

PERFORMANCE REPORT

As Required By

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project F-6-R-22

Region 2-C Fisheries Studies

Objective I: Fisheries Management
Project Leader: Roger L. McCabe
Assistant Project Leader: Kenneth K. Sellers

Clayton T. Garrison
Executive Director
Texas Parks and Wildlife Department

Lonnie J. Peters
Chief, Inland Fisheries

Robert J. Kemp
Director, Fish and Wildlife

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ABSTRACT

Recommended changes in fish harvest regulations, based on biological data, were presented at public hearings and were approved by the Texas Parks and Wildlife Commission.

Fishery management surveys were conducted on Lakes Waco (McLennan County), and Proctor (Comanche County). Other survey work was done on Lakes Belton (Bell County), Stillhouse Hollow (Bell County), and Waco for walleye evaluation purposes. Data from all field work were compiled and used to determine management needs on each lake visited.

Predator game fish were stocked in the following waters in 1974: Lake Belton, Lake Waco, Lake Stillhouse Hollow, Lake Whitney (Hill and Bosque Counties), Lake Brelsford (Eastland County), Lake Tucker (Palo Pinto County), Cleburne State Park Lake (Johnson County), and Marlin City Lake (Falls County).

Stockings of predator game fish and/or forage species are recommended on Lakes Whitney, Stillhouse Hollow, Waco, and Brownwood (Brown County).

Past survey data, physical and descriptive data, and public access information were used to assess management needs and to prepare a five year plan for all U. S. Army Corps of Engineers impoundments in Region 2-C. Recommended management procedures were outlined for Lakes Proctor, Waco, Stillhouse Hollow, Belton, Whitney, and Hords Creek (Coleman County).

PERFORMANCE REPORT

State: Texas Project Number: F-6-R-22

Project Title: Region 2-C Fisheries Studies

Project Section: Research and Surveys

Study Title: Fisheries Management

Contract Period: From January 1, 1974 To December 31, 1974

Program Narrative Objective No.: 9

Objective: To situate fishery management practices in waters of Fisheries Region 2-C. (1) Harvest regulations (2) Fish stocking (3) Fish control (4) Pollution investigations (5) Vegetation control (6) Fisherman access needs.

I. Job Segment Objectives:

A. Job No. 9 Objectives:

1. To recommend fish harvest regulations to the Texas Parks and Wildlife Commission.
2. To recommend stocking rates of newly constructed or renovated waters and for waters having established fish populations but lacking favorable species composition.
3. To recommend population control measures.
4. To monitor physicochemical characteristics and investigate incidents of pollution and/or fish die-offs.
5. To determine vegetation control needs.
6. To determine public access needs.

II. Summary of progress:

Fish harvest regulations, based on biological data and field observations, were formulated and discussed at a meeting of game wardens and biologists before presentation to the public at hearings in all counties under Regulatory Authority. The proposals were then forwarded to the Texas Parks and Wildlife Commission for approval.

No public lakes were renovated and no new lakes were constructed during the year. Management surveys, walleye evaluation work and supplementary field data were used to fulfill objectives 2 through 6. No incidences of pollution were reported to this project; therefore, no investigations were necessary. No vegetation problems were encountered during the segment. Public access needs were noted in conjunction with other activities on all lakes visited.

Fisheries management surveys, conducted in the spring, included gill netting, marginal seining, and water profile analyses. Permanent sampling stations were established for each sampling method. The number of sites selected was proportional to each lake's size. One standard experimental gill net (150 feet long and 8 feet deep with 1-inch to 3 1/2-inch graduated mesh) was set over night at each station. Seining consisted of two 50-foot drags at each site with a bag seine (26 feet long and 6 feet deep with 1/4-inch mesh). Water samples were taken with a Kemmerer Model 1200 sampler. A profile of samples were taken at 1-meter intervals from the surface to the bottom of the lake. Analyses were done using a Hach DR-EL Portable Engineers Laboratory, a YSI Model 51-A oxygen-temperature meter, a YSI Model 33 specific conductivity meter, and two 1,000 ml Imhoff cones.

Gill net collections were separated by species, counted, and bulk weighed. All game fishes and a representative sample of other species were weighed and measured individually. Data were compiled to determine species composition, relative abundance, average weight, and catch per unit of effort. Seine collections were keyed and separated by species, divided into inch classes, and counted. The catch per unit of effort was calculated for each species. Temperature and dissolved oxygen were measured on all water profile samples. Surface, middle and bottom samples were also tested to determine pH, turbidity, total alkalinity, settleable solids, and specific conductivity (adjusted to 25 deg. C). Secchi disc transparency and climatic conditions were recorded each time profiles were taken. Data were compiled and tabulated for comparative purposes.

Walleye evaluation procedures were implemented on Lake Belton to aid in defining the reservoir and in determining some of the more important ecological conditions which contribute to using walleye introductions as a successful management practice. The major areas of investigation included:

1. Spawning observations - to determine gonadal conditions and spawning success of walleye.
2. Seine samples - to determine the capture per unit of effort and relative strength of 0 age fish.
3. Categorization (cove rotenone samples) - to estimate the standing crop and species composition of fishes in reservoirs stocked with walleye.
4. Vegetation cover - to categorize the major vegetation types in reservoirs stocked with walleye.
5. Age and growth - to compare growth of walleye in reservoirs of different physicochemical characteristics.
6. Young of the year walleye survival - to determine growth of young of the year walleye and other age groups of walleye in the reservoir.
7. Physicochemical - to monitor physicochemical characteristics which may contribute to the success of walleye introductions.

Equipment and procedures used to conduct fisheries management surveys were also used to obtain the above information. Frame netting, electroshocking, and cove rotenone sampling were also used. Frame nets (4-foot by 6-foot frames with 1-inch mesh and a 40-foot lead) were set in March and April to determine walleye growth. Supplemental information was obtained with an electroshocking boat equipped with a McCullough Model 3000 (110/220 volt A/C, 3,000 watt) generator. Physicochemical and seining data were acquired on Lakes Belton and Waco. Seining collections were also made on Lake Stillhouse Hollow. Notes were made on vegetation types and abundance on all three lakes. In addition to the water profile analyses mentioned for management surveys, quarterly tests were run by the regional chemist to determine concentrations of nitrates, phosphates, and total dissolved solids; sulfates were run by project personnel.

A species checklist was prepared for Lakes Belton, Stillhouse Hollow, Waco and Proctor (Table 1). Scientific and common names are from Special Publication No. 6, A List of Common and Scientific Names of Fishes from the United States and Canada (Third Edition), a publication of the American Fisheries Society.

Regulatory hearings attended by project personnel are listed in Table 2. Changes in fish harvest regulations affecting Region 2-C were:

1. A change in the flathead catfish daily bag limit from twenty-five (25) to five (5) and possession limit from fifty (50) to ten (10).
2. Prohibiting the removal of game fish eggs from public waters.
3. Removal of the 10-inch minimum size on largemouth, smallmouth and spotted black bass.
4. Adding coho salmon and kamloops trout to the list of trout which have a daily bag limit of five (5) and possession limit of ten (10).
5. Prohibiting the use of "any hand-operated device under water designed to snag fish, commonly called (noodling) poles or gaffs other than the ones permitted under Article 4050 C-1 of the revised civil statute."
6. Requiring any net used in the public waters by sports fishermen to be identified by a legible tag constructed of a material as durable as the net, bearing the name and address of the fisherman and the date it was set out.

The proposed changes, along with tape recordings of each hearing, were reviewed by the Texas Parks and Wildlife Commission. The Statewide Hunting, Fishing and Trapping Proclamation No. A-2, 1974-75, was approved on April 29, 1974.

Three coves, totaling 5 acres, were selected to be rotenoned on Lake Belton to estimate the standing crop. The area of each cove was measured using a plane table. Depth soundings were recorded to determine the volume and average depth of each cove. Block-off nets (3/4-inch pogy net) were stretched across

the cove and floated above the surface on the afternoon preceding treatment. At approximately 10:00 P. M., the net was lowered to block the mouth of the cove. Electroshocking, seining, and frame netting were implemented to capture approximately 100 fish and tagging. The fish were measured, tagged with a Floy tagging gun, and put into the cove to determine the recovery rate. At approximately 8:00 A. M., 5% liquid rotenone was applied at a concentration sufficient to cause a total kill. Fish were picked up on the day of application and on the following day. All tagged fish returns were separated by species and inch class during both fish recovery days. Inch classes were designated as follows: inch group I, 0-1.49 inches; inch class II, 1.49-2.5 inches; inch class III, 2.49-3.5 inches; etc. All recoveries were separated by species and inch classes, counted and bulk weighed. On the second day, numbers of fish in each inch class were recorded, but no weights were taken. Data from each cove were later compiled and standing crop was calculated.

Lake Belton (Bell County), initially stocked with walleye in 1973, received and additional 327,000 fry in 1974. Walleye were introduced in Lake Waco (McLennan County) with the stocking of 138,000 fry. Lake Stillhouse Hollow (Bell County) received initial stockings of both walleye and smallmouth bass. An estimated 150,000 walleye fry were stocked with about 20% mortality. Approximately 100,000 smallmouth bass were stocked with 50% mortality. Lake Whitney (Hill and Bosque counties), originally stocked with striped bass in 1973, received supplemental stockings of 230,000 fingerlings this year. Two-inch fingerling northern pike were stocked in Brelsford Lake (Eastland County), Lake Tucker (Palo Pinto County), Cleburne State Park Lake (Johnson County), and Marlin City Lake (Falls County). Stocking mortalities were at less than 5%.

Management recommendations were prepared for all U. S. Corps of Engineers reservoirs in Region 2-C. The five year management plan included proposals on Lakes Whitney, Waco, Belton, Stillhouse Hollow, Hords Creek and Proctor.

Project members attended a meeting for the investigation and evaluation of fish and wildlife resources of the Big Creek Watershed (Limestone, Falls and McLennan counties). The meeting included Texas Parks and Wildlife Department fisheries and wildlife biologists, U. S. Soil Conservation Service personnel, and Bureau of Sports Fisheries and Wildlife personnel. The group conducted cursory field investigations and contributed to a preliminary report describing the existing fish and wildlife habitat and estimating the possible impacts of pending flood control proposals.

Fishery management and walleye evaluation data were combined to determine management needs. Information on vegetation types and abundance were compiled and are presented in Table 3. Survey results are discussed below under the heading of each lake visited.

Lake Belton

Belton Reservoir lies within Bell County and is supplied by the Leon River. It was impounded in 1954 and its level was raised in 1973 to increase its area to 12,300 acres. It is a deep, clear, oligotrophic lake, and most of its 136

mile shoreline is bordered by steep rock bluffs. The lake has several large, shallow, sand and gravel beaches, and rock rip-rap is present along the earth-fill dam.

All work done on the lake was associated with walleye evaluation surveys or with a lake categorization study (Job 10). Locations of sampling stations and cove rotenone sites are shown in Figure 1.

A total of 24 gill nets were set in April, May and September. A high catch per unit of effort was noted for numbers of gizzard shad, river carpsucker, longnose gar, and white bass (Table 4). The catch per unit of effort (by weight) was dominated by longnose gar, smallmouth buffalo, river carpsucker, and carp. Channel catfish and white bass were well represented in the net catches. Other native game fish, captured in smaller numbers, included spotted bass, flathead catfish and white crappie. Three walleye were taken in April and May which ranged from 0.8 pounds to 1.1 pounds, and one was taken in September which weighed 1.0 pounds.

Frame netting results (Table 5) show the catch per unit of effort of bluegills, gray redhorse, and white bass was high. Gray redhorse numbers were also high in the electroshocking catch (Table 6). By weight, gray redhorse, gizzard shad, white bass, and carp dominated the sample.

Seining surveys were done each month from April through September. A total of 24 species was taken during the year and seining was productive at all stations (Table 7). Good numbers of forage species such as threadfin shad, spottail shiners, and Mississippi silversides were collected. The following game fishes were taken during seining activities: spotted bass, largemouth bass, channel catfish, flathead catfish, and white bass.

Three coves (totaling 5 acres) were rotenoned to estimate the standing crop. Based on the return on tagged fishes, a 62% recovery was calculated. The unadjusted standing crop for the lake was 2,840.50 fish per acre; by weight, the standing crop was 250.69 pounds per acre. Estimates of standing crop by individual species can be found in Table 8. Two walleye were recovered during rotenone pickups, but both were outside the cove barriers. The fish weighed approximately 1.5 pounds each; their total lengths were 400mm and 405mm. Both fish were from the 1973 stocking, as was verified by scale readings.

Monthly water analyses results from lower and mid-lake stations are shown in Tables 9 through 12. Thermal stratification occurred in August and September; however, definite limits of a thermocline could not be established. Test results were similar for both sampling sites and no problems were observed during the segment.

Lake Stillhouse Hollow

Stillhouse Hollow Reservoir (Bell County) was impounded in 1968 and is supplied by the Lampasas River. It covers 6,430 acres and has 58 miles of shoreline. The lower portion of the lake is bordered by steep rock bluffs and rock rip-rap lines the dam. The upper portion of the lake is rocky with several

shallow sandy beaches. Walleye and smallmouth bass were introduced into the lake in 1974. Other important game species are channel catfish, flathead catfish, largemouth bass, spotted bass, white bass, and white crappie.

Seining surveys were carried out in June, August and September. Figure 2 shows locations of sampling sites. No walleye were recovered and only one smallmouth bass was recaptured during the year (Table 13). The catch per unit of effort was relatively low for most species. Mississippi silverside were abundant and far outnumbered other fishes; 77% of this species were taken at station 8 on the upper end of the lake. Potamogeton sp., Chara sp., and Najas sp. became abundant during summer months as the lake's water level dropped. Due to the re-filling of the lake, these species were not found at any seining stations during the September survey.

Lake Waco

Lake Waco, impounded in 1929, is located on the Bosque River in McLennan County. The construction of a new dam was completed in 1965, increasing the lake area to 7,270 acres. Most of the 60 mile shoreline consists of rapidly sloping sand and clay beaches. A high rate of sedimentation has been observed since impoundment causing high turbidity in this shallow reservoir. Dominant game fish are flathead catfish and white crappie. Walleye were introduced in 1974. Since no recoveries have been made since the stocking, no information has been obtained to indicate growth rates or survival.

A fishery management survey was conducted in May, and supplemental data were acquired from seining and water sampling conducted according to walleye evaluation procedures. Figure 3 shows locations of sampling sites.

Gill net catches were dominated by gizzard shad, smallmouth buffalo, and river carpsucker (Table 14). Small numbers of channel catfish, flathead catfish, white bass, white crappie, black crappie, largemouth bass, and spotted bass were netted. White crappie (by number) and flathead catfish (by weight) were the most abundant game fishes taken.

Three seining surveys (May, July and September) were conducted during the segment. The catch per unit of effort was low for most species but adequate forage numbers were indicated for the lake (Table 15). Large numbers of threadfin shad, red shiners, and juvenile gizzard shad were taken. Game fishes collected included flathead catfish, channel catfish, largemouth bass, spotted bass, and white crappie.

Water profile data was acquired from March through September and is presented in Tables 16 through 19. No water samples were taken in August due to time required to accomplish field activities on other reservoirs. Turbidity was high most of the year. Nitrate concentrations were higher than those found on other reservoirs worked this segment. Other readings were considered normal. No thermocline was established during the sampling period.

Lake Proctor

This 4,610 acre lake was impounded in 1963 and is located in Comanche County. It is supplied by the Leon River and is relatively shallow and turbid. Most of the 38 mile shoreline is gradually sloping sand or clay with a sparse distribution of aquatic vegetation.

A fishery management survey was conducted in April; locating of sampling sites can be found in Figure 4. Five gill nets were set for one night at each station. The number per net of gizzard shad and river carpsucker was high, as was the weight per net of river carpsucker and smallmouth buffalo (Table 20). The total number and weight of white crappie was higher than for other game fishes.

Red shiners were caught in good numbers at most seining stations (Table 21). Young of the year gizzard shad were also well represented in the catch. Two yearling largemouth bass and two adult white crappie were the only game fish seined.

Water profile analyses showed high turbidity, specific conductivity, and settleable solids; other readings were similar to those found on other lakes. Water analyses data is given in Table 22.

III. Significant Deviation:

There was no significant deviation from outlined segment objectives.

IV. Conclusions, Evaluations, and Recommendations:

A five year management plan was prepared for the U. S. Corps of Engineers. Management recommendations were made for the following waters: Lake Proctor (Comanche County), Lake Waco (McLennan County), Lake Whitney (Hill and Bosque counties), Lake Stillhouse Hollow (Bell County), Lake Belton (Bell County), and Lake Hords Creek (Coleman County). Past survey data, physical and descriptive data, and public access information were used to determine management needs. The following techniques were suggested according to the needs of each reservoir:

1. Fishing docks - to be provided to improve public access to good fishing grounds.
2. Heated fishing docks - to provide improved access and protection to the fisherman during the winter months.
3. Fishing information - to provide information such as productive fishing areas and methods of taking game fish to improve angler success.
4. Fish attractors - to install brush shelters in order to increase food production for forage and game fishes and to concentrate fishes for angler harvest.
5. Reservoir stabilization - to maintain the conservation level of the reservoir and thereby provide predator fish with increased spawning habitat, increased nursery area for fry, and improved survival of young of the year fishes.
6. Winter drawdown - to concentrate forage for predator game fishes.
7. Tailwater improvement - to maintain stable water levels in tailwaters to provide maximum habitat for game species.

8. Nursery ponds - to construct ponds close to the margin of the lake for use in rearing forage species for stocking in the reservoir.
9. Creel census - to design and conduct creel census in order to evaluate applied management practices and to determine future management needs.

Table 23 denotes which of the above management practices were recommended on each U. S. Corps of Engineers reservoir.

Lake Stillhouse Hollow was initially stocked with walleye and smallmouth bass in 1974. Additional stockings should be made to provide year classes of these species until natural reproduction occurs. It is therefore recommended that the lake be stocked with 65,000 (10/acre) smallmouth bass (3-inch) and 129,000 (20/acre) walleye fry in 1975. It is also recommended that 32,000 threadfin shad be introduced into the lake to provide another forage species for predator game fish populations.

Lake Waco, stocked with walleye in 1974, should receive a supplemental stocking of 73,000 (10/acre) walleye fry in 1975. This will provide another year class in the lake and improve the chances of establishing a reproducing population. It is also recommended that white bass/striped bass hybrids be stocked at a rate of 10/acre in June, 1975, if the fish are available. This would provide another sports fish for the lake and provide more effective utilization of forage species.

Lake Whitney, which has received two years of stockings of striped bass, should be stocked again in 1975. Approximately 235,500 (10/acre) 2-inch striped bass should be stocked to provide another age class in the lake, and to aid in the establishment of a reproducing population in the Brazos River system.

Lake Brownwood (Brown County), which was impounded in 1933, is a shallow, turbid reservoir with a large rough fish population. Fishing pressure is high while fishing success has declined during recent years. In order to improve species diversity, provide more effective utilization of forage, and provide another species for the sports fisherman, the introduction of 80,000 (10/acre) of 2-inch Florida bass is recommended in 1975.

Fishery management work will be continued under Project F-30 during the next segment.

V. Cost: \$ 38,900.00

VI. Prepared by: Kenneth K. Sellers
Assistant Project Leader

Date: November 18, 1974

Robert L. Bounds
Region 2 Inland Fisheries
Director

Approved by: David L. Pritchard
Dingell-Johnson Coordinator

Table 1. A combined species checklist from four reservoirs sampled in 1974.

Scientific Name	Common Name	Stillhouse			
		Hollow	Belton	Proctor	Waco
<u>Lepisosteus oculatus</u>	Spotted gar		X		X
<u>Lepisosteus osseus</u>	Longnose gar		X		X
<u>Dorosoma petenense</u>	Threadfin shad		X		X
<u>Dorosoma cepedianum</u>	Gizzard shad	X	X	X	X
<u>Ictiobus bubalus</u>	Smallmouth buffalo		X	X	X
<u>Carpiodes carpio</u>	River carpsucker		X	X	X
<u>Moxostoma congestum</u>	Gray redbhorse		X		
<u>Cyprinus carpio</u>	Carp		X	X	X
<u>Notemigonus crysoleucas</u>	Golden shiner	X	X	X	
<u>Notropis amabilis</u>	Texas shiner		X		
<u>Notropis venustus</u>	Blacktail shiner	X	X		X
<u>Notropis lutrensis</u>	Red shiner	X	X	X	X
<u>Pimephales vigilax</u>	Bullhead minnow	X	X	X	X
<u>Ictalurus punctatus</u>	Channel catfish		X	X	X
<u>Ictalurus melas</u>	Black bullhead		X	X	
<u>Ictalurus natalis</u>	Yellow bullhead		X		
<u>Pylodictis olivaris</u>	Flathead catfish		X	X	X
<u>Noturus gyrinus</u>	Tadpole madtom		X		
<u>Fundulus notatus</u>	Blackstripe minnow		X		
<u>Fundulus olivaceus</u>	Blackspotted topminnow				X
<u>Gambusia affinis</u>	Mosquitofish	X	X		X
<u>Menidia audens</u>	Mississippi silverside	X			X
<u>Labidesthes sicculus</u>	Brook silverside				X
<u>Morone chrysops</u>	White bass		X		X
<u>Micropterus dolomieu</u>	Smallmouth bass	X			
<u>Micropterus punctulatus</u>	Spotted bass	X	X		X
<u>Micropterus salmoides</u>	Largemouth bass	X	X	X	X
<u>Lepomis gulosus</u>	Warmouth		X		X
<u>Lepomis cyanellus</u>	Green sunfish	X	X		
<u>Lepomis symmetricus</u>	Bantam sunfish			X	
<u>Lepomis microlophus</u>	Redear sunfish		X		X
<u>Lepomis macrochirus</u>	Bluegill	X	X	X	X
<u>Lepomis megalotis</u>	Longear sunfish	X	X	X	X
<u>Pomoxis annularis</u>	White crappie	X	X	X	X
<u>Pomoxis nigromaculatus</u>	Black crappie		X		X
<u>Stizostedion vitreum</u>	Walleye		X		
<u>Percina caprodes</u>	Logperch		X	X	X
<u>Etheostoma spectabile</u>	Orangethroat darter		X		
<u>Aplodinotus grunniens</u>	Freshwater drum		X	X	X

Table 2. Regulatory hearings attended by F-6 personnel during 1974.

Possum Kingdom Regulatory District

Date	Location	County
3-25-74	Meridian	Bosque
3-25-74	Hamilton	Hamilton
3-25-74	Stephenville	Erath
3-25-74	Brownwood	Brown
3-25-74	Coleman	Coleman
3-25-74	Baird	Callahan
3-26-74	Glen Rose	Somervell
3-26-74	Granbury	Hood
3-26-74	Cleburne	Johnson
3-26-74	Albany	Shackelford
3-26-74	Breckenridge	Stephens
3-26-74	Palo Pinto	Palo Pinto
3-27-74	Waco	McLennan
3-27-74	Hillsboro	Hill
3-27-74	Eastland	Eastland
3-27-74	Comanche	Comanche
3-27-74	Goldwaite	Mills

Table 3. Types and relative abundance of aquatic vegetation in reservoirs surveyed in 1974.

Vegetation type	Relative abundance*			
	Lake Belton	Lake Stillhouse Hollow	Lake Waco	Lake Proctor
Filamentous algae	Sparse	Sparse	Sparse	
<u>Chara sp.</u>	Common	Sparse		
<u>Salix sp.</u>	Sparse		Common	Sparse
<u>Eleocharis sp.</u>	Common			Sparse
<u>Scirpus sp.</u>	Common			Common
<u>Typha sp.</u>		Sparse		
<u>Juncus sp.</u>		Sparse		Common
<u>Potamogeton sp.</u>		Common		
<u>Najas sp.</u>		Common		
<u>Hypercium sp.</u>			Common	

* Abundance described as sparse, common or abundant.

Table 4. Lake Belton gill netting results, 1974.

Species	Number	Weight (lbs.)	Average Weight (lbs.)	Number/ Net*	Weight/ Net** (lbs.)
<u>Lepisosteus oculatus</u>	4	6.18	1.54	0.17	0.26
<u>Lepisosteus osseus</u>	62	199.89	3.22	2.58	8.33
<u>Dorosoma cepedianum</u>	144	40.73	0.35	4.75	1.70
<u>Ictiobus bubalus</u>	19	218.88	11.52	0.79	9.12
<u>Carpionodes carpio</u>	59	176.25	2.98	2.45	7.34
<u>Moxostoma congestum</u>	19	43.24	2.27	0.79	1.80
<u>Cyprinus carpio</u>	10	78.49	7.84	0.42	3.27
<u>Ictalurus punctatus</u>	32	76.51	2.39	1.33	3.19
<u>Pylodictis olivaris</u>	3	13.58	4.52	0.12	0.57
<u>Morone chrysops</u>	53	62.65	1.18	2.21	2.61
<u>Micropterus punctulatus</u>	20	12.24	0.61	0.83	0.51
<u>Micropterus salmoides</u>	12	9.20	0.76	0.50	0.38
<u>Lepomis cyanellus</u>	2	0.23	0.11	0.08	0.01
<u>Lepomis microlophus</u>	3	0.90	0.30	0.13	0.04
<u>Lepomis macrochirus</u>	50	9.35	0.18	2.08	0.39
<u>Lepomis megalotis</u>	5	0.62	0.12	0.21	0.03
<u>Pomoxis annularis</u>	6	3.90	0.65	0.25	0.16
<u>Stizostedion vitreum</u>	4	3.80	0.70	0.17	0.16
<u>Aplodinotus grunniens</u>	9	8.63	0.95	0.38	0.36
Total	486	965.27			

* Number of fish caught per 150-foot standard experimental gill net (based on 24 nets set one night each).

** Weight of fish caught per 150-foot standard experimental gill net (based on 24 nets set one night each).

Table 5. A summary of Lake Belton frame net data from March and April surveys, 1974.

<u>Species</u>	<u>Number</u>	<u>Weight (lbs.)</u>	<u>Average Weight (lbs.)</u>	<u>Number/ Net*</u>	<u>Weight/ Net** (lbs.)</u>
<u>Lepisosteus osseus</u>	2	4.50	2.25	0.22	0.50
<u>Dorosoma cepedianum</u>	1	0.19	0.19	0.11	0.02
<u>Moxostoma congestum</u>	15	30.38	2.03	1.67	3.38
<u>Morone chrysops</u>	18	18.18	1.03	2.00	2.06
<u>Micropterus salmoides</u>	8	1.98	0.25	0.89	0.22
<u>Lepomis cyanellus</u>	6	1.25	0.21	0.67	0.14
<u>Lepomis microlophus</u>	8	2.41	0.30	0.89	0.27
<u>Lepomis macrochirus</u>	138	21.43	0.16	15.33	2.38
<u>Lepomis megalotis</u>	15	1.85	0.12	1.67	0.21
<u>Pomoxis annularis</u>	13	4.38	0.34	1.44	0.49
Total	224	86.95			

* Number of fish captured per frame net (based on nine nets set one night each).

** Weight of fish captured per frame net (based on nine nets set one night each).

Table 6. A summary of Lake Belton electroshocking data collected in March, 1974.

<u>Species</u>	<u>Number</u>	<u>Weight (lbs.)</u>	<u>Average Weight* (lbs.)</u>	<u>Number/ hour*</u>	<u>Weight/ hour** (lbs.)</u>
<u>Lepisosteus oculatus</u>	1	0.82	0.82	0.50	0.41
<u>Dorosoma cepedianum</u>	6	21.25	3.54	3.00	10.63
<u>Moxostoma congestum</u>	18	35.75	1.99	9.00	17.88
<u>Cyprinus carpio</u>	1	13.32	13.32	0.50	6.66
<u>Morone chrysops</u>	8	18.94	2.37	4.00	9.47
<u>Micropterus punctulatus</u>	8	3.44	0.43	4.00	1.72
<u>Micropterus salmoides</u>	4	1.94	0.49	2.00	0.97
<u>Lepomis cyanellus</u>	5	0.88	0.18	2.50	0.44
<u>Lepomis macrochirus</u>	14	1.00	0.07	7.00	0.50
<u>Lepomis megalotis</u>	7	0.63	0.09	3.50	0.32
Total	72	97.97			

* Number of fish captured in one hour of actual shocking time.

** Weight of fish captured in one hour of actual shocking time.

Table 7. A summary of Lake Belton seining results, 1974.

Species	Station								Total	* Catch/ 50 feet	
	1	2	3	4	5	6	7	8			
Dorosoma petenense			11		102					113	2.35
Dorosoma cepedianum		1	1	1			1	1		5	0.10
Ictiobus bubalus								1		1	0.02
Cyprinus carpio		1								1	0.02
Notemigonus chrysoleucas	15	12	6		1	17	4	1		56	1.17
Notropis amabilis					1					1	0.02
Notropis venustus	8	44	46	22	12	19	107	47		305	6.35
Notropis lutrensis	8		13	7	10	4		8		50	1.04
Pimephales vigilax	1		3	1	2			37		44	0.92
Ictalurus punctatus	1	8	3		2	1		16		31	0.65
Pylodictis olivaris		2								2	0.04
Noturus gyrinus		3								3	0.06
Gambusia affinis		1						2		3	0.06
Menidia audens	44	48	36	204	82	85	102	253		854	17.79
Morone chrysops			1	1						2	0.04
Micropterus punctulatus		5	5		4	3	6			23	0.48
Micropterus salmoides	6	15	4	2		6	1	12		46	0.96
Lepomis cyanellus	3	2	1			6	2	4		18	0.38
Lepomis punctatus	2		4							6	0.13
Lepomis microlophus	4	15	8		2		2	14		45	0.94
Lepomis macrochirus	31	214	55	3	2	39	17	96		457	9.52
Lepomis megalotis	13	2	16	2	7	4	43	3		90	1.88
Percina caprodes	1	1	5	1		1	3	1		13	0.27
Etheostoma spectabile		1	1							2	0.04
Total**	137	375	219	244	227	185	288	496			

*Total= number of each species captured in 2,400 feet of seining.
 **Total= number of fish captured in six surveys totaling 300 feet of seining at each station.

Table 8. The observed standing crop of Lake Belton, by species; September, 1974.

Species		No./acre	Lbs./acre	Species		No./acre	Lbs./acre
<u>Lepisosteus</u>	<u>oculatus</u>	2.95	3.37	<u>Fundulus</u>	<u>notatus</u>	0.67	0.01
<u>Lepisosteus</u>	<u>osseus</u>	0.34	2.38	<u>Morone</u>	<u>chrysops</u>	1.27	0.51
<u>Dorosoma</u>	<u>petenense</u>	76.25	0.35	<u>Micropterus</u>	<u>punctulatus</u>	26.66	0.94
<u>Dorosoma</u>	<u>cepedianum</u>	59.29	16.52	<u>Micropterus</u>	<u>salmoides</u>	76.41	37.49
<u>Ictiobus</u>	<u>bubalus</u>	14.05	62.91	<u>Lepomis</u>	<u>gulosus</u>	125.16	1.35
<u>Carpionodes</u>	<u>carpio</u>	3.23	6.74	<u>Lepomis</u>	<u>cyanelus</u>	594.55	5.13
<u>Moxostoma</u>	<u>congestum</u>	3.14	5.10	<u>Lepomis</u>	<u>microlophus</u>	177.34	3.58
<u>Cyprinus</u>	<u>carpio</u>	2.00	16.43	<u>Lepomis</u>	<u>macrochirus</u>	1,185.67	64.77
<u>Pimephales</u>	<u>vigilax</u>	44.09	0.17	<u>Lepomis</u>	<u>megalotis</u>	289.70	4.26
<u>Ictalurus</u>	<u>punctatus</u>	40.79	10.79	<u>Pomoxis</u>	<u>annularis</u>	36.96	4.34
<u>Ictalurus</u>	<u>melas</u>	4.28	0.10	<u>Pomoxis</u>	<u>nigromaculatus</u>	0.19	0.09
<u>Ictalurus</u>	<u>natalis</u>	2.24	0.24	<u>Percina</u>	<u>caprodes</u>	36.88	0.38
<u>Pylodictis</u>	<u>olivaris</u>	1.26	0.08	<u>Aplodinotus</u>	<u>grunniens</u>	3.30	2.54
<u>Noturus</u>	<u>gyrinus</u>	31.83	0.12				
Totals						2,840.50	250.69

Table 9. Monthly temperature and oxygen profiles from the lower sampling station on Lake Belton in 1974.

Depth (m)	JAN 22		FEB 19		MAR 21		APR 23		MAY 28		JUNE 19		JULY 23		AUG 22		SEPT 29		
	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂									
5	12.0	11.1	12.5	10.2	17.0	9.6	20.0	10.0	26.0	9.2	26.0	8.6	30.0	8.6	29.0	6.9	23.5	6.4	6.4
1	12.0	11.1	12.5	10.8	16.0	9.2	20.0	9.8	26.0	8.9	26.0	8.4	30.0	8.5	29.0	8.0	23.0	6.4	6.4
2	12.0	11.0	12.0	10.8	16.0	9.2	20.0	9.7	26.0	8.9	26.0	8.5	29.0	8.6	28.0	6.7	23.0	6.4	6.4
3	11.5	11.1	12.0	10.8	16.0	9.2	20.0	9.8	25.5	8.8	26.0	8.5	29.0	8.6	28.0	6.6	23.0	6.3	6.3
4	11.5	11.0	12.0	10.8	16.5	9.2	20.0	9.7	25.0	8.4	26.0	8.5	28.0	8.6	28.0	6.5	23.0	6.2	6.2
5	11.5	10.9	12.0	10.6	16.0	9.2	20.0	9.8	24.0	8.0	26.0	8.3	28.0	8.3	28.0	6.5	23.0	6.2	6.2
6	11.0	10.9	12.0	10.6	16.0	9.2	19.5	9.9	23.5	7.5	26.0	8.1	27.5	7.9	27.0	6.3	23.0	6.2	6.2
7	11.0	10.8	12.0	10.6	16.0	9.2	19.0	9.8	23.0	7.2	25.5	7.2	27.0	7.6	27.0	6.1	23.0	6.2	6.2
8	11.0	10.7	12.0	10.4	15.0	9.2	19.5	9.8	22.5	6.4	25.5	6.8	27.0	6.5	26.0	2.5	23.0	6.2	6.2
9	11.0	10.5	12.0	10.4	15.0	9.2	19.0	9.8	22.0	6.1	25.5	7.4	26.5	5.0	26.0	2.4	23.0	6.2	6.2
10	11.5	10.4	12.0	10.4	15.0	9.2	19.0	9.8	21.0	5.6	25.0	6.1	26.0	3.5	25.0	2.1	23.0	6.4	6.4
11	11.0	10.4	12.0	10.2	15.0	9.2	18.5	9.4	20.5	5.8	24.0	5.4	25.5	1.9	24.0	2.1	23.0	6.6	6.6
12	11.5	10.2	12.5	10.2	15.0	9.4	18.5	9.2	19.5	5.6	22.0	3.6	24.5	1.2	23.0	1.5	23.0	6.6	6.6
13	11.0	10.3	12.0	10.0	15.0	9.2	18.0	9.0	19.5	5.2	21.0	3.6	22.0	0.7	22.0	0.4	23.0	6.6	6.6
14	11.0	10.2	12.5	10.0	15.0	9.4	17.0	8.2	19.0	5.4	20.0	3.9	21.0	0.8	21.0	0.5	22.5	6.7	6.7
15	11.0	10.1	12.0	10.2	15.0	9.6	17.0	7.8	21.0	6.6	23.5	7.5	20.0	0.8	20.0	0.5	22.5	6.8	6.8
16	11.0	10.1	12.0	10.4	15.0	9.0	16.5	7.6	17.5	5.1	23.5	7.5	19.0	0.8	19.5	0.5	22.5	6.8	6.8
17	11.0	10.1	12.0	10.2	15.0	9.0	16.0	7.6	17.5	5.0	18.5	3.8	18.5	0.8	19.0	0.5	22.0	6.8	6.8
18	11.0	10.2	12.0	10.2	15.0	9.4	16.0	7.7	16.5	4.7	18.5	3.7	18.5	0.8	18.0	0.5	21.5	2.0	2.0
19	11.0	10.2	12.5	10.0	15.0	9.4	15.0	6.9	16.5	4.7	18.0	3.7	18.0	0.6	17.5	0.5	18.5	1.1	1.1
20	11.0	10.2	12.0	10.0	13.0	9.2	15.0	6.8	16.0	4.7	18.0	3.4	17.5	0.6	17.5	0.4	18.0	1.4	1.4
21	12.0	10.6	12.0	10.0	13.0	8.9	15.0	6.6	19.0	6.3	17.5	3.7	17.1	0.5	17.0	0.4	18.0	1.6	1.6
22	11.5	9.8	12.0	10.2	12.0	8.2	15.0	6.2	19.0	6.3	17.0	3.3	17.0	0.5	18.0	0.5	17.0	0.7	0.7
23	12.0	10.2	12.0	10.2	13.0	8.8	14.5	6.0	15.5	3.2	21.0	6.2	17.0	0.5	18.0	0.7	17.0	0.8	0.8
24	11.0	9.9	11.5	10.6	12.5	8.8	14.0	6.4	16.0	3.3	21.0	6.3	17.0	0.5	17.0	0.6	17.0	0.8	0.8
25	11.0	10.1	12.0	10.4	12.5	9.0	14.5	5.6	16.0	3.3	17.0	1.9	17.0	0.5	17.0	0.6	17.0	0.8	0.8
26			11.5	10.6	12.0	8.8	15.0	5.7	17.0	3.5		18.0	0.5		17.0	0.6	17.0	0.8	0.8

Table 10. Physicochemical profile data collected from the lower sampling station on Lake Belton in 1966.

Month	Sample	pH	Turbidity (ftu)	Specific conductivity (micromhos 25°C)	Total alkalinity (mg/l)	Total dissolved solids (mg/l)	Sul- fates (mg/l)	Nit- rates (mg/l)	Phos- phates (mg/l)	Settle- able solids (ml/l)	Secchi (m)
JAN 22	S*	8.0	10	300	140	224				< 0.1	
	M	8.2	10	310	160	216				< 0.1	2.9
	B	8.1	< 10	330	150	251				< 0.1	
FEB 19	S	7.9	< 10	335	165	274				< 0.1	
	M	7.8	< 10	320	165	290				< 0.1	2.7
	B	7.7	< 10	340	155	252				< 0.1	
MAR 21	S	8.1	< 10	275	150	209				< 0.1	
	M	8.3	< 10	275	150	217				< 0.1	3.7
	B	7.8	15	265	145	225				< 0.1	
APR 23	S	7.2	< 10	345	155	274	17	0.6650	0.00654	< 0.1	
	M	7.1	< 10	340	150	278	17	0.8650	0.01630	< 0.1	3.9
	B	7.1	10	340	140	342	19	1.6000	0.02280	< 0.1	
MAY 28	S	7.1	< 10	392	150	191				< 0.1	
	M	6.8	< 10	432	155	266				< 0.1	2.3
	B	6.2	10	456	135	252				< 0.1	
JUN 19	S	7.1	< 10	392	135	212				< 0.1	
	M	6.2	< 10	404	140	246				< 0.1	3.1
	B	6.1	25	403	150	232				0.6	
JUL 23	S	6.9	< 10	370	130	381	15	0.0890	0.00650	< 0.1	
	M	6.3	< 10	402	140	396	14	0.2220	0.00650	< 0.1	2.6
	B	6.3	< 10	402	145	398	15	0.4000	0.00650	< 0.1	
AUG 22	S	6.7	< 10	373	120	225				< 0.1	
	M	6.4	< 10	403	145	229				< 0.1	1.9
	B	6.2	< 10	402	145	217				< 0.1	
SEP 29	S	6.4	< 10	352	130	170	12			< 0.1	
	M	6.7	< 10	354	130	185	12			< 0.1	2.1
	B	6.2	< 10	399	160	224	13			< 0.1	

* Symbols: S = Surface of profile
M = Middle of profile
B = Bottom of profile

Table 11. Monthly temperature and oxygen profiles from the mid-lake sampling station on Belton Reservoir, 1974.

Depth (m)	JAN 22		FEB 19		MAR 21		APR 23		MAY 28		JUNE 19		JULY 23		AUG 22		SEPT 29		
	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂									
5	11.5	10.8	11.5	9.5	16.0	10.2	20.0	9.6	26.0	10.6	26.5	8.6	31.0	8.3	29.0	7.8	22.5	6.9	6.9
1	13.0	10.8	12.0	9.6	16.0	9.5	20.0	9.6	26.0	8.6	26.5	8.6	29.5	8.3	29.5	7.8	22.5	6.9	6.9
2	12.5	11.0	12.0	9.6	16.0	9.5	20.0	9.7	26.0	8.6	26.5	8.6	29.0	8.3	29.0	8.0	22.5	6.9	6.9
3	12.0	11.0	12.0	9.5	16.0	9.6	20.0	9.6	26.0	8.6	26.5	8.6	29.0	8.3	29.0	8.0	22.5	6.9	6.9
4	11.5	11.0	12.0	9.4	16.0	9.5	20.0	9.6	26.0	8.3	26.5	8.6	29.0	8.3	28.5	7.9	22.5	6.9	6.9
5	11.5	11.1	12.0	9.4	16.0	9.7	20.0	9.5	26.0	8.5	26.0	8.6	28.0	8.2	28.0	7.3	22.5	6.9	6.9
6	11.5	11.0	11.5	9.6	16.0	9.4	19.5	9.6	25.5	8.5	26.0	8.5	28.0	8.0	28.0	7.2	22.5	6.9	6.9
7	11.5	11.0	11.5	9.6	16.5	9.4	20.0	9.4	25.0	8.4	26.0	8.5	28.0	7.6	28.0	6.2	22.5	6.9	6.9
8	11.5	10.9	12.0	9.5	16.0	9.6	19.0	9.4	23.5	7.3	26.0	8.4	27.0	6.8	27.5	6.0	22.5	6.9	6.9
9	11.5	10.8	11.5	9.8	16.0	9.6	19.5	9.4	23.0	6.2	26.0	8.1	27.0	7.5	27.0	2.7	22.5	6.9	6.9
10	11.5	10.8	11.5	9.9	16.0	9.5	18.0	8.8	21.0	5.4	25.0	7.1	26.0	3.6	26.5	2.0	22.5	6.9	6.9
11	11.0	10.9	11.5	9.9	16.0	9.6	18.0	8.8	23.0	6.8	23.5	4.4	25.5	0.1	26.0	1.3	22.0	6.9	6.9
12	11.0	10.9	11.5	9.8	15.5	9.6	18.0	8.4	17.0	4.2	22.0	3.3	24.5	0.4	25.0	0.6	22.0	6.9	6.9
13	11.0	10.7	11.5	9.8	15.5	9.8	18.0	8.0	23.5	8.1	21.5	2.5	23.0	0.4	22.5	0.5	22.0	6.9	6.9
14	11.0	10.7	11.5	9.8	15.5	9.5	18.0	8.7	19.0	4.4	20.0	1.9	21.0	0.4	21.0	0.6	22.0	6.9	6.9
15	11.0	10.6	11.5	9.8	13.5	9.2	17.5	7.7	21.0	5.0	19.5	1.7	20.0	0.4	20.0	0.5	22.0	6.9	6.9
16	10.5	10.5	11.5	9.8	12.5	9.1	17.0	7.6	25.5	8.2	19.5	1.5	19.0	0.5	19.0	0.5	22.0	6.8	6.8
17	10.5	10.4	11.5	9.8	12.5	9.1	16.5	6.6	18.0	3.0	18.0	1.3	18.5	0.5	19.0	0.6	22.0	6.6	6.6
18	10.0	10.4	11.5	9.8	12.5	8.9	17.0	7.3	17.0	2.0	19.5	2.1	18.0	0.8	18.0	0.6	19.0	1.7	1.7
19	10.0	10.2	11.5	9.6	12.5	8.8	16.5	6.8	20.5	5.2	19.0	1.1	18.0	0.8	17.5	0.6	17.5	1.6	1.6
20	10.0	10.2	11.5	9.6	12.5	8.8	16.0	6.2	17.0	1.8	17.5	1.3	18.0	0.8	17.5	0.7	17.5	1.0	1.0
21	10.0	10.2	11.5	9.8	12.5	8.9	16.0	5.4	18.0	2.8	17.5	1.4	17.5	0.7	17.5	0.8	17.5	1.0	1.0
22	10.0	10.0	11.5	9.7	12.5	8.8	16.0	5.4	20.5	4.7	17.5	1.1	17.5	0.8	18.0	0.9	17.5	1.2	1.2
23	10.0	10.0	11.5	9.6	12.5	8.8	16.5	6.7	19.0	4.3	16.5	1.0	17.0	0.8	17.5	0.6	17.5	1.1	1.1
24	10.0	10.0	11.5	9.7	12.5	8.8	15.0	4.6	18.5	4.0	18.5	1.0	17.0	0.9	18.0	0.7	17.0	1.1	1.1
25	10.0	10.0	11.5	9.6	12.0	8.8	15.0	4.8	16.0	1.0			18.0	0.9	19.5	0.8	17.5	1.2	1.2
26	10.0	10.0	11.5	9.8	12.5	8.9	15.0	5.0	17.0	0.4			19.0	0.8			17.0	1.0	1.0

Table 12. Physicochemical profile data collected from the mid-lake sampling station on Lake Belton in 1974.

Date	Symbol	pH	Turbidity (ftu)	Specific conductivity (micromhos 25C°)	Total alkalinity (mg/l)	Total		Sul- fates (mg/l)	Nit- rates (mg/l)	Phos- phates (mg/l)	Settle able solids (ml/l)	Secchi (m)			
						dissolved solids (mg/l)	solids (mg/l)								
JAN 22	S*	8.3	20	285	160	258					<0.1	3.3			
	M	8.1	10	280	140	245					<0.1				
	B	8.2	10	225	140	239					<0.1				
FEB 19	S	8.2	<10	320	165	238					<0.1	2.7			
	M	8.1	<10	325	165	246					<0.1				
	B	7.8	<10	340	165	272					<0.1				
MAR 21	S	8.2	<10	280	140	180					<0.1	3.8			
	M	8.0	<10	280	160	193					<0.1				
	B	7.9	20	285	145	207					<0.1				
APR 23	S	7.2	<10	385	140	277					18	0.6210	0.00978	<0.1	3.5
	M	7.1	<10	340	150	272					18	0.6650	0.00326	<0.1	
	B	7.1	<10	330	150	315					18	1.1100	0.00228	<0.1	
MAY 28	S	6.9	<10	392	130	268						<0.1	2.2		
	M	6.7	<10	400	155	251						<0.1			
	B	6.2	<10	456	165	292						<0.1			
JUN. 19	S	7.2	<10	374	130	229						<0.1	2.6		
	M	6.2	<10	397	140	219						<0.1			
	B	6.0	<10	390	150	262						<0.1			
JUL 23	S	6.8	<10	370	130	353					15	0.0443	0.01300	<0.1	3.0
	M	6.2	<10	416	140	347					15	0.2220	0.01960	<0.1	
	B	6.2	<10	422	150	449					13	0.2660	0.01300	<0.1	
AUG 22	S	6.7	<10	360	125	218						<0.1	1.8		
	M	6.2	<10	398	180	252						<0.1			
	B	6.2	10	418	160	263						<0.1			
SEP 29	S	6.7	<10	341	140	194					13	<0.1	1.7		
	M	6.8	<10	333	140	172					12	<0.1			
	B	6.2	<10	398	170	216					11	0.1			

* Symbols: S= Surface of profile
M= Middle of profile
B= Bottom of profile

Table 13. A summary of seining surveys on Lake Stillhouse Hollow, 1974.

Species	Station								* Total	Catch/ 50 feet	
	1	2	3	4	5	6	7	8			
<i>Dorosoma cepedianum</i>						3				3	0.13
<i>Notemigonus crysoleucas</i>								1		1	0.04
<i>Notropis venustus</i>	4	2	2	5	4	1	5			23	1.00
<i>Notropis lutrensis</i>							2	2		4	0.17
<i>Pimephales vigilax</i>			1				1	7		9	0.39
<i>Gambusia affinis</i>								1		1	0.04
<i>Menidia audens</i>		22	4	6	2	1	2	121		158	6.86
<i>Micropterus dolomieu</i>			1							1	0.04
<i>Micropterus punctulatus</i>				3			3	4		10	0.43
<i>Micropterus salmoides</i>	2	6		2				4		14	0.60
<i>Lepomis cyanellus</i>				1			1			2	0.08
<i>Lepomis macrochirus</i>	8	2			6	5	6	20		47	2.04
<i>Lepomis megalotis</i>	7						6			13	0.56
<i>Pomoxis annularis</i>					1					1	0.04
Total**	21	32	8	17	13	10	26	160			

*Total= number of each species captured in 1150 feet of seining.

**Total= number of fish captured in 3 surveys, totaling 600 feet of seining at each station (a total of 550 feet were seined at station 6 which was inaccessible during the September sampling effort).

Table 14. A summary of gill netting efforts on Lake Waco in May, 1974.

<u>Species</u>	<u>Number</u>	<u>Weight (lbs.)</u>	<u>Average Weight (lbs.)</u>	<u>Number/ Net*</u>	<u>Weight/ Net** (lbs.)</u>
<u>Lepisosteus oculatus</u>	7	31.63	4.52	0.70	3.16
<u>Lepisosteus osseus</u>	3	4.13	1.38	0.30	0.41
<u>Dorosoma cepedianum</u>	119	65.01	0.55	11.90	6.50
<u>Ictiobus bubalus</u>	25	137.20	5.49	2.50	13.72
<u>Carpiodes carpio</u>	58	140.46	2.42	5.80	14.05
<u>Cyprinus carpio</u>	5	26.76	5.35	0.50	2.68
<u>Ictalurus punctatus</u>	18	14.18	0.79	1.80	1.42
<u>Pylodictis olivaris</u>	8	43.19	5.40	0.80	4.32
<u>Morone chrysops</u>	10	6.10	0.61	1.00	0.61
<u>Micropterus punctulatus</u>	1	0.59	0.59	0.10	0.06
<u>Micropterus salmoides</u>	1	0.72	0.72	0.10	0.07
<u>Lepomis macrochirus</u>	3	0.29	0.10	0.30	0.03
<u>Pomoxis annularis</u>	30	15.18	0.51	3.00	1.52
<u>Pomoxis nigromaculatus</u>	1	0.90	0.47	0.10	0.09
<u>Aplodinotus grunniens</u>	59	27.76	0.47	5.90	2.78
Total	348	514.10			

* Number of fish caught per 150-foot standard experimental gill net (based on 10 nets set one night each).

** Weight of fish caught per 150-foot standard experimental gill net (based on 10 nets set one night each).

Table 15. A summary of Lake Waco seining results, 1974.

Species	Station							Total*	Catch/ 50 feet
	1	2	3	4	5	6	7		
<u>Dorosoma petenense</u>	17	1	28	51	644	79	3	823	39.19
<u>Dorosoma cepedianum</u>	24	4	99	34	8	232	1	402	19.14
<u>Ictiobus bubalus</u>				1				1	0.04
<u>Notropis venustus</u>	1	1			6	12		20	0.95
<u>Notropis lutrensis</u>	6	17	25	10	11	65	16	150	7.14
<u>Pimephales vigilax</u>	3	7	3	17	3	1	1	35	1.66
<u>Ictalurus punctatus</u>		1						1	0.04
<u>Pylodictis olivaris</u>	1							1	0.04
<u>Fundulus olivaceus</u>							1	1	0.04
<u>Gambusia affinis</u>						4	2	6	0.28
<u>Menidia audens</u>							1	1	0.04
<u>Labidesthes sicculus</u>			1	1		1		3	0.14
<u>Micropterus punctulatus</u>				1				1	0.04
<u>Micropterus salmoides</u>	1					4	1	6	0.28
<u>Lepomis gulosus</u>	1							1	0.04
<u>Lepomis microlophus</u>		1						1	0.04
<u>Lepomis macrochirus</u>			4	1		1	1	7	0.33
<u>Lepomis megalotis</u>	5	2	2	1	2			12	0.57
<u>Pomoxis annularis</u>	2						1	3	0.14
<u>Percina caprodes</u>	1							1	0.04
Total**	62	34	162	117	674	399	28		

*Total = number of each species captured in 1050 feet of seining.

**Total = number of fish captured in three surveys totaling 150 feet of seining at each station.

Table 16. Monthly temperature and oxygen profiles from the mid-lake sampling station on Lake Co, 1974.

Depth (m)	MAR 28		APR 30		MAY 14		JUNE 21		JULY 22		AUG		SEPT 19	
	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂
5	16.0	10.0	22.0	8.9	23.5	7.8	27.5	7.0	30.0	8.0			25.0	7.9
1	16.0	10.0	22.0	8.6	23.5	7.9	28.0	6.8	30.0	8.0			25.0	7.8
2	16.0	10.0	21.0	8.3	23.5	7.9	27.5	6.8	28.5	6.2			25.0	7.8
3	16.0	9.9	21.0	8.2	23.5	7.8	27.0	6.6	28.0	5.6			25.0	7.4
4	16.0	9.2	21.0	8.2	23.5	7.8	27.0	6.7	28.0	4.9			24.0	7.1
5	16.0	9.1	21.0	7.9	23.5	7.7	27.0	6.5	28.0	3.5			24.0	6.8
6			21.0	7.9	23.5	7.6	27.0	6.2	28.0	1.8			25.0	6.0
7					23.5	7.6	27.0	6.0					24.5	5.0
8													24.0	5.1

Table 17. Physicochemical profile data collected from the mid-lake sampling station on Lake Waco in 1974.

	PH	Turbidity (ITU)	Specific conductivity (micromhos 25C°)	Total alkalinity (mg/l)	Total dissolved solids (mg/l)	Sul- fates (mg/l)	Nit- rates (mg/l)	Phos- phates (mg/l)	Settle- able solids (ml/l)	Secchi (m)
MAR 28	S*	7.7	45	135	231				< 0.1	0.4
	M	7.8	45	150	222				< 0.1	
	B	7.5	80	335	225				< 0.1	
APR 30	S	7.2	35	145	315	25	1.9950	0.05220	< 0.1	0.3
	M	7.1	30	140	317	25	2.3000	0.05860	< 0.1	
	B	7.0	60	270	309	25	2.0400	0.06520	< 0.1	
MAY 14	S	6.9	10	130	179		2.3000	0.03580	< 0.1	0.3
	M	6.7	10	130	227		1.9450	0.04240	< 0.1	
	B	6.7	10	326	204		2.2300	0.05550	< 0.1	
JUN 21	S	6.5	25	130	99			0.03580	< 0.1	0.2
	M	6.5	25	135	121			0.05380	< 0.3	
	B	6.5	45	356	131			0.19400	< 0.1	
JUL 22	S	< 10	289	115	280	15	0.9330		< 0.1	0.5
	M	< 10	312	115	241	16	1.1100		< 0.1	
	B	< 10	312	120	161	18	1.7750		< 0.1	
AUG	S									
	M									
	B									
SEP 19	S	6.7	< 10	120	198				< 0.1	0.3
	M	6.8	< 10	120	186				< 0.1	
	B		10	200	155				< 0.1	

* Symbols: S=Surface of profile
M=Middle of profile
B=Bottom of profile

Table 18. Monthly temperature and oxygen files from the lower sampling station on Lake We 1974.

Depth (m)	MAR 28		APR 30		MAY 14		JUNE 21		JULY 22		AUG		SEPT 19	
	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂	C°	O ₂
S	17.0	10.0	23.0	9.3	26.0	7.9	29.5	8.4	32.0	7.9			25.5	7.8
1	17.5	9.9	22.0	8.7	26.0	7.9	29.0	8.4	31.0	8.2			25.5	7.7
2	17.5	9.8	22.0	8.4	26.0	7.8	29.0	8.4	29.0	6.6			25.0	7.7
3	17.5	9.8	21.5	8.5	25.0	7.8	29.0	8.1	29.0	5.4				7.4
4	17.5	9.8	21.5	8.5	25.0	7.7	28.0	6.9	28.0	5.9				7.4
5	17.5	9.8	21.5	8.4	25.0	7.7	28.0	6.4	28.0	5.4				7.2
6	17.5	9.7	21.5	8.3	24.5	7.6	27.5	6.3	28.0	5.3			24.5	7.0
7	17.0	9.1	21.0	8.4	24.5	7.6	27.5	5.8	28.0	1.8			24.0	5.0
8	17.0	9.5	21.0	8.2	24.5	7.6	27.5	4.6	27.5	1.8				4.4
9			21.0	8.0	24.5	7.6	27.5	4.7	28.0	1.6				4.6
10			21.0	8.0	24.5	7.6	27.0	3.8	28.0	1.4			23.5	4.6
11			21.0	7.7	24.5	6.9	27.0	2.5	28.0	0.8			23.5	4.7
12			21.0	7.7									24.0	4.8
13													24.0	4.4

Table 19. Physicochemical profile data collected from the lower sampling station on Lake Waco, 1974.

		pH	Turbidity (ftu)	Specific conductivity (micromhos 25C°)	Total alkalinity (mg/l)	Total dissolved solids (mg/l)	Sul- fates (mg/l)	Nit- rates (mg/l)	Phos- phates (mg/l)	Settle- able solids (ml/l)	Secchi (m)
MAR 28	S	7.6	30	320	150	225				<0.1	0.5
	M	7.6	30	325	145	221				<0.1	
	B	7.5	35	340	155	220				<0.1	
APR 30	S	7.4	25	265	135	336	20	1.4200	0.03920	<0.1	0.4
	M	7.4	30	270	140	317	25	1.6850	0.04560	<0.1	
	B	7.1	110	270	150	315	40	2.2600	0.06520	<0.1	
MAY 14	S	7.1	<10	318	140	195		0.9950	0.04240	<0.1	0.4
	M	7.1	<10	320	140	191		1.7250	0.03580	<0.1	
	B	7.2	10	320	140	198		1.6800	0.07160	0.3	
JUN 21	S	7.2	10	338	120	145			0.01960	<0.1	0.6
	M	6.5	10	338	125	138			0.02930	<0.1	
	B		80	356	130	171			0.11400	0.3	
JUL 22	S		<10	289	115	172	17	0.4000	0.01960	<0.1	0.8
	M		<10	464	115	185	16	0.0933	0.02930	<0.1	
	B		<10	312	130	180	50	1.7300	0.11400	<0.1	
AUG	S										
	M										
	B										
SEP 19	S	6.6	<10	267	110	195	15			<0.1	0.5
	M		<10	222	110	186	8			<0.1	
	B		<10	192	110	148	9			0.1	

* Symbols: S = Surface of profile
M = Middle of profile
B = Bottom of profile

Table 20. Lake Proctor gill netting results, April, 1974.

Species	Number	Weight (lbs.)	Average Weight (lbs.)	Number/ Net*	Weight/ Net** (lbs.)
<u>Dorosoma cepedianum</u>	33	7.60	0.23	6.60	1.52
<u>Ictiobus bubalus</u>	18	96.32	5.36	3.60	19.27
<u>Carpionodes carpio</u>	49	77.37	1.58	9.80	15.48
<u>Cyprinus carpio</u>	6	8.45	1.41	1.20	1.69
<u>Ictalurus punctatus</u>	2	2.57	1.28	0.40	0.52
<u>Ictalurus melas</u>	1	0.20	0.20	0.20	0.04
<u>Pylodictis olivaris</u>	2	6.50	3.25	0.40	1.30
<u>Micropterus salmoides</u>	2	4.26	2.13	0.40	0.86
<u>Lepomis macrochirus</u>	14	1.33	0.10	2.80	0.27
<u>Lepomis megalotis</u>	1	0.10	0.10	0.20	0.02
<u>Pomoxis annularis</u>	28	11.33	0.41	5.60	2.27
<u>Aplodinotus grunniens</u>	15	51.02	3.41	3.00	10.21
Total	171	267.05			

* Number of fish caught per 150-foot standard experimental gill net
(based on 5 nets set one night each).

** Weight of fish caught per 150-foot standard experimental gill net
(based on 5 nets set one night each).

Table 21. Lake Proctor seining results, 1974.

Species	Station					Total*	Catch/ 50 feet
	1	2	3	4	5		
<u>Dorosoma cepedianum</u>	26	1			26	53	5.3
<u>Notemigonus chrysoleucas</u>			1		4	5	0.5
<u>Notropis lutrensis</u>	18	7	35	95	209	364	36.4
<u>Pimephales vigilax</u>	1	5		10		16	1.6
<u>Micropterus salmoides</u>			1	1		2	0.2
<u>Lepomis symmetricus</u>	2					2	0.2
<u>Lepomis macrochirus</u>			3	3	1	7	0.7
<u>Pomoxis annularis</u>					2	2	0.2
<u>Percina caprodes</u>	1	3			2	6	0.6
Total**	48	16	40	109	244	457	

*Total= number of each species captured in 500 feet of seining.

**Total= number of fish captured in 100 feet of seining at each station.

Table 22. Lake Proctor water analyses results, 1974.

Depth (meters)	T ^o C	D.O (mg/l)	pH	Turbidity (jtu)	Specific conductivity (micromhos 25C ^o)	Total alkalinity (mg/l)	Settleable solids (ml/l)
surface	16	10.6	7.4	20	732	130	2.0
1	16	10.5					
2	16	10.5					
3	16	10.6					
4	16	10.4	7.3	20	720	130	1.5
5	16	10.5					
6	16	10.0					
7	16	10.0					
8	16	10.0	7.2	30	528	140	1.5

Table 23. Management recommendations proposed for U. S. Corps of Engineers reservoirs in Region 2-C in 1974.

Reservoir	Recommended Management Practice										
	Fishing docks	Heated fishing docks	Fishing information	Creel census	Tailwater improvement	Reservoir stabilization	Winter drawdown	Fish attractors	Nursery ponds		
Lake Belton (Bell Co.)	X	X	X	X		X	X	X			
Lake Stillhouse Hollow (Bell Co.)	X		X	X	X	X	X	X	X	X	
Lake Whitney (Bosque and Hill Cos.)	X	X	X	X	X	X	X	X			
Lake Waco (McLennan Co.)	X		X	X		X	X	X			
Lake Proctor (Comanche Co.)	X	X	X	X		X	X	X			
Lake Hords Creek (Coleman Co.)	X	X	X	X		X	X	X			

FIGURE 1.

LAKE BELTON

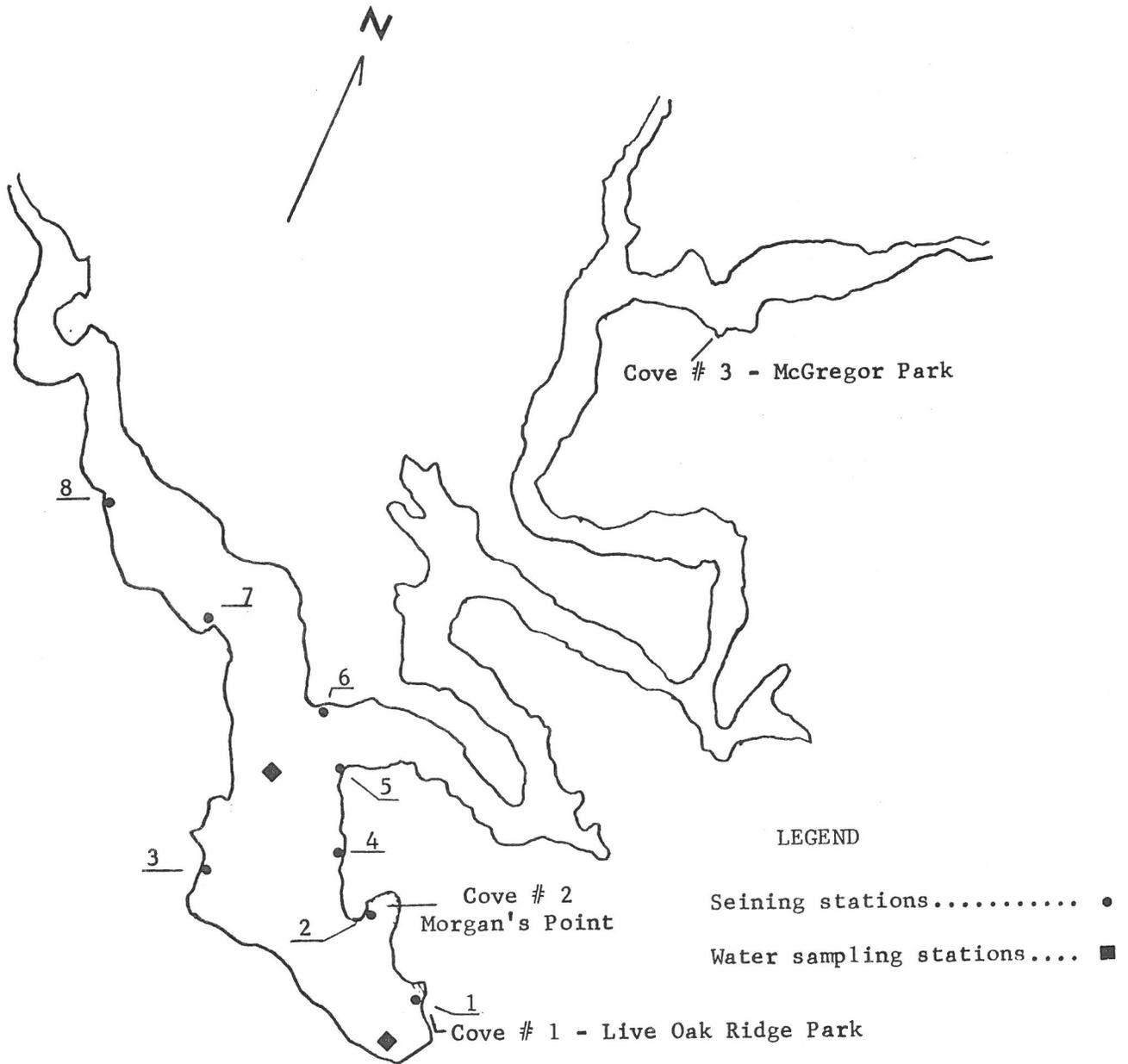
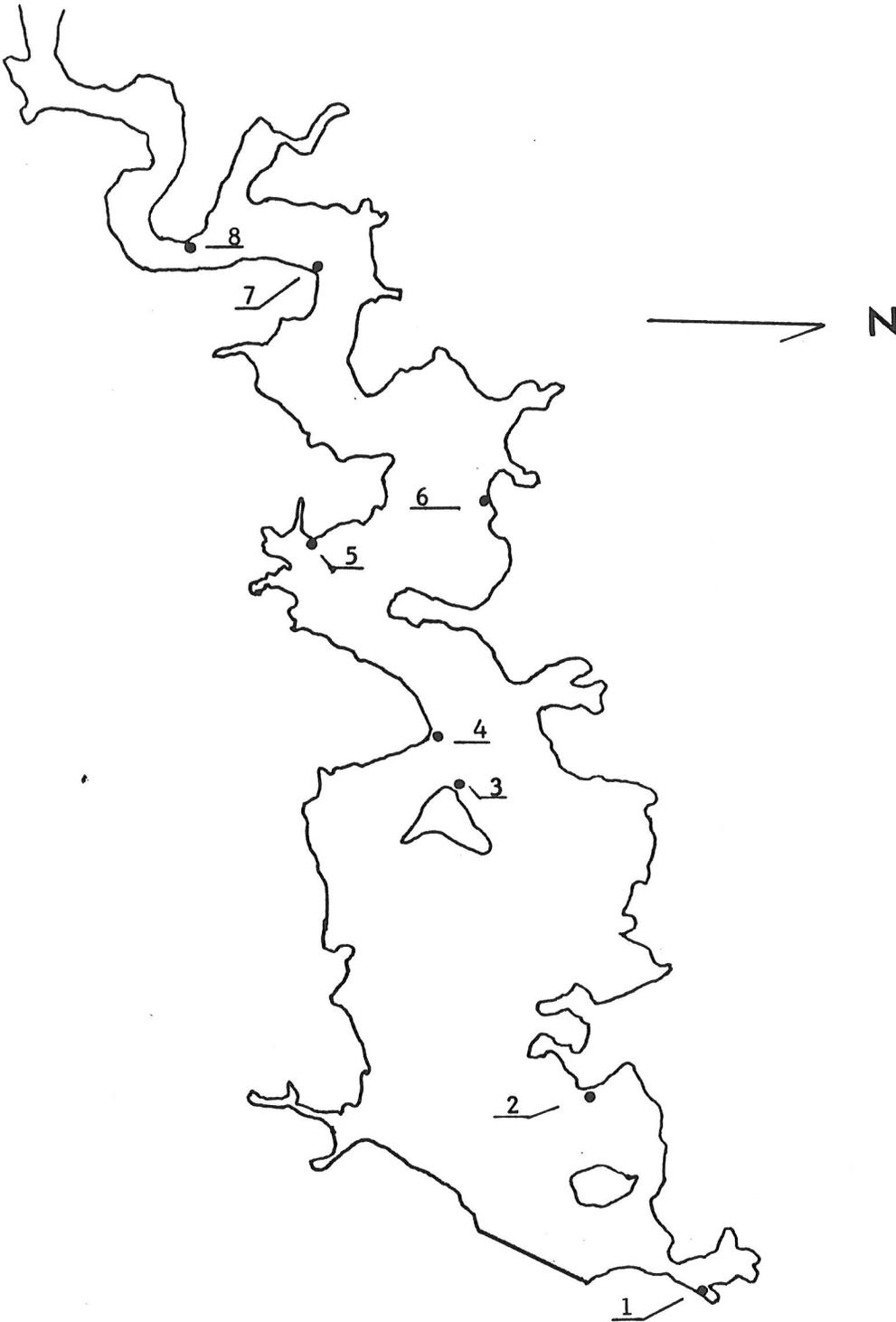


FIGURE 2.

STILLHOUSE HOLLOW



LEGEND

Seining stations.... •

FIGURE 3.

LAKE WACO

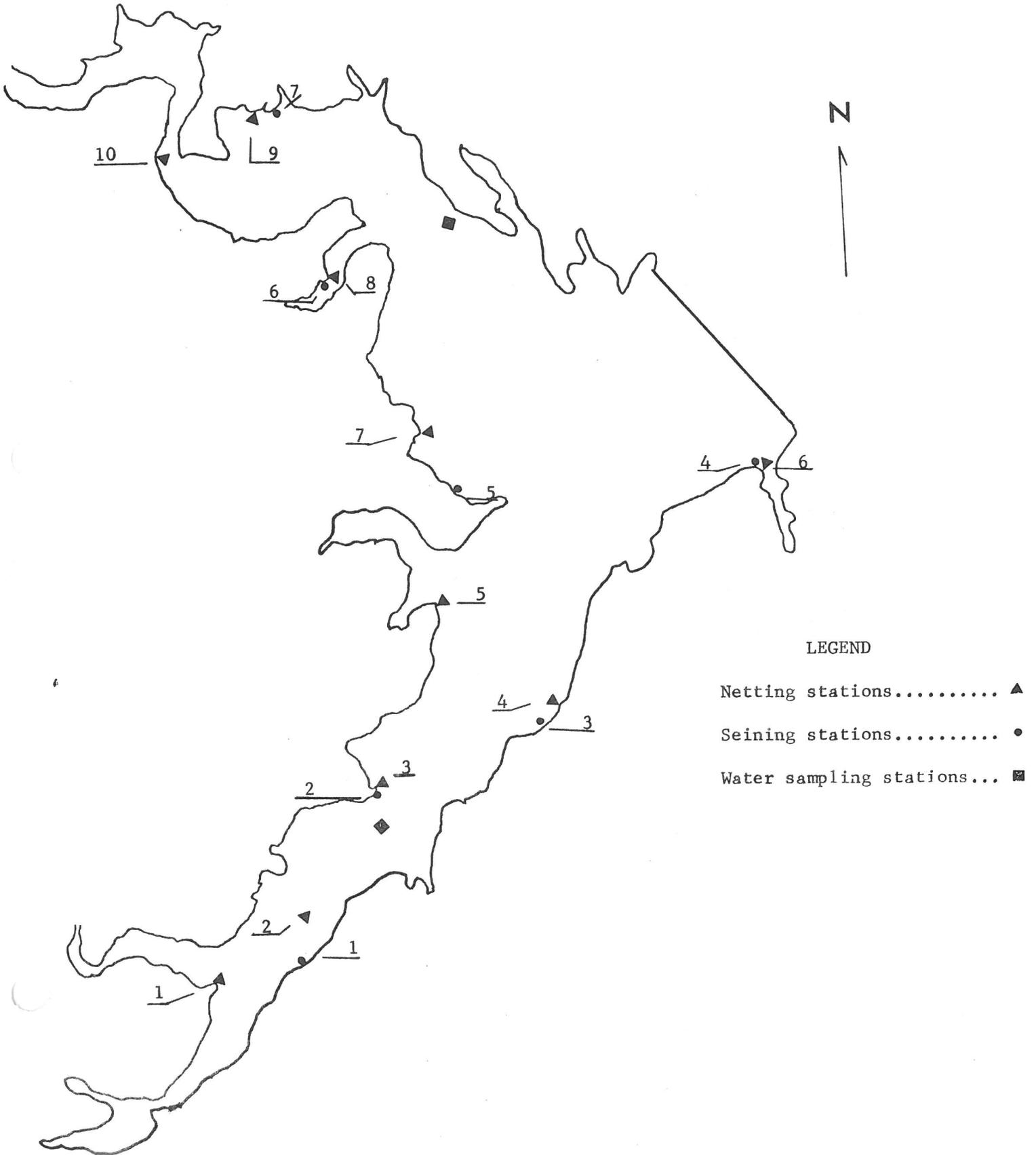


FIGURE 4.

LAKE PROCTOR



LEGEND

- Netting stations..... ▲
- Seining stations..... ●
- Water sampling stations.... ■