

PERFORMANCE REPORT

As Required By

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project F-6-R-21

Region 2-C Fisheries Studies

Objective 9: Fisheries Management
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ABSTRACT

Annual fisheries management surveys are necessary for obtaining data whereby management needs are identified and techniques selected. Lake Whitney (Bosque and Hill counties), Lake Brownwood (Brown County), Lake Granbury (Hood County), Lake Creek (McLennan County), and Lake Stillhouse Hollow (Bell County) were surveyed. Survey results were compiled and tabulated for assessing management needs. Harvest limits and means and methods, as set forth in the Regulatory Authority Proclamation, were reviewed and amended according to management survey findings. A single incident of pollution, affecting the Nolan River, was investigated and was attributed to an oil line breakage. Stockings of predator and/or forage species are recommended for Lakes Whitney, Waco, and Stillhouse Hollow.

PERFORMANCE REPORT

State: Texas Project Number: F-6-R-21
Project Title: Fisheries Investigations - Region 2-C
Project Section: Research and Surveys
Study Title: Fisheries Management
Contract Period: From January 1, 1973 To December 31, 1973
Program Narrative Objective No.: 9 Objective: To situate fisheries management practices in waters of Region 2-C.

I. Segment Objectives:

1. To recommend fish harvest regulations to the Texas Parks and Wildlife Commission.
2. To recommend stocking ratios for newly constructed or renovated waters having established fish populations but insufficient reproduction.
3. To recommend control of overabundant rough and/or game fish species.
4. To 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:

Biologists and game wardens met in February to formulate changes in fish harvest regulations. Proposed changes were presented to the public at hearings in each county under regulatory authority. Tape recordings of each hearing were submitted to the Texas Parks and Wildlife Commission for consideration before the changed regulatory proclamation was approved. Hearings attended by Project F-6-R personnel are shown in Table 1.

No existing public reservoirs were renovated by Project F-6-R, and no public reservoirs were constructed during the segment. Data pertaining to objectives 2 through 6 were obtained from spring and fall fisheries management surveys. Semi-annual surveys were conducted on Lake Creek (McLennan County), Lake Whitney (Bosque and Hill counties), Lake Brownwood (Brown County), Lake Granbury (Hood County), and Lake Stillhouse Hollow (Bell County). In addition to these surveys, marginal seining was implemented on Lake Waco (McLennan County) to assess game fish reproduction, and night seining was conducted on Lake Belton (Bell County) to determine survival and growth of predator game fish introductions.

Permanent netting, seining, and water sampling stations were established on each of the five reservoirs surveyed. The number of sampling stations selected

on each water was based on the size of the impoundment. Lakes of 5,000 surface acres or less had five netting and seining stations and one water sampling station. Lakes from 5,000 to 10,000 surface acres had 10 netting and seining stations and two water sampling stations. Lakes larger than 10,000 surface acres had 15 netting and seining stations and three water sampling stations. Seining areas were in close proximity to netting stations. In some areas, seining was not conducted due to the physical characteristics of the shoreline.

One standard experimental gill net (150 feet long and 8 feet deep with 1-inch to 3½-inch graduated mesh) was set at each netting station over night during each survey. Marginal seining consisted of one 100-foot drag (or two 50-foot drags) at each sampling station using a 26-foot bag seine with ½-inch mesh. A Kemmerer Model 1200 water sampler was used to take profile samples at 10-foot intervals from surface to bottom at each sampling station. A Hach DR-EL Portable Engineers Laboratory was used for analyses of water samples. Dissolved oxygen and water temperatures were measured with a YSI Model 51-A Oxygen-Temperature meter. An electroshocking boat was used on Brownwood and Stillhouse Hollow Reservoirs. The shocking device was equipped with a McCullough Model 300 110/220 volt, 3,000 watt, A/C generator and a Model VVP-3E variable voltage pulsator.

Gill net samples were separated by species, counted, and bulk weighed. Data recorded on popular sports fishes included weight, length, sexual development, stomach contents, and occurrence of parasites. Lengths and weights were recorded on a representative sample of all other fishes captured. Data were compiled in the laboratory to show species composition, relative abundance, average weight, and catch per unit effort of all species netted. In addition, coefficient of condition (K factor) was calculated on species commonly sought by sports fishermen.

Seining collections were separated by station, preserved in 10% formalin, and identified in the laboratory. Catches from gill nets were separated by species, divided into size groups (juvenile, intermediate, and adult), and measured and counted. Catch per unit effort was computed to compare the relative catch of all species by station. Specimens captured during electroshocking operations were weighed, measured, and released. Data were tabulated to show the relative catch during each shocking effort.

Relative abundance of predominant vegetation was noted during each management survey. All water samples were tested for temperature, dissolved oxygen, chlorides, phenolphthalein alkalinity, methyl-orange alkalinity, pH, turbidity, total hardness, and carbon dioxide. Data were tabulated for comparisons of stations, surveys, and lakes. Incidences of pollution or fish die-offs were investigated when requested by the regional chemist. Efforts were made to determine the nature, source, and effects of the pollutant on the fishery involved.

A species checklist (Table 2) shows all species encountered in Region 2-C during the segment. Common and scientific names are in accordance with 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. Abbreviations were assigned to each species in order to conserve space in the data records.

No changes were made in fish harvest regulations affecting Region 2-C; however, for clarification purposes, the following definitions were included in the Statewide Hunting, Fishing and Trapping Proclamation No. A-1, 1973-74:

1. "The term 'trotline' when used in this proclamation includes a sail line or rubber band line and shall be constructed of nonmetallic materials."
2. "For the purpose of this Act a trotline shall be defined as a main fishing line with more than five hooks attached at a minimum interval of three horizontal feet."
3. "For the purpose of this Act a throwline shall be defined as a main fishing line with five or less hooks attached at a minimum of three horizontal feet, with one end permanently attached to a permanent fixture."
4. "For the purpose of this Act a jug line shall be defined as a free floating main fishing line with five or less hooks attached at a minimum of three horizontal feet with the main line tied to a free floating device."

The Proclamation, including additions, was approved by the Texas Parks and Wildlife Commission on April 26, 1973.

Lake Belton was stocked with 360,000 walleye fry on April 30, 1973, and an additional 133,000 fry were stocked on May 10, 1973. Fry ranged from 3/4 inch to 1-inch in size, and stocking mortality was estimated at less than 5%. In an effort to determine survival of the fry after stocking, nighttime seining was implemented on May 22. Twelve 100-foot drags, using a 26-foot bag seine, were made at different locations, but no walleye were captured. The lake was seined again on the night of August 2 and four walleye were caught during 925 feet of seine drags. Two were caught on a submerged concrete boat ramp and two were caught on an old sand and gravel road bed. Stomach analyses revealed that three of the four fish had consumed Mississippi silversides. The specimens ranged from 131 mm. to 170 mm. T.L. On September 16, a walleye (239 mm. T.L.) was caught on hook and line by a local fisherman. Information obtained to date indicates that walleye stocking was successful and that the fish are experiencing rapid growth. Supplemental stockings of this predator game fish species are planned for 1974 and 1975. More extensive sampling techniques will be applied in evaluating this species during future segments.

Marginal seining was conducted at Lake Waco (McLennan County) in May. Eight 100-foot drags were made with a 26-foot bag seine in various parts of the lake. Only four juvenile largemouth bass were captured. Numbers of forage fishes appeared adequate. The most abundant species in the seine catch were blacktail shiners, red shiners, and bullhead minnows.

Assistance was given to the regional chemist in the investigation of an oil spill on the Nolan River (Johnson County) in February, 1973. A break in an AMOCO Oil Company oil line occurred on February 5, 1973, and approximately 11,000 barrels of oil were lost before pumping was stopped. An estimated four river miles were affected by the spill. When the break was discovered, the oil company erected barriers on the river. The oil was pumped into tank trucks and hauled from the site. Due to heavy rains and flooding, a small portion of the oil over-

flowed the barriers and escaped into a few small coves at the upper end of Lake Pat Cleburne. The remaining oil was burned from the surface of the water. A three day fish count was conducted on the area affected by the spill. Dead and dying fishes included 217 catfish, 79 white crappie, 26 minnows (bullhead minnows and golden shiners), 276 sunfish, 15 largemouth bass, and 12 spotted bass. An investigation report was completed by regional chemist Tom Chandler and remedial action was taken by the Environmental Protection Agency which also investigated the incident.

Project personnel met with U. S. Fish and Wildlife Service biologist Glen Stanley and planned public access sites for the proposed Aquilla Creek Reservoir (Hill County). The proposed site was visited and areas were selected for boat ramps and sampling sites. Plans were formulated for clearing of these areas before impoundment.

Fisheries Management Surveys

A comparison of fish species collected in each reservoir during fisheries management surveys are presented in Table 3. Lake characteristics and survey results are discussed below.

Lake Whitney

Lake Whitney is located on the Brazos River in Hill and Bosque counties. The lake was impounded in 1951 and originally covered 15,760 surface acres. The water level was raised 3 feet in 1969 and an additional 10 feet in 1972, which increased the volume of the lake from 379,190 to 627,100 acre-feet. The lake now covers 23,560 surface acres and has approximately 300 miles of shoreline. The southern third of the lake is characteristically deep and almost entirely bordered by solid rock bluffs. A few sandy beaches and areas with inundated grasses and trees are present. Shallow sandy areas are more frequent in the middle portion of the lake; however, rock bluffs dominate most of the margin. Large, relatively shallow coves with sand and gravel banks and vast areas of inundated grasses and trees are present in the northern end of the lake. The reservoir has a history of good white bass and crappie fishing. Since the water level was raised, increased interest in largemouth bass fishing has been observed. Striped bass were stocked in the lake in 1973 and supplemental stockings are scheduled for future years. This introduction provides another predator sports species and adds to the species diversity of the lake.

A total of 30 gill nets were set during sampling surveys and results are presented in Table 4. The number of each species caught at each station during spring and fall surveys is shown in Table 5. The 1973 gill netting catch per unit effort was compared with catch per unit effort from past surveys. A substantial increase in numbers of gizzard shad per net was revealed.

Only two largemouth bass were caught in the gill nets, but a large number of juveniles were captured during spring marginal seining activities. The majority of largemouth bass seined were taken at stations 12, 14, and 15 (Table 6). These stations are located at the north end of the lake (Figure 1) where favorable largemouth bass spawning habitat was abundant during the spring survey.

Physical and vegetative characteristics of these areas are shown in Table 7. Numbers of forage species collected were good during both surveys. Blacktail shiners, red shiners, and Mississippi silversides were abundant and widely distributed in the lake.

Problems with vegetation and public access were not encountered during the segment. Water quality data from all three sampling stations were considered normal for the lake (Table 8). Unusually high turbidity readings were obtained from bottom water samples taken at all stations during the fall survey. These high readings were probably the result of bottom sediment trapped in the sampling device.

Stillhouse Hollow Reservoir

Lake Stillhouse Hollow in Bell County is supplied by water from the Lampasas River. The lake was impounded in 1968 and covers approximately 6,430 surface acres. It has 58 miles of shoreline and a mean depth of 37 feet. High boulders and limestone bluffs line most of the shoreline with occasional small coves and sandy gravel beaches. Sand and silt deposits are found in upper limits of the lake.

Twenty gill nets were set during the year and catches were considered poor at all stations (Table 9). White bass (averaging 1.4 pounds each), channel catfish and largemouth bass were well represented in net returns (Table 10).

A total of 698 fish was collected during marginal seining activities (Table 11). Descriptions of seining stations can be found in Table 12, and a map showing locations is presented in Figure 2. Station 3 could not be seined during the fall survey due to lack of suitable shoreline area. Young-of-the-year largemouth bass were caught in fair numbers. Golden shiners, red shiners, and Mississippi silversides were well represented in the seine sample. During the fall survey, nighttime electroshocking was implemented to supplement netting and seining data. The predominant species captured were gizzard shad, carp, largemouth bass, and bluegill. Results of the shocking effort are given in Table 13. No calculations of catch per unit effort were made due to unfamiliarity of project members with the operation of the shocking unit, and due to a malfunction of the generator.

Analyses of water profiles failed to reveal a thermocline even though some chemical stratification was indicated in the data (Table 14). Water test results were considered normal for the reservoir and no problems were encountered during the segment.

Lake Brownwood

Lake Brownwood (Brown County) was impounded in 1933 and covers 7,300 surface acres. The lake has a volume of 143,400 acre-feet and has approximately 100 miles of shoreline. It is bordered by large rock cliffs with only a few sandy beaches. Shallow coves which are silty and turbid can be found in both arms of the lake (Stations 1 and 10, Figure 3).

The yield from 20 gill nets set during management surveys is shown in Table 15. Good numbers of channel catfish, white crappie, and largemouth bass were netted. Also, 13 flathead catfish, averaging 8.5 pounds, were caught. Netting success at each sampling station is shown in Table 16. Catch per unit effort and species diversity were compared with 1970 survey data and no significant differences were found.

Marginal seining was productive during both the spring and fall surveys. As is shown in Table 17, rapidly sloping rock bluffs prohibited seining at stations 5 and 7. Blacktail shiners, red shiners, bullehead minnows, Mississippi silversides and juvenile gizzard shad were captured in large numbers. A small number of young-of-year largemouth bass were taken at various locations on the lake (Table 18).

Nighttime electroshocking was conducted during the fall survey. Results of electroshocking operations can be found in Table 13. Largemouth bass and channel catfish composed a large majority of the catch. This information supports netting and seining data which also showed a predominance of these fishes.

Thermal stratification was noted at 27 to 34 feet at station 1 during the spring survey. No thermocline was evident in the fall survey data. High turbidity readings were noticed in the fall bottom water sample at station 1 and in the spring bottom water sample at station 2. These high readings were probably due to bottom sediments accidentally trapped in the water sampler. All water analyses results are shown in Table 19.

Lake Granbury

Lake Granbury is located on the Brazos River in Hood County. The lake is long and narrow with approximately 100 miles of shoreline. It covers 8,500 surface acres and has a volume of 153,000 acre-feet. The reservoir is bordered by rock bluffs along its entire length, but shallow beaches, with abundant aquatic vegetation growths, are found in many areas. Inundated trees are common and a silt bottom exists in most shallow areas in the upper end of the lake. Figure 4 is a map showing all netting, seining, and water sampling stations.

A total of 535 fish were caught in the 20 gill nets set during the year (Table 20). The catch per unit effort showed channel catfish to be the predominant game fish in the net yield (Table 21). Marked increases in the catch per unit effort of gizzard shad, smallmouth buffalo, and carp were revealed in a comparison of 1971, 1972, and 1973 netting data.

Marginal seining resulted in catches of young-of-year largemouth bass at all stations during the year (Table 22). The catch per unit effort was boosted by good numbers of threadfin shad, blacktail shiners, red shiners, bullhead minnows, and Mississippi silversides. An extreme increase in vegetation types and abundance was noted at most seining stations during the fall survey in comparison to what was observed during the spring survey (Table 23). These increases were attributed to warm water temperatures and water clarity (Table 24). The abundance of vegetation in these shallow water areas is expected to decrease as a result of winter water temperatures. Thermal stratification was apparent at 35 to 45 feet at station 1 during the spring survey. Water quality appears normal with no unusual conditions observed in the data.

Lake Creek Reservoir

Lake Creek is a 590 surface acre impoundment located in McLennan County. It is used as a cooling reservoir for an electric power plant; therefore, no water is released and water, to compensate for evaporation, is pumped from the nearby Brazos River. Only a small amount of water enters the lake from surface runoff from surrounding terrain. The lake is relatively shallow with a maximum depth of 35 feet and an estimated mean depth of 14.4 feet. Fishing in the lake is allowed only during daylight hours and is open to the general public only on a permit basis.

A total of 266 fish were taken in 10 gill nets set during the year. Table 25 shows the number of fish caught at each station during surveys. The catch per unit effort was favorable and relative abundance of species netted was considered normal for the lake (Table 26).

The seining catch was relatively poor at all stations during both the fall and spring surveys (Table 27). Only three young-of-year largemouth bass were caught during seining activities. Fair numbers of forage fishes were captured; blacktail shiners and Mississippi silversides were relatively abundant and taken at most sampling stations.

Locations of sampling stations are shown in Figure 5 and descriptive information is given in Table 28. Vegetation was sparse at most sampling stations during the spring survey and more abundant during the fall. Water temperatures were slightly higher than those found in other lakes at the same time of year due to the heated effluent from the power plant. Other analyses were considered normal (Table 29).

III. Significant Deviation:

There was no significant deviation from outlined segment objectives.

IV. Conclusions, Evaluations, and Recommendations:

Water levels were increased at Lakes Whitney and Belton in 1972 which resulted in improved bass fishing and renewed public interest in both reservoirs. No departmental creel surveys have been conducted on these reservoirs but fisherman interviews and public opinion, particularly the largemouth bass enthusiast, indicate a marked improvement in the fisheries since water level increases were initiated. Joint coordination of planned water level fluctuation by controlling agencies and the Texas Parks and Wildlife Department is needed to make this a more effective management technique.

Striped bass were introduced into Lake Granbury in 1972 and Lake Whitney in 1973. These lakes exhibit characteristics favorable for reproduction and survival of this species. Introductions were made to increase species diversity, increase utilization of existing forage, and provide fishermen with another sports fish for their creel.

Supplemental stocking of Lake Granbury was implemented in 1973 and additional stockings are recommended for 1974 and 1975 at a rate of 10 fingerlings per surface acre. These stockings should provide adequate year classes until expected reproduction occurs.

Additional stockings are recommended for Lake Whitney annually through 1976. A stocking rate of ten fingerlings per surface acre is recommended. These stockings will establish year classes until predicted reproduction occurs.

Walleye were introduced into Lake Belton in 1973 to improve species diversity and to improve utilization of forage. A stocking rate of ten fingerlings per surface acre should be made in 1974 and 1975 to provide year classes until natural reproduction can occur.

Although no creel surveys have been conducted on Lake Waco, past survey data and fisherman interviews indicate a gradual decline in largemouth bass and white crappie populations. Increasing numbers of gizzard shad were also revealed in netting data. Walleye would provide another species for the sports fisherman and would occupy the niche of a large open water predator capable of utilizing the gizzard shad population. An initial stocking (20 fingerlings per surface acre) is recommended with additional stocking the following two years (ten fingerlings per surface acre). The supplemental stockings should provide adequate year classes until fish from the original releases become sexually mature.

Physical features of Lake Stillhouse Hollow are conducive to both walleye and smallmouth bass. A poor catch per unit effort of all species was noted during fisheries management surveys. In addition, fisherman yields have been low since the lake was impounded in 1968. Introductions of walleye and smallmouth bass are recommended to increase species diversity and to provide two additional game fish species. Hopefully, these species would occupy vacant ecological niches and provide additional utilization of existing forage species. An initial stocking of walleye is recommended at a rate of 20 fingerlings per surface acre. Two years of additional stocking should be implemented (at a rate of 10 fingerlings per surface acre) to provide adequate year classes until reproduction occurs. Smallmouth bass stocking is recommended at a rate of ten fingerlings per surface acre. Supplemental stockings are recommended until individuals of the original stocking are sexually mature.

Introductions of threadfin shad are recommended at a rate of 20 per surface acre. Due to the limited maximum size of adults, these fish would provide forage which could be utilized by a majority of game fish predator species.

V. Costs: Approximately \$22,700.00

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

Date: January 4, 1974

Robert L. Bounds

Region 2 Inland Fisheries Director

Approved by: *David L. Pritchard*

Dingell-Johnson Coordinator

Table 1. Regulatory hearings attended by project personnel during the 1973 segment.

Possum Kingdom Regulatory District

Date	Location	County
3-27-63	Granbury	Hood
3-26-73	Meridian	Bosque
3-27-73	Stephenville	Erath
3-27-73	Comanche	Comanche
3-27-73	Hamilton	Hamilton
3-28-73	Hillsboro	Hill
3-28-73	Brownwood	Brown
3-28-73	Coleman	Coleman
3-29-73	Eastland	Eastland
3-29-73	Baird	Callahan
3-29-73	Cleburne	Johnson
3-29-73	Waco	McLennan
4-02-73	Glen Rose	Somervell
4-02-73	Goldthwaite	Mills

Trinity-Brazos Regulatory District

Date	Location	County
3-26-73	Georgetown	Williamson
3-26-73	Gatesville	Coryell
3-26-73	Belton	Bell
3-27-73	Cameron	Milam
3-27-73	Marlin	Falls

Table 2. Checklist of all fish species encountered during the 1973 segment.

Scientific Name	Common Name	Abbreviation
<u>Lepisosteus oculatus</u>	Spotted gar	SG
<u>Lepisosteus osseus</u>	Longnose gar	LNG
<u>Dorosoma cepedianum</u>	Gizzard shad	GS
<u>Dorosoma petenense</u>	Threadfin shad	TFS
<u>Campostoma anomalum</u>	Stoneroller	SR
<u>Cyprinus carpio</u>	Carp	CRP
<u>Notemigonus crysoleucas</u>	Golden shiner	GDS
<u>Notropis amabilis</u>	Texas shiner	TS
<u>Notropis fumeus</u>	Ribbon shiner	RS
<u>Notropis lutrensis</u>	Red shiner	RDS
<u>Notropis venustus</u>	Blacktail shiner	BTS
<u>Pimephales vigilax</u>	Bullhead minnow	BHM
<u>Carpionodes carpio</u>	River carpsucker	RCS
<u>Ictiobus bubalus</u>	Smallmouth buffalo	SMB
<u>Moxostoma congestum</u>	Grey redhorse	GRH
<u>Ictalurus punctatus</u>	Channel catfish	CCF
<u>Pylodictis olivaris</u>	Flathead catfish	FCF
<u>Strongylura marina</u>	Atlantic needlefish	ANF
<u>Fundulus notatus</u>	Blackstripe topminnow	BST
<u>Gambusia affinis</u>	Mosquitofish	MF
<u>Labidesthes sicculus</u>	Brook silverside	BSS
<u>Menidia audens</u>	Mississippi silverside	MSS
<u>Morone chrysops</u>	White bass	WB
<u>Morone saxatilis</u>	Striped bass	STB
<u>Lepomis auritus</u>	Redbreast sunfish	RBS
<u>Lepomis cyanellus</u>	Green sunfish	GSF
<u>Lepomis gulosus</u>	Warmouth	WAM
<u>Lepomis humilis</u>	Orangespotted sunfish	OSF
<u>Lepomis macrochirus</u>	Bluegill	BG
<u>Lepomis megalotis</u>	Longear sunfish	LES
<u>Lepomis microlophus</u>	Redear sunfish	RES
<u>Micropterus punctulatus</u>	Spotted bass	SB
<u>Micropterus salmoides</u>	Largemouth bass	LMB
<u>Pomoxis annularis</u>	White crappie	WC
<u>Etheostoma gracile</u>	Slough darter	SD
<u>Stizostedion vitreum</u>	Walleye	WP
<u>Percina caprodes</u>	Log perch	LP
<u>Aplodinotus grunniens</u>	Freshwater drum	FWD
<u>Tilapia sp.</u>	Mouthbrooder	TP

Table 3. A comparison of fish species collected in each reservoir surveyed during 1973.

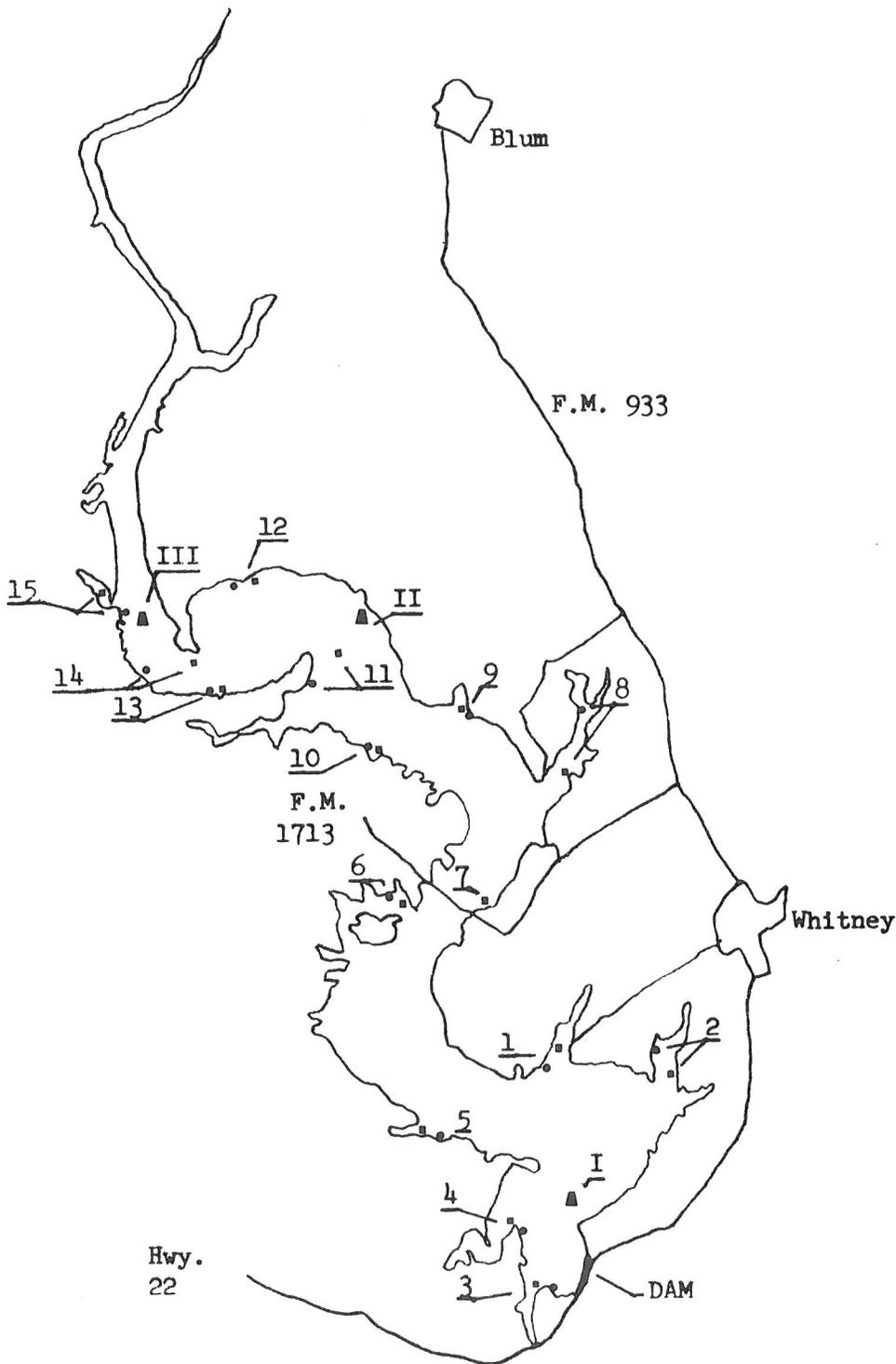
Species	Reservoir				
	Whitney	Brownwood	Stillhouse Hollow	Granbury	Lake Creek
<u>Lepisosteus oculatus</u>		x	x	x	
<u>Lepisosteus osseus</u>	x	x	x	x	x
<u>Dorosoma cepedianum</u>	x	x	x	x	x
<u>Dorosoma petenense</u>	x	x		x	x
<u>Campostoma anomalum</u>	x		x		
<u>Cyprinus carpio</u>	x	x	x	x	x
<u>Notemigonus crysoleucas</u>	x	x	x	x	
<u>Notropis amabilis</u>				x	
<u>Notropis fumeus</u>	x				
<u>Notropis lutrensis</u>	x	x	x	x	x
<u>Notropis venustus</u>	x		x	x	x
<u>Pimephales vigilax</u>	x	x	x	x	x
<u>Carpionodes carpio</u>	x	x	x	x	x
<u>Ictiobus bubalus</u>	x	x	x	x	x
<u>Moxostoma congestum</u>			x		
<u>Ictalurus punctatus</u>	x	x	x	x	x
<u>Pylodictis olivaris</u>	x	x	x	x	x
<u>Strongylura marina</u>					x
<u>Fundulus notatus</u>	x	x	x		
<u>Gambusia affinis</u>	x	x	x	x	
<u>Labidesthes sicculus</u>	x			x	
<u>Menidia audens</u>	x	x	x	x	x
<u>Morone chrysops</u>	x	x	x	x	
<u>Morone saxatilis</u>	*			x	
<u>Lepomis auritus</u>	x				
<u>Lepomis cyanellus</u>	x	x	x	x	x
<u>Lepomis gulosus</u>	x	x			x
<u>Lepomis macrochirus</u>	x	x	x	x	x
<u>Lepomis megalotis</u>	x	x	x	x	x
<u>Lepomis microlophus</u>	x	x	x	x	x
<u>Micropterus punctulatus</u>	x		x	x	x
<u>Micropterus salmoides</u>	x	x	x	x	x
<u>Pomoxis annularis</u>	x	x	x	x	x
<u>Percina caprodes</u>	x	x	x	x	x
<u>Aplodinotus grunniens</u>		x		x	x
<u>Tilapia sp.</u>					x

* None were taken during fisheries management surveys; however, this species was taken from Lake Whitney during other project activities.

FIGURE 1.

LAKE WHITNEY

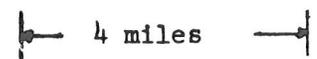
23,560
SURFACE ACRES



LEGEND

- Netting Stations..... ▣
- Seining Stations..... ○
- Water Sample Stations... ▴

SCALE



3/8-inch - approximately 1 mile

Table 4. Summary of 1973 Lake Whitney netting data.

Species	Total No.	Total Wt. (Lbs)	Average Wt. (Lbs)	Average "K"	No./150 ft. of Net	Wt./150 ft. of Net (Lbs)
Longnose gar	118	364.9	3.3	-	3.93	12.16
Gizzard shad	134	79.8	0.6	-	4.47	2.66
Smallmouth buffalo	41	359.0	8.8	-	1.37	11.97
River carpsucker	54	144.6	2.7	-	1.80	4.82
Carp	18	65.7	3.6	-	0.60	2.19
Channel catfish	29	49.8	1.7	1.90	0.97	1.66
Flathead catfish	5	45.5	9.1	1.98	0.17	1.52
White bass	26	23.9	0.9	2.61	0.87	0.80
Spotted bass	1	0.3	0.3	2.22	0.03	0.01
Largemouth bass	2	1.7	0.9	2.48	0.06	0.06
Warmouth	1	0.6	0.6	-	0.03	0.02
Green sunfish	1	0.2	0.2	-	0.03	0.01
Redear sunfish	2	0.6	0.3	-	0.06	0.02
Bluegill sunfish	27	4.9	0.2	-	0.90	0.16
Redbreast sunfish	3	1.3	0.4	-	0.10	0.04
Longear sunfish	6	0.8	0.1	-	0.20	0.03
White crappie	37	17.9	0.5	3.05	1.23	0.60
Freshwater drum	<u>14</u>	<u>6.0</u>	0.4	-	0.47	0.20
Total	519	1167.5				

Table 5. Spring and fall gill netting results by station, from Lake Whitney, 1973.

Sta.	Species																		Total
	LNG	GS	SMB	RCS	CRP	CCF	FCF	WB	LMB	SB	WAM	GSF	BG	LES	RES	RBS	WC	FWD	
1	S		5	1	3		4	1	1							1			16
	F		5		8		3		4				2		2		1		25
2	S		4	1		2		1								1			9
	F	3	6				3	1	3				1				1		20
3	S		2					1										1	4
	F	4	1	4					1	1			2	2			3		18
4	S	4	9		1	1		2	2				1						20
	F	2										2					1		5
5	S	11	4																15
	F	1		3	1	2			1				2				2	1	13
6	S	12	12			2	1						2						29
	F	2	1		5					1							1		10
7	S	6			1	1	3		1			1	4	3		1	2	3	26
	F	1	7		2	1	1		1	1							4		18
8	S	1	1				1						3				1	1	8
	F	1	5	5	3	1	2										1		18
9	S	3	16	2		1							1						23
	F	2	3						1				3						9
10	S	19	3		1	2	1						1					2	29
	F	1	2	4	2		1										3		13
11	S	6	1																7
	F	4					1										1		6
12	S	9	10		4	1					1		1	1			1	2	30
	F	5	5	3	6	3	1		3								1		27
13	S	6	5	3	2		1						1						18
	F	1	2	1	4	1	1		1										11
14	S		2	1	1												4	4	12
	F	3	4	2	4		2		1								2		18
15	S	4	16	6	3		1		2								1		33
	F	7	3	5	3		2		3				1				5		29
																			519

TABLE 7. General descriptions and relative abundance of predominant vegetation characterizing springs and fall sampling stations at Lake Whitney, 1973.

Sta.	Bedrock	Gravel	Sand	Clay	Rapid slope	Gradual slope	Inundated trees	Inundated grasses	Devoid of vegetation	Filamentous algae		Chara sp.		Najas sp.		Potamogeton sp.		Scirpus sp.		Typha sp.		Eleocharis sp.		Salix sp.	
										S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F
1	X	X	X			X	X	X		S	S			A					C					S	S
2		X	X				X	X		S				A					C					S	S
3	X	X			X				X					A									S	S	
4		X			X		X							A									S	S	
5	X	X			X		X							A									S	S	
6	X	X				X								A					A				S	C	
7	X				X				X																
8		X	X			X	X	X		S				A					S						
9		X	X			X	X	X						A					S						
10		X	X		X		X	X				S		A				C					A	C	C
11			X	X	X		X	X						A				C					C	C	
12		X	X			X	X	X						A				C					S	S	
13		X			X		X	X				S		A				S					C	S	
14		X	X		X		X	X						A				S					A	S	
15	X		X	X		X	X	X						A									A	A	A

X = Characteristic present at time of sampling
A = Abundant, C = Common, S = Sparse

TABLE 8. Results of spring and fall water profile analyses; Lake Whitney, 1973.

Sta. No.	Date	Sample Depth(ft.)	Water Temp.(°F)	O ₂ (ppm)	CO ₂ (ppm)	ph-th Alk. (ppm)	M.O. Alk. (ppm)	Jack. Turb.(JTU)	Cl ⁻ (ppm)	pH	Total Hard. (ppm)	
I	5/8/73	Surface	74.0	7.0	2.5	0	120.0	5.0	470.0	7.6	-	
		15	72.0	7.0	2.5	0	120.0	5.0	455.0	7.5	-	
		25	70.0	7.0	2.5	0	120.0	5.0	460.0	7.1	390.0	
		35	70.0	7.0	2.5	0	120.0	5.0	460.0	7.1	400.0	
		45	69.0	7.0	5.0	0	125.0	5.0	465.0	7.1	420.0	
		55	68.0	6.0	5.0	0	125.0	5.0	465.0	7.0	410.0	
		65	68.0	6.0	5.0	0	120.0	5.0	460.0	7.0	410.0	
		75	68.0	6.0	5.0	0	120.0	15.0	475.0	7.0	420.0	
		85	66.0	5.0	5.0	0	120.0	15.0	490.0	6.5	430.0	
		10/15/73	Surface	75.0	6.7	2.5	0	120.0	5.0	412.0	8.2	350.0
II	5/9/73	10	74.0	6.7	2.5	0	130.0	5.0	420.0	8.2	340.0	
		20	74.0	6.7	2.5	0	130.0	5.0	420.0	8.2	350.0	
		30	74.0	6.7	2.5	0	130.0	5.0	415.0	8.2	345.0	
		40	75.0	6.6	2.5	0	120.0	5.0	412.0	8.0	345.0	
		50	75.0	6.6	2.5	0	120.0	30.0	422.0	8.2	350.0	
		60	74.0	6.8	2.5	0	120.0	10.0	433.0	8.2	345.0	
		70	74.0	6.7	2.5	0	125.0	5.0	430.0	7.9	350.0	
		80	74.0	6.7	2.5	0	130.0	5.0	430.0	8.3	340.0	
		90	73.0	4.5	2.5	0	130.0	5.0	425.0	7.5	360.0	
		10/18/73	100	72.0	2.0	2.5	0	150.0	60.0	420.0	7.1	400.0
III	5/9/73	Surface	75.0	9.0	2.5	0	120.0	5.0	345.0	7.3	310.0	
		10	74.0	9.0	2.5	0	125.0	5.0	310.0	7.2	300.0	
		20	74.0	8.0	2.5	0	130.0	8.0	315.0	7.0	310.0	
		30	71.0	7.0	2.5	0	125.0	10.0	370.0	6.8	310.0	
		40	71.0	7.0	2.5	0	125.0	10.0	440.0	6.7	360.0	
		50	74.0	7.0	2.5	0	130.0	12.0	365.0	7.6	320.0	
		60	73.0	7.0	2.5	0	150.0	12.0	455.0	7.2	380.0	
		10/18/73	Surface	75.0	7.8	2.5	0	140.0	10.0	440.0	8.2	350.0
		10	75.0	7.6	2.5	0	140.0	10.0	435.0	8.1	360.0	
		20	73.0	6.0	2.5	0	140.0	5.0	437.0	8.3	360.0	
30	73.0	6.0	2.5	0	140.0	10.0	437.0	7.9	350.0			
40	73.0	6.0	2.5	0	130.0	10.0	435.0	8.0	350.0			
50	73.0	6.0	2.5	0	140.0	10.0	440.0	8.2	350.0			
60	73.0	6.0	2.5	0	140.0	115.0	442.0	7.6	350.0			
III	5/10/73	Surface	74.0	8.0	2.5	0	140.0	5.0	375.0	7.1	350.0	
		8	74.0	7.0	2.5	0	140.0	5.0	400.0	7.1	350.0	
		18	74.0	7.0	2.5	0	145.0	5.0	440.0	7.0	360.0	
		28	72.0	7.0	2.5	0	160.0	5.0	575.0	7.1	460.0	
		38	70.0	7.0	2.5	0	160.0	5.0	575.0	7.1	500.0	
		10/18/73	Surface	73.0	11.4	2.5	0	130.0	10.0	415.0	8.2	350.0
		13	72.0	8.2	2.5	0	125.0	15.0	407.0	8.2	330.0	
		23	72.0	8.0	2.5	0	115.0	15.0	425.0	8.2	330.0	
		33	73.0	5.2	2.5	0	105.0	60.0	607.0	7.9	430.0	

Table 10. Summary of 1973 Lake Stillhouse Hollow netting data.

Species	Total No.	Total Wt.(Lbs)	Average Wt.(Lbs)	Average "K"	No./150 Ft. of Net	Wt./150 Ft. of Net(Lbs)
Spotted gar	2	2.2	1.1	-	0.10	0.11
Longnose gar	33	49.8	1.5	-	1.65	2.49
Gizzard shad	10	2.4	0.2	-	0.50	0.12
Smallmouth buffalo	4	17.9	4.5	-	0.20	0.89
River carpsucker	10	26.9	2.7	-	0.50	1.34
Grey redhorse	3	3.3	1.1	-	0.15	0.17
Carp	10	19.4	1.9	-	0.50	0.97
Channel catfish	12	26.4	2.2	1.90	0.60	1.32
Flathead catfish	1	1.8	1.8	1.82	0.05	0.09
White bass	25	35.7	1.4	2.96	1.25	1.78
Spotted bass	1	0.6	0.6	2.43	0.05	0.03
Largemouth bass	9	19.4	2.2	2.68	0.45	0.97
Redear sunfish	1	0.2	0.2	-	0.05	0.01
Bluegill sunfish	17	3.1	0.2	-	0.85	0.15
Longear sunfish	3	0.3	0.1	-	0.15	0.01
White crappie	<u>6</u>	<u>4.0</u>	0.7	2.79	0.30	0.20
Total	147	213.4				

Table 12. General descriptions and relative abundance of predominant vegetation characterizing spring and fall sampling stations at Lake Stillhouse Hollow, 1973.

Sta.	Bedrock	Gravel	Sand	Clay	Rapid slope	Gradual slope	Inundated trees	Inundated grasses	Devoid of vegetation	Filamentous algae	<i>Najas</i> sp.	<i>Potamogeton</i> sp.	<i>Scirpus</i> sp.	<i>Typha</i> sp.	<i>Blechnum</i> sp.	
1	X*	X	X	X	X	X	X			S	A**	C	S	S	S	C
2	X	X	X	X	X	X				S	S	C	S	S	S	
3	X				X				X							
4			X	X		X	X			S	A	C	A	S	S	A
5	X	X			X	X	X			S	C	S	C			
6			X			X			S	C	C	S	C			
7		X			X	X	X		S	C	C	S	C			
8		X			X				S	C	C	S				
9			X	X		X	X	X	C			S	A	S	S	S
10		X	X	X	X	X	X	X	S	C						S

* X = Characteristic present at time of sampling

** A = Abundant, C = Common, S = Sparse

Table 13. Electroshocking results from Lakes Brownwood and Stillhouse Hollow, 1973.

Species	Reservoir			
	Brownwood		Stillhouse Hollow	
	No.	Wt.	No.	Wt.
<u>Lepisosteus oculatus</u>			2	0.9
<u>Dorosoma cepedianum</u>	2	1.5	36	5.9
<u>Carpionodes carpio</u>	2	1.6	1	2.6
<u>Cyprinus carpio</u>	4	5.4	10	14.1
<u>Ictiobus bubalus</u>	1	5.2		
<u>Ictalurus punctatus</u>	11	7.4		
<u>Morone chrysops</u>	5	1.1		
<u>Lepomis cyanellus</u>	2	0.5	4	0.3
<u>Lepomis macrochirus</u>	9	1.0	22	0.9
<u>Lepomis megalotus</u>	2	0.2	4	0.2
<u>Lepomis microlophus</u>	4	0.7		
<u>Micropterus punctulatus</u>			1	1.9
<u>Micropterus salmoides</u>	20	7.2	14	19.4
<u>Pomoxis annularis</u>	1	0.5	2	1.2
<u>Aplodinotus grunniens</u>	5	1.7		
	68	34.0	96	47.4 Total

Table 14. Results of spring and fall water profile analyses; Lake Stillhouse Hollow, 1973.

Sta. No.	Date	Sample Depth (ft)	Water Temp. (°F)	O ₂ (ppm)	CO ₂ (ppm)	ph-th Alk. (ppm)	M.O. Alk. (ppm)	Jack. Turb. (JTU)	Cl ⁻ (ppm)	pH	Total Hard. (ppm)
I	6/21/73	Surface	80.0	11.0	2.5	0	160.0	5.0	65.0	7.1	190.0
		10	78.0	11.0	2.5	0	160.0	5.0	65.0	7.1	190.0
		20	78.0	11.0	2.5	0	160.0	5.0	65.0	7.1	190.0
		30	78.0	10.0	2.5	0	160.0	5.0	65.0	7.1	195.0
		40	76.0	9.0	2.5	0	170.0	5.0	65.0	7.0	195.0
		50	72.0	7.0	2.5	0	170.0	5.0	70.0	7.0	200.0
		60	72.0	7.0	2.5	0	160.0	5.0	70.0	7.0	200.0
		70	68.0	7.0	2.5	0	160.0	5.0	70.0	7.0	200.0
		80	67.0	7.0	2.5	0	160.0	5.0	75.0	7.0	200.0
		90	65.0	6.0	5.0	0	160.0	5.0	75.0	7.0	200.0
I	11/8/73	100	63.0	6.0	5.0	0	150.0	5.0	75.0	7.0	200.0
		Surface	71.0	7.4	2.5	0	170.0	5.0	75.0	8.1	180.0
		10	70.0	7.3	2.5	0	180.0	5.0	75.0	8.0	200.0
		20	70.0	7.3	2.5	0	180.0	5.0	68.0	8.0	200.0
		30	70.0	7.3	2.5	0	180.0	5.0	75.0	8.6	200.0
		40	68.0	7.4	2.5	0	180.0	5.0	75.0	7.8	210.0
		50	68.0	7.5	2.5	0	180.0	5.0	68.0	7.8	210.0
		60	68.0	7.2	2.5	0	180.0	10.0	75.0	7.8	210.0
		70	68.0	3.5	2.5	0	190.0	5.0	75.0	7.9	200.0
		80	66.0	1.3	2.5	0	200.0	10.0	75.0	7.5	210.0
II	6/21/73	90	64.0	1.1	2.5	0	210.0	10.0	75.0	7.3	200.0
		100	64.0	1.2	2.5	0	200.0	5.0	75.0	7.7	200.0
		Surface	83.0	7.0	2.5	0	180.0	5.0	55.0	8.4	190.0
		6	82.0	7.0	2.5	0	180.0	5.0	55.0	8.3	190.0
		16	82.0	7.0	2.5	0	170.0	5.0	55.0	8.3	190.0
		26	80.0	5.0	2.5	0	140.0	5.0	45.0	8.1	190.0
		Surface	72.0	9.0	2.5	0	180.0	5.0	68.0	7.8	195.0
		7	71.0	9.0	2.5	0	180.0	5.0	68.0	8.1	190.0
		17	70.0	8.4	2.5	0	170.0	5.0	68.0	7.7	190.0
		27	70.0	7.7	2.5	0	170.0	15.0	68.0	7.6	200.0

Table 15. Summary of 1973 gill netting data compiled from Lake Brownwood, including catch per unit effort.

Species	Total No.	Total Wt. (lbs)	Avg. Wt. (lbs)	Avg. "K"	No./150 ft. of Net	Wt..150 ft. of Net (lbs)
Longnose gar	29	91.5	3.2	-	1.45	4.58
Gizzard shad	151	53.7	0.4	-	7.55	2.69
Smallmouth buffalo	77	353.9	4.6	-	3.85	17.70
River carpsucker	59	144.5	2.4	-	2.95	7.22
Carp	7	20.2	3.4	-	0.35	1.01
Channel catfish	20	12.1	0.7	1.66	1.00	0.61
Flathead catfish	13	93.9	8.5	2.12	0.65	4.69
White bass	7	4.6	0.6	2.40	0.35	0.23
Largemouth bass	12	6.9	0.1	2.32	0.60	0.35
Warmouth	1	0.1	0.1	-	0.05	0.01
Green sunfish	2	0.2	0.1	-	0.01	0.01
Redear sunfish	6	1.3	0.2	-	0.30	0.06
Bluegill sunfish	16	2.0	0.2	-	0.80	0.10
Longear sunfish	5	0.4	0.1	-	0.25	0.02
White crappie	23	6.6	0.3	2.66	1.15	0.33
Freshwater drum	24	21.9	0.9	-	1.20	1.09
Total	452	813.8				

FIGURE 3.

LAKE BROWNWOOD

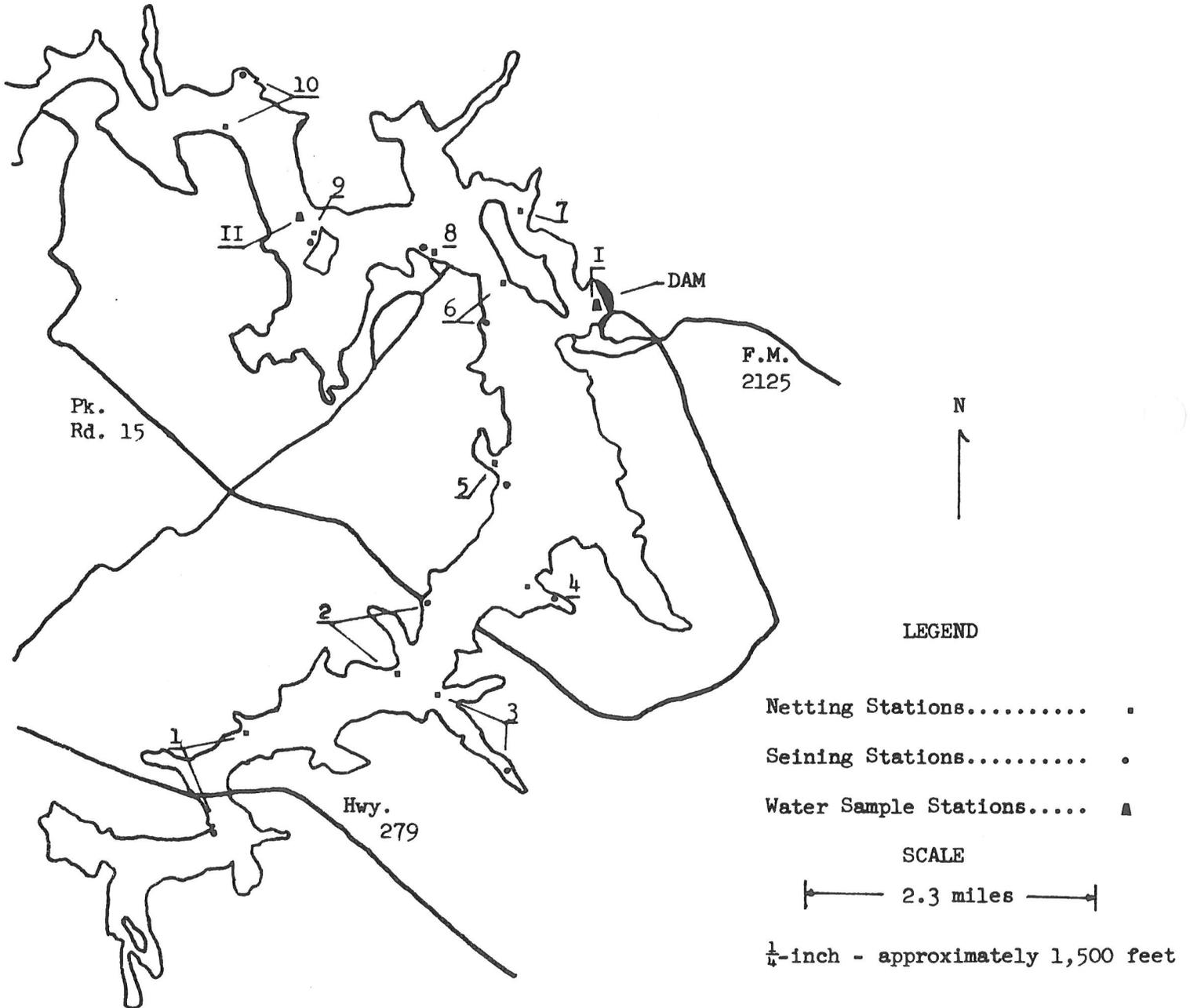


Table 16. Spring and fall gill netting results by station, from Lake Brownwood, 1973.

Sta.		Species															Total	
		LNG	GS	SMB	RCS	CRP	CCF	FCF	WB	LMB	WAM	GSF	BG	LES	RES	WC		FWD
1	S		9	1		1	1									5		17
	F	1	5	1	1				1							3		12
2	S		10	3	4		2			1						2	1	23
	F	2	10	3	4	1	1	1		1			1			3		27
3	S		6		1	2	2							1			12	24
	F		6	9			1	1				2		2				21
4	S	1	4	1	5			2					1		1		2	17
	F		12	1	3													16
5	S	1	5	7	7		2		1	1	1		2				1	28
	F	1	9	4	11			2					1					28
6	S		2	4	4	1	2	2					2	1			2	20
	F	5	7	17	6		2		1	1								39
7	S	1	6	3	4	2	1								1			18
	F	1		2				1		1							2	7
8	S	1	10	1	2		2	3	1	1		2	4	1	2	1	4	35
	F	7	12	4	4		2			1		2	2			5		37
9	S	1	21	5	1		1		2	3			1					35
	F	5	2	4					1	1		1	1	1		1		16
10	S			1				1		1								3
	F	2	15	6	2		1									3		29
																	452	

Table 17. General descriptions and relative abundance of predominant vegetation characterizing spring and fall sampling stations at Lake Brownwood, 1973.

Sta.	Devoid of vegetation										Filamentous algae		Chara sp.		Typha sp.		Polygonum sp.				
	Bedrock	Gravel	Sand	Clay	Rapid slope	Gradual slope	Inundated trees	Inundated grasses			S	F	S	F	S	F	S	F	S	F	
1			X*	X	X	X	X	X			C**		S						S	C	
2			X	X	X	X	X				C										
3			X	X	X	X	X	X			S								A	A	
4			X	X	X	X	X	X			S									S	
5		X	X						X		S										
6			X	X	X	X	X				C	C								A	A
7	X				X				X												
8		X	X			X					S	S									
9		X	X			X	X	X			S	S									
10			X	X	X	X	X	X			S	S	S	S						C	C

* X = Characteristic present at time of sampling
 ** A = Abundant, C = Common, S = Sparse

Table 18. Spring and fall seining results by station, from Lake Brownwood, 1973.

Sta.	Species																		Total
	SG	GS	TFS	RCS	CRP	GDS	BTS	RDS	BHM	MF	MSS	WB	LMB	BG	LES	RES	WC	LP	
1	S	6				1	5	4	5				1			2			24
	F	15	12					3	1		8		1	3	2		3	1	49
2	S						3	1					2						6
	F		23				15	41	74		7			1					161
3	S																		
	F		110					6	5		32				1				154
4	S		56					5					8	1					70
	F		8				11	6	167		235			4		15			446
5	S																		
	F																		
6	S		60			1					1	9	3	1	2	2			79
	F		1				4	41	73	3	140		1	7	5	7			282
7	S																		
	F																		
8	S		18					1	1		6	1		5			1		33
	F		54			1	34	9	52		18			1					169
9	S		93		27	1		13	15	3	3		6	1	1				163
	F		12				3	5	4	1	124								149
10	S		26		10				4		8		7	2	5			1	63
	F	1	16																17
																		1864	

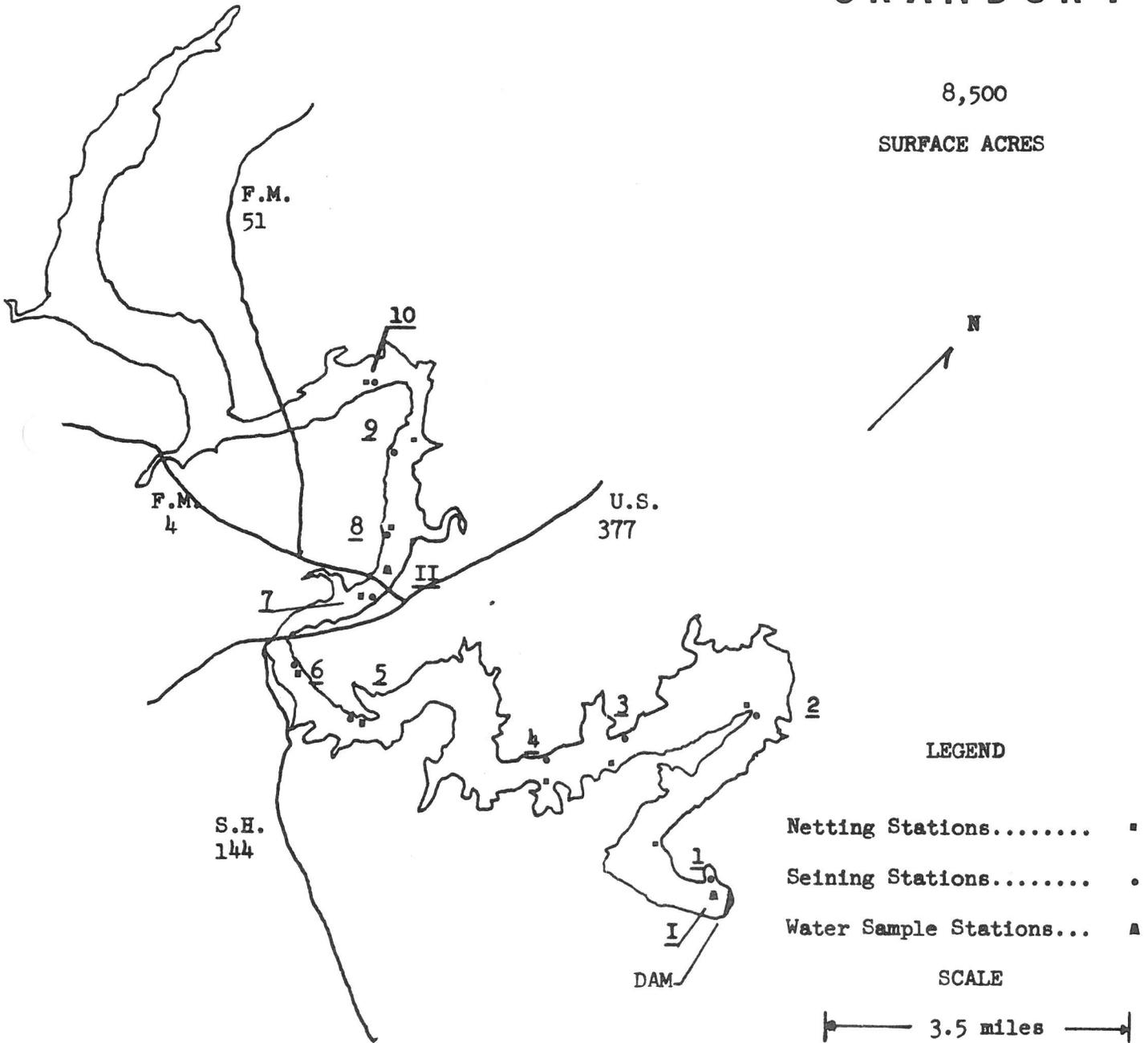
Table 19. Results of spring and fall water profile analyses; Lake Brownwood, 1973.

Sta. No.	Date	Sample Depth (ft)	Water Temp. (°F)	O ₂ (ppm)	CO ₂ (ppm)	ph-th Alk. (ppm)	M.O. Alk. (ppm)	Jack. Turb. (JTU)	Cl ⁻ (ppm)	pH	Total Hard. (ppm)
I	6/26/73	Surface	79.0	8.0	2.5	0	110.0	5.0	95.0	8.0	180.0
		7	79.0	8.0	2.5	0	110.0	5.0	95.0	8.2	180.0
		17	79.0	8.0	2.5	0	110.0	10.0	95.0	7.6	180.0
		27	78.0	8.0	2.5	0	120.0	10.0	95.0	8.4	180.0
		34	77.0	3.0	2.5	0	110.0	5.0	95.0	8.4	180.0
		37	76.0	3.0	2.5	0	120.0	10.0	95.0	8.3	180.0
		47	75.0	2.0	2.5	0	120.0	10.0	95.0	8.3	190.0
	11/1/73	57	75.0	2.0	2.5	0	120.0	15.0	95.0	7.8	190.0
		67	75.0	2.0	2.5	0	120.0	15.0	95.0	8.0	190.0
		Surface	66.0	7.8	2.5	0	125.0	15.0	98.0	8.3	170.0
		10	66.0	7.8	2.5	0	120.0	20.0	98.0	8.3	180.0
		20	66.0	7.8	2.5	0	120.0	15.0	98.0	8.3	180.0
		30	66.0	7.8	2.5	0	125.0	10.0	98.0	8.3	180.0
II	6/27/73	40	66.0	7.8	2.5	0	120.0	20.0	98.0	8.3	180.0
		50	66.0	7.8	2.5	0	125.0	20.0	98.0	8.3	180.0
		60	66.0	7.7	2.5	0	120.0	195.0	98.0	8.3	180.0
		Surface	80.0	8.0	2.5	0	130.0	25.0	95.0	8.5	180.0
		5	80.0	8.0	2.5	0	130.0	30.0	95.0	8.5	180.0
		15	79.0	7.0	2.5	0	130.0	45.0	95.0	8.5	190.0
		25	79.0	6.0	2.5	0	120.0	100.0	95.0	8.5	190.0
	11/1/73	Surface	64.0	8.8	2.5	0	110.0	20.0	98.0	8.4	190.0
		10	64.0	8.8	2.5	0	110.0	10.0	98.0	8.4	180.0
		20	64.0	8.3	2.5	0	110.0	20.0	98.0	8.4	180.0
		30	63.0	8.1	2.5	0	110.0	55.0	98.0	8.2	180.0

FIGURE 4.

LAKE GRANBURY

8,500
SURFACE ACRES



LEGEND

- Netting Stations..... ▣
- Seining Stations..... •
- Water Sample Stations... ▴

SCALE

3.5 miles

7/8-inch - approximately 8,000 feet

Table 20. Spring and fall gill netting results by station from Lake Granbury, 1973.

Sta.	Species																Total	
	LNG	SG	GS	SMB	RCS	CRP	CCF	FCF	WB	STB	LMB	SB	BG	LES	RES	WC		FWD
1	S			1	4								3	1				9
	F		2	8		1					1					1		13
2	S	5				6	2						5					18
	F	4				1	1	2	1		1		2					12
3	S		12			6	1						2			1	2	24
	F		2	3		3										2	1	11
4	S		8		1	1	3		1				1					15
	F		18	9		4			5	1			1					38
5	S	10	5	13		35	1	2					22	1	1			90
	F		6	1		1	1						1				1	11
6	S		8	3	3	11	18	3			1		1					48
	F		11	10	4	9	2		1	5		1	3		1	2		49
7	S		7			1			1		2		2			1	1	15
	F	1	1	27	10	9	7		2				1			4		62
8	S		1			1										1		3
	F		19		2		2		4				1			2		30
9	S		3	2		1							2				3	11
	F	1	5	1		2							1			3	3	16
10	S	5	4	4	2	2	1		2				1	1		1		23
	F	5	6	4	6	4	1						3			7	1	37
																	535	

Table 21. Summary of 1973 gill netting data compiled from Lake Granbury, including catch per unit effort.

Species	Total No.	Total Wt. (lbs)	Avg. Wt. (lbs)	Avg. "K"	No./150 ft. of Net	Wt./150 ft. of Net (lbs)
Spotted gar	1	5.3	5.3	-	0.05	0.27
Longnose gar	31	94.3	3.0	-	1.55	4.71
Gizzard shad	144	26.0	0.2	-	7.20	1.30
Smallmouth buffalo	69	143.2	2.1	-	3.45	7.16
River carpsucker	31	48.5	1.6	-	1.55	2.43
Carp	96	69.4	0.7	-	4.80	3.47
Channel catfish	33	31.4	1.0	1.88	1.65	1.57
Flathead catfish	7	21.8	3.1	2.03	0.35	1.08
White bass	17	11.8	0.7	2.48	0.85	0.59
Striped bass	6	9.2	1.5	2.23	0.30	0.46
Spotted bass	1	0.7	0.7	2.32	0.05	0.03
Largemouth bass	5	2.4	0.5	2.27	0.25	0.12
Redear sunfish	2	0.2	0.1	-	0.10	0.01
Bluegill sunfish	52	6.2	0.1	-	2.60	0.31
Longear sunfish	3	0.4	0.1	-	0.15	0.02
White crappie	25	9.2	0.4	2.84	1.25	0.46
Freshwater drum	12	7.2	0.6	-	0.60	0.36
Total	535	487.2				

Table 23. General descriptions and relative abundance of predominant vegetation characterizing spring and fall sampling stations at Lake Granbury, 1973.

Sta.	Bedrock	Gravel	Sand	Clay	Rapid slope	Gradual slope	Inundated trees	Inundated grasses	Devoid of vegetation	Filamentous algae	Chara sp.	Najas sp.	Myriophyllum sp.	Potamogeton sp.	Typha sp.	Eleocharis sp.	Salix sp.
1			X*			X				C		C**			A		
2			X			X						A		A	A		
3			X	X	X					S		A	A	A			
4			X	X	X					S		A	A	A	S		
5			X	X		X	X	X		S		C	A	C	A	S	C
6		X	X	X		X		X		S		S	A	S	A	S	
7		X				X				S		C				S	
8			X	X		X	X			S		S		S		S	S
9		X	X			X	X	X		S		A		S	A	S	
10				X	X	X	X	X		S		S		S	A		

* X = Characteristic present at time of sampling
 ** A = Abundant, C = Common, S = Sparse

Table 24. Results of spring and fall water profile analyses; Lake Granbury, 1973.

Sta. No.	Date	Sample Depth (ft)	Water Temp. (°F)	O ₂ (ppm)	CO ₂ (ppm)	ph-th Alk. (ppm)	M.O. Alk. (ppm)	Jack. Turb. (JTU)	Cl ⁻ (ppm)	pH	Total Hard. (ppm)
I	6/6/73	Surface	82.0	8.0	2.5	0	120.0	5.0	650.0	7.1	420.0
		5	79.0	8.0	2.5	0	120.0	5.0	650.0	7.0	470.0
		15	78.0	8.0	2.5	0	120.0	5.0	650.0	7.0	470.0
		25	77.0	8.0	2.5	0	120.0	5.0	650.0	7.1	480.0
		35	75.0	7.0	2.5	0	120.0	5.0	660.0	6.9	490.0
	10/24/73	45	68.0	2.0	2.5	0	140.0	5.0	720.0	6.8	510.0
		55	67.0	2.0	2.5	0	140.0	10.0	760.0	6.8	540.0
		65	64.0	1.0	2.5	0	140.0	10.0	835.0	6.7	590.0
		Surface	72.0	7.6	2.5	0	105.0	10.0	700.0	8.3	470.0
		5	72.0	7.6	2.5	0	105.0	5.0	715.0	8.3	480.0
		15	72.0	7.5	2.5	0	105.0	5.0	705.0	8.3	480.0
II	6/6/73	25	72.0	7.5	2.5	0	100.0	5.0	705.0	8.3	480.0
		35	72.0	7.5	2.5	0	110.0	5.0	715.0	8.3	480.0
		45	72.0	7.4	2.5	0	100.0	5.0	700.0	8.2	480.0
		55	72.0	7.3	2.5	0	100.0	5.0	685.0	8.2	480.0
		65	72.0	7.3	2.5	0	100.0	20.0*	690.0	8.1	480.0
	10/24/73	Surface	80.0	8.0	2.5	0	120.0	5.0	620.0	7.1	510.0
		12	78.0	7.0	2.5	0	120.0	5.0	700.0	6.9	520.0
		22	77.0	6.0	2.5	0	130.0	10.0	710.0	6.8	520.0
		32	76.0	4.0	2.5	0	130.0	10.0	710.0	6.8	520.0
		42	75.0	3.0	2.5	0	140.0	10.0	730.0	6.8	530.0
		Surface	72.0	8.6	2.5	0	100.0	20.0	394.0	8.4	280.0
10/24/73	10	72.0	7.5	2.5	0	100.0	25.0	364.0	8.4	260.0	
	20	72.0	7.6	2.5	0	100.0	20.0	364.0	8.1	270.0	
	30	72.0	6.2	2.5	0	100.0	30.0	394.0	8.0	290.0	
	40	72.0	3.6	2.5	0	105.0	30.0	545.0	7.5	370.0	

FIGURE 5.

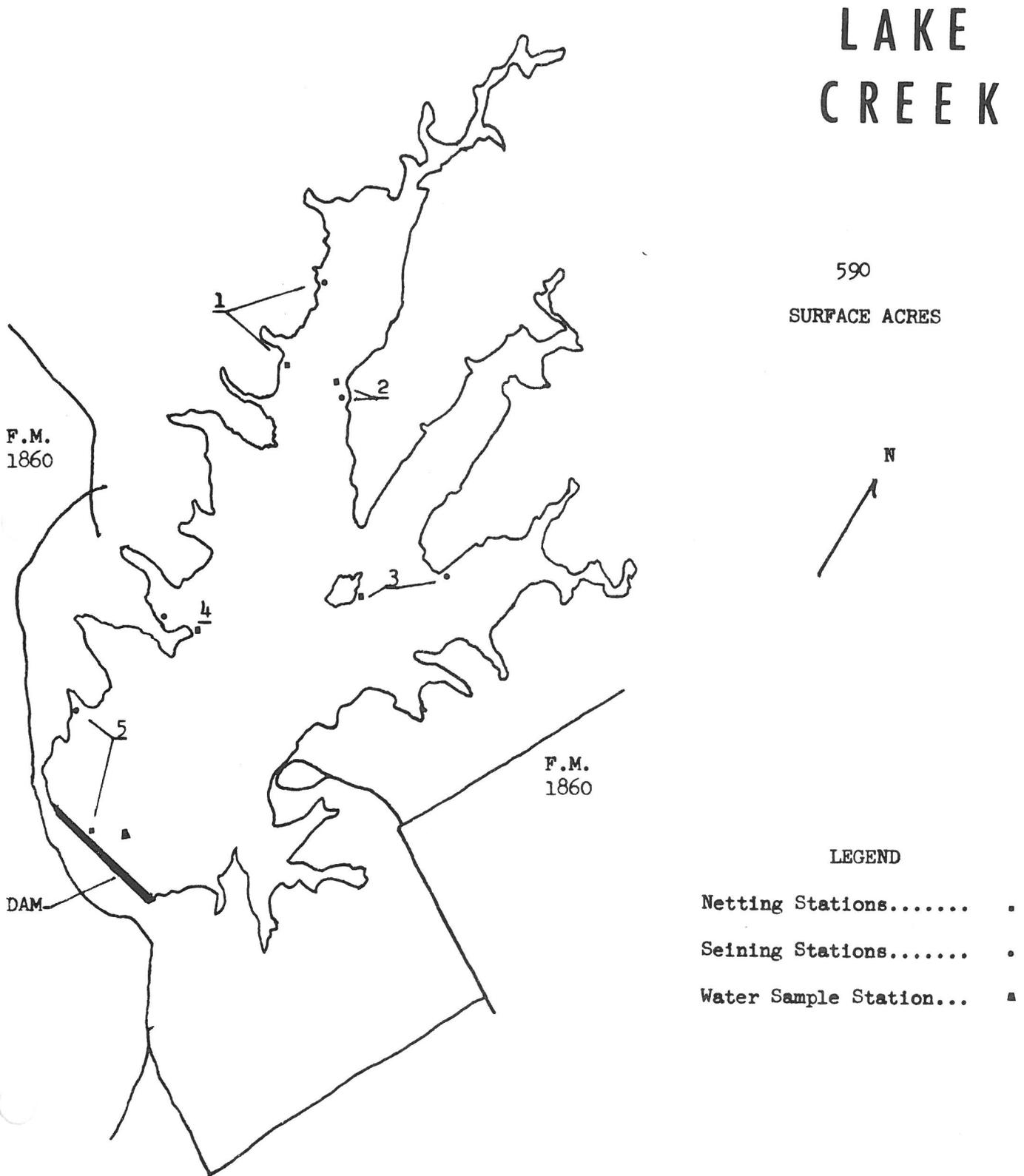


Table 25. Spring and fall gill netting results by station, from Lake Creek, 1973.

Sta.	Species																			Total
	LNG	SG	GS	SMB	RCS	CRP	CCF	FCF	ANF	LMB	SB	WAM	GSF	BG	LES	RES	WC	FWD	TP	
1	S		10			5	4			4				14			1	1		40
	F		1			1	5			1									1	9
2	S		9			11	6							4	1					32
	F	1	9			4	4		1	2				3		1	1		4	30
3	S		7			12	3							1		1	1			25
	F		5			2	2										5	3		17
4	S		5		2	3	2	1		1				4				1		19
	F		2	3		8	1		1					1			1		2	19
5	S	1	10		1	2	2					1	2	18		1	1		6	45
	F		10			3	2			2	3			5			1		3	30
																				266

Table 26. Summary of 1973 gill netting data compiled from Lake Creek, including catch per unit effort.

Species	Total No.	Total Wt. (lbs)	Avg. Wt. (lbs)	Avg. "K"	No./150 ft. of Net	Wt./150 ft. of Net (lbs)
Spotted gar	3	5.7	1.9	-	0.30	0.57
Longnose gar	2	6.0	3.0	-	0.20	0.60
Gizzard shad	68	34.7	0.5	-	6.80	3.47
Smallmouth buffalo	3	6.7	2.2	-	0.30	0.68
River carpsucker	3	6.5	2.2	-	0.30	0.65
Carp	51	117.0	2.3	-	5.10	11.70
Channel catfish	31	41.4	1.3	1.76	3.10	4.14
Flathead catfish	1	9.3	9.3	2.00	0.10	0.93
Atlantic needlefish	2	0.5	0.2	-	0.20	0.05
Spotted bass	3	1.8	0.6	2.34	0.30	0.18
Largemouth bass	10	11.6	1.2	2.20	1.00	1.16
Warmouth	1	0.2	0.2	-	0.10	0.02
Green sunfish	2	0.7	0.4	-	0.20	0.07
Redear sunfish	3	0.5	0.2	-	0.30	0.05
Bluegill sunfish	50	8.2	0.2	-	5.00	0.82
Longear sunfish	1	0.1	0.1	-	0.10	0.01
White crappie	11	6.0	0.6	2.88	1.10	0.60
Freshwater drum	5	1.7	0.3	-	0.50	0.17
Tilapia	16	15.1	0.9	-	1.60	1.51
Total	266	273.7				

Table 27. Spring and fall seining results by station, from Lake Creek, 1973.

Sta.		Species								Total	
		BTS	RDS	MSS	LMB	SB	BG	LES	RES		TP
1	S	8		7	1	1					17
	F	3		5			1	1	2		12
2	S	42	3	14							59
	F	4		20			2				26
3	S	1	1				1	1			4
	F	1							2		3
4	S					1	7	8	1		17
	F	1			1						2
5	S	7	1		1		28	2		3	42
	F	11		10		1			1		23
										<u>205</u>	

Table 29. Results of spring and fall water profile analyses; Lake Creek, 1973.

Sta. No.	Date	Sample Depth(ft)	Water Temp.(°F)	O ₂ (ppm)	CO ₂ (ppm)	ph-th Alk.(ppm)	M.O. Alk.(ppm)	Jack. Turb.(JTU)	Cl ⁻ (ppm)	pH	Total Hard.(ppm)	
I	7/24/73	Surface	91.0	8.5	2.5	0	110.0	5.0	145.0	8.4	190.0	
		10	91.0	8.5	2.5	0	110.0	5.0	140.0	8.3	190.0	
		20	88.0	5.0	2.5	0	110.0	5.0	150.0	150.0	8.2	190.0
		25	86.0	3.0	2.5	0	110.0	5.0	135.0	135.0	8.0	190.0
I	10/4/73	30	82.0	1.0	2.5	0	150.0	5.0	115.0	8.0	190.0	
		Surface	86.0	9.4	2.5	0	115.0	10.0	175.0	175.0	8.6	190.0
		10	85.0	7.0	2.5	0	120.0	10.0	180.0	180.0	8.6	200.0
		20	82.0	5.6	2.5	0	120.0	10.0	175.0	175.0	8.3	200.0
		25	81.0	4.8	2.5	0	120.0	10.0	175.0	175.0	8.3	200.0
		35	81.0	1.8	2.5	0	220.0	250.0	175.0	7.5	220.0	