PERFORMANCE REPORT

As Required By

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project F-3-R-21

Region 3-B Fisheries Studies

Objective 15: Fisheries Management Recommendations
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ABSTRACT

The objective of this study is to recommend fisheries management practices for the public waters of Northeast Texas. Fisheries surveys were made on the following major reservoirs of Region 3-B in 1973: Toledo Bend (Panola, Shelby, and Sabine Counties), Caddo Lake (Marion-Harrison Counties), Lake O' the Pines (Marion-Upshur Counties), Lake Blundell (Titus County), Lake Striker (Rusk-Cherokee Counties), Lake Murvaul (Panola County) and Lake Texarkana (Bowie-Cass Counties). Survey results were tabulated and comparisons made with previous survey data for given waters. Proposed fishery regulation changes were presented by project personnel at public hearings in each regulatory authority county within Region 3-B. Management recommendations made for the candidate waters in 1973 included:

1.) the treatment of water hyacinths on Caddo Lake,
2.) the construction of nursery ponds on Lake Texarkana and Lake O' the Pines,
3.) the construction of lighted fishing piers on Lake Texarkana and Lake O' the Pines,
4.) periodic water drawdowns from October - January every third year on Lake Texarkana and Lake O' the Pines,
5.) the opening of Lake Blundell to sport fishing June 1, 1974,
6.) a reduction of daily bag limits on blue, channel and flathead catfish in Lake Blundell,
7.) the continuance of spot treatment of marginal vegetation in Lake O' the Pines by U. S. Army Corps of Engineers,
8.) the continuation of channel catfish rearing at Lake Murvaul,
9.) the stocking of Lake Texarkana with walleye to provide an additional game fish,
10.) the stocking of Tilapia sp. for additional forage in Lake Striker.

PERFORMANCE REPORT

State: Texas Project Number: F-3-R-21

Project Title: Region 3-B Fisheries Studies

Project Section: Research and Surveys

Study Title: Fisheries Management Recommendations

Contract Period: From February 1, 1973 To January 31, 1974

Program Narrative Objective Number: 15

Objective: To determine, in Region 3-B waters, the need for:

1. Changes in fish harvest regulations.
2. Fish population control.
3. Stocking of game fish species.
4. Noxious vegetation control.
5. Emergency measures needed to correct unpredictable events adversely affecting fish populations.

I. Segment Objective: Same as 1-5 above.

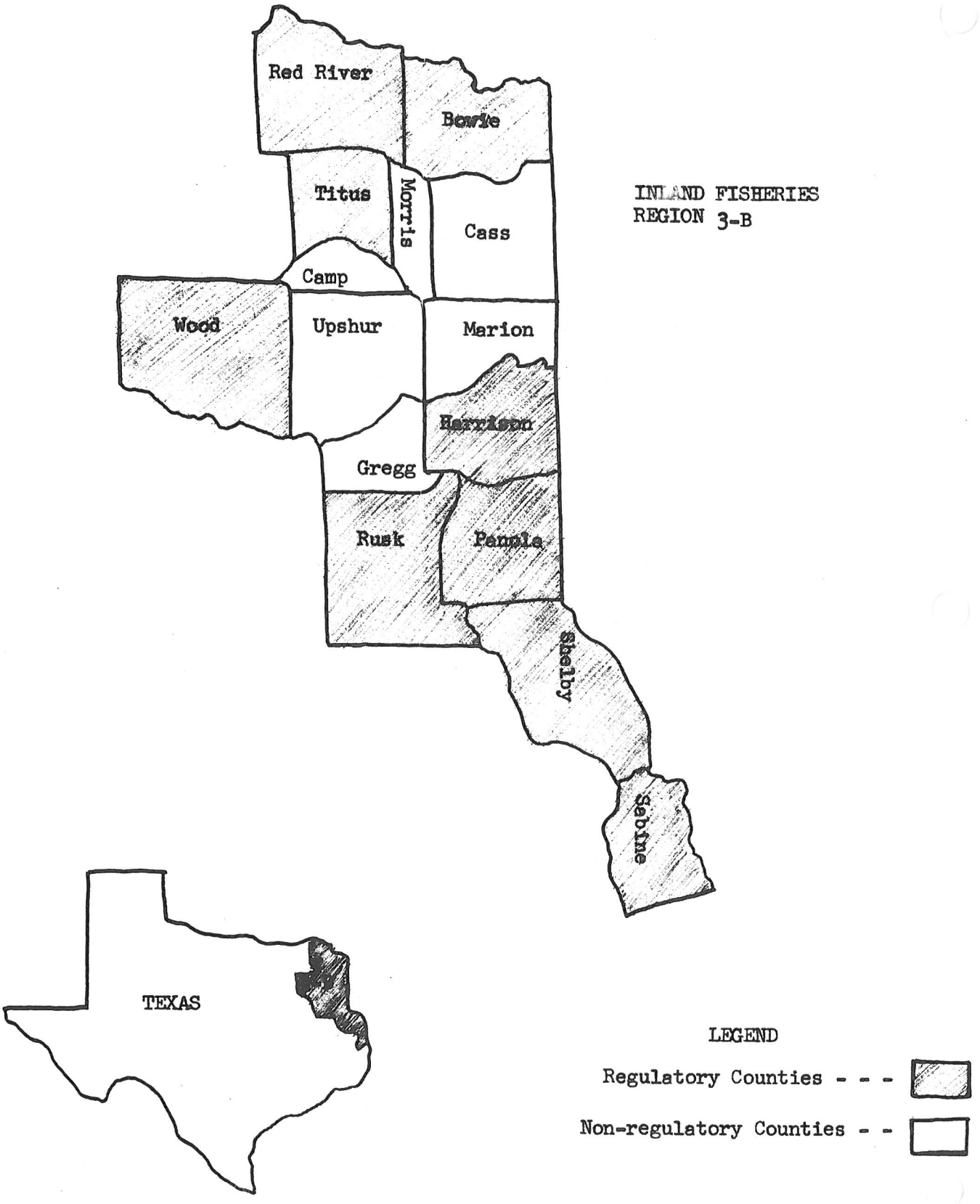
II. Summary of Progress:

Public hearings were attended by project biologists in all regulatory counties within Region 3-B (Figure 1). Recommended changes affecting area waters included the prohibition of nets in the Panola and Harrison County portions of the Sabine River, and the prohibition of sport fishing in Lake Blundell.

For clarification purposes, the following definitions were presented as Statewide changes:

1. "The term 'trotline' when used in this proclamation includes a sail line or rubber band line and shall be constructed of nonmetallic materials."
2. "For the purpose of this Act a trotline shall be defined as a main fishing line with more than five hooks attached at a minimum interval of three horizontal feet."

FIGURE 1.


Red River
Bowie
Titus
Morris
Cass
Camp
Wood
Upshur
Marion
Harrison
Gregg
Rusk
Panola
Shelby
Sabine
TEXAS
INLAND FISHERIES
REGION 3-B
LEGEND
Regulatory Counties - - -
Non-regulatory Counties - -

3. "For the purpose of this Act a throwline shall be defined as a main fishing line with five or less hooks attached at a minimum interval of three horizontal feet, with one end permanently attached to a permanent fixture."

4. "For the purpose of this Act a jug line shall be defined as a free floating main fishing line with five or less hooks attached at a minimum of three horizontal feet with the main line tied to a free floating device."

Proclamation No. A-1, 1973-74 was approved by the Texas Parks and Wildlife Commission on April 26, 1973.

Fisheries Management Surveys

Fisheries surveys to determine the need for management recommendations were made on Toledo Bend Reservoir, Caddo Lake, Lake O' the Pines, Lake Blundell, Lake Striker, Lake Murvaul, and Lake Texarkana in 1973.

Multifilament nylon gill nets and bag seines were used as standard collection equipment on these surveys. Each unit of gill net consisted of 150 feet of bar mesh increasing each 25 feet by 1/2 inch increments from 1 to 3 1/2 inches. These nets were 8 feet in depth. A 30 foot nylon bag seine of 3/8 inch mesh was used in conjunction with a 15 foot bag seine of 3/16 inch mesh for making seine collections.

Gill nets were randomly set overnight. On Toledo Bend, Lake Texarkana, Lake O' the Pines and Caddo, netting was conducted on two successive nights when work schedules permitted. Total net units set in each reservoir were: Toledo Bend - 30; Caddo-24; Lake O' the Pines - 24; Blundell - 24; Texarkana - 18; Murvaul - 12; Striker - 12. Specific collection dates are included in the netting tables for each candidate water.

Net data were compiled by species to include number and weight, percent of number and weight, average weight, and catch per unit (net) by weight and number.

Seining samples were separated by species, with reference to the presence of adult and young-of-the-year size groups. Seining data were analyzed to determine stocking recommendations from the standpoint of degree of reproduction by game fishes, the need for an additional introduced species to provide an additional sport fishery or control of undesirable species, and the introduction of forage species where inadequate forage was available for standing crops of game fishes.

Observations were made in conjunction with field survey work to determine the extent of aquatic vegetation and evaluate the need and feasibility of control in problematic areas.

Water quality analyses were made with a Hach Model DR-EL kit. Oxygen-temperature analyses were made with a Yellowsprings Model 51-A meter. Additional conductivity and salinity tests were made with a YSI Model 33 meter.

A checklist of the scientific and common names of fishes referred to in this report is included in appendix I. The names are those accepted by the American Fisheries Society and found in Special Publication No. 6, A List of Common and Scientific of Fishes from the United States and Canada, 1970.

Toledo Bend Reservoir

Toledo Bend, an impoundment on the Sabine River in Panola, Shelby, Sabine, and Newton Counties, contains 184,000 acres of water. This giant reservoir was constructed in 1967-68 by the Lower Sabine River Authority for hydro-electric power generation, flood control, water supply, and recreation.

A comparison of 1971-72 survey data with similar 1973 tabulations indicated a relatively stable fish population in the reservoir. Catch per unit effort has been lower in Toledo than in other area lakes (Table 1.). This is partially attributed to the extremely low turbidity often found in many areas of the lake.

Gizzard shad, spotted gar and yellow bullhead catfish continued to be the most abundant rough fishes netted. Although collection data were not indicative of a heavy carp population, this species does exist in large numbers and may be a problem within the next few years.

Seining collections indicated poor reproduction of most game fishes with the exception of largemouth bass (Table 2).

Toledo Bend continued to be a national attraction to bass fishermen in 1973. The daily bag limit has been maintained at 15 per day on black basses to conform to Louisiana regulations. A daily bag limit of 2 was placed on striped bass in Toledo Bend to provide uniform inter-state regulations on this species. Through repeated stocking efforts of the Louisiana Wildlife and Fisheries Commission, a striped bass fishery has been established in the reservoir. To date the largest striper taken weighed 21

Table I. Toledo Bend Netting Results

netting units-March 13,1973; 12 units-June 25,26,1973; 12 units-September 18,19,1973

Species	Number	Percent of Number	Weights (lbs)	Percent of Weight	Average Weight	30 net units Catch/effort Number	30 net units Catch/effort Weight
Spotted gar	56	13.66	120.05	21.26	2.14	1.87	4.00
Longnose gar	6	1.46	17.75	3.14	2.96	0.20	0.59
Bowfin	6	1.46	57.25	10.14	9.54	0.02	1.91
Golden shiner	1	0.24	0.77	0.14	---	0.03	0.03
Gizzard shad	83	20.24	50.74	8.99	0.61	2.77	1.92
Carp	10	2.44	73.53	13.02	7.35	0.33	2.45
River carpsucker	17	4.14	39.25	6.95	2.31	0.57	1.30
Spotted sucker	9	2.20	25.50	4.52	2.83	0.30	0.85
Lake chubsucker	1	0.24	0.75	0.13	---	0.03	0.02
*Channel catfish	10	2.44	23.38	4.14	2.34	0.33	0.78
Black bullhead	3	0.73	5.37	0.95	1.79	0.10	0.18
Yellow bullhead	45	10.98	47.87	8.48	1.06	1.50	1.59
*Yellow bass	4	0.98	0.87	0.15	0.22	0.13	0.03
*Largemouth bass	15	3.66	21.63	3.83	1.44	0.50	0.72
*Warmouth	2	0.49	0.44	0.08	0.22	0.07	0.01
*Redear sunfish	15	3.66	4.56	0.81	0.30	0.50	0.15
*Bluegill	64	15.61	15.07	2.67	0.24	2.13	0.50
*White crappie	10	2.44	20.06	3.56	2.01	0.33	0.67
*Black crappie	50	12.20	38.75	6.86	0.78	1.67	1.29
*Flier	3	0.73	1.00	0.18	0.33	0.10	0.03
TOTAL	410	100.00	564.59	100.00	-	13.66	18.82
Rough Fish	237	57.79	438.83	77.72		7.90	14.63
* Game Fish	173	42.21	125.76	22.28		5.76	4.19

Table 2. Toledo Bend Seining Results

Species	Number	Number/unit effort	Adult	Young-of-year
Golden shiner	13	1.08	x	x
Blacktail shiner	31	2.58	x	x
Sand shiner	30	2.50	x	x
Bullhead minnow	30	2.50	x	x
Golden topminnow	13	1.08	x	
Blackstripe topminnow	33	2.75	x	x
Brook silverside	21	1.75	x	x
Largemouth bass	32	2.66		x
Spotted sunfish	14	1.16		x
Redear sunfish	52	4.33	x	x
Bluegill	210	17.50	x	x
Longear sunfish	7	0.58	x	x
TOTAL	486			

Date	No. Hauls	Seining Area	Total No. Fish	Catch/effort
March 13, 1973	4	Six Mile Creek	132	33.00
June 25, 26, 1973	4	Dam Area	120	30.00
September 18, 19, 1973	4	Huxley Bay	234	58.50
TOTAL	12		486	40.50

pounds - 4 ounces, a new Texas state record. No evidence of reproduction by striped bass has been found in Toledo Bend.

Although commercial netting is prohibited in the Texas portions of Toledo Bend, it is legal in Louisiana and, in the writers opinion, poses a threat to the flathead catfish.

Water quality analyses made in 1973 were considered normal on Toledo Bend (Table 3). Low turbidity and complete thermal stratification occurred during the summer months in most areas.

Although aquatic vegetation did not pose an immediate problem, observations of scattered water hyacinth plants indicated future control of this plant may be required. Submerged aquatics have become a nusiance in many marina areas.

Caddo Lake

Located on Cypress Bayou in Marion and Harrison Counties, Caddo Lake lies in Texas and Louisiana. The Texas portion of this natural lake contains some 14,000 acres, much of which is covered with dense cypress breaks. Caddo is an extremely shallow lake with an average depth of 4 feet. Siltation and deposition of organic plant material has slowly transformed many areas into swamp habitat. The recent construction of Blundell and Cypress Springs Reservoirs on the upper Cypress drainage will further reduce annual water flow to Caddo. Without the flushing action of annual flood waters excessive eutrophication will occurr in Caddo.

Game fish production in Caddo Lake continued to be good in 1973, as indicated by collection data (Table 4). Unlike most reservoir basins, Caddo acreage is almost totally utilized for fish propagation and abundant cover exists for fry protection. Numerous forage species were collected in seines on Caddo as well as abundant largemouth bass and black crappie young-of-the-year (Table 5).

Chacteristics of Caddo water quality are low pH and high turbidity as contained in Table 6.

Aquatic vegetation of all types continued to be a serious problem in the lake. Many areas conjested with submerged plants during the summer and fall months became totally inaccessible to fishermen. The Statewide Noxious Vegetation Control project treated boat roads and public access areas in 1973 with pelleted 2,4-D at a rate of 100 pounds per acre. Two separate treatments were made in some areas. Hyacinths were also treated with liquid 2,4-D in problematic areas of the lake. Additional hyacinth control will no doubt be required in 1974.

Table 3. Toledo Bend Limnological Data

Date: March 13, 1973

Air Temperature 21.7°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	21.2°C	8.6 ppm	-	-	16 inches *
3'	20.5	7.4	-	-	
6'	19.8	7.4	-	-	
9'	15.0	5.6	-	-	
12'	12.5	3.4	-	-	
15'	11.5	2.1	-	-	
18'	11.0	1.2	-	-	
21'	11.0	0.8	-	-	
24' (bottom)	10.4	0.5	-	-	

Surface Analyses:

M.O. Alkalinity 55 ppm Total Hardness 70 ppm Chlorides 46 ppm

pH 7.1 Weather Conditions cloudy and windy

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Date: June 25, 1973

Air Temperature 32°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	30.0°C	8.4 ppm	0.0	176 uhmos/cm	56 inches *
3'	30.0	8.3	-	-	
6'	30.0	8.3	-	-	
9'	29.0	8.3	0.0	176	
12'	28.0	8.2	-	-	
15'	27.0	8.1	-	-	
18'	27.0	7.2	-	-	
21'	27.0	7.0	0.0	176	
24'	25.5	2.7	-	-	
27'	21.0	0.4	-	-	
30'	17.0	0.3	-	-	
33'	16.0	0.3	-	-	
36'	15.0	0.2	-	-	
39'	14.0	0.2	0.0	158	
42'	13.0	0.2	-	-	
45'	12.0	0.2	-	-	

Surface Analyses:

M.O. Alkalinity 50 ppm Total Hardness 70 ppm Chlorides 40 ppm

pH 7.1 Weather Conditions cloudy

* Secchi disk

Table 3. Cont.

Date: September 18, 1973

Air Temperature 29°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	27.5°C	6.0 ppm	trace	150 uhmos/cm	45 inches *
3'	27.5	5.3	-	-	
6'	27.0	4.0	-	-	
9'	27.0	4.0	-	-	
12'	27.0	4.1	trace	175	
15'	27.0	4.6	-	-	
18'	27.0	4.6	-	-	
21'(bottom)	26.5	2.8	trace	195	

Surface Analyses:

M.O. Alkalinity 30 ppm Total Hardness 35 ppm Chlorides 45 ppm

pH 7.1 Weather Conditions partly cloudy

* Secchi disk

Table 4. Caddo Lake Netting Results

6 units-June 13, 1973; 12 units-September 25,26, 1973; 6 units-December 29,1973

Species	Number	Percent of Number	Weights (lbs)	Percent of Weight	Average Weight	30 net units Catch/effort Number	30 net units Catch/effort Weight
Spotted gar	55	10.25	103.27	18.57	1.88	2.29	4.30
Longnose gar	1	0.19	1.43	0.26	---	0.04	0.06
Bowfin	4	0.74	39.25	7.06	9.81	0.16	1.63
Skipjack herring	3	0.56	2.37	0.43	0.79	0.12	0.09
Gizzard shad	85	15.83	72.95	13.12	0.86	3.54	3.03
Chain pickerel	10	1.86	11.94	2.15	1.19	0.41	0.49
Carp	1	0.19	5.43	0.98	---	0.04	0.22
Golden shiner	2	0.37	0.46	0.08	0.23	0.08	0.01
Smallmouth buffalo	1	0.19	3.44	0.62	---	0.04	0.14
River carpsucker	15	2.79	45.93	8.26	3.06	0.62	1.91
Spotted sucker	33	6.15	73.79	13.27	2.23	1.37	3.07
Lake chubsucker	5	0.93	3.25	0.58	0.65	0.20	0.13
*Channel catfish	27	5.02	18.94	3.40	0.70	1.12	0.79
Black bullhead	5	0.93	8.89	1.60	1.77	0.21	0.37
Yellow bullhead	12	2.23	15.43	2.77	1.28	0.50	0.64
*Flathead catfish	3	0.56	9.05	1.63	3.01	0.12	0.37
*White bass	18	3.35	19.64	3.53	1.09	0.75	0.81
*Yellow bass	155	28.87	46.79	8.41	0.30	6.46	1.95
*Largemouth bass	2	0.37	7.57	1.36	3.78	0.08	0.31
*Warmouth	2	0.37	1.18	0.21	0.59	0.08	0.05
*Redear sunfish	23	4.28	6.05	1.09	0.26	0.96	0.25
*Bluegill	8	1.49	1.94	0.35	0.24	0.33	0.08
*White crappie	10	1.86	4.31	0.77	0.43	0.41	0.18
*Black crappie	50	9.32	40.08	7.20	0.80	2.08	1.67

Table 4. con't

Species	Number	Percent of Number	Weights (lbs)	Percent of Weight	Average Weight	30 net units Catch/effort Number	30 net units Catch/effort Weight
Freshwater drum	7	1.30	12.79	2.30	1.82	0.29	0.53
TOTAL	537	100.00	556.17	100.00		22.37	23.17
Rough fish	239	44.51	400.62	72.03		9.96	16.69
*Game fish	298	55.49	155.55	27.97		12.42	6.48

Table 5. Caddo Lake Seining Results

Species	Number	Number/Unit Effort	Adult	Young-of-year
Spotted gar	3	0.25	X	X
Threadfin shad	21	1.75	X	X
Chain pickerel	2	0.16		X
Goldfish	1	0.08		X
Golden shiner	32	2.66	X	X
Pugnose minnow	4	0.33	X	
River shiner	8	0.66	X	
Red shiner	2	0.16	X	
Spottail shiner	1	0.08	X	
Spotted shiner	46	3.83		X
Lake chubsucker	4	0.33		X
Golden topminnow	69	5.75	X	X
Blackstripe topminnow	25	2.08	X	
Mosquitofish	91	7.58	X	X
Brook silverside	31	2.58	X	X
Largemouth bass	58	4.83		X
Warmouth	5	0.41		X
Bantam sunfish	1	0.08		X
Spotted sunfish	26	2.16	X	X
Redear sunfish	55	4.58	X	X
Bluegill	121	10.08	X	X
Black crappie	77	6.41		X
Log perch	1	0.08		X
TOTAL	684			

Table 5. cont

Date	No. Hauls	Seining Area	Total No. Fish	Catch/effort
June 13, 1973	6	Big Lake	471	78.50
September 8, 1973	6	Big Cypress Bayou	213	35.50
TOTAL	12		684	57.00

Table 6. Caddo Lake Limnological Data

Date: June 13, 1973

Air Temperature 22.2°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	29.0°C	7.2 ppm	0.0	75 uhmos/cm	40 inches *
3'	29.0	7.0	-	-	
6'	27.5	5.0	-	-	
9'	27.0	4.5	0.0	80	
12'	26.0	2.0	-	-	
15'(bottom)	26.0	1.0	0.0	100	

Surface Analyses:

M.O. Alkalinity 50 ppm Total Hardness 20 ppm Chlorides 10 ppm

pH 6.4 Weather Conditions rainy

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Date: September 25, 26, 1973

Air Temperature 27.8°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	26.0°C	5.6 ppm	trace	100 uhmos/cm	42 inches *
3'	25.5	5.3	-	-	
6'	25.0	5.2	-	-	
9'	25.0	5.0	trace	110	
12'	25.0	5.0	-	-	
15'(bottom)	25.0	2.0	trace	110	

Surface Analyses:

M.O. Alkalinity 35 ppm Total Hardness 20 ppm Chlorides 15 ppm

pH 6.5 Weather Conditions clear

* Secchi disk

Table 6. Cont.

Date: December 29, 1973

Air Temperature 18.0°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	15.0°C	7.3 ppm	trace	70 uhmos/cm	22 inches *
3'	15.0	6.2	-	-	
6'	15.0	5.8	trace	75	
9'	15.0	5.3	-	-	
12'(bottom)	15.0	2.0	trace	110	

Surface Analyses:

M.O. Alkalinity 35 ppm Total Hardness 40 ppm Chlorides 15 ppm

pH 6.8 Weather Conditions clear

* Secchi disk

Lake O' the Pines

An 18,600 reservoir on Cypress Bayou, Lake O' the Pines is located in Marion and Upshur Counties. This reservoir is relatively deep, with an average depth of 13.4 feet. It normally maintains a low turbidity, a condition conducive to excessive vegetation growths in littoral zones.

Although fewer fishes were netted from Lake O' the Pines in 1973, the percents by number of game and rough fishes were comparable to those of 1972. Gizzard shad, channel catfish, largemouth bass, and redear sunfish were well represented in the 1973 collections (Table 7).

Reproduction of largemouth bass and black crappie continued to be adequate as indicated by seining collections (Table 8). Major forage species such as threadfin shad, gizzard shad, sand shiner, and brook silverside were also abundant.

This reservoir now contains an established channel catfish population. Large-scale stockings totaling some 300,000 channel catfish fingerlings were made in 1967-70 due to a lack of reproduction of this species. These fingerlings ranged from 3 - 5 inches in length. Channel catfish fingerlings were recovered in 1973 for the first time since the lake's impoundment. Reproduction was believed to have occured due to increased, sustained turbidity and higher water levels in the late spring.

Lake O' the Pines has maintained an excellent flathead catfish fishery. This important predatory species has apparently controlled bullhead catfish in the reservoir. Flatheads may be legally taken with 3 1/2 inch bar mesh nets in Lake O' the Pines. It is the writers opinion that this method should be prohibited. As increased netting pressure is applied the adult flathead population will no doubt be reduced in this reservoir.

Water quality tests revealed water stratification on Lake O' the Pines during the summer and higher turbidity during 1973 (Table 9).

Lake Blundell

Lake Blundell was constructed in 1972 on Blundell Creek in Titus County. This 2,000 acre reservoir was built by the Industrial Generating Company as a water supply source for steam-electric power generation. Blundell was stocked in April, 1973 with the following species and respective rates per acre: Florida largemouth bass (Micropterus salmoides

Table 7. Lake O' the Pines Netting Results

6 units-May 3,1973; 12 units-September 8,9,1973; 6 units-December 6,1973

Species	Number	Percent of Number	Weights (lbs)	Percent of Weight	Average Weight	30 net units Catch/effort Number	30 net units Catch/effort Weight
Spotted gar	43	9.58	123.25	22.05	2.86	1.78	5.14
Gizzard shad	96	21.38	80.88	14.47	0.84	4.00	3.37
Chain pickerel	38	8.47	54.71	9.79	1.43	1.58	2.28
Carp	3	0.67	19.00	3.40	6.33	0.12	0.79
Golden shiner	6	1.34	3.95	0.71	0.65	0.25	0.16
Spotted sucker	13	2.90	43.75	7.82	3.36	0.54	1.82
*Channel catfish	28	6.24	48.12	8.61	1.71	1.16	2.00
*Blue catfish	3	0.67	6.13	1.10	2.04	0.12	0.25
Black bullhead	8	1.78	9.50	1.70	1.18	0.33	0.39
.ellow bullhead	4	0.89	5.00	0.89	1.25	0.17	0.20
*Flathead catfish	9	2.00	54.88	9.82	6.09	0.37	2.29
*White bass	5	1.11	3.78	0.68	0.75	0.20	0.16
*Largemouth bass	28	6.23	49.32	8.82	1.77	1.16	2.05
*Spotted bass	1	0.22	1.09	0.19	---	0.04	0.05
*Warmouth	3	0.67	1.37	0.25	0.45	0.12	0.06
*Redear sunfish	95	21.16	19.13	3.42	0.20	3.96	0.80
*Bluegill	42	9.35	8.19	1.46	0.19	1.75	0.34
*Longear sunfish	1	0.22	0.13	0.02	---	0.04	---
*White crappie	2	0.44	3.88	0.69	1.94	0.08	0.16
*Black crappie	21	4.68	23.00	4.11	1.09	0.87	0.96
Total	449	100.00	599.06	100.00		18.70	23.29
Game fish	238	53.00	219.02	39.17		9.92	9.13
Rough fish	211	47.00	340.04	60.83		8.79	14.17

Table 8. Lake O' the Pines Seining Results

Species	Number	Number/Unit Effort	Adult	Young-of-year
Threadfin shad	23	1.91	X	X
Gizzard shad	7	0.58	X	X
Grass pickerel	2	0.16		X
Golden shiner	9	0.75	X	X
Blacktail shiner	13	1.08	X	X
Sand shiner	42	3.50	X	
Tadpole madtom	2	0.16	X	
Golden topminnow	7	0.58	X	
Blackstripe topminnow	14	1.16	X	X
Mosquitofish	5	0.41	X	
Brook silverside	111	9.25	X	X
Largemouth bass	74	6.16		X
Bantam sunfish	1	0.08		X
Spotted sunfish	1	0.08		X
Redear sunfish	44	3.66	X	X
Bluegill	10	0.83	X	X
Longear sunfish	17	1.41	X	X
White crappie	2	0.16		X
Black crappie	34	2.83		X
TOTAL	418			

Date	No. Hauls	Seining Area	Total No. Fish	Catch/effort
August 8,9, 1973	12	Brushy Creek	418	34.83
TOTAL	12		418	34.83

Table 9. Lake O' The Pines Limnological Data

Date: August 8, 9, 1973

Air Temperature 32.5°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	29.5°C	7.7 ppm	0.0	105 uhmos/cm	48 inches *
3'	29.5	7.5	-	-	
6'	29.5	7.1	-	-	
9'	29.0	6.8	-	-	
12'	29.0	6.4	-	-	
15'	28.5	5.3	-	-	
18'	28.0	2.3	0.0	115	
21'	26.5	0.4	-	-	
25'	26.5	0.4	-	-	
27'	23.5	0.03	-	-	
30'	23.0	0.03	0.0	140	

Surface Analyses:

M.O. Alkalinity 30 ppm Total Hardness 40 ppm Chlorides 25 ppm

pH 7.2 Weather Conditions partly cloudy

- -

Date: May 4, 1973

Air Temperature 21.2°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	19.9°C	8.5 ppm	0.0	82 uhmos/cm	32 inches *
3'	19.9	8.0	-	-	
6'	19.9	7.8	-	-	
9'	20.0	7.8	0.0	82	
12'	19.5	7.6	-	-	
15'	19.5	7.5	-	-	
18'	19.5	7.5	-	-	
21'	19.5	7.5	-	-	
23' (bottom)	19.5	6.0	trace	105	

Surface Analyses:

M.O. Alkalinity 35 ppm Total Hardness 50 ppm Chlorides 25 ppm

pH 7.4 Weather Conditions clear

* Secchi disk

Table 9. Cont.

Date: December 6, 1973

Air Temperature 11.0°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	13.5°C	8.2 ppm	-	-	14 inches *
3'	13.8	8.4	-	-	
6'	13.8	8.4	-	-	
9'	13.8	8.2	-	-	
12'	13.8	8.2	-	-	
15'	13.8	8.2	-	-	
18' (bottom)	13.8	8.2	-	-	

Surface Analyses:

M.O. Alkalinity 35 ppm Total Hardness 35 ppm Chlorides 20 ppm

pH 7.2 Weather Conditions clear, cold and windy

* Secchi disk

floridanus) - 50; channel catfish - 100; blue catfish - 10; flathead catfish - 1; walleye - 500 (fry). Native largemouth bass, spotted bass, and black crappie were well established in the reservoir basin prior to inundation. All introduced and native fishes were well represented in the 1973 survey data and have displayed excellent growth rates (Table 10). Seining collections have been minimal due to the physical characteristics of the lake's shoreline. Excessive brush and deep water resulted in poor catch per effort (Table 11).

Water quality data as contained in Table 12 indicate a wide trubidity range for 1973. Temperature data will be compared to those recorded after heated effluent is discharged from the steam-electric power plant.

Lake Striker

Lake Striker is a 2,300 acre reservoir on Striker Creek in Rusk and Cherokee Counties. The lake was created in 1957 by the Water Control and Improvement District No. 1 in cooperation with the Texas Power and Light Company for water storage and steam-electric power production.

Netting data of 1973 were comparable to those of previous segments. Channel catfish, white bass and white crappie were collected in large numbers although average weights were small (Table 13). Seining collections indicated insufficient forage fishes in the lake (Table 14). Stunting of channel catfish and white bass has occurred as indicated by comparisons of 1973 data to those of basic survey and subsequent management surveys.

This lake contains higher average salinity content than other East Texas reservoirs. The influx of salt water from the extensive East Texas Oil Field has caused minor fish kills in Striker Creek and the upper reservoir in previous years. Table 15 contains water quality test data collected in 1973.

The carp has been a problematic species in Lake Striker since 1965. Netting data compiled since 1972, however, suggest a decline in this species.

Lake Murvaul

Lake Murvaul is a 3,800 acre reservoir on Murvaul Bayou in Panola County. A relatively shallow reservoir, Murvaul contains

Table 10. Lake Blundell Netting Results

6 units-March 24,1973; 6 units-September 11,1973; 6 units-October 17,1973; 6 units-January 22,1974

Species	Number	Percent of Number	Weight (lbs)	Percent of Weight	Average Weight	24 net units Catch/effort Number	24 net units Catch/effort Weight
Spotted gar	15	2.71	24.50	6.98	1.63	0.62	1.02
Bowfin	13	2.35	12.13	3.46	.93	0.54	0.51
Gizzard shad	5	.90	3.87	1.10	.77	0.20	0.16
Spotted sucker	2	.36	2.50	.71	1.25	0.08	0.10
Lake chubsucker	5	.90	2.80	.80	.56	0.20	0.11
*Channel catfish	237	42.78	141.06	40.21	.60	9.87	5.88
*Blue catfish	33	5.96	20.81	5.93	.63	1.37	0.86
Black bullhead	70	12.64	23.53	6.71	.34	2.91	0.98
Yellow bullhead	31	5.60	12.67	3.61	.41	1.29	0.52
*Flathead catfish	7	1.26	12.68	3.62	1.81	0.29	0.53
*Spotted bass	1	.18	.10	.03	---	0.04	0.01
*Largemouth bass	41	7.40	54.73	15.60	1.33	1.70	2.28
*Warmouth	4	.72	1.50	.43	.37	0.16	0.06
*Green sunfish	1	.18	.25	.07	---	0.04	0.01
*Spotted sunfish	1	.18	.13	.04	---	0.04	0.01
*Bluegill	40	7.22	10.14	2.89	.25	1.67	0.42
*Longear sunfish	1	.18	.25	.07	---	0.04	0.01
*Hybrid sunfish	1	.18	.31	.09	---	0.04	0.01
*White crappie	8	1.44	7.11	2.03	.89	0.33	0.29
*Black crappie	13	2.35	2.06	.59	.15	0.54	0.08
*Walleye	25	4.51	17.66	5.03	.77	1.04	0.73
TOTAL	554	100.00	350.79	100.00		23.08	14.16
*Game fish	413	74.55	268.79	76.62		17.20	11.20
Rough fish	141	25.45	82.00	23.38		5.87	3.42

Table 11. Lake Blundell Seining Results

Species	Number	Number/Unit Effort	Adult	Young-of-year
Gizzard shad	18	1.00		X
Golden shiner	1	0.05	X	
Red shiner	19	1.05	X	X
Black bullhead	5	0.27		X
Blackstripe topminnow	10	0.55	X	X
Mosquitofish	10	0.55	X	X
Largemouth bass	7	0.38		X
Green sunfish	1	0.05		X
Longear sunfish	3	0.16		X
TOTAL	74			

Date	No. Hauls	Seining Area	Total No. Fish	Catch/effort
March 24, 1973	6	Station 1-6	21	3.50
September 11, 1973	6	Station 1-6	44	7.33
October 17, 1973	6	Station 1-6	9	1.50
TOTAL	18		74	4.11

Table 12. Lake Blundell Limnological Data

Date: March 24, 1973

Air Temperature 15°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	15.0°C	9.5 ppm	0.0	168 uhmos/cm	18 inches *
3'	15.0	9.5	-	-	
6'	15.0	8.4	-	-	
9'	14.8	7.4	-	-	
11'(bottom)	14.0	6.5	0.0	175	

- -

Date: September 11, 1973

Air Temperature 26°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	28.0°C	7.8 ppm	0.0	215 uhmos/cm	54 inches
3'	28.0	7.8	-	-	
6'	28.0	7.4	0.0	225	
9'	28.0	7.0	-	-	
12'	27.5	3.6	-	-	
15'	26.5	1.0	0.0	215	

Surface Analyses:

M.O. Alkalinity 60 ppm Total Hardness 60 ppm Chlorides 20 ppm

pH 7.1 Weather Conditions heavy overcast

- -

Date: October 17, 1973

Air Temperature 8.4°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	23.5°C	6.2 ppm	0.0	160 uhmos/cm	30 inches *
3'	24.0	5.8	-	-	
6'	23.0	5.6	-	-	
9'	23.0	5.4	-	-	
12'	23.0	5.0	0.0	160	
15'	23.0	5.0	-	-	
18'	23.0	5.0	-	-	
21	23.0	4.8	-	-	
bottom	20.0	0.6	0.0	160	

Table 12. Cont.

Surface Analyses:

M.O. Alkalinity 50 ppm Total Hardness 50 ppm Chlorides 20 ppm

pH 6.8 Weather Conditions clear

* Secchi disk

Table 13. Lake Striker Netting Results

6 units-May 22,1973; 6 units-October 20,1973

Species	Number	Percent of Number	Weight (lbs)	Percent of Weight	Average Weight	12 net units Catch/effort Number	12 net units Catch/effort Weight
Spotted gar	1	0.49	5.00	3.28	---	0.08	0.41
Gizzard shad	39	19.12	11.94	7.84	0.31	3.25	0.99
Spotted sucher	8	3.92	8.06	5.29	1.01	0.67	0.67
Carp	7	3.43	40.68	26.71	5.81	0.58	3.39
*Channel catfish	53	25.98	38.18	25.07	0.72	4.42	3.18
*Flathead catfish	5	2.45	11.25	7.39	2.25	0.25	0.93
*White bass	20	9.80	15.88	10.43	0.79	1.67	1.32
*Spotted bass	1	0.49	0.19	0.13	---	0.08	0.01
*Largemouth bass	1	0.49	0.81	0.53	---	0.08	0.06
*Redear sunfish	21	10.30	5.88	3.86	0.28	1.75	0.49
*Bluegill	21	10.30	4.06	2.67	0.19	1.75	0.33
*Longear sunfish	5	2.45	0.69	0.45	0.14	0.42	0.05
*White crappie	20	9.80	8.93	5.86	0.45	1.67	0.74
*Black crappie	2	0.98	0.75	0.49	0.38	0.17	0.06
TOTAL	204	100.00	152.30	100.00		17.00	12.69
Rough fish	55	29.96	65.68	43.13		4.58	5.47
*Game fish	149	73.04	86.62	56.87		12.42	7.22

Table 14. Lake Striker Seining Results

Species	Number	Number/Unit Effort	Adult	Young-of-year
Gizzard shad	1	0.08	X	
Pugnose minnow	1	0.08	X	
Texas shiner	7	0.58	X	
Blacktail shoner	8	0.66	X	X
Bullhead minnow	10	0.83	X	X
Lake chubsucker	4	0.33	X	X
Blackstripe topminnow	4	0.33	X	
Channel catfish	3	0.25		X
Pirate perch	1	0.08	X	
Brook silverside	17	1.41	X	
Largemouth bass	1	0.08		X
Spotted sunfish	5	0.41		X
Redear sunfish	17	0.41	X	X
Bluegill	50	4.16	X	X
Longear sunfish	7	0.58	X	X
TOTAL	136			

Date	No. Hauls	Seining Area	Total No. Fish	Catch/effort
May 22, 1973	6	Concession #2	60	10.00
October 12, 1973	6	Power Plant	76	12.67
TOTAL	12		136	11.33

Table 15. Lake Striker Limnological Data

Date: May 22, 1973

Air Temperature 22.8°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	28.0°C	7.4 ppm	0.5	320 uhmos/cm	18 inches *
3'	27.5	7.2	-	-	
6'	27.0	7.4	-	-	
8'			0.5	320	
9'	28.0	7.2	-	-	
12'	27.0	6.8	-	-	
14	26.0	6.2	-	-	
15'	26.0	0.8	0.5	320	

Surface Analyses:

M.O. Alkalinity 25 ppm Total Hardness 40 ppm Chlorides 75 ppm

pH 6.8 Weather Conditions clear wind 10 - 15 mph

Date: October 10, 1973

Air Temperature 26.5°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	28.0°C	8.0 ppm	0.5	340 uhmos/cm	50 inches *
3'	27.0	7.8	-	-	
6'	27.0	7.5	-	-	
9'	27.0	7.5	-	-	
12'	27.0	7.5	0.5	355	
15'	27.0	7.5	-	-	
18'	27.0	7.4	-	-	
21'	27.0	7.4	-	-	
24'	27.0	5.2	0.5	380	

Surface Analyses:

M.O. Alkalinity 40 ppm Total Hardness 40 ppm Chlorides 65 ppm

pH - Weather Conditions cloudy and showers

* Secchi disk

Table 15. Cont.

Date: January 22, 1974

Air Temperature 13.5°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	11.4°C	9.5 ppm	trace	85 uhmos/cm	50 inches *
3'	11.4	9.0	-	-	
6'	11.2	8.2	-	-	
9'	11.0	8.0	-	-	
12'	10.5	7.5	-	-	
15'	10.4	7.0	trace	125	
18'	10.4	7.0	-	-	
21'	10.0	7.0	-	-	
23' (bottom)	9.6	7.0	trace	128	

Surface Analyses:

M.O. Alkalinity 65 ppm Total Hardness 57 ppm Chlorides 25 ppm

pH 7.1 Weather Conditions cloudy

* Secchi disk

large areas of standing timber. Submerged cover is abundant in the form of brush, trees, and logs. The 35 miles of shoreline includes numerous cove areas conducive to fish production. Marginal vegetation, principally water milfoil (Myriophllum sp.) becomes a nuisance to fishermen each summer. However, as indicated by a separate research study; Job 17, Largemouth Bass Study, this vegetation also serves as a primary cover and food source for young-of-the-year bass and other fishes.

Dominant forage species in Murvaul were the threadfin shad, golden shiner, gizzard shad, and lake chubsucker (Table 16).

Species composition of the Murvaul fish population remained unique in that no large rough fishes such as carp, buffalo, or freshwater drum existed. Channel catfish have been stocked in Murvaul by the lake authority, Panola County Water District No. 1, since 1967. No reproduction of this species has been found.

Adequate standing crops of largemouth bass, black crappie, channel catfish, and flathead catfish were indicated by the 1973 net data (Table 17).

Table 18 contains water quality test results from Lake Murvaul in 1973. No adverse water quality conditions were noted.

Lake Texarkana

This 20,000 acre reservoir was constructed by the U. S. Army Corps of Engineers in 1956. Impounded on the Sulphur River for flood control, the lake also serves as a municipal and industrial water supply. Texarkana is an extremely shallow reservoir with riverine charateristics common to a natural lake. Surrounded by rolling hills covered with pine-hardwood timber, Texarkana water levels have fluctuated drastically in previous years. During 1973 water use commitments resulted in a more stable pool elevation.

The shallow fertile waters of this lake have consistently produced abundant standing crops of channel catfish, blue catfish, flathead catfish, white crappie, white bass, smallmouth buffalo, and freshwater drum. Net collections for 1973 were not representative of catfish or buffalo populations. (Table 19).

Seining collections included abundant forage fishes (Table 20). Reproduction of largemouth bass has declined in Lake Texarkana and the need for an additional game fish was apparent as indicated by 1973 net and seine data.

Table 16. Lake Murvaul Seining Results

Species	Number	Number/Unit Effort	Adult	Young-of-year
Spotted gar	1	0.02		X
Threadfin shad	3,306	82.65	X	X
Gizzard shad	16	0.04	X	X
Grass pickerel	5	0.12		X
Golden shiner	263	6.57	X	
Pugnose minnow	48	1.20	X	
Blacktail shiner	2	0.05	X	
Sand shiner	6	0.15	X	
Blackspot shiner	3	0.07	X	
Bullhead minnow	92	2.31	X	
Lake chubsucker	3	0.07		X
Pirate perch	1	0.02		X
Golden topminnow	72	X		
Blackstripe topminnow	1	0.02	X	
Mosquitofish	20	0.50	X	X
Largemouth bass	471	11.71		X
Warmouth	2	0.05		X
Spotted sunfish	12	0.30		X
Redear sunfish	12	0.30		X
Bluegill	1,148	28.70	X	X
Redbreast sunfish	14	0.35	X	X
Longear sunfish	52	1.35	X	X
White crappie	3	0.07		X
Black crappie	4	0.10		X
Log perch	4	0.12	X	
TOTAL	5,562			

Table 16. Cont.

Date	No. Hauls	Seining Area	Total No. Fish	Catch/effort
July 24, 1973	20	Upper end of lake	3,196	159.00
September 28, 1973	20	Lower end of lake	1,972	98.60
TOTAL	40		5,562	139.05

Table 17. Murvaul Netting Results

6 units-June 21,1973; 6 units-October 3,1973

Species	Number	Percent of Number	Weight (lbs)	Percent of Weight	Average Weight	12 unit nets Catch/effort Number	12 unit nets Catch/effort Weight
Spotted gar	9	3.15	36.31	17.34	4.03	0.75	3.02
Gizzard shad	86	30.07	25.63	12.24	0.03	7.16	2.13
Spotted sucker	1	0.35	1.88	0.90	---	0.08	0.15
Lake chubsucker	18	6.29	7.69	3.67	0.42	1.50	0.64
*Channel catfish	10	3.50	30.69	14.66	3.06	0.83	2.55
Yellow bullhead	48	16.78	26.13	12.48	0.54	4.00	2.17
*Flathead catfish	2	0.70	26.50	12.66	13.52	0.16	2.20
*Largemouth bass	10	3.50	18.75	8.95	1.87	0.83	1.56
*Warmouth	4	1.40	1.00	0.48	0.25	0.33	0.08
*redear sunfish	15	5.24	2.06	0.98	0.14	1.25	0.17
*Bluebill	46	16.08	8.62	4.12	0.19	3.82	0.71
*White crappie	5	1.74	5.13	2.45	1.02	0.41	0.42
*Black crappie	32	11.19	19.00	9.07	0.59	2.66	1.58
TOTAL	286	100.00	209.39	100.00		23.83	17.45
Rough fish	162	56.64	97.64	46.63		13.50	8.14
*Game fish	124	43.36	111.75	53.37		10.33	9.31

Table 18. Lake Murvaul Limnological Data

Date: June 21, 1973

Air Temperature 30°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	29.0°C	7.6 ppm	0.0	190 uhmos/cm	36 inches *
14'	25.0	2.0	0.0	191	
21' (bottom)	23.0	0.3	0.0	191	

Surface Analyses:

M.O. Alkalinity 65 ppm Total Hardness 60 ppm Chlorides 40 ppm

pH 7.4 Weather Conditions cloudy and humid

Date: October 3, 1973

Air Temperature 27.8°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	29.0°C	10.0 ppm	0.0	170 uhmos/cm	42 inches
3'	28.0	9.6	-	-	
6'	27.0	7.0	-	-	
9'	27.0	3.8	-	-	
12'	26.5	1.0	0.0	175	
15'	26.0	0.2	-	-	
18'	26.0	0.1	-	-	
21'	25.5	0.0	0.0	175	

Surface Analyses:

M.O. Alkalinity 60 ppm Total Hardness 65 ppm Chlorides 35 ppm

pH 7.3 Weather Conditions clear

* Secchi disk

Table 19. Lake Texarkana Netting Results

12 units-July 11,12,1973; 6 units-October 24,1973

Species	Number	Percent of Number	Weight (lbs)	Percent of Weight	Average Weight	18 net units Catch/effort Number	18 net units Catch/effort Weight
Longnose gar	6	1.80	32.25	9.50	5.37	0.33	1.79
Shortnose gar	19	5.71	39.69	11.69	2.09	1.05	2.21
Spotted gar	12	3.61	22.31	6.57	1.86	0.66	1.24
Gizzard shad	102	30.63	44.94	13.24	0.44	5.66	2.50
Bigmouth buffalo	1	0.03	8.25	2.43	---	0.06	0.46
Smallmouth buffalo	15	4.51	35.68	10.51	2.38	0.83	1.98
River carpsucker	4	1.20	7.00	2.06	1.75	0.22	0.39
*Channel catfish	9	2.70	8.88	2.62	0.99	0.50	0.49
*Flathead catfish	3	0.90	3.75	1.10	1.25	0.16	0.21
*White bass	41	12.31	61.62	18.15	1.50	2.28	3.42
*Bluegill	6	1.80	0.93	0.27	0.16	0.33	5.17
*White crappie	73	21.92	56.37	16.61	0.77	4.06	3.13
*Black crappie	3	0.90	2.50	0.74	0.83	0.16	0.14
Freshwater drum	39	11.71	15.31	4.51	0.39	2.17	0.85
TOTAL	333	100.00	339.48	100.00		18.50	18.88
Rough fish	198	59.46	205.43	60.51		11.00	11.41
*Game fish	135	40.54	134.05	39.49		7.50	7.45

Table 20. Lake Texarkana Seining Results

Species	Number	Number/Unit Effort	Adult	Young-of-year
Threadfin shad	356	29.66	X	X
Gizzard shad	77	6.41	X	X
Pallid shiner	26	2.16	X	X
Bullhead minnow	72	6.00	X	X
Brook silverside	287	23.91	X	X
Largemouth bass	11	0.91		X
TOTAL	829			

Date	No. Hauls	Seining Area	Total No. Fish	Catch/effort
July 11, 1973	12	Big Creek	829	69.09
TOTAL	12		829	69.09

Table 21. Lake Texarkana Limnological Data

Date: July 11, 1973

Air Temperature 30.5°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	29.5°C	8.0 ppm	0.0 ppt	175 uhmos/cm	19 inches *
3'	29.0	7.6	-	-	
6'	28.0	6.0	-	-	
9'	27.5	4.5	0.0	200	
12'	27.5	4.2	-	-	
15'	27.0	4.0	-	-	
18'	26.5	3.4	-	-	
21' (bottom)	26.0	1.0	0.0	235	

Surface Analyses:

M.O. Alkalinity 100 ppm Total Hardness 110 ppm Chlorides 30 ppm

pH 8.2 Weather Conditions cloudy and windy

Date: October 24, 1973

Air Temperature 27.0°C

Depth	Temperature	Dissolved Oxygen	Salinity	Conductivity	Turbidity
surface	24.0°C	11.0 ppm	0.0 ppt	200 uhmos/cm	19 inches *
3'	22.5	10.8	-	-	
6'	21.5	9.6	-	-	
9'	21.5	5.8	0.0	195	
12'	21.0	5.8	-	-	
15'	21.0	5.2	-	-	
18' (bottom)	20.8	2.0	0.0	340	

Surface Analyses:

M.O. Alkalinity 95 ppm Total Hardness 110 ppm Chlorides 25 ppm

pH 8.0 Weather Conditions clear

* Secchi disk

Water quality test results were considered normal for this reservoir (Table 21). Texarkana exhibits alkaline characteristics not normally found in East Texas Waters.

Three inch bar mesh nets may be used for taking rough fishes and catfish in Lake Texarkana. Although years of continued heavy netting pressure has been exerted on this lake, no significant decrease has been evident in any commercial species.

III. Conclusions, Evaluations, and Recommendations:

Fisheries Regulations

The modification of present fishing regulations on most Region 3-B waters to provide better management and/or uniformity has been difficult due to boundry control. Toledo Bend and Caddo are both border waters of Texas and Louisiana. In addition, Caddo and Lake Texarkana lie partially within non-regulatory counties. Lake O' the Pines is entirely within a non-regulatory area. Until fisheries regulations may be formulated to affect these impoundments in their entirety, most effective management programs will not be successful.

A June 1, 1974 date will be recommended for opening Blundell Reservoir to sport fishing. Additional recommendations will be made to apply a reduced daily bag limit of 15 on channel and blue catfish, and a daily bag limit of 2 on flathead catfish. Reproduction of these species is normally inadequate in clear water reservoirs of East Texas. Supplemental hatchery stockings are expected to be required, thus the lower limits are suggested as a possible aid in maintaining adequate fisheries for these species.

Management Recommendations

Management recommendations were made in 1973 to the U.S. Army Corps of Engineers, New Orleans District, for Lake O' the Pines and Lake Texarkana. The following recommendations were made for both reservoirs:

1.) The construction of 50 acres of nursery ponds for rearing-stocking programs.

2.) Periodic winter drawdowns from October - January every third year for aeration of the eulittoral zones and exposure of vegetation in Lake O' the Pines.

3.) The construction of lighted fishing piers adjacent to recreational areas to increase reservoir usage by the non-boating public.

4.) An additional recommendation to continue spot treatments of marginal vegetation by corps personnel on Lake O' the Pines was made.

5.) Spot treatment control of water hyacinths is recommended in 1974 on Caddo Lake. Additional herbicide treatments of boat road areas may be necessary to control submerged aquatics.

Fish Stocking Recommendations

To supplement the inadequate forage in Lake Striker, the recommendation is made to stock this lake with Tilapia sp. Survival of this fish should be possible in the heated effluent of the power plant discharge. Threadfin shad stockings were attempted in 1971 and 1973 but no evidence of survival or reproduction has been found.

The recommendation is made to introduce walleye in Lake Texarkana at a rate of 20 fingerlings per acre in 1974. Abundant forage fishes are available for an additional game fish in this lake.

It is recommended that channel catfish production be continued in the two existing rearing ponds on Lake Murvaul.

V. Costs: Approximately $18,500.00

VI. Prepared by: Joe E. Toole
Project Leader

Date: April 10, 1974

Jack E. Crabtree
Region 3 Inland Fisheries Director

Approved by: David L. Pulchard
Dingell-Johnson Coordinator

APPENDIX I

Checklist of Fish Species Mentioned in this Report

(American Fisheries Society, 1970)

Shortnose gar	*Lepisosteus platostomus*
Spotted gar	*Lepisosteus oculatus*
Longnose gar	*Lepisosteus osseus*
Bowfin	*Amia calva*
Skipjack herring	*Alosa chrysochloris*
Threadfin shad	*Dorosoma petenense*
Gizzard shad	*Dorosoma cepedianum*
Grass pickerel	*Esox americanus*
Chain pickerel	*Esox niger*
Carp	*Cyprinus carpio*
Goldfish	*Carassius auratus*
Golden shiner	*Notemigonus crysoleucas*
Pugnose minnow	*Opsopoeodus emiliae*
Texas shiner	*Notropis amabilis*
Pallid shiner	*Notropis amnis*
Blacktail shiner	*Notropis venustus*
Red shiner	*Notropis lutrensis*
Sand shiner	*Notropis stramineus*
Blackspot shiner	*Notropis atrocaudalis*
Bullhead minnow	*Pimephales vigilax*
Bigmouth buffalo	*Ictiobus cyprinellus*
Smallmouth buffalo	*Ictiobus bubalus*
River carpsucker	*Carpiodes carpio*

APPENDIX I - Cont.

Spotted sucker	*Minytrema melanops*
Lake chubsucker	*Erimyzon sucetta*
Channel catfish	*Ictalurus punctatus*
Blue catfish	*Ictalurus furcatus*
Black bullhead	*Ictalurus melas*
Yellow bullhead	*Ictalurus natalis*
Flathead catfish	*Pylodictis olivaris*
Tadpole madtom	*Noturus gyrinus*
Pirate perch	*Aphredoderus sayanus*
Golden topminnow	*Fundulus chrysotus*
Blackstripe topminnow	*Fundulus notatus*
Mosquitofish	*Gambusia affinis*
Brook silverside	*Labidesthes sicculus*
White bass	*Morone chrysops*
Yellow bass	*Morone mississippiensis*
Striped bass	*Morone saxatilis*
Spotted bass	*Micropterus punctulatus*
Largemouth bass	*Micropterus salmoides*
Florida largemouth bass	*Micropterus salmoides floridanus*
Warmouth	*Lepomis gulosus*
Green sunfish	*Lepomis cyanellus*
Bantam sunfish	*Lepomis symmetricus*
Spotted sunfish	*Lepomis punctatus*
Redear sunfish	*Lepomis microlophus*
Bluegill	*Lepomis macrochirus*
Redbreast sunfish	*Lepomis auritus*

APPENDIX I - Cont.

Longear sunfish	Lepomis megalotis
White crappie	Pomoxis annularis
Black crappie	Pomoxis nigromaculatus
Flier	Centrarchus macropterus
Walleye	Stizostedion vitreum
Logperch	Percina caprodes
Freshwater drum	Aplodinotus grunniens