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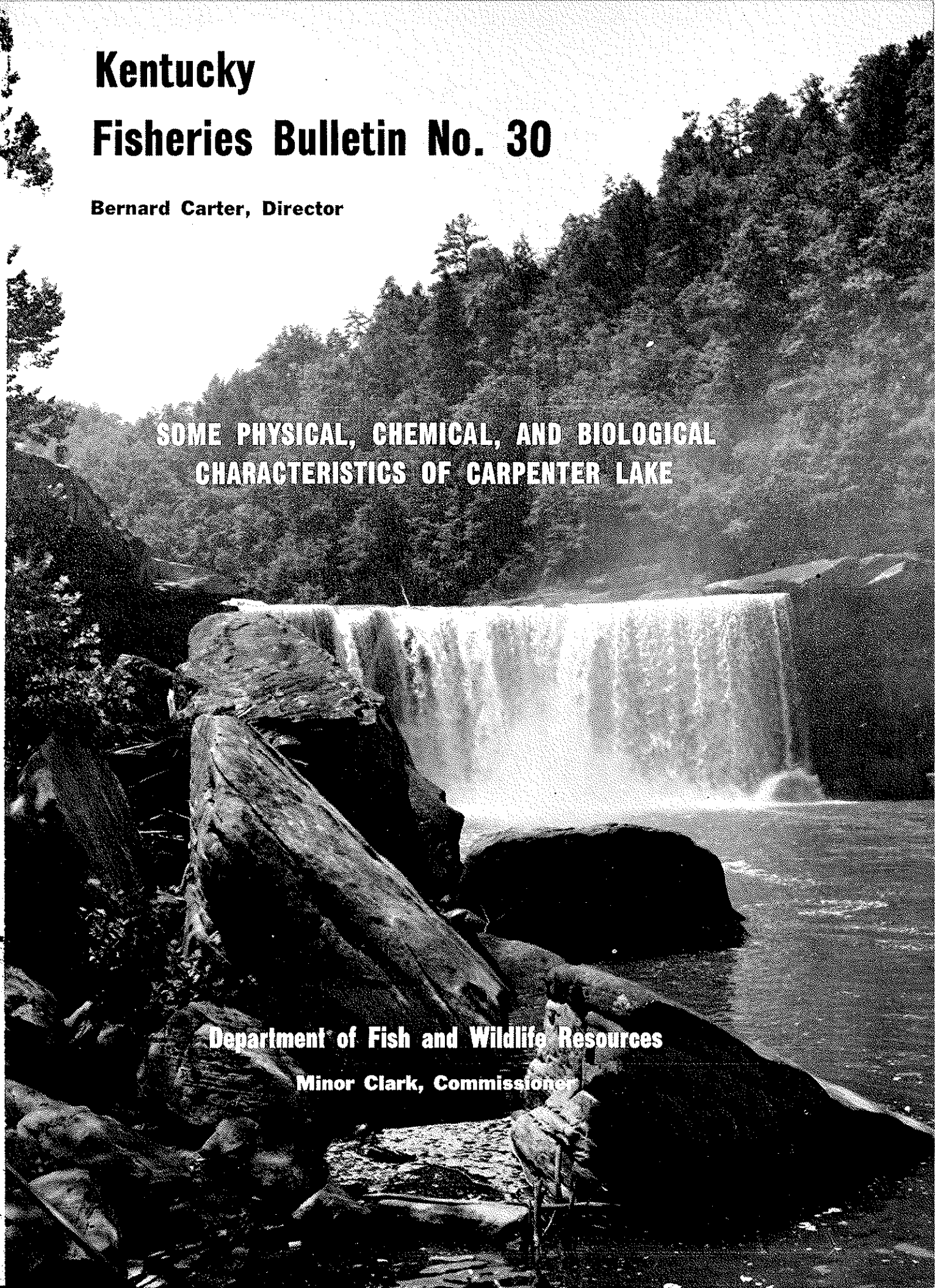
Bernard Carter, Director



SOME PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS OF CARPENTER LAKE

Department of Fish and Wildlife Resources

Minor Clark, Commissioner

SOME PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS OF CARPENTER LAKE

By

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ABSTRACT

Physical, chemical, and biological studies were conducted on Carpenter Lake from 1960 through 1963.

A bathymetric map of the lake is presented. Other physical data are given which include surface area, miles shoreline, volume, and mean and maximum depth. Mean monthly temperature profiles are presented. Stratification was evident by mid-May, at which time the thermocline was located between 6 and 19 feet. Fall circulation was complete by November, when a homothermic condition was found.

Mean monthly dissolved oxygen profiles show this variable to be present above 3.6 ppm, to a depth of 10 feet, during all sampling periods. It became void in the lower depths during July, August, and September. Ranges for total alkalinity, total phosphates, pH, and free carbon dioxide are given.

Aquatic vegetation studies showed that dense beds of the curly pondweed, Potamogeton crispus *L., were produced in 1960. An average of 73 stems per square foot of sampled area were found.*

Population studies indicated a decreasing fish population. The standing crop dropped from 271.5 pounds per acre in 1960 to 88.4 pounds per acre in 1963. The largemouth bass and bluegill spawned each year from 1960 through 1963. The magnitude of the spawn varied from year to year but did not always relate to the density of the standing crop, which may have acted as a suppressent in 1960.

The creel survey studies showed an increasing harvest from 32.1 pounds per acre in 1960 to 69.8 pounds per acre in 1963. No channel catfishes were recorded in the survey during the four years of study.

INTRODUCTION

Carpenter Lake is a shallow 68-acre impoundment located in Daviess County, approximately 10 miles northeast of Owensboro, in the Western Coalfield Physiographic Region of the state. The lake was built in 1936 and opened to fishing in 1938. This report includes the results of the physical, chemical, and biological studies conducted from 1960 through 1963. The physical and chemical studies were conducted from 1960 through 1962, aquatic vegetation studies in 1960, fish population studies from 1960 through 1963, and the creel survey studies from 1960 through 1963. The fish stocking record was as follows:

Date	Species	Size	Number
10/22/41	Largemouth bass	5"	1,000
10/24/46	Crappie	Adult	175
10/24/46	Bluegill	Adult	35
7/21/48	Largemouth bass	——	2,000
8/12/48	Largemouth bass	4"	300
8/5/53	Largemouth bass	2 - 3"	3,600
10/7/54	Redear sunfish	——	3,000
8/5/55	Largemouth bass	Fingerling	1,500
9/18/56	Redear sunfish	1 - 2"	1,000
5/30/58	Largemouth bass	1 1/2"	15,000
10/7/59	Channel catfish	Fingerling	7,000
12/15/60	Channel catfish	3"	3,000
11/1/61	Largemouth bass	4 - 5"	1,000
11/15/61	Channel catfish	3 - 5"	1,000
10/9/62	Channel catfish	3 - 4"	3,000
11/7/63	Channel catfish	4"	2,000
9/1/64	Channel catfish	3"	1,700
8/2/65	Channel catfish	6 - 8"	2,000
9/6/66	Channel catfish	5 - 12"	3,400

METHODS

Physical

The basic outline of the bathymetric map presented in Figure 1 was made from an aerial photograph. The depths and contour intervals were determined using a Raytheon echo sounder.

Temperature profiles were recorded monthly with a Whitney thermometer, near the dam at the point of greatest depth. Temperatures were taken in one-foot decrements and recorded at every 0.5° F. change.

Chemical

Dissolved oxygen profiles were determined monthly using the modified Winkler method. Samples for this characteristic were collected every 5 feet to a depth of 20 feet, and every 10 feet to the bottom.

Total alkalinity, pH, free carbon dioxide, and available phosporous determinations were made from monthly samples collected as described above. The amount of free CO_2 present was determined by nomograph using known quantities of pH and alkalinity. The values presented in this report are an

average of the results obtained from samples collected at the surface, middle, and near bottom. All sampling was done near the dam at the point of greatest depth.

Soil samples were taken from the watershed with a soil auger which sampled to a depth of six inches. These samples were taken in proportion to the amount of specific types of soils present in the watershed. Analyses of these samples were made by the University of Kentucky Soils Laboratory.

Biological

Population studies were conducted each year in pre-selected cove areas. These areas were measured to the nearest tenth of an acre using the plane table method. At approximately 7:00 a.m., a block net measuring 300' x 20' x 1" (bar measure) was placed across the mouth of the cove to be sampled. Emulsifiable rotenone (Chem-Fish Regular) was applied with a venturi-type boat bailer at the rate of 1 ppm (0.05 ppm actual rotenone). All fish that surfaced in the sample area within 60 hours were picked up, sorted to species, counted, measured to the nearest inch, and weighed.

A creel survey was conducted each year during the seven-month period from April through October. The survey was taken during pre-selected two-hour periods between 7:00 a.m. and 7:00 p.m. Each week, one weekday and one weekend day were sampled. The days and time periods sampled were rotated each week until the total time surveyed amounted to 58 days and included 2-hour periods for 6 Mondays, 6 Tuesdays, 6 Wednesdays, 6 Thursdays, 6 Fridays, 14 Saturdays, and 14 Sundays. A conservation officer conducted the survey. At the beginning of each survey period the officer boated completely around the lake and made a total count of all fishermen. After making the count he began interviewing fishing parties (a fishing party consists of one or more fishermen), trying first to contact two parties who had completed their trips for the day. After making or failing to make these contacts, the officer moved

around the lake interviewing fishing parties until he had boated completely around the lake, making sure that he stayed within the two-hour period. The survey was then complete for that day.

To insure that interviews were taken in all areas of the lake, the officer, after making the total count, began interviewing at the dam, moving one day to the left and the next to the right. The third and fourth days after making the count, he began interviewing at the farthermost point from the dam moving one day to the left and the next to the right. The fifth and sixth days he returned to the dam and repeated the procedure.

The data from the parties who were interviewed were projected to determine fishing pressure, catch, fishing methods, sex ratio, and numbers of resident and non-resident fishermen.

Aquatic vegetation studies were conducted to determine the location, extent, and density of all wholly aquatic vegetation and all obnoxious shoreline vegetation. The aquatic plant beds were located and measured. A Peterson dredge was used to take a random number of samples from each bed. These samples, which were approximately one foot square, were washed, weighed, and the number of stems counted. After ten of these samples had been so processed (to establish the average number of stems per pound), the remaining samples were washed and weighed only. These data were then projected to determine the number of stems for the entire weed bed.

Physical Characteristics

A bathymetric map of Carpenter Lake is presented in Figure 1. This lake has a maximum depth of 14.0 feet, a mean depth of 8.0 feet, 3.0 miles of shoreline, and a total volume of 564 acre feet. Table 1 gives the volume in gallons and cubic feet and the percent volume for each five-foot contour.

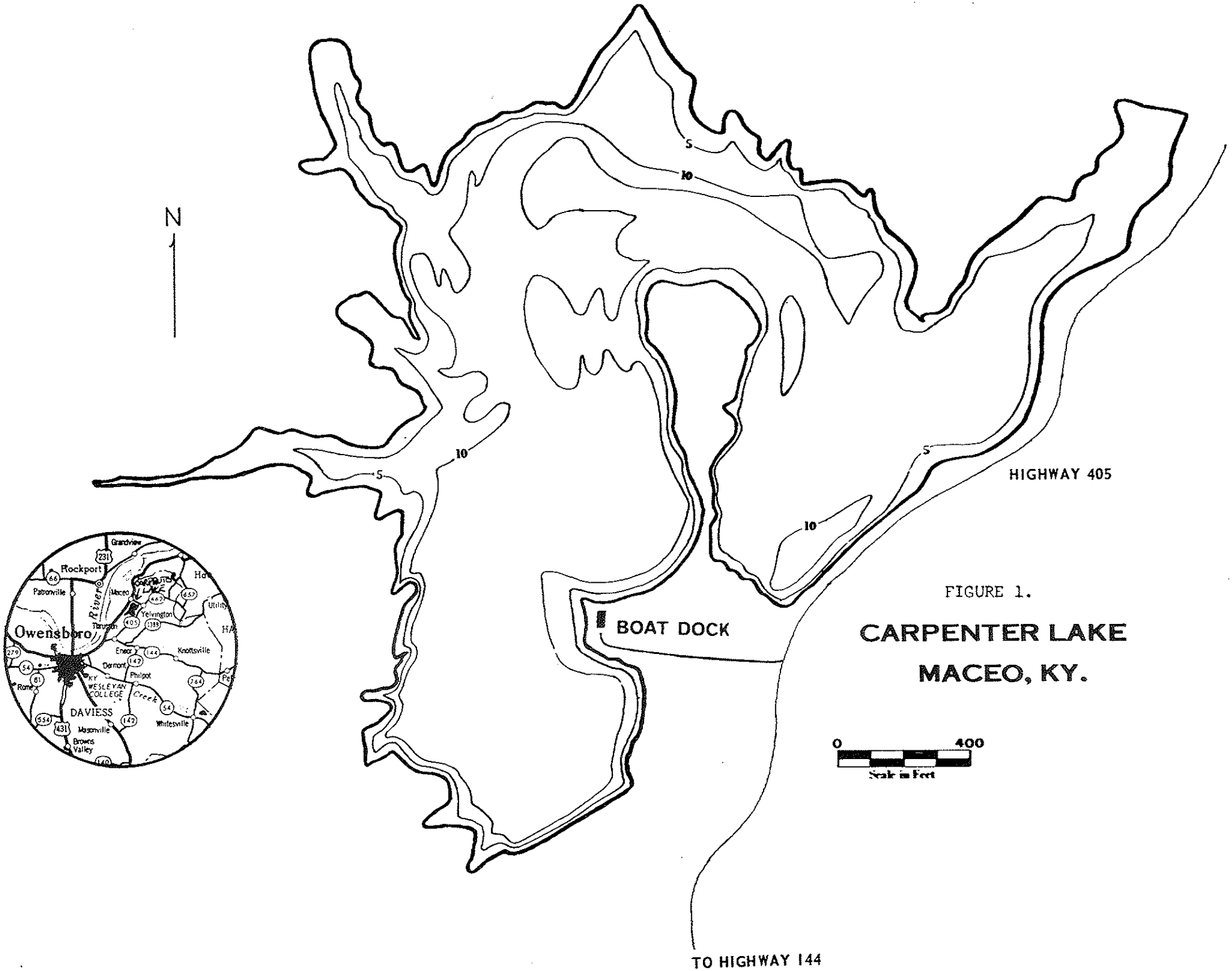


FIGURE 1.

CARPENTER LAKE
MACEO, KY.

Table 1. Percent volume of Carpenter Lake for each five-foot contour in gallons and cubic feet.

Depth	Volume		Percent volume
	Gallons	Cubic feet	
0 - 5'	101,012,986	13,504.410	55.0
5' - 10'	65,387,616	8,741,660	35.6
10' - 14'	17,271,940	2,309,083	9.4

Temperature

The values given in Table 2 are a monthly average of temperatures taken once each month for four years (1960-1963). Stratification usually became evident during mid-May at which time the thermocline extended from 5 to 10 feet. The upper limit of this stratum maintained its position until August, after which it began to dissipate, Table 2. The lower limits gradually moved downward, reaching 13 feet in August, after which fall circulation occurred. Stratification in shallow lakes such as Carpenter is more easily broken up than in the deeper ones. Consequently, the lake was thoroughly mixed by late October.

Chemical Characteristics

The watershed of Carpenter Lake is comprised of pastureland and cultivated fields. An analysis of the soils from the watershed revealed a moderately acid condition, pH 5.8; a low amount of available phosporous, 3 pounds per acre; and a moderate amount of available potassium, 146 pounds per acre.

Oxygen

The mean dissolved oxygen profiles are given in Table 2 with the mean monthly temperature profiles. Dissolved oxygen was present in adequate amounts (above 3 ppm) for fish survival to a depth of 10 feet during all sampling periods. During the months of July, August, and September it became void below

Table 2. Mean temperatures and dissolved oxygen concentrations (ppm) for Carpenter Lake.

Depth in Feet	Jan. D.O.-°F	Feb. D.O.-°F	Mar. D.O.-°F	Apr. D.O.-°F	May D.O.-°F	June D.O.-°F	July D.O.-°F	Aug. D.O.-°F	Sept. D.O.-°F	Oct. D.O.-°F	Nov. D.O.-°F	Dec. D.O.-°F
0	13.9-37°	11.7-46°	12.6-46°	11.3-60°	9.7-78°	9.5-80°	9.9-84°	10.9-90°	8.6-79°	8.2-63°	10.9-47°	10.0-39°
5	14.3-39°	11.7-46°	12.2-47°	10.9-59°	10.4-73°	9.3-79°	9.8-79°	11.5-82°	8.1-76°	8.0-62°	11.0-47°	10.3-39°
10	13.8-40°	11.9-46°	12.3-47°	10.6-56°	7.8-65°	7.7-72°	5.2-72°	5.0-74°	3.6-74°	7.2-61°	10.8-47°	10.7-39°
15	- -40°	- -45°	- -47°	- -54°	5.4-60°	2.4-66°	0.0-64°	0.0-66°	0.0-70°	- -58°	10.8-47°	- -39°

Thermocline ----------

Oxygen Depletion Zone _____

10 feet and limited the survival of fish in that area. During the time period from October through April oxygen was present in adequate amounts all the way to the bottom. Mean surface concentrations fluctuated from a high of 13.9 ppm in January to a low of 8.2 ppm in October.

Alkalinity

Total alkalinity expressed as ppm $CaCO_3$ showed very little monthly or annual fluctuation from 1960 through 1962. Values ranged from a low of 67.0 ppm during May of 1961 to a high of 113.0 ppm during September of 1962.

Phosphates

The mean total phosphate concentrations fluctuated widely from month to month, and more than doubled from 1960 to 1962. Soil analysis indicated a low concentration of 3 pounds per acre available in the watershed. This low concentration, however, was not reflected by a low concentration in the lake. Bullock Pen Lake had a high watershed concentration of 182 pounds per acre and a mean lake concentration of only 0.06 ppm, while this lake had a watershed concentration of only 3 pounds per acre, but a higher mean lake concentration of 0.20 ppm. The fertility of this lake was not a reflection of its watershed.

pH

The monthly pH values taken during 1960 and 1961 ranged from a low of 7.0 to a high of 8.8. Analysis of the watershed soil indicated a pH of 5.8.

Free Carbon Dioxide

Mean monthly free CO_2 concentrations recorded in 1960 and 1961 ranged from a low of 0.0 ppm to a high of 18.0 ppm. Concentrations were highest during November and December and lowest during April, May and June.

Biological Characteristics

Aquatic Vegetation Studies

In 1960 Carpenter Lake supported dense beds of pondweed, *Potamogeton crispus* L. The lake was sampled on May 17, 18, and 19. The plants were found growing profusely in water to a depth of eight feet. Two hundred samples were taken from 48 percent of the total surface area of the lake. An average of 73 stems per square foot of sampled area were found. In addition to the pondweed, approximately five acres of the lake were covered with lotus, *Nelumbo lutea* (Wild.) Pers. This area was not sampled.

Fish Population Studies

In 1960, the first year of study revealed a standing crop of 271.5 pounds of fish per acre, Table 3. Of that weight, game fishes made up 10.7 percent, panfishes 87.3 percent, commercial fishes 1.6 percent, and forage fishes 0.4 percent. The high concentration of panfishes, comprised largely of harvestable-size bluegill, resulted in a high F/C ratio of 12.9 which was not considered good. There was no danger, however, of overpopulation and stunting due to the lack of predation. The heavy concentration of bluegill seemed to act as a suppressent, and as a result, the reproduction of all species was very light. The A_t value of 74.5 was the highest found in any lake since the beginning of the project in 1958.

The second year's investigations at Carpenter Lake (1961) revealed a different picture from 1960. The average total weight, 108.1 pounds per acre, was less than one-half that recovered in 1960 (Table 4). This was due to a heavy loss of fish over the dam. Torrential rains in that part of the state washed out a portion of the spillway, and the lake level was lowered approximately one foot.

Table 3. Average weight and number of fish per acre taken from Carpenter Lake during 1960 (2 studies).

SPECIES	FINGERLING SIZE			INTERMEDIATE SIZE			HARVESTABLE SIZE			TOTAL		% OF TOTAL	
	Range	No.	Wt.	Range	No.	Wt.	Min. in.	No.	Wt.	No.	Wt.	No.	Wt.
GAME FISH													
Largemouth bass	0-4	67	0.81	5-9	58	3.10	10	9	14.56	134	18.47	4.49	6.80
Black crappie	0-4	-	-	5-7	89	10.69	8	-	-	89	10.69	2.98	3.94
TOTAL		67	0.81		147	13.79		9	14.56	223	29.16	7.47	10.74
PANFISHES													
Warmouth	0-2	-	-	3-5	48	1.82	6	1	0.22	49	2.04	1.64	0.75
Bluegill	0-2	187	1.72	3-5	1046	40.95	6	997	143.27	2230	185.94	74.66	68.49
Green sunfish	0-2	70	0.34	3-5	44	2.23	6	2	0.28	116	2.85	3.88	1.05
Longear sunfish	0-2	-	-	3-5	93	6.11	6	15	1.89	108	8.00	3.62	2.94
Redear sunfish	0-2	-	-	3-5	77	6.26	6	154	31.82	231	38.08	7.73	14.03
TOTAL		257	2.06		1308	57.37		1169	177.48	2734	236.91	91.53	87.26
COMMERCIAL FISH													
Bullhead	0-4	2	0.04	5-8	9	1.42	9	7	2.81	18	4.27	0.60	1.57
TOTAL		2	0.04		9	1.42		7	2.81	18	4.27	0.60	1.57
							ABOVE FORAGE SIZE						
FORAGE FISH													
Misc. minnows	0-3	2	0.02	4-7	6	0.77	8	2	0.36	10	1.15	0.33	0.42
Topminnows	0-3	2	0.01	4-7	-	-	8	-	-	2	0.01	0.07	0.01
TOTAL		4	0.03		6	0.77		2	0.36	12	1.16	0.40	0.43
GRAND TOTAL		330	2.94		1470	73.35		1187	195.21	2987	271.50	100.00	100.00
% OF TOTAL		11.05	1.08		49.21	27.02		39.74	71.90	100.00	100.00		

Table 4. Average weight and number of fish per acre taken from Carpenter Lake during 1961 (2 studies).

SPECIES	FINGERLING SIZE			INTERMEDIATE SIZE			HARVESTABLE SIZE			TOTAL		% OF TOTAL	
	Range	No.	Wt.	Range	No.	Wt.	Min. in.	No.	Wt.	No.	Wt.	No.	Wt.
GAME FISH													
Largemouth bass	0-4	443	2.88	5-9	31	5.68	10	-	-	474	8.56	10.50	7.92
Black crappie	0-4	-	-	5-7	-	-	8	1	0.29	1	0.29	0.02	0.27
TOTAL		443	2.88		31	5.68		1	0.29	475	8.85	10.52	8.19
FOOD FISH													
Channel catfish	0-4	1	0.04	5-9	1	0.09	10	-	-	2	0.13	0.04	0.12
TOTAL		1	0.04		1	0.09		-	-	2	0.13	0.04	0.12
PANFISHES													
Warmouth	0-2	2	0.01	3-5	37	2.86	6	11	1.57	50	4.44	1.11	4.11
Bluegill	0-2	2257	7.98	3-5	1278	23.20	6	226	38.64	3761	69.82	83.32	64.60
Green sunfish	0-2	4	0.04	3-5	39	2.06	6	4	0.50	47	2.60	1.04	2.41
Longear sunfish	0-2	-	-	3-5	28	1.92	6	9	1.33	37	3.25	0.82	3.01
Redear sunfish	0-2	-	-	3-5	36	2.44	6	56	12.38	92	14.82	2.04	13.70
TOTAL		2263	8.03		1418	32.48		306	54.42	3987	94.93	88.33	87.82
COMMERCIAL FISH													
Bullhead	0-4	20	0.46	5-8	12	2.57	9	1	0.49	33	3.52	0.73	3.26
TOTAL		20	0.46		12	2.57		1	0.49	33	3.52	0.73	3.26
							ABOVE FORAGE SIZE						
FORAGE FISH													
Misc. cyprinids	0-3	12	0.08	4-7	3	0.27	8	1	0.29	16	0.64	0.35	0.59
Topminnows	0-3	1	0.01	4-7	-	-	8	-	-	1	0.01	0.03	0.01
TOTAL		13	0.09		3	0.27		1	0.29	17	0.65	0.38	0.60
GRAND TOTAL		2740	11.50		1465	41.09		309	55.49	4514	108.08	100.00	100.00
% OF TOTAL		60.70	10.64		32.45	38.02		6.85	51.34	100.00	100.00		

Table 5. Average weight and number of fish per acre taken from Carpenter Lake during 1962 (2 studies).

SPECIES	FINGERLING SIZE			INTERMEDIATE SIZE			HARVESTABLE SIZE				TOTAL		% OF TOTAL	
	Range	No.	Wt.	Range	No.	Wt.	Min. in.	No.	Wt.		No.	Wt.	No.	Wt.
GAME FISH														
Largemouth bass	0-4	430	5.42	5-9	153	14.90	10	14	11.29		597	31.61	40.12	33.88
TOTAL		430	5.42		153	14.90		14	11.29		597	31.61	40.12	33.88
FOOD FISH														
Channel catfish	0-4	-	-	5-9	1	0.07	10	-	-		1	0.07	0.07	0.08
TOTAL		-	-		1	0.07		-	-		1	0.07	0.07	0.08
PANFISHES														
Warmouth	0-2	1	0.01	3-5	25	1.51	6	10	1.54		36	3.06	2.42	3.28
Bluegill	0-2	139	0.68	3-5	420	14.92	6	169	27.27		728	42.87	48.92	45.95
Green sunfish	0-2	-	-	3-5	34	1.75	6	4	0.60		38	2.35	2.55	2.52
Longear sunfish	0-2	-	-	3-5	12	1.17	6	5	0.71		17	1.88	1.14	2.02
Redear sunfish	0-2	-	-	3-5	27	2.11	6	22	7.35		49	9.46	3.30	10.13
TOTAL		140	0.69		518	21.46		210	37.47		868	59.62	58.33	63.90
COMMERCIAL FISH														
Bullhead	0-4	13	0.22	5-8	4	1.01	9	1	0.73		18	1.96	1.21	2.10
TOTAL		13	0.22		4	1.01		1	0.73		18	1.96	1.21	2.10
							ABOVE FORAGE SIZE							
FORAGE FISH														
Misc. cyprinids	0-3	4	0.04	4-7	-	-	8	-	-		4	0.04	0.27	0.04
TOTAL		4	0.04		-	-		-	-		4	0.04	0.27	0.04
GRAND TOTAL		587	6.37		676	37.44		225	49.49		1488	93.30	100.00	100.00
% OF TOTAL		39.45	6.83		45.43	40.13		15.12	53.04		100.00	100.00		

Table 6. Average weight and number of fish per acre taken from Carpenter Lake during 1963 (2 studies).

SPECIES	FINGERLING SIZE			INTERMEDIATE SIZE			HARVESTABLE SIZE			TOTAL		% OF TOTAL	
	Range	No.	Wt.	Range	No.	Wt.	Min. in.	No.	Wt.	No.	Wt.	No.	Wt.
GAME FISH													
Largemouth bass	0-4	110	1.01	5-9	92	14.14	10	8	13.60	210	28.75	10.40	32.51
TOTAL		110	1.01		92	14.14		8	13.60	210	28.75	10.40	32.51
PANFISHES													
Warmouth	0-2	2	0.02	3-5	3	0.16	6	5	0.87	10	1.05	0.50	1.19
Bluegill	0-2	1281	3.47	3-5	233	7.66	5	222	40.86	1736	51.99	85.98	58.79
Green sunfish	0-2	-	-	3-5	15	0.73	6	2	0.32	17	1.05	0.84	1.19
Longear sunfish	0-2	2	0.02	3-5	12	0.85	6	6	0.88	20	1.75	0.99	1.98
Redear sunfish	0-2	6	0.03	3-5	1	0.02	6	4	1.47	11	1.52	0.55	1.71
TOTAL		1291	3.54		264	9.42		239	44.40	1794	57.36	88.86	64.86
COMMERCIAL FISH													
Bullhead	0-4	6	0.14	5-8	4	0.51	9	3	1.49	13	2.14	0.64	2.43
TOTAL		6	0.14		4	0.51		3	1.49	13	2.14	0.64	2.43
							ABOVE FORAGE SIZE						
FORAGE FISH													
Misc. cyprinids	0-3	-	-	4-7	1	0.03	8	1	0.15	2	0.18	0.10	0.20
TOTAL		-	-		1	0.03		1	0.15	2	0.18	0.10	0.20
GRAND TOTAL		1407	4.69		361	24.10		251	59.64	2019	88.43	100.00	100.00
% OF TOTAL		69.69	5.30		17.88	27.25		12.43	67.45	100.00	100.00		

The F/C ratio remained approximately the same, but the A_t value decreased from 75.0 to 52.0. This drop, of course, resulted from the loss of harvestable fish over the spillway. (They were not creeled as there was a 50 percent drop in the harvest this year.) This thinning effect resulted in more food and space, and an increase in the reproduction of all species.

The standing crop of fish at Carpenter dropped 13 percent to 93.0 pounds per acre in 1962. The panfishes showed the largest decrease; however, this was partially offset by a substantial increase in the game fishes (Table 5.)

The A_t value of 55.9 was approximately the same as recorded in 1961. The reproduction of the piscivorous species maintained the level recorded in 1961, however, the non-piscivorous species exhibited a marked decrease.

The last year of study (1963), at Carpenter Lake indicated a standing crop of 88.0 pounds per acre. This weight was composed of 33.0 percent game fishes, 65.0 percent panfishes and 3.0 percent commercial fishes (Table 6).

All species had spawned lightly, and the A_t value and F/C ratio did not significantly vary from that calculated in 1962. Generally speaking, the structure of the fish population recorded in 1963 was very similar to that recorded in 1962.

Creel Survey Studies

During the 7-month survey in 1960, a total of 13,888 man-hours of fishing effort were expended. Fish were harvested at the rate of 99 per hour (0.2 pound) for a total catch of 197 fish (32.1 pounds) per acre, Table 8.

A total of 3,497 fisherman trips was made to the lake (Table 9). Resident fishermen made 89 percent of these trips. One-half of the anglers used the still-fishing method while the rest used casting. Seventy-nine percent of the anglers visiting the lake were males.

In 1961 the total fishing pressure dropped 30 percent to 9,792 hours. Fishermen creeled 222 fish (61.5 pounds) per surface acre, and caught 6.2 fish (1.7 pounds) per trip or 1.6 fish (0.4 pound) per hour (Table 7).

Sunfishes and crappies dominated the catch both in number and weight. The weight per acre of sunfishes cropped in 1960 increased two-fold in 1961, while the number per acre remained approximately the same, indicating a better quality sunfish in 1961. The number and quality of crappies caught also increased in 1961.

A total of 2,426 fisherman trips, or 36 trips per acre, was made to Carpenter in 1961. Of that total, 98 percent was made by residents and 81 percent was made by males. Twenty-two percent of the anglers visiting the lake used the casting method, while 78 percent still fished.

The results of the creel survey conducted in 1962 indicated a slight increase in the fishing pressure. A total of 11,260 (160 hours per acre) man-hours of fishing effort was expended in harvesting 79.3 (3.5 fish) pounds of fish per acre (Table 7). This represents an increase in the weight of the harvest over 1961; however, there was also a significant increase in the number caught which consequently reduced the quality of each fish taken (Table 8). Sunfishes and crappies still dominated the creel.

There were approximately 2,815 fisherman trips made to the lake. Of the total, 20 percent used the casting method while 80 percent used still fishing; 89 percent were residents and 78 percent males (Table 9).

The 1963 survey at Carpenter Lake indicated a harvest similar to that recorded in 1962. A total of 10,372 fisherman hours — 163 per acre — was expended in harvesting 69.8 pounds of fish per acre. Sunfishes still dominated the catch, but the crappies, which contributed approximately 18 and 14 percent of the harvest (weight) in 1961 and 1962, respectively, were absent from the creel (Table 8).

There was a total of 2,305 fisherman trips made to the lake. Of that total, 83 percent used casting, while 17 percent used still fishing. Ninety-seven percent were residents and 76 percent were males (Table 9).

Channel catfish fingerlings were stocked in Carpenter Lake initially in 1959, and during each year the lake was studied. It is impossible to say with certainty that none of these fish were harvested from the lake, but according to the creel survey there were no channel catfish harvested from 1960 through 1963 (Table 8).

Table 7. Catch statistics from Carpenter Lake for 1960 - 1963.

Year surveyed	Acres	Avg. no. fisherman hrs./acre	Avg. no. fisherman trips/acre	Avg. no. fish/hour	Avg. wt. fish/hour	Avg. no. fish/trip	Avg. wt. fish/trip
1960	68	204	51	0.9	0.16	3.8	0.61
1961	68	144	36	1.6	0.43	6.2	1.72
1962	68	160	40	2.1	0.50	8.4	2.00
1963	68	158	34	1.9	0.46	8.4	2.06

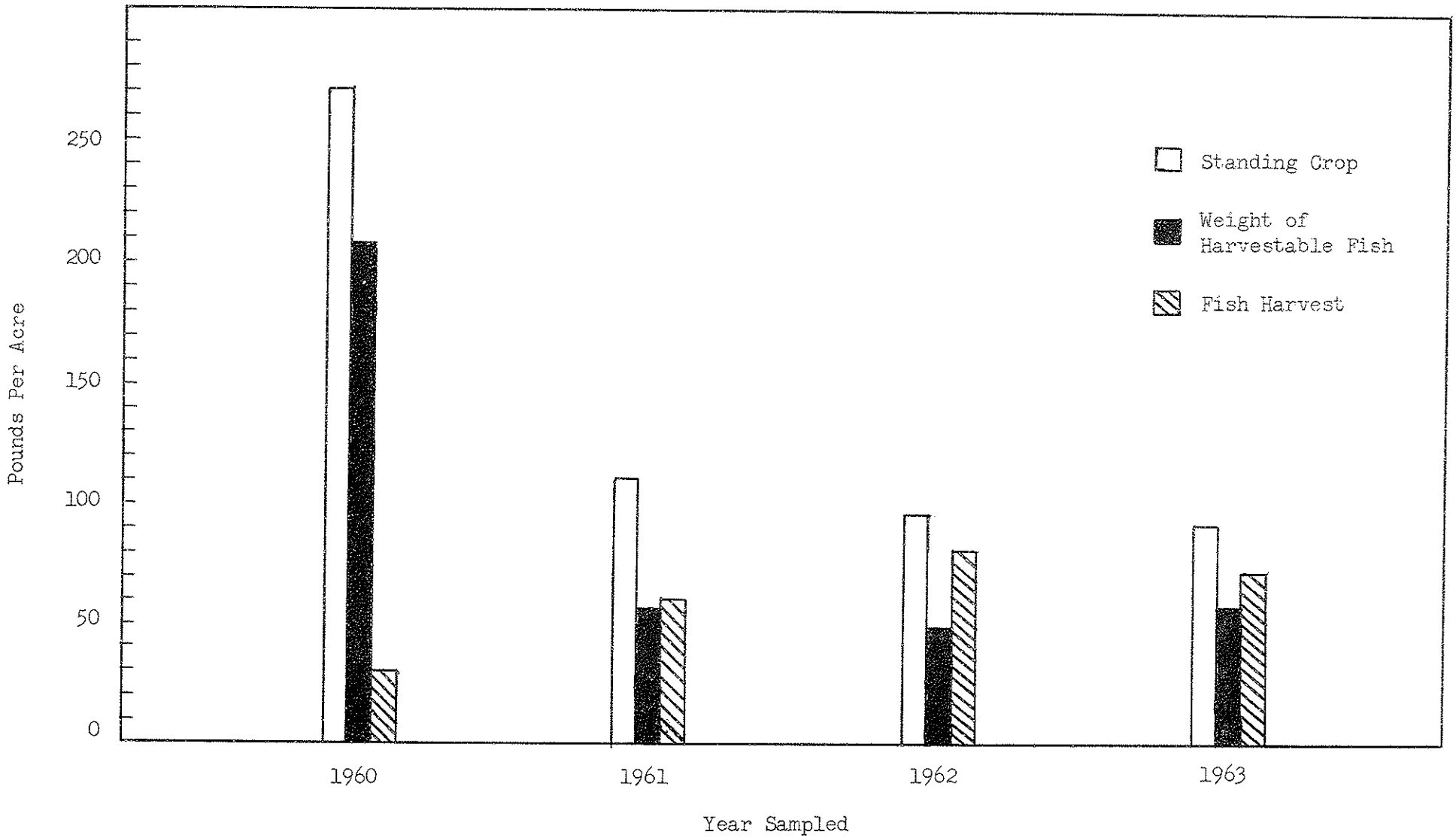
Table 8. Average catch per surface acre at Carpenter Lake from 1960 - 1963.

Year surveyed	Acres	Largemouth bass		Sunfish		Crappie		Channel catfish		Totals	
		No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
1960	68	15	13.5	179	18.8	3	0.6	0	0.0	197	32.1
1961	68	3	2.7	192	48.0	27	10.8	0	0.0	222	61.5
1962	68	4	4.7	328	63.8	22	10.9	0	0.0	354	79.3
1963	68	2	3.0	284	66.9	0	0.0	0	0.0	286	69.8

Table 9. Creel survey statistics, Carpenter Lake, 1960-1963.

Year surveyed	Total no. fisherman trips	No. still fishing	% of total	No. casting	% of total	No. residents	% of total	No. non-residents	% of total	No. males	% of total	No. females	% of total
1960	3497	1858	53	1639	47	3115	89	382	11	2759	79	738	21
1961	2426	1899	78	527	22	2388	98	38	2	1975	81	451	19
1962	2815	2165	80	550	20	2407	89	408	11	2106	78	609	22
1963	2305	1916	83	389	17	2228	97	77	3	1747	76	558	24

Figure 2. Standing Crop, Weight of Harvestable Fish, and Fish Harvest in Carpenter Lake From 1960-1963.



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