FISH PRODUCTION IN A CENTRAL ALABAMA STOCK WATER POND

by

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ABSTRACT

The use of suitably constructed and located stock water ponds for food fish culture is recommended, based upon investigation into the possibilities of these small bodies of water to rear a channel catfish-largemouth bass combination. Stocked with 2,000 catfish and 100 bass per acre with supplemental feeding, two, two-year production cycles showed the following results: total fish production, 2,634 and 3,791 pounds per acre; feed conversion, 2.5 and 2.4; recovery of stocked catfish, 84 and 91 percent; recovery of stocked bass, 40 and 50 percent. In addition to supplying food fish, the pond provided recreation through the fish cultural activity and by hook and line fishing.

INTRODUCTION

There are thousands of small stock water ponds or waterholes on farms and ranches in the southern half of the United States. More are being built each year, as they provide an economical and trouble-free source of water for an expanding livestock industry.

While the recreational value of a body of water smaller than one-fourth acre is limited, productivity of a small pond can be equal to or greater than a large one on a per-acre basis. Unfortunately, management methods which are effective for larger ponds are not directly applicable to smaller ones (Swingle, 1949, Hooper, 1970) and these small bodies of water are generally overlooked as a source of recreation or food fish production. However, by changing the stocking combination to channel catfish and largemouth bass and feeding supplementally, Crance and McBay, (1966), reported that several owners of stock water ponds were able to obtain substantial yields of fish from these bodies of water. In the production trials they reported, rates of 2,000 and 3,000 channel catfish plus 100 bass per acre were stocked. The catfish were fed supplementally and fishing was begun toward the end of the first growing season. In the ten ponds studied, catch per acre during the first two years of fishing averaged 709 pounds per year for the 2,000 rate and 257 pounds for the 3,000 fish stocking rate.

In 1967, construction of a 0.1-acre stock water pond on the property of the writer made a facility available for further investigation into the potential of such water for the production of food fish and recreation. This waterhole was dug with a dragline according to specifications of the U.S. Soil Conservation Service. It was rectangular in shape with a maximum depth of 6 feet. Three sides were shaped to a two to one slope with the fourth dug to about a six to one slope to provide livestock access. The pond had no drain. However, a substantial flow of water passed through it during rainy weather, as there was a small spring and about five acres of watershed draining through it. The outflow passed into a shallow field ditch, ultimately reaching Perry Lake, a oxbow pond near the Cahaba River. Distance from the pond to a permanent body of water is estimated to be about 1.3 miles.

METHODS

Two production cycles of two years each were included in the study. Channel catfish, *Ictalurus punctatus*, (Rafinesque), fingerlings were stocked in the fall at a rate of 2,000 per acre. The following spring, during the month of May, largemouth bass,

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Micropterus salmoides, (Lacepede), were added at a rate of 100, two-inch fingerlings per acre. The pond was fertilized initially to produce enough phytoplankton to reduce light penetration to less than two feet. Supplemental feeding was begun within two weeks of stocking, using waste food from the table of a family of six persons. This feed was weighed to the nearest 0.2 pound and placed in the pond intermittently in amounts of from one to four pounds. Beginning in March after stocking, pelleted commercial catfish feed was also fed starting at a rate of three pounds per acre per day and gradually being increased to 20 pounds by mid-August the first cycle and 25 pounds the second cycle. The fish were fed daily during the first growing season, intermittently on warm days during the winter months, and every second or third day the second growing season. The rate per acre per day was lowered to 15 pounds the second summer of the first cycle and to 20 pounds the second summer of the second cycle.

Fishing was commenced a year after stocking the catfish. The weight and number of fish caught by species was recorded. Two years after stocking, the standing crop was determined by applying cube powder containing five percent rotenone to the pond at a rate of two parts per million. As soon as affected fish surfaced, collection with dip nets and a 100-foot, 1-inch mesh drag seine was done until no more fish could be caught. The fish collected were sorted by species and size (usable as food or smaller), counted and weighed. Criteria for sorting as to size were those established by Swingle (1950). Two days after poisoning, a count was made of the uncollected fish which had floated to the surface since the first day. For the first cycle, catfish were stocked on October 20, 1967. Harvesting took place October 16, 1969. For the second cycle, catfish were stocked on November 18, 1969 and harvested on October 16, 1971.

RESULTS AND DISCUSSION

Data on the standing crop of fish produced during the first cycle are shown in Table 1. Those for the second cycle are presented in Table 2. In addition to the two species stocked, ten others entered the pond, presumably by way of the outflow. Species of wild fish present were bluegill, *Lepomis macrochirus*, (Rafinesque), bowfin *Amia* calva, (Linnaeus), green sunfish, *Lepomis cyanellus* (Rafinesque), goldfish, *Carassius* auratus, (Linnaeus), spotted sucker, *Minytrema melanops*, (Rafinesque), speckled bullhead, *Ictalurus nebulosus marmoratus*, (Holbrook), white catfish, *Ictalurus catus*, (Linnaeus), yellow bullhead, *Ictalurus natalis*, (LeSeurer), golden shiner, *Notemigonus crysoleucas*, (Mitchill), and carp, *Cyprinus carpio*, (Linnaeus). Six of the ten species were common to both cycles. Goldfish and speckled bullhead were only found in the first cycle, while golden shiners and carp were found only in the second cycle. Young of year bluegill, green sunfish, golden shiner and yellow bullhead apparently were produced in the pond the second summer. With the exception of the yellow bullheads which were 4-6 inches total length, no attempt was made to determine their weight as the fish were judged to be too small to have a significant effect on the total poundage produced.

Table 1. Production data for the first cycle.

Species	Hook and line catch		Rotenone harvest		Total recovery	
	No.	Wt., lbs.	No.	Wt., lbs.	No.	Wt., lbs.
Channel catfish	42	39.9	111	125.0	153	164.9[1]
Largemouth bass	2	1.3	2	4.3	4	5.6
Bluegill	3	0.6	19	3.7	22	4.3
Green sunfish	14	2.7	5	1.0	19	3.7
White catfish	--	--	5	8.0	5	8.0
Speckled bullhead	--	--	1	0.8	1	0.8
Yellow bullhead	4	1.0	215	51.0	219	52.0
Spotted sucker	--	--	23	6.3	23	6.3
Bowfin	--	--	1	0.8	1	0.8
Goldfish	--	--	1	0.2	1	0.2
Totals		45.5		201.1		246.6

Hook and line fishing removed 45.5 pounds of fish from the first cycle and 13.7 the second. Ten fishing trips were made during the first cycle but only two the second. Catfish were taken on all fishing trips, with the number varying from 1 to 13 per trip. For the first cycle it was possible to account for 84 percent of the catfish stocked, but only 40 percent of the bass. For the second cycle, 91 percent of the catfish and 50 percent of the bass were accounted for.

[1]Later observation showed 15 average size or larger channel catfish were not recovered. Estimated weight 16.8 pounds.

Table 2. Production data for the second cycle.

Species	Recovered and weighed		Counted, wt. estimated		Total[1]	
	No.	Wt., lbs.	No.	Wt., lbs.	No.	Wt., lbs.
Channel catfish	131	216.0	43	68.8	174	284.8[2]
Largemouth bass	5	7.5	--	--	5	7.5
Bluegill	12	2.4	--	--	12	2.4
Green sunfish	5	0,6	--	--	5	0.6
White catfish	8	3.2	4	2.0	12	5.2
Yellow bullhead, large	37	31.8	2	1.0	39	32.8
Yellow bullhead, small	--	29.0	--	--	--	29.0
Bowfin	1	2.5	--	--	1	2.5
Carp	1	0.3	--	--	1	0.3
Spotted sucker	2	0.3	--	--	2	0.3
Totals		293.6		71.8		365.4

Data on the amount of feed supplied and conversions obtained are shown in Table 3. Considering only the catfish, this was 3.6 for the first cycle and 3.0 for the second. Including all fish except the young of the year which were not weighed, conversion was 2.5 for the first cycle and 2.4 for the second. The contribution the table scraps made was not measured, but the size of the conversion suggests that it was somewhat less than for the dry feed. Presence of the wild fish probably reduced the weight and size of the catfish produced.

Yield of fish from the second cycle was substantially higher than for the first. Several factors are thought to have been involved, although the amount of feed supplied was probably the most important. More commercial feed was given the second cycle than the first. Residual nutrients from the first cycle could have made a contribution, as the pond was not drained between cycles. Size of the catfish stocked the first cycle was 4.5 inches total length, but was about 8 inches the second time. Better survival of both catfish and bass occurred during the second cycle. Even though the density of catfish was greater for the second cycle, average size was larger, 1.6 pounds as compared to 1.1 pounds the first. Also during the second cycle, 15-25 steers on a shelled corn ration were watered in the pond. Undigested corn entered the pond and could have been consumed by the fish. The digestive tract of one fish caught with hook and line was noted to contain kernels of yellow corn.

[1]One to two pounds of small fish including golden shiners, bluegills, green sunfish and yellow bullheads were not picked up or estimated for inclusion in this total.

[2]Does not include 13.7 pounds of catfish removed by hook and line.

The catch per acre of 455 pounds during the first cycle compares well with that reported by Crance and McBay, (1966). The low figure of 137 pounds during the second cycle was a reflection of the change in interests of the persons to whom the pond was open for fishing.

Quality of the catfish produced was judged to be excellent when eaten fresh or after being frozen. Collection with rotenone made no detectable difference in flavor in this situation.

No effort was made to evaluate the procedure as to economic feasibility. However, in terms of retail value of fresh and frozen catfish, it is thought that feed and labor costs could be readily recovered. Recreational value of the cultural operation along with hook and line harvesting could be substantial. Even the total harvesting phase of the operation was considered to have recreation value if one can exclude dressing and processing the catch for storage.

Migration of wild fish into the pond is of interest, as a distance of 1.3 miles separates the waterhole and permanent water downstream. The invading species were indigenous to Perry Lake and probably moved into the waterhole during winter or spring rains. Little or no downstream migration of catfish was evident, although this could have been a cause of the low bass survival.

Based upon this personal experience, I would recommend that any suitably located and constructed stock waterhole be stocked with channel catfish and largemouth bass for production of food fish and recreation.

Table 3. Food supplied and fish produced.

Item	First crop	Second crop
Commercial feed, lbs.	384	720
Table scraps, lbs.	269	180
Total channel catfish produced, lbs.	181.7	298.6
Feed conversion, channel catfish only	3.6	3.0
Average size, channel catfish, lbs.	1.1	1.6
Total wt., all fish, lbs.	263.4	379.1
Feed conversion, all fish	2.5	2.4

LITERATURE CITED

Crance, J. H. and L. G. McBay. 1966. Results of tests with channel catfish in Alabama ponds. Progressive Fish-Culturist 28(4):193-200.

Hooper, G. R. 1970. Results of stocking largemouth bass, bluegills and redear sunfish in ponds less than 0.25 acre. Proceedings of the Twenty-third Annual Conference Southeastern Association of Game and Fish Commissioners p. 474-479.

Swingle, H. S. 1949. Some recent developments in pond management. Transactions Fourteenth North American Wildlife Conference, p. 295-312.

. 1950. Relationships and dynamics of balanced and unbalanced fish populations. Bulletin 274 Alabama Agricultural Experiment Station, Auburn Alabama.