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## LAKE MANAGEMENT REPORTS

### 2. Fork Lake near Mount Zion, Illinois

David H. Thompson

and

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## 2. FORK LAKE NEAR MOUNT ZION, ILLINOIS

David H. Thompson and George W. Bennett  
Illinois Natural History Survey

Fork Lake was built in 1920 by Mr. Paul S. Smith for waterfowl, hook-and-line fishing and other recreational uses. Since its establishment, the lake has been used by large numbers of waterfowl during their spring and fall migrations. As many as 25,000 ducks have visited this pond during the course of a season.

Soon after the lake was made, it was stocked with fish and for a few years furnished excellent catches of bass and other "fine" fish. Later, in spite of heavy stocking, hook-and-line fishing became very poor. During the past year or two the lake appeared to be crowded with small black bullheads. Golden shiners and small sunfish were also known to be present. Occasional evidence was seen of large "rough" fish which would not take the hook.

We recommended that all of these fish be removed and the lake restocked with largemouth bass and bluegills. Since the lake could not be drained readily, the fish were poisoned, June, 1938. A complete census of the fish present was made at this time. This census is especially significant because, very few fish having been removed in recent years, it shows the carrying capacity of such waters for fish.

After the fish were removed the water became clear. Within two weeks the lake was restocked with largemouth bass fry and adult bluegills. The bluegills spawned throughout the summer and their fry have been an important food for the bass. These bass have grown very rapidly and some of them should reach legal length by the time they are a year old.

## ACKNOWLEDGMENTS

Mr. Smith furnished a great deal of the information in this report and, together with Mr. Sam A. Parr of the Conservation Department and Dr. Donald F. Hansen of the Natural History Survey, helped in all stages of the work. When the census was made, we were assisted by a number of people from the Department of Zoology of the University of Illinois. Mr. Louis A. Krumholz of the Survey made the map. The view of the lake is from a photograph by Mr. James S. Ayars, editor for the Survey. The duck pictures were taken from a blind by Mr. Smith a number of years ago.

## DESCRIPTION OF THE LAKE

Fork Lake was formed by throwing an earthen dam across a ravine. It is fed by surface drainage from about 60 acres, part farmland and part timber. The soil is a tight, light-colored clay loam.

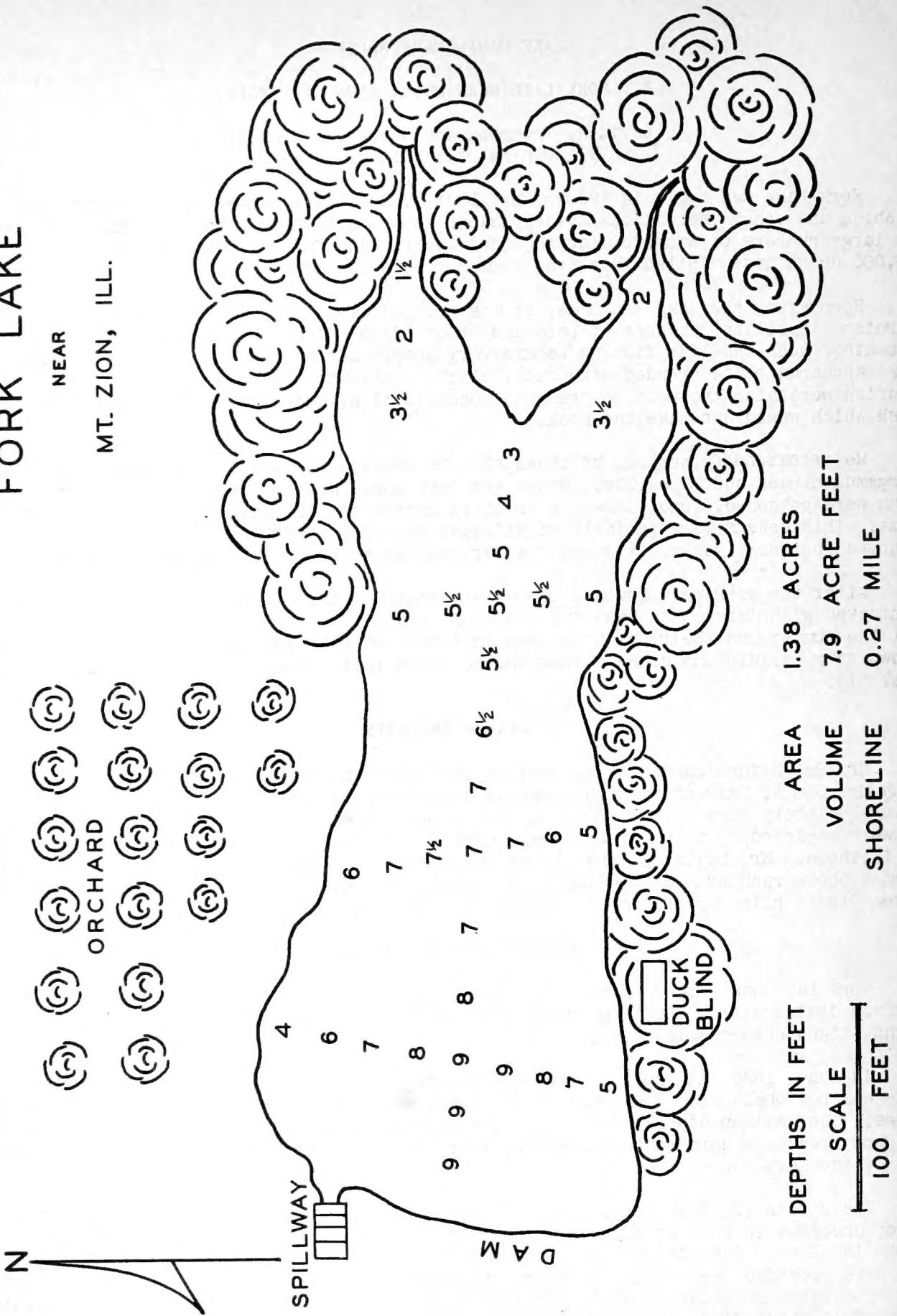
In June, 1938, at the time the accompanying map was made, the water surface of the lake was 5 inches below the crest of the spillway. The water area at that time was 1.38 acres. The maximum depth was 9 feet. The average depth was 5.7 feet, and the capacity 7.9 acre feet. According to Mr. Smith, there is now about 4 feet of silt in the lower end of the lake.

The dam is 120 feet long. The spillway is 12 feet wide and 20 feet long. The water descends in four steps, the highest of which is 3 feet. The height of these steps is of some interest since it seems likely that, during freshets, carp and buffalo may have ascended the stream and jumped the spillway into the lake. The lake has not suffered extreme shrinkage during drought years. During the drought of 1930, the water level fell about  $3\frac{1}{2}$  feet below the crest of the spillway.

# FORK LAKE

NEAR

MT. ZION, ILL.



The dam is faced on the lake side with strips of metal roofing and woven wire held in place by metal posts. This has prevented damage by muskrats and ducks. In August, 1938, the dam and spillway were raised 18 inches.

The upper half of the lake and the south shore are screened by a dense fringe of brush and trees. On the slope above the north shore is a fruit and nut orchard. No submerged aquatic plants are present in the lake. At one time cattails grew all around the lake shore, but by 1938 there were only a few. Bass have been seen nesting on their roots. Most of the cattails died during low water after the ducks had exposed the roots, allowing them to freeze.

In the brush on the south side is a blind for observation, photography or shooting. There is one boat.

### HISTORY OF FISH POPULATION

Fish were planted in Fork Lake a number of times before 1938. There are no records of these plantings, but Mr. Smith has furnished the following account from memory.

The earliest planting of fish, made in 1920 soon after the lake had filled, consisted of shiners, chubs and a few miscellaneous sunfishes collected from nearby streams. In 1921 several hundred largemouth bass, bluegills and other sunfishes were placed in the lake. Four hundred 6- to 7- inch bass were planted the following year (1922). Shiners and chubs were seined from nearby streams to serve as food for these bass. Bullheads were first introduced in 1924 when a school of them was brought in from Finley Creek. The first crappies were put in this same year.

During these early years, bass fishing was good\* and remained so for three or four years after the original stock had reached legal length. The largest bass taken from the lake during this period weighed 2-1/2 pounds. By 1926 good catches of bullheads were being taken on trotlines. A summer or two later (1927 or 1928) many large bullheads died (apparently from lack of oxygen) along with a few shiners and sunfishes.

In 1932, 100 channel catfish were planted and, in 1934, 32 crappies, 11 to 12 inches long. In 1935, 12 large bass and a number of bluegills were added. No stocking has been done since 1935, until in the summer of 1938.

In 1935, 8 or 10 large schools of young bullheads were frequently seen swimming near the surface. The bullheads of the 1938 census probably belonged to this large 1935 brood.

Carp and buffalo were never planted intentionally. It is possible that they ascended the spillway during high water, or were introduced accidentally by anglers.

It is interesting to compare the kinds and numbers of fishes planted with those found when the lake was poisoned. The 32 large crappies planted in 1934 had not been taken out on hook and line nor had they been seen dead in the lake. One hundred channel catfish were planted in 1932. The census shows only four channel cats. Although hundreds of bass were planted, the total count was five at the time of the poisoning. The 12 large bass put in three years before were not removed by fishermen nor seen dead along the shore. The fish not accounted for probably died one at a time and were eaten by other fish, crayfishes, turtles, predatory birds or mammals without coming to the attention of occasional visitors to the lake.

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\* See Thompson, David H., and George W. Bennett, 1938. Lake Management Reports 1. Horseshoe Lake near Cairo, Illinois. Ill. Nat. Hist. Surv. Biological Notes No. 8.

## FISH PREDATORS

A few animals prey on the fish of Fork Lake. Snappers and painted turtles migrate up the creek to the spillway and climb the dam. The numbers of both turtles and snakes have been kept down by shooting. Bullfrogs were fairly common a few years ago, but only two were seen or heard this year. The belted kingfisher, the little blue heron, the great blue heron, the little green heron and several kinds of ducks visit the lake each year and probably eat a few fish. A flock of little blue herons (in the white phase) roosted in the low trees at the upper end of the pond for several summers.

## DUCKS AND DUCK HUNTING

Even before Lake Decatur (3 miles northwest of Fork Lake) was built, ducks visited ponds and marshes near the town of Warrensburg (17 miles northwest of Fork Lake), and similar areas southeast of Mount Zion. Between them was a natural flyway or duck "pass." Later these marshy areas were drained and the flyway broken up, but it has been reestablished with the construction of Lake Decatur and Fork Lake.

Ducks were shot on Fork Lake between the years 1923 and 1933 by six men from Decatur and Mr. Smith. The pond was baited with corn, and the ducks moved back and forth between it and Lake Decatur. Corn was fed in both the spring and fall, although of course there was no shooting in the spring. As an example, Mr. Smith's notes show that 339 bushels of corn were fed in the spring of 1931.

A record of the kill of ducks was kept from 1925 until 1933 and is summarized by years in table 1.

TABLE 1.—ANNUAL KILL OF DUCKS AT FORK LAKE

Year	Number
1925	156
1926	199
1927	268
1928	738
1929	268
1930	287
1931	152
1932	613
1933	375
Total	3,056

Mr. Smith says that the average number of ducks visiting the lake was in the neighborhood of 25,000 each year. At one time in the spring of 1931 it was estimated that 20,000 ducks were on the pond and along the banks. Of these about 14,000 were mallards and 6,000 were pintails and a scattering of other kinds. In 1931 Mr. C. M. Powers and Mr. Dean Gorham, amateur ornithologists of Decatur, observed four European widgeons. Before that (1927) three male European widgeons spent three weeks on the pond. During most of the fall migration the mallard is the most numerous duck, although early in the season other ducks are common, such as blue-winged teal, green-winged teal, lesser scaup, ring-necked duck, widgeon and gadwall. Pintails are more common in the spring than in the fall. Black ducks increased each year from 1920 to 1931. Occasionally the lake has been visited by flocks of from 8 to 20 Canada geese. Buffleheads, shovellers and ruddies are rare. Since heavy feeding has been discontinued the number of ducks has declined sharply.

## 1938 FISH CENSUS

The fish of Fork Lake were killed by a single treatment with poison. The method developed by the Fisheries Institute of the Michigan Department of Conservation was

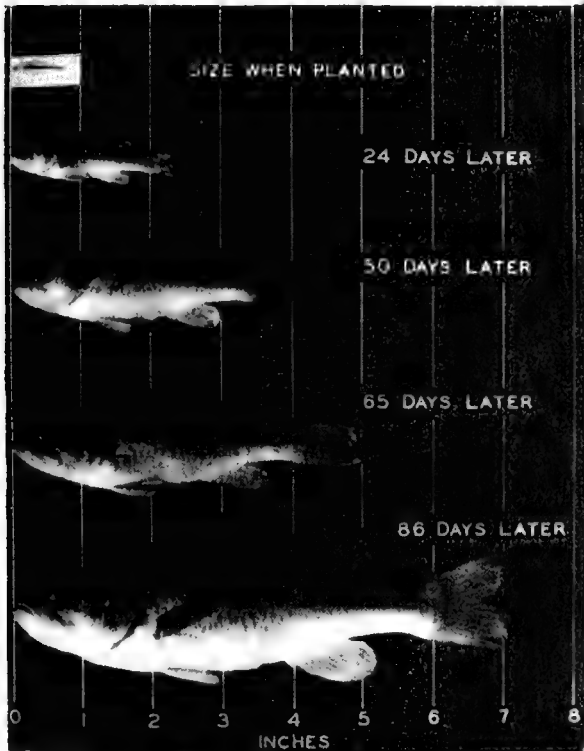


Above--Spring thaws bring mallards, black ducks, pintails, lesser scaups, ring-necked ducks, American widgeons, gadwalls, and other ducks to Fork Lake.

Right--Mallard drake coming in, photographed from blind.

Lower Right--Gathering poisoned fish along south shore of Fork Lake.

Below--Growth of largemouth bass fry after planting in Fork Lake on June 23, 1938.



used. Subsequent work has shown no evidence that any fish survived this treatment.

The poison was applied at 5:50 p.m., June 7, 1938. Within 15 minutes six fish were seen struggling at the surface of the water. As many more were seen within the next 10 minutes, in addition to several hundred inch-long buffalo fry that were dying. Within an hour redmouth buffalo and carp were gasping at the surface and the smaller kinds of fishes were dying rapidly. Before dark, three men had gathered up 748 black bullheads, 16 large buffalo and 3 carp.

When fish have been poisoned some of them float and can be picked up immediately, but a good share of them sink. In turbid water, or in deep water, dead fish cannot be gathered up until they bloat and rise to the surface. The surface of the lake was entirely cleared of fish each day for four days after the dose of poison. The numbers of each of the important species handled each day are shown in table 2. All of the fish handled after the first day had risen from the bottom of the lake.

TABLE 2.—NUMBERS OF FISHES RISING TO THE SURFACE EACH DAY AFTER POISONING

Kind	First Day	Second Day	Third Day	Fourth Day
Largemouth bass . . . . .	.....	5	.....	.....
White crappie . . . . .	29	72	6	6
Warmouth bass . . . . .	1	29	.....	.....
Bluegill. . . . .	9	106	.....	.....
Green sunfish . . . . .	29	360	.....	.....
Orange-spotted sunfish. . . . .	3	52	.....	.....
Channel cat . . . . .	.....	4	.....	.....
Black bullhead. . . . .	1996	1372	143	9
Redmouth buffalo. . . . .	69	29	.....	.....
Carp. . . . .	5	5	1	.....
Golden shiner . . . . .	967	38	.....	.....
TOTAL	3108	2072	150	15

Twenty-two hours after the poison was applied collections were made with dip nets and minnow seines to find out whether other animal life had been affected. Samples were taken from the northwest shore of the pond (where the concentration of poison was highest) and from mud dipped from deep water. The numbers and kinds of living and dead invertebrates are given in table 3. The poison in the concentration used seems to be

TABLE 3.—KINDS AND NUMBERS OF AQUATIC INVERTEBRATES

Kind	Number Living	Number Dead
Crayfishes. . . . .	7	....
Mayfly mymphs . . . . .	6	....
Hydroporus. . . . .	2	....
Palpomyia . . . . .	7	....
Midge larvae. . . . .	7	....
Pulmonate snails. . . . .	8	7
Dragonfly nymphs. . . . .	2	....
Oligochaetes. . . . .	12	2
TOTAL	51	9

specific for fish. Most of the invertebrates were unaffected, and even gill-breathing vertebrates other than fish, such as frog tadpoles, survived.

The buffalo fry which died a few minutes after the pond was poisoned had almost disappeared by the next morning. They were eaten by the larger fishes, which were affected somewhat later. A large water snake (*Natrix sipedon*) was caught. Although unaffected by the poison, this snake was sluggish because it had swallowed about two pounds of fish. A pectoral spine of one of the bullheads had punctured its stomach and body wall, and yet it survived. A few small fish were eaten by birds, principally by the little green heron. No turtles were seen.

Dip nets were used from two boats to pick up fish. Other nets were used by men who walked along the shore or waded in the shallow water. The fish were sorted by species into tubs, buckets and baskets. Each kind was counted and then weighed in convenient lots on a Chatillon spring balance. This balance weighs to 60 pounds by 1-ounce intervals. It was suspended on a heavy tripod. The fish were weighed promptly after collection to avoid losses by drying. The standard length of almost every fish was taken on measuring boards to the nearest 0.1 inch. Lengths of all the numerous small black bullheads and golden shiners were not taken, but large representative samples were measured. The total numbers, total weights and average individual weights of the different kinds of fishes found in Fork Lake are shown in table 4. Length measurements of the more important species are grouped in  $\frac{1}{2}$ -inch classes in table 5.

TABLE 4.—CENSUS OF ALL FISHES IN FORK LAKE, JUNE, 1938

Kind	Number	Weight, Pounds	Average Weight per Fish, Pounds	Per Cent of Total Weight
G A M E F I S H				
Largemouth bass . . . . .	5	8.06	1.61	
TOTAL	5	8.06		1.1
O T H E R " F I N E " F I S H				
White crappie . . . . .	113	15.60	0.138	
Warmouth bass . . . . .	30	1.47	0.049	
Bluegill . . . . .	115	4.56	0.040	
Green sunfish . . . . .	389	15.40	0.040	
Orange-spotted sunfish . . . . .	55	1.31	0.024	
Sunfish hybrids . . . . .	1	0.06	.....	
TOTAL	703	38.40		5.2
C A T F I S H				
Channel cat . . . . .	4	4.56	1.140	
Black bullhead . . . . .	3,520	301.90	0.086	
TOTAL	3,524	306.46		41.2
" R O U G H " F I S H				
Redmouth buffalo . . . . .	98	286.10	2.920	
Mongrel buffalo . . . . .	1	6.06	.....	
Quillback . . . . .	1	1.38	.....	
White-nosed sucker . . . . .	1	0.75	.....	
Carp . . . . .	11	58.90	5.350	
TOTAL	112	353.19		47.5
F O R A G E F I S H				
Golden shiner . . . . .	1,005	37.90	0.038	
Common shiner . . . . .	1	0.12	.....	
TOTAL	1,006	38.02		5.1

Total number of fish = 5,350  
 Total weight of fish = 744 lbs.  
 Number of fish per acre = 3,877  
 Weight of fish per acre = 539 lbs.

TABLE 5.—FREQUENCIES OF STANDARD LENGTHS OF THE MORE IMPORTANT FISHES.

Standard Length, Inches	White Crappie	Largemouth Bass	Carp	Redmouth Buffalo	Channel Cat
3	....	....	....	....	....
3 ½	3	....	....	....	....
4	7	....	....	....	....
4 ½	17	....	....	....	....
5	41	....	....	....	....
5 ½	16	....	....	....	....
6	7	....	....	....	....
6 ½	4	....	....	....	....
7	2	....	....	....	....
7 ½	....	....	....	....	....
8	2	....	....	3	....
8 ½	3	....	....	....	....
9	3	....	....	2	....
9 ½	1	....	....	....	1
10	....	....	....	....	....
10 ½	....	1	....	....	....
11	....	2	....	....	1
11 ½	....	....	....	2	....
12	....	....	....	2	....
12 ½	....	1	....	1	....
13	....	1	....	7	....
13 ½	....	....	....	25	2
14	....	....	1	29	....
14 ½	....	....	....	14	....
15	....	....	1	8	....
15 ½	....	....	3	....	....
16	....	....	1	1	....
16 ½	....	....	2	....	....
17	....	....	....	....	....
17 ½	....	....	....	....	....
18	....	....	1	3	....
18 ½	....	....	....	....	....
19	....	....	....	....	....
19 ½	....	....	....	....	....
20	....	....	....	....	....
20 ½	....	....	....	....	....
21	....	....	1	....	....
21 ½	....	....	....	1	....
22	....	....	1	....	....
Number measured	106	5	11	98	4

Standard Length, Inches	Black Bullhead	Golden Shiner	Green Sunfish	Orange-Spotted Sunfish	Warmouth Bass	Bluegill
1	....	....	....	....	....	....
1 ½	....	....	56	....	13	....
2	....	1	77	12	10	52
2 ½	....	6	53	31	2	45
3	2	37	38	11	....	5
3 ½	14	12	51	1	....	1
4	11	114	45	....	....	....
4 ½	135	59	23	....	....	1
5	234	12	12	....	1	4
5 ½	32	....	7	....	2	7
6	7	....	3	....	2	....
6 ½	....	....	....	....	....	....
7	1	....	....	....	....	....
Number measured	436	241	365	55	30	115



Putrefaction was pronounced during the second and third days after poisoning, and it seems likely that there may have been weight shrinkage as great as 5 or 10 per cent due to bacterial action. No corrections have been attempted for such losses. Large representative samples were preserved for the Survey collections and for subsequent examination. Scales from several kinds were taken for age determination.

As many of the fry of the year as could be gathered up were preserved. These amounted to about one pound. All other fish were buried as fast as the observations on them were completed.

The four most abundant species (by weight) in Fork Lake were the black bullhead, redmouth buffalo, carp and golden shiner. Only 32 of the 3,520 black bullheads were large enough to be caught and dressed. Redmouth buffalo almost never take the hook. Carp bite more readily but few people are interested in fishing for them. The golden shiner is a large minnow but is not considered edible nor sought for by anglers. The numbers and weights of fish of legal size of those kinds which take the hook readily are given in table 6. These edible hook-and-line fish weighed 36.7 pounds, less than 5 per cent of the total weight of all fish.

TABLE 6.—HOOK-AND-LINE FISH OF EDIBLE SIZES

Legal Length, Inches	Kind	Number	Weight, Pounds
10	Largemouth bass . . . . .	5	8.06
8	White crappie . . . . .	16	6.28
6	Warmouth bass . . . . .	5	1.25
5	Bluegill. . . . .	12	2.63
5	Green sunfish . . . . .	71	7.99
10*	Channel catfish . . . . .	4	4.56
7*	Black bullhead. . . . .	32	5.97
	TOTAL	145	36.74

\* Arbitrary sizes chosen as the minimum for table use.

LIMNOLOGICAL OBSERVATIONS

At the time of the fish census the lake had a surface temperature between 80 and 90 degrees F. The water was thermally stratified and had a temperature approximately 70 degrees F. near the bottom. Later (August 10), during a period of very warm weather, temperatures and dissolved oxygen concentrations near the center of the lake were found as shown in table 7.

TABLE 7.—TEMPERATURES AND DISSOLVED OXYGEN CONCENTRATIONS, AUGUST 10, 1938

Depth, Feet	Temperature, Degrees F.	Dissolved Oxygen, Parts per Million
Surface	90.5	8.7
1	90.5	...
2	89.0	...
3	85.0	6.0
4	82.0	...
5	79.5	4.3
6	77.0	...
7	74.0	2.3

While the deeper samples showed depletion of oxygen, there was still sufficient for most of the kinds of fish found in Illinois lakes. Although the lake is protected

by trees on the east and south sides, it seems likely that north and northwest winds may occasionally cause complete circulation of the water.

At the time the lake was poisoned (June 7) objects were visible at depths of only 5 or 6 inches beneath the surface. About a week later the lake had cleared until objects could be seen at depths of about 3 feet. However, on August 10 the water was again turbid and gave a Secchi disc reading of 13 inches. This increase in turbidity was due, for the most part, to the activity of an enormous tadpole population, which survived the poisoning. During the two months following the poisoning these tadpoles had grown to unusually large sizes and roiled the lake by their repeated trips to the surface for air. Their numbers were in the thousands, perhaps even tens of thousands, and their total weight must have been several hundred pounds. By the end of September most of these tadpoles had metamorphosed into frogs and left the pond. Large numbers of young frogs were noticed below the spillway, hopping down the ravine toward Finley Creek and Lake Decatur. Tadpoles remaining in the pond were less active, and again the water became clear. Objects were visible in several feet of water early in November, 1938.

Although no chemical analyses of the water are available, it seems likely that droppings from the large numbers of ducks visiting the lake have materially increased the fertility of its water.

#### RESTOCKING WITH LARGEMOUTH BLACK BASS AND BLUEGILLS

Restocking of Fork Lake was begun as soon as the census was completed, four days after the poisoning. Between June 11 and 18, 270 adult bluegills between 5 and 7 inches long were brought from Homewood Fishing Club Lake at Decatur. Many of these bluegills were almost ready to spawn when they were planted. On June 22, 27 bluegill nests were counted along the north side of Fork Lake, 12 on the south side and 3 at the east end. A few newly-hatched fry were seen along the shore at this time. The bluegills continued to spawn throughout the summer. As a result, the 1938 broods of bluegills vary widely in size. On September 15 some were 3-3/4 inches long, while others were less than 3/4 inch.

On June 23, largemouth bass fry, estimated to be two or three weeks old, were seined from Homewood Lake and 1,440 of them were put into Fork Lake. They were counted, a dozen or two at a time, in a shallow white pan and examined to make sure no other kinds were present. These fry were of uniform size, averaging about 7/8 inch total length.

In Fork Lake they have grown at a rate which must be near the maximum for this latitude. Several times during the summer, samples of them were collected with a minnow seine and preserved. Their average lengths are shown in table 8. On August 25 one or two fish slightly over 6 inches in length were taken by Mr. Smith on a fly rod. The largest bass taken September 15 was 7.4 inches. On September 17, Mr. Smith took on a fly one that was 8.2 inches and another on September 24 a trifle over 9 inches.

TABLE 8.—GROWTH OF LARGEMOUTH BLACK BASS

Date	Number Measured	Average Standard Length	Average Total Length
June 23. . . . .	46	0.72	0.87
July 15. . . . .	11	2.07	2.53
August 10. . . . .	13	3.48	4.25
August 25. . . . .	46	3.76	4.62
Sept. 15 . . . . .	45	4.76	5.72
Oct. 4 and 21. . . . .	74*	5.29	6.45

\* Taken on fly rod, measured and returned to water.

Throughout the summer and early autumn, these bass were very fat and plump. On August 10, stomachs of three bass were examined. A 4-1/4 inch bass contained two crayfishes and several midge larvae; a 3-1/2 inch bass, a 1-inch bluegill and 20 or 30 midge larvae; and a 3-inch bass, two bluegills and several midge larvae. It seems likely that the larger bass were feeding on the smaller tadpoles before the latter metamorphosed. The bass taken on October 21 were noticeably slender and in poorer condition than were those taken earlier in the month.

### RECOMMENDATIONS

Heavy hook-and-line fishing for both bass and bluegills should be carried on. No fish planting of any sort is recommended. Minnows or other fish should not be used for bait since they may escape and contaminate the pond. The water of Fork Lake is fertile, and no special feeding of the fish or fertilizing of the water seems necessary. In fact, there is danger that such practices may cause, during certain periods, serious oxygen deficiencies in the water.

The dam, the gullies leading into the lake and the shores should be planted to reduce erosion. This will help keep the lake clear, protect the dam and furnish a certain amount of food and cover for game. Plantings of submerged aquatic plants (Potamogeton) and of marginal plants (Sagittaria, etc.) will furnish food for waterfowl and support a variety of aquatic animal life useful as fish food.

Fish husbandry practices, which should be designed to fit the individual body of water, require an accumulation of pertinent information. A gage board should be set up and a record kept of fluctuations of the water level. Gage records should be kept in a bound book along with records of the fish removed, notes on fish predators, notes on waterfowl, occurrences of dead fish, etc. A written record of the catch of fish is particularly important since it is the only reliable measure of the success or failure of various management practices. The record book should be kept in a locked box (perhaps in the present duck blind) with keys carried by all persons permitted to use the lake. This box may also contain a spring scale and measuring board for recording the lengths and weights of the fish removed; a supply of scale envelopes to hold scales for age determination; a supply of labels, small cloth bags and a jar of formaldehyde (diluted with seven parts of water) to preserve stomachs for food analysis; and a Secchi disc for measuring the transparency of the water. A rough table near the duck blind would be a convenient place to clean fish and make these observations.

### SUMMARY

1. There was good largemouth bass fishing for a few years after Fork Lake was built and stocked with fish.
2. Fishing became poorer year by year in spite of heavy stocking with bass and other kinds of hook-and-line fishes.
3. Accidental contamination with carp and buffalo, and by other kinds of fishes brought in as forage for bass, interfered with the growth and multiplication of the more desirable kinds.
4. Fork Lake was poisoned on June 7, 1938, and all of the fishes died within two hours. Some of the fish floated, but many sank. The latter bloated and rose to the surface during the next four days.
5. Frog tadpoles were unaffected by the poison, as well as insect larvae and most other aquatic invertebrates.
6. A complete fish census was made. A total of 5,350 fish weighed 744 pounds, the equivalent of 3,877 fish weighing 539 pounds per acre. About 5 per cent of the total, 36.7 pounds, were hook-and-line fish of edible sizes.

7. There were numerous indications of crowding and stunting among the catfishes and the various kinds of "fine" fishes.

8. In June, 1938, Fork Lake was restocked with 270 adult bluegills and 1,440 newly-hatched largemouth bass fry.

9. After the lake had been poisoned and restocked with bluegills and largemouth bass, its water became clear. These kinds do not roil the silt on the bottom as do carp, buffalo and bullheads.

10. Beginning a few days after restocking, the bluegills spawned throughout the summer and early autumn. Their fry were an important food for the rapidly-growing bass. A moderate number of the bluegill fry escaped being eaten and in October, 1938, the largest were 3 to 4 inches long.

11. Other important items in the diet of the bass were midge larvae, crayfishes and, probably, frog tadpoles.

12. In October, 1938, the bass averaged  $6\frac{1}{2}$  inches total length, with occasional individuals 8 or 9 inches long. They took the smaller artificial baits readily.

13. A map with soundings has been made of the lake. Some of the physical characteristics of its water were measured under summer conditions.

14. This pond has been visited by large numbers of ducks.

15. Suggestions for the improvement and management of Fork Lake during the next few years are outlined.















