

SEGMENT COMPLETION REPORT
Investigations Project

FILE

STATE OF TEXAS

Project No. F2R4 Name Fisheries Investigations and Surveys of the Waters of Region 6-B.

Job No. B-14 Title An Inventory and Creel Census of the Fishes of Lake Inks, Texas.

Period Covered: February 1956 through January 1957.

ABSTRACT

The fish population of Lake Inks was sampled with nets and seines on a monthly basis from February 1956 through January 1957 in an effort to determine the relative abundance of the species present. In addition a creel census was made to obtain the basis for an estimate of the total anglers' catch, by species, and the relative abundance of each species in the total anglers' catch.

Compared with data obtained during the previous study of the fish population of Lake Inks, it was learned that gizzard shad, Dorosoma cepedianum, were increasing in relative abundance. For this reason a selective kill of this species was performed, in November 1956, under the Statewide Rough Fish Control Project. At that time it was estimated that shad were reduced at the rate of 125 pounds per acre. Unfortunately sufficient data concerning the present status of the gizzard shad population has not as yet been obtained. Netting studies have, however, indicated a reduction in the relative abundance of this species. The population study and creel census will be continued for another full year to determine the full results of this type of population manipulation in regard to improvement of fishing quality and increasing the harvest of game fish by anglers.

During the study period an estimated 61,181 fish weighing 28,504 pounds were harvested from Lake Inks during an estimated 34,547 man days of fishing. In terms of per acre yield this means 68 fish, weighing 32 pounds, were caught per acre. The overall rates of catch were 0.46 fish per man hour for boat fishermen, 0.80 fish per man hour for shore fishermen and 0.32 fish per trotline hour for trotline fishermen.

As during the previous census period on this lake, live baits were more successful in catching fish; but artificial baits are still the most popular with black bass fishermen.

In the order of their relative abundance in the total angler's catch, the five most frequently taken species were sunfishes, principally bluegills, white bass, white crappie, largemouth bass and channel catfish.

OBJECTIVES

To determine the relative abundance of the species present in Inks Lake; to estimate the total anglers' catch by species; and to obtain data regarding the relative abundance of each species in the total anglers' catch.

TECHNIQUES

Inventory of Species

The work begun during the preceding segment period (June 1955 through January 1956) was continued during the present segment period. As usual, a monthly field trip

was made to the lake during which specimens were collected with nets and seines, and data was recorded as outlined in the segment completion report for Job B-14, Project F-2-R-3.

Net collections were made during each month with the exception of November 1956, at which time a "selective kill" of gizzard shad was attempted under Job 16a-1, Project F-14-D, the Statewide Rough Fish Control Project.

Seine collections were made at random localities each month from February through August when seining efficiency fell off to the point where it was no longer profitable or possible to take fish in large enough numbers to be of significance. This impasse was brought about by the luxuriant growth of Myriophyllum sp. which almost completely took over the shoreline of the lake. During the previous year this condition did not arise because of a late spring drawdown which controlled the vegetation during most of that segment period.

Creel Census

The total catch by species was estimated by using the same methods used in the preceding segment period.

As experienced during the latter part of the 1955 study period, the census stations proved to be of little value, except on occasion, and it was necessary to go to the fishermen wherever they were fishing and interview them on the spot. The reasons for the marked decline in numbers of fishermen are not clear, but it is suspected that the economy of the region has been seriously affected by the drouth and that many of the people, who could afford to go fishing at Inks Lake during previous years, no longer can afford to make such a long trip, or they now fish at lakes closer to home.

The formula used in estimating the total anglers' catch or total yield for the segment period, excluding trotline fishermen, is as follows:

$$\text{Total yield} = (a \cdot b \cdot d) \left(\frac{f}{g} \right)$$

- Where: a = the average number of fishermen counted on the lake during all cruise counts made during the census period.
- b = the average length of the fishing day, i.e. the length of time in hours from when appreciable numbers of fishermen start fishing until virtually all have stopped fishing for the day.
- d = the number of days in census period.
- f = the total number of fish caught by the fishermen interviewed.
- g = the total effort in hours by the fishermen interviewed.

The derivation of this formula was given in detail in the report for Segment 3, Job B-14.

FINDINGS

Inventory of Species

Table 1 contains a checklist of species of fish found to occur in Lake Inks. A total of 70 seine collections and 84 net collections provided a grand total of 5296 specimens representing 25 species of 11 fish families. These collections are broken down by species, type of gear, and month of collection in Tables 2 and 3.

Table 4 is a record of gonadal development of the more regularly collected species taken in gill nets. This development was rated from 1 to 5 with No. 1. representing ripe; 2. representing nearly ripe; 3. representing sexes not easily distinguishable; and 5. representing spent fish, gonads empty.

Table 5 presents the results of analyses made on the food remains found in the stomachs of 40 specimens of channel catfish. These stomachs contained a total of 797.3 ml. of food. Of this, 80.44 percent was composed of fish in various stages of digestion. Over half of this food was identified as gizzard shad remains, while sunfish, freshwater drum, white bass, minnows and unidentifiable fish remains made up the rest. Various types of vegetable matter made up another 16.68 percent of the total volume, with algae and Myriophyllum sp. comprising the bulk of this. Insect remains comprised only 2.34 percent of the total volume, with beetles (Coleoptera) accounting for the largest portion of this volume. Other items of food remains present in the catfish stomachs included pieces of cut liver, pecans, various microscopic crustaceans, pieces of shrimp, etc.

On the basis of frequency of occurrence in channel catfish stomachs, gizzard shad was found in nearly half of the stomachs containing food. Algae and Myriophyllum sp. were next in order of frequency, with chironomid larvae and beetles next. These insect remains were almost always found in the stomachs in association with vegetation.

Only five largemouth bass stomachs were found to contain food. This food amounted to a total of 39 ml., 34 ml. of which were gizzard shad remains and 5 ml. were shiner minnows.

The three spotted bass stomachs found to contain food held the remains of gizzard shad only.

Four white bass stomachs contained a total of 77 ml. of partially digested food. 72 ml. of this food were the remains of gizzard shad, 4.0 ml. were unidentifiable fish and 1.0 ml. was the remains of damselflys.

A single warmouth bass stomach contained 0.2 ml. of crustacean remains.

(1957) J D N O S V F P W V M J (1956)



40%

45%

Table 8 contains information similar to that in Tables 6 and 7 but is concerned only with trotline fishing.

Table 9 compares the relative success of the various methods of fishing employed on Inks Lake during the study period. It gives the total number of fish taken by each method, the time required to catch the fish and the rate of catch for each method. Similarly, Table 10 presents information concerning the relative success of Lake Inks anglers in fishing for the various species of fish caught during the study period. These data are based only on pure catches, where only a single species was involved.

In Table 11 is a breakdown of the total catch of boat and shore anglers and trotline fishermen showing the number of fish caught on the various type of baits used by fishermen during the study period.

The estimated total yield to anglers, excluding trotline fishermen, during the eleven months covered by the census is presented in Table 12. Due to other work within Region 6-B and to assistance given to the Project Leader of Region 7-B, the regularly scheduled work on Lake Inks was not done during November 1956.

Table 13 is a breakdown of the estimated total yield, showing the total number of each species and the weight of each species in the sample obtained; the percentage of the total number and total weight of the sampled catch for each species; the estimated yield in number and weight for each species; and the estimated yield per surface acre in number and weight for each species. Fish taken by trotline are not included in these data.

Table 14 shows the average length in inches for each species in the sample both on a monthly and study period basis.

Table 15 presents an estimate of the total number of fishermen using Inks Lake during the 336 days covered by the creel census.

Table 16 shows the origin, or point of residence, of the fishermen interviewed by creel census personnel during the study period.

DISCUSSION

Inventory of Species

The nettable fish population of Lake Inks showed some change during the present segment over the 1955-56 segment. In particular, gizzard shad, which accounted for more than 51 percent of the fish taken in experimental type gill nets, during the seven month period from July 1955 through January 1956, increased to approximately 66 percent of the total fish taken during the period from February through October 1956. Graphically these percentages of the total monthly net catches during the 1956 netting study were as follows:



In November, in an effort to reduce the relative abundance of gizzard shad, a "selective kill" of gizzard shad was attempted under Job 16a-1, Project F-14-D. No netting was done during November 1956, but in December, 68 fish were taken in nets and 53 percent of these were gizzard shad. A month later, in January 1957, nets were again set, taking 153 fish. Gizzard shad accounted for 62 percent of this total.

From the data, as illustrated in the graph, it appears as if the "selective kill" of gizzard shad was only partially successful. It remains to be seen whether or not the reduced relative abundance of gizzard shad will remain below the 66 percent level indicated by the total catch of fish taken in experimental type gill nets during the period from February through October 1956. This will be closely watched during the next segment of work on Lake Inks.

The river carpsucker also seems to be increasing in relative abundance. This species, during the short segment of 1955-56 accounted for 6.37 percent of the total netted specimens while in the longer segment of 1956-57 its abundance rose to 7.61 percent of the total.

Smallmouth buffalo, on the other hand, dropped from 3.20 percent to 2.08 percent, while garfish increased in relative abundance from 0.85 percent to 1.98 percent. The decrease in smallmouth buffalo might be attributed to the fact that commercial netting for this species has increased during the past year.

The combined rough and obnoxious species taken in nets accounted for 77.61 percent of the year's total catch in nets. This was an increase of 14.93 percentage points over the short segment of 1955-56.

In percentage of the total weight of the netted catch, rough fish comprised 3.75 percent; a decrease of only 0.03 percentage points.

The game fish group, including catfish, white bass, black bass and white crappie, but excluding the sunfishes, increased from 12.42 percent of the total netted catch to 14.17 percent during the present segment period.

Like the rough fishes, the game fish group remained relatively constant in percent of the total weight of the netted catch, increasing 0.62 of a percentage point, from 22.95 percent of the weight of the netted catch in 1955-56 to 23.57 percent of the total weight of the netted catch in 1956-57.

At present some doubt exists as to the ability of white bass to find optimum conditions for spawning in Inks Lake. Regardless of the fact that, other than sunfish, this species accounted for the largest number of fish in the creels of anglers, only 38 specimens were taken in the 84 gill net collections during the study period. These specimens accounted for only 1.2 percent of the fish caught in gill nets. None were taken in seine collections.

The only indication of spawning success for white bass at all is found in the fact that 51 white bass that averaged 8.0 inches in total length were taken by anglers interviewed in August 1956.

Relatively speaking, fishing pressure on the white bass population is great and the species is highly prized by anglers. Unless something can be done to aid the white bass in its reproduction, however, this species can be expected, at best, to provide only mediocre fishing in Inks Lake. Some thought, it appears, should be given to artificially increasing the numbers of white bass in this lake and the possibility

of replenishing stocks of white bass through restocking with fry obtained by stripping techniques merits future attention.

Creel Census

Excepting November 1956, a total of 1297 fishermen were interviewed by creel census personnel during the period from February 1956 through January 1957. Of these, 495 were boat fishermen and 802 were shore fishermen. In addition, the catch from 32 trotlines was also examined. Together, these fishermen including the trotliners caught a total of 2458 fish of 17 species (Tables 6, 7, 8 and 9).

The average rates of catch for fishermen using the lake varied only slightly during the eleven months of this study period from the average rates of catch of the preceding shorter study period.

Boat fishermen during the 1955-56 segment had an average rate of catch of 0.45 fish per man hour. During the last segment this increased only slightly to 0.46 fish per man hour (Table 6). Lakewise, shore fishermen had only a slight increase in rate of catch from 0.79 fish per man hour to 0.80 fish per man hour. (Table 7). Trotline fishing had a decrease from 0.28 to 0.23 fish per trotline hour (Table 8).

From these slight variations in average rate of catch it appears as if fishing success remains at about the same level of quality over long periods of time. This stability may be upset during the coming year by the reduction in the numbers of gizzard shad as accomplished in November 1956.

Generally speaking, more than half of the anglers, fishing on Lake Inks, are successful (Tables 6, 7, and 8) and the most successful method of fishing remains, as it was during the preceding study period, still fishing. This is true regardless of whether a person is fishing from a boat or from the shore (Table 9).

Based on the sample obtained during the creel census, live baits are the most effective types of bait used in catching fish (Table 11) and the most successful of these are minnows and worms. Fly fishing, however, during the months of June and July, the peak months of the sunfish bedding season, was very successful. Unfortunately, few anglers use this method and as a result the sunfish harvest from the lake is much smaller than it could be.

As for success in taking the various types of fish, sunfish continue to be the most easily caught. Boat fishermen caught them at an average rate of 1.79 fish per man hour and shore fishermen caught them at 1.47 fish per man hour (Table 10). All sunfish species combined made up 48.95 percent of the total sampled catch (Table 13) but the bulk of these were small bluegills of approximately 5.7 inches in average total length (Table 14). During the eleven months of the census it is estimated that 29,948 sunfish were caught, for a per acre yield of 33 sunfish weighing approximately 5 pounds (Table 13).

As in the preceding short segment period, white bass were the second most frequently caught type of fish. Overall, these white bass had an average length of 10.9 inches and it is estimated that 9,630 of these were caught. This is a per acre yield of 10.7 fish weighing 8.51 pounds for the eleven month period (Table 13).

From netting samples, it would appear that white crappie are not overly abundant in Lake Inks (Table 3), and judging from specimens contained in the fishermen's creels, are not very large. The average total length of the crappie taken by fishermen was only 7.0 inches (Table 14).

Regardless of the apparent paucity of crappie in the lake and their smallness of size, the white crappie accounted for 15 percent of the total anglers' catch for the eleven months of the creel census (Table 13). Most of these crappie were taken during April, May, and June, the height of the spawning season. During the remainder of the year, few crappie are caught and it appears as if they are not actively sought after.

The total number of white crappie harvested during the study period is estimated at 9,575 fish weighing 7,656 pounds for a per acre yield of 10.6 fish and 2.7 pounds (Table 13).

Largemouth bass, though most actively sought after by boat fishermen on Lake Inks, were the fourth most abundantly caught fish. They comprised a little over 10 percent of the fish in the creels of fishermen interviewed by census personnel.

It is estimated that 6,442 largemouth bass were taken from the lake and these were caught at an average rate of catch of 0.43 fish per man hour. Boat fishermen caught them at the rate of 0.38 fish per man hour and the few that were caught by shore fishermen were caught at the rate of 0.90 fish per man hour (Table 10). The average total length of these bass was 12.3 inches (Table 14). Per acre, 7.15 bass weighing 9.71 pounds were taken from Lake Inks by fishermen during the study period (Table 13).

Channel catfish were caught in surprisingly smaller numbers during the last census period than they were during the preceding shorter census period. They dropped from approximately 11 percent of the total sampled catch to 6 percent of the total catch during the 1956-57 census period. In all it is estimated that 3,861 channel catfish weighing 2,916 pounds were taken by Lake Inks anglers, not including those taken by trotline fishermen. This is a per acre yield of 4.28 fish and 3.25 pounds (Table 13).

Based on data recorded by census personnel it is estimated that 61,181 fish were harvested during the eleven months covered by the census. (Table 12). The estimated total catch weighed 28,504 pounds. On a per acre basis, it is estimated that Lake Inks yielded 68 fish weighing 32 pounds to anglers during the period covered by the creel census. (Table 13).

The estimated number of man days spent by Lake Inks anglers during the last segment period of eleven months was 34,493 man days. Of this total, 10,946 were spent by boat fishermen and 23,547 by shore fishermen (Table 15). Persons contacted on Lake Inks during the course of the study period come from 95 different townships in 63 counties and from four states other than Texas. The home counties, states and towns of 1,202 fishermen are listed in Table 16.

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Approved by Marion Toole
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Date May 23, 1957

Table 1. Checklist of Species, Lake Inks.

Scientific Name	Common Name
<u>Lepisosteus osseus</u> x	longnose gar
<u>Dorosoma cepedianum</u>	gizzard shad
<u>Ictiobus bubalus</u>	smallmouth buffalo
<u>Moxostoma congestum</u> *	grey redhorse
<u>Carpiodes carpio</u>	river carpsucker
<u>Cyprinus carpio</u>	carp
<u>Notemigonus crysoleucas</u> *	golden shiner
<u>Notropis venustus</u>	spottail shiner
<u>Notropis lutrensis</u>	redhorse shiner
<u>Ictalurus punctatus</u>	southern channel catfish
<u>Pilodictus olivaris</u>	yellow or flathead catfish
<u>Fundulus notatus</u> *	blackstripe topminnow
<u>Gambusia affinis</u>	common mosquitofish
<u>Roccus chrysops</u>	white bass
<u>Micropterus punctulatus</u> o	Kentucky spotted bass
<u>Micropterus treculi</u>	Texas spotted bass
<u>Micropterus salmoides</u>	largemouth bass
<u>Chaenobryttus gulosus</u>	warmouth
<u>Lepomis cyanellus</u>	green sunfish
<u>Lepomis microlophus</u>	redeer sunfish
<u>Lepomis macrochirus</u>	bluegill
<u>Lepomis auritus</u>	yellowbelly sunfish
<u>Lepomis megalotis</u>	longear sunfish
<u>Pomoxis annularis</u>	white crappie
<u>Percina caprodes</u>	logperch
<u>Etheostoma spectabile</u> o	orangethroated darter
<u>Aplodinotus grunniens</u>	freshwater drum

Note: x Erroneously reported as Lepisosteus platostomus in previous report.

* Added to checklist during present segment.

o Not collected during present segment.

Table 2. Seining Results, Inks Lake, February 1956 through August 1956.

Species	February	March	April	May	June	July	August	Totals	Percent of Total
<u>D. cepedianum</u>	53	7	42	112	35	232	4	485	22.36
<u>Carpionodes carpio</u>	0	0	0	0	0	1	0	2	0.09
<u>N. venustus</u>	225	24	62	43	79	85	0	518	23.88
<u>N. lutrensis</u>	28	24	0	2	2	16	0	72	3.32
<u>F. notatus</u>	1	17	2	3	9	0	0	32	1.47
<u>G. affinis</u>	0	25	0	1	4	8	0	38	1.75
<u>M. treculi</u>	0	0	0	0	1	0	0	1	0.05
<u>M. salmoides</u>	18	4	5	50	25	19	3	124	5.72
<u>C. gulosus</u>	3	0	0	2	2	0	0	7	0.32
<u>L. cyanelinus</u>	0	0	1	3	0	3	11	18	0.83
<u>L. microlophus</u>	69	15	14	16	7	18	1	140	6.45
<u>L. macrochirus</u>	260	11	18	170	86	123	6	674	31.08
<u>L. aurtus</u>	2	2	3	10	19	14	1	51	2.35
<u>L. megalotis</u>	0	1	1	0	0	0	4	6	0.28
<u>P. caprodes</u>	0	0	0	1	0	1	0	2	0.09
Totals	659	130	148	413	269	520	30	2169	100.00

Table 3. Inks Lake Netting Results, February 1956 through January 1957.

Species	February		March		April		May		June		July		August		September	
	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.
<i>L. osseus</i>	2	14.8	5	29.6	4	18.4	27	133.8	16	81.1	5	22.1	1	6.1	0	---
<i>D. cepedianum</i>	104	19.5	112	20.1	275	42.9	430	57.9	319	43.1	332	41.3	125	16.6	59	10.2
<i>I. bubalus</i>	6	21.4	14	50.1	3	11.2	9	35.8	20	76.1	7	23.4	2	7.8	0	---
<i>M. congestum</i>	0	---	1	4.3	1	2.4	0	---	0	---	0	---	0	---	0	---
<i>Cariodes carpio</i>	29	64.3	52	121.6	37	100.4	37	74.9	35	55.5	6	12.1	6	13.8	7	14.7
<i>Cyprinus carpio</i>	0	---	0	---	0	---	1	5.3	0	---	0	---	0	---	0	---
<i>N. crysoleucas</i>	0	---	2	0.4	0	---	0	---	0	---	0	---	0	---	0	---
<i>I. punctatus</i>	17	23.5	18	21.1	14	16.4	24	31.7	32	45.6	47	87.6	24	23.7	9	11.5
<i>P. olivaris</i>	2	5.1	0	---	1	3.6	0	---	0	---	0	---	1	1.4	1	5.7
<i>R. chrysops</i>	2	3.6	2	4.1	3	3.8	2	2.4	5	3.9	8	5.3	1	0.2	2	2.1
<i>M. treculi</i>	0	---	1	2.6	3	7.3	2	4.4	0	---	0	---	1	2.2	1	1.4
<i>M. salmoides</i>	3	6.1	4	7.5	1	1.4	2	1.1	1	0.4	1	0.2	0	---	2	1.3
<i>C. gulosus</i>	0	---	4	0.5	0	---	0	---	0	---	0	---	0	---	0	---
<i>L. microlophus</i>	3	0.4	6	0.5	2	0.1	2	0.3	12	1.1	3	0.4	1	0.1	1	0.1
<i>L. macrochirus</i>	10	1.0	27	2.1	21	1.8	18	1.8	54	5.1	25	2.4	10	1.1	18	2.2
<i>L. megalotis</i>	0	---	0	---	0	---	3	0.3	1	---	2	0.2	0	---	0	---
<i>P. annularis</i>	6	1.0	15	3.0	32	5.3	41	5.8	18	4.4	9	2.2	3	0.3	7	0.9
<i>A. grummiens</i>	0	---	1	1.1	1	0.3	2	0.9	3	1.7	2	0.9	0	---	1	0.4
Totals	184	160.7	264	268.6	398	215.3	600	356.4	515	318.0	447	198.1	175	73.3	108	50.5

(Continued on next page)--

Table 3. (Continued)---

Species	October		November*		December		January		Total Number	Total Weight in lbs.	Percent of Number	Percent of Weight
	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.				
<i>L. osseus</i>	1	6.8	0	---	1	0.6	0	---	62	313.3	1.98	16.64
<i>D. cepedianum</i>	161	23.3	0	---	36	6.5	96	12.0	2049	293.4	65.52	15.58
<i>I. bubalus</i>	1	5.5	0	---	1	2.4	2	6.3	65	240.0	2.08	12.75
<i>M. congestum</i>	0	---	0	---	0	---	0	---	2	6.7	0.07	0.35
<i>Carpionodes carpio</i>	8	16.2	0	---	6	13.7	15	37.3	238	524.5	7.61	27.86
<i>Cyprinus carpio</i>	0	---	0	---	0	---	0	---	1	5.3	0.03	0.28
<i>N. crysoleucas</i>	0	---	0	---	0	---	0	---	2	0.4	0.06	0.03
<i>I. punctatus</i>	19	38.3	0	---	13	22.9	20	20.7	237	343.0	7.58	18.21
<i>P. olivaris</i>	0	---	0	---	0	---	0	---	5	15.8	0.16	0.84
<i>R. chrysops</i>	9	11.5	0	---	1	2.0	3	3.3	38	42.2	1.22	2.24
<i>M. treculi</i>	0	---	0	---	0	---	0	---	8	17.9	0.26	0.95
<i>M. salmoides</i>	0	---	0	---	1	3.1	2	3.8	17	24.9	0.54	1.33
<i>C. gulosus</i>	1	0.2	0	---	0	---	1	0.3	6	1.0	0.19	0.06
<i>L. microlophus</i>	3	0.3	0	---	0	---	6	0.7	39	4.0	1.25	0.21
<i>L. macrochirus</i>	9	1.3	0	---	6	0.4	7	0.5	205	19.7	6.56	1.05
<i>L. megalotis</i>	0	---	0	---	0	---	0	---	5	0.5	0.16	0.02
<i>P. annularis</i>	3	1.5	0	---	3	0.3	1	0.1	138	24.8	4.41	1.31
<i>A. grunniens</i>	0	---	0	---	0	---	0	---	10	5.3	0.32	0.29
Totals	215	104.9	0	---	68	51.9	153	85.0	3127	1882.7	100.00	100.00

Note: * Selective eradication of gizzard shad attempted, no netting done in November.

Table 4. Inks Lake - Gonadal Development.

Species	February	March	April	May	June	July	August	September	October	November	December	January
<u>L. osseus</u>	1	1-2	1-2	1-2-3	1-2	-	-	-	-	-	-	-
<u>D. cepedianum</u>	3	3	2	1	1	5	5	3	3	-	3	3
<u>I. bubalus</u>	1	1-3	1-2	1-2	1-2	-	5	-	5	-	3	-
<u>M. congestum</u>	-	1	1-2	-	-	-	-	3	-	-	-	-
<u>Cariodes carpio</u>	1	1-2	1-2	2-5	1	-	1-2-5	3-5	3-5	-	2	1-2
<u>Cyprinus carpio</u>	-	-	-	2	-	-	-	-	-	-	-	-
<u>I. punctatus</u>	2-3-4	1-2-3	1-2-3-4	1-2-3-4	1-2-3-4	1-2-3-5	1-3-5	1-4-5	3-5	-	3-4	2-3-4
<u>P. olivaris</u>	3-4	-	2-3	-	-	-	5	5	-	-	-	-
<u>R. chrysops</u>	1	1	1-2-3	5	5	3-5	3	5	3	-	2	1-3
<u>M. treculi</u>	-	-	2	2-3	-	-	5	4	-	-	-	-
<u>M. salmoides</u>	1-2	-	2	1-3	5	-	-	5	-	-	2	2
<u>C. gulosus</u>	-	2	-	-	-	-	-	-	4	-	-	2
<u>L. cyaneellus</u>	-	-	-	-	-	-	-	-	-	-	-	-
<u>L. microlophus</u>	2-3	2	2-3	1-2	-	1	2	5	3	-	-	3
<u>L. macrochirus</u>	2-3	2-3-4	3	1-2	-	1-2	2-5	5	3-4	-	3	3
<u>L. auritus</u>	-	-	-	-	-	-	-	-	-	-	-	-
<u>L. megalotis</u>	-	-	-	-	-	-	-	-	-	-	-	-
<u>P. annularis</u>	2-3	1-2	1-2-3	1-2	1-2-3-5	3-5	3	3-5	3	-	3	3
<u>A. grunniens</u>	-	3	2	1-2	1-5	1-3	-	-	-	-	-	2

Table 5. Results of Channel Catfish Stomach Analyses (40 Stomachs), Lake Inks, February 1956 through January 1957.

Food Types	Frequency of Occurrence	Volume in Ml.	Total in Ml.	Percent of Volume	Total Percent
FISH					
gizzard shad	17	380.0		47.66	
sunfish	3	123.0		15.42	
drum	2	80.0		10.04	
white bass	1	14.0		1.75	
minnows	1	traces		traces	
Unidentified fish	7	44.4		5.57	
<u>Total</u>			641.4		80.44
VEGETATION					
algae	15	68.7		8.62	
<u>Myriophyllum</u>	13	40.7		5.10	
Maize	4	20.6		2.59	
<u>Typha (cattails)</u>	1	3.0		0.37	
<u>Total</u>			133.0		16.68
INSECTS					
chironomid larvae	9	traces		traces	
beetles	5	8.7		1.09	
mayflies	1	3.0		0.38	
damsel flies	1	1.9		0.24	
unidentified insects	8	5.0		0.63	
<u>Total</u>			18.6		2.34
MISCELLANEOUS					
liver	1	3.0		0.37	
pecans	1	0.3		0.04	
crustaceans	1	traces		traces	
shrimp	2	1.0		0.13	
<u>Total</u>			4.3		0.54
<u>GRAND TOTAL</u>			797.3		100.00
			797.3		100.00

Table 6. Lake Inks Creel Census - Boat Fishing Results - These Data Represent only the Fishermen Interviewed by Texas Game and Fish Commission Personnel During the Period February 1956 through January 1957.*

Month	Successful Fishermen		Unsuccessful Fishermen		Total Fish Caught	Successful Hours Fished		Fish/Successful Fishing Hr.	Total Fishermen		Total Hours Fished		Fish/Total Fishermen Hr. for all fishermen	% of All Fishermen Unsuccessful
	Successful Fishermen	Unsuccessful Fishermen	Successful Fishermen	Unsuccessful Fishermen		Successful Hours Fished	Total Hours Fished		Total Fishermen	Total Hours Fished				
February	12	8	20	38.0	0.53	20	56.5	0.35	40.00					
March	35	17	83	148.0	2.37	52	200.5	0.41	33.00					
April	41	22	56	146.0	0.38	63	204.0	0.27	34.92					
May	42	34	170	191.75	0.89	76	278.25	0.61	44.73					
June	52	25	181	135.5	1.34	77	202.5	0.89	32.46					
July	34	30	68	109.0	0.62	64	174.0	0.39	46.87					
August	24	26	49	75.0	0.65	50	124.75	0.39	52.00					
September	13	6	30	62.0	0.48	19	73.5	0.41	31.59					
October	14	17	28	60.0	0.47	31	107.0	0.26	54.83					
November	*	--	--	--	--	--	--	--	--					
December	9	9	9	27.0	0.33	18	60.5	0.15	50.00					
January	11	14	9	18.0	0.50	25	50.0	0.18	56.00					
Total	287	208	703	1010.25	0.70	495	1531.5	0.46	42.00					

Note: * No creel census interviews were made during November 1956.

Table 7. Lake Inks Creel Census - Shore Fishing Results - These Data Represent only the Fishermen Interviewed by Texas Game and Fish Commission Personnel during the Period February 1956 through January 1957.*

Month	Successful Fishermen	Unsuccessful Fishermen	Total Fish Caught	Successful Hours Fished	Successful Fish/man Hr. Fishing	Total Fishermen men	Total Hours Fished	Fish/man Hr. for all Fishermen	% of all Fishermen Unsuccessful
February	12	43	32	40.00	0.80	55	94.75	0.34	78.18
March	53	50	125	223.00	0.56	103	339.50	0.37	49.00
April	96	43	550	423.75	1.31	139	55.00	1.10	44.79
May	103	84	297	279.00	1.06	187	396.50	0.75	44.91
June	61	23	248	118.25	2.10	84	143.75	1.73	27.38
July	38	10	107	84.50	1.27	48	99.00	1.08	20.83
August	39	15	75	108.50	0.69	54	132.00	0.57	27.77
September	40	25	100	127.00	0.79	65	191.50	0.52	38.46
October	12	19	52	36.50	1.42	31	58.50	0.89	61.29
November	*	--	--	--	--	--	--	--	--
December	5	11	42	13.50	3.11	16	38.50	1.09	68.75
January	9	11	33	15.00	2.20	20	20.00	1.65	55.00
Total	468	334	1661	1469.00	1.13	802	2064.00	0.80	41.64

Note: * No creel census interviews were made during November 1956.

Table 8. Lake Inks Creel Census - Trotline Fishing Results - These Data Represent only the Fishermen Interviewed by Texas Game and Fish Commission Personnel During the Period February 1956 through January 1957.*

Month	Total Trotlines	Total Fish Caught on Trotlines	Total Trotline Hours Fished	Fish/Trotline Hour	Percent of Trotlines Catching Fish
February	--	--	----	-----	-----
March	1	11	11.0	1.00	100.00
April	11	38	122.5	0.31	55.00
May	5	19	104.0	0.18	80.00
June	4	8	49.0	0.16	100.00
July	3	9	31.0	0.29	100.00
August	5	6	68.0	0.07	100.00
September	2	2	3.0	0.67	100.00
October	--	--	----	-----	-----
November *	1	1	13.0	0.08	100.00
December	--	--	----	-----	-----
January	--	--	----	-----	-----
Total	32	94	401.5	0.23	91.87

Note: * No creel census interviews were made during November 1956.

Table 9. Lake Inks Creel Census -- Returns in Fish and the Return Per Unit of Effort in Fish Caught Per Man Hour or Trotline Hour for the Various Methods of Fishing Used. These Data Represent Only those Trips where a Single Method of Fishing was Employed.

Type of Fishing	February	March	April	May	June	July	August	Sept.	October	December	Jan.	Total Fish Caught	Total Average Effort Rate of Hrs. Catch
<u>Still Fishing (Boat)</u>												369	513.5
Fish Hours	----	40	21	110	101	43	24	18	12	-----	----		
Rate	----	42.5	72.5	162.0	98.0	89.5	79.0	49.5	18.5	-----	----		0.71
	---	0.94	0.29	0.7	1.04	0.48	0.30	0.36	0.65	-----	---		
<u>Still Fishing (Shore)</u>												1490	1727.75
Fish Hours	15	110	517	254	247	83	61	87	48	41	27		
Rate	82.5	306.5	474.5	333.75	127.0	84.0	123.5	143.5	52.5	32.0	15.0		0.86
	0.18	0.36	1.10	0.76	1.94	0.99	0.49	0.61	0.91	1.28	1.8		
<u>Casting (Boat)</u>												157	534.25
Fish Hours	19	31	24	23	11	1	14	12	4	9	9		
Rate	46.5	91.0	80.0	38.25	42.0	18.5	33.5	23.0	70.0	50.5	41.0		0.29
	0.41	0.34	0.30	0.6	0.26	0.05	0.42	0.52	0.06	0.18	0.22		
<u>Casting (Shore)</u>												83	127.5
Fish Hours	7	5	10	10	0	14	13	13	4	1	6		
Rate	10.25	12.0	5.5	13.25	17.0	14.5	6.5	33.0	4.5	6.5	4.5		0.65
	0.68	0.42	1.82	0.75	0.0	0.97	2.0	0.39	0.89	0.15	1.33		
<u>Fly Fishing (Boat)</u>												98	42.0
Fish Hours	---	---	---	27	46	22	3	---	---	---	---		
Rate	---	---	---	18.0	14.0	5.0	5.0	---	---	---	---		2.33
	---	---	---	0.7	3.29	4.4	0.6	---	---	---	---		
<u>Fly Fishing (Shore)</u>												0	2.0
Fish Hours	---	---	---	---	---	---	0	---	---	---	---		
Rate	---	---	---	---	---	---	2.0	---	---	---	---		0.00
	---	---	---	---	---	---	0.0	---	---	---	---		
<u>Trotting (Boat)</u>												19	26.25
Fish Hours	0	0	1	---	2	2	8	0	6	---	---		
Rate	4.0	2.0	2.0	---	7.5	2.0	6.75	1.0	1.0	---	---		0.72
	0.0	0	0.5	---	0.27	1.0	1.19	0.0	6.0	---	---		
<u>Trotline</u>												94	401.5
Fish Hours	---	---	11	38	19	8	9	6	2	1	---		
Rate	---	---	11.0	122.5	104.0	49.0	31.0	68.0	3.0	13.0	---		0.23
	---	---	1.0	0.31	0.18	0.16	0.29	0.07	0.67	0.08	---		

Note: No creel census interviews were made during November 1956.

Table 10. (Continued) ---

Type of fishing	February	March	April	May	June	July	August	Sept.	October	December	Jan.	Total Fish Caught	Total Effort in Hrs.	Average Rate of Catch
<u>White Bass</u> <u>(Shore)</u>	Fish 2 Hours 5.5 Rate 0.36	6 17.0 0.35	2 12.0 0.16	26 54.5 0.47	4 2.5 1.60	20 19.0 1.05	38 58.0 0.65	49 63.0 0.77	6 5.5 1.09	1 0.5 2.0	7 8.0 0.87	161	245.50	0.65
<u>Channel Catfish</u> <u>(Boat)</u>	Fish --- Hours --- Rate ---	--- --- ---	3 6.5 0.46	20 28.5 0.70	9 19.5 0.46	---	---	12 7.5 1.60	---	---	---	44	62.00	0.70
<u>Channel Catfish</u> <u>(Shore)</u>	Fish --- Hours --- Rate ---	1 5.0 0.20	5 30.75 0.16	49 50.0 0.98	5 4.5 1.11	---	2 7.0 0.28	1 12.0 0.08	---	---	---	63	109.25	0.57
<u>Channel Catfish</u> <u>(Trotline)</u>	Fish --- Hours --- Rate ---	--- --- ---	11 11.0 1.0	35 56.5 0.61	7 84.0 0.08	8 49.0 0.16	8 19.0 0.42	6 68.0 0.08	2 3.0 0.66	1 13.0 0.07	---	78	303.50	0.25
<u>Yellow Catfish</u> <u>(Trotline)</u>	Fish --- Hours --- Rate ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	1 12.0 0.08	---	---	---	1	12.00	0.08
<u>Carp</u>	Fish --- Hours --- Rate ---	1 6.0 0.16	4 12.0 0.33	---	---	---	---	---	---	---	---	5	18.00	0.27
<u>Smallmouth Buffalo</u> <u>(Shore)</u>	Fish --- Hours --- Rate ---	2 8.0 0.25	---	---	---	---	---	---	---	---	---	2	8.00	0.25
<u>Freshwater Drum</u> <u>(Shore)</u>	Fish --- Hours --- Rate ---	---	---	---	---	1 1.5 0.66	---	---	---	---	---	1	1.50	0.66

Table 12. Inks Lake Creel Census -- Estimated Monthly Yields in Total Numbers of Fish Taken by Boat and Shore Fishermen during the Period February 1956 through January 1957.

Month	Boat	Shore	Total
February	639.5	890.4	1,529.9
March	1,369.3	1,410.8	2,780.1
April	1,359.4	7,114.8	8,474.2
May	3,362.6	8,602.5	11,965.1
June	3,991.7	14,168.7	18,160.4
July	1,193.9	6,293.0	7,486.9
August	1,122.9	2,666.9	3,789.8
September	1,018.4	1,758.1	2,776.5
October	326.9	1,664.2	1,991.1
November	-----	-----	-----
December	117.2	699.5	816.7
January	224.7	1,185.7	1,410.4
Totals	14,726.5	46,454.6	61,181.1

Table 13. Inks Lake Creel Census -- Results of Boat and Shore Fishing and the Estimated Yields of Fish Taken by Those Methods During the Period February 1956 through January 1957. (Acre yields are based on an estimated 900 surface acres.)

Species	Total Number	Percent of Total No.	Estimated Total Catch	Estimated Yield Per Acre	Total Weight In Lbs.	Percent of Weight	Estimated Total Wt. In Pounds	Estimated Yield Per Acre in Lbs.
Longnose gar	2	0.09	55.1	0.06	3.6	0.32	91.21	0.10
Smallmouth buffalo	9	0.38	232.5	0.25	24.2	2.20	627.09	0.70
European carp	11	0.47	287.6	0.32	23.1	2.10	598.59	0.67
Channel catfish	149	6.31	3,860.5	4.28	112.7	10.23	2,915.98	3.24
Yellow catfish	3	0.12	73.4	0.08	5.4	0.49	139.67	0.16
Yellow bullhead	1	0.04	24.5	0.03	0.3	0.03	8.55	0.01
White bass	372	15.74	9,629.9	10.70	295.9	26.86	7,656.23	8.51
Spotted bass	11	0.46	281.4	0.31	14.9	1.35	384.81	0.43
Largemouth black bass	249	10.53	6,442.4	7.15	337.6	30.65	8,736.54	9.71
Warmouth	8	0.34	208.0	0.23	1.8	0.16	45.61	0.05
Green sunfish	14	0.59	361.0	0.40	2.2	0.20	57.00	0.06
Redear sunfish	29	1.22	746.4	0.83	5.1	0.47	133.97	0.15
Bluegill sunfish	1,067	45.14	27,617.1	30.69	157.4	14.29	4,073.25	4.53
Yellowbreasted sunfish	16	0.68	416.0	0.46	2.7	0.24	68.41	0.08
Longear sunfish	23	0.98	599.6	0.67	4.0	0.37	105.47	0.12
White crappie	370	15.65	9,574.8	10.64	93.2	8.46	2,411.46	2.68
Freshwater drum	30	1.26	770.1	0.86	17.3	1.58	450.37	0.50
Totals	2,364	100.00	61,180.3	67.98	1,101.4	100.00	28,504.20	31.67

Table 14. Inks Lake Creel Census -- Average Total Length in Inches, of Fish Taken by Anglers (Excluding Trotline Fishermen) during the Period February 1956 through January 1957.

Common Name	February	March	April	May	June	July	August	September	October	November	December	January	Average Length
Longnose gar	---	---	---	27.0	---	---	---	---	---	---	---	---	27.0
Smallmouth buffalo	---	17.0	15.0	---	---	---	---	---	---	---	---	---	15.8
River carpsucker	---	---	---	---	---	---	---	---	---	---	---	---	---
European carp	---	13.8	16.3	---	---	---	---	---	---	---	---	---	15.1
Channel catfish	13.0	12.3	13.1	13.5	14.0	10.5	11.3	10.2	11.6	---	---	---	12.9
Black bullhead	---	---	---	8.0	---	---	---	---	---	---	---	---	8.0
Yellow catfish	13.0	---	16.0	---	---	---	---	---	---	---	---	---	15.0
White bass	11.6	9.3	11.5	12.0	9.3	9.3	8.0	12.5	11.2	---	14.5	14.1	10.9
Spotted bass	14.7	---	---	10.3	17.0	---	---	---	11.0	---	17.0	14.0	13.1
Largemouth black bass	12.7	12.3	11.7	12.6	8.7	9.5	15.8	10.0	16.8	---	13.9	14.0	12.3
Warmouth	---	6.5	6.5	---	5.0	---	---	---	---	---	---	---	6.1
Green sunfish	---	6.0	6.0	---	5.0	5.2	---	---	---	---	6.0	---	5.7
Redear sunfish	6.0	6.0	5.9	4.6	5.0	7.0	---	6.0	---	---	---	---	5.7
Bluegill sunfish	5.3	5.4	5.9	5.5	5.5	5.8	5.9	5.7	5.9	---	5.6	5.6	5.7
Orangespotted sunfish	---	---	---	---	---	---	---	---	---	---	---	---	---
Yellowbreasted sunfish	---	6.0	7.5	---	6.0	5.0	7.0	5.2	---	---	---	---	5.9
Longear sunfish	5.0	---	6.3	---	5.5	6.5	---	---	---	---	---	---	5.7
White crappie	7.0	8.2	6.8	6.7	7.7	7.0	8.0	8.0	6.0	---	---	---	7.0
Freshwater drum	---	12.0	---	11.0	9.6	11.6	---	---	10.0	---	---	---	10.1

Table 15. Inks Lake Creel Census -- Estimated Total Usage of Inks Lake by Fishermen in Man-Days During the Period February 1956 through January 1957.

Type of Fishing	Avg. No. of Fishermen Counted on all Cruises	Average Length of Fishing Day	Length of Avg. Fishing Trip	Number Days in Census Period	Total Man-Days Fished
BOAT					
February	6.0	10.5	3.25	29	562
March	9.3	11.5	4.25	31	780
April	13.7	12.25	3.25	30	1,549
May	14.7	12.5	3.00	31	1,900
June	11.5	13.0	2.50	30	1,794
July	8.5	11.6	2.00	31	1,528
August	7.2	12.9	2.25	31	1,279
September	7.2	11.5	5.25	30	473
October	3.9	10.4	3.50	31	359
November	---	---	---	---	---
December	2.8	9.0	3.50	31	223
January	6.6	6.1	2.50	31	499
Total				336	10,946
SHORE					
February	8.6	10.5	1.75	29	1,496
March	10.7	11.5	2.75	31	387
April	17.6	12.25	3.0	30	2,156
May	29.6	12.5	2.5	31	4,588
June	21.0	13.0	1.5	30	5,460
July	16.2	11.6	1.5	31	3,818
August	16.7	12.9	3.0	31	2,226
September	9.8	11.5	2.5	30	1,352
October	5.8	10.4	1.5	31	1,247
November	---	---	---	---	---
December	2.3	9.0	2.0	31	338
January	3.8	6.1	1.5	31	479
Total				336	23,547

Note: No creel census interviews were made during November 1956.

Table 16. Inks Lake Creel Census -- Home Towns and Counties of Fishermen Interviewed.

SECTION	COUNTY	TOWN	NO. PERSONS	TOTAL
<u>PANHANDLE</u>	Gray	Pampa	1	3
	Potter	Amarillo	2	
<u>SOUTH PLAINS</u>	Cochran	Morton	1	128
	Concho	Eden	6	
	Crockett	Ozona	2	
	Ector	Odessa	22	
	Hale	Plainview	2	
	Hockley	Levelland	5	
	Howard	Big Spring	21	
	Lubbock	Lubbock	18	
	Martin	Stanton	2	
	Midland	Midland	17	
	Runnels	Ballinger	9	
	Schleicher	Eldorado	2	
	Scurry	Snyder	2	
	Sterling	Sterling City	3	
	Tom Green	San Angelo	12	
	Tom Green	Water Valley	2	
Ward	Grand Falls	2		
<u>TRANS PECOS</u>	El Paso	El Paso	4	4
<u>NORTH CENTRAL TEXAS</u>	Callahan	Cross Plains	3	50
	Callahan	Clyde	2	
	Dallas	Dallas	17	
	Dallas	Grand Prairie	2	
	Hardeman	Quanah	4	
	Palo Pinto	Possum Kingdom	3	
	Tarrant	Fort Worth	19	
<u>CENTRAL TEXAS</u>	Bandera	Bandera	2	
	Brown	Brownwood	1	
	Bell	Belton	1	
	Bell	Fort Hood	41	
	Bell	Killeen	73	
	Burnet	Inks Lake	39	
	Burnet	Burnet	112	
	Burnet	Briggs	6	
	Burnet	Bertram	21	
	Burnet	Lake Victor	6	
	Burnet	Longhorn Cavern	2	
	Caldwell	Lockhart	1	
	Comal	New Braunfels	5	
	Comanche	Comanche	4	

Table 16. --- Continued.---

SECTION	COUNTY	TOWN	NO. PERSONS	TOTAL
<u>CENTRAL TEXAS</u>	Coryell	Copperas Cover	44	
	Coryell	Gatesville	2	
	Fayette	Schulenburg	7	
	Gillespie	Flatonia	4	
	Gillespie	Fredericksburg	8	
	Hays	San Marcos	2	
	Kerr	Kerrville	1	
	Kerr	Ingram	2	
	Lampasas	Lampasas	78	
	Lee	Lexington	5	
	Llano	Buchanan	20	
	Llano	Bluffton	2	
	Llano	Llano	12	
	McLennan	Waco	13	
	McLennan	Moody	2	
	Milam	Thorndale	3	
	Milam	Rockdale	5	
	San Saba	Cherokee	2	
	San Saba	San Saba	4	
	Travis	Austin	120	
	Williamson	Bartlett	2	
	Williamson	Florence	15	
	Williamson	Gerogetown	41	
	Williamson	Granger	2	
	Williamson	Jarrell	6	
	Williamson	Round Rock	4	
	Williamson	Taylor	12	732
	<u>EAST TEXAS</u>	Bowie	Maud	1
Brazos		Bryan	1	
Burleson		Somerville	3	
Brazoria		Lake Jackson	2	
Cass		Atlanta	2	
Galveston		Texas City	4	
Harris		Baytown	2	
Harris		Highlands	3	
Harris		Houston	67	
Harris		Pasadena	6	
Jefferson		Beaumont	3	
Madison		Madisonville	2	
Montgomery		Magnolia	1	
Nacogdoches		Nacogdoches	5	
Trinity		Trinity	2	104

Table 16. --- Continued. ---

<u>SECTION</u>	<u>COUNTY</u>	<u>TOWN</u>	<u>NO. PERSONS</u>	<u>TOTAL</u>
<u>SOUTH TEXAS</u>	Bexar	San Antonio	152	
	Bexar	Randolph Field	2	
	Brooks	Falfurrias	2	
	Cameron	Harlingen	5	
	DeWitt	Yoakum	3	
	Frio	Dilley	3	
	Guadalupe	Marion	2	
	Nueces	Corpus Christi	5	174
<u>OUT OF STATE</u>		Milwaukee, Wisconsin	1	
		St. Louis, Missouri	2	
		Oklahoma City, Oklahoma	2	
		New York City, New York	2	7
<u>GRAND TOTAL</u>				1,202

