

CONFIDENCE LIMITS ON SEINE HAUL MEANS

The means and variances of 50-foot seine haul catches transformed by the logarithm of $N + 1$ were calculated using only numbers of bluegill (*Lepomis macrochirus*) captured in the above seine hauls. Separate estimates were made on each day for the first hauls and the second hauls. The 95 percent confidence limits of the means were derived. Then the percent of the mean that one-half of the confidence interval represented was calculated. These values ranged from 32 to 300 percent for 46 four-haul sampling sets. The median of these values was 100.25.

CONCLUSION

It is concluded that in sampling ponds by seining to determine balance more than four 50-foot seine hauls need to be taken and that these hauls should be made in different sections of the ponds. The author realizes the impracticality of doing this in many of the ponds that have to be checked for balance. However, the limitations of the seining method should always be kept in mind.

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CATFISH BASKET COMPARISON STUDY *

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ABSTRACT

A study was conducted which tested the orientation of the slotted opening in welded wire catfish baskets. Comparisons were made as to the catfish and gamefish catches when the slotted openings were set horizontally, vertically, or at random.

Catch rates are presented in 48, 72, 96, and 120-hour set periods. Catfish (primarily white catfish) comprised 97.79 percent of the total weight, and

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were caught at an overall rate of 1.16 pounds per basket-day. The random, horizontal, and vertical opening baskets yielded 1.28, 1.06, and 1.15 pounds of catfish per basket-day, respectively. Catch rates for crappie were 0.021, 0.005, and 0.023 pounds per basket-day in the same order.

The catch of gamefish species other than crappie was insignificant when compared with the total catch. However, on the basis of weight, the catch of these species in baskets with horizontal slots was one-half that taken by the randomly positioned slots and only one-third of the catch taken in baskets with vertical slots.

INTRODUCTION

The present regulation concerning the setting of catfish baskets in inland waters of North Carolina specifies that the traps be constructed in the form of a "D" so that the inner slotted funnel will be parallel to the bottom. This regulation does not permit the maximum utilization of non-game species.

One of the major problems of reservoir management is the maximum utilization of the non-game fishery resource without damage to the game fish populations. Removal of rough fish may or may not benefit sport fishing. Regulations controlling the taking of non-game fish should be based on whether the total fishery is being properly utilized as well as upon the degree of benefit to sport fishing. Restrictions should be applied only to the methods and devices which adversely affect the game fish populations. Therefore, a test was conducted to determine whether or not the approved design, or possibly another design, of catfish basket would prove to be more effective in catching catfish without taking undue numbers of game fish.

EXPERIMENTAL PROCEDURE

Briefly the procedure was to set three types of catfish baskets and compare the catch of each. The types tested were:

1. "The Horizontal D"—one side of the basket was flattened so that the trap resembled the letter "D". The second or slot funnel opening was arranged so that it was parallel to the flat bottom surface.
2. "The Vertical D"—a "D" type trap as described above but with the second funnel opening set vertical to the bottom.
3. "The Round"—a trap circular in cross section so that when set, the slotted opening could be in any position from vertical to horizontal.

All baskets were of one-inch mesh, welded wire construction; four feet long and 70 inches in circumference. Each type had two funnels of welded wire at one end. The outer funnel contained a circular opening with a diameter of 10 to 12 inches. The inner funnel opening was 6 inches. A sleeve of woven nylon cord was fastened to the inner funnel. This sleeve was tapered to a 6-inch slotted opening which could be tied to set either horizontally or vertically.

The baskets were set in four selected locations in the Abbotts Creek arm of High Rock Reservoir. Three baskets (one of each type) were fastened to a centrally located pole with about 75 feet of rope to each basket. Positions of the baskets in relation to the pole were switched periodically in order to reduce bias. When the baskets were fished, the catch from all four baskets of each type was combined and the species, number, and weight were recorded.

Cut fish and fish scraps were used as bait. All baskets at each pole were fished and baited at the same time. The 12 baskets were set for a total of 3,048 basket days between March 18, 1959 and November 27, 1959. The fishing interval varied from one to ten days.

RESULTS AND DISCUSSION

A total of 22,746 fish (3,626.6 pounds) was taken during the test period (Table I). Of these, 95.22 percent were catfish which made up 97.79 percent of the total weight. Crappie comprised 3.15 percent of the total number and 1.38 percent of the total weight. The catch of other game fish (Table I) was insignificant, comprising only 1.61 percent of the total number and 0.50 percent of the total weight.

A comparison of the species composition in the catches of the three types of baskets (Table II) shows that there were only minor variations in the relative numbers of fish taken.

TABLE I
SPECIES COMPOSITION OF FISH TAKEN IN CATFISH BASKETS FROM HIGH ROCK
LAKE FOR THE PERIOD MARCH 18, 1959 TO NOVEMBER 27, 1959

Species	Av. No. Catfish/basket set—21.3		Av. Wt. Catfish/basket set— 3.4 pounds	
	Number	Wt. (Lbs.)	% Total No.	% Total Wt.
Catfish	21,657	3,546.7	95.22	97.79
Crappie	716	50.1	3.15	1.38
Pumpkinseed	220	8.7	0.97	0.24
Bluegill	112	5.8	0.49	0.16
Yellow Perch	17	1.4	0.07	0.04
Warmouth	11	1.0	0.05	0.03
White Perch	8	1.0	0.03	0.03
Carp	5	11.9	0.02	0.33
TOTALS	22,746	3,626.6	100.00	100.00

TABLE II
COMPARISON OF SPECIES OF FISH CAUGHT IN THE 3 TYPES OF CATFISH BASKETS

Type Basket	Species	Number	Wt. (Lbs.)	% Total Number	% Total Weight
Round	Catfish	8,081	1,298.6	95.1	98.0
	Crappie	299	21.0	3.5	1.6
	Other game fish*	117	5.8	1.4	0.4
	Carp	1	0.1
	TOTALS	8,498	1,325.5
Horizontal D	Catfish	6,729	1,079.6	98.0	98.9
	Crappie	86	5.2	1.3	0.5
	Other game fish*	50	2.8	0.7	0.2
	Carp	2	4.2	Tr.	0.4
	TOTALS	6,867	1,091.8
Vertical D	Catfish	6,847	1,168.5	92.8	96.6
	Crappie	331	23.9	4.5	2.0
	Other game fish*	201	9.3	2.7	0.8
	Carp	2	7.6	Tr.	0.6
	TOTALS	7,381	1,209.3

* Includes Pumpkinseed, Bluegill, Yellow perch, Warmouth, and White perch.

TABLE III
CATFISH AND CRAPPIE CATCH PER BASKET DAY FOR 48, 72, AND 120 HOUR
SET PERIODS

Length of Set Period	No. of Sets	Round		Type of Basket Horizontal D		Vertical D	
		No.	Wt. (Lbs.)	No.	Wt. (Lbs.)	No.	Wt. (Lbs.)
Catfish							
48 hr.	48	10.72	1.73	7.13	1.19	7.86	1.43
72 hr.	20	9.92	1.63	8.70	1.38	8.31	1.43
96 hr.	4	3.28	0.57	4.36	0.63	3.03	0.48
120 hr.	6	4.06	0.60	6.20	1.04	5.71	0.90
Average	..	6.99	1.13	6.58	1.06	6.23	1.06
Crappie							
48 hr.	48	0.37	0.025	0.09	0.006	0.40	0.026
72 hr.	20	0.18	0.011	0.07	0.004	0.30	0.025
96 hr.	4	0.27	0.019	0.11	0.007	0.37	0.028
120 hr.	6	0.11	0.007	0.02	0.001	0.10	0.004
Average	..	0.23	0.015	0.07	0.004	0.29	0.021

Considering the total weight of catfish taken, 36.6 percent was captured in the round basket, 30.4 percent in the horizontal "D" basket and 33.0 percent in the vertical "D" basket.

The vertical "D" and round baskets took a larger percentage of game fish than did the horizontal "D" baskets. Inasmuch as crappie dominate the game fish population in High Rock Reservoir, it was not surprising to find a fair number of them in the baskets. Of the total number of crappie captured in all baskets, 12.0 percent were taken in the horizontal "D" baskets, with 41.8 percent in the round and 46.2 percent in the vertical "D" baskets. The highest catch rate for any type of basket was less than 0.03 pounds of crappie per basket day in the vertical "D" baskets during 96-hour set periods. This catch rate is so low that it may be considered negligible in the study reservoir.

A comparison of the catch record data for all types of catfish baskets (Table III) shows that the yield of fish declined as the length of time set increased. It is logical to deduce that escapement from the baskets was responsible for the reduction in number of fish captured. For efficient operations, catfish baskets should be fished at least every 48 hours.

CONCLUSIONS

1. The round type catfish basket with the slotted opening of the inner funnel positioned at random was slightly more effective for catching catfish than were the other two types tested.
2. Game fish catch was very low in all traps but the traps having a horizontally set opening captured fewer game fish than did the other types.
3. The yield of fish from catfish baskets was inversely proportional to the fishing time. Maximum catches were made from baskets set over a 48-hour period.
4. None of the baskets tested took game fish in a quantity considered detrimental to the game fish population in High Rock Reservoir.

LOW-FLOW REGULATION AS A MEANS OF IMPROVING STREAM FISHING

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ABSTRACT

Studies by the U. S. Study Commission, Southeast River Basins, and co-operating agencies have disclosed that utilization of many streams in the study area is curtailed in part by excessively low stages and sometimes by excessively high stages during the fishing season. The U. S. Study Commission has considered the regulation of low flows by controlled discharge from upstream storage reservoirs as one means of improving such streams for fishing.

Concepts and methods employed in the determination of flow-storage relationships, flow-fishery relationships, storage required to regulate flows, and measurement of fishery benefits are described in this paper. Results of the study indicate that the utility of some streams may be increased from two to five times with low-flow regulation; however, a much better understanding is needed of flow-storage-fishing relationships on which to base more accurate determinations of desired stages and potential benefits.

INTRODUCTION

An inventory of fishing waters in the Southeast River Basins area by the U. S. Study Commission, Southeast River Basins, revealed about 4,700 miles of warm water streams of particular significance with a surface area of over 124,000 acres. These streams have a potential capacity of sustaining around 2 million man-days of sport fishing—according to standards employed by the U. S. Study Commission, Southeast River Basins.

Present as well as potential utilization, however, is curtailed by excessively low stages and sometimes by excessively high stages during the fishing season.