

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-21 Resurvey of Lake Corpus Christi

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ABSTRACT

In order to furnish the City of Corpus Christi with a more dependable water supply, a new dam was built on the Nueces River just below the old dam in 1958. Surface elevation of the lake was raised from 74 to 94 feet above sea level.

The old lake had been surveyed from 1953 to 1955 and a survey of the "new lake" was carried out in 1961. The principal change in water quality was a significant reduction in turbidity with a resulting improvement in fisheries conditions.

Game fish increased from 39 per cent by numbers in netting collections made in the old lake to 47 per cent in the new lake but showed slight decreases from 31 per cent to 29 per cent of the total weight. This is believed due to the three most common rough fish species attaining a greater average weight than most game fish and to the large numbers of young catfish (usually the heaviest of the game fish) being taken. Overall, the gill net catch from the "new lake" appears to indicate a 15 per cent increase in total fish production over the old lake.

Recommendations are made to continue periodic investigations of the lake to determine if management work will be required in the future.

JOB COMPLETION REPORT

State of Texas

Project No. F-6-R-9

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

Job No. B-21

Title: Resurvey of Lake Corpus Christi

Period Covered: January 1 - December 31, 1961

Objectives:

To determine the present status of the fish populations of Lake Corpus Christi and any other physical, chemical and biological changes in the lake that have taken place since the last fisheries survey.

Techniques Used:

Fish populations were regularly sampled at monthly intervals from 16 gill netting and 7 seining stations distributed over the lake. In addition, water samples were also collected at monthly intervals from four water sampling stations (Figure 1).

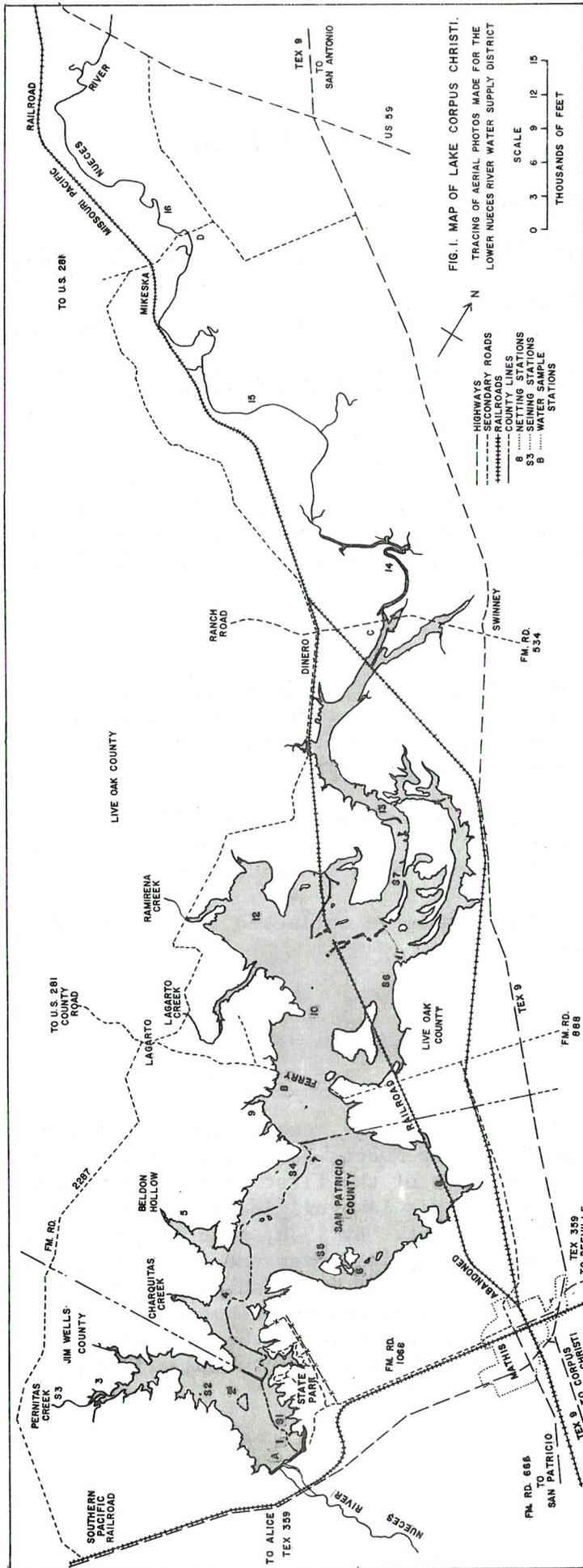
Fish taken in nets were collected with 125- by 8-foot experimental gill nets consisting of five 25-foot long sections of square mesh webbing, ranging from 1- to 3-inches in $\frac{1}{2}$ inch intervals.

Seined specimens were collected in a 4- by 20-foot nylon seine with a $\frac{1}{2}$ inch mesh.

Findings:

Introduction

Old Lake Corpus Christi, then named Lake Lovenskiold, was first formed in 1930 by a dam across the Nueces River about five miles SW. of Mathis. Failure of the dam caused the loss of the first lake and a more permanent structure was completed in 1934. This lake originally covered some 5,500 acres and had a volume of 55,000 acre-feet. By 1948, according to a Soil Conservation Service report, the lake had lost over one-fourth of its volume because of siltation. The need of a larger water supply for the City of Corpus Christi brought about the formation of the Lower Nueces River Water Supply District. Engineering surveys showed the site of the old lake to be most feasible for the impounding of a larger lake and a new dam was completed in April 1958 about one mile downstream from the old dam.



Physical Description

Although the new dam was designed to maintain a lake surface elevation of 94 feet above mean sea level, the gates were left down so that the surface is presently maintained at 88 feet. This was done in order to prevent interference with some old oil wells.

At an elevation of 88 feet m.s.l. the new lake now covers approximately 16,730 acres and has a capacity of 185,920 acre-feet. Because of steep caliche hills surrounding the lower part of the lake, the 14-foot rise caused little change in this area; however, low islands in the middle and upper parts of the old lake were flooded and the impounded heads of several arroyos were extended in length. Above Collins' Islands of the old lake, the terrain flattens considerably, especially on the east shore, and here, a large area was flooded by the new lake level. The banks and lowlands along the old lakeshore above Lagarto Bridge, which is now flooded and replaced by a ferry, and about four miles upstream were flooded upstream from that area. The lake in the Nueces River channel is still contained by the natural levees.

Water level fluctuations, summarized from records on file with the Lower Nueces River Water Supply District, show that the total variation during 1961 amounted to only 3.01 feet. A low of 86.20 feet m.s.l. occurred on June 8 and a high of 89.21 feet m.s.l. was recorded on June 28. These variations in water level had little apparent effect on the fisheries and were insignificant compared to the almost 8-foot fluctuations in level which occurred in the lake prior to completion of the new dam.

Because the larger volume, due to the new dam, allows river borne silt to settle farther up the lake, the water is not nearly so turbid as it once was. Clearer water, together with an improved local economy, has resulted in considerable development of the lake shore as housing and resort subdivisions. Where, prior to the new dam, the lake area contained only two or three developments with a total of about 100 private homes, and most of them on 15-year land leases from ranch owners, there are now more than 400 homes on the lake shore in 15 or more subdivisions. This development is continuing and will increase when the lake is raised to the 94-foot level.

Chemical Analyses

Water samples, collected monthly from four regular stations (Figure 1), were analyzed for dissolved oxygen, carbon dioxide, phenolthalien and methyl-orange alkalinity, turbidity and pH (Tables 1 through 4). In addition, records were made of temperatures at the depths from which samples were collected.

The most noticeable change in water quality of Lake Corpus Christi during 1961, as compared with records of water quality from previous years, was in turbidity. Prior to the building of the new dam, turbidities of less than 25 p.p.m. were never recorded. In fact, most readings ranged from 40 to 60 p.p.m. and some were far over 100 p.p.m. During 1961, at Station A, almost 75 per cent of the turbidity readings were less than 25 p.p.m. Only two were over 100 p.p.m. and these were for samples collected at the bottom in 60 feet

Table 1. Chemical analysis of water samples, Lake Corpus Christi, Station A, 1961.

Depth in Feet	Analysis	January	February	March	April	May	June	July	August	September	October	November	December	Range		Average
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	
0'	OF.	52	55	67	69	78	81	84	83	81	77	64	57	52	84	70.66
	O ₂ (ppm)	11.0	11.8	7.8	10.8	10.4	11.2	6.4	5.0	6.8	8.0	8.8	7.8	5.0	11.8	8.82
	CO ₂ (ppm)	1.0	3.0	0	0	0	0	0	0	0	0	0	0	0	3.0	0.33
	Alkalinity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	ph-th (ppm)	134	128	138	136	159	174	152	156	156	86	170	166	86	174	147.08
	M.O. (ppm)	34	*	*	*	*	*	*	*	*	32	*	27	*	34	34
Turbidity (ppm)	8.5	(-)	8.3	8.6	8.8	8.8	8.2	8.8	8.8	8.8	8.6	8.8	8.7	8.8	8.62	
10'	OF.	51	55	67	68	76	81	82	83	80	76	64	57	51	83	70.00
	O ₂ (ppm)	12.0	11.2	6.4	9.8	8.6	9.8	6.0	7.4	4.6	5.6	7.4	7.8	4.6	12.0	8.05
	CO ₂ (ppm)	0	3.0	0	0	0	0	0	0	0	0	0	0	0	3.0	0.25
	Alkalinity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	ph-th (ppm)	138	124	140	136	166	166	144	144	192	174	170	158	124	198	158.83
	M.O. (ppm)	32	*	*	*	*	*	*	*	*	32	27	*	*	32	32
Turbidity (ppm)	8.2	(-)	8.3	8.6	8.8	8.8	8.3	8.8	8.8	8.6	8.7	8.8	8.7	8.8	8.60	
20'	OF.	50	53	67	67	76	81	82	82	79	76	64	57	50	82	69.50
	O ₂ (ppm)	8.2	11.4	5.4	7.8	3.6	5.8	6.0	9.4	4.6	4.0	7.4	6.4	3.6	11.4	6.67
	CO ₂ (ppm)	1.0	3.0	0	0	0	0	0	0	0	0	0	0	0	6.0	0.83
	Alkalinity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	ph-th (ppm)	128	124	138	132	157	166	144	144	120	170	180	166	120	180	149.25
	M.O. (ppm)	32	*	*	*	*	*	*	*	*	37	26	26	*	37	37
Turbidity (ppm)	8.1	(-)	8.3	8.8	8.8	8.5	8.8	8.8	8.8	8.6	8.7	8.8	8.7	8.8	8.62	
30'	OF.	49	53	66	66	75	81	81	82	79	76	64	57	49	82	69.08
	O ₂ (ppm)	9.8	12.2	4.8	7.6	3.4	8.2	5.6	4.2	3.8	4.6	6.2	6.2	3.4	12.2	6.38
	CO ₂ (ppm)	1.0	3.0	0	0	6.0	2.0	0	0	4.0	0	0	1.0	0	6.0	1.42
	Alkalinity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	ph-th (ppm)	130	124	140	136	177	160	142	142	170	170	178	162	124	178	154.92
	M.O. (ppm)	33	*	*	*	*	*	*	*	*	33	*	27	*	33	33
Turbidity (ppm)	7.9	(-)	8.3	8.8	8.8	8.1	8.6	8.6	8.8	8.6	8.5	8.8	7.9	8.8	8.53	
40'	OF.	50	53	65	67	74	81	81	82	78	75	63	57	50	82	68.83
	O ₂ (ppm)	11.0	8.4	3.0	9.0	4.2	4.4	3.8	2.4	2.2	1.8	5.2	7.4	1.8	11.0	5.23
	CO ₂ (ppm)	1.0	3.0	1.0	0	6.5	6.0	0	3.0	4.0	5.0	0	0	0	6.5	2.46
	Alkalinity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	ph-th (ppm)	134	124	147	132	154	162	142	156	170	170	178	162	124	178	152.58
	M.O. (ppm)	32	*	*	*	27	*	*	*	*	26	*	29	*	32	32
Turbidity (ppm)	7.8	(-)	8.4	8.8	8.8	8.2	8.6	8.6	8.8	8.4	8.5	8.8	7.8	8.8	8.52	
50'	OF.	50	53	58	65	74	80	72	73	78	75	63	59	50	80	66.68
	O ₂ (ppm)	11.4	4.4	0.6	2.6	3.3	5.0	0.6	0.4	2.0	1.0	5.0	6.2	0.6	11.4	3.54
	CO ₂ (ppm)	1.0	4.0	6.0	5.0	4.0	8.0	15.0	21.0	3.0	6.0	0	0	0	21.0	6.08
	Alkalinity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	ph-th (ppm)	128	124	148	136	162	164	186	212	176	170	182	164	124	212	162.66
	M.O. (ppm)	33	*	*	*	*	31	*	*	*	27	*	29	*	37	37
Turbidity (ppm)	7.7	7.9	8.1	8.8	8.2	7.9	7.8	7.8	7.8	8.4	8.5	8.8	7.7	8.8	8.23	
60'	OF.	49	52	56	58	73	77	66	68	78	75	63	58	49	78	64.62
	O ₂ (ppm)	5.8	10.0	0.8	0.6	1.5	3.2	0	0	0	0.4	4.6	5.4	0	10.0	2.71
	CO ₂ (ppm)	1.0	4.0	5.0	15.0	26.0	19.0	31.0	31.0	43.0	7.0	0	0	0	43.0	13.17
	Alkalinity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
	ph-th (ppm)	132	124	148	146	174	202	216	232	180	184	184	164	124	232	173.83
	M.O. (ppm)	36	*	*	*	180	140	*	*	*	38	*	30	*	180	180
Turbidity (ppm)	8.0	8.0	8.1	8.2	7.6	8.0	7.4	7.4	7.8	8.2	8.5	8.8	7.4	8.8	8.12	

(-) No test taken

* Less than

Table 2. Chemical analysis of water samples, Lake Corpus Christi, Station B, 1961.

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Range		Avg.
												Min.	Max.	
52	60	71	66	80	82	84	91	82	78	61	53	52	91	71.67
9.0	8.0	8.6	10.8	16.0	12.4	4.2	7.0	9.8	10.4	10.6	5.8	4.2	16.0	9.38
2.0	0	0	0	0	7.0	0	0	0	0	0	9.0	0	9.0	1.50
0	60	0	0	0	0	0	0	0	0	40	0	0	60	8.33
128	56	132	158	174	162	150	172	168	190	128	162	56	190	148.33
47	37	*	43	*	33	29	*	37	34	50	35	*	50	
7.7	8.0	8.3	8.8	8.8	8.0	8.8	(-)	8.6	8.8	8.8	8.6	7.7	8.8	8.47
48	60	71	67	79	81	83	85	80	78	61	52	48	85	70.42
11.4	8.4	8.0	9.8	5.4	9.0	4.6	4.0	5.8	9.6	8.0	6.6	4.0	11.4	7.55
2.0	0	0	0	0	3.0	0	10.0	0	0	0	4.0	0	10.0	1.58
0	20	0	0	0	0	0	0	0	0	44	0	0	44	5.33
136	96	164	158	170	170	156	174	182	190	132	150	96	190	156.50
53	36	*	37	*	37	29	37	49	30	55	45	*	55	
7.8	7.7	8.4	8.8	8.2	8.4	8.8	(-)	8.6	8.6	8.8	8.8	7.7	8.8	8.45
47	58	69	67	79	81	83	84	80	76	60	53	47	84	69.75
11.2	4.6	4.8	9.0	3.4	8.8	4.2	1.8	2.2	2.8	5.2	6.4	1.8	11.2	5.37
2.0	6.0	7.0	20.0	3.0	0	0	10.0	14.0	22.0	0	4.0	0	22.0	7.33
0	0	20	0	0	0	0	0	0	0	0	0	0	20	1.67
128	94	128	158	174	176	154	154	176	184	186	166	94	186	156.50
56	83	34	34	27	37	33	27	54	37	75	50	27	83	45.58
7.7	7.7	8.4	8.8	8.2	8.7	8.8	(-)	8.0	8.0	8.8	8.7	7.7	8.8	8.35
46	55	68	66	78	79	83	84	(-)	76	59	53	46	84	67.91
10.0	5.2	2.8	5.8	10.0	13.6	3.0	2.2	(-)	2.0	5.2	6.6	2.0	13.6	6.04
2.0	5.0	11.0	7.0	6.0	0	5.0	11.0	(-)	11.0	0	0	0	11.0	5.27
0	0	0	0	0	0	0	0	(-)	0	0	0	0	0	0.00
130	92	174	158	182	178	140	176	(-)	186	188	166	92	188	160.91
58	85	39	90	30	75	39	32	(-)	38	67	54	30	90	55.18
7.6	8.0	8.2	8.8	8.6	8.4	8.8	(-)	(-)	8.0	8.8	8.7	7.6	8.8	8.39

Table 3. Chemical analysis of water samples, Lake Corpus Christi, Station C, 1961.

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Range		Avg.
												Min.	Max.	
53	62	77	70	82	82	83	86	81	75	65	57	53	86	72.75
9.6	4.2	5.2	5.2	9.6	7.2	1.8	3.4	3.4	6.0	2.6	3.8	1.8	9.6	5.17
0	7.0	8.0	9.0	3.0	6.0	8.0	5.2	11.0	8.0	5.0	4.0	0	11.0	6.18
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
198	122	206	116	186	272	220	178	178	184	102	146	102	272	175.66
*	48	42	150	32	240	34	37	44	42	123	85	*	240	
(-)	8.0	8.5	8.6	8.4	8.6	8.4	8.3	8.2	8.2	8.2	8.0	8.0	8.6	8.31
49	60	73	67	79	82	83	85	78	75	64	57	49	85	71.00
7.6	5.2	2.6	2.4	6.4	5.8	1.4	2.8	3.0	5.8	2.8	3.6	1.4	7.6	4.12
0	6.0	11.0	12.0	9.0	5.0	7.0	7.0	10.0	8.0	8.0	8.0	0	12.0	7.58
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
194	120	202	120	189	252	224	186	174	192	108	140	108	252	175.08
26	49	26	142	47	280	38	39	53	60	180	87	26	280	85.58
(-)	8.0	8.5	8.6	7.6	8.4	8.4	7.8	8.0	8.0	8.1	7.8	7.6	8.6	8.11
49	59	69	66	77	80	83	84	77	75	64	56	49	84	69.92
7.0	7.8	1.2	2.4	3.6	2.7	0.6	1.0	2.0	4.8	2.4	4.6	0.6	7.8	3.34
0	7.0	9.0	12.0	6.0	9.0	5.0	6.0	12.0	9.0	9.0	6.0	0	12.0	7.50
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
196	124	216	100	188	268	242	176	176	192	108	144	100	268	177.50
28	59	32	182	*	410	43	60	49	57	178	85	*	410	
(-)	8.1	8.3	8.6	8.0	8.8	8.4	7.7	7.8	8.0	8.1	7.8	7.7	8.8	8.15
49	59	69	66	75	80	82	84	77	74	64	55	49	84	69.50
6.8	6.6	0.2	3.4	2.0	0	0.6	1.4	1.4	4.6	3.2	2.6	0	6.8	2.73
0	8.0	10.0	9.0	17.0	12.0	10.0	7.0	14.0	8.0	7.0	7.0	0	17.0	9.08
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
194	130	212	112	202	272	242	190	176	194	118	150	112	272	182.67
34	67	42	210	280	590	65	67	49	60	200	90	34	590	146.17
(-)	8.0	8.5	8.4	7.2	8.2	8.4	7.7	7.8	8.0	8.2	7.8	7.2	8.5	8.01

Table 4. Chemical analysis of water samples, Lake Corpus Christi, Station D, 1961.

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Range		Avg.
												Min.	Max.	
50	62	79	69	84	78	84	85	79	70	59	57	50	85	71.33
(#)	5.4	6.6	7.2	10.6	6.2	4.0	7.2	10.0	4.2	7.2	5.4	4.0	10.6	6.73
(-)	4.0	0	11.0	0	3.0	0	0	0	11.0	11.0	11.0	0	11.0	4.64
(-)	0	0	0	0	0	0	0	28	0	0	0	0	28	2.55
(-)	168	224	134	227	138	170	198	154	106	142	276	106	276	176.09
(-)	330	29	160	33	700	56	43	44	450	70	44	29	700	178.09
(-)	7.8	8.3	8.8	8.4	8.3	8.8	8.6	8.8	8.2	8.7	8.8	7.8	8.8	8.50
(-)	62	73	66	82	(-)	84	84	78	70	58	59	58	84	71.60
(-)	6.2	3.4	5.0	5.2	(-)	6.4	6.2	3.8	4.2	12.4	4.0	3.4	12.4	5.68
(-)	7.0	3.0	11.0	4.0	(-)	0	0	10.0	6.0	9.0	0	0	11.0	5.00
(-)	0	0	0	0	(-)	0	0	0	0	0	0	0	0	0.00
(-)	176	228	118	226	(-)	176	200	194	122	144	284	118	284	186.80
(-)	360	49	130	81	(-)	59	49	65	600	89	41	41	600	152.30
(-)	8.4	7.7	8.8	7.2	(-)	8.8	8.7	8.6	8.2	8.6	8.8	7.2	8.8	8.38

of water after the influx of flood waters into the reservoir (Table 1).

Less significant changes in water quality occurred in general, though slight, reductions in water temperatures and pH. This is most probably due to the increased depth and volume of water in the reservoir.

Generally speaking, dissolved oxygen and carbon dioxide levels harmful to fish life were not encountered except during the late summer and fall months and these were usually restricted to water at 20 or more feet below the surface (Tables 1 through 4). Only twice were less than 3.0 p.p.m. of dissolved oxygen found at the surface. This was at Station C at Dinero Bridge, in the impounded channel of the Nueces River, during July and November (Table 3). The reason for these low oxygen records was not readily apparent.

It is clear that the higher lake level elevation, brought about by the new dam, has materially improved the habitat for fish life in Lake Corpus Christi since 1958. Undoubtedly raising of the gates on the new dam to the 94-foot elevation to raise the water an additional six feet would decrease the turbidity even more and further improve fishing conditions, especially for largemouth bass.

Fish Collections

Netting - A total of 5,486 fish of 21 species were collected in gill nets from Lake Corpus Christi during 1961. In all, a total of 203 nets were set at the 16 netting stations during the year. All of the nets used at the stations were set at the surface except at Station 1 where each month one net was set at the surface and an additional net was set on the bottom in 65 feet of water.

Of the total fish taken, 2,587 were game fish. These included: channel, blue and flathead catfish, white and largemouth bass, warmouth, blue-gill, redear and longear sunfish, and white and black crappie. The other 2,899 specimens were classed as rough fish and included: alligator, spotted and longnose gars, threadfin and gizzard shads, smallmouth buffalo, carp, freshwater drum and Rio Grande perch (Tables 5, 6, and 7).

Although the species list for Lake Corpus Christi in 1961 varies somewhat from what it was in 1953 through 1955 (see job completion reports for Jobs A-3 and B-3, D.J. Projects F-6-R-1 and F-6-R-2) the game fish-rough fish ratio of the fish population shows considerable improvement. Netting results in 1953-1955 indicated a game fish-rough fish ratio of 39.7 per cent game fish to 60.3 per cent rough fish. Presently the ratio is 47.16 per cent game fish to 52.84 per cent rough fish. This apparent increase in abundance of game fish is largely due to reductions in the relative abundance of freshwater drum and smallmouth buffalo and to the increases of white bass, which were not present in 1953-1955, and of largemouth bass.

The 5,486 fish taken in nets weighed a total of 5,867 pounds (Table 8). Of this weight, game fishes comprised 29.4 per cent and rough fishes comprised 70.6 per cent. Opposed to the marked rise in numbers of game fish in the lake since the completion of the new dam, the relative weight of game fish has decreased somewhat. This is due to the fact that three common rough fish species

Table 5. A List of Fish Species Recorded from
Lake Corpus Christi

Common Name	Scientific Name
Alligator gar	<u>Lepisosteus spatula</u> Lacepede
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)
Carp	<u>Cyprinus carpio</u> Linnaeus
Golden shiner	<u>Notemigonus crysoleucas</u> (Mitchill)
Pugnose minnow	<u>Opsopoeodus emiliae</u> Hay
Red shiner	<u>Notropis lutrensis</u> (Baird & Girard)
Bullhead minnow	<u>Pimephales vigilax</u> (Baird & Girard)
Channel catfish	<u>Ictalurus punctatus</u> (Rafinesque)
Blue catfish	<u>Ictalurus furcatus</u> (LeSueur)
Yellow bullhead	<u>Ictalurus natalis</u> (LeSueur)
Flathead catfish	<u>Pylodictis olivaris</u> (Rafinesque)
Sheepshead minnow	<u>Cyprinodon variegatus</u> Lacepede
Mosquitofish	<u>Gambusia affinis</u> (Baird & Girard)
Sailfin molly	<u>Mollienesia latipinna</u> LeSueur
Tidewater silverside	<u>Menidia beryllina</u> (Cope)
White bass	<u>Roccus chrysops</u> (Rafinesque)
Largemouth bass	<u>Micropterus salmoides</u> (Lacepede)
Warmouth	<u>Chaenobryttus gulosus</u> (Cuvier)
Redear sunfish	<u>Lepomis microlophus</u> (Gunther)
Bluegill	<u>Lepomis macrochirus</u> Rafinesque
Longear sunfish	<u>Lepomis megalotis</u> (Rafinesque)
White crappie	<u>Pomoxis annularis</u> Rafinesque
Black crappie	<u>Pomoxis nigromaculatus</u> (LeSueur)
Freshwater drum	<u>Aplodinotus grunniens</u> Rafinesque
Rio Grande perch	<u>Cichlasoma cyanoguttatum</u> (Baird & Girard)

Table 6. Results of collections with experimental gill nets, Lake Corpus Christi.

Species	Numbers of fish collected																	Total	Per Cent of Total Number
	1B	1T	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Alligator gar	0	1	1	1	1	0	3	1	3	0	6	6	3	3	1	3	0	33	.60
Spotted gar	0	1	24	17	11	30	30	31	35	60	23	34	29	41	20	12	7	405	7.38
Longnose gar	1	25	0	0	1	1	1	2	0	0	2	1	2	3	24	50	20	133	2.42
Threadfin shad	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	.04
Gizzard shad	5	86	69	63	70	58	47	94	90	71	71	99	51	64	59	93	91	1181	21.53
Smallmouth buffalo	2	0	17	21	0	17	11	0	30	3	14	17	2	10	23	15	30	212	3.86
Carp	0	1	1	1	0	2	3	0	1	0	0	3	0	1	1	2	1	17	.31
Channel catfish*	3	51	45	90	137	103	57	58	50	39	36	44	25	22	14	38	8	820	14.95
Blue catfish*	2	92	13	35	53	14	5	30	5	11	14	22	23	4	6	6	1	339	6.18
Yellow bullhead	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	.02
Flathead catfish*	0	1	0	1	0	1	0	0	1	0	0	0	0	1	3	1	0	9	.16
White bass	0	41	4	8	61	5	11	23	3	1	2	4	3	3	23	14	65	265	4.83
Largemouth bass*	0	0	8	8	0	5	4	3	14	2	13	18	5	6	2	3	1	92	1.68
Warmouth*	0	0	0	5	0	3	4	3	2	2	0	1	3	1	0	0	0	24	.44
Redear sunfish*	0	0	2	2	0	4	5	2	9	4	1	4	0	0	0	0	0	33	.60
Bluegill*	0	1	4	3	1	11	5	5	7	21	7	22	2	0	0	1	2	92	1.67
Longear sunfish*	0	0	1	0	0	2	1	0	0	2	1	0	0	3	0	0	0	10	.19
White crappie*	1	10	27	95	36	65	35	103	46	76	40	63	61	44	44	64	28	838	15.27
Black crappie*	0	1	5	2	2	10	6	11	5	4	5	4	4	4	1	1	0	65	1.19
Freshwater drum	7	63	3	61	142	63	65	119	29	34	48	40	57	24	26	59	46	886	16.15
Rio Grande perch	0	0	1	2	0	4	0	0	0	2	12	6	0	1	1	0	0	29	.53
Totals	21	375	225	409	520	398	293	486	330	332	295	388	270	236	246	352	300	5486	
Per Cent	.38	6.83	4.10	7.46	9.48	7.25	5.34	8.86	6.02	6.05	5.38	7.07	4.92	4.30	4.49	6.60	5.47		100.00
Per cent game fish																			47.16
Per cent rough fish																			52.84

*Indicates game fish species

Table 7. Results of collections with experimental gill net Lake Corpus Christi.

in.	Numbers of Fish Collected												Per Cent of Total Number
	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
0	2	4	10	2	4	3	4	2	1	0	1	33	.60
22	18	42	64	44	41	48	21	28	27	25	25	405	7.38
6	18	3	3	10	12	37	10	14	7	3	10	133	2.42
0	0	0	0	0	2	0	0	0	0	0	0	2	.04
35	48	146	129	58	86	113	79	98	154	104	131	1181	21.53
14	14	19	13	18	12	22	15	31	26	14	14	212	3.86
0	0	2	1	2	4	1	2	2	1	0	2	17	.31
45	77	94	54	47	31	63	55	37	65	82	70	820	14.95
56	24	17	22	7	18	10	14	33	40	52	46	339	6.18
0	0	0	0	0	0	0	0	1	0	0	0	1	.02
0	0	3	0	1	0	1	1	1	1	1	0	9	.16
7	6	10	5	4	3	5	1	11	55	59	99	265	4.83
10	12	13	5	7	10	10	5	9	7	1	3	92	1.68
3	0	4	5	4	1	4	0	2	0	1	0	24	.44
2	1	3	4	5	3	4	3	4	0	2	2	33	.60
4	4	2	2	13	11	15	11	11	10	3	6	92	1.68
0	0	0	0	4	4	0	0	1	0	0	1	10	.19
88	54	35	60	34	32	48	38	69	139	122	119	838	15.26
0	0	0	0	0	0	3	10	3	4	25	18	65	1.19
07	112	42	153	100	56	39	41	92	47	59	38	886	16.15
0	2	1	0	3	5	3	8	3	2	1	1	29	.53
99	392	442	530	363	335	429	318	452	586	554	586	5486	
09	7.15	8.05	9.66	6.62	6.11	7.82	5.79	8.24	10.68	10.10	10.69		100.00

Table 8. Results of collections with experimental gill nets, Lake Corpus Christi.

Species	Weights of fish collected (pounds)																Per Cent of total Weight	
	Stations																	
	1B	1F	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16
Alligator gar	0	11.55	15.02	8.74	11.05	0	58.63	12.11	37.19	0	77.34	97.41	35.81	50.30	12.18	24.63	0	451.96
Spotted gar	0	2.93	52.90	36.34	35.09	60.77	57.13	74.33	69.47	118.87	58.32	83.23	73.26	98.33	57.75	30.13	10.82	919.67
Longear sunfish	3.93	113.93	0	0	2.75	7.37	3.19	10.12	0	0	12.83	3.19	10.15	15.42	81.77	139.95	44.28	448.88
Tomcod	0	0	0	0	0	0	0	0	0	0	0	0	0	.09	0	0	0	.13
Gizzard shad	2.24	19.89	19.23	11.61	13.39	11.25	10.13	28.88	19.09	16.95	22.13	27.81	17.94	22.05	13.61	31.91	30.54	318.65
Smallmouth buffalo	11.11	0	75.14	108.65	0	85.99	57.63	0	146.24	17.55	74.46	89.86	11.43	55.29	127.64	73.69	141.78	1076.46
Carp	.90	3.69	.83	6.99	0	4.99	9.21	0	5.50	0	17.30	27.30	0	5.74	4.81	15.33	9.12	69.90
Channel catfish*	0	15.51	13.96	35.52	30.13	44.42	30.82	17.30	17.76	16.29	24.06	27.30	12.36	16.28	10.76	19.00	4.12	336.49
Blue catfish*	18.36	99.01	65.02	88.05	18.35	5.76	20.19	20.19	17.64	12.60	6.95	18.49	13.44	5.92	4.89	4.61	.29	425.15
Yellow bullhead	0	0	0	0	0	0	.25	0	0	0	0	0	0	0	0	0	0	.25
Flathead catfish*	0	3.81	4.43	3.69	0	8.37	5.12	5.12	5.12	1.62	1.70	4.05	3.43	1.50	13.08	1.37	0	36.94
White bass*	0	52.79	10.86	4.71	62.72	5.77	11.64	32.56	19.28	1.31	1.63	12.16	6.74	3.50	24.36	16.39	66.42	297.61
Largemouth bass*	0	0	0	0	0	4.82	4.34	4.34	2.25	1.31	1.63	12.16	6.74	6.97	.47	2.72	1.20	93.86
Warmouth*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redear sunfish*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bluegill*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Longear sunfish*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White crappie*	.96	5.94	11.85	56.00	29.98	37.55	25.01	64.33	33.85	39.47	28.92	36.64	30.72	20.44	21.48	27.51	14.36	485.01
Black crappie*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Freshwater drum	4.94	53.77	4.26	79.44	108.25	73.22	100.88	4.95	4.01	2.53	2.13	2.52	2.28	1.82	4.3	.32	0	29.78
Rio Grande perch	0	.05	.58	.71	0	2.30	0	0	0	1.33	5.42	1.78	0	20.18	22.45	50.56	37.93	846.15
Totals	42.44	383.03	278.25	443.50	362.02	375.55	345.30	371.15	414.96	259.27	384.40	463.57	273.74	323.87	396.14	438.80	351.14	5867.13
Per Cent	.72	6.53	4.74	7.56	5.32	6.40	5.88	6.33	7.07	4.42	6.55	7.90	4.67	5.52	6.75	7.48	6.16	100.00
Per cent game fish																		29.35
Per cent rough fish																		70.65

*Indicates game fish species

including the spotted gar, smallmouth buffalo and freshwater drum, achieve greater average weights than most game fish species and that these three species increased in average weight since the dam was completed.

The most important changes in the fish population as reflected in netting results are the increase in relative abundance of gizzard shad and the decrease in relative abundance of smallmouth buffalo. Presently gizzard shad are the most abundant species in the netting collections where they previously had been the fifth most abundant species. Smallmouth buffalo in the 1953-55 data were second in number and first in weight, whereas they now are the eighth most numerous species but they remain first in percentage of the total weight of netted fish (Table 8).

The average number of fish per net increased from 22.75 in the 1953-55 data to 27.02 in the present data. This is an increase of 18.8 per cent in number. The average pounds of fish per net also increased from 24.98 to 28.91 or 15.7 per cent (Table 9).

Since field and tabulating techniques were identical and the numbers of nets set were almost the same, although the original survey covered two years, the indicated increase in the net catch may be construed to show an overall increase in basic productivity of about 15 per cent. This could reasonably be expected with the increased capacity of the lake and the reduction of turbidity permitting increased production of basic foods.

Seining - A total of 77 seining collections was made at seven stations on the lake (Tables 10, 11, and Figure 1). In all, some 7,713 specimens of 20 fish species were collected with seines. Nine of the species collected in seines were not taken in netting collections. An effort was made in selecting the sites for seining stations to include as many habitat sites as possible. The results of seining as well as of netting will be discussed in the following annotated species list.

Annotated Species List

Alligator gar - A total of 33 specimens was taken that weighed over 450 pounds. The majority of these were caught at Stations 10 and 11 in April (Table 6). Nearly three times as many alligator gars with over twice the total weight were taken during 1961 than were taken in the two years of the 1953-55 survey. It appears that this species has increased in relative numbers and in average weight. Although many of the seining collections were made through weed beds, no young gars of any species were taken in 1961.

Only three alligator gars taken in nets contained food in their stomachs. One contained a white crappie, another contained a gizzard shad and the third contained unidentifiable fish remains. One of these gars was infested with tapeworms.

Table 9. Success of gill netting in terms of numbers and pounds of fish caught.

Month	Number of Nets Set	Number of Feet of Nets Set	Number of Fish Caught	Average Number of Fish/Net	Average Number of Fish/Foot of Net	Lbs. of Fish Caught	Average Lbs. of Fish/Net	Avg. Lbs. of Fish/Foot of Net
January	16	2,000	499	31.19	0.250	470.44	29.40	0.2352
February	17	2,125	392	23.06	0.184	450.98	26.53	0.2122
March	17	2,125	442	26.00	0.208	539.40	31.73	0.2538
April	17	2,125	530	31.18	0.249	696.52	40.97	0.3277
May	17	2,125	363	21.35	0.171	451.10	26.54	0.2122
June	17	2,125	335	19.71	0.158	401.61	23.62	0.1889
July	17	2,125	429	25.24	0.202	505.88	29.76	0.2380
August	17	2,125	318	18.71	0.150	383.16	22.54	0.1803
September	17	2,125	452	26.59	0.213	545.12	32.07	0.2565
October	17	2,125	586	34.47	0.276	499.43	29.38	0.2350
November	17	2,125	554	32.59	0.261	410.11	24.12	0.1929
December	17	2,125	586	34.47	0.276	513.38	30.20	0.2415
Total	203	25,375	5486			5867.13		
Averages	16.92	2114.58	457.17	27.02	0.216	488.93	28.91	0.2312

Table 10. Results of collections with 20-foot straight seine, Lake Corpus Christi.

Species	Numbers of Fish Collected							Per Cent of Total	
	1	2	3	4	5	6	7		Total
Threadfin shad	294	364	294	139	50	239	339	1719	22.28
Gizzard shad	9	32	10	5	7	47	151	261	3.39
Mexican tetra	7	0	0	3	1	0	0	11	.14
Carp	0	0	0	0	8	0	1	9	.12
Golden shiner	2	5	0	0	0	0	0	7	.09
Pugnose minnow	7	9	31	9	6	8	10	80	1.03
Red shiner	87	72	99	262	78	207	84	889	11.53
Bullhead minnow	1	0	0	0	1	0	0	2	.03
Channel catfish	0	0	0	0	0	1	0	1	.01
Sheepshead minnow	0	0	0	0	0	3	1	4	.05
Mosquitofish	61	58	33	20	122	106	48	448	5.81
Sailfin molly	92	109	33	15	78	115	153	595	7.71
Tidewater silverside	467	530	317	513	1031	417	110	3385	43.86
Largemouth bass	0	1	3	0	1	0	0	5	.06
Redear sunfish	5	2	0	0	7	0	10	24	.32
Bluegill	27	60	34	32	10	6	13	182	2.36
Longear sunfish	1	0	0	0	0	0	0	1	.01
White crappie	0	0	1	0	0	0	0	1	.01
Black crappie	0	1	0	0	0	0	0	1	.01
Rio Grande perch	27	38	5	0	7	3	8	88	1.15
Totals	1087	1281	860	998	1407	1152	928	7713	
Per Cent	14.09	16.60	11.15	12.94	18.24	14.93	12.05		100.00

Table 11. Results of collections with seines, Lake Corpus Christi

Numbers of Fish Collected													Per Cent of Total
Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
35	1	70	5	184	115	456	111	104	568	0	70	1719	22.28
0	112	2	1	0	39	39	14	4	27	3	20	261	3.39
0	0	0	0	0	0	0	0	9	1	0	1	11	.14
0	1	0	0	0	8	0	0	0	0	0	0	9	.12
0	0	0	0	0	0	0	0	0	5	2	0	7	.09
0	0	0	3	2	11	2	31	11	4	9	7	80	1.03
0	59	9	37	76	79	20	49	126	174	123	137	889	11.53
0	0	0	0	0	0	0	0	0	0	2	0	2	.03
0	0	0	0	0	0	0	0	0	1	0	0	1	.01
0	0	0	0	0	0	0	0	0	2	0	2	4	.05
0	10	22	22	0	20	12	69	19	76	188	10	448	5.81
15	0	3	1	1	3	1	5	0	99	421	46	595	7.71
154	1001	177	79	181	247	246	122	95	503	223	357	3385	43.89
0	0	0	2	0	0	0	1	1	1	0	0	5	.06
0	2	0	0	0	0	0	0	0	3	16	3	24	.32
0	11	0	3	0	1	0	131	23	2	11	0	182	2.36
0	0	0	0	0	1	0	0	0	0	0	0	1	.01
0	0	0	0	0	0	0	0	1	0	0	0	1	.01
0	0	0	0	0	0	0	1	0	0	0	0	1	.01
0	0	0	0	0	38	4	40	2	1	3	0	88	1.15
204	1197	283	153	444	562	780	574	395	1467	1001	653	7713	
2.64	15.52	3.67	1.98	5.76	7.28	10.12	7.44	5.12	19.02	12.98	8.47		100.00

The average length and weight and "K" factor for this species remained much the same as before. Most of the specimens taken were collected in spring and early summer, from near shore and in flooded brush.

Of the 12 stomachs of spotted gars examined, four contained threadfin shad, three contained gizzard shad, one had a bluegill and four contained unidentifiable fish. One of the specimens was infested with tapeworms.

Longnose gar - A total of 133 longnose gar weighing 448 pounds were taken in nets in 1961. Compared with the 1953-55 netting data, the species increased in numbers from 1.9 to 2.4 per cent of the total and in weight from 7.2 to 7.7 per cent. They were most abundantly taken in nets in the spring and summer months from the up-lake, river channel stations.

In all, 12 stomachs of longnose gars were examined and all of these contained gizzard and/or threadfin shad or unidentifiable fish remains.

Threadfin shad - An important forage fish species, seining collections of threadfin shad indicated it to be less abundant in 1961 than it was in earlier work. It dropped in percentage of the total fish seined from 40 per cent in 1953-55 to 22 per cent in 1961. This decrease could be due to increased cropping of threadfins by predators.

Gizzard shad - The most common species taken in nets, the gizzard shad comprised 21.5 per cent of the number and 5.4 per cent of the weight of the total fish collected with nets. They also comprised 3.4 per cent of the fish collected in seines. Gizzard shad have increased considerably since 1953-55 when they comprised only 6.3 per cent of the number taken in nets and 2.7 per cent of the total weight.

Young-of-the-year gizzard shad furnish important forage for game fish and, although the population is increasing and will in time become overabundant, it has not yet reached the point where a "selective kill" of this species is necessary.

Mexican tetra - Only 11 specimens of the Mexican tetra were taken in seining collections during 1961. When compared with the 452 taken in the 1953-55 survey, it appears the species is declining in numbers. The decline was most likely due to predation by the increased population of largemouth bass present in the lake in 1959.

Smallmouth buffalo - In netting, 212 smallmouth buffalo weighing 1,076 pounds were taken. These averaged approximately five pounds each. Fairly consistent numbers of them were taken each month but most were from the near shore stations. Fewer were taken in deep water stations, free of adjacent bushy cover. The river channel stations were most productive in fall and early winter. In netting data from the 1953-55 survey, this species was the second most abundant species taken. In 1961 they were only eighth in order of abundance in the collections but remained first in weight.

Carp - The average weight of carp taken in nets during 1961 was about double that of those taken in the earlier survey. This weight increased

from 2.14 pounds to 4.11 pounds. The species seemed to prefer the lower portion of the lake where nets were set adjacent to brush. That only sparse numbers of carp were caught throughout the year indicated this species to be of little importance at this time.

Golden shiner - Since only seven specimens of the golden shiner were collected in seines, it is felt these could be present as the result of bait releases.

Pugnose minnow - This species has declined in Lake Corpus Christi since the previous survey when it comprised 11 per cent of the seined specimens. During 1961, the 80 specimens taken made up only one per cent of the seining collections. The decline in abundance is probably due to increased predation by an expanding game fish population.

Red shiner - This is the only desirable forage fish species which showed an increase in relative abundance since completion of the new dam. In all, the total of 889 specimens taken comprised 11.5 per cent of the fish seined. In 1953-55 they comprised only seven per cent of the fish taken in seines.

Bullhead minnow - This species has also declined in abundance and at present is relatively rare in the lake. Only two specimens were collected in current work, whereas 170 specimens had been taken in the previous survey.

Channel catfish - One of the five most abundant game fish species in Lake Corpus Christi, 820 channel catfish, weighing 336.5 pounds, were taken in nets during 1961. Since only 35 per cent of the total catfish taken were caught from April through September, it is indicated the species is more active during the fall, winter and spring months. Netting at Stations 3, 4, and 5 each took about twice as many channel catfish as any other single station and the catch of catfish reduced progressively at each more up-lake station.

A very successful spawn of channel catfish in both 1960 and 1961 was indicated from the numbers of advanced fingerlings taken in the nets and catches reported by fishermen.

In the 38 channel catfish stomachs examined, there were ten containing only threadfin shad. Two stomachs contained gizzard shad, a Rio Grande perch, ten unidentified fish and a mussel. Five others contained algae, mayfly nymphs, and three crayfish. Four held fish scales from commercial fish cleaning and one softshell turtle and one other stomach contained kidney bait. The remaining 14 stomachs were empty.

A total of 647 of the 820 channel catfish netted were infested with visceral round worms.

Blue catfish - The 339 blue catfish netted during 1961 weighed a total of 425 pounds. Though this species appears to be less abundant both by number and weight in the netting collections from what it was during 1953-55, it is believed that the species is actually more numerous than in the past. The indicated reduction in average size of the blue catfish is probably due to greater reproduction and a catch of smaller fish in the netting samples.

Fourteen of the 28 stomachs examined contained unidentified fish, ten stomachs held threadfin shad, one contained a white crappie and the remaining three held algae and a saltwater shrimp bait.

Thirty-two of the 339 blue catfish were parasitized with visceral round worms.

Yellow bullhead - Only a single yellow bullhead was taken in nets during 1961. This was caught during September at the most up-lake netting station. During 1953-55 five bullheads were caught. Four of these were yellow and one was a black bullhead.

Flathead catfish - Only nine flathead, or yellow catfish, weighing a total of 36 pounds, were caught in nets during 1961. This is about half as many as were taken in the earlier survey and appears to indicate a decline in numbers of this, the favorite species of trotline fishermen. In the one stomach found to contain food was an eight-inch Rio Grande perch. Four of the nine flatheads were parasitized with visceral round worms.

Sheepshead minnow - Only four specimens of this relatively rare species in Lake Corpus Christi were taken in the seining collections. More were collected in earlier surveys from the lake.

Mosquitofish - The gambusia or mosquitofish was found to be very abundant along the shallow, weedy shores and among the floating water hyacinths. Most of the specimens were collected during late fall and early winter. All were seined.

Sailfin molly - Also very abundant, the sailfin molly was collected in greatest numbers at seine stations 1, 2, 6, and 7. Most were collected in November.

Tidewater silversides - Of the total specimens taken in seines, 43 per cent were tidewater silversides, making it the most abundant species taken with seines. Observations made while using this minnow as bait for white crappie, indicated it to be a poorer bait species than the red shiner. The significant increase in the size of the population of tidewater silversides in the face of increased predation by game fish species also indicate it to be a less desirable forage species.

White bass - First stocked in Lake Corpus Christi from Falcon Reservoir in September 1958, the present population of white bass appears to be well established. Spawning migrations were observed in the Frio River at the dam at Three Rivers in February of 1960 and 1961. Large numbers of white bass were taken by anglers during these migrations at the Three Rivers dam.

A total of 265 white bass weighing 297 pounds were taken in netting collections during 1961. They have become the seventh most numerous species netted and promise to become a significant part of the Lake Corpus Christi sport fishery. However, the size of the population attained by this species will be greatly influenced by conditions in the Nueces and Frio Rivers in late winter months.

Of those examined, 22 white bass stomachs contained threadfin shad, one contained a gizzard shad, one held a Rio Grande perch, another contained tidewater silversides and eight held unidentified fish remains.

Largemouth bass - The most productive months for netting largemouth bass during 1961 were January through March, June, July, and September. A total of 92, weighing 95 pounds were collected in nets. All net stations except Stations 1 and 4, which were the deep, open water stations, produced at least one bass each. Net Stations 10 and 11 were the most productive.

In the 1953-55 survey only 12 bass were taken in nets and since it is known that largemouth bass in comparison to other species are difficult to net, a significant increase in the bass population is indicated. Spawning success was good during 1958 and 1959 at a time when there were tremendous amounts of forage and large areas of newly inundated land, with great amounts of newly flooded shoreline brush for cover. Spawning of largemouth bass in 1960 was not nearly so successful because of cold weather that extended into April. This poor success is reflected in the decidedly lower fisherman's catch of this species in 1960 and 1961.

Since only five young-of-the-year largemouth bass were taken in the 77 seining collections during 1961, spawning success for the year was probably poor.

Of the nine stomachs of largemouth bass containing food, two had sunfish, one contained a threadfin shad and four had unidentified fish remains.

Warmouth - The warmouth is a relatively unimportant species in Lake Corpus Christi. Only 24 were taken in nets and these were from the near shore stations except for those taken in the river channel of the upper lake area. None were taken in seines.

Redear sunfish - Like the warmouth, the redear is of relatively little importance in the fish population. A total of 33 were collected in nets and 24 others were taken in seines.

Bluegills - Bank fishermen utilize this species to some degree and they are quite often caught along with other sunfish for use as live bait on trotlines set for flathead catfish. A total of 92 bluegills were taken in gill nets and 182 were collected in seines. Most were caught during the period from May through October. Percentagewise, the bluegill population is little changed from what it was during earlier work.

Longear sunfish - Only ten specimens were collected in nets. One other was taken in the seining collections. The species is of little importance in the lake.

White crappie - One of the most popular of the game fish species in Lake Corpus Christi, a total of 838 white crappie, weighing 485 pounds, were taken in nets during 1961. Though there was little change in the relative abundance of the species since 1953-55, the average weight of the netted specimens increased from 5.3 ounces to 9.3 ounces. White crappie were regularly taken

throughout the year at all stations but the heaviest catches were at Net Stations 3 and 7 during the fall and winter months.

All of the 54 white crappie stomachs examined contained the remains of fish only and this was mostly the remains of threadfin shad. Only 18 of the specimens were parasitized with intestinal round worms, a great reduction in incidence of parasitism from that of data for specimens collected during 1953-55.

Black crappie - Due to earlier misidentification, black crappie were not recorded from the lake previously. During 1961, a total of 65 individuals of this species were collected in nets.

Freshwater drum - A total of 386 freshwater drum, weighing 346 pounds, were taken in the 1961 netting collections, making it the second most numerous species taken. The average weight of individual drum increased from 9.1 ounces in 1953-55 to 15.3 ounces in 1961. Observations of the commercial and sport catches of the species indicate it is utilized to a small extent. The large population, however, competes for food and space with more desirable species.

Of the 24 stomachs examined, 18 contained threadfin shad, three had unidentified fish remains, one contained a crayfish and another had a few small mussels. Only ten of the total netted were found to have visceral round worms during 1961, while during earlier work a very large percentage of this species was infected.

Rio Grande perch - A total of 88 Rio Grande perch was taken in seines and 29 were collected in nets during the year. Based on these data, little change has occurred in the population since the earlier work. The species is frequently used for trotline bait by sport fishermen. Only one of the specimens was infested with visceral round worms.

Vegetation Problems

Although the water district had planned to remove all trees and brush from the bed of the new lake before impoundment, only a very few sections were actually cleared. Now, besides the taller of the dead trees that were in the old lake, approximately 50 per cent of the upper half of the new lake is covered with dead emergent trees. Cultivated fields and improved pastures that were flooded are, of course, now in open water. Along the old river channel and adjacent low lands, willows, hackberry, huisache and, in several places, live oaks stand well out of the water. Brushy pastures now have dead thickets of mesquite, hackberry and thorny brush standing emergent. Many of these dead trees, mostly willows and hackberries, have already been broken off at the new 88-foot water line by high winds. Almost all of the small brush has disintegrated and the shrubby huisache is dissolving.

Most of the mesquite, live oak, and larger huisache trees can be expected to remain in the lake practically permanently, as they did for 20 years in the old lake. In many places emergent trees, especially those above the old Lagarto Bridge, are impenetrable to boat travel and those blown over by winds become floating logs. These are dangerous to boats everywhere in the lake and form drift lines along many of the beaches around the lake.

Water hyacinths which had infested the old lake were largely removed from the lower half of the new lake by a flood and north winds just prior to closure of the new dam. The hyacinths that were above the old Lagarto Bridge were windblown into the newly flooded trees and are now held in place there. They reproduced in large quantities and the new lake is now infested with two to three times as many acres of hyacinths, blocked up into permanent beds in the flooded trees, as were present on the old lake. If the trees and brush had been removed from the new lake bed, the hyacinths would almost certainly have been blown along the northwesterly shorelines and their eradication would have been easily accomplished by chemical spraying.

Although the old lake had rather extensive beds of cattails and some bullrushes, they were only a minor problem because of the small amount of lake shore development. Within the first year after the impoundment of the new lake, few bullrush beds developed but several shore areas became badly infested with cattails. Bank fishing is impossible along perhaps 30 per cent of the shore of the lower lake. As a result several property owners have requested information concerning how to control or eradicate the cattails along their beaches. Several efforts at chemical and mechanical control have had only limited success. Any control work done at this time would have little or no effect on the lake after the gates are raised to the 94-foot elevation. It is probable that some control of cattails may be needed after the gates are raised.

Submerged vegetation, consisting mostly of Potamogeton, developed during the summer and fall in shallow areas. Complaints have been voiced by owners from property adjacent to such areas. This problem will almost certainly increase with additional reduction in turbidity expected to result from raising the gates. These weed beds furnish very important cover for game and forage fish and, therefore, only localized control by individual property owners is probably the most logical recommendation.

Recommendations:

Continuing periodic checks of the fish population in Lake Corpus Christi should be made. Development of the five major game species populations and the principal undesirable fish species populations should be periodically checked both by net and seine collections and by watching fishermen's reports.

It seems certain that gizzard shad, at least, may become overabundant and require a selective kill within the foreseeable future. If the three species of gar continue to increase, it may be necessary to take control measures. Perhaps this could be done by intensive netting if spawning concentrations can be located.

A water hyacinth control program is presently underway and, if aerial application is feasible, complete success may be anticipated.

When the gates of the new dam are raised to increase the surface elevation to 94 feet above sea level, it will be necessary to keep a close watch on the development of cattails. Perhaps control measures on the first bunches

to develop may forestall larger, more expensive projects in the future.

When the 94-foot elevation is attained, another full scale one year resurvey should be carried out.

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