OKLAHOMA FISHERY RESEARCH LABORATORY
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OFRL
473- Oologah
16.0

FINAL REPORT

COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT

NMFS PROJECT 2-397-R-1

OKLAHOMA COMMERCIAL FISHERIES PROJECT

COMMERCIAL LAKE MONITORING STUDY

JANUARY 1, 1983 THROUGH DECEMBER 31, 1983

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Federal Office Building
144 First Avenue, South
St. Petersburg, Florida 33701

REPORT FOR:

[XX] COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT (PL 88-309)

[ ] ANADROMOUS FISH ACT (PL 89-304)

[ ] JELLYFISH ACT (PL 89-720)

STATE Oklahoma TYPE OF REPORT: [ ] Quarterly (Coordination projects only)

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[XX] Completion

PROJECT NO. 2-397-R SEGMENT NO. 1

PROJECT TITLE Commercial Fisheries Project

PERIOD COVERED January 1, 1983 - December 31, 1983

PREPARED BY Mark E. Ambler & David L. Combs DATE June 18, 1984

APPROVED BY Harold E. Namminga DATE June 18, 1984

ABSTRACT
(Instructions on reverse side)

Seven commercial fish species were collected in the gillnet and seine samples. Commercial fish populations in 1983 appeared to be comparable to those observed in previous surveys. Current commercial fishing practices in Oologah do not appear to be having any effect on commercial or sportfish populations.

Largemouth bass and white crappie were found in low densities with continued recruitment problems. White bass showed an increase in density and mean size indicating that more and larger fish were available to anglers. Walleye fry introductions in 1982 continued to add to the sportfishery. Walleye from the fry stocked in 1983 were not found.

Forage fish populations continued to be dominated by bluegill sunfish and gizzard shad. Both species experienced low reproductive success in 1983. Quality size bluegill density appeared to be low with a PSD value of 9%. The gizzard shad sampled were generally too large to be available to predators.

Recommendations were to continue commercial fishing on Oologah and to continue stocking walleye fry or fingerlings as an additional predator on gizzard shad.

(Rev. 10/3/70)

FINAL REPORT

Oklahoma Commercial Fisheries Project

NMFS Project 2-397-R-1

Oklahoma Commercial Lake Monitoring Study

For

Oologah Reservoir

Prepared by Mark E. Ambler and David L. Combs

FINAL REPORT

STATE: Oklahoma PROJECT NO.: 2-397-R-1

PROJECT TITLE: Commercial Fisheries Project

STUDY TITLE: Oklahoma Commercial Lake Monitoring Study

PERIOD COVERED: January 1, 1983 - December 31, 1983

OBJECTIVE: To monitor selected fish populations in lakes undergoing commercial harvest in Oklahoma.

ABSTRACT

Seven commercial fish species were collected in the gillnet and seine samples. Commercial fish populations in 1983 appeared to be comparable to those observed in previous surveys. Current commercial fishing practices in Oologah do not appear to be having any effect on commercial or sportfish populations.

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Forage fish populations continued to be dominated by bluegill sunfish and gizzard shad. Both species experienced low reproductive success in 1983. Quality size bluegill density appeared to be low with a PSD value of 9%. The gizzard shad sampled were generally too large to be available to predators.

Recommendations were to continue commercial fishing on Oologah and to continue stocking walleye fry or fingerlings as an additional predator on gizzard shad.

INTRODUCTION

Oologah Reservoir is an 11,939 hectare impoundment located on the Verdigris River approximately 40 kilometers northeast of Tulsa in Rogers and Nowata Counties. The reservoir was constructed and initially impounded in 1963 by the U.S. Army Corps of Engineers for flood control and navigation. This initial impoundment covered only 2,367 hectares. In 1972, the conservation pool was raised to 11,939 hectares.

Past fish stockings include 100,000 walleye fry in 1968; 518,000 walleye fry in 1970; 144,000 channel catfish fingerlings in 1971; and 100,000 largemouth bass fingerlings in 1979. Recent introductions of walleye were made in 1982 (2.5 million fry) and in 1983 (5.5 million fry) in an attempt to develop harvestable populations.

Previous surveys have been conducted by the Northcentral and Tulsa Regions from 1978-79, 1981-82. Commercial fishes present in Oologah Reservoir were represented by eight species. All commercial species were found in low abundance in the surveys. Commercial harvests were reported as impacting neither the sport or commercial fish species of the reservoir. The surveys generally indicated that moderate densities of sportfish populations were present with apparent survival of 1982 walleye introductions.

Tulsa Regional Fisheries personnel collected fish population data on Oologah Reservoir from April through November 1983, according to the outline in "Standardized Sampling Procedures for Lake Management Recommendations." Fish populations trends and fisheries management recommendations are based on survey data collected.

MATERIALS AND METHODS

Electrofishing (A.C.) was conducted on 26, 27 and 31 May and 1, 14, 20 and 21 June 1983; shoreline seining on 25, 26, 27 July and 4 August 1983; and gill netting (experimental type) on 8, 9 and 15 November 1983. Standardized netting quotas were unable to be met because of the severe ice conditions during December 1983. A detailed description of gear types and methods used are presented in "Standardized Sampling Procedures for Lake Management Recommendations".

RESULTS AND DISCUSSION

Commercial Fish Species

Seven commercial fish species were collected by both seine and gillnet sampling in 1983. The commercial fish species present were carp, freshwater drum, buffalo fishes (bigmouth and smallmouth), river carpsucker, and flathead catfish. White bass are also a commercially fished species even though they are a major sport fish and are discussed below. Experimental gill netting failed to capture any commercial species in abundance (Table 1). Commercial species abundance appears to be unchanged from 1982 with the exception of increased catches of carp. An increase in the size of individuals available for harvest was observed in the CPUE by weight, while changes in mean weights varied by species. Recruitment success (Table 2) was verified for only 4 of the 7 commercial species (carp, drum, smallmouth buffalo, white bass) during 1983. Smallmouth buffalo and drum recruitment increased dramatically from 1982, while white bass and carp showed slight decreases from previous surveys.

A commercial species of special concern in Oklahoma waters has been the flathead catfish. Flathead catfish were not collected in large enough numbers for detailed analysis, but the experimental gill netting showed a relatively stable

population available in Oologah Reservoir. The flathead catfish average size has been increasing since 1979 (Table 1). The additional sampling technique of stationary electrofishing used in 1982 to sample flathead catfish was unable to be used because of technical problems in the sampling gear.

Commercial fishermen harvested 27,997 kg of fish representing 5 commercial species from Oologah during 1983. Of these harvests, approximately 25% (7,097 kg) were made up of flathead catfish (Gary Peterson, personal communication, Oklahoma Department of Wildlife Conservation). The total commercial harvest in 1982 was only 6,355 kg. The level of commercial fishing occurring in Oologah apparently has not reduced the commercial fish species abundance.

Largemouth and Spotted Bass

Reproductive success for black bass during 1983 was verified by shoreline seining (Table 2) with 11 largemouth bass young-of-year observed. Spotted bass reproduction was not verified in 1983. Largemouth bass reproduction was low in 1983 (CPUE 0.11) and continued the trend of decreasing reproductive success since 1978 (Table 2). Reproductive successes of largemouth bass continue to be low in Oologah Reservoir despite high water levels during 1983 providing spawning and nursery habitat. Low CPUE values in Oologah are normally attributed to fluctuating water levels (Hicks 1978, 1981 and Wolf and Hicks 1978).

Spring electrofishing sampling resulted in the collection of 138 black bass (80 largemouth bass and 58 spotted bass) during 54 units of effort (13.5 h). Largemouth and spotted bass densities in Oologah were low as evidenced by the CPUE values (Table 3). The densities observed were a sharp decline from 1981 and 1982 surveys (Table 3). The apparent decline in largemouth bass density may actually be the result of sampling problems created by the high water conditions of the reservoir during the sampling period. Although the electrofishing samples showed a decline in density, the mean weight of largemouth bass (497 g) improved over 1982 indicating that harvestable fish were available during 1983. Spotted bass

densities appear to be relatively unchanged from 1981 surveys although the size of individual fish observed in the survey has apparently improved as indicated in the CPUE by weight and mean weight (Table 3).

As in 1982, the largemouth bass length frequencies confirmed the low level of reproductive success from Oologah reported during the previous survey. Length frequency information showed that approximately 9 percent of the largemouth bass collected during 1983 were young-of-year fish (Figure 1). A young ($\leq$152 mm) to adult ($\geq$ 305 mm) ration (YAR) of 0.24:1 calculated for Oologah largemouth bass is below the value Reynolds and Babb (1978) reported as optimum (3:1 to 10:1) and indicates recruitment problems. The YAR value observed in 1983 is a decline from the improvement in recruitment observed from 1979 to 1982 (Hicks 1979, 1981; Combs 1982). Length frequency of the largemouth bass population showed a good population distribution ranging from 81 to 540 mm with a mode of 281-300 mm fish. This modal group moving into the stock size category in 1983 resulted in a major change in the Proportional Stock Density (PSD) and an apparent decline in the population structure. The PSD for largemouth bass was 43 percent (Table 5), down from 84 percent observed in 1982 and slightly below the 50-70 percent range recommended for bass populations in large impoundments where shad is the primary prey (Anderson 1978). The proportion of the trophy-size category of bass ($>$ 380 mm) declined from previous surveys. This resulted from an increase in stock size fish. The spotted bass population observed in the electrofishing samples ranged from 81 to 420 mm in total length with the majority of the fish in the stock size category (Figure 1).

The relative weights (W_r) of largemouth bass computed from spring electrofishing (Figure 5) were near but below the optimum 95-105 range suggested by Wege and Anderson (1978) for the majority of the bass population. Largemouth bass 321-360 mm and those greater than 421 mm were within the acceptable limits of condition. These lower than optimum values represent the first observed decline in condition of bass in Oologah Reservoir.

In summary, the largemouth bass population in Oologah has declined in density, structure, recruitment, and condition from 1982. The bass population appears to have a low density, low recruitment, and slightly lower than optimum population structure and condition during 1983.

White Crappie

Crappie were found in extreme low abundance during 1983. Reproduction was verified by quadrant seining with the capture of one young-of-year crappie for a CPUE of 0.01. Reproductive success as evidenced by seining was extremely low continuing the trend of poor reproduction since 1978 (Table 2).

Spring electrofishing samples (Table 3) also showed crappie to be in low abundance with the collection of 58 fish for a CPUE of 1.04. The CPUE value represented a continued decline in crappie abundance since 1981 (Table 3). As crappie density continues to decline, the mean weight of individuals improves (Table 3) with mean weights increasing from 47 to 337 g in 1981 and 1983, respectively. The length frequency of crappie (Figure 2) confirmed the increase in mean weight with the majority of fish (95%) being of quality size ($>$ 200 mm). Crappie ranged from 121-340 mm in total length with a mean of 278 mm and a mode of 289-300 mm. The crappie population of Oologah appeared to be composed predominately of the 1978 and 1979 year classes (4-5 year old fish) that probably would be lost to the fishery during 1983-84 through natural mortality.

Crappie were virtually non-existent from the gillnet samples in Oologah. Four crappie ranging from 152 to 282 mm were captured for a CPUE of 0.02 (Table 1). The CPUE value is the lowest recorded for Oologah and confirms the trend of declining crappie populations. The low to moderate crappie recruitment success observed in the 1982 quadrant seine samples (Combs 1982) was unable to be observed as yearlings during gill netting. The failure of yearling survival suggests a continued trend in low or declining crappie population in Oologah.

Relative weights of white crappie (Figure 6) were computed from the spring electrofishing samples. Relative weights were nearly all above the preferred range (95-100 Wege and Anderson 1978) indicating low densities of fish in excellent condition.

In summary, white crappie populations were found in low densities with a continuation of the decline trend observed from previous surveys. Recruitment problems continue to plague crappie populations with poor year class recruitment to continue the fishery dominated by large size, older individuals.

White Bass

White bass reproduction was successful during 1983 with the collection of 388 young-of-year fish by shoreline seining for a CPUE of 3.87. The 1983 CPUE for white bass was lower than that observed in 1982, but higher than those observed in 1978 or 1979 (Table 2). The CPUE during 1983 for white bass was also higher than the regional average for reservoirs greater than 4,050 hectares (Table 4).

There were 61 white bass collected by gill netting in 1983 for a CPUE of 0.26. The 1983 CPUE is almost twice as high as the 1982 CPUE (Table 1) and slightly higher than the regional average (Table 4). The white bass ranged in length from 162 to 417 mm with a mean length of 315 mm and a mean weight of 499 g (Table 1). The length frequency of white bass gill netted during 1983 (Figure 3) indicated good population structure with harvestable size fish available. There were strong modal groups at 301-320 and 321-340 mm, with an increase in the mean weight and CPUE every year since 1979 (Table 1), indicating that larger individuals and more fish from the population were available to the angler than in the year previous.

Walleye

There were 5 walleye collected during the gill netting for a CPUE of 0.02. The walleye collected ranged in length from 368 to 443 mm with a mean length of 395 mm and a mean weight of 695 g (Table 1). The fish collected by gill netting were from the 1982 stocking of 2.5 million fry. There were no fish from the 1983

stocking of 5.45 million fry collected by gill netting or quadrant seine sampling. The high water conditions and the duration that the flood gates on Lake Oologah were open may have resulted in many of the fish stocked in 1983 being lost. Many small walleye 8 to 10 inches in length were reportedly caught by anglers in the tailwaters of Lake Oologah. The walleye growth rates appear to be comparable to those observed by Lewis (1970) for Canton Reservoir, and above those by Hackney and Holbrook (1978) for southern reservoirs and the Mississippi River. The walleye are continuing to add to the fishery of Lake Oologah and should continue to do so as long a stocking is continued and natural reproduction begins within the reservoir system.

Channel Catfish

Channel catfish reproduction was verified by shoreline seining with the collection of 17 individuals for a CPUE of 0.17 (Table 2). The channel catfish reproduction in 1983 was comparable to that observed in 1982 and 1979, and lower than that observed in 1978 (Table 2).

Forty channel catfish ranging from 150 to 606 mm (Figure 3) were collected during gill netting for a CPUE of 0.17 (Table 1). The channel catfish density in 1983 was lower than in 1982 (CPUE = 0.22, Table 1) but still above the regional average for reservoirs greater than 4050 hectares (Table 4). The channel catfish in Lake Oologah for 1983 average 383 mm long and weighed 608 g, which is up from 1982 (Table 1).

In summary, the channel catfish population in Oologah appears to be above regional average density with a good population structure and harvestable size fish appear to be available to anglers.

Sunfish

Sunfish species observed were bluegill, longear, orangespotted, redear, green and warmouth. Bluegill dominated the sunfish collected by electrofishing and seining. There were 195 bluegill young-of-year collected in shoreline seining for

a CPUE of 1.95 (Table 2). The 1982 seine CPUE and regional average CPUE were twice as high as the 1983 sample values (Tables 2 and 4). The low CPUE of bluegill in the 1983 seine sample may indicate that bluegill sunfish experienced some reproduction problems in 1983.

Spring electrofishing resulted in collecting 267 bluegill during 47 units of effort for a CPUE of 5.68 (Table 3). The 1983 CPUE is much lower than the 1982 CPUE and the regional average CPUE (Table 3 and 4). The bluegill collected by electrofishing ranged in length from 44 to 167 mm with a mean length of 112 mm and a mean weight of 29 g (Table 3). There was a strong modal group at 101-120 mm with 41% of the sample in this size range. Length frequency data (Figure 2) indicated that quality size (> 150 mm) bluegill densities were low with only 22 fish of quality size and no trophy size individuals being collected. The PSD of 9% confirms the low density of quality size fish observed. Anderson (1978) suggested that bluegill PSD's be 20-40% in reservoirs where gizzard shad were present and a quality largemouth bass fishery is desired.

Relative weights (W_r) of bluegill (Figure 2) were all within, or above, the optimum level of 95-100 percent indicating good to excellent condition.

In summary, the bluegill population in Oologah appears to be decreasing in density, experiencing reproduction problems, and mostly below quality size. Bluegill do not appear to be providing a good fishery in Lake Oologah for anglers.

Forage Fish Species

The 1983 seine samples were dominated by gizzard shad (CPUE 15.95), Notropis sp. (CPUE 11.98), Pimephales sp. (CPUE 9.16), brook silversides (CPUE 3.03), and mosquito fish (CPUE 2.04, Table 2). Absent from the 1983 seine samples, but observed in 1982, were inland silversides and logperch. The 1982 CPUE for gizzard shad is over seven times higher than the 1983 CPUE (Table 2); and the regional average is almost five times higher (Table 4). Gizzard shad reproduction in 1983 appears to be low for Oologah.

Electrofishing produced 540 gizzard shad for a CPUE of 18.6 almost a third higher than the 1982 CPUE and regional average (Table 3 and 4, respectively). The gizzard shad collected ranged in length from 95 to 263 mm with a mean length of 165 and a mean weight of 40 g. There were strong modal groups at 161-180 and 181-200 mm with 47.8% of the gizzard shad collected during electrofishing occurring in these two modal groups (Figure 4). Gill netting produced 140 gizzard shad for a CPUE of 0.59 comparable to 1982 (CPUE 0.50) and almost twice as high as the regional average (Table 4). Gizzard shad collected by gill netting ranged in length from 130 to 272 mm with a mean length of 182 mm and a mean weight of 56 g. The gizzard shad in Oologah had a strong modal group at 181-200 mm with 52.1% of the gill netting sample occurring in this length group (Figure 4). No quality size (>275 mm) gizzard shad were collected in electrofishing or gillnetting so PSD calculations were not possible.

Relative weights of gizzard shad collected by electrofishing (Figure 5) showed that fish <140 mm and > 220 mm were in good condition, but fish between 141 to 220 mm were in less than optimum condition indicating that high densities caused competition for food in these length groups.

RECOMMENDATIONS

Fish Population Manipulation

Commercial Fishing

Fish population data do not suggest the need for changes in the administration of commercial fishing in Oologah Reservoir.

Stocking

With the successful introduction of walleye fry in 1982 and the availability of prey species, introductions of walleye should continue.

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Table 1. Total number (N), total and mean weight, and catch per unit effort (CPUE) for selected fishes collected by fall gill netting from Lake Oologah during 1978, 1979, 1982 and 1983.

Species	N	Weight (g) Total	Weight (g) Mean	CPUE (h) Number	CPUE (h) Weight
White Crappie					
1978	53	12,590	238	0.11	25.96
1979	24	3,739	156	0.07	11.00
1982	29	7,292	251	0.06	16.42
1983	4	546	137	0.02	2.28
White Bass					
1978	189	90,305	478	0.39	186.20
1979	38	11,062	291	0.11	32.53
1982	66	28,704	435	0.15	64.65
1983	61	30,460	499	0.26	127.45
Walleye					
1978	--	--	--	--	--
1979	--	--	--	--	--
1982	4	496	124	0.01	1.12
1983	5	3,476	695	0.02	14.54
Channel Catfish					
1978	19	20,661	1,087	0.04	42.60
1979	36	18,574	516	0.11	54.63
1982	96	43,088	449	0.22	97.04
1983	40	24,314	608	0.17	101.73
Carp					
1978	4	5,188	1,297	0.01	10.70
1979	4	3,452	863	0.01	10.15
1982	4	4,048	1,012	0.01	9.12
1983	12	11,926	994	0.05	49.90
Freshwater Drum					
1978	1	490	490	t	1.01
1979	23	4,289	186	0.07	12.62
1982	16	1,836	115	0.04	4.14
1983	14	5,153	368	0.06	21.56
Smallmouth Buffalo					
1978	2	2,778	1,389	t	5.73
1979	1	519	519	t	1.53
1982	7	4,866	695	0.02	10.96
1983	3	3,551	1,184	0.01	14.86
Bigmouth Buffalo					
1978	2	7,144	3,572	t	14.73
1979	2	4,139	2,070	0.01	12.17
1982	1	4,301	4,301	t	9.69
1983	1	3,632	3,632	t	15.20
River Carpsucker					
1978	8	7,673	959	0.02	15.82
1979	5	2,808	562	0.01	8.26
1982	21	13,392	590	0.05	27.91
1983	19	10,488	552	0.08	43.88
Flathead Catfish					
1978	6	20,554	3,426	0.01	38.46
1979	2	2,325	1,162	0.01	6.84
1982	7	19,660	2,809	0.02	44.28
1983	6	18,288	3,048	0.03	76.52
Gizzard Shad					
1978	49	6,470	132	0.10	13.34
1979	64	2,219	35	0.19	6.53
1982	223	9,355	52	0.50	21.07
1983	140	7,880	56	0.59	32.97

Table 2. Total number (N) and catch per unit effort (CPUE)* for species collected by quadrant seining from Oologah Reservoir, 1978-79 and 1982-83.

Species	1978a N	1978a CPUE	1979b N	1979b CPUE	1982c N	1982c CPUE	1983 N	1983 CPUE
Largemouth Bass	66	1.27	28	0.40	17	0.23	11	0.11
Spotted Bass	1	0.02	--	---	1	0.01	--	---
White Crappie	466	8.95	28	0.40	88	1.21	1	0.01
White Bass	139	2.67	21	0.30	404	5.57	388	3.87
Walleye	--	---	--	---	1	0.01	--	---
Channel Catfish	15	0.29	8	0.12	7	0.10	17	0.17
Bluegill	346	6.64	119	1.72	324	4.47	195	1.95
Longear Sunfish	7	0.13	3	0.04	5	0.07	--	---
Orangespotted Sunfish	1	0.02	--	---	6	0.08	--	---
Green Sunfish	12	0.23	2	0.03	1	0.01	--	---
Carp	4	0.08	11	0.16	11	0.15	6	0.06
Freshwater Drum	73	1.40	44	0.63	13	0.18	91	0.91
Smallmouth Buffalo	103	1.98	5	0.07	8	0.11	137	1.37
Bigmouth Buffalo	8	0.15	3	0.04	1	0.01	--	---
River Carpsucker	22	0.42	--	---	16	0.22	--	---
Flathead Catfish	--	---	--	---	1	0.01	--	---
Longnose Gar	--	---	--	---	6	0.08	--	---
Gizzard Shad	2065	39.65	5858	84.36	8296	114.36	1598	15.95
Inland Silverside	--	---	--	---	624	8.60	--	---
Brook Silverside	72	1.38	153	2.21	10	0.14	304	3.03
Golden Shiner	32	0.61	--	---	4	0.06	14	0.14
Bullhead Minnow	106	2.04	426	6.15	53	0.73	73	0.73
Blackstriped Topminnow	14	0.27	21	0.30	7	0.10	2	0.02
Mosquito Fish	118	2.27	1230	17.74	940	12.96	204	2.04
Logperch	2	0.04	1	0.01	5	0.07	--	---
Stoneroller	4	0.08	--	---	15	0.21	7	0.07
Ghost Shiner	--	---	--	---	106	1.46	81	0.81
Red Shiner	179	3.44	1995	28.78	790	10.89	74	0.74
Notropis sp.	1	0.02	143	2.06	1152	15.88	1200	11.98
Pimephales sp.	--	---	--	---	--	---	918	9.16

* Catch per unit effort based upon 100 m^2 (52 units in 1978, 69.3 units in 1979, 72.5 units in 1982, 100.2 units in 1983).

a data from Hicks 1978

b data from Wolf and Hicks 1979

c data from Combs 1982

Table 3. Total number (N) total and mean weight and catch per unit effort (CPUE) for selected fishes collected by electrofishing from Oologah Reservoir 1981-1983.

Species	N	Weight (g) Total	Weight (g) Mean	CPUE (15 min) No.	CPUE (15 min) Wt.
Largemouth Bass					
1981a Spring	210	129,995	619	6.56	4062.34
1982 Spring	182	85,528	470	7.91	3718.61
1983 Spring	80	39,765	497	1.48	736.39
Spotted Bass					
1981 Spring	44	9,315	211	1.38	291.09
1982 Spring	--	--	--	--	--
1983 Spring	58	15,017	336	1.04	349.13
White Crappie					
1981 Spring	265	38,901	147	8.28	1215.66
1982 Spring	66	15,578	236	3.14	741.81
1983 Spring	56	18,853	337	1.04	349.13
Bluegill					
1981 Spring	252	8,694	34	7.88	271.69
1982 Spring	345	9,032	26	16.43	430.10
1983 Spring	267	7,478	29	5.68	159.11
Gizzard Shad					
1981 Spring	397	15,215	38	12.41	475.47
1982 Spring	278	14,153	51	13.24	673.95
1983 Spring	540	21,399	40	18.62	737.90

a data from Hicks 1981

Table 4. Regional catch per unit effort (CPUE) by number for selected species by gear type on reservoirs greater than 4050 hectares.

Species	Gear Type		
	Electrofishing	Seining	Gill Netting[c]
Largemouth bass	4.43	0.63	--
Spotted bass	1.38	--	--
White bass	--	2.85	0.22
White crappie	3.14	3.52	0.08
Channel catfish	--	--	0.12
Bluegill sunfish	7.72	4.28	--
Drum	--	--	0.04
Smallmouth buffalo	--	--	0.01
Bigmouth buffalo	--	--	t
Flathead catfish	--	--	0.01
Gizzard shad	12.09	79.46	0.26
Red shiner	--	14.37	--

a effort is based on 15 minute samples

b effort is based on 100 m^2

c effort is based on one net hour

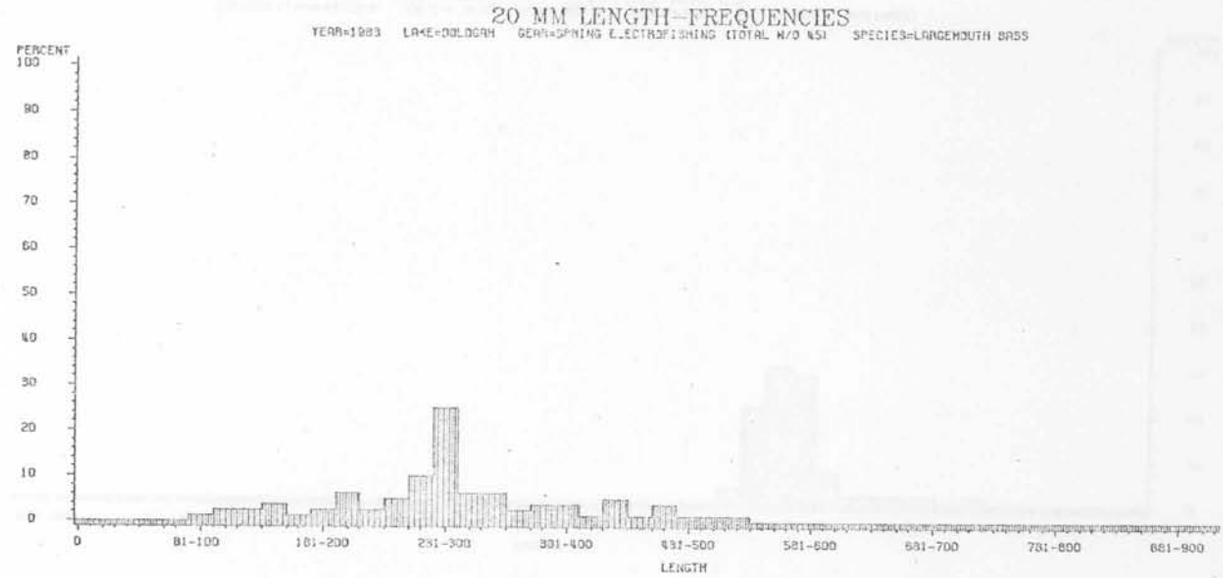
t denotes values less than 0.01

Table 5. Proportional and relative stock density indices from selected species collected by spring electrofishing from Oologah Reservoir 1981-1983.

Species	N	Number			PSD	RSD
		Stock	Quality	Trophy		
Largemouth Bass						
1981a	210	147	102	60	69	41
1982	182	92	77	44	84	48
1983	80	69	30	15	43	22
Bluegill						
1981a	252	216	24	0	11	0
1982	345	240	26	0	11	0
1983	267	246	22	0	9	0
Gizzard Shad						
1981	397	177	0	0	0	0
1982	278	170	0	0	0	0
1983	540	247	0	0	0	0

a data from Hicks 1981

Figure 1. Length frequencies of largemouth bass and spotted bass collected by spring electrofishing from Lake Oologah, 1983.



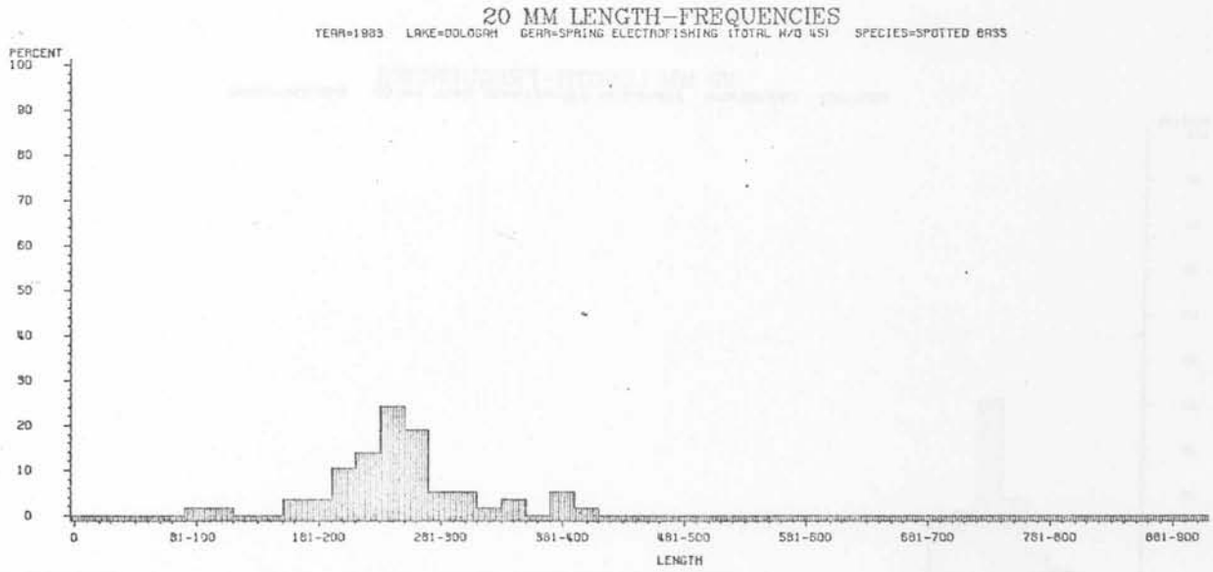


Figure 2. Length frequencies of white crappie and bluegill collected by spring electrofishing from Lake Oologah, 1983.

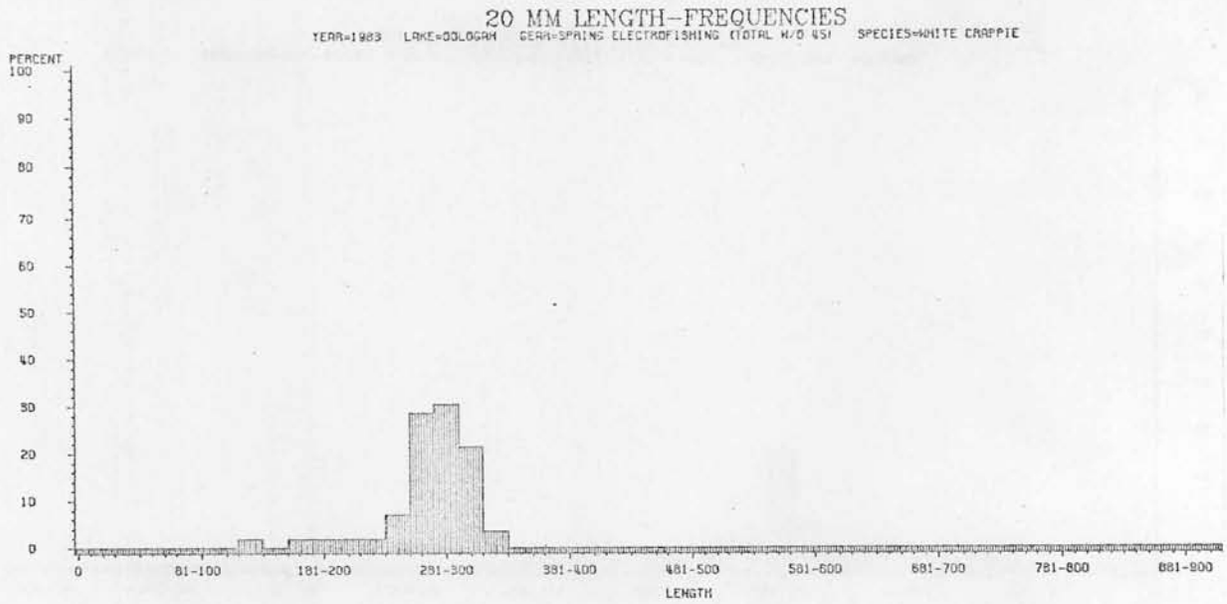
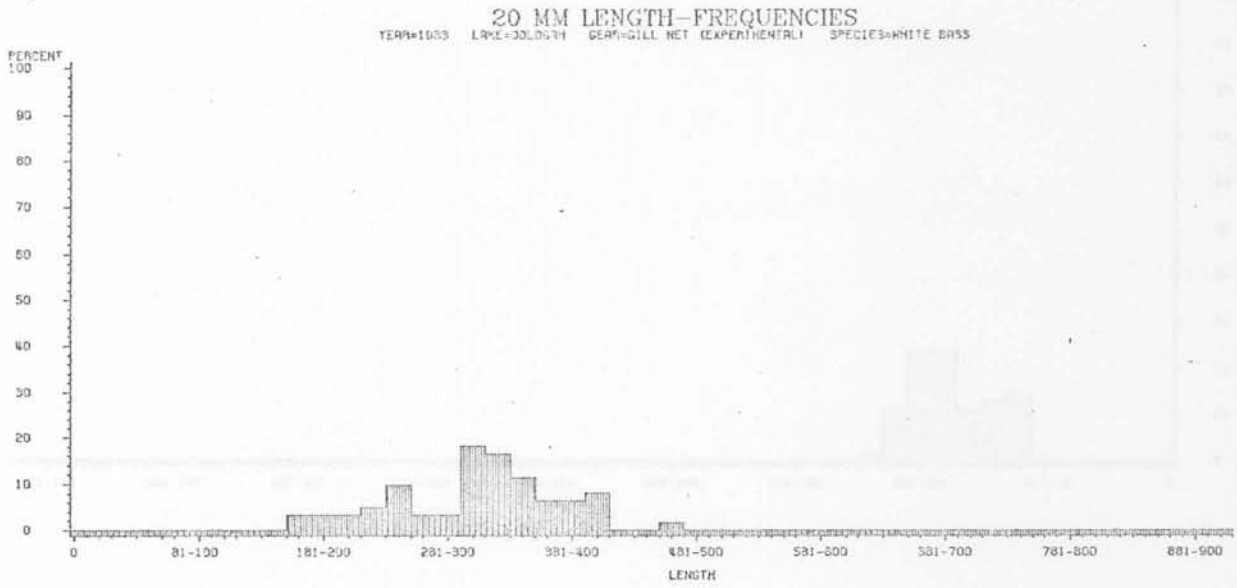


Figure 3. Length frequencies of white bass and channel catfish collected by gill netting from Lake Oologah, 1983.



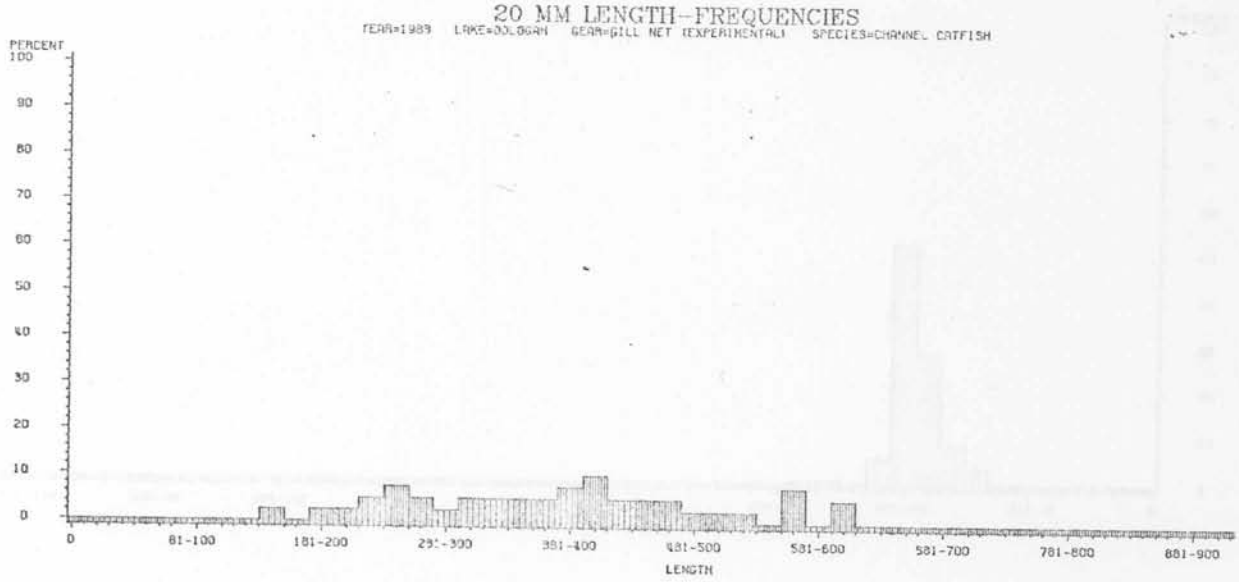
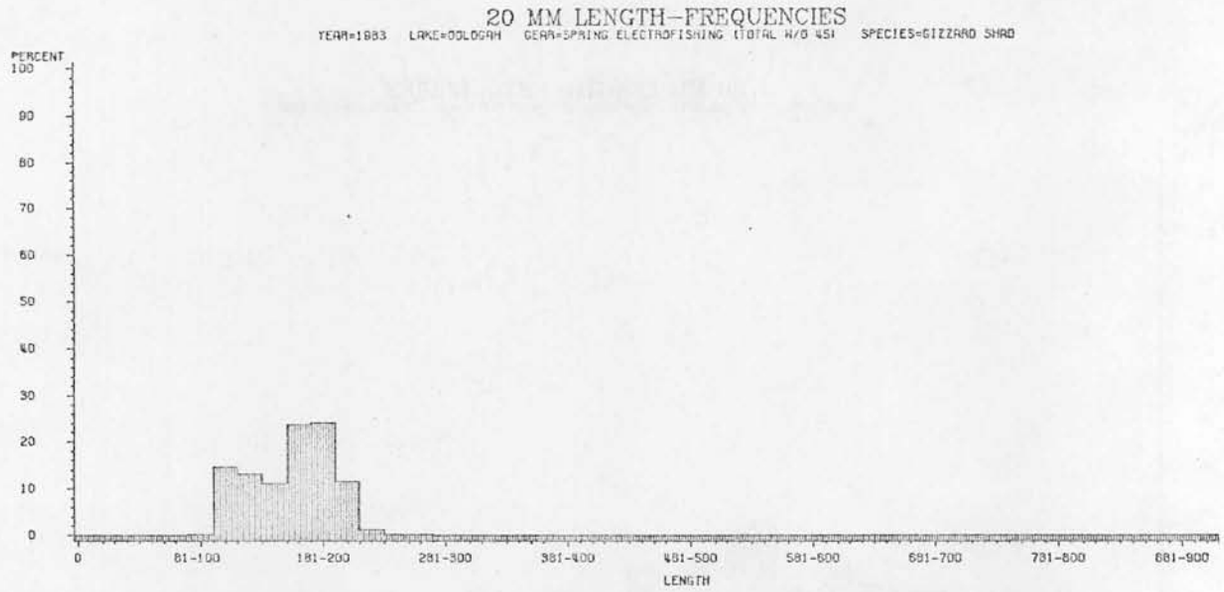


Figure 4. Length frequencies of gizzard shad collected by spring electrofishing and gill netting from Lake Oologah, 1983.



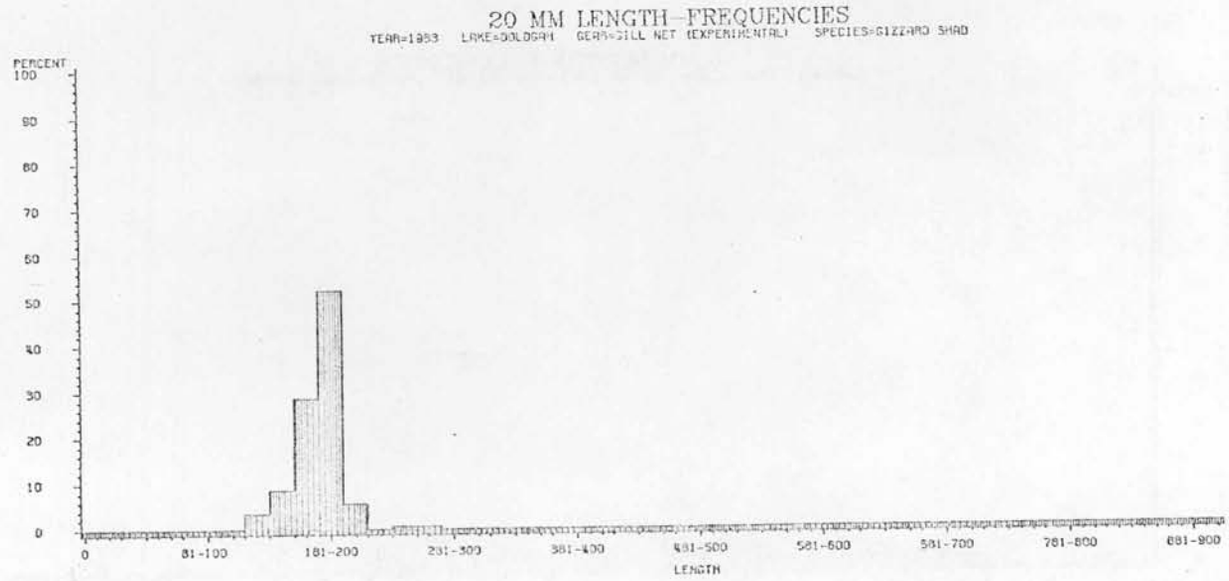


Figure 5. Plot of mean relative weights by length group for fish collected from Lake Oologah during 1983.

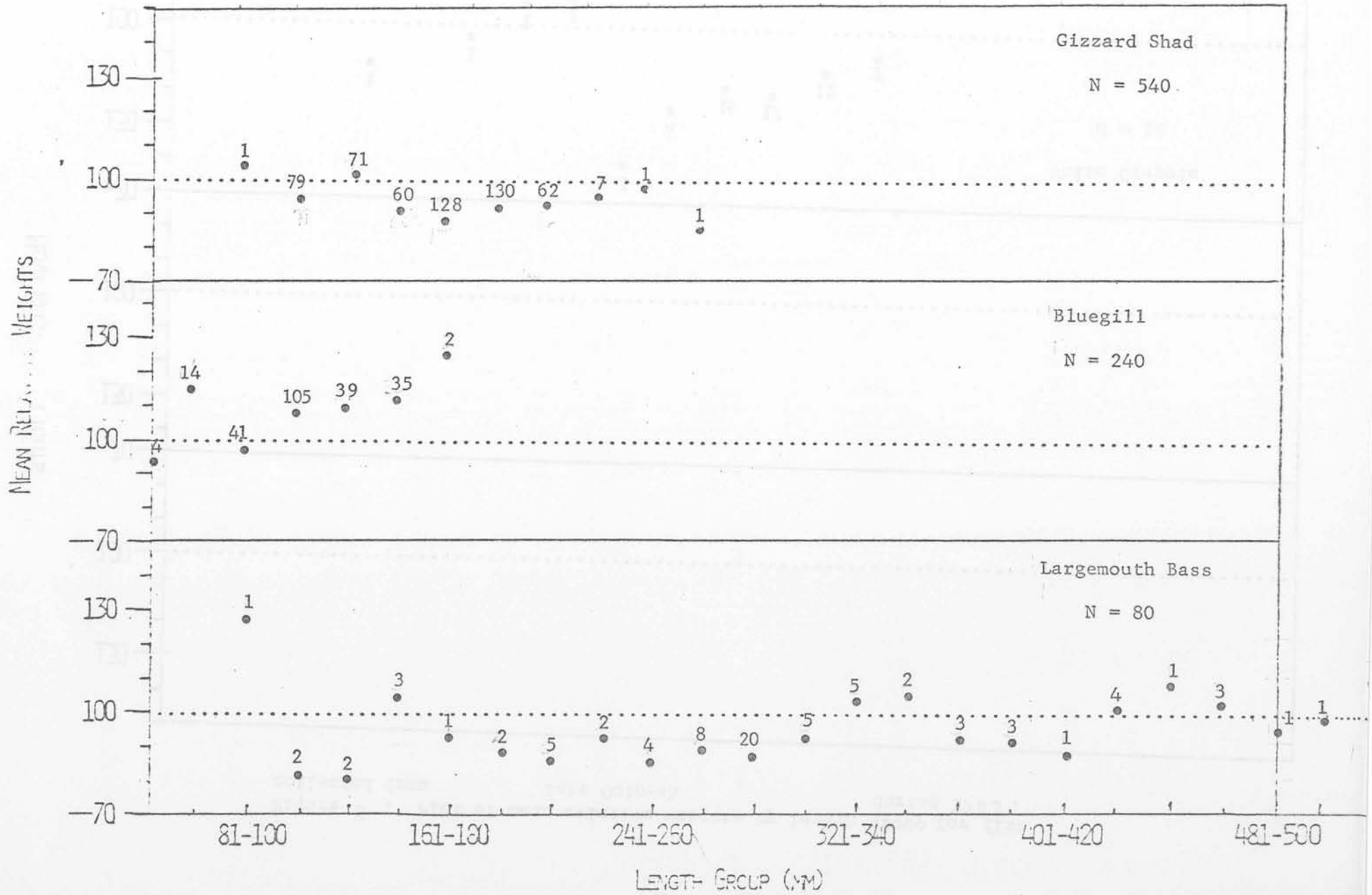
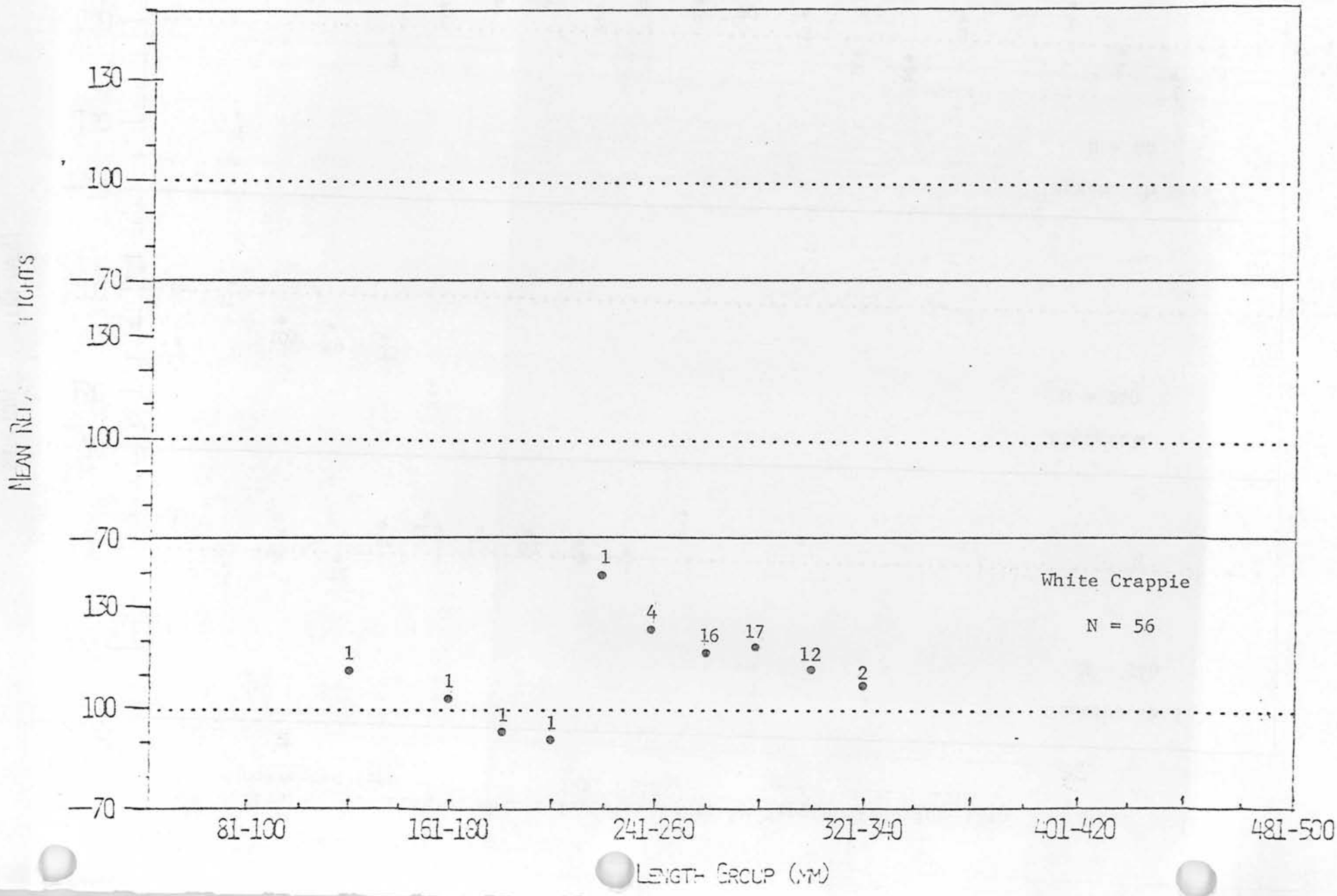



Figure 6 . Plot of mean relative weights by length group for fish collected from Lake Oologah during 1983 .