

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-6-R-9

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION 8-B

Job No. B-20 Fisheries Reconnaissance

Project Leader: Alvin G. Flury

H. D. Dodgen  
Executive Secretary  
Texas Game and Fish Commission  
Austin, Texas

Marion Toole  
D-J Coordinator

Eugene A. Walker  
Director, Program Planning

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## ABSTRACT

Five lakes were visited during this segment to see if any appreciable changes in the fish populations had occurred since the previous survey. Also, four lakes in the Escondido Creek watershed were checked as well as portions of the Frio and Leona Rivers in Frio County. Largemouth bass fingerlings were stocked in the Nueces River in Zavala County.

In Delta Orchards Lake, near Monte Alto, Hidalgo County, game fish species (channel and Rio Grande blue catfish, white crappie and freshwater drum) showed a relative increase in numbers and a relative decrease in weight.

Rough fish species (spotted and longnose gars, gizzard shad, small-mouth buffalo, river carpsucker, carp, freshwater drum and Rio Grande perch) were found to be dominant in Falcon Lake, both by numbers and by weight. However, game fish species including white bass, largemouth bass, white crappie, channel catfish and Rio Grande blue catfish, are in good condition and anglers continue to catch nice strings of fish.

Two significant changes were noted concerning the fish population in Fort Brown Lake. There was an increase in the number of gizzard shad and a decrease in the number of bluegills.

Current information shows that longnose and spotted gars, buffalo, carp, river carpsucker, Rio Grande perch, Rio Grande blue catfish and white crappie are now present in Bentsen State Park Lake. The lake was renovated in January 1960.

Lake Casa Blanca's white crappie population showed more than a 17 per cent increase since the previous survey in July 1960. River carpsucker, threadfin shad, and channel catfish showed slight increases in numbers, percentage wise, but these "changes" are probably attributable to netting bias. Gizzard shad and freshwater drum were found in lesser numbers than in the previous survey.

Three of the four lakes in the Escondido Creek watershed, checked during this segment, contained populations of bullheads. Sunfish, of one species or another, were present in all the lakes checked.

The fish populations in portions of the Frio and Leona Rivers in Frio County were checked in order to formulate the fish harvest regulations for Frio County which is under regulatory authority of the Game and Fish Commission.

Largemouth bass fingerlings were stocked in the Nueces River in Zavala County on the findings of the recent study (Project F-6-R-8, Job B-16) made on that river.

No recommendations for Federal Aid developmental work are made in this report.

## JOB COMPLETION REPORT

State of Texas

Project No. E-6-R-9

Name: Fisheries Investigations and Surveys  
of the Waters of Region 8-B

Job No. B-20

Title: Fisheries Reconnaissance

Period Covered: January 1 through December 31, 1961

### Objectives:

To conduct limited investigations to obtain current information concerning gross changes in fishing conditions and factors influencing fish populations.

### Techniques Used:

Experimental gill nets and seines were used to sample the fish populations. Nets were set overnight at previously established netting stations and were run the following morning. The netted specimens were weighed in grams and measured in millimeters in the field. Sex and sexual development and the occurrence of parasites in the individual specimens were noted and recorded. Seined specimens were preserved and taken to the regional fisheries laboratory at Mathis for identification. A list of the common and scientific names of fish species taken during this study is included as Table 1.

Water analyses were made on Casa Blanca Lake but were not made on other lakes checked due to old or insufficient quantities of reagents. A limited check of the surrounding area of each lake was made to determine land usage and possible sources of pollution.

Reference points were established on many of the lakes studied during this period for the purpose of comparing water levels.

Fishermen usage of the various lakes was determined largely by talking to camp owners, game wardens and sometimes fishermen. With the exception of the lakes in the Escondido Creek watershed, public access is available to the lakes studied in this segment.

### Findings:

#### Delta Orchards Lake

Delta Orchards Lake, a 2,200 surface acre irrigation reservoir near

Table 1. Checklist of Species Referred to in Text and Tables

Common Name	Scientific Name
Alligator gar	<u>Lepisosteus spatula</u> Lacépède
Spotted gar	<u>Lepisosteus oculatus</u> (Winchell)
Longnose gar	<u>Lepisosteus osseus</u> (Linnaeus)
Threadfin shad	<u>Dorosoma petenense</u> (Gunther)
Gizzard shad	<u>Dorosoma cepedianum</u> (LeSueur)
Mexican tetra	<u>Astyanax mexicanus</u> (Filippi)
Smallmouth buffalo	<u>Ictiobus bubalus</u> (Rafinesque)
River carpsucker	<u>Carpionodes carpio</u> (Rafinesque)
Carp	<u>Cyprinus Carpio</u> Linnaeus
Golden shiner	<u>Notemigonus crysoleucas</u> (Mitchill)
Pugnose minnow	<u>Opsopoeodus emiliae</u> Hay
Texas shiner	<u>Notropis amabilis</u> (Girard)
Red shiner	<u>Notropis lutrensis</u> (Baird and Girard)
Bullhead minnow	<u>Pimephales vigilax</u> (Baird and Girard)
Stoneroller	<u>Campostoma anomalum</u> (Rafinesque)
Channel catfish	<u>Ictalurus punctatus</u> (Rafinesque)
Rio Grande blue catfish	<u>Ictalurus furcatus</u> (LeSueur)
Black bullhead	<u>Ictalurus melas</u> (Rafinesque)
Flathead catfish	<u>Pylodictus olivaris</u> (Rafinesque)
Atlantic needlefish	<u>Strongylura marina</u> (Walbaum)
Sheepshead minnow	<u>Cyprinodon variegatus</u> Lacépède
Mosquitofish	<u>Gambusia affinis</u> (Baird and Girard)
Amazon molly	<u>Mollinnesia formosa</u> (Girard)
Tidewater silverside	<u>Menidia beryllina</u> (Cope)
White bass	<u>Roccus chrysops</u> (Rafinesque)
Largemouth bass	<u>Micropterus salmoides</u> (Lacépède)
Warmouth	<u>Chaenobryttus gulosus</u> (Cuvier)
Green sunfish	<u>Lepomis cyanellus</u> Rafinesque
Redear sunfish	<u>Lepomis microlophus</u> (Gunther)
Bluegill	<u>Lepomis macrochirus</u> Rafinesque
White crappie	<u>Pomoxis annularis</u> Rafinesque
Freshwater drum	<u>Aplodinotus grunniens</u> Rafinesque
Rio Grande perch	<u>Cichlasoma cyanoguttatum</u> (Baird and Girard)

Monte Alto, is a part of the Hidalgo and Willacy Counties Water Control and Improvement District No. 1. The reservoir contains approximately 20,000 acre-feet of water which is used to irrigate nearly 70,000 acres of farm land. Water in the lake originates in the Rio Grande River and reaches it through a system of gravity flow irrigation canals.

Public angling in Delta Orchards is permitted for a fee of 25 cents per person per day. Trotline fishing, however, is prohibited except to certain persons who are issued special permission. That more than 20,000 fishing permits were sold in 1961, is some measure of the lake's popularity with sports fishermen.

Of the 25 cents per day fee, a portion is paid to the concessionaire and the remainder goes to the water improvement district.

Netting - In March 1961, five netting collections took a total of 339 fish of 11 species (Tables 2 and 3). The game fish species taken in nets included channel catfish, Rio Grande blue catfish, white crappie and freshwater drum. Normally the drum is considered a rough fish species, but is classed as a game fish in this case because Delta Orchards anglers harvest them in large numbers the year around.

Of the total fish taken in nets, game fish species comprised 68.17 per cent of the number and 38.67 per cent of the weight. A year previously, game fish comprised 65.81 per cent and 28.62 per cent by number and weight respectively. This increase in numbers and weight in the March 1961 netting data may have been in part due to the commercial netting of rough fish from June through November 1960. Though no commercial netter was working the lake at the time of the March 1961 sampling trip, a six-month contract had been let by the water district for the summer of 1961.

Compared with netting data for the same period in 1960, gizzard shad in the March 1961 collections increased about 4 per cent in relative numbers. Contrarily, smallmouth buffalo decreased about 5 per cent.

A successful spawn for freshwater drum during the 1960 season was indicated by their increase of nearly 15 per cent in the 1961 netting data. These fish ranged in standard length from slightly less than 6 to over 11 inches. The average was 7 inches.

Even though the concessionaire reported anglers to be very successful in taking large numbers of white crappie as well as freshwater drum, crappie numbers decreased from 17 per cent of the total fish netted in March 1960 to 10 per cent in March 1961. The average "K" factor, or index of physical condition, remained fairly constant for white crappie: 2.20 in March 1961 and 2.22 in March 1960.

Seining - The data for seining are inconclusive since only one collection was made and this took place during mid-afternoon at a time when a 20 to 25 m.p.h. southeasterly wind was blowing. However, 9 specimens of 3 species of fish were taken and these included: 1 Atlantic needlefish, 5 thread-fin shad and 3 tidewater silversides.

Table 2. Results of gill netting, Delta Orchards Lake, March 1961.

Species	Numbers Taken	Per Cent of Total Number	Weights (grams)	Per Cent of Total Weight
Alligator gar	2	0.58	0 <sup>1</sup>	0.00
Spotted gar	11	3.24	8,428	8.21
Longnose gar	13	3.83	16,714	16.28
Gizzard shad	56	16.53	5,356	5.22
Smallmouth buffalo	23	6.78	29,852	29.08
Carp	1	0.29	2,466	2.40
Channel catfish <sup>2</sup>	1	0.29	212	0.20
Rio Grande blue catfish <sup>2</sup>	36	10.63	11,305	11.01
Atlantic needlefish	2	0.58	148	0.14
White crappie <sup>2</sup>	35	10.33	5,667	5.52
Freshwater drum <sup>2</sup>	159	46.92	22,532	21.94
Totals	339	100.00	102,680	100.00
Per Cent game fish		68.17		38.67
Per Cent rough fish		31.83		61.33

<sup>1</sup>These gar were too large for scales and were not weighed

<sup>2</sup>Game fish species

Table 3. Length-weight statistics for fish from Delta Orchards Lakes, March 1961.

Species	Standard length (millimeters)		Weight (grams)		"K" factors	
	Range	Average	Range	Average	Range	Average
Alligator gar	*	*	*	*	*	*
Spotted gar	347-645	484.54	231-1899	766.18	0.53-0.70	0.59
Longnose gar	433-899	643.23	252-2948	1296.69	0.28-0.49	0.39
Gizzard shad	145-235	170.12	50-197	89.35	1.46-2.24	1.73
Smallmouth buffalo	312-400	350.86	879-2098	1297.91	2.62-3.29	2.95
Carp	466-466	466.00	2466-2466	2466.00	2.43-2.43	2.43
Channel catfish	260-260	260.00	212-212	212.00	1.20-1.20	1.20
Rio Grande blue catfish	170-554	274.44	64-2722	314.02	0.99-1.60	1.20
Atlantic needlefish	355-376	365.50	66-82	74.00	0.14-0.15	0.14
White crappie	98- <del>255</del>	187.91	22-316	161.85	1.80-3.10	2.20
Freshwater drum	136-282	186.43	51-430	146.15	1.69-2.52	2.13

\*Length-weight measurements not recorded; fish weighed greater than 20 pounds.

Stomach analyses - Besides algae, most of the Rio Grande blue catfish stomachs examined contained insect and fish remains. A six pound Rio Grande blue catfish, however, had two Atlantic needlefish in its stomach.

Stomachs of white crappie, freshwater drum and gars were also examined but most were completely empty and no significant food analysis data were collected.

Other Lake Conditions - Although algae was found in several catfish stomachs, aquatic vegetation is rather scarce in the lake. This may be attributed in part to the fact that the prevailing, strong, southeasterly winds keep silt in suspension. This is evidenced by Secchi disc readings of light penetration which ranged from 22 to 23 inches in the lake's east portion and from 13 to 14.5 inches in the west portion. However, since the water level is virtually constant, other forms of vegetation will probably become established.

#### Recommendations:

Since wild fish from the Rio Grande River have constant access to Delta Orchards Lake, population control work would be ineffective and therefore is not recommended. It is recommended, however, that commercial fishing with nets be permitted to harvest as many of the undesirable fish as possible. Commercial netters should not be allowed to take any of the catfish species in order that this population be kept as abundant as possible.

In addition to the commercial netting of rough fish, it is recommended that white crappie and freshwater drum be cropped as heavily as possible by sport fishermen in order to make full use of these species.

#### Falcon Lake

Netting - A total of 12 gill net collections was made on Falcon Lake during March 1961. All were surface sets in water ranging from 10- to 70-feet in depth. In all, these nets took a total of 542 fish of 15 species (Table 4).

Rough fish species comprised 75.46 per cent of the number of fish netted. This is 7.4 per cent decrease in numbers from comparable data for March 1959. There was a similar decrease of 5.2 per cent in the total weights of these species.

Longnose gar decreased noticeably in numbers and weight in the March 1961 collections as compared to similar data for 1959. They comprised 12.58 per cent of the number and 34.86 per cent of the weight of the total fish netted in March 1959 but only 2.40 per cent and 14.48 per cent of the number and weight, respectively, in March 1961. On the other hand, slight increases in numbers or weights were recorded for the threadfin and gizzard shads, river carpsucker and carp.

Rio Grande blue catfish were considerably more abundant in the netting collections for March 1961. In the March 1959 collections they comprised 9.89 per cent of the number and 5.38 per cent of the weight of the total fish

Table 4. Results of gill netting, Falcon Lake, March 1961.

Species	Numbers Taken	Per Cent of Total Number	Weights (grams)	Per Cent of Total Weight
Spotted gar	1	0.18	992	0.61
Longnose gar	13	2.40	23,409	14.48
Threadfin shad	7	1.29	387	0.23
Gizzard shad	332	61.26	51,963	32.16
Smallmouth buffalo	12	2.21	22,198	13.73
River carpsucker	10	1.85	7,022	4.34
Carp	8	1.48	7,963	4.93
Channel catfish*	9	1.66	1,057	0.65
Rio Grande blue catfish*	83	15.32	30,205	18.68
White bass*	20	3.69	3,916	2.42
Largemouth bass*	9	1.66	4,319	2.67
Redear sunfish*	1	0.18	39	0.02
White crappie*	11	2.03	2,951	1.83
Freshwater drum	25	4.61	5,139	3.18
Rio Grande perch	1	0.18	115	0.07
Totals	542	100.00	161,675	100.00
Per Cent Game Fish		24.54		26.27
Per Cent Rough Fish		75.46		73.73

\*Indicates game fish

netted. In the 1961 collections they comprised 15.32 per cent of the number and 18.68 per cent of the weight.

Gizzard shad and Rio Grande blue catfish were taken in all netting collections and longnose gar, threadfin shad and smallmouth buffalo were all well distributed over the lake. River carpsucker and freshwater drum were limited largely to the upper portions of the lake. White bass were found mainly in the lower portions of the lake at the time of the survey.

Table 5 shows the length-weight statistics of the fish taken in the netting collections. The average "K" factors of all species showed a slight decrease.

Seining - Five seining collections took a total of 1,872 fish of 5 species. Tamaulipas shiners and tidewater silversides were taken at all seining stations. Silversides alone comprised 92.59 per cent of the seining collections (Table 6); they showed 78.59 per cent in 1959. Threadfin shad, a very important forage fish in the lake, was down to 4.43 per cent from 18.91 per cent in 1959.

Other Lake Conditions - Secchi disc readings in the lower portions of the lake ranged from 50½ to 55 inches while those in the upper portions ranged from 12 to 31 inches. Evidently the silt settles before reaching the lower portions of the lake.

Aquatic vegetation is scarce along the Texas side of Falcon; no investigation was made on the Mexican side. Algae was found in many of the catfish stomachs but no other aquatics were found. These findings are in line with previous studies of Falcon.

Since Falcon is an international reservoir, no developmental work is planned for the future.

#### Fort Brown Lake

Netting - Four gill net collections were made in March 1961 and took a total of 120 fish of 7 species (Table 7). Of the 7 species, 3 were classed as game fishes (channel catfish, Rio Grande blue catfish and largemouth bass) and 4 were classed as rough fishes (gizzard shad, bluegills, freshwater drum and Rio Grande perch).

Rough fish species comprised 89.17 per cent of the number and 75.03 per cent of the weight of the fish netted. Overall, this is a 7 per cent increase in numbers and a 15 per cent increase in weight of rough fishes since the 1960 survey. The majority of this relative increase is due to the gizzard shad.

One freshwater drum was taken in the March 1961 netting collections. This was the first specimen of this species taken since the lake was renovated in the spring of 1958. Apparently this fish was introduced from the Rio Grande River since the lake's water supply comes from the river. Attempts were made to screen the incoming water before it entered the lake, but the screens con-

Table 5. Length-weight Statistics of Fish taken with experimental gill nets, Falcon Lake, March 1961.

Fish	Standard length (millimeters)		Weight (grams)		"K" factors	
	Range	Average	Range	Average	Range	Average
	505-505	505.00	992-992	992.00	0.77-0.77	0.77
	408-880	702.84	246-3005	1800.69	0.17-0.56	0.41
	93-166	141.28	16-75	55.28	1.33-2.14	1.88
	121-287	196.85	43-447	157.75	1.27-2.45	1.94
	335-455	387.66	709-3572	1849.83	1.03-4.08	3.07
	210-329	277.40	<del>225</del> -1049	702.20	2.43-3.57	3.04
	255-385	325.12	506-1531	995.37	2.68-3.05	2.81
	153-289	193.87	55-358	132.12	1.37-1.72	1.58
	183-477	282.03	50-1673	363.91	1.13-2.10	1.38
	163-238	196.50	115-324	195.80	1.98-2.92	2.51
	225-305	268.77	255-709	479.88	2.07-2.62	2.35
	101-101	101.00	39-39	39.00	3.79-3.79	3.79
	141-249	207.45	73-450	268.27	2.30-3.08	2.76
	141-315	188.44	81-978	205.56	2.07-3.25	2.70
	136-136	136.00	115-115	115.00	4.57-4.57	4.57

Table 6. Seining results, Falcon Lake, March 1961.

Species	S T A T I O N S						Total	Per Cent of Total
	A	B	C	D	E			
Threadfin shad	0	0	0	83	0	0	83	4.43
Tamaulipas shiner	10	3	1	2	0	0	16	0.85
Red shiner	0	0	26	0	0	0	26	1.39
Sheepshead minnow	0	8	6	0	0	0	14	0.74
Tidewater silverside	47	327	402	89	868		1733	92.59
Totals	57	338	435	174	868		1872	100.00

Table 6. Seining results, Falcon Lake, March 1961.

Species	S T A T I O N S					Total	Per Cent of Total
	A	B	C	D	E		
Threadfin shad	0	0	0	83	0	83	4.43
Tamaulipas shiner	10	3	1	2	0	16	0.85
Red shiner	0	0	26	0	0	26	1.39
Sheepshead minnow	0	8	6	0	0	14	0.74
Tidewater silverside	47	327	402	89	868	1733	92.59
Totals	57	338	435	174	868	1872	100.00

Table 7. Results of gill netting, Fort Brown Lake, March 1961,

Species	Numbers Taken	Per Cent of Total Number	Weights (grams)	Per Cent of Total Weight
Gizzard shad	50	41.67	33,178	67.79
Channel catfish*	2	1.66	4,720	9.64
Rio Grande blue catfish*	3	2.50	5,302	10.84
Largemouth bass*	8	6.67	2,198	4.49
Bluegill	44	36.67	1,556	3.18
Freshwater drum	1	0.83	737	1.50
Rio Grande perch	12	10.00	1,254	2.56
Totals	120	100.00	161,675	100.00
Per cent game fish		10.83		24.97
Per cent rough fish		89.17		75.03

\*Indicates game fish

tinued to break due to lack of attention.

Carp comprised 25.72 per cent of the 1959 collections but none were found in either the 1960 or 1961 collections. Even though none were found in the latest two surveys, they are probably present in small numbers.

The length-weight statistics of the fish taken in the nets are presented in Table 8. Gizzard shad and channel catfish show slight increases in "K" factors. Largemouth bass show a slight reduction in "K" factors since the latest survey in 1960.

Seining - No seining collections were made on the lake due to thick growths of submerged vegetation, which made seining almost impossible.

Other Lake Conditions - Aquatic vegetation is a serious problem in this comparatively shallow oxbow lake. Najas, Chara and Ceratophyllum are the principal aquatic plants in the lake and are aided by the extremely clear water as indicated by the 72-inch Secchi disc readings. No vegetation control work was undertaken during this segment, although it may be necessary in the future to avoid a fish kill. So far no fish kill has been observed or reported.

#### Recommendations:

Perhaps a selective rotenone treatment of the lake to remove the gizzard shad and extensive trapping to remove excessive sunfish and Rio Grande perch would improve the largemouth bass and catfish potential. Success of such work, however, would depend on more effective screening of the water supply and is not being proposed at this time.

#### Bentsen State Park Lake

Netting - Five gill netting collections were made on this lake during the reconnaissance period; two were made in April and three were made in October. The gill nets took a total of 94 fish of 14 species (Tables 9 and 10).

Rough fish species (alligator, spotted and longnose gars, gizzard shad, smallmouth buffalo, river carpsucker and Rio Grande perch) were dominant in both collections: 77.54 per cent of the number in April and 68.89 per cent of the number in October.

This lake was chemically treated for a complete kill of fish in January 1960 (see Job Completion Report for Project F-14-D-4, Job 16a25) and restocked with largemouth bass in March 1960. Attempts in June to screen native fish from the incoming water of the Rio Grande River were unsuccessful (see Supplementary Report for Project F-14-D-4, Job 16a25).

The "K" factors of fish, as shown in Table 11, appear to be normal for this area. No data are available for comparison.

Seining - Two seining collections took a total of 269 fish of 5 species; largemouth bass, tidewater silversides, mosquitofish, sheepshead minnows and

Table 8. Length-weight statistics of fish taken with experimental gill nets,  
Fort Brown Lake, March 1961.

Species	Standard length (millimeters)		Weight (grams)		"K" Factors	
	Range	Average	Range	Average	Range	Average
Gizzard shad	185-350	303.16	135-964	663.56	1.91-2.70	2.28
Channel catfish	425-477	451.00	1814-2906	2360.00	2.36-2.68	2.52
Rio Grande blue catfish	405-500	460.00	1049-2325	1767.33	1.58-1.86	1.74
Largemouth bass	167-308	221.87	90-737	274.75	1.89-2.52	2.17
Bluegill	80-110	91.86	17-50	35.36	2.79-4.32	3.54
Freshwater drum	300-300	300.00	737-737	737.00	2.73-2.73	2.73
Rio Grande perch	110-158	128.33	55-214	104.50	4.09-5.42	4.76

Table 9. Results of gill netting, Bentsen State Park Lake, April 1961.

Species	Numbers Taken	Per Cent of Total Number	Weights (grams)	Per Cent of Total Weight
Longnose gar	2	4.08	1,644	13.40
Gizzard shad	29	59.18	3,409	27.79
Smallmouth buffalo	2	4.08	2,069	16.87
River carpsucker	2	4.08	593	4.84
Rio Grande blue catfish*	1	2.04	245	1.99
Largemouth bass*	5	10.21	3,161	25.77
Warmouth*	5	10.21	322	2.62
Bluegill	1	2.04	50	0.40
Freshwater drum	1	2.04	709	5.78
Rio Grande perch	1	2.04	67	0.54
Totals	49	100.00	12,269	100.00
Per cent game fish		22.46		30.38
Per cent rough fish		77.54		69.62

\*Indicates game fish

Table 10. Results of gill netting, Bentsen State Park Lake, October 1961.

Species	Numbers Taken	Per Cent of Total Number	Weights (grams)	Per Cent of Total Weight
Alligator gar	10	22.22	11,596	36.37
Spotted gar	1	2.22	199	0.62
Gizzard shad	15	33.34	1,194	3.74
Smallmouth buffalo	3	6.67	9,242	28.99
Carp	2	4.44	4,820	15.12
Rio Grande blue catfish*	4	8.89	2,790	8.75
Largemouth bass*	9	20.00	1,894	5.94
White crappie*	1	2.22	150	0.47
Totals	45	100.00	31,885	100.00
Per cent game fish		31.11		15.16
Per cent rough fish		68.89		84.84

\*Indicates game fish

Table 11. Length-weight statistics of fish taken with experimental gill nets, Bentsen State Park Lake, April and October, 1961.

Species	Standard length (millimeters)		Weight (grams)		"K" factors	
	Range	Average	Range	Average	Range	Average
Alligator gar	410-602	524.55	595-1871	1288.44	0.77-0.95	0.85
Spotted gar	315-315	315.00	199-199	199.00	0.63-0.63	0.63
Longnose gar	525-570	547.50	737-907	822.00	0.48-0.50	0.49
Gizzard shad	122-235	181.08	41-243	136.36	1.82-2.39	2.07
Smallmouth buffalo	300-432	375.40	907-3374	2262.20	3.35-4.27	3.88
River carpsucker	205-233	219.00	260-333	296.50	2.63-3.01	2.82
Carp	395-458	426.50	1843-2977	2410.00	2.99-3.09	3.04
Rio Grande blue catfish	257-446	322.40	245-1474	607.00	1.44-1.66	1.56
Largemouth bass	159-297	225.80	82-751	372.30	2.03-3.34	2.53
Warmouth	115-123	120.20	59-71	64.40	3.49-4.14	3.70
Bluegill	102-102	102.00	50-50	50.00	4.71-4.71	4.71
White crappie	160-160	160.00	150-150	150.00	3.66-3.66	3.66
Freshwater drum	300-300	300.00	709-709	709.00	2.62-2.62	2.62
Rio Grande perch	111-111	111.00	67-67	67.00	4.89-4.89	4.89

bluegills. The bass, taken in the April collection, ranged from 1 to 2 inches in total length and represent successful reproduction by this species. Mosquitofish were dominant in both collections.

In view of the fish collections, it is clear that the benefits obtained from the fish eradication in January 1960 have been nullified. Fishing is reported to be "fair"; occasionally, anglers catch some nice bass. The park manager said in October that one angler caught "a 15-inch bass." Some catfish fishing is done on the lake but with little success.

Other Lake Conditions - The water level has been abnormally low all year. The upper portion (the bend) of this oxbow lake is dry, however, there are approximately 10 acres of water in both "arms" of the lake. Map 1 shows the approximate areas of water in the lake. Only that portion designated "east" was netted because no practical means of launching a boat in the "west" portion could be found.

A new irrigation canal, completed in July 1961, was built immediately north of the park to provide more water for farmers in the Hidalgo County Water Control and Improvement Districts Number 7 and 14. Water is pumped directly from the Rio Grande River to supply the canal. At one time it seemed as though an agreement would be reached whereby the park lake would get its water from the irrigation canal. However, no such agreement has been reached.

#### Recommendations:

Periodic netting and seining checks should be continued to check changes and developments in the fish population. Spring and fall checks should be adequate. No further developmental work is planned because of the unfavorable water supply.

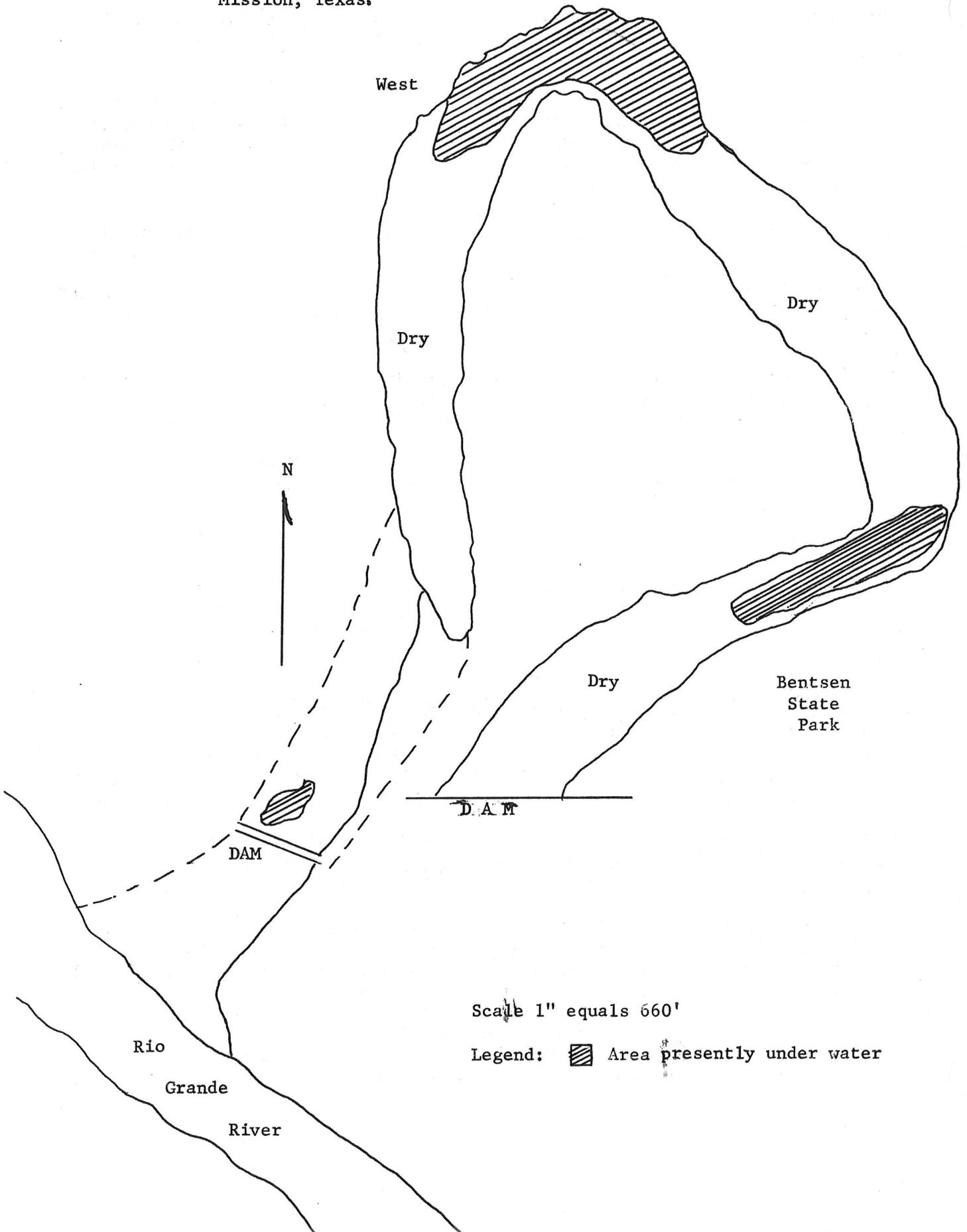
#### Casa Blanca Lake

Casa Blanca Lake is located about six miles northeast of Laredo in Webb County. This county-owned lake covers an area of about 2,000 acres and is the county's recreation center. Trotlines are prohibited in this lake in the interest of public safety. Otherwise, there are no special fishing regulations.

Since Webb County recently came under regulatory authority of the Game and Fish Commission, the fish taken in the netting collections were divided into three categories: game, forage and rough.

Netting - Four gill netting collections, made in September 1961, took 275 fish of 12 species (Table 12). Game fish species (channel catfish, black bullhead, largemouth bass, flathead catfish, white crappie and freshwater drum) comprised 57.45 per cent of the numbers and 53.66 per cent of the weight. Rough fish species (smallmouth buffalo, river carpsucker and Rio Grande perch) comprised 12.72 per cent of the number and 38.71 per cent of the weight. Forage fish species (threadfin and gizzard shads, and bluegills) comprised 29.83 per cent by number and 7.63 per cent by weight.

Map 1. Bentsen State Park Lake, Mission, Texas.



Scale 1" equals 660'

Legend:  Area presently under water

Table 12. Results of gill netting, Casa Blanca Lake, September 1961.

Species	Numbers Taken	Per Cent of Total Number	Weights (grams)	Per Cent of Total Weight
Threadfin shad <sup>1</sup>	46	16.74	2,112	2.56
Gizzard shad <sup>1</sup>	30	10.91	3,958	4.81
Smallmouth buffalo <sup>2</sup>	1	0.36	2,424	2.94
River carpsucker <sup>2</sup>	32	11.64	28,954	35.19
Channel catfish <sup>3</sup>	24	8.73	15,447	18.78
Black bullhead <sup>3</sup>	1	0.36	454	0.55
Flathead catfish <sup>3</sup>	1	0.36	1,021	1.24
Largemouth bass <sup>3</sup>	2	0.72	3,416	4.16
Bluegill <sup>1</sup>	6	2.18	211	0.26
White crappie <sup>3</sup>	127	46.19	22,951	27.89
Freshwater drum <sup>3</sup>	3	1.09	861	1.04
Rio Grande perch <sup>2</sup>	2	0.72	479	0.58
Totals	275	100.00	82,288	100.00
Per cent game fish		57.45		53.66
Per cent rough fish		12.72		38.71
Per cent forage fish		29.83		7.63

<sup>1</sup> Indicates forage fish

<sup>2</sup> Indicates rough fish

<sup>3</sup> Indicates game fish

Since the latest survey in July 1960, four species (threadfin shad, river carpsucker, channel catfish and white crappie) show relative increases in numbers and five species (threadfin and gizzard shads, river carpsucker, channel catfish and white crappie) show relative increases in weight. Of these species, white crappie show the only significant "change" in numbers and weight. White crappie rose from 28.47 per cent by numbers in 1960 to 46.19 per cent in 1961 and from 8.91 per cent by weight in 1960 to 27.89 per cent in 1961.

The smallmouth buffalo was the only species found to show a substantial "decrease" both in numbers and in weight. In 1960, smallmouth buffalo comprised 5.17 per cent of the numbers as compared to 0.36 per cent a year later and, they comprised 25.32 per cent of the weight in the 1960 collections as compared to 2.94 per cent in 1961. This interesting "change" is probably due to netting bias rather than an actual change in the fish population.

Table 13 shows the length-weight statistics of the fish taken in this survey. It is interesting to note that three rough fish species (smallmouth buffalo, river carpsucker and Rio Grande perch) show decreases in "K" factors while largemouth bass and white crappie show increases.

Seining - Two seining collections took 470 fish of 11 species and one freshwater shrimp, Palaemonetes. The most abundant species, threadfin shad, comprised 89.71 per cent of the collections. Gizzard shad, red shiners, mosquitofish, tidewater silversides and bullhead minnows were found in lesser numbers. Only one largemouth bass, 90 mm. in total length, and two white crappie 89-90 mm. in total length, were taken in the seining collections.

Water Analyses - Two water analyses were made on the lake in conjunction with the netting and seining trip. At water sample Station No. 1, near the dam in open water, samples were taken at 0-, 10- and 20-foot depths. At Station No. 2, samples were taken at 0- and 10-foot depths. Tests were made for dissolved oxygen, carbon dioxide, methyl orange alkalinity and pH.

At Station No. 1, the dissolved oxygen content ranged from 5.8 ppm. at the surface (0 feet) to 1.2 ppm. at 20 feet. Carbon dioxide ranged from 0 to 5 ppm. from 0 to 20 feet respectively. Methyl orange alkalinity ranged from 144 to 176 ppm. and pH ranged from 8.4 to 8.6.

At Station No. 2, carbon dioxide ranged from 12.0 ppm. at the surface to 6.0 ppm. at 10 feet. Methyl orange alkalinity ranged from 174 to 184 ppm. and dissolved oxygen ranged from 1.8 ppm. to 0.0 ppm., from surface to 10 feet respectively.

Turbidity, as measured with the Jackson turbidimeter, ranged from less than 25 ppm. in the open water at Station No. 1 to 151 ppm. at 10 feet at Station No. 2. The Secchi disc readings ranged from 21½ inches at Station No. 1 to 9 inches at Station No. 2. These values are considered normal for this area.

#### Recommendations:

Gill netting and seining checks should be continued to check the

Table 13. Length-weight statistics for fish from Casa Blanca Lake, September 1961.

Species	Standard length(millimeters)		Weight (grams)		"K" Factors	
	Range	Average	Range	Average	Range	Average
Threadfin shad	110-152	126.50	33-68	45.91	1.60-3.07	2.27
Gizzard shad	108-258	185.10	22-312	131.93	1.58-2.20	1.83
Smallmouth buffalo	425-425	425.00	2424-2424	2424.00	3.15-3.15	3.15
River carpsucker	270-367	317.31	567-1389	904.81	2.25-3.61	2.77
Black bullhead	274-274	274.00	454-454	454.00	2.20-2.20	2.20
Flathead catfish	375-375	375.00	1021-1021	1021.00	1.93-1.93	1.93
Largemouth bass	388-400	394.00	1460-1956	1708.00	2.49-3.05	2.77
Bluegill	94-103	99.16	23-43	35.16	2.76-4.05	3.57
White crappie	119-287	190.11	45-652	188.96	1.97-3.08	2.48
Freshwater drum	220-245	235.00	236-340	287.00	2.06-2.31	2.19
Rio Grande perch	180-183	181.50	225-254	239.50	3.85-4.14	3.99

fish population.

No recommendations for developmental work are made at this time. Possibly, a selective shad kill will be needed later but more intensive study of the fish population is needed.

#### Escondido Creek Watershed

Escondido Creek rises in Karnes County, west of Karnes City, and flows in an easterly direction through the south central part of the county, emptying into the San Antonio River in the southeast corner of the county. The area of the watershed is 117 square miles. From 1954 through 1958, 11 dams were constructed on the watershed as a soil conservation demonstration; one on Escondido Creek and 10 on tributaries which drain into Escondido Creek.

A basic survey and inventory of fish species present in nine of the 11 lakes was made in 1958-59 (see Job Completion Report for Project F-6-R46, Job B-14). Four of the 11 lakes in the watershed are included in this reconnaissance job. Three of these lakes were included in the basic survey. The four lakes were at normal elevation when checked in this latest survey. Table 14 shows the combined netting results of the four lakes but the following discussion will treat each lake separately.

Lake No. 2: Netting and Seining - Two gill net collections, made in May 1961, took a total of 16 fish of 4 species. Since the basic survey, there were four noticeable changes: relative increases in bluegills and white crappie, and relative decreases in channel catfish and largemouth bass. Neither bluegills nor white crappie were found during the basic survey but they were found to comprise over 80 per cent of the netting collections in this reconnaissance survey.

No largemouth bass were taken in the nets but three specimens (23 to 30 mm.) were taken in the seining collection. Obviously, larger bass are present but their abundance is questionable. Largemouth bass fishing was reported to be excellent two years ago but not so at the time the lake was sampled in May. Apparently the large number of bluegills and white crappie have contributed to the poor bass fishing.

Channel catfish revealed a relative decrease of from over 50 per cent to slightly over 12 per cent. Black and yellow bullheads were not found in either the basic survey or the reconnaissance. This is the only lake included in this reconnaissance check of Escondido Creek that was lacking of bullheads.

Aquatic vegetation consisted of thick growths of algae scattered throughout the lake.

Lake No. 3: Netting - Two gill net collections made in May 1961 found that the fish population consisted of channel catfish, black bullheads, largemouth bass and bluegills. Compared to the basic survey, the fish population was very similar. Slight reductions in the numbers of channel catfish, black bullheads, and bluegills were noticed and a slight increase in

Table 14. Results of collections with experimental gill nets, Escondido Creek Watershed Lakes, April 1961.

	Numbers of fish collected					Per Cent of Total Number	Weights of fish collected (grams)					Per Cent of Total Weight		
	Lakes						Total	Lakes					Total	
	2	3	8	11	Total			2	3	8	11			Total
h	2	1	9	20	32	32.66	2257	751	3188	8361	14557	51.88		
	0	1	8	17	26	26.53	0	81	730	1947	2758	9.83		
s	0	5	7	0	12	12.24	0	1086	6776	0	7862	28.01		
	0	0	2	0	2	2.04	0	0	360	0	360	1.28		
	0	0	1	1	2	2.04	0	0	205	255	460	1.64		
sh	1	0	0	0	1	1.02	86	0	0	0	86	0.30		
	5	10	0	0	15	15.31	397	889	0	0	1286	4.58		
	8	0	0	0	8	8.16	696	0	0	0	696	2.48		
	16	17	27	38	98	100.00	3436	2807	11259	10563	28065	100.00		

the number of largemouth bass.

No flathead catfish were taken in the nets but the owner stated that he had stocked a number of them in past years and had been unable to catch any recently. Indications are that they are still present. The "reductions" in channel catfish, bluegills, and bullheads might be attributed to the presence of flatheads.

Seining - One seining collection, consisting of six hauls, took 35 fish of 3 species: three largemouth bass (2½ to 4 inches), 14 redear sunfish (1 to 7 inches), and 18 bluegills (½ to 2½ inches).

Lake No. 8: Netting - Two gill net collections made in this lake took 27 fish of 5 species. Channel catfish revealed about a 50 per cent reduction in numbers since the basic survey. In the two previous mentioned lakes, a similar decrease in the numbers of channel catfish was observed. This indicates that after the original stocking, their numbers diminish in these small 40-acre lakes probably because there is little or no natural reproduction. On the other hand, black bullheads show increases in numbers since the basic survey. At the time of the basic survey, black bullheads comprised 9 per cent of the netting collections as compared to 30 per cent in this reconnaissance survey. Largemouth bass showed a relative increase in numbers from 9 per cent to over 25 per cent. Of the four lakes in the Escondido Creek watershed that were checked, this lake appears to offer the best bass fishing.

Seining - One seining collection took the following species: 104 red shiners (30 to 68 mm.); 23 mosquitofish (no length recorded); and one redear sunfish (42 mm.).

Lake No. 11: Netting - A total of 38 fish of 3 species was taken in one netting collection. Channel catfish and black bullheads comprised the majority of the catch. Only one green sunfish was collected along with the catfish. The breakdown was as follows: channel catfish, 53 per cent; black bullheads, 45 per cent; and green sunfish, 2 per cent.

Seining - One seining collection took one golden shiner. Evidently this fish was stocked as forage with the channel catfish and largemouth bass from the fish hatchery.

#### Recommendations:

After working these lakes in April, the project leader recommended to the Work Unit Conservationist, Soil Conservation Service, in Kenedy, that the existing fish populations in the four lakes be removed by chemically treating the water with rotenone and then restocked with desirable game fish species. At this time, no further interest has been shown by the landowners to apply the management recommendations. Public access is not available to any of the lakes and any developmental work would have to be done by the individuals concerned.

### Frio River

An inventory of fish species in the Frio River was made from July 1953 through June 1956. To have more up-to-date information on the fish population in the public waters of Frio County, for a basis of fish harvest regulations (for Job B-19, Project F-6-R-9), a field trip was made in May.

Netting - A total of 46 fish of 8 species was taken in one gill net collection made near Frio Town. Rough fish species (alligator and longnose gars, gizzard shad, smallmouth buffalo and freshwater drum) comprised 89.13 per cent of the numbers and 95.03 per cent of the weight of fish taken in the netting collection. Bluegills, classified as forage fish in this regulatory authority county, comprised 4.35 per cent of the number and 0.33 per cent of the weight. Game fish species (channel catfish and white crappie) comprised slightly over 5 per cent of the numbers and less than 5 per cent of the weight of fish taken in the netting collection (Table 15).

Seining - Table 16 shows the results of the three seining collections; the upper portion shows the results of the seining on the Frio River and the lower portion shows the results of the seining on the Leona River in Frio County. Mexican tetras were found in both rivers, as were mosquitofish. Red shiners and largemouth bass were found only in the Frio River. They are expected to be present in the Leona River as well, even though none were found in the seining collection.

Other Observations - Much of the Frio and Leona Rivers were dry when visited in May 1961. One small channel dam on the Frio River, near Frio County State Park, retains a small amount of water for irrigation purposes. The local game warden said "a little" fishing was done in the area of the Frio by persons visiting the state park. Otherwise, little fishing is done on the Frio and Leona Rivers.

Aquatic vegetation consists of Chara, Sagittaria and Potamogeton. Since the water supply of both rivers is irregular, the vegetation is not considered harmful.

#### Recommendations:

Because of the intermittent nature of the Frio and Leona Rivers in Frio County, no developmental work is recommended. Cursory checks, for a basis of fish harvest regulations, should be continued once a year.

### Fish Stocking, Nueces River

In April and June 1961, 100,200 largemouth bass fingerlings were stocked in the Nueces River in Zavala County. The fish were stocked in areas where they would most likely survive. Sufficient food and cover were found in the river during the recent study (see Job B-16, Project F-6-R-8). The fish

Table 15. Results of experimental gill net collection,  
Frio River, May 1961.

Species	Number	Per Cent	Weight*	Per Cent
Alligator gar	2	4.35	22678	53.87
Longnose gar	19	41.30	10101	24.00
Gizzard shad	13	28.27	1459	3.47
Smallmouth buffalo	6	13.04	5612	13.33
Channel catfish	2	4.35	1503	3.57
White crappie	1	2.17	453	1.07
Bluegills	2	4.35	142	0.33
Freshwater drum	1	2.17	155	0.36
Totals	46	100.00	42103	100.00

\* In grams.

Table 16. Results of seining collections, Frio River, May 1961.

Species	Number	Per Cent by Number
Spotted gar	1	0.49
Mexican tetra	10	4.85
Golden shiner	1	0.49
Texas shiner	17	8.25
Red shiner	88	42.72
Stoneroller	8	3.88
Mosquitofish	33	16.02
Largemouth bass	40	19.41
Green sunfish	1	0.49
Redear sunfish	2	0.97
Bluegill	5	2.43
Totals	206	100.00

Results of seining collection, Leona River, May 1961.

Species	Number	Per Cent by Number
Mexican tetra	187	82.74
Mosquitofish	39	17.26
Totals	226	100.00

were supplied by the Medina Lake State Fish Hatchery at Devine and the National Fish Hatchery, Uvalde, Texas.

For information purposes a comparison of netting success is included as Table 17.

Prepared by Charles T. Menn  
Assistant Project Leader

Approved by Marion Toole  
Coordinator

Date February 7, 1962

Kenneth C. Jurgens  
Regional Supervisor

Table 17. Success of gill netting on all lakes in terms of numbers and pounds of fish caught.

Lake and Date	Number of Nets	Number of feet of nets	Number of fish caught	Average number of fish per net	Average number of fish per foot of net	Pounds of fish caught	Average pounds of fish per net	Average pounds of fish per foot of net
Delta Orchards March 1961	5	625	339	67.80	0.542	226.2	45.24	0.361
Falcon March 1961	12	1500	542	45.17	0.361	356.1	29.68	0.237
Fort Brown March 1961	4	500	120	30.00	0.240	107.8	26.95	0.215
Bentsen State Park April & October 1961	5	625	94	18.80	0.150	97.3	19.46	0.156
Casa Blanca September 1961	4	500	275	68.75	0.550	181.3	45.32	0.363
Escondido Creek April 1961	7	875	98	14.00	0.112	61.8	8.83	0.071
Frio River May 1961	1	125	46	46.00	0.368	92.7	92.70	0.742