

INITIAL ANGLER HARVEST AND LARGEMOUTH BASS  
EXPLOITATION IN A NEW MISSISSIPPI IMPOUNDMENT

by

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INTRODUCTION

Tippah County Lake, a newly constructed 150 acre impoundment in northeast Mississippi, was allowed to fill during the winter of 1973-74. The Game and Fish Commission immediately began intensive study of the impoundment.

Water quality, essential and trace element levels, fish population surveys, creel census and tagging studies were initiated to provide background data of the new impoundment. Largemouth bass tagging data and a total fisherman creel survey conducted the first four days of fishing provided interesting information and are the subject of this paper. Tippah County Lake was stocked with 50,750 bluegill and 21,750 redear on November 11, 1973, and 16,000 "Florida" bass during the spring of 1974. An additional 28,000 redear and 10,800 channel catfish were stocked during the fall of 1974. In addition to the stocked fish, initial surveys of the impoundment during late 1974 indicated that numerous other fishes had entered the lake via two small streams draining several farm ponds in the watershed.

Access to the impoundment was limited to one entrance, therefore, user activities could be easily monitored. This provided an excellent opportunity to conduct fisherman creel surveys and obtain accurate fish tagging data. Excessive angling pressure on largemouth bass was reported as early as 1956 (Bowers and Martin, 1956 and Martin, 1957). Graham (1974) reported that as high as 72 percent of tagged bass were removed from Missouri lakes during the first year. Hill and Shell (1975) found the bass exploitation rate in a 25.5 acre pond to be 60.7 percent. This resulted from 82.8 fishermen/trips per acre during a 75 day fishing period.

METHODS & FINDINGS

Tippah County Lake was opened to fishing June 11, 1975, approximately 16-17 months after filling. Before the opening of the lake, 200 bass were tagged and released in the lake. These fish ranged from 255 mm to 500 mm in length. Extremely clear water made

collecting by shocking virtually impossible and only 26 shocked fish were tagged. The remaining 174 fish were captured by angling and tagged. A total fisherman survey was conducted the first four days of fishing. The opening day anglers captured 23 percent (Table 1.) of the tagged bass by exerting a fishing pressure of 11.21 hours per acre. During the first four days, 32 percent of the tagged bass were captured. By the end of December, 49 percent had been caught, and by the end of November, 1976, one and one half years after opening, 57 1/2 percent of the tagged bass had been captured. It is interesting that only 25.6 fisherman hours per acre were expended to capture 32 percent of the harvestable size bass during the first four days of angling. Angler vulnerability of bass decreased rapidly as only an additional 25 1/2 percent bass had been caught one and one half years later. These values do not reflect recruitment of young bass nor loss of fish through natural mortality.

Table 1. Angler catch of 200 tagged bass in Tippah County Lake.

<u>Date</u>	<u>No. Bass</u>	<u>Percent</u>
6/11/75	46	23
6/12/75	9	4 1/2
6/13/76	2	1
6/14/75	7	3 1/2
June 15-30, 75	14	7
July, 75	10	5
Aug. 75	8	4
Oct., 75	1	1/2
Nov., 75	1	1/2
Feb., 76	3	1 1/2
March, 76	3	1 1/2
April, 76	1	1/2
May, 76	4	2
June, 76	4	2
July, 76	1	1/2
Sept., 76	1	1/2

By using the tag returns, a population estimate of the adult largemouth bass can be made. Lackey (1974) noted that the simplest estimate was:  $N = \frac{mC}{r}$  where  $m$ =number of fish marked  
 $C$ =catch taken for census  
 $r$ =number of recaptured fish.

By this method, Tippah County Lake contained 1263 bass in excess of 10 inches long prior to opening day. Confidence intervals were calculated by adjusting the recapture of tagged fish from a Poisson to a normal distribution with:  $r \pm 1.92 \pm 1.96 \sqrt{r+1}$ . The confidence interval at  $\alpha=0.05$  was  $998 < N < 1584$ .

Another method to calculate the population is by the "inverse" (Bailey, 1951 and Chapman, 1952) sampling. This method takes into account sampling bias. By this method  $T$  = number of tagged fish

$m$  = recaptured tagged fish

$n$  = total recaptured fish,

$$N = \frac{n(T+1)}{m} - 1 = 1268.$$

Thus, by this estimate, the number of bass greater than 10 inches was 1268, only five fish different from the "direct" method. One standard deviation allows the population to range from 1148 to 1388.

The total fisherman survey (Table 2.) conducted the first four days was actually only 76 percent of the anglers. Numerous campers and a few unsuccessful anglers avoiding the survey accounted for the loss of anglers. Fishing pressure these four days was 25.6 hr/acre and 13.41 pounds harvest per acre. Anglers caught 0.52 lbs/hr. and 1.7 fish/hr. during an average fishing trip of 3.07 hours. An angler harvest of 0.50 lb/hr. is generally considered to be good fishing, by this estimate, opening fishing at Tippah County Lake was slightly above average.

During this period, bass averaged 1.33 pounds which is high for a new lake and indicated a low bass population.

Table 2. Lake Tippah County first four days total creel - June 11-14, 1975.

Species	No. fish checked in 76% creel	Av. Wt. of fish caught	Projected No. caught	Proj. Wt. fish caught
Largemouth bass	346	1.33	404	534.92
Redear	169	0.23	239	53.37
Bluegill	2379	0.22	3295	708.91
Other sunfish (green & hybrids)	1789	0.23	2262	511.62
Channel catfish	64	0.99	83	82.36
Bullhead catfish	43	0.98	54	52.61

Totals			6337	1943.79
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Average length of fishing trip:	3.07 hours
Total pressure/acre in fishermen trips:	8.34 trips
Total pressure/acre in hours/acre:	25.60 hours
Total hours fishing first 4 days:	3726 by 1209 fishermen
Average lbs./hour:	0.52 pounds
Average fish/hour:	1.70 fish
Pounds/acre:	13.41 pounds
Tagged bass caught:	64 of 200 = 32 percent

A July, 1975 population study also indicated that the bass population was low, 7 lbs/acre and an extremely high poundage, 53.25 pounds of 1 and 2 inch bluegill. These values helped to contribute to the lake being unbalanced, F/C ratio = 14.57. Swingle (1950) stated that any F/C ratio over 10 is unbalanced. The unbalanced F/C ratio, combined with the high angler exploitation of bass, prompted us to wish for adult bass which could be stocked. Although this technique is of doubtful value, we were left with a few alternatives. We did lower the lake 4 feet from November, 1975 to March, 1976 to concentrate forage fish so that the bass could feed readily. This was done during winter when feeding is low.

In June, 1976, 63 adult brood bass from the Meridian National Fish Hatchery became available. These fish were tagged and released in the lake on June 2, 1976. These fish ranged from two to four pounds in weight and were healthy, although they were in fairly poor condition as they had been off feed during spawning. We felt that these bass would provide additional angler exploitation data and also exert pressure on the large sunfish population. These bass had been in a hatchery all their life and thus had never been subjected to fishing pressure, therefore, had no "knowledge" of lures. Initial tag returns indicated that they were being caught at nearly the exact rate as the original fish. That is, about 1/3 were caught the first week and then the catch rate fell off drastically. See Table 3.

Table 3. Angler catch of 63 adult hatchery bass released June 2, 1976.

<u>Date</u>	<u>No. Bass</u>	<u>Percent</u>
June 3, 76	2	3.2
June 4, 76	3	4.8
June 5, 76	0	-
June 6, 76	9	14.2
June 7, 76	6	9.5
June 8, 76	1	1.6
June 12, 76	1	1.6
July 11, 76	1	1.6
July 30, 76	1	1.6
Aug. 19, 76	1	1.6
Oct., 10, 76	1	1.6

In conclusion, angler harvest during the first four days of fishing was above average. A fishing pressure of only 25.6 hrs/acre resulted in an exploitation of 32 percent of the tagged bass these four days and 1 1/2 years later a total of 57 1/2 percent of the initially tagged bass had been captured. The 63 adult brood bass stocked in the lake were caught at very similar rates as the original fish. Two different population estimator methods yielded similar population sizes.

This study was supported by Mississippi Game & Fish Commission with Federal Aid funds under Mississippi Project F-39.

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