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EVALUATION OF SLAT TRAPS AS COMMERCIAL FISHING GEAR IN LOUISIANA

by

LLOYD POSEY and HARRY SCHAFFER

INTRODUCTION

Dingell-Johnson research project F-5-R dealt with an evaluation of commercial fishing gear in Louisiana and, when completed in 1959, recommended certain changes in the commercial fishing laws. The legalized use of wooden slat traps for catfish was one of the proposals. Project research had indicated that slat traps were selective for catfish and it was thought that there would be a need for such gear should the minimum mesh size of 2.5" bar measure be adopted. An industry which depended strongly on the use of 1.0" or 1.5" square mesh nets for capturing catfish had developed in certain areas of Louisiana. It was evident that those fishermen would need a selective and efficient gear to continue their harvest.

The proposed changes in commercial fishing regulations were enacted by the legislature in 1960 and were scheduled to become effective on May 1, 1961. This legalized the use of wooden slat or basket traps having slats six inches or less in width spaced so as to leave at least a one inch opening between slats. However, just before the date on which slat traps were to become legal gear that portion of the law which legalized their use was suspended by Senate Concurrent Resolution Number Eleven until further action by the legislature. The

Louisiana Wild Life and Fisheries Commission was then asked to conduct further studies into the efficiency and selectivity of slat traps.

TRAP DESIGN AND PROCEDURE

Thirty-six traps were constructed for this study. Most differed in some detail of design. Each trap had one or two cone shaped throats or flues usually constructed of flexible, tapered oak strips. In some cases wire or webbing throats were used. Thin oak or masonite strips were used for slats. Spacing between the slats ranged from 0.0 to 2.0 inches except length was four feet. Width and height were either 13 or 14 inches except for the round traps. A removable wooden door was placed at the rear of each trap to facilitate baiting and removal of catch.

Traps were weighted with bricks or scrap metal in order to sink them. Bait was inserted into the pound area through the removable rear door. Bait was either loose or enclosed in a piece of burlap, depending upon type. Several baits were used in an effort to determine which were most effective.

Traps were set in water ranging from two to twenty feet in depth. The average depth was approximately 4.5 feet. A rope was attached to the front of each trap to serve as a buoy line and to life traps from the water. Prior to 1963, traps were fished at random. Eighteen streams or lakes throughout the state were sampled coincident with other duties. In 1963 traps were fished extensively in one body of water, Lake Des Allemands. A listing of sampling areas may be found in Table I.

After fishing these devices for some time it became apparent that constantly moving them from lake to lake at weekly intervals was not conducive to good results. The alternate drying and soaking of traps caused a problem. The traps would not sink without additional weight and failed to achieve the desired "age" characteristics. Experienced

TABLE I
LIST OF STUDY AREAS

Bayou Dorcheat	Grand River flats
Boeuf River	Lake Des Allemands
Caddo Lake	Lake Louie
Cane River Lake	Lake St. John
Catahoula Lake	Lake St. Joseph
Cedar Lake	Saline Bayou
Clark's Bayou	Spanish Lake
Cocodrie Lake	Tensas River
Flag Lake	Weem's Lake

commercial fishermen suggested that a period of "seasoning" in the body of water to be fished would improve catch rates. Lake Des Allemands, a large, shallow lake 40 miles west of New Orleans, was chosen as the site to test this theory. Traps were fished continuously from May 7 to June 13, 1963 in this lake. As the traps "seasoned" they absorbed water, and would usually sink without the addition of weights. They also accumulated a coating of algae and appeared to blend with the natural habitat.

TABLE II
TOTAL RESULTS OF SLAT-TRAP FISHING WITH PROJECT
TRAPS—1,456 TRAP-DAYS

SPECIES	Total No.	Avg. Length	Total Wt.	% of Total		No. Trap- Day
				Avg. Wt.	No. Caught	
Channel catfish	313	14.6	464.9	1.5	90.46	.215
Blue catfish	8	13.8	8.9	1.1	2.31	.005
Flathead catfish	7	19.5	43.5	6.2	2.02	.005
Black bullhead	6	11.7	6.0	1.0	1.73	.004
Yellow bullhead	5	10.9	3.5	0.7	1.45	.003
Brown bullhead	2	13.3	2.3	1.2	0.58	.001
Longear	1	4.0	0.1	0.1	0.29	.001
Bluegill	2	7.0	0.4	0.2	0.58	.001
Stripped mullet	2	16.0	2.9	1.5	0.58	.001
TOTALS	346		532.5		100.00%	

Number of fish captured per tray day = .238
Lbs. of fish captured per trap day = .366

TABLE III
RESULTS OF SLAT-TRAP FISHING WITH PROJECT
TRAPS PRIOR TO 1963
TOTAL TRAP-DAYS FISHED 993

SPECIES	Total Number	Avg. Length	Total Weight	% of Total	
				Avg. Weight Pounds	No. Caught
Channel catfish	39	13.9	45.9	1.2	58.21
Blue catfish	8	13.8	8.9	1.1	11.94
Flathead catfish	6	20.8	42.8	7.1	8.96
Black bullhead	6	11.7	6.0	1.0	8.96
Yellow bullhead	5	10.9	3.5	0.7	7.46
Brown bullhead	2	13.3	2.3	1.2	2.98
Longear sunfish	1	4.0	0.1	0.1	1.49
TOTALS	67		109.5		100.00%

Number of fish captured per trap day = .067
Lbs. of fish captured per trap day = .110

RESULTS

A total of 1,456 trap-days of fishing effort was recorded. A trap-day is one trap fished for a twenty-four hour period. A total of 346 fish were captured yielding a catch of .238 fish per tray-day (Table II). This compares favorably with the catch in one inch and one and one-half inch fesh hoop nets as recorded by Davis and Posey (1959). They reported .263 commercial fish per net-day. Catches of game in hoop nets were greater than that of commercial species.

Breaking the data down into two parts, that fished at random around the state and that fished exclusively in Lake Des Allemands, shows an interesting comparison. The catch per trap-day prior to 1963 was .067 (Table III). A significant increase (Table IV) to .603 fish per trap-day was recorded for Lake Des Allemands in 1963.

Of interest is the species composition of the catch. Catfish accounted for 98.55 percent of all fish caught. Channel catfish comprised 90.46 percent of the total yield. Starrett and Barnickol (1955) reported 80.8 percent catfish in 74 slat trap sets on the upper Mississippi River.

TABLE IV
RESULTS OF SLAT TRAP FISHING IN LAKE DES ALLEMANDS

May - June 1963

TOTAL TRAP DAYS FISHES 463

SPECIES	Total Number	Avg. Length	Total Weight	Avg. Weight Pounds	% of Total No. Caught
Channel catfish	274	14.70	419.0	1.53	98.20
Flathead catfish	1	11.50	0.7	0.70	0.36
Stripped mullet	2	16.0	2.9	1.45	0.72
Bluegill	2	7.0	0.4	0.20	0.72
TOTALS	279		423.0		100.00%

Number of fish captured per trap-day = .603

Lbs. of fish captured per trap-day = .914

FACTORS AFFECTING CATCH

In Lake Des Allemands the majority of fish taken on any one night were caught in three or four traps, while the others remained empty. Location of the trap and trap design apparently were not the only factors involved. A trap that caught well on one occasion, although left in that location, might fail to catch fish during the following days. Research in commercial catfish ponds conducted by the Bureau of Commercial Fishes suggested the possibility of a "decoying effect" (Anon., 1964, Commercial Fisheries Review). After one or two fish enter a particular trap, their presence and activity may induce others to enter the same trap.

Starrett and Barnickol (1955) report that live gravid females are often placed in traps during the spawning season to serve as decoys. Since experimental fishing in Lake Des Allemands coincided with the spawning period, the relationship of spawning activity to catch rates would have to be considered. The relatively high catch rate for un-

baited traps (.760 fish/trap-day) in Des Allemands might be an indication that catfish were seeking spawning sites.

The analyses of minor variations in trap design were inconclusive, since there were few duplications in design and since destruction plus theft reduced the number of traps in use to eleven. Traps 3 and 29 had the best record, capturing 1.238 and 1.064 fish per trap-day, respectively. Trap number 3 had one variation, a solid wooden end, which might have had some effect on its efficiency. Trap number 29 had one-half inch spacings between the top slats. These features caused both traps to have a darker interior than traps of other designs. The high catch rates in these two traps might lead to the assumption that darkness was a significant factor in their success. However, trap number 8 possessed the combined characteristics of traps 3 and 29, but only caught .089 fish per trap-day. Trap 13 had a solid wooden end and the spaces between slats were covered so as to reduce light penetration. Even under these darkened conditions this trap caught no fish.

Twenty-two of the traps were constructed of masonite slats on oak frames, fourteen had white oak slats. The masonite traps were not as strong as the wooden traps but caught more fish per unit of effort.

Analyses of baits used were attempted. Table V lists those baits which were fished for more than one hundred days and indicates one was outstanding. Those baited with a combination of cottonseed cake and canned dog food captured .773 fish per trap-day. It is interesting to note that cottonseed cake alone caught .111 fish per trap-day, while dog food alone fared even worse, .081 fish per trap-day. Cheese, the old favorite, logged .091 fish per trap-day.

Traps set unbaited caught .686 fish per trap-day. Since catches in unbaited traps ranked second in overall efficiency, "decoy effect", spawning activity, or trap location, appears to be more significant factors than type of bait.

CONCLUSION

Slat traps were selective for catfish. These devices can take channel catfish more efficiently than one inch or one and one-half inch mesh hoop nets. Game fish are captured infrequently, accounting for less than one per cent of the total catch throughout this study.

TABLE V
ANALYSES OF BAITS USED IN SLAT-TRAP STUDY

TYPE OF BAIT	Days Fished	No. Caught	No./Trap-Day
Cottonseed cake	467	52	.111
Canned dog food	123	10	.081
Cheese	121	11	.091
Commercial catfish bait	208	14	.067
Bone meal	114	12	.105
Cottonseed cake and dog food	119	92	.773
No bait	204	140	.686

The analyses of baits used suggest that bait is not the most important factor in producing good catches. The roles of trap location, spawning activity and "decoy effect" are not clear. These would be promising avenues for additional research.

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REDUCTION OF THREADFIN SHAD HAULING MORTALITY BY THE USE OF M.S. 222 AND COMMON SALT*

Since the advent of intensive fishery management of large man-made impoundments, biologists have searched for the perfect forage fish. They wanted a species that would be suited to reservoir living, but would not be detrimental to the desirable species normally found in these impoundments.

Small gizzard shad, *Dorosoma cepedianum*, although temporarily supplying the needs of young predators in newly impounded waters, soon outgrow their usefulness. The large adult size obtained by gizzard shad and tendency to overpopulate with consequential reduction of spawning success reduces its utilization by smaller carnivorous species.

In 1956, Arkansas fishery personnel became interested in threadfin shad, *Dorosoma petenense*, as a replacement for the less desirous gizzard shad.

The climate here is such that the threadfin, once established, expand rapidly during the spring and summer, but are controlled naturally by winter kills.

A source of supply was discovered in the southeastern portion of the state in Lake Chicot. Biologists began hauling threadfin shad often as far as two hundred miles or more north of their native range. Using routine hauling methods, fifty percent mortality was common and as much as ninety-five percent mortality was experienced at times.

During hauling operations in the early summer of 1961, Dr. Kirk Strawn, Zoology Department, University of Arkansas and Project Leader of Arkansas' Dingell-Johnson Project F-8-R, (a project concerned with threadfin shad introduction in Lake Ft. Smith, Arkansas) suggested that the addition of common salt to the hauling water might reduce mortality. He based his suggestion on his previous experience with marine and aquarium fishes where the addition of salt improved survival during handling. Since threadfin shad are considered recent

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