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RESULTS OF FISH MANAGEMENT PRACTICES (INCLUDING INTENSIVE
CREEL CENSUS) ON LITTLE LONG LAKE, BUCKHORN RANCH,
(OSCEOLA COUNTY) DURING 1941

by

David S. Shetter

Records of all the fishermen using this private lake were obtained for the fourth year at the direction of the owner, Paul Travis, through the efforts of Robert Smith, caretaker, and his foreman, Ira Briggs. All anglers given permission to fish were requested to fill in a creel census blank on termination of their fishing each day, listing their success or non-success. Instructional blanks were posted on the tool-room wall, and scales and rulers and pencil were provided.

A larger number of anglers used the lake than in previous years; 93 fishing trips were recorded between June 25 - September 1, while 3 individuals tried their luck during September and October, making a total of 96 anglers up until the records were collected for analysis (October 18). Of this number, only 7, or 8.5 per cent, caught no fish, in a total of 284.75 hours of fishing (See Table I).

The total catch of legal fish consisted of 814 bluegills, 95 large-mouth black bass, and 44 yellow perch, a combined total of 953 fish. The

catch per hour for the season was 3.35 fish, almost double that for 1940 (when it was 1.77 fish). The average time spent fishing, per angler, was 2.9 hours, during which time the average catch was approximately 7.8 fish. The fishing improved steadily from June 25 on until September, starting out with a catch per hour of 1.63, and increasing each two-week period until a catch per hour of 4.24 fish was registered during the last half of August. Both fishing pressure and fishing quality were apparently reduced sharply after Labor Day (Table I).

The best fishing for largemouth bass and also yellow perch was had during the last two weeks of July, while bluegills were caught most readily during the last half of August. The highest catch per hour during the 1940 season was also recorded in the last half of August.

Comparison of 1941 results with those of previous seasons (1940, 1938, 1937) indicate that the fishing pressure (measured in terms of man-hours of angling per acre for the season) increased to a new high of 8.2 man-hours per acre as compared to 6.7 in 1940, and 2.6 in 1937 and 1938.

Intensive creel census data taken from five public lakes covered in 1941 by Conservation Department employees demonstrate that the average angling pressure on the lakes under intensive census was approximately 41 man-hours per acre per season, or about five times as great as the fishing pressure on Little Long Lake (MS., L. Krumholz).

Although the 1941 angling pressure on Little Long Lake increased only approximately 20 per cent over 1940, the total catch of 1941 was over 100 per cent greater, and the bluegill catch was 3.4 times as large as in 1940.

The 1941 catch of largemouth bass fell off from 1940, and was 25 per cent less than the record total of 126, and 8 per cent fewer yellow perch were taken in 1941.

Since almost all fish removed from the lake were weighed, a very close estimate of the total poundage of fish removed from Little Long Lake can be made. In the instances where weights were not given, the average weight of the species as determined from weighed specimens was assigned. The yield data for the lake are presented in Table 2.

The fishing produced 814 bluegills which weighed 347.80 pounds, 95 largemouth bass which weighed 90.93 pounds, and 44 yellow perch weighing 16.99 pounds. The catch per acre in terms of legal fish and pounds of fish for the species in the same order were:

bluegills	23.59 fish	10.08 pounds
largemouth bass	2.75 fish	2.64 pounds
yellow perch	1.28 fish	0.49 pounds

The combined total yield was 953 legal fish, weighing 455.72 pounds which was a per acre crop of 27.62 fish weighing 13.21 pounds, or an average weight of slightly less than $\frac{1}{2}$ pound.

The very large increase in pounds of fish was brought about by the marked increase in the catch of bluegills, since the take of this species increased from 80.92 pounds in 1940 to 347.80 pounds in 1941.

The average sizes of the game fish removed are presented in Table 3. It is not definitely known how many of the fish were actually measured, and the averages given were computed from the data as reported on the creel census sheets. In general it appears that the average size of the bluegills was about one-half inch larger than in 1940, largemouth bass were approximately of the same average size, while perch were about one-fourth inch shorter than in 1940. During the four years in which the census has been operated on Little Long Lake, the average size of the bluegills has varied as follows:

1937 - 7.5 inches
1938 - 8.2 inches
1940 - 7.8 inches
1941 - 8.2 inches

The average size of the largemouth bass has ranged consistently from 12.0 to 12.2 inches, while the average length of yellow perch has varied in the last two years between 8.1 and 8.3 inches (Table 3).

A Review of the Plantings of Game, Forage Fish
and Crawfish, and the Results to Date

Establishment in Little Long Lake of one species of game fish (smallmouth black bass), two species of forage fish (fat-headed minnows (Pimephales promelas) and golden shiners (Notemigonus c. crysoleucas)), and crawfish (Cambarus immunis) have been attempted by introduction. The numbers released and the dates of release are as follows:

<u>Species</u>	<u>Year</u>	<u>Number</u>	<u>Size</u>
Smallmouth bass	July 18, 1936	2,000	2 inches
" "	June, 1937	5,000	1-2 inches
" "	October, 1938	300	5 inches
Fat-headed minnows	May, June, 1937	15,466	1½ inches
Golden shiners	September, 1939	3,250	1-5 inches
Crawfish	September, 1939	12,000	1 3/8-2 7/8 inches

There have been no verified records of the capture of smallmouth black bass of legal size (10 inches or larger) by any anglers since the dates of introduction. One 1½-inch specimen was captured by seining in September, 1937, and one smallmouth bass of about 7 inches was taken on a fly by the author and returned to the water during July of 1939. Repeated seinings and gill-netting since then (and also the yearly fishing records) have failed to reveal the presence of smallmouth bass any larger than those mentioned above. At this date it appears that the efforts to establish smallmouth bass have been in vain. Two suppositions may be made concerning

the fate of the fingerling smallmouth bass planted in 1936, 1937 and 1938; either they were eaten by the resident largemouth bass, bluegills and perch before they had an opportunity to grow, or else the general ecological and physical conditions (such as food, shelter and spawning conditions) in Little Long Lake were not suitable for the establishment of this species. If predation on the fingerling smallmouth by the adults of the resident game species was the cause of the previous failure, it might be possible to establish the smallmouth bass by planting from 200 to 500 bass 8 inches or larger. If released at such a size they should escape any serious amount of predation.

Introductions of food items for the game fish has been more successful, as there is evidence at hand to indicate that the blunt-nosed minnow (Hyborhynchus notatus) has become established in Little Long Lake. The presence of this species was first detected in seinings during July, 1940, and was substantiated by capture of further blunt-nosed minnows in September, 1941 and in October, 1941 by use of a seine. Spawning activity of blunt-nosed minnows was observed during July, 1940.

The presence of this species in numbers apparently adequate for successful reproduction and survival is of some interest, since none of the plantings of forage minnows was considered to have had mixed with them any great numbers of blunt-nosed minnows. According to W. F. Carbine, an unknown, but small, number was mixed in with the 1939 release of golden shiners.

The 15,466 fat-headed minnows planted in 1937 apparently have failed to survive. After their release in May and June, 1937, specimens were taken by seining only in July, 1937. At the latter date only two adult fish were captured. Subsequent seinings in 1937, 1939, 1940 and 1941 have not recorded their presence.

Golden shiners were found to be present in the original survey of the lake, but not in large numbers. In September, 1939, W. F. Carbine released 3,250 golden shiners in an effort to establish this species. Seining and gill netting in 1940 could reveal no golden shiners, but in September, 1941, several young golden shiners were taken by seining, giving evidence of successful reproduction of this species, either from the original stock or from the introduced fish.

The crawfish, which were planted at the same time as the golden shiners (September, 1939) also have failed to survive. None was taken in seine hauls of July, 1940. Only one was observed by jack-light on a tour of the entire lake shore by night at the same time. In October, 1941, five traps were set in varying depths of water (from 1 to 30 feet) in an effort to capture crawfish. No crawfish were taken in approximately 15 trap-days.

One other species of minnow was noted in the September, 1941, seining. This was the black-nosed shiner (Notropis h. heterolepis). Since only one specimen was captured, and it is the first time it has been recorded at Little Long Lake, its abundance cannot be predicted. It was probably introduced with the golden shiners and blunt-nosed minnows in 1939.

If the blunt-nosed minnow and the golden shiner continue to survive and reproduce in Little Long Lake, the game fish will be assured of a supply of forage minnows. It will be important to note whether the catch per hour of bass improves as a result of these introductions of forage minnows. It will also be important to note any change which may occur in the growth of the bass and of the perch and bluegills. A good series of scale samples from each of these species should therefore be secured during the next five years.

Management Suggestions for 1942

1. Continue the detailed recording of the anglers' catch, as in 1941.
2. Encourage anglers to fish for perch, as this species has not been "cropped off" to any degree in past years. A moderate amount of winter fishing for both perch and bluegills might be permitted to the advantage of the bionomics of the lake.
3. Re-locate or replace minnow-spawning devices (slabs, tiles, star-shaped concentrations of boards) on the sandy beaches in from two to eighteen inches of water.
4. The privilege of fishing in Little Long Lake should be refused those individuals who violate the fish laws or who do not cooperate in recording their angling results accurately and promptly. In 1941, the legal limit for bluegills and perch was 25 per day of each species, and for largemouth bass, 5 per day. On two occasions this limit was exceeded, once by an angler taking out 27 bluegills, and another time by an angler removing 48 bluegills.

In 1942 the limit on bluegills will be 15 per day and the combined catch of panfish including perch and bluegills must not exceed 25, only 15 of which may be bluegills. According to Messrs. Smith and Briggs, several of the local anglers objected to weighing and recording their results. To the author, this seems a small task to perform in return for the privilege of fishing in a lake which provides such excellent sport and food. The angling privilege should be revoked in the future if cooperation is not given.

INSTITUTE FOR FISHERIES RESEARCH

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Table 1

Intensive Creel Census Data From Little Long Lake (34.5 acres)
for the 1941 Season, With Comparative Totals for Past Years.

1941 season	Total anglers	Percentage taking no fish	Total hours fished	Legal fish caught ↓				Total catch per hour	Catch per acre	
				Bluegill	Largemouth bass	Yellow perch	Total		Pounds	Number of fish
June 25-30	11	0	32.00	35	17	...	52	1.63	0.87	1.51
July 1-15	18	0	57.25	163	26	9	198	3.46	3.49	5.74
July 16-31	26	12	63.25	175	30	21	226	3.57	2.82	6.55
August 1-15	22	9	62.25	221	18	4	243	3.90	3.24	7.04
August 15-31	16	0	55.00	220	3	10	233	4.24	2.76	6.75
September 1-October 18	3	66	15.00	...	1	...	1	0.06	0.03	0.03
Totals or averages, 1941	96	8.5	284.75	814	95	44	953	3.35	13.21	27.62
Totals or averages, 1940	72	14.0	231.00	233	126	50	409	1.77	6.27	11.85
Totals or averages, 1938	39	5.0	90.50	296	41	1	338	3.73	?	9.80
Totals or averages, 1937	35	0.0	88.50	331	65	13	409	4.63	?	11.85

↓ Four bullheads were also taken.

Table 2

Total Yield and Yield Per Acre in Terms of Number
of Legal Fish and Pounds of Legal Fish Taken
by Anglers, Little Long Lake, 1941

Species	Number taken	Total weight	Yield per acre	
			Number	Pounds
Bluegill	814	347.80	23.59	10.08
Largemouth bass	95	90.93	2.75	2.64
Yellow perch	44	16.99	1.28	0.49
Totals, 1941	953	455.72	27.62	13.21
Totals, 1940	409	216.31	11.85	6.27

Table 3

Average Length of Game Fish Taken by Anglers at Little Long Lake,
1941 Season (Lengths Are Given in Inches, Weights in Pounds),
With Comparative Data For the Preceding Seasons of Creel Census.

Time period	Bluegills			Largemouth bass			Yellow perch		
	Number	Average length	Total weight	Number	Average length	Total weight	Number	Average length	Total weight
June 25-30	35	8.29	15.50	17	11.41	14.56	...	...	...
July 1-15	163	8.90	90.00	26	12.38	28.25	9	6.22	2.06
July 16-31	175	7.89	65.25	30	12.33	23.06	21	8.52	8.93
August 1-15	221	7.83	89.25	18	12.36	20.81	4	9.00	1.75
August 16-31	220	8.17	87.80	3	12.66	3.25	10	8.75	4.25
September 1-October 18	...	...	...	1	12.00	1.00	...	...	...
Totals or averages, 1941	814	8.22	347.80	95	12.19	90.93	44	8.12	16.99
Totals or averages, 1940	233	7.80	80.92	126	12.20	117.88	50	8.31	17.51
Totals or averages, 1938	296	8.20	...	41	12.00	...	1	12.00	...
Totals or averages, 1937	331	7.50	...	65	12.20	...	13	9.50	...