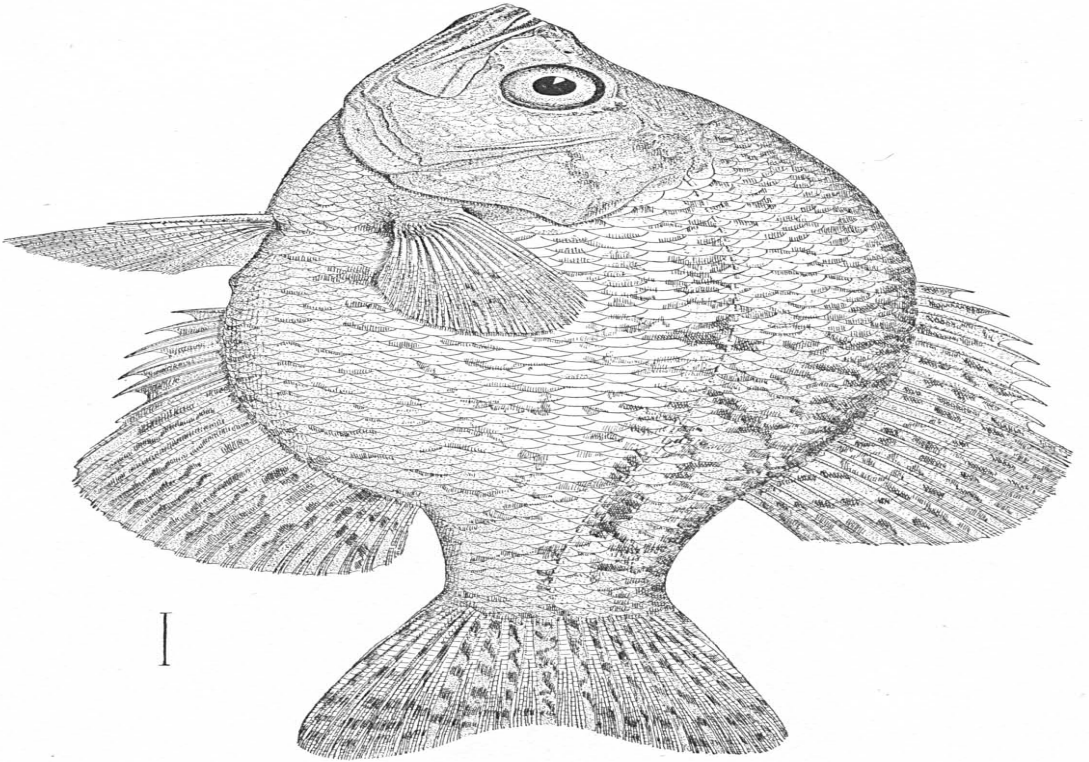
LUCIUS VERMICULATUS (LeSueur). *Little Pickerel.*



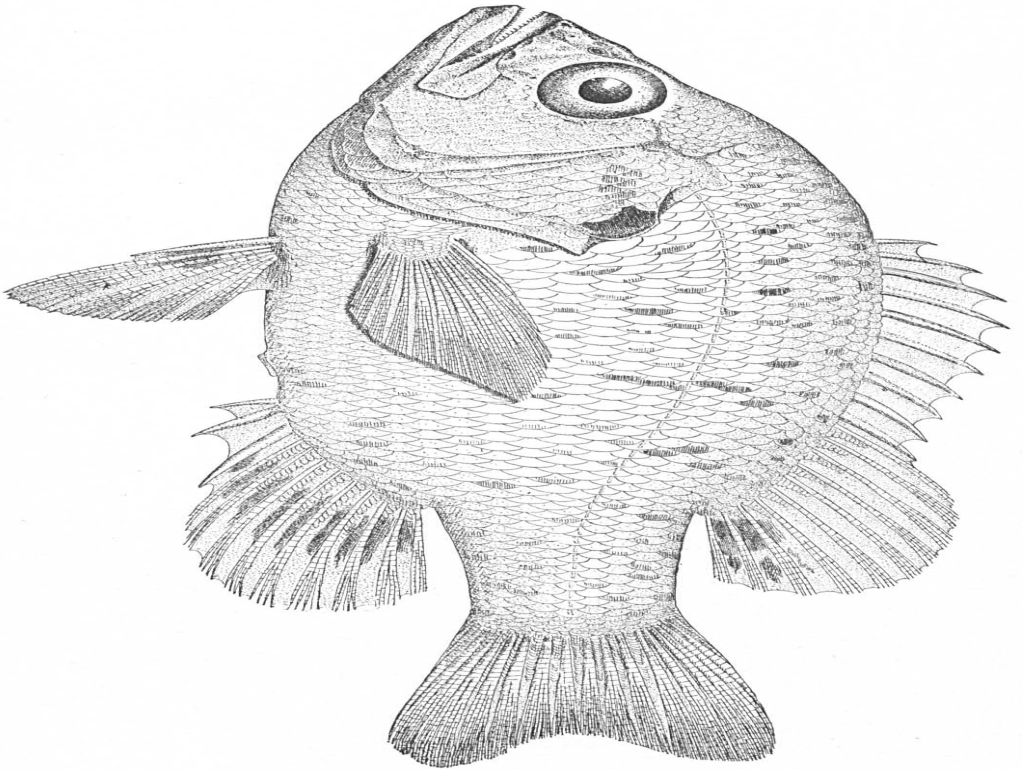
MUGIL CEPHALUS Linnæus. *Common Mullet; Striped Mullet.*



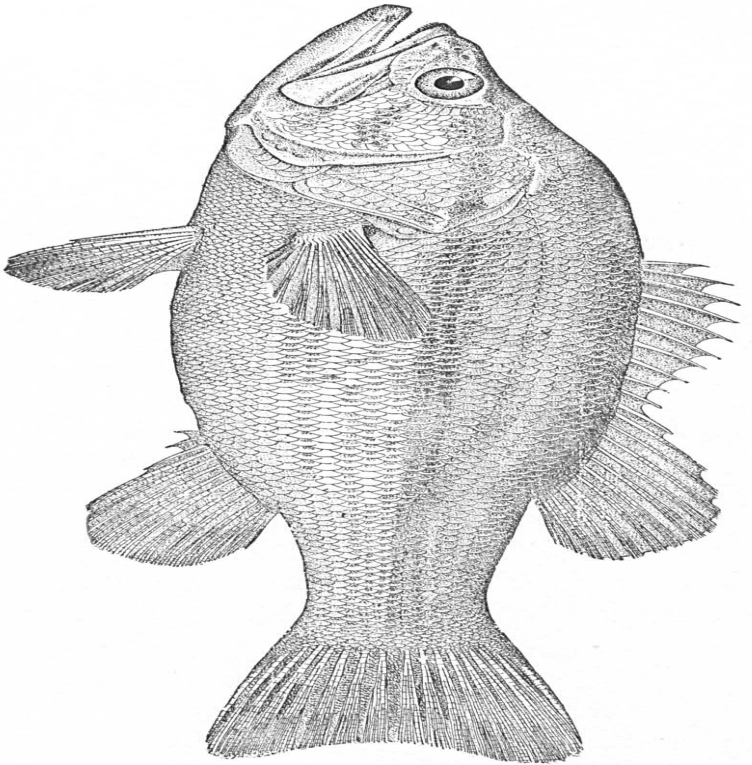
POMOXIS ANNULARIS Rafinesque. *Crappie.*



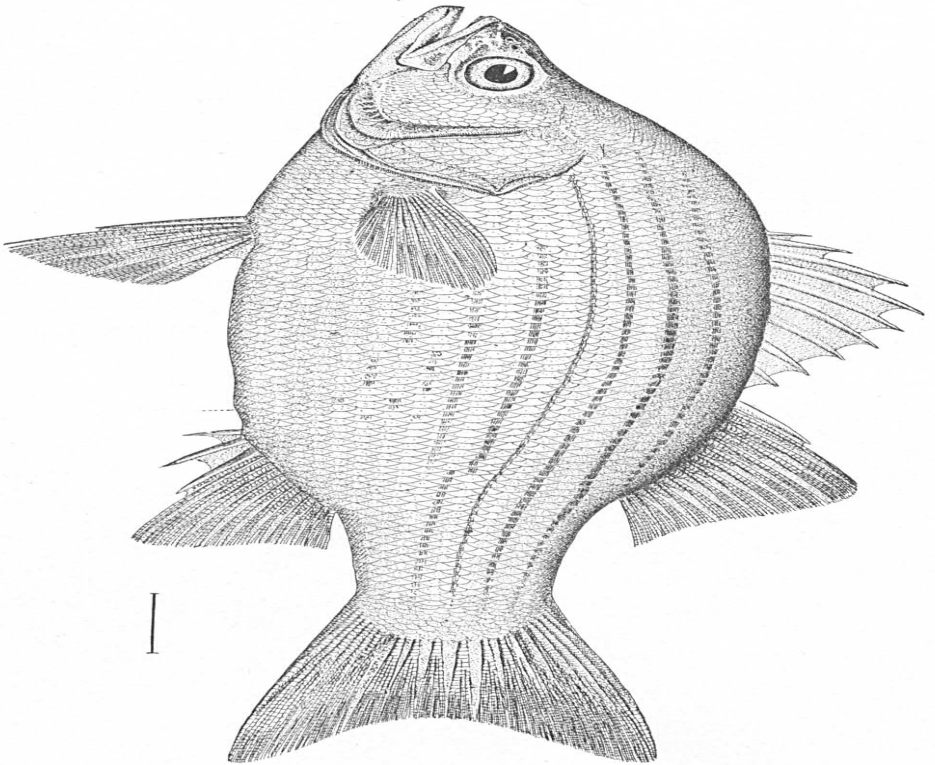
POMOTIS SPAROIDES Lacépède. *Strawberry Bass, Calico Bass.*



CHÆNOBRYTTUS GULOSUS (Cuvier & Valenciennes). Yarmouth, "Gruggle-eye."



MICROPTERUS SALMOIDES (Lacépède). *Large-mouthed Black Bass*, "*Trout*," "*Green Trout*."



ROCCUS CHRYSOPS (Rafinesque). *White Bass*, "*Barfish*."

LAGODON RHOMBOIDES (Linnæus). *Sailor's Choice; Bream; Pinfish.*

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ARCHOSARGUS PROBATOCEPHALUS (Walbaum). *Sheepshead.*

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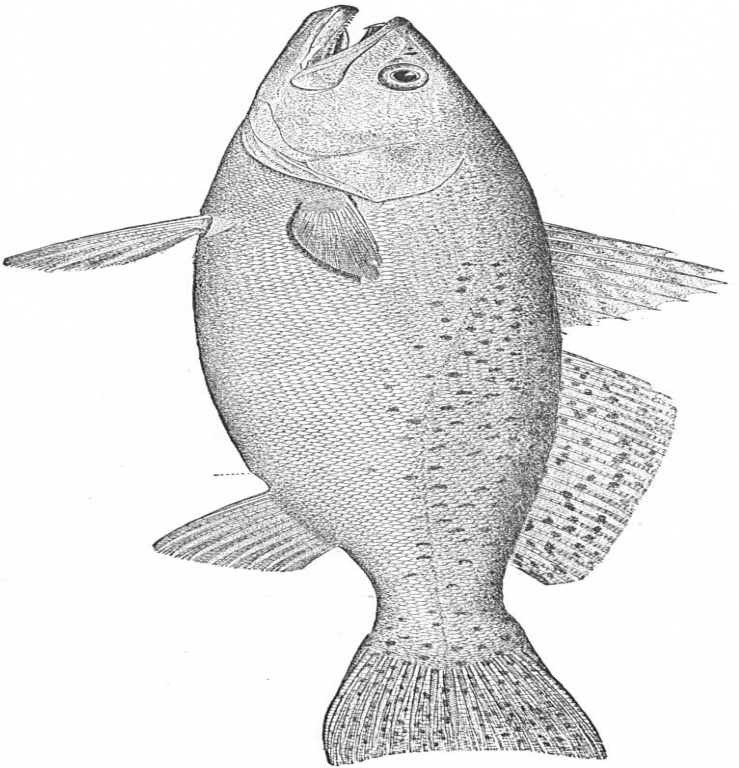
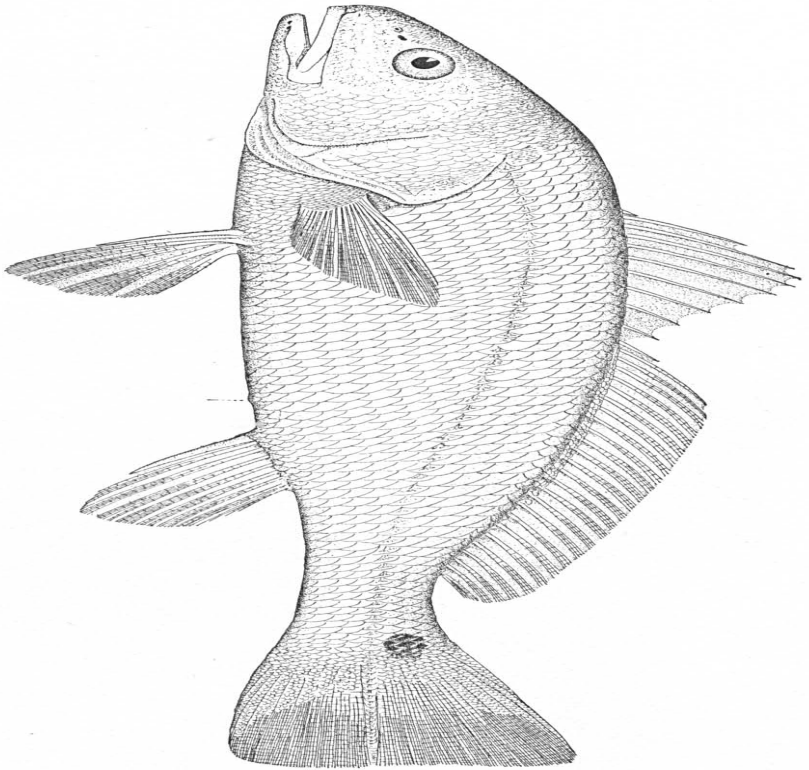
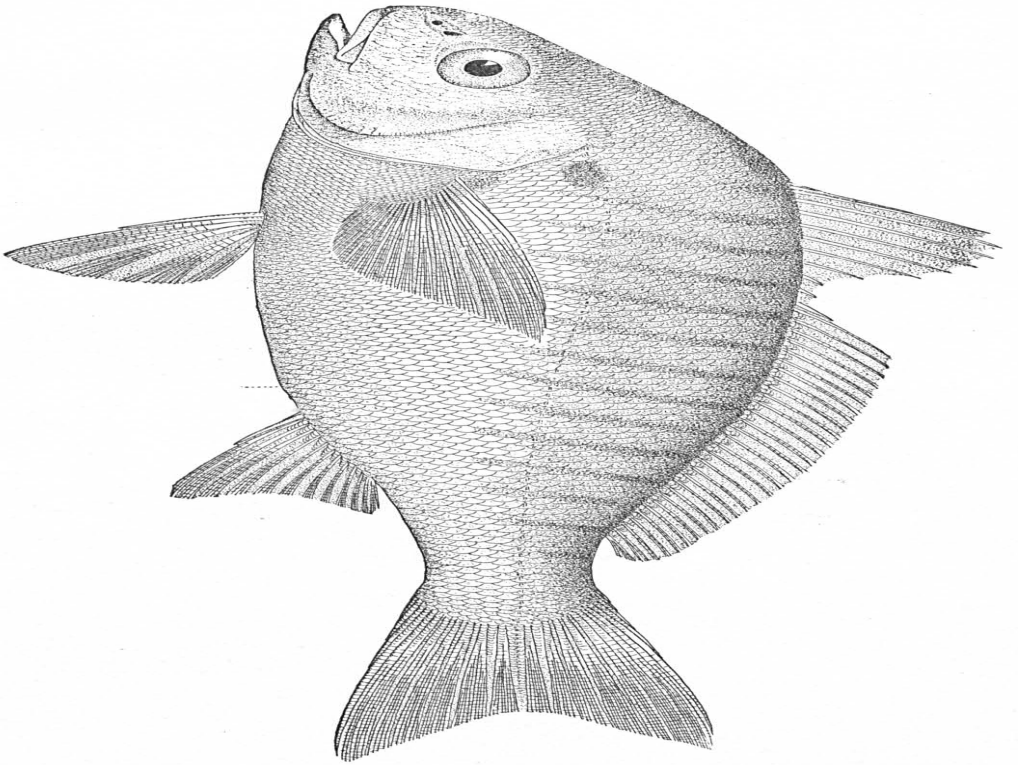


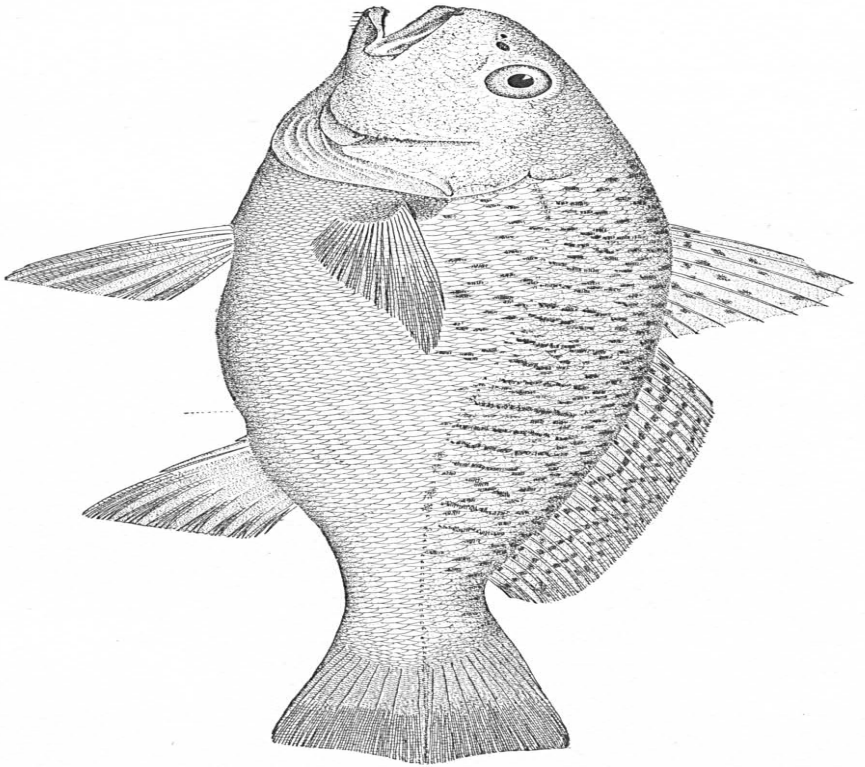
CYNOSCION NEBULOSUS (Cuvier & Valenciennes). *Spotted Squeteague; Spotted Sea Trout.*



SCIÆNOPS OCELLATUS (Linnæus). *Red Drum; Red fish.*



LEIOSTOMUS XANTHURUS Lacépède. *Printed*



MICROPOGON UNDULATUS (Linnæus). *Croaker.*

APLODINOTUS GRUNNIENS Rafinesque. *Fresh water Drum;* "*Gaspergou;*" "*White Perch.*

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