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SURVEY REPORT

OKLAHOMA FISHERIES MANAGEMENT PROGRAM

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

SALLY JONES LAKE

1982

Job Performance Report

Oklahoma Fisheries Management Program

Federal Aid Project No. F-38-R-5

Fish Management Surveys and Recommendations

for

Sally Jones Lake

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Job Performance Report

State: Oklahoma Project No.: F-38-R-5

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations - Sally Jones Lake

Period Covered: January 1, 1982 - December 31, 1982

ABSTRACT

Fish population data were collected on Sally Jones Lake in 1982 according to the guidelines outlined in "Standardized Sampling Procedures for Lake and Reservoir Management Recommendations". Findings indicated low bass population density, satisfactory young/adult ratio and very high relative stock density (RSD_{15}). The spring PSD value for bluegill was 12 %, down from 27 % found in 1980 and below the recommended range. Gizzard shad relative population density in 1982 was considerably lower than the 1980 value.

Larger sample sizes for crappie and catfish species will be necessary to more accurately evaluate population status. Recommendations included stocking 5,000 largemouth bass fingerlings to supplement the satisfactory young to adult ratio and a water manipulation plan. Since Sally Jones Lake fluctuates along with Kerr Lake, a water level manipulation plan on Kerr should also benefit Sally Jones.

INTRODUCTION

Sally Jones Lake is a 101 ha oxbow that was formed years ago from the Arkansas River. The lake lies within the boundaries of the Sequoyah National Wildlife Refuge, and is located three miles south of Vian, in Sequoyah County. It is a very popular lake for local anglers, waterfowl hunters and tourists who visit the Refuge. The lake is shallow with an average depth of four feet, turbid and heavily wooded. There are no developed facilities except for a few cleared access points for fishing and two gravel boat launching areas. The water level fluctuates with Robert S. Kerr Lake as the lake is connected to Kerr by a narrow densely wooded channel running from the east side of Sally Jones to Vian Creek just east of the refuge headquarters. The lake lies within a bottomland area known locally as the "Sandtown Bottoms".

Northeast Region fisheries personnel surveyed Sally Jones Lake in 1980 and their findings indicated a low bass population density, unsatisfactory young/adult ratio, very high spring proportional stock density (PSD) and apparent recruitment problems. Therefore, 21,250 fingerling largemouth bass were stocked in May 1981. Eastcentral Regional fisheries personnel surveyed Sally Jones Lake in April, May, August and October 1982, according to guidelines outlined in "Standardized Sampling Procedures for Lake and Reservoir Management Recommendations". Survey methods included electrofishing and water quality monitoring. Fisheries management recommendations are based on survey data collected.

MATERIALS AND METHODS

Shoreline seining was not attempted due to a lack of suitable sites and gill netting was not attempted due to shallow water conditions. Spring electro-

fishing was conducted on 20 April, 4 and 25 May and fall electrofishing was conducted on 14 October. Personnel used alternating current with a Power Guard 5000 Watt, 60 cycle 120/240 Volt AC generator and a Coffelt Model-10 variable voltage pulsator. Water quality monitoring was conducted on 11 August, using a portable DR-EL/2 Hach water quality kit and conductivity meter.

Several indices were used to assess fish population structure and well being. Proportional stock density (PSD) measurements have been described by Anderson (1976), Anderson and Weithman (1978) and Novinger and Legler (1978). In a balanced bass-bluegill community preferred ranges of 20-40 % for bluegill and 40-60 % for largemouth bass populations. Where shad becomes the dominant prey 50-70 % is the preferred range for largemouth bass. Wege and Anderson (1978) described relative stock density (RSD); an RSD_{15} for bass reflects the percentage of stock size bass considered to be trophy fish. Young/Adult Ratio (YAR) measurements have been described by Reynolds and Babb (1978) and Anderson and Weithman (1978) as a convenient index for evaluation of the success of reproduction. A ratio of 1-3:1 is preferred for largemouth bass collected in the fall. Relative weight (W_r), described by Wege and Anderson (1978), has been used as a means of measuring fish condition. Mean relative weight values of 95-100 are preferred. Values less than 95 indicate intense competition for food, while values above 100 appear to indicate less than optimal relative population density.

RESULTS AND DISCUSSION

Largemouth Bass

Largemouth bass population density was low as shown by the low CPUE from

spring electrofishing of 1.06 (Table 1). The 1980 CPUE was 2.75 and the Eastcentral Regional CPUE average of 3.95 (Table 2) were both considerably higher. Structure of the population consisted primarily of larger size individuals (Figure 1), mean weight of 878 g which remained almost identical to the 880 g in 1980. The PSD decreased from 77 % in 1980 to 60 % and was within the recommended range of 50-70 % (Table 3). The RSD_{15} was also 60 % and indicated the population had a high percentage (52.9 %) of trophy size bass (over 380 mm).

Condition of the population appeared good with only slight forage problems in the majority of size groups according to relative weights (Figure 4). Bass over 241 mm long appeared to be in the most favorable condition.

Age 0 largemouth bass were collected in fall electrofishing samples and indicated that reproduction occurred. The length frequency mode from fall electrofishing (Figure 2) was 101-120 mm with 26.3 % of the total catch, and although the CPUE of 2.11 decreased from the 1980 CPUE of 3.11 the high percentage of YOY indicated a satisfactory year-class. The YAR was 2 and within the recommended range of 1-3:1.

Crappie

Both white and black crappie were sampled by spring and fall electrofishing. Few numbers were caught, but black crappie appeared to be the dominant species in Sally Jones Lake. The CPUE of 1.19 and 1.22 (Table 1) for spring and fall electrofishing were above the Eastcentral Regional average (Table 2). White crappie were below average by both methods. Condition of both white (Figure 5) and black (Figure 6) crappie was good with relative weight generally above 100, but population density appeared to be less than optimal.

Bluegill Sunfish

Population density of bluegill was low as shown by low CPUE from spring electrofishing of 3.25 (Table 1). The 1980 CPUE of 17.00 and the Eastcentral Regional CPUE average of 8.25 were both considerably greater. The PSD of 12 % dropped below the recommended range of 20-40 % and below the 1980 PSD of 27 % (Table 3). Structure of the population shifted towards intermediate size bluegill. Recruitment into stock size increased while quality size recruitment decreased (Figure 3). The 141-160 mm size group was missing from the sample.

No forage problems existed for bluegill as the relative weight (Figure 7) of all size groups was above 100 and condition appeared good but the relative population density was less than optimal.

Gizzard Shad

Gizzard shad spring electrofishing CPUE was 12.06 (Table 1), a decrease from the 1980 CPUE of 17.75, and was also lower than the Eastcentral Regional CPUE average of 17.37 (Table 2).

The population structure remained basically the same with high relative density of 161-200 mm size groups with 65 % of the total catch in 1980, and 72 % in 1982 (Figure 3). The mean weight decreased slightly from 49 g to 45 g. Condition of gizzard shad appeared to be good with 201 mm and above length group to have a less than optimal population densities (Figure 8).

Water Quality

Water quality monitoring on 11 August indicated no thermal stratification (Table 4). Dissolved oxygen was found to be adequate for fish survival from

the surface to the bottom. Conductivity and pH measurements were similar to those encountered at nearby Robert S. Kerr Lake.

RECOMMENDATIONS

Stocking

Survey findings indicated large sized but low bass population densities, satisfactory fall YAR (2:1), and a high spring RSD_{15} (60 %) measurement which indicates a disproportionate number of larger sized individuals. To rectify these problems, stocking of 25,000 largemouth bass fingerlings is recommended in 1983; an early stocking will permit the bass to maintain an edge on prey fish growth, and perhaps increase survival of stocked fish. Increased survival of young fish should improve recruitment, bass population density, and the population structure.

Water Level Manipulation

Because Sally Jones Lake fluctuates with Kerr Reservoir, a water manipulation on Kerr would also benefit Sally Jones. A spring water level management plan would prevent dewatering bass nests and increase reproductive success.

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LITERATURE CITED

Anderson, R. O. 1976. Management of small warmwater impoundments. Fisheries 1(6):5-7, 26-28.

_____; A. S. Weithman. 1978. The concept of balance for coolwater fish populations. Pages 371-381 in R. L. Kendall, ed. Selected coolwater fishes of North America. Am. Fish. Soc. Spec. Publ. No. 11.

Novinger, G. D., and R. E. Legler. 1978. Bluegill population structure and dynamics. Pages 37-49 in G. D. Novinger and J. G. Dillard, eds. New approaches to the management of small impoundments. N. Central Div., Am. Fish. Soc. Spec. Publ. No. 5.

Reynolds, J. B., and L. F. Babb. 1978. Structure and dynamics of largemouth bass populations. Pages 50-60 in G. D. Novinger and J. G. Dillard, eds. New approaches to the management of small impoundments. N. Central Div., Am. Fish. Soc. Spec. Publ. No. 5.

Wege, G. W., and R. O. Anderson. 1978. Relative Weight (W_r): A new index of condition for largemouth bass. Pages 79-91 in G. D. Novinger and J. G. Dillard, eds. New approaches to the management of small impoundments. N. Central Div., Am. Fish. Soc. Spec. Publ. No. 5.

Table 1. Total number (N), weight and catch per unit effort for fishes collected by electrofishing, Lake Sally Jones, Apr.-May and Oct. 1982.

Species	Effort	N	Weight (g) Total	Weight (g) Mean	Catch per 15 min No.	Catch per 15 min Wt.
Largemouth Bass						
Spring 1980	8	22	19362	880	2.75	2420
Spring 1982	16	17	14929	878	1.06	933
Fall 1980	9	28	16897	603	3.11	1877
Fall 1982	9	19	4170	219	2.11	463
White Crappie						
Spring 1980	8	10	2317	232	1.25	290
Spring 1982	16	13	5160	397	0.81	322
Fall 1980	9	16	1996	125	1.78	222
Fall 1982	9	4	173	43	0.44	19
Black Crappie						
Spring 1980	8	16	2280	143	2.00	285
Spring 1982	16	19	2650	139	1.19	166
Fall 1980	9	7	1253	179	0.78	139
Fall 1982	9	11	1185	108	1.22	132
Bluegill						
Spring 1980	8	136	6358	47	17.00	795
Spring 1982	16	52	2467	47	3.25	154
Gizzard Shad						
Spring 1980	8	142	7010	49	17.75	876
Spring 1982	16	193	8668	45	12.06	542

Table 2. E. C. Regional catch per unit effort averages by gear types (1977-1982).

Species	Spring Electrofishing		Fall Electrofishing	
	N	Catch per 15 min	N	Catch per 15 min
Largemouth Bass	1247	3.95	939	4.45
Spotted Bass	72	1.29	---	----
Black Bass (Combined)	---	----	---	----
White Crappie	456	1.48	125	0.73
Black Crappie	126	0.42	134	0.78
Crappie Spp. (Combined)	---	----	---	----
White Bass	---	----	---	----
Striped Bass	---	----	---	----
Walleye	---	----	---	----
Sauger	---	----	---	----
Channel Catfish	---	----	---	----
Blue Catfish	---	----	---	----
C. and B. Catfish (Combined)	---	----	---	----
Bluegill	2005	8.25	705	11.95
Flathead Catfish	---	----	---	----
Gizzard Shad	2588	17.37	439	9.54
Threadfin Shad	4	0.11	---	----
G. and T. Shad (Combined)	---	----	---	----
Inland Silversides	---	----	---	----
Brook Silverside	---	----	---	----
Notropis Spp.	---	----	---	----
Pimephales Spp.	---	----	---	----

Table 3. Proportional stock density (PSD) and relative stock density (RSD) measurements for selected species collected by electrofishing from Sally Jones Lake.

Species		No. Individuals	No. Stock Size	PSD	RSD_{15}
Largemouth Bass					
Spring	(1980)	22	22	77	50
Spring	(1982)	17	15	60	60
Fall	(1980)	28	19	63	53
Fall	(1982)	19	10	40	10
Bluegill					
Spring	(1980)	136	124	27	--
Spring	(1982)	52	50	12	0

Table 4. Water quality data collected from Sally Jones Lake during 1982.

Station: W1

Date: 11 August 1982

Secchi (in): 18

Depth (m)	Temp (C)	DO (mg/l)	pH	Conduct (micromhos/cm)
S	30.0	7.1	8.5	525
1	28.5	5.8		
B	28.5	4.7	8.5	500

Figure 1 Length frequency of fishes collected by Electrofishing Lake Sally Jones April-May 1980 and 1982.

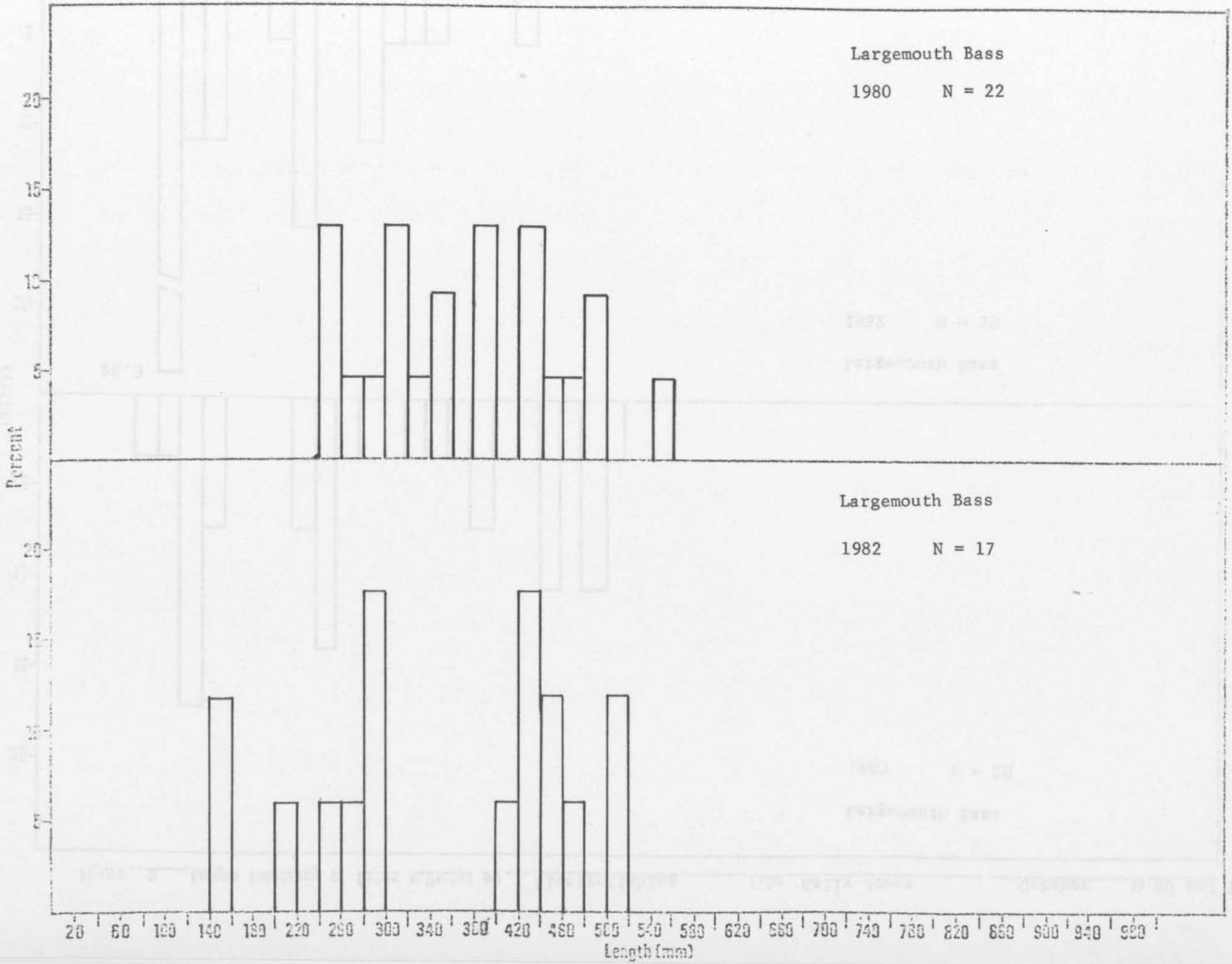

Figure 2 Length frequency of fishes collected by Electrofishing Lake Sally Jones October 19 80 and 1982.

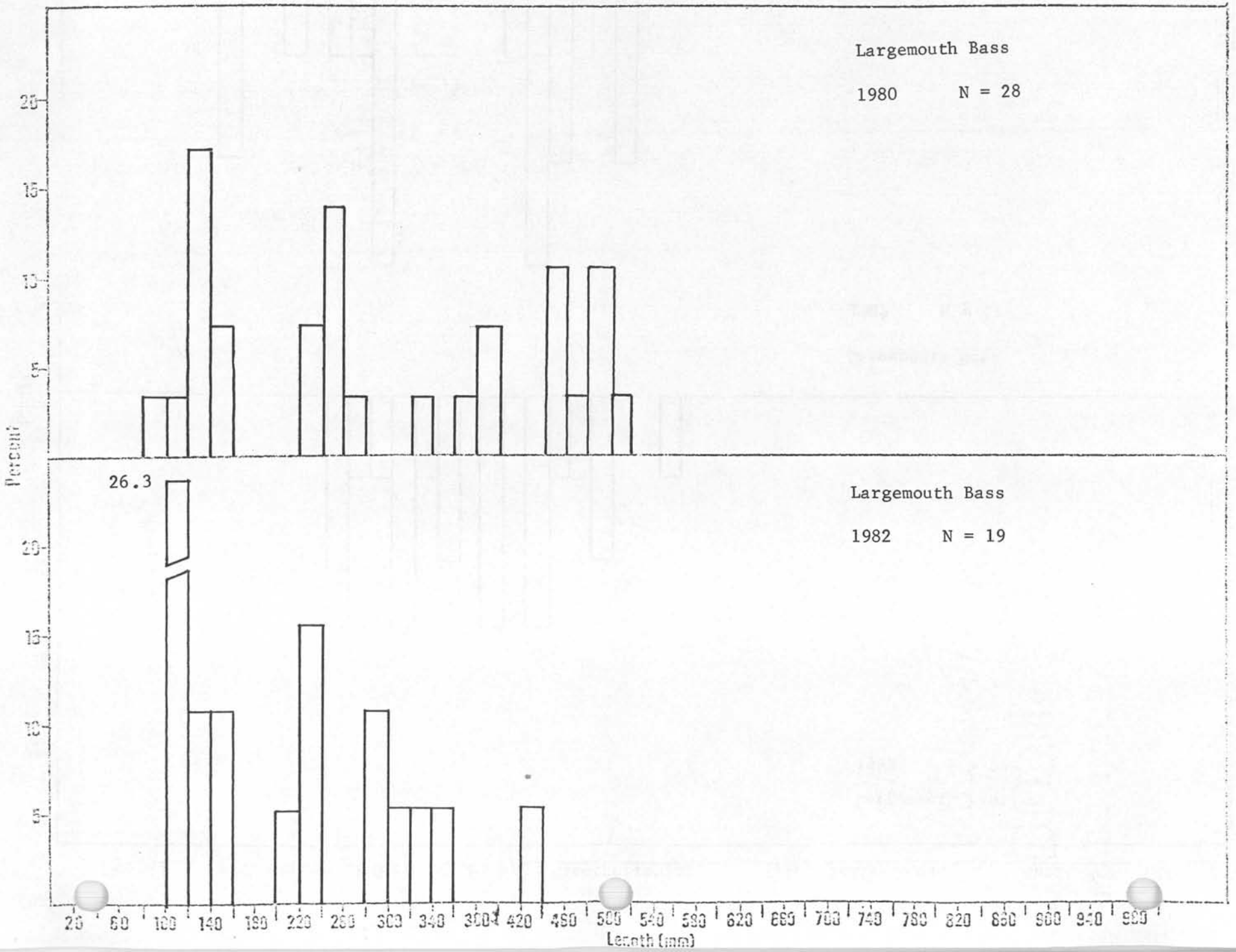

Figure 3. Length frequency of fishes collected by Electrofishing Lake Sally Jones April-May 19 80-1982

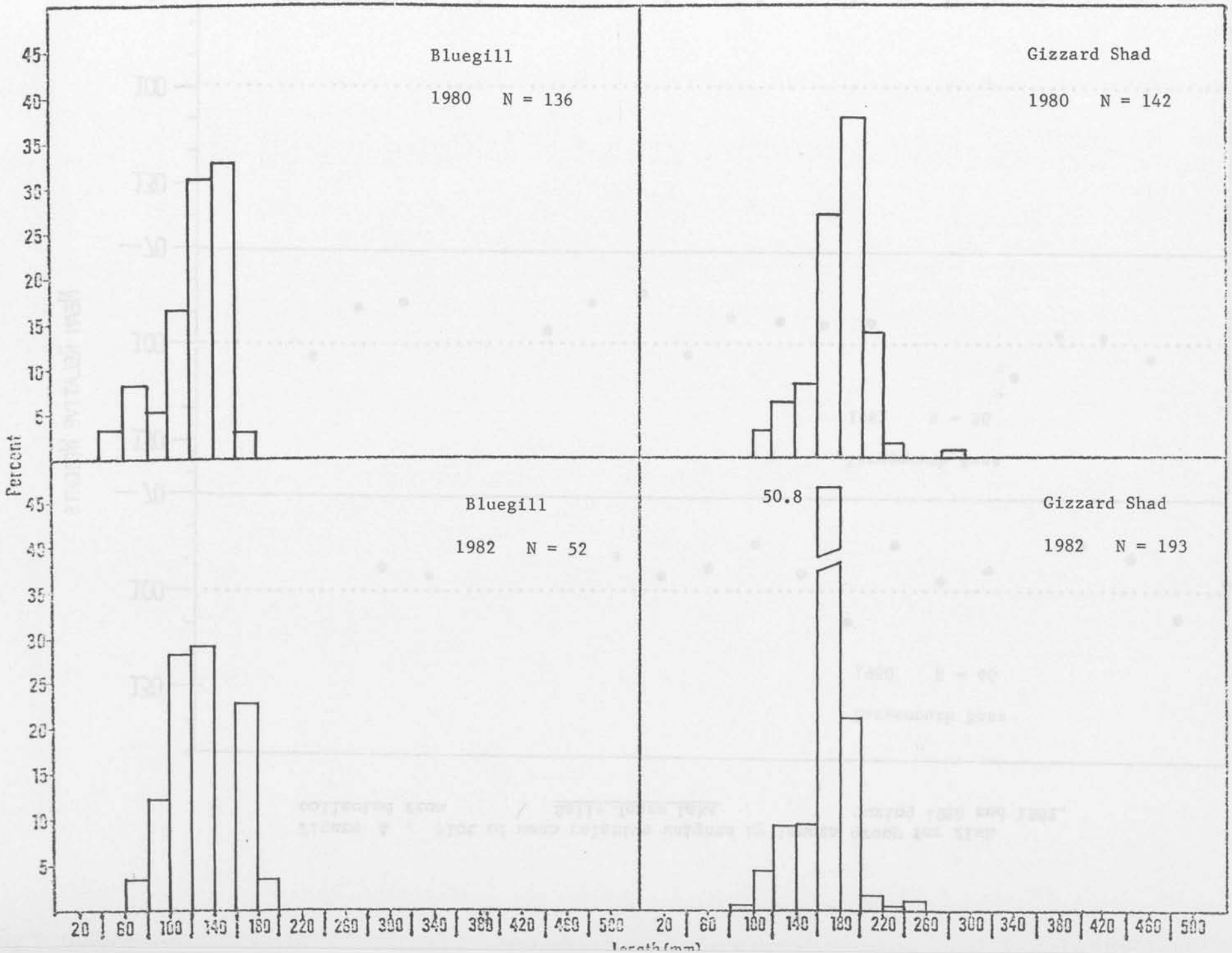

Figure 4 . Plot of mean relative weights by length group for fish collected from Sally Jones Lake during 1980 and 1982.

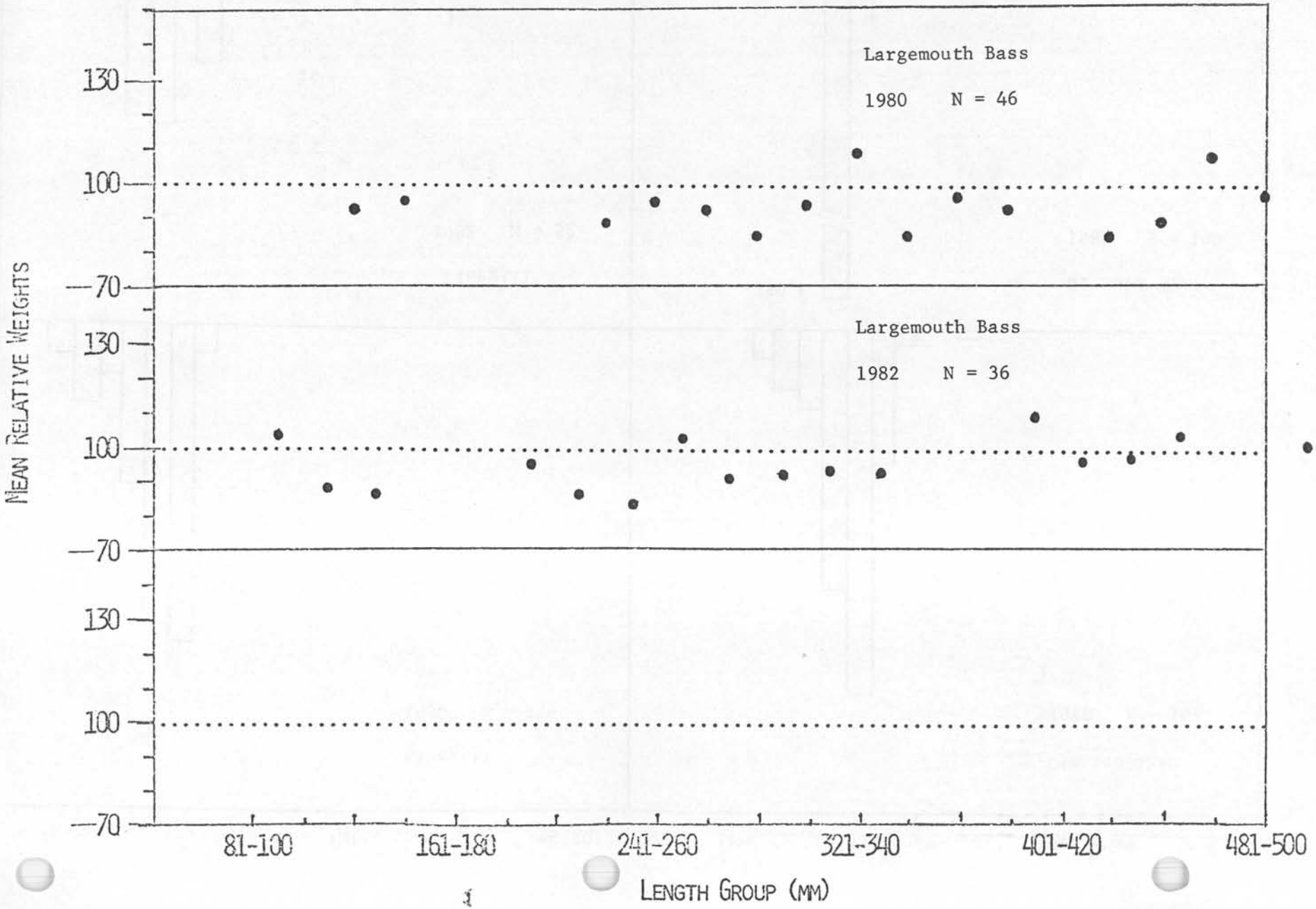

Figure 5 . Plot of mean relative weights by length group for fish collected from Sally Jones Lake during 1980 and 1982.

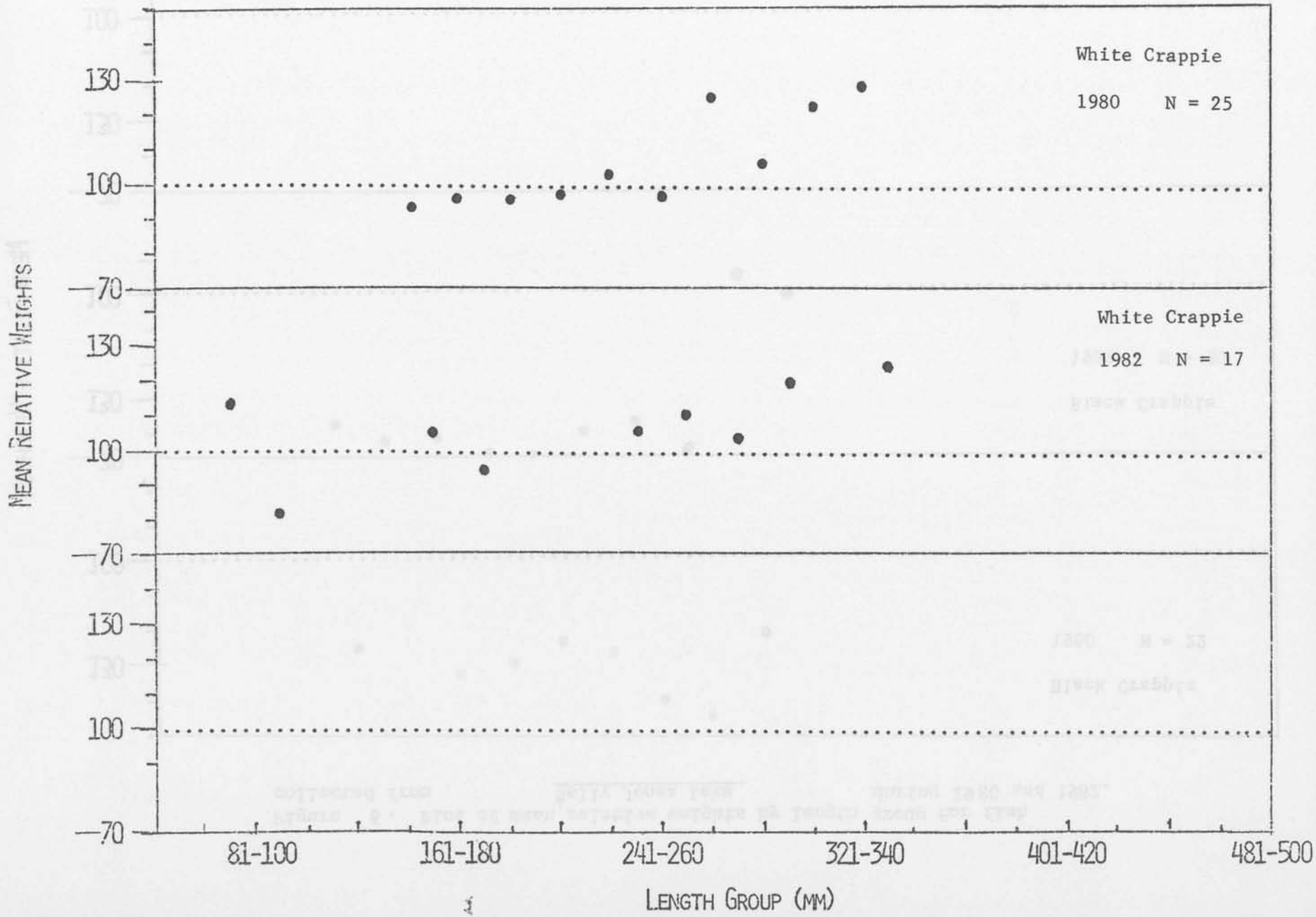

Figure 6. Plot of mean relative weights by length group for fish collected from Sally Jones Lake during 1980 and 1982.

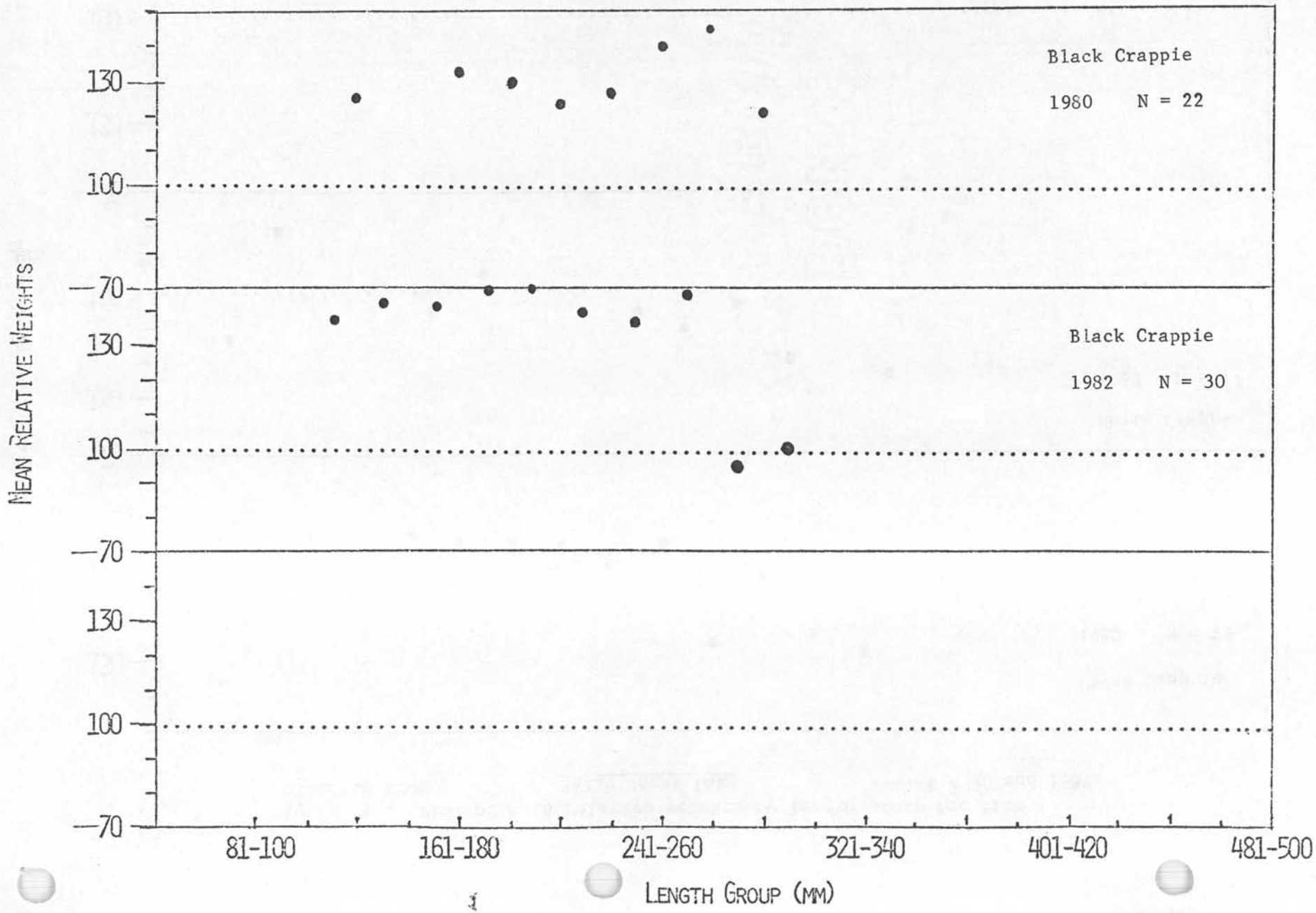

Figure 7. Plot of mean relative weights by length group for fish collected from Sally Jones Lake during 1980-1982.

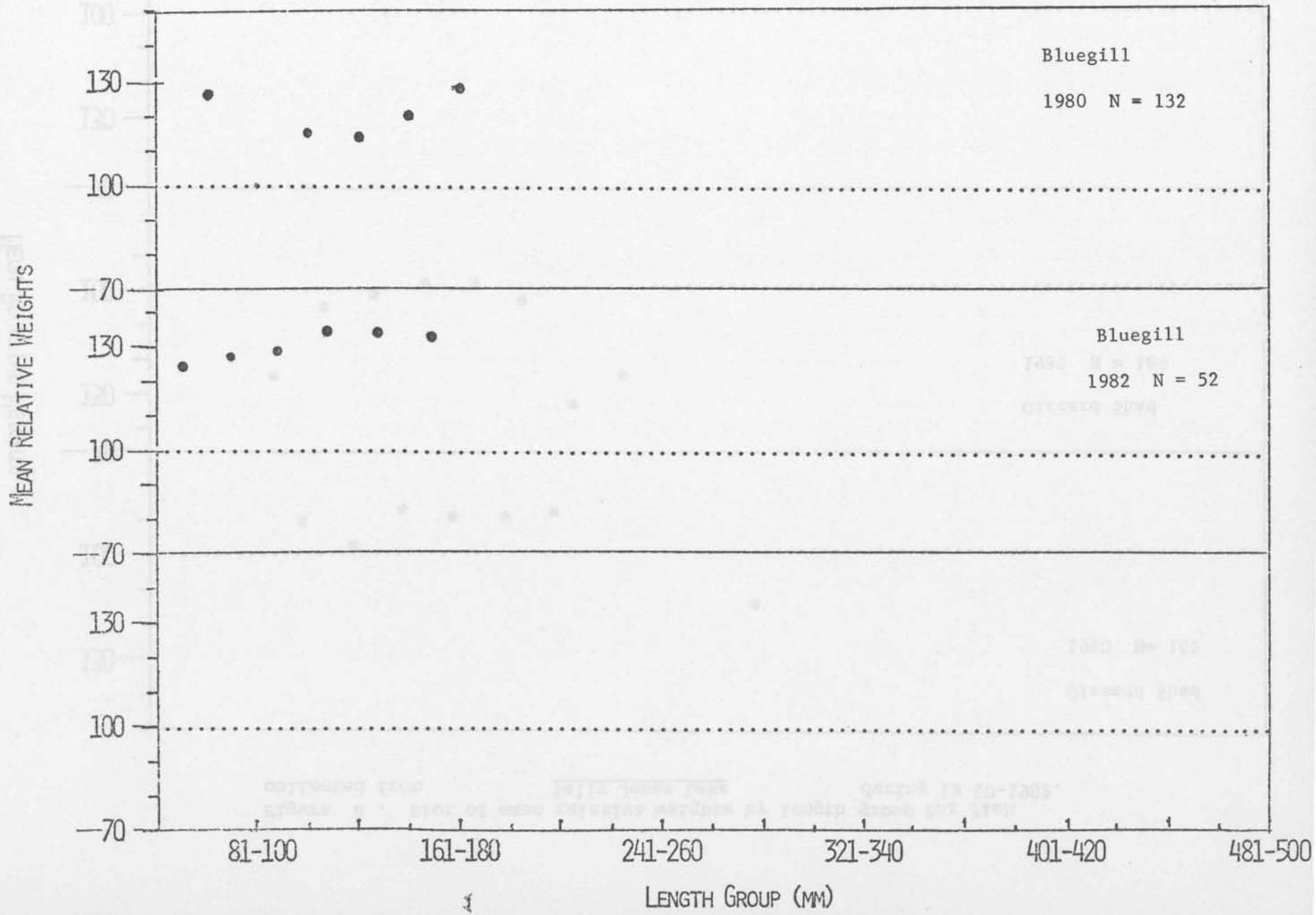
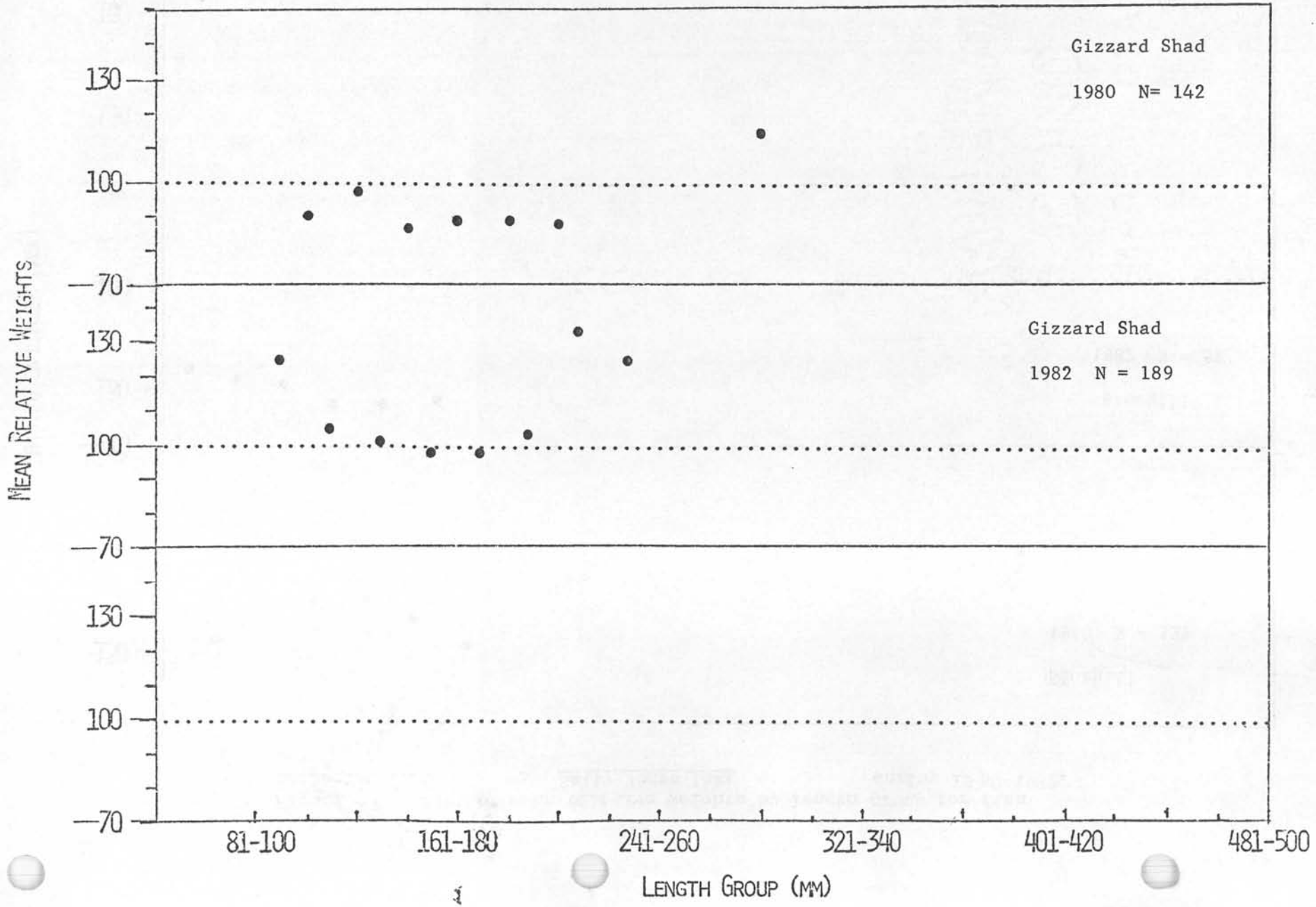
Figure 8 . Plot of mean relative weights by length group for fish collected from Sally Jones Lake during 19 80-1982.