

# FISH UTILIZATION OF MIDWATER AND BOTTOM FISH ATTRACTORS IN A FERTILIZED COMMUNITY FISHING LAKE

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*Abstract:* Fish associated with midwater fish attractors, bottom fish attractors, and open water devoid of cover were sampled by electrofishing at Madison County Public Fishing Lake. Both types of attractors concentrated harvestable-size largemouth bass *Micropterus salmoides* better than open-water areas devoid of cover. Midwater attractors concentrated harvestable-size largemouth bass as well as bottom attractors.

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Although fixed bottom attractors such as tire and brush structures have been used extensively to concentrate fish in freshwater environments (Wilbur 1974), and the effectiveness of such structures has been documented (Pierce and Hooper 1979), little work has been done with suspended midwater structures in freshwater.

Midwater structures composed of plywood sheets were shown to attract Alabama spotted bass *Micropterus punctulatus henshalli* and bluegill *Lepomis macrochirus* when suspended at depths of 5 m and 8 m in Lewis Smith Reservoir (Reeves et al. 1977). Water clarity in this deep, clear oligotrophic reservoir allowed visual observation of fish associated with the artificial structures by SCUBA divers.

Many bodies of water are more fertile than Lewis Smith Reservoir. Largemouth bass, a more prominent game fish than the spotted bass, is often dominate in this type environment over other species of black bass. The purpose of this study was to determine if midwater structures would attract largemouth bass in a fertile body of water with limited visibility.

## METHODS

Madison County Public Fishing Lake located in north central Alabama is 40 ha in size and receives 5,715 kg of 20-20-5 fertilizer and 5,171 kg of triple super-phosphate annually to increase fish production. Maximum depth is 11.5 m and the average depth is 4 m. Annual water level fluctuation is less than 1 m. Numerous fish attractors composed primarily of willow trees placed in 2 - 3 m of water are present on the western side of the lake. Other bottom attractors composed of cedar trees and tires are present.

Largemouth bass, bluegill, and redear sunfish *Lepomis microlophus* were stocked in 1960 - 1961 using the normal procedure for stocking state-owned and managed fishing lakes (Byrd and Crance 1965).

Additional species have been introduced since the original stocking. Florida largemouth bass *Micropterus salmoides floridanus* were stocked as fingerlings in 1976, 1977, and 1978. Walleye *Stizostedion vitreum vitreum* were stocked as fingerlings in 1976 and 1977. Hybrid striped bass *Morone chrysops* × *Monrone saxatilis*

were stocked as fingerlings in 1977. Threadfin shad *Dorosoma petenense* were stocked in 1977 and 1978. Channel catfish *Ictalurus punctatus*, blue catfish *Ictalurus furcatus*, white crappie *Pomoxis annularis*, and gizzard shad *Dorosoma cepedianum* are also present at Madison County Lake.

On 14 - 15 July 1977, 4 midwater attractors were placed in Madison County Lake. Each midwater structure consisted of 2 plywood sheets ( $2.4 \times 1.2 \times 0.1$  m), notched through half their length and interlocked in opposite planes. The plywood sheets were supported by wooden braces at alternate quadrants of the structures. These were the same structures used by Reeves et al. (1977) at Lewis Smith Reservoir. Damage which occurred when the structures were raised and loaded for transport was repaired.

Polyethylene line was used to suspend each of the 4 structures between a floating station buoy and a 48-kg weight. A short length of chain was used as a connector between the buoy and the polyethylene line. The structures were placed in a line average of 12 m apart near the center of the lake. The mid-lines of the structures ranged in depth from 2.7 - 3.7 m and averaged 3.1 m in depth. They were placed in water averaging 7.5 m deep.

On 8 - 9 September 1977, 4 bottom attractors were placed on a relatively level area with a silt bottom in the upstream portion of the lake. These attractors were spaced from 20 - 60 m apart. Their depth approximated the depth of the midwater attractors. The attractors were of the same plywood construction as the midwater attractors and were anchored to the bottom with a 48-kg weight. A buoy marked each of the attractors.

During the period 1 October 1977 - 4 October 1978 the midwater attractors, bottom attractors, and 4 open-water areas devoid of cover were sampled 19 times by electrofishing using 60 pps DC current with 4 ms pulse width at 560 volts and 4 amperes.

Each attractor unit and each of the 4 open-water areas was considered a station. Four stations of each habitat (midwater attractors, bottom attractors, or open-water) were considered a sample. The order each of the samples were shocked was selected randomly. Each station within a sample was shocked for 35 seconds during the 1st sampling trip. Sampling time was lengthened to 50 seconds on succeeding trips.

Fish captured were held in a live well until all 4 stations of one sample were shocked. Total length and weight were recorded for captured fish; then the fish were released.

Observation of fish around the midwater attractors was undertaken on 8 August 1977 and 25 August 1978. An attempt was made to observe fish on the bottom attractors on 25 August 1978. SCUBA gear was used during these observations.

## RESULTS AND DISCUSSION

Nineteen sampling trips between 3 October 1977 and 4 October 1978 produced 16 harvestable-size largemouth bass (total length greater than 250 mm) from the midwater attractors and 6 harvestable-size bass from the bottom attractors. Open-water areas devoid of cover produced no largemouth bass. The difference between the attractor areas and the open-water control area was highly significant with an analysis of variance 1-way classification. Catch of harvestable-size largemouth bass

at midwater attractors and bottom attractors did not differ significantly. Total length of harvestable-size largemouth bass from the midwater attractors averaged 431 mm (261 mm - 555 mm), whereas bass from the bottom attractors averaged 386 mm (313 mm - 476 mm) total length.

Midwater attractors and bottom attractors each yielded a total of 13 largemouth bass below harvestable lengths. These bass were primarily young-of-year which appeared to be associated with a buoy rather than an attractor unit. The small bass responded immediately to the electrical current while the larger bass took several seconds to reach the surface.

A total of 4 bluegills was collected at the midwater attractors. One bluegill was collected in the open-water area. Threadfin shad were collected from all 3 areas on 3 October 1977 when the lake was turbid following heavy rains. Four gizzard shad were collected from the bottom attractors and 2 from the open-water area. One hybrid striped bass (length 324 mm) was collected at the midwater attractors on 9 September 1978. Two channel catfish (lengths 355 mm and 538 mm) were collected at the bottom attractors on 4 October 1978.

No fish were captured during the four sampling trips from 12 December 1977 through 10 March 1978. Similarly, no fish were observed on mid-water structures at Lewis Smith Reservoir in November and December (Reeves et al. 1977).

During the 1st visual observation of the midwater attractors on 8 September 1977, 1 largemouth bass estimated to be approximately 450 mm was observed suspended beneath the mid-line of an attractor unit. Visibility on this dive was approximately 75 cm. During the dive on the midwater attractors on 25 August 1978, schools of bluegill fry, 12 mm - 25 mm in length, were observed around two of the structures. The schools contained from 1,000 - 2,000 individuals. Visibility on this dive was approximately 60 cm. An attempt was made to observe fish at the bottom attractors on the same trip. The bottom attractors had sunk approximately 10 cm into the silt bottom. The diver's motion stirred up the sediment reducing visibility to near zero. An abundance of terminal tackle and fishing line lost by fishermen utilizing the structures created hazardous conditions in the low visibility water, and the diver returned to the surface.

The number of fish captured during this project was low. Probably, fish associated with the attractors were near the maximum effective range of the electro-fishing equipment. The small size of these attractors probably contributed to the low numbers of fish collected. Wilbur (1974) suggested bottom attractors covering 9.29 m<sup>2</sup> approached minimum size. Chapman (1975), working with tire attractors composed of 22 and 33 tires, noted the relatively small number of tires used in his study did not attract large quantities of fish. Relatively high numbers of fish were observed associated with midwater structures composed primarily of fiberglass panels and automobile tires in comparison with the previously used plywood structures at Lewis Smith Reservoir (Smith et al. 1980).

Midwater attractors concentrated harvestable-size largemouth bass as well as bottom attractors in this fertile community fishing lake. Midwater attractors appear useful for concentrating fish in deep open-water areas of lakes where bottom attractors would be below the thermocline during summer months.

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