

Job Completion Report

by

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TITLE

Inventory of the species present and their distribution in those portions of the Brazos River within the boundaries of Region 6-B.

OBJECTIVES

To determine the species present and their relative abundance.

METHODS

The fish population of the lower Brazos River, from U. S. Highway 190, to the Gulf Coast near Freeport, was sampled with 8' x 125', square mesh experimental gill nets, consisting of five 25 foot sections, with mesh sizes graduated in one-half inch intervals, from one to three inches. Gill nets 8' x 100' long consisting of 1½, 2, and 3 inch square mesh sizes were also used. Seine collections were made with 30' x 6' bag seines, 30' x 6' straight seines, of ¼" square mesh, and 6' x 4' bobbinet seines of 1/8" square mesh.

The lower Brazos River as defined above, was divided into thirteen stream sections, as shown on accompanying map, for convenience in working the river. Twenty-four seine and forty-five net collections provided a total of 8805 specimens.

Seined specimens and unidentified gill net specimens were preserved in the field with a 10% formalin solution and later identified in the laboratory. Data recorded for individual netted specimens included weight, length, sex, and stage of sexual development. Cooperation of Dr. Clark Hubbs, Department of Zoology, University of Texas, in the verification and identification of several species was greatly appreciated.

RESULTS

Physical Characteristics

The area through which the lower Brazos River flows is divided into two ecological sections by a line that is not easily defined because of much over lapping of physical characteristics. The Post Oak Belt to the north is a rolling wooded plain much of which has been cleared for agricultural purposes along the course of the river. Soil types are sand and sandy loams, and are cut deep by the river, often forming high vertical banks. To the south the river extends through the heavy clays, largely grass covered, of the Coastal Prairies. Deep cut banks are common and like that portion of the stream in the Post Oak Belt the river bed is heavily silted.

Chemical Characteristics

Table I contains a key to the water analysis stations in each of the thirteen stream sections. The enclosed map shows these stream sections numbered from one to thirteen. Table II records the results of a portion of the water analysis done in connection

with Job A-5. As the table indicates, the stream is turbid, and becomes increasingly more turbid during periods of heavy run off over the highly erodable soils of the area. The river was at a low stage when these water analyses were made. However the chart is representative of the respective stream sections during the study period.

### Fish Collections

Table III is a key to the location of the stream sections on the lower Brazos River within Region 6-B. A checklist of fishes collected on the lower Brazos River by netting and seining is contained in Table IV and gives an indication as to the abundance of the 44 species collected. Abundance was based upon the number of stream sections in which each species was found in relation to the thirteen stream sections sampled.

The 44 species collected may be divided into five groups on the basis of their abundance and distribution in the portion of the river under study. The first and most abundant group is composed of the river carpsucker, sharpnose shiner, Brazos River shiner, broadhead shiner, red shiner, parrot minnow, and channel catfish, having been found in over 54% of the stream sections.

The second group includes gizzard shad, speckled dace, common mosquitofish, and striped mullet which are the next most abundant occurring in 38-53% of the stream sections.

Group three includes alligator gar, shortnose gar, blue catfish, bluegill sunfish, longear sunfish and freshwater drum which are third in abundance appearing in 23-37% of the stream sections.

Spotted gar, green sunfish, orange spotted sunfish and white crappie found next in abundance comprise group four occurring in 9-22% of the stream sections.

Group five includes all of those species found to be least abundant collected in 8% or less of the stream sections. This group numbered 23 species or 52% of the 44 species collected. Although recorded data indicates that carp and smallmouth buffalo occur rarely, commercial fishermen report that these species are abundant. Large numbers have been taken in deep water all along the lower Brazos.

Table V contains a checklist of 23 fish species reported to occur in the Brazos River and/or its drainage, none of which were collected in the lower Brazos River within Region 6-B, but some of which might be expected to occur. Job completion reports of Project F-2-R-1, Job B-6 and F-2-R-2, Job A-4 and B-9 report the occurrence of twenty-one of the species in the San Gabriel, Leon, Lampasas and Little Rivers including Brushy Creek, within the boundaries of Region 6-B. According to Job Completion Report, Project F-4-R-1, Job B-6, nine species are reported to occur in the Brazos River and/or its drainage within Region 4-b of which none were collected in the lower Brazos River Job B-12.

Seining and netting results by number of each species is reported in Table VI and includes the number of each species collected per stream section. The tarpon (*T. atlanticus*) reported was collected with rod and reel and had a total length of 39 inches and weight of 17.5 lbs.

Table VII reports the length, weight and coefficient of condition of fish species collected by gill nets from the lower Brazos River, December 1, 1954 through May 30, 1955. Gizzard shad and river carpsucker dominated the rough fish catch totaling 54.39% of 343-netted specimens while channel catfish led game species with 20.43%. Alligator gar and sharpnose shark comprised 71.18% of the total catch by weight. The other twenty species caught by gill nets resulted in only 28.82% of the total catch by weight.

Sport fishermen and commercial fishermen are believed to use the fish resources of the Brazos River extensively. Many anglers were observed, fishing mostly for catfish,

while near the mouth tarpon fishermen were active during the late spring. Commercial fishermen were observed in several localities fishing with nets and others running glass jar traps. Minnows are caught in the traps and large numbers are known to be taken by commercial bait dealers.

#### SUMMARY

1. The lower Brazos River meanders through two overlapping ecological regions. The Post Oak Belt to the north and the Coastal Prairies to the south.
2. The stream is turbid as the chemical analysis chart indicates and becomes more so during periods of heavy run off over the highly erodable soils of the area.
3. Sixty-nine fish collections on the lower Brazos River and its tributaries produced 8805 specimens. Forty-four species were found to occur and twenty-three others are reported to occur in its drainage within Regions 6-B and 4-B.
4. Gizzard shad and river carpsucker dominated the rough fish catch, totaling 54.39% of 343 netted specimens. Channel catfish led the game species with 20.43%.
5. Sport fishermen are believed to harvest large numbers of catfish from the lower Brazos and commercial fishermen are known to use the fish resources extensively.

Table I  
Key to Water Analysis Stations on the Lower Brazos River

Station number	Location
1.	Brazos River, at crossing of U. S. Highway 190, west of Hearne.
2.	Brazos River, at crossing of U. S. Highway 79, southwest of Hearne.
3.	Brazos River, at crossing of State Highway 21, southwest of Bryan.
4.	Brazos River, at crossing of Farm Road 60, southwest of College Station.
5.	Brazos River, at crossing of farm road, southwest of Welborn.
6.	Brazos River, at Washington State Park, Washington.
7.	Brazos River, at crossing of U. S. Highway 290, west of Hempstead.
8.	Brazos River, at crossing of U. S. Highway 159, southwest of Hempstead.
9.	Brazos River, at Stephen F. Austin State Park, east of Sealy.
10.	Brazos River, at crossing of Farm Road 723, north of Rosenberg.
11.	Brazos River, 4 miles northeast of Crabb, Ronson Farm, Fort Bend County.
12.	Brazos River, at crossing of State Highway 35, East Columbia.
13.	Brazos River, at crossing of State Highway 36, near Freeport.

Table II  
Water Analysis of the Lower Brazos River

Stream Section	Date	Air Temp. °F	Water Temp. °F	pH	Chlorides ppm	CO <sub>2</sub> ppm	Secchi disk
1.	11-29-54	64	58	8.2	16	2	11.0
2.	11-29-54	66	58	7.9	14	4	4.0
3.	11-29-54	65	59	8.5	14	1	7.5
4.	11-29-54	73	61	8.6	15	0	10.0
5.	11-29-54	68	59	8.8	14	0	
6.	11-30-54	63	57	8.1	14	3	7.0
7.	11-30-54	64	60	8.3	33	2	7.5
8.	11-30-54	70	63	7.9	39	5	8.0
9.	11-30-54	72	62	8.1	13	2	5.0
10.	11-30-54	77	66	8.4	14	1	5.0
11.	1- 5-55	75	70	8.3	19	3	10.0
12.	1- 6-55	65	65	8.4	28	2	5.0
13.	3-17-55	82	78	8.2	1535	-	12.0

Table III  
Key to Stream Sections on the Lower Brazos River

Stream Section	Location
1.	Brazos River, one mile above U. S. Highway 190, west of Hearne, to one mile above U. S. Highway 79, southwest of Hearne.
2.	Brazos River, one mile above U. S. Highway 79, southwest of Hearne, to one mile above State Highway 21, southwest of Bryan.
3.	Brazos River, one mile above State Highway 21, southwest of Bryan, to one mile above Farm Road 60, southwest of College Station.
4.	Brazos River, one mile above Farm Road 60, southwest of College Station, to one mile above farm road, southwest of Welborn.
5.	Brazos River, one mile above farm road, southwest of Welborn, to six miles above State Highway 90, southwest of Navasota.
6.	Brazos River, six miles above State Highway 90, southwest of Navasota, to one mile above U. S. Highway 290, west of Hempstead.
7.	Brazos River, one mile above U. S. Highway 290, west of Hempstead, to one mile above State Highway 159, southwest of Hempstead.
8.	Brazos River, one mile above State Highway 159, southwest of Hempstead, to one mile above S. F. Austin State Park, east of Sealy.
9.	Brazos River, one mile above S. F. Austin State Park, east of Sealy, to one mile above Farm Road 1093, northeast of Wallis.
10.	Brazos River, one mile above Farm Road 1093, northeast of Wallis, to one mile above U. S. Highway 59, east of Richmond.
11.	Brazos River, one mile above U. S. Highway 59, east of Richmond, to five miles above State Highway 35, east of West Columbia.
12.	Brazos River, five miles above State Highway 35, east of West Columbia, to one mile below Farm Road 521, east of Brazoria.
13.	Brazos River, one mile below Farm Road 521, east of Brazoria, to the mouth of the river on the Gulf Coast, near Freeport.

Table IV  
Checklist of Fishes from the Lower Brazos River

Scientific Name	Common Name	Abundance
<u>Scoliodon terrae-novae</u>	sharpnose shark	R
<u>Lepisosteus spatula</u>	alligator gar	C
<u>Lepisosteus platostomus</u>	shortnose gar	C
<u>Lepisosteus productus</u>	spotted gar	F
<u>Elops saurus</u>	bigeye herring	R
<u>Tarpon atlanticus</u>	tarpon	R
<u>Brevoortia gunteri</u>	bay menhaden	R
<u>Dorosoma petenensis</u>	threadfin shad	R
<u>Dorosoma cepedianum</u>	gizzard shad	A
<u>Anchoa mitchilli</u>	bay anchovy	R
<u>Cycleptus elongatus</u>	bluesucker	R
<u>Ictiobus bubalus</u>	smallmouth buffalo	R
<u>Carpiodes carpio</u>	river carpsucker	VA
<u>Cyprinus carpio</u>	carp	R
<u>Opsopoeodus emiliae</u>	pugnose minnow	R
<u>Hybopsis aestivalis</u>	speckled dace	A
<u>Notropis atherinoides</u>	emerald shiner	R
<u>Notropis oxyrhynchus</u>	sharpnose shiner	VA
<u>Notropis brazosensis</u>	Brazos River shiner	VA
<u>Notropis potteri</u>	broadhead shiner	VA
<u>Notropis lutrensis</u>	red shiner	VA
<u>Pimephales vigilax</u>	parrot minnow	VA
<u>Ictalurus punctatus</u>	channel catfish	VA
<u>Ictalurus furcatus</u>	blue catfish	C
<u>Pilodictus olivaris</u>	yellow catfish	R
<u>Bagre marina</u>	gafftopsail catfish	R
<u>Galeichthys felis</u>	sea catfish	R
<u>Gambusia affinis</u>	common mosquitofish	A
<u>Aphredoderus sayanus</u>	pirate perch	R
<u>Mugil cephalus</u>	striped mullet	A
<u>Morone chrysops</u>	white bass	R
<u>Chaenobryttus coronarius</u>	warmouth bass	R
<u>Lepomis cyanellus</u>	green sunfish	F
<u>Lepomis macrochirus</u>	bluegill sunfish	C
<u>Lepomis humilis</u>	orangespotted sunfish	F
<u>Lepomis megalotis</u>	longear sunfish	C
<u>Pomoxis annularis</u>	white crappie	F
<u>Aplodinotus grunniens</u>	freshwater drum	C
<u>Leiostomus xanthurus</u>	spot	R
<u>Micropogon undulatus</u>	Atlantic croaker	R
<u>Cynoscion nebulosus</u>	spotted squeteague	R
<u>Lagodon rhomboides</u>	pinfish	R
<u>Urophysis floridanus</u>	hake	R
<u>Fundulus grandis</u>	large killifish	R

Abundance was based upon the percentage of the total number of stream sections in which each species was found. Example: VA very abundant (present in over 54% of the stream sections), A abundant (38-53%), C common (23-37%), F frequent (9-22%), and R rare (8% or less).

Table V

Checklist of species reported to occur in the Brazos River Drainage, but not collected in the Lower Brazos River.

Scientific Name	Common Name	Region 6-B	Region 4-B
<u>Astynax fasciatus</u>	Rio Grande tetra	x	
<u>Moxostoma congestum</u>	gray redhorse	x	x
<u>Notropis fumeus</u>	ribbon shiner		x
<u>Notropis amnis</u>	pallid shiner		x
<u>Notropis venustus</u>	blacktail shiner	x	x
<u>Notropis volucellus</u>	mimic shiner	x	
<u>Notropis buchanani</u>	ghost shiner	x	
<u>Dionda episcopa</u>	roundhouse minnow	x	
<u>Hybognathus nuchalis</u>	silvery minnow	x	x
<u>Pimephales promelas</u>	fathead minnow	x	
<u>Compostoma anomalum</u>	stoneroller	x	
<u>Ameiurus melas</u>	black bullhead	x	
<u>Ameiurus natalis</u>	yellow bullhead	x	x
<u>Schilbeodes gyrinus</u>	tadpole madtom	x	
<u>Fundulus nototus</u>	blackstripe topminnow	x	x
<u>Micropterus punctulatus</u>	spotted black bass	x	
<u>Micropterus treculi</u>	Texas spotted bass	x	
<u>Micropterus salmoides</u>	largemouth bass	x	x
<u>Lepomis punctatus</u>	spotted sunfish	x	x
<u>Haproterus scierus</u>	dusky darter	x	
<u>Percina caprodes</u>	logperch	x	
<u>Etheostoma chorosomum</u>	bluntnose darter	x	
<u>Etheostoma spectabile</u>	orangethroat darter	x	

Table VI

Number of Each Fish Species Taken From Each Stream Section  
by Seining and Netting Dec. 1954 through May 1955.

Fish Species	Stream Sections							
	1	2	3	4	5	6	7	8
<i>S. terrae-novae</i>	0	0	0	0	0	0	0	0
<i>L. spatula</i>	0	0	0	0	0	0	0	0
<i>L. platostomus</i>	0	12	0	0	0	0	0	0
<i>L. productus</i>	0	0	0	0	0	0	0	0
<i>E. saurus</i>	0	0	0	0	0	0	0	0
<i>T. atlanticus</i>	0	0	0	0	0	0	0	0
<i>B. gunteri</i>	0	0	0	0	0	0	0	0
<i>D. petensis</i>	0	0	0	0	0	0	0	0
<i>D. cepedianum</i>	9	51	0	0	0	64	0	0
<i>A. mitchilli</i>	0	0	0	0	0	0	0	0
<i>C. elongatus</i>	0	0	0	0	0	1	0	0
<i>I. bubalus</i>	0	0	1	0	0	0	0	0
<i>Carpiodes carpio</i>	17	25	0	0	9	21	2	0
<i>Cyprinus carpio</i>	0	0	0	0	0	1	0	0
<i>O. emiliae</i>	0	0	0	0	0	1	0	0
<i>H. aestivalus</i>	65	0	0	2	21	25	0	1
<i>N. atherinoides</i>	0	0	0	0	0	0	0	0
<i>N. oxyrhynchus</i>	137	81	26	94	213	532	177	478
<i>N. brazosensis</i>	13	0	14	100	0	89	9	6
<i>N. potteri</i>	48	14	17	3	14	68	4	0
<i>N. lutrensis</i>	1295	162	77	67	57	450	69	652
<i>P. vigilax</i>	380	22	30	31	10	186	28	14
<i>I. punctatus</i>	11	12	0	2	0	31	0	0
<i>I. furcatus</i>	0	10	0	0	0	7	0	0
<i>P. olivaris</i>	0	0	0	0	0	1	0	0
<i>B. marina</i>	0	0	0	0	0	0	0	0
<i>G. felis</i>	0	0	0	0	0	0	0	0
<i>G. affinis</i>	43	3	2	0	0	0	0	0
<i>A. sayanus</i>	0	0	0	0	0	0	0	0
<i>M. cephalus</i>	0	0	0	0	0	9	0	0
<i>M. chrysops</i>	0	0	0	0	0	1	0	0
<i>C. coronarius</i>	2	0	0	0	0	0	0	0
<i>L. cyanellus</i>	9	0	0	0	0	0	0	0
<i>L. macrochirus</i>	226	0	0	0	0	5	0	0
<i>L. humilis</i>	2	0	0	0	0	4	0	0
<i>L. megalotis</i>	263	5	0	0	0	3	0	0
<i>P. annularis</i>	0	1	0	0	0	3	0	0
<i>A. grunniens</i>	0	1	0	0	0	6	0	0
<i>L. xanthurus</i>	0	0	0	0	0	0	0	0
<i>M. undulatus</i>	0	0	0	0	0	0	0	0
<i>C. nebulosus</i>	0	0	0	0	0	0	0	0
<i>L. rhomboides</i>	0	0	0	0	0	0	0	0
<i>U. floridanus</i>	0	0	0	0	0	0	0	0
<i>F. grandis</i>	0	0	0	0	0	0	0	0
Totals	2520	399	167	299	324	1508	289	1151

Table VI - Continued  
 Number of Each Fish Species Taken From Each Stream Section  
 by Seining and Netting Dec. 1954 Through May 1955

Fish Species	9	10	11	12	13	Total	Percent
<i>S. terrae-novae</i>	0	0	0	0	5	5	0.06
<i>L. spatula</i>	0	2	2	2	2	8	0.09
<i>L. platostomus</i>	3	1	1	0	0	17	0.19
<i>L. productus</i>	0	0	1	0	0	1	0.01
<i>E. saurus</i>	0	0	0	0	2	2	0.02
<i>T. atlanticus</i>	0	0	0	0	1	1	0.01
<i>B. gunteri</i>	0	0	0	0	28	28	0.32
<i>D. petensis</i>	0	0	1	0	0	1	0.01
<i>D. cepedianum</i>	2	0	5	0	11	142	1.61
<i>A. Mitchilli</i>	0	0	0	0	2	2	0.02
<i>C. elongatus</i>	0	0	0	0	0	1	0.01
<i>I. bubalus</i>	0	0	0	0	0	1	0.01
<i>Carpiodes carpio</i>	8	3	0	0	0	85	0.97
<i>Cyprinus carpio</i>	0	0	0	0	0	1	0.01
<i>O. emiliae</i>	0	0	0	0	0	1	0.01
<i>H. aestivalus</i>	24	0	0	0	0	138	1.56
<i>N. atherinoides</i>	0	0	1	0	0	1	0.01
<i>N. oxyrhynchus</i>	430	61	0	0	0	2229	25.31
<i>N. brazosensis</i>	8	4	0	0	0	243	2.75
<i>N. potteri</i>	2	0	0	0	0	170	1.93
<i>N. lutrensis</i>	171	627	29	0	0	3656	41.52
<i>P. vigilax</i>	82	29	1	0	0	813	9.23
<i>I. punctatus</i>	7	4	1	0	0	68	0.77
<i>I. furcatus</i>	3	0	0	4	0	24	0.27
<i>P. olivaris</i>	0	0	0	0	0	1	0.01
<i>B. marina</i>	0	0	0	0	5	5	0.06
<i>G. felis</i>	0	0	0	0	3	3	0.03
<i>G. affinis</i>	0	27	21	0	0	96	1.09
<i>A. sayanus</i>	0	1	0	0	0	1	0.01
<i>M. cephalus</i>	1	33	405	1	49	498	5.65
<i>M. chrysops</i>	0	0	0	0	0	1	0.01
<i>C. coronarius</i>	0	0	0	0	0	2	0.02
<i>L. cyanellus</i>	0	1	0	0	0	10	0.11
<i>L. macrochirus</i>	2	2	0	0	0	235	2.66
<i>L. humilis</i>	0	0	0	0	0	6	0.07
<i>L. megalotis</i>	4	0	0	0	0	275	3.12
<i>P. annularis</i>	0	0	0	0	0	4	0.05
<i>A. grunniens</i>	1	0	0	2	0	10	0.11
<i>L. xanthurus</i>	0	0	0	0	4	4	0.05
<i>M. undulatus</i>	0	0	0	0	12	12	0.14
<i>C. nebulosus</i>	0	0	0	0	1	1	0.01
<i>L. rhomboides</i>	0	0	0	0	1	1	0.01
<i>U. floridanus</i>	0	0	0	0	1	1	0.01
<i>F. grandis</i>	0	0	0	0	1	1	0.01
Totals	748	795	468	9	128	8805	99.93

Table VII

Length, Weight, and Coefficient of Condition of Fish Collected by Gill Nets  
From the Lower Brazos River, Dec. 1954 through May 1955.

Fish Species	Number of Spec.	Standard Length Range	Standard Length Average	Weight Range (grams)	Total Weight (lbs.)	Weight Average (grams)	"K" Factor Range	"K" Factor Average
<i>S. terrae-novae</i>	5	36.5"-66"	54.6"	32*-93*	301.0	60.4*	-	-
<i>L. spatula</i>	8	2.2'-6.1**	7.3'	2.5*-120*	537.5	67.2*	-	-
<i>L. platostomus</i>	16	620-1000	733	879-6209	94.3	2677	0.579-5.465	3.035
<i>L. productus</i>	2	450-477	464	567-680	2.8	624	0.589-0.762	0.672
<i>D. cepedianum</i>	132	125-330	243	85-709	73.0	305	1.315-4.352	2.059
<i>C. elongatus</i>	1	486	486	2126	4.7	2126	1.852	1.852
<i>I. bubalus</i>	1	350	350	1531	3.4	1531	3.571	3.571
<i>Carpiones carpio</i>	55	146-315	237	4-964	54.3	450	0.091-4.047	2.754
<i>Cyprinus carpio</i>	1	418	418	2155	4.8	2155	2.950	2.950
<i>I. punctatus</i>	46	64-466	251	14-1814	38.2	376	1.165-5.334	1.751
<i>I. furcatus</i>	24	94-521	303	85-2268	28.8	546	1.063-4.764	1.628
<i>P. olivaris</i>	1	369	369	1134	2.5	1134	2.257	2.257
<i>E. marina</i>	5	325-508	405	539-1474	11.8	1016	1.053-2.325	1.528
<i>G. felis</i>	3	75-325	168	14-567	1.4	213	1.652-5.375	3.448
<i>M. cephalus</i>	13	237-284	262	312-482	10.9	383	1.362-2.458	2.318
<i>M. chrysops</i>	1	200	200	227	0.5	227	2.838	2.838
<i>Lepomis (all sunfish)</i>	1	101	101	40	0.1	40	3.884	3.884
<i>P. annularis</i>	3	120-215	153	57-312	1.0	147	3.135-4.046	3.502
<i>A. grunniens</i>	10	143-249	203	57-397	4.4	199	1.312-2.573	2.322
<i>L. xanthurus</i>	3	104-167	177	57-113	0.6	86	2.075-5.067	3.189
<i>M. undulatus</i>	11	59-235	139	14-340	1.9	76	0.977-6.804	2.802
<i>C. nebulosus</i>	1	189	189	142	0.3	142	2.103	2.103
Totals		** total lgth.		* pounds	1178.2			

# LOWER BRAZOS RIVER VALLEY OF TEXAS

