PERFORMANCE REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project F-2-R-21

Fisheries Studies, Region 5-B

Objective B-26: Fisheries Management Recommendations

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ABSTRACT

Public hearings were held to discuss changes in fishing regulations in regulatory counties. No major changes were proposed. Surveys were conducted on four of the major reservoirs in Region 5-B: Lakes Canyon, Travis, Lyndon B. Johnson, and Inks. All lakes revealed little change in the fish populations over the previous two years. Seining collections indicate poor largemouth reproduction or survival in Lakes Lyndon B. Johnson and Inks.

Striped bass were stocked in Lakes Canyon and Travis this segment. Surveys indicate survival of the stockings and good growth since stocking.

Walleye were stocked in Lakes Canyon and Lyndon B. Johnson. The species appears to be doing well in both lakes with individuals collected in excess of one pound after nine months growth.

Management recommendations include:

1. The stocking of threadfin shad in all lakes for additional forage.
2. The continuing of surveys on Lakes Canyon, Travis, and Lyndon B. Johnson to evaluate the introduction of striped bass and walleye.
3. Investigation of methods to construct artificial cover in Lake Lyndon B. Johnson through the cooperation of area fishermen.
4. The stocking of smallmouth bass in Canyon Lake.
5. The development of standard management procedures and methods for collecting management data.
6. The stocking of walleye in Lake Inks.

PERFORMANCE REPORT

State: Texas Project Number: F-2-R-21

Project Title: Fisheries Studies, Region 5-B

Project Section: Research and Surveys

Study Title: Fisheries Management Recommendations

Contract Period: February 1, 1973 to January 31, 1974

Program Narrative Objective Number: B-26

Objective: To situate fishery management practices in the public waters of Region 5-B

I. Segment Objectives:

A. To propose fish harvest regulations for the waters of Region 5-B.

B. To recommend renovation or population control for waters which do not provide adequate sports fishing.

C. To recommend supplemental stocking of hatchery reared fish in newly impounded reservoirs, renovated reservoirs, waters that have sustained major fish kills, and waters which have had negligible natural reproduction.

D. To determine vegetation control needs.

E. To determine public access needs.

II. Summary of Progress:

Proposed fishing regulations were presented to the public in those counties in Region 5-B under regulatory authority. No major changes in the regulations were proposed for the Edwards Plateau, Possum Kingdom, and Trinity-Brazos Regulatory Districts.

Quarterly surveys were conducted on Lakes Canyon, Travis, Lyndon B. Johnson, and Inks. Experimental gill nets, 150 feet in length and 8 feet in depth, were utilized at stations located to uniformly cover the lakes. Gill net mesh sizes ranged from 1 inch to 3½ inches increasing ½ inch every 25 feet of length. The number of nets set on a particular lake depended upon the size of the lake surveyed. Seine samples were collected at various times between June and October on each lake with a 20 foot by 4 foot common sense minnow seine having a mesh size of 3/8-inch. Water samples were collected during surveys as well as information concerning needs for vegetation control and public access.

Lake Canyon

Lake Canyon is a 8,240 surface acre lake constructed in a limestone basin on the eastern reaches of the Edwards Plateau in Comal County. The lake impounds waters of the Guadalupe River drainage basin composed primarily of spring waters and runoff from the Edwards Plateau. Lake Canyon is a relatively deep lake with a maximum depth of 125 feet and an average depth of 47 feet. Constructed and controlled by the U.S. Corps of Engineers, the impounded waters are discharged from a depth of 125 feet and provide a cold water fishery in the tailrace. Lake use is primarily for water conservation, flood control, irrigation, and recreation. Lake Canyon exhibits a monolithic pattern, stratifying in normal years by June and destratifying by October.

Lake Canyon was surveyed quarterly during 1973 with a total of 1,225 fish collected weighing 2,030.12 pounds. A total of 60 experimental gill nets were set in the four surveys. Rough fish represented 60.90 percent by number and 60.19 percent by weight of the total fish collected with the remainder game fish and sunfish (Table 1). The data indicates very little change in the overall population during the past three years when expressed in catch per unit effort (Figure 1). White bass (Morone chrysops) were collected in regular quarterly surveys for the first time although anglers have reported catches during the past two years. A limited number of mature white bass were collected in the surveys, but larger numbers of young individuals were collected in monofilament gill nets during striped bass surveys conducted in October, November, and December. It appears that there is a strong first year age class of this species present in Lake Canyon and it is expected that an excellent white bass fishery will develop by next year. The data also reflects good populations of channel catfish, flathead catfish, white crappie, and largemouth bass.

The gray redhorse sucker (Moxostoma congestum) and gizzard shad (Dorosoma cepedianum) remain the dominant rough fish in Lake Canyon. These two species contributed over 50 percent of the total number of fish collected and over 30 percent of the biomass. However, Canyon still reflects a better rough-game fish balance than other lakes in the area.

A total of 20,000 striped bass fingerling were stocked in Lake Canyon during July. Survival was documented two weeks later when seven stripers were collected in routine seining collections. Striped bass surveys produced a total of 47 stripers during the three months of surveys with the stripers averaging eight ounces in the December collections. Present plans call for the stocking of striped bass in Lake Canyon for two additional years at a rate of 10 per surface acre.

Approximately 625,000 walleye fingerling were also stocked in Lake Canyon during April. No walleye were collected until October at which time a nine ounce walleye was collected in a monofilament gill net used in the striped bass surveys. No walleye have appeared as of yet in regular quarterly surveys, but a total of 27 walleye were collected in the three months of striper surveys. The largest walleye collected to

Table 1

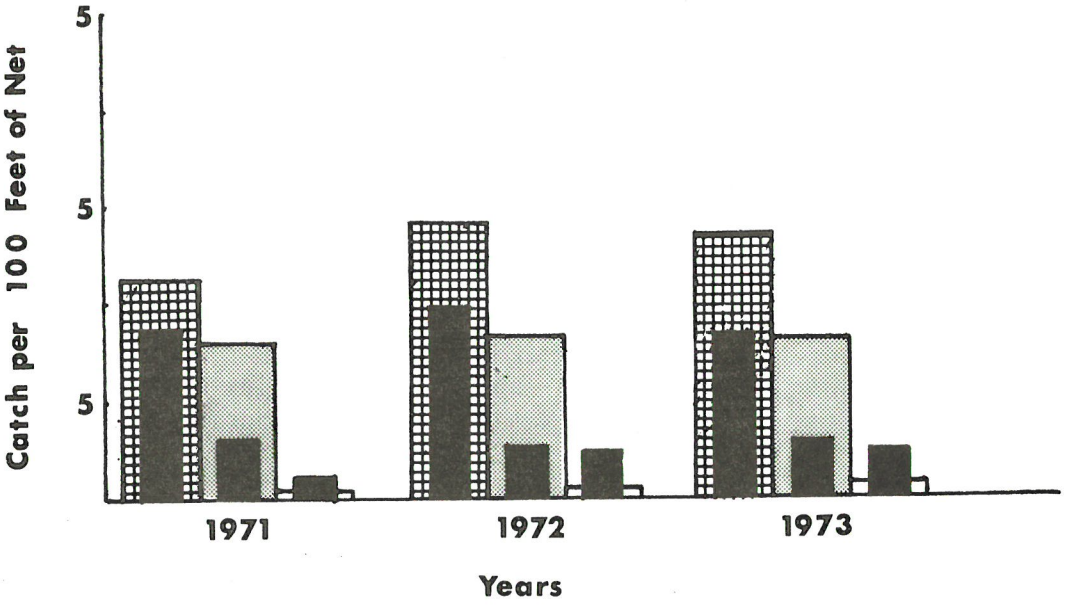
Results of Canyon Lake Gill Netting for 1973
60 Nets Set

Species	Number	Percent of Number	Weight (Pounds)	Percent of Weight	Average Weight
Longnose gar	42	3.43	102.70	5.06	2.45
Gizzard shad	314	25.63	156.89	7.73	0.50
Golden shiner	5	0.41	1.59	0.08	0.32
Carp	69	5.63	416.26	20.50	6.03
River carpsucker	9	0.73	37.08	1.83	4.12
Gray redhorse sucker	305	24.90	506.80	24.96	1.66
Channel catfish*	117	9.55	261.74	12.89	2.24
Flathead catfish*	62	5.06	409.76	20.18	6.61
White bass*	12	0.98	16.88	0.83	1.41
Largemouth black bass*	45	3.68	42.56	2.10	0.95
Warmouth sunfish*	7	0.57	2.59	0.13	0.37
Green sunfish*	17	1.39	2.51	0.12	0.15
Redbreast sunfish*	5	0.41	0.94	0.05	0.19
Bluegill sunfish*	47	3.84	7.13	0.35	0.15
Redear sunfish*	140	11.43	58.63	2.89	0.42
Longear sunfish*	2	0.16	0.38	0.02	0.19
White crappie*	25	2.04	5.12	0.25	0.20
Rio Grande perch	2	0.16	0.56	0.03	0.28
Total	1,225	100.00	2,030.12	100.00	

* Designates Game Fish Species

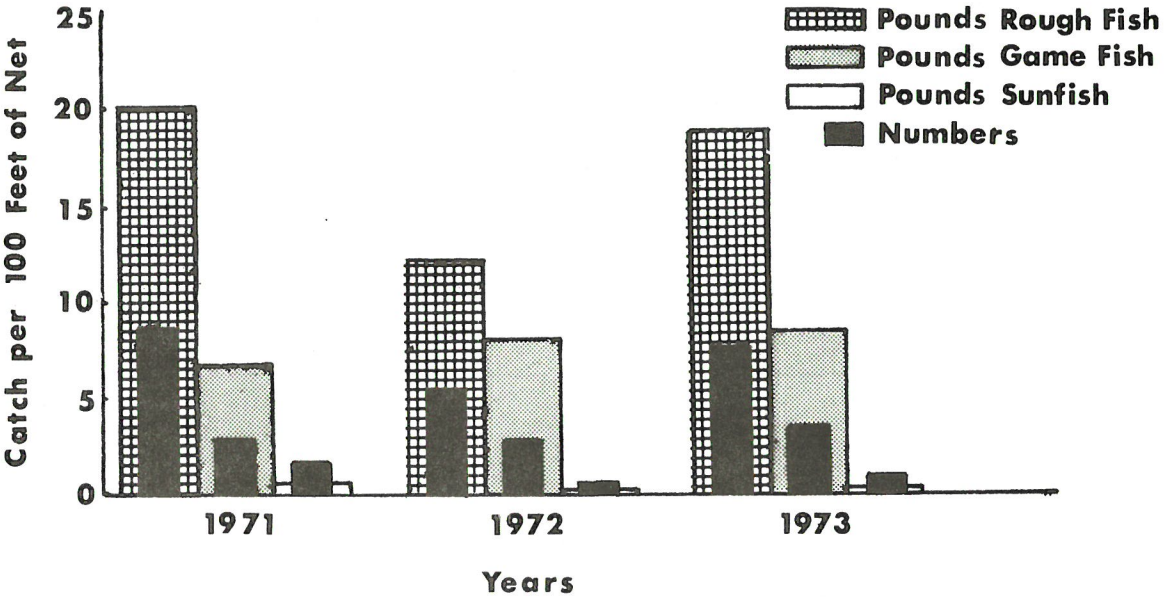
Percent of catch by:	Number	Weight
Rough fish =	60.90	60.19
Game fish =	21.31	36.26
Sunfish =	19.29	3.55

Catch per 100 feet of net:	Number	Weight
Rough fish =	8.29	13.58
Game fish =	2.90	8.18
Sunfish =	2.42	0.80



CANYON LAKE

Figure 1. Comparison of the average catch (weight and number) of rough fish, game fish, and sunfish per 100 feet of gill net during the years 1971, 1972, and 1973 in Canyon Lake. There were three or more gill netting surveys conducted each year.



LAKE TRAVIS

Figure 2. Comparison of the average catch (weight and number) of rough fish, game fish, and sunfish per 100 feet of gill net during the years 1971, 1972, and 1973 in Lake Travis. There were three or more gill netting surveys conducted each year.

date measured 14.5 inches and weighed 1 pound and 2 ounces. Sexual development was observed in a few male and female individuals and the possibility of limited reproduction occurring this season is being investigated.

Seining data reflects acceptable largemouth bass reproduction and survival in 1973 (Table 2). Good numbers of small forage species were also collected, with red shiners, blacktail shiners, mosquitofish, and silversides the dominant species. Additional forage, small shad and sunfish, should be available during the spring and early summer, but with the introduction of striped bass and walleye, other forage species are being considered.

Lake Canyon has not experienced vegetation problems since impoundment. Although the water is generally very clear, there are few shallow areas that could present vegetation problems to fishermen.

Public access will probably never be a problem on Lake Canyon. Numerous concrete launching facilities are available throughout the lake at the various public parks constructed and maintained by the U.S. Corps of Engineers. Camping, swimming, and bank fishing areas are also available within these parks.

Lake Travis

Lake Travis is a large, meandering lake with a normal pool of 18,930 surface acres, impounding waters of the Colorado River in Travis County. Lake Travis is a deep lake with a maximum depth of 192 feet and a mean depth of 62 feet. Constructed in 1940 by the Lower Colorado River Authority, the impoundment is used for flood control, irrigation, hydroelectric power, recreation, and municipal and industrial water supply.

Lake Travis was also surveyed quarterly during this segment. Due to the large size of the lake, additional netting stations were established. A total of 95 gill nets yielded 1,695 fish weighing 3,763.72 pounds. Gizzard shad contributed the greatest number and smallmouth buffalo the greatest biomass. Game species made up 28.97 percent by number and 30.69 percent by weight of the total fish collected with white bass accounting for 11.8 percent of the total fish (Table 3). Catch per unit effort calculations indicate an increase in rough fish over 1972, but approximately the same as 1971 (Figure 2). Since the average weights remained relatively the same throughout this period, it is doubtful that an increase in 1973 or a decrease in 1972 actually occurred. It is more likely that this was a result of the sampling techniques and collection times.

Seining collections were made on Lake Travis from June through September. It appears that largemouth bass reproduction was successful and survival was good through September (Table 4). A total of 155 young-of-the-year largemouth bass were collected in the June samples with an average of 2.98 per seine haul decreasing to .25 per

Table 2

Seining Results - Lake Canyon

Species	June (28 hauls)		July (18 hauls)		October (22 hauls)		Totals
	Number	Number per seine haul	Number	Number per seine haul	Number	Number per seine haul	
Notropis texanus	3	.12	-	-	-	-	3
Notropis venustus	189	6.75	378	21.00	140	6.36	707
Notropis lutrensis	10	.36	24	1.33	62	2.82	96
Campostoma anomalum	6	.21	-	-	-	-	6
Gambusia affinis	3	.11	124	6.89	-	-	127
Menidia beryllina	74	2.64	109	6.06	11	.50	194
Notemigonus crysoleucas	7	.25	-	-	7	.32	14
Dorosoma cepedianum	190	6.78	-	-	7	.32	197
Percina caprodes	16	.57	2	.11	-	-	18
Pimephales vigilax	18	.64	-	-	1	.04	19
*Lepomis auritus	67	2.39	2	.11	17	.77	86
*Lepomis macrochirus	69	2.46	3	.17	18	.82	90
*Lepomis microlophus	14	.50	-	-	1	.04	15
*Chaenobryttus cyanellus	1	.04	-	-	-	-	1
Carpiodes carpio	2	.07	-	-	-	-	2
*Micropterus salmoides	64	2.29	17	4	9	.41	90
*Pomoxis annularis	2	.07	-	-	-	-	2
*Morone saxatilis	-	-	7	.39	-	-	7
*Ictalurus punctatus	-	-	-	-	2	.09	2

* Denotes game species

Table 3

Results of Lake Travis Gill Netting for 1973
95 Nets Set

Species	Number	Percent of Number	Weight (Pounds)	Percent of Weight	Average Weight
Longnose gar	64	3.78	206.00	5.47	3.22
Gizzard shad	488	28.79	296.91	7.89	0.61
Carp	78	4.60	234.41	6.23	3.01
River carpsucker	275	16.22	744.76	19.79	2.71
Gray redhorse sucker	47	2.77	79.05	2.10	1.68
Smallmouth buffalo	78	4.60	967.67	25.70	12.41
Channel catfish*	47	2.77	107.74	2.86	2.29
Blue catfish*	18	1.06	50.04	1.33	2.78
Flathead catfish*	69	4.08	529.01	14.06	7.67
White bass*	200	11.80	265.33	7.05	1.33
Largemouth black bass*	82	4.84	71.73	1.91	0.87
Spotted black bass*	53	3.13	112.86	3.00	2.13
Warmouth sunfish*	5	0.29	1.13	0.03	0.23
Green sunfish*	21	1.24	3.33	0.09	0.16
Redbreast sunfish*	13	0.77	3.99	0.11	0.31
Bluegill sunfish*	76	4.48	17.12	0.45	0.23
Longear sunfish*	19	1.12	2.05	0.05	0.11
White crappie*	22	1.30	18.32	0.49	0.83
Rio Grande perch	16	0.94	3.70	0.10	0.23
Freshwater drum	24	1.42	48.57	1.29	2.02
Total	1,695	100.00	3,763.72	100.00	

* Designates Game Fish Species

Percent of catch by:	Number	Weight
Rough fish =	63.13	68.58
Game fish =	28.97	30.69
Sunfish =	7.90	0.73

Catch per 100 feet of net:	Number	Weight
Rough fish =	7.51	18.11
Game fish =	3.45	8.11
Sunfish =	0.94	0.19

Table 4

Seining Results - Lake Travis

Species	June (52 hauls)		July (51 hauls)		August (15 hauls)		September (8 hauls)		Totals
	Number	Number per seine haul	Number	Number per seine haul	Number	Number per seine haul	Number	Number per seine haul	
Notropis amabalis	-	-	-	-	3	.20	1	.12	4
Notropis venustus	226	4.35	155	3.04	12	.80	23	2.88	416
Notropis lutrensis	-	-	15	.29	-	-	-	-	15
Compostoma anomalum	-	-	-	-	4	.27	-	-	4
Gambusia affinis	1	.02	135	2.65	28	1.87	19	2.38	183
Menidia beryllina	2154	41.42	364	7.14	269	1.43	108	13.50	2895
Notemigonus crysoleucas	-	-	2	2.04	-	-	-	-	2
Dorosoma cepedianum	-	-	-	-	9	.60	-	-	9
Etheostoma sp.	7	.13	-	-	5	.33	-	-	12
*Lepomis auritus	9	.17	8	.16	3	.20	7	.88	27
*Lepomis macrochirus	59	1.13	142	2.78	30	12.00	26	3.25	257
*Lepomis microlophus	3	.06	-	-	-	-	-	-	3
*Chaenobryttus cyanellus	-	-	-	-	-	-	3	.38	3
*Chaenobryttus gulosus	-	-	-	-	-	-	1	.12	1
Cyprinus carpio	-	-	1	.02	-	-	-	-	1
*Micropterus salmoides	155	2.98	64	1.23	21	1.40	2	.25	242
*Micropterus punctulatus	8	.15	-	-	-	-	-	-	8
Cichlasoma cyanoguttatum	1	.02	1	.02	2	.13	4	.50	8

* Denotes game species

seine haul in September. Small forage species are abundant, but it is felt that additional forage such as threadfin shad could be of benefit to largemouth bass.

A total of 126,000 striped bass fingerling were stocked in Lake Travis during July, 1973. To date no stripers have been collected in quarterly surveys, but 15 stripers were taken in the course of striped bass surveys. December collections produced striped bass averaging 11 ounces in weight. Stripers will be stocked in Lake Travis for two additional years in an attempt to establish a reproducing population.

There are few areas in Lake Travis with any significant growth of aquatic vegetation and no control measures are needed on this lake at this time.

Public access to some parts of Lake Travis is a problem due to the morphology of the lake itself. Much of the shoreline consist of large bluffs and private property not lending itself to bank fishing. There are few concrete boat launching facilities available for a lake of this size. Two public parks maintained by the Lower Colorado River Authority and numerous resort areas have launching facilities, but many are not usable during periods of low water level. Additional facilities would be desirable but the improvement of the existing launches would be of considerable help.

Lake Lyndon B. Johnson

Lake Lyndon B. Johnson is a 6,375 surface acre lake impounding waters of the Colorado and Llano Rivers. The constant level reservoir discharges through turbines into Lake Marble Falls and receives water from Lake Inks immediately upstream. Lake Lyndon B. Johnson and Inks Lake differ from the other lakes in the Colorado River lake chain in that they both lie upon granite basins between Llano and Burnet Counties. Lake Lyndon B. Johnson is controlled by the Lower Colorado River Authority and its waters are used for recreation and hydroelectric power. A steam generator plant is now under construction near Lake Lyndon B. Johnson and is to be completed in 1974. Water from the lake will be used in the cooling of the condensors within the plant resulting in a thermal discharge into the lake. Studies are presently being conducted by the University of Texas to determine the effects of this effluent upon the aquatic life. Lake Lyndon B. Johnson was chemically renovated in April, 1971, and restocked with largemouth bass fry, channel catfish fingerling, and 150 adult flathead catfish.

Four surveys were conducted on Lake Lyndon B. Johnson during this segment. A total of 69 gill nets resulted in the collection of 1,622 fish weighing 1,992.12 pounds. This represents a composition of 69.67 percent rough fish by number and 67.92 percent by weight (Table 5). Figures 3 and 4 graphically illustrate the catch per unit effort since renovation, indicating a decrease of all groups in numbers but an increase in the average weights since 1972. The river carpsucker continues

Table 5

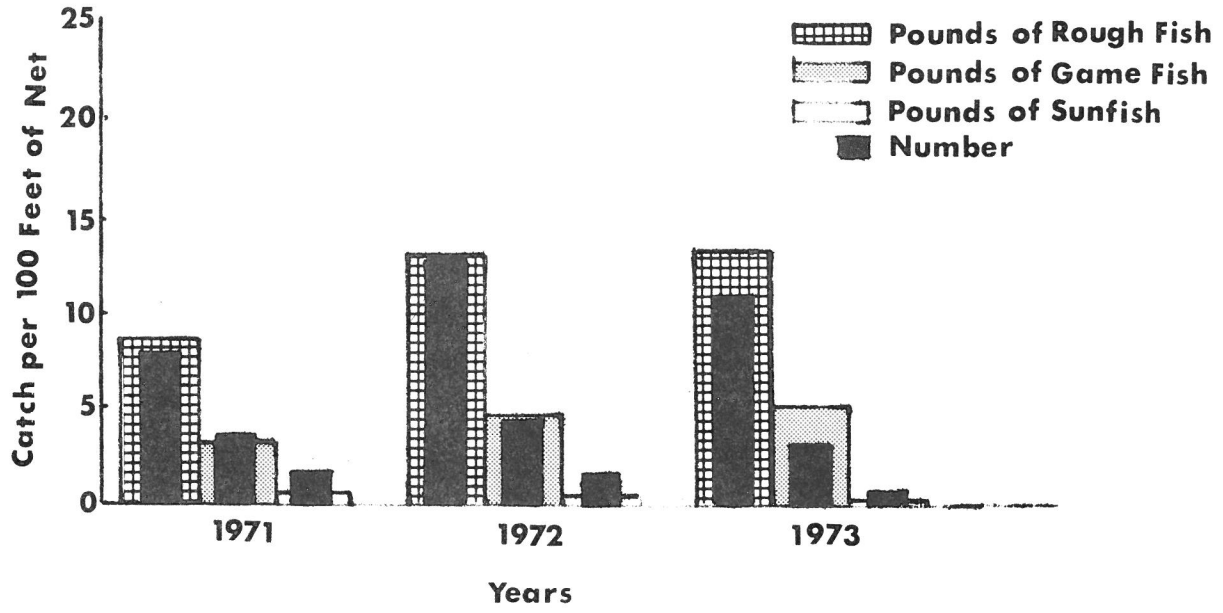
Results of Lake Lyndon B. Johnson Gill Netting for 1973
69 Nets Set

Species	Number	Percent of Number	Weight (Pounds)	Percent of Weight	Average Weight
Longnose gar	148	9.12	479.44	19.04	2.56
Gizzard shad	259	15.97	89.23	4.48	0.34
Carp	79	4.87	186.39	9.36	2.36
River carpsucker	419	25.83	469.43	23.55	1.12
Gray redhorse sucker	28	1.73	17.11	0.86	0.61
Smallmouth buffalo	176	10.85	190.22	9.55	1.08
Black bullhead catfish	4	0.25	1.13	0.06	2.82
Channel catfish*	73	4.50	100.04	5.02	1.37
Flathead catfish*	56	3.45	231.07	11.60	4.13
White bass*	125	7.71	174.05	8.74	1.39
Largemouth black bass*	31	1.91	40.60	2.04	1.31
Warmouth sunfish*	10	0.62	4.12	0.21	0.41
Green sunfish*	15	0.93	3.11	0.16	0.21
Redbreast sunfish*	2	0.12	0.43	0.02	0.22
Bluegill sunfish*	30	1.85	4.74	0.24	0.16
Redear sunfish*	1	0.06	0.19	0.01	0.19
Longear sunfish*	11	0.68	1.25	0.06	0.11
White crappie*	129	7.95	73.81	3.71	0.57
Black crappie*	1	0.06	0.94	0.05	0.94
Walleye*	17	0.49	4.63	0.23	0.58
Freshwater drum	8	1.05	20.19	1.01	1.19
Total	1,622	100.00	1,992.12	100.00	

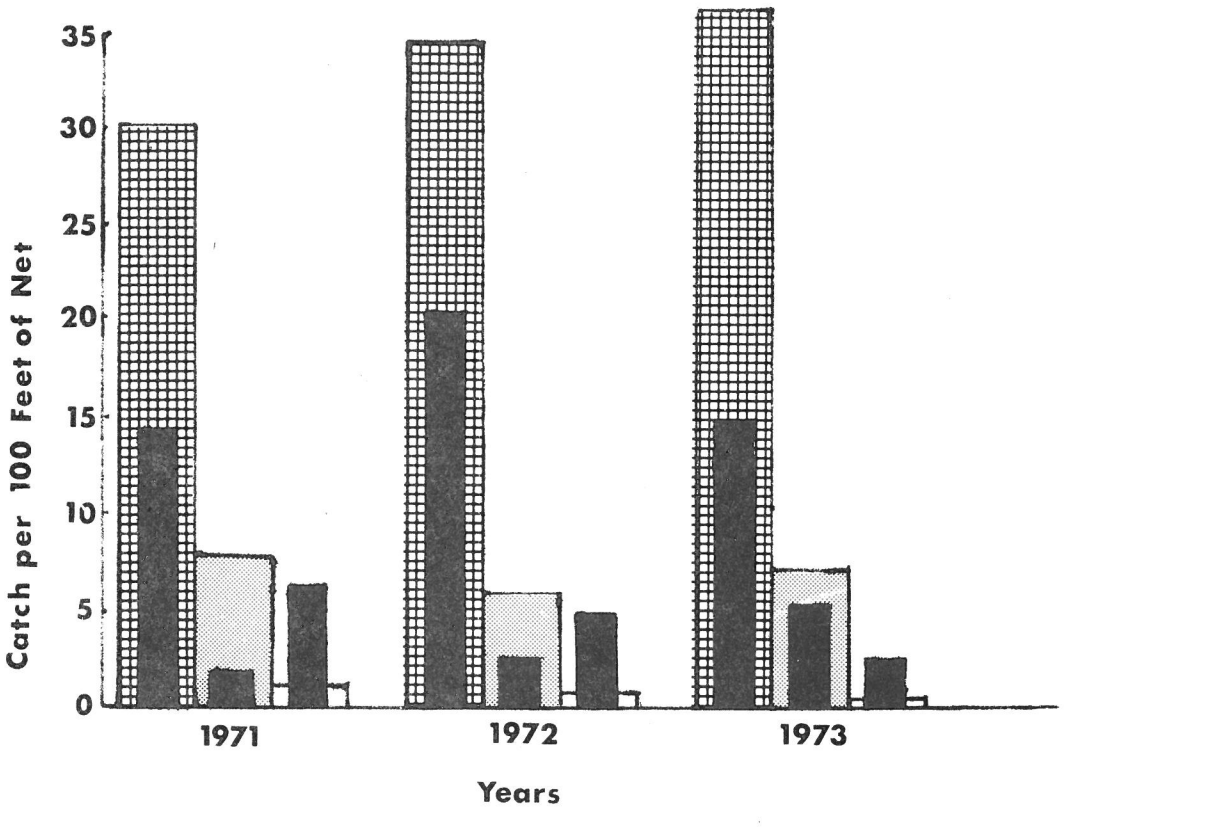
* Designates Game Fish Species

Percent of catch by:	Number	Weight
Rough fish =	69.67	67.92
Game fish =	26.08	31.38
Sunfish =	4.25	0.70

Catch per 100 feet of net:	Number	Weight
Rough fish =	10.92	13.07
Game fish =	4.09	6.04
Sunfish =	0.67	0.13



LAKE L.B.J.



INKS LAKE

Figures 3 & 4 . Comparison of the average catch (weight and number) of rough fish, game fish, and sunfish per 100 feet of gill net during the years 1971, 1972, and 1973 in Lakes L.B.J. and Lake Inks.

to be the dominant rough fish as was the case prior to renovation. The carpsucker contributed the greatest numbers and biomass of the rough fish and total fish while the white bass represented the greatest number of game fish. It appears that flathead catfish have reestablished with a total 56 collected averaging 4.13 pounds. The data also indicates a good population of white crappie with this species representing almost 8 percent of the total catch.

Only 31 largemouth bass were collected in the surveys representing 1.91 percent of the total fish. This compares with 85 collected in 1972 comprising 4.05 percent. It is not clear what the cause of decrease could have been other than the absence of desirable habitat. The lowering of the lake prior to renovation revealed the absence of cover condusive to good bass populations and very little vegetation has returned to the lake to provide additional cover.

Red shiners, blacktail shiners, and silversides are the most abundant small forage in Lake Lyndon B. Johnson (Table 6). The seining data also indicates limited natural reproduction or survival of the largemouth bass. A total of 48 seine hauls yielded only five young-of-the-year largemouth bass.

A total of six million walleye fry were stocked in Lake Lyndon B. Johnson during April, 1973. Survival from the stocking was documented in June when four 3½-inch walleye were collected in seining collections. Quarterly surveys in October produced 17 walleye averaging nine ounces in weight and measuring 9 to 12 inches. Walleye will be stocked in Lake Lyndon B. Johnson for two additional years.

Lake Lyndon B. Johnson is free from any problem vegetation. Shallow areas have either sand or solid granite bottoms prohibiting the growth of most macrophytes. No vegetation control measures are needed on Lake Lyndon B. Johnson at the present time.

Existing public access is adequate for Lake Lyndon B. Johnson. There are numerous boat launching facilities and bank fishing areas in the various resorts on the lake although private property does limit bank fishing to some degree.

Lake Inks

Lake Inks is an 803 surface acre lake maintaining a constant level and impounding waters of the Colorado River discharged from Lake Buchanan located immediately upstream. The lake is a relatively shallow lake with a mean depth of only 23 feet. The lake is controlled by the Lower Colorado River Authority and is used primarily for recreation and hydroelectric power.

A total 30 overnight, bottom gill nets were set in Lake Inks this segment resulting in the collection of 963 fish weighing 2,128.73 pounds (Table 7). The data indicates a high composition of rough

Table 6

Seining Results - Lake Lyndon B. Johnson

Species	June (7 hauls)		July (27 hauls)		September (14 hauls)		Totals
	Number	Number per seine haul	Number	Number per seine haul	Number	Number per seine haul	
Notropis venustus	40	5.71	375	13.89	60	4.29	475
Notropis lutrensis	52	7.43	78	2.89	22	1.57	152
Menidia beryllina	473	67.57	1338	49.55	449	32.07	2260
Dorosoma cepedianum	1	.14	1	.04	-	-	2
*Lepomis auritus	7	1.00	1	.04	14	1.07	22
*Lepomis macrochirus	8	1.14	32	1.18	24	1.71	64
*Lepomis microlophus	1	.14	1	.04	-	-	2
*Lepomis megalotis	5	.71	11	.41	2	.14	18
*Chaenobryttus cyanellus	-	-	4	.15	1	.07	5
Percina caprodes	-	-	-	-	1	.07	1
*Micropterus salmoides	-	-	2	.07	3	.21	5
*Stizostedion vitreum	4	.57	-	-	-	-	4

* Denotes Game Species

Table 7

Results of Inks Lake Gill Netting for 1973
30 Nets Set

Species	Number	Percent of Number	Weight (Pounds)	Percent of Weight	Average Weight
Longnose gar	16	1.66	62.42	2.93	3.90
Gizzard shad	356	36.97	124.93	5.87	.35
Carp	21	2.18	78.48	3.69	3.74
River carpsucker	205	21.29	804.68	37.80	3.92
Gray redhorse sucker	1	0.10	4.50	0.21	4.50
Smallmouth buffalo	70	7.27	662.67	31.13	9.47
Channel catfish*	45	4.67	53.26	2.50	1.12
Flathead catfish*	11	1.14	111.98	5.26	10.18
White bass*	84	8.72	143.99	6.76	1.74
Largemouth black bass*	19	1.97	31.93	1.50	1.68
Spotted bass*	17	1.77	17.13	0.80	1.01
Warmouth sunfish*	5	0.52	1.05	0.05	.21
Green sunfish*	13	1.35	2.42	0.11	.19
Redbreast sunfish*	7	0.73	0.81	0.04	.11
Bluegill sunfish*	50	5.19	6.12	0.29	.12
Redear sunfish*	7	0.73	1.39	0.07	.20
Longear sunfish*	24	2.49	2.37	0.11	.10
White crappie*	5	0.52	4.60	0.22	.92
Freshwater drum	7	0.73	14.00	0.66	2.00
Total	963	100.00	2,128.73	100.00	

* Designates Game Fish Species

Percent of catch by:	Number	Weight
Rough fish =	70.20	82.29
Game fish =	18.80	17.05
Sunfish =	11.00	0.66

Catch per 100 feet of net:	Number	Weight
Rough fish =	15.02	38.93
Game fish =	4.02	8.06
Sunfish =	2.36	0.31

fish both by weight and number with over 70 percent of the number and 82 percent of the weight contributed by the rough fish. River carpsucker (Carpiodes carpio) and smallmouth buffalo (Ictiobus bubalus) represented over 58 percent of the total catch and averaged 3.9 pounds and 9.4 pounds respectively.

Although game species comprise a small percentage of the population, white bass continue to do well, in spite of the rough fish infestation, contributing almost 9 percent of the total catch in this lake.

Comparisons in the catch per unit effort data (Figure 4) indicates little change in the overall composition in the past three years other than an increase in the average weights of the rough fish.

Seining collections were made during June-September on Lake Inks. Only one young-of-the-year largemouth bass was collected in a total of 22 seine hauls indicating the possibility of poor reproduction or survival (Table 8). Only two species of small forage is available and additional forage such as threadfin shad should be introduced. The possibility of stocking walleye in this lake should be investigated.

Vegetation has been controlled periodically in Lake Inks by lowering the lake level during the winter months, thus few vegetation problems exist at this time.

Public access is limited almost entirely to Inks Lake State Park facilities but the size of the lake does not warrant additional public access. There are boat launching facilities within the park area and bank fishing is possible on over 50 percent of the shoreline.

III. Significant Deviation:

Plans were made in this segment to conduct cove rotenone surveys on area lakes where time permitted. The standard procedures to be followed in the surveys were compiled and distributed late in the segment and it was felt that it would be best to plan the surveys for the next segment when better preparations could be made.

IV. Conclusions, Evaluations, and Recommendations:

Canyon Lake will be stocked with additional walleye fingerling and striped bass in 1974 and 1975. Hopefully, reproducing populations of both can be established. With the introduction of these species, additional forage such as threadfin shad should be introduced to provide more open water forage. Surveys should continue on this lake to evaluate the walleye and striped bass introductions. Smallmouth bass might provide an additional sports fish in Lake Canyon and plans should be made to stock this species when the fish are available.

Lake Travis will be stocked with striped bass again in 1974 and 1975. Surveys should continue on Lake Travis to assist in the evaluation of these stockings. Threadfin shad should be introduced in this lake also, to provide an additional forage species. The possibility of access improvement in the form of launching facilities should be investigated.

Table 8

Seining Results - Lake Inks

Species	June (9 hauls) Number	June (9 hauls) Number per seine haul	August (5 hauls) Number	August (5 hauls) Number per seine haul	September (8 hauls) Number	September (8 hauls) Number per seine haul	Totals
Notropis venustus	744	82.66	25	5.0	367	45.88	1136
Gambusia affinis	2	.22	-	-	-	-	2
Menidia beryllina	1648	183.11	37	7.40	495	61.88	2180
Dorosoma cepedianum	2	.22	-	-	1	.12	3
*Lepomis auritus	23	2.56	6	1.20	5	.62	34
*Lepomis macrochirus	-	-	6	1.20	5	.62	11
*Lepomis megalotis	4	.44	-	-	-	-	4
*Chaenobryttus cyanellus	1	.11	-	-	-	-	1
Percina caprodes	-	-	1	.20	-	-	1
Campostoma anomalum	2	.22	-	-	-	-	2
*Micropterus salmoides	-	-	-	-	1	-	1
*Micropterus punctulatus	2	.22	-	-	-	-	2

* Denotes Game Species

Surveys should continue on Lake Lyndon B. Johnson to evaluate the introduction of walleye and to provide fishery information to the University of Texas in the evaluation of the thermal effluent on this lake. There is a need for some type of natural or artificial cover in Lake Lyndon B. Johnson. Investigations should be conducted as to programs to construct some type of artificial cover with assistance from local clubs and fishermen. Threadfin shad should be introduced into Lake Lyndon B. Johnson also.

Although data indicates a high rough fish population in Lake Inks, no recommendations will be made this year. The evaluation of walleye introductions in Lake Lyndon B. Johnson will provide valuable information as to the feasibility of establishing this species in Lake Inks to provide an additional sports fish.

The use of monofilament gill nets during the striped bass evaluations brought about some interesting observations concerning the differences in the number of game fish caught in the monofilament nets as compared to those caught in the nylon experimental gill nets used in quarterly surveys. The monofilament nets were constructed of 150 feet sections of 3/4, 1-1/4, and 2 inch mesh with the net totaling 450 feet in length. Although the mesh sizes do not compare with those of the experimental gill nets, it is felt that the difference is of enough significance to mention in this report.

It was observed during the netting surveys on Lakes Canyon and Travis that more game fish were being caught in the monofilament nets being used in striped bass evaluations than the nylon nets used in quarterly surveys. The data was compiled in catch per unit effort and the comparison is listed below. Due to the different mesh sizes, no other comparisons could be made. The total fish collected in the three months of striper surveys were compared with the fall and winter collections with nylon nets on Canyon and Travis Lakes.

Lake Travis	#Rough Fish	#Game Fish*
Monofilament Gill nets	7.70/100 ft. net	10.77/100 ft. net
Nylon Gill nets	6.05/100 ft. net	3.01/100 ft. net

Lake Canyon	#Rough Fish	#Game Fish*
Monofilament Gill nets	11.68/100 ft. net	10.25/100 ft. net
Nylon Gill nets	7.38/100 ft. net	2.64/100 ft. net

*Excludes sunfish

Gill Netting Results
Species Checklist

Species	Inks	Canyon	Travis	Lyndon B. Johnson
Lepisosteus osseus		X	X	X
Dorosoma cepedianum		X	X	X
Notemigonus crysoleucas		X		
Cyprinus carpio		X	X	X
Carpiodes carpio		X	X	X
Ictiobus bubalus			X	X
Moxostoma congestum		X	X	X
Ictalurus furcatus			X	
Ictalurus melas				X
Ictalurus natalis		X		
Ictalurus punctatus		X	X	X
Pylodictus olivaris		X	X	X
Morone chrysops		X	X	X
Lepomis auritus		X	X	X
Lepomis macrochirus		X	X	X
Lepomis megalotis		X	X	X
Lepomis microlophus		X		X
Chaenobryttus cyanellus		X	X	
Chaenobryttus gulosus		X	X	
Micropterus punctulatus			X	
Micropterus salmoides		X	X	
Pomoxis annularis		X	X	X
Pomoxis nigromaculatis				X
Cichlasoma cyanoguttatum		X	X	
Aplodinotus grunniens			X	X
Stizostedion vitreum				X

Seining Results
Species Checklist

Species	Inks	Canyon	Travis	Lyndon B. Johnson
Notropis amabilis			X	
Notropis venustus	X	X	X	X
Notropis lutrensis		X	X	X
Pimephales vigilax		X		X
Campostoma anomalum	X	X	X	
Percina caprodes	X	X		X
Gambusia affinis	X	X	X	
Menidia beryllina	X	X	X	X
Notemigonus crysoleucas		X	X	
Dorosoma cepedianum	X	X	X	X
Etheostoma sp.			X	
Lepomis auritus	X	X	X	X
Lepomis macrochirus	X	X	X	X
Lepomis microlophus		X	X	X
Lepomis megalotis	X	X	X	X
Chaenobryttus cyanellus	X	X	X	X
Chaenobryttus gulosus			X	
Carpiodes carpio		X		
Cyprinus carpio			X	
Micropterus salmoides	X	X	X	X
Micropterus punctulatus	X		X	
Pomoxis annularis		X		
Ictalurus punctatus		X		
Morone saxitilis		X		
Stizostedion vitreum				X
Cichlasoma cyanoguttatum			X	

The monofilament gill nets produced over three times the number of game fish than the nylon nets in both instances and increased the rough fish catch considerably in Canyon Lake.

A total of 74 largemouth bass were collected in 4,050 feet of monofilament net on Lake Travis while only 82 were collected in over 14,000 feet of nylon net. The number of largemouth bass collected in Canyon Lake with monofilament net was three times that collected in quarterly surveys using nylon net.

This illustrates the need for a standard procedure using a variety of collection techniques to gather management data. The rotenone samples planned for next segment and the management evaluation techniques presently being designed by department personnel should provide basis for the collection of more useful data in the future.

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