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AN EVALUATION OF TRAPS AND BAITS FOR CAPTURING WATERFOWL IN COASTAL LOUISIANA[1]

by

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ABSTRACT

Three trap designs, four baits types, and two welded wire mesh sizes were evaluated for trapping waterfowl in the Louisiana coastal marshes. A total of 2251 trap days, extending from 21 January 1974 through 26 April 1974, were used in the evaluation. During this time, 4806 waterfowl were captured, 4339 of which were Lesser Scaup *(Aythya affinis)*, 352 were puddle ducks, and the remainder were American Coots *(Fulica americana)*. Whole corn or wheat was the best bait for Lesser Scaup (P .01), and wheat was the best bait for puddle ducks. There was no significant difference between the number of waterfowl captured in traps built with welded wire having a 1 x 2 inch or a 2 x 2 5/8 inch mesh. A newly designed five-entrance star trap proved to be the most efficient trap (P .01), catching 3049 birds. Clover-leaf traps caught 1140 birds, and box traps were least efficient, catching 608 birds.

INTRODUCTION

Waterfowl banders working in the northern United States and Canada have less difficulty trapping an abundance of puddle ducks than is experienced in Louisiana, where the bander is competing with an enormous tonnage of natural waterfowl food. With the exception of McIlhenny's success from 912 through 1939 (McIlhenny 1940), puddle duck trapping in Louisiana has proven to be inefficient. A total of 105,818 puddle ducks had been banded in Louisiana by the end of 1970 (Donna R. Rogers, unpublished data, 1974), but several species are inadequately represented in this sample. Gadwall *(Anas strepera)* and American Wigeon *(Anas americana)* have proven to be the most difficult to trap. Gadwalls comprise an estimated 25.5 percent of Louisiana's coastal puddle duck population (Palmisano 1972), but only 246 had been banded by the end of 1970. American Wigeons represent approximately 19.3 percent of the puddle ducks and only 388 had been banded by this time. Other species that have proven difficult to trap are the Pintail *(Anas acuta)*, Northern Shoveler *(Anas clypeata)*, American Green-winged Teal *(Anus crecca carolinensis)* and Mottled Duck *(Anus fulvigula)*.

Joanen (1964) conducted a study evaluating two trap designs and three bait types for capturing Lesser Scaup *(Aythya affinis)*. This had been the only such study done in Louisiana.

We began preliminary trapping in the winter of 1973 to develop techniques designed primarily to capture Gadwall, American Wigeon, and Pintail. Two trap designs were

[1]A joint contribution of the Louisiana Cooperative Wildlife Research Unit, Louisiana State University, Louisiana Wild Life and Fisheries Commission, Wildlife Management Institute and the U.S. Fish and Wildlife Service cooperation.

tested during the first winter. Box traps (rectangular traps of Addy 1956) were constructed of 1 x 2 inch mesh welded wire, and clover-leaf traps (Addy 1956) were made of 2 x 2 5/8 inch mesh welded wire. Whole corn, wheat, rice, and milo were used as baits. Both trap designs were tested with each bait. During this time 330 ducks were captured, 297 in cloverleaf traps and 33 in box traps. Wheat was the most effective bait, rice was second, and milo was third. No birds were caught on corn as a result of poor bait site selection. Very few puddle ducks were captured, with the exception of Blue-winged Teal *(Anas discors).*

For the following winter of 1974, we enlarged and refined the study to further test differences in bait, trap design, and welded wire mesh size, for capturing selected species of puddle ducks. This paper presents an analysis of the data collected during that time.

We would like to thank Mr. Ted Joanen, Mr. Larry L. McNeese, and Mr. Hugh A. Bateman of the Louisiana Wild Life and Fisheries Commission for their advice and cooperation, Mr. Howard Dupuie of the Louisiana Wild Life and Fisheries Commission and Mr. Brad Robichaux of Louisiana Tech University for their help collecting field data. Dr. Pretiss E. Schilling of Louisiana State University assisted with the statistical analysis. The Louisiana Wild Life and Fisheries Commission provided financial support for the project.

MATERIALS AND METHODS

All trapping took place in the Price Lake area of Rockefeller Wildlife Refuge in southwestern Louisiana. This location is characteristic of a brackish coastal marsh. The dominant emergent vegetation is wiregrass *(Spartina patens),* saltgrass *(Distichlis spicata),* and leafy three-square *(Scirpus robustus).* Aquatic vegetation consists mainly of widgeongrass *(Ruppia maritima).*

Three trap designs and two welded wire mesh sizes were tested. Twenty-eight traps were built with 1 x 2 inch mesh, 16 gauge welded wire and six with heavy duty 2 x 2 5/8 inch mesh, 16 gauge pheasant wire. Pheasant wire was used because traps built with a larger mesh would be less conspicuous to the ducks, cost less, and also weigh less.

The box traps were 48 inches long, 36 inches wide, and 36 inches high. A single full height funnel entrance was located on one end of the trap. One inch mesh poultry netting was attached as a skirt on the inside of the funnel, to prevent ducks from escaping. Twelve box traps were built of 1 x 2 inch mesh wire and two with pheasant wire.

Clover-leaf traps were 50 miles wide and 36 inches high. They were made by attaching three, 5-foot segments of wire end to end, allowing the natural curve of the wire to shape the trap. A top and floor then attached. Three funnel entrances extended the full height of the trap, and each was trimmed with 1-inch poultry netting. Twelve clover-leaf traps were made of 1 x 2 inch mesh wire and two of pheasant wire.

The star trap used in this study was a new design, and as the name implies it is shaped like a five-pointed star (Figure 1). They were 11 feet across and 36 inches high. Construction of a star trap begins by cutting ten 5-foot segments of welded wire. Each segment was straightened by removing its natural curve. Segments are then separated into five pairs. The segments of four of the pairs are connected together end to end with 1-inch hog rings. The paired segments are stood vertically and opened to approximately a 45-degree angle. The trap will assume the shape of a star when the ends of each segment are placed together. The outer edge of the fifth pair of segments was fashioned into a funnel and attached to a removable catch box. One loose end of the arm was fastened to each side of the entrance. A funnel, trimmed with 1-inch poultry netting, was located in the angles formed by each arm of the star. Before attaching the top, the funnels are drawn toward the center of the trap forming the smallest possible angle. Black nylon netting with a 1-inch mesh was lashed to the upper edge of the wire forming a top. Excess netting was removed allowing at least 6 inches to overlap the edge. The star trap would not remain rigid without some form of supplemental support. To provide the necessary support, a 5-foot section of one-half-inch tubing was

inserted through rings at each point of the star, and into the ground. Three star traps were built with 1 x 2 inch welded wire and two were built with pheasant wire.

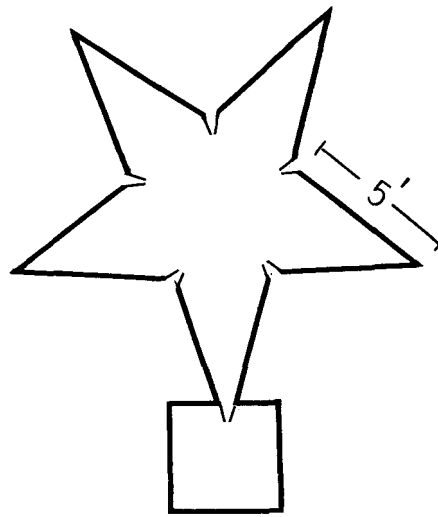

Figure 1. Top view of a star trap and its catch box.

Trap design, wire mesh size, and bait were tested at five stations selected at each of three sites in the study area. Traps at four of the stations received one of four baits—whole corn, wheat, rice, or milo—to test differences in bait attractiveness. Two trap designs, a clover-leaf trap with 1 x 2 inch wire and a box trap with 1 x 2 inch wire, were set in each of these four stations to compare effectiveness of trap design. The fifth station, an extra corn station, in each of the three sites had a star trap built with 1 x 2 inch mesh welded wire. Star traps could then be compared to the clover-leaf traps and box traps set in the other three corn stations. The extra corn stations in two of the three sites each contained one star trap, one clover-leaf trap, and one box trap, built from pheasant wire. These additional traps provided a further comparison of the three trap designs and the two mesh sizes. Two unbaited traps, one clover-leaf and one box trap were located at the fifth station of the third site and served as controls.

Water depths ranged from 1 to 16 inches in the sites, but never varied more than two inches between bait stations within a site.

Each station was prebaited for 3 days before traps were moved into the site. Traps were baited once daily, and each funnel in every trap received a 2-pound coffee can of bait. On days when large numbers of birds were captured, traps were visited in the morning and late evening, otherwise they were run only in the evening.

An Analysis of Variance was used to determine significant differences that may have occurred between baits, trap designs, and welded wire mesh sizes.

RESULTS

Trapping was conducted for 77 days from 21 January 1974 through 26 April 1974, resulting in 2251 trap days excluded the controls. A total of 4806 ducks of nine species were captured, including recaptures.

To permit statistical analysis, species were grouped into the following categories: (1) Lesser Scaup, (2) puddle ducks, and (3) American Coots.

Table 1. Comparison of baits used to capture waterfowl in coastal Louisiana.

SPECIES	WHOLE CORN	WHEAT	RICE	MILO	EXTRA CORN
			Birds captured/100 trap days		
Lesser Scaup	178.5	163.9	108.3	77.6	510.5
American Coot	5.4	14.6	2.0	6.3	8.8
Blue-winged Teal	18.0	18.5	17.1	6.8	15.7
Am. Green-winged Teal	0.5	4.4	2.4	0.0	3.8
Mottled Duck	0.5	1.5	1.0	2.0	4.7
Gadwall	0.5	3.4	0.0	2.0	1.6
American Wigeon	1.0	2.0	1.0	1.0	1.7
AM. Pintail	1.0	1.5	0.0	0.0	0.0
Total Puddle Ducks	21.9	31.2	21.5	13.7	27.5
Redhead	0.0	0.0	0.0	0.0	0.1
Total Waterfowl	204.8	241.0	153.2	96.6	547.0

Table 2. Comparison of traps used to capture waterfowl in coastal Louisiana.

One thousand eighty-three Lesser Scaup were captured with the four baits. Whole corn and wheat proved to be significantly more attractive (P .01) than rice or milo. Traps baited with whole corn averaged 178.5 Lesser Scaup per 100 trap days compared with 163.9 for wheat (Table 1). No statistical difference was detected between captures with corn and wheat. Rice ranked third with 108.3 per 100 trap days, and milo was the least effective bait with an average of 77.6 Lesser Scaup per 100 trape days. There was no significant difference between puddle duck captures with the four baits. Traps baited with wheat captured 36 percent of the total puddle ducks taken and averaged 31.2 birds per 100 trap days. Corn averaged 21.9 and rice was a very close third with 21.5 puddle ducks captured per 100 trap days. No significant difference between baits was detected for American Coots, although a majority were captured with wheat (Figure 2).

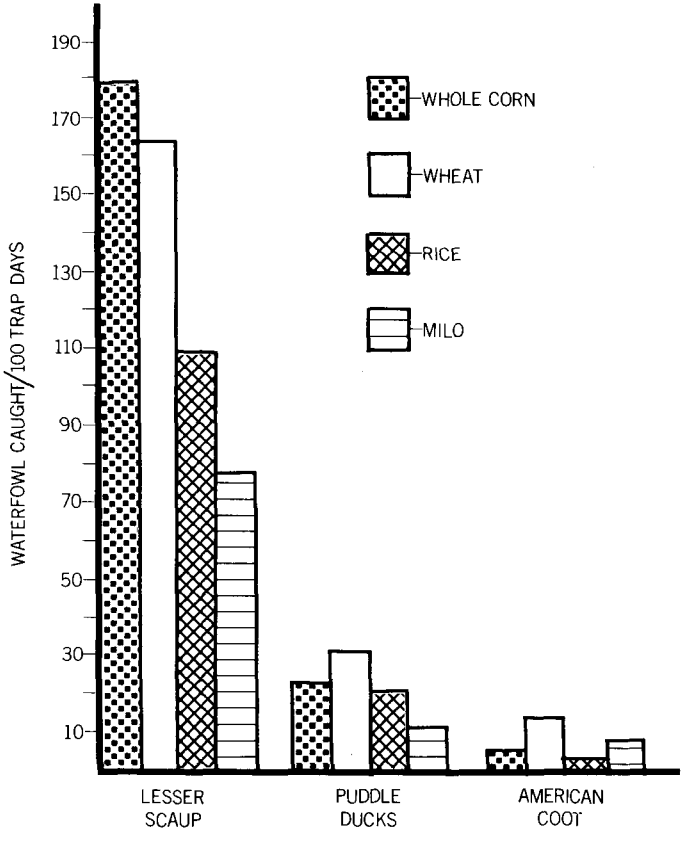

Figure 2. Comparative trapping success using four baits in coastal Louisiana.

SPECIES	STAR TRAP 1″ x 2″ mesh	STAR TRAP 2″ x 2 ⅝″ mesh	CL. TRAP 1″ x 2″ mesh	CL. TRAP 2″ x 2 ⅝″ mesh	BOX TRAP 1″ x 2″ mesh	BOX TRAP 2″ x 2 ⅝″ mesh
			Birds caught / 100 trap days			
Lesser Scaup	710.5	976.6	83.1	195.9	52.1	84.4
American Coot	4.0	31.7	4.0	0.7	4.8	0.7
Blue-winged Teal	47.7	3.4	96.8	0.0	1.6	0.7
Am. Green-winged Teal	5.0	9.7	1.2	0.0	0.7	0.0
Mottled Duck	5.5	9.0	0.7	1.4	0.5	2.7
Gadwall	3.0	1.4	1.2	1.4	0.2	0.0
American Wigeon	3.0	2.8	0.7	0.7	0.5	0.0
AM. Pintail	0.0	0.0	0.7	0.0	0.0	0.0
Total Puddle Ducks	64.3	26.2	18.2	4.1	3.6	3.4
Redhead	0.0	0.7	0.0	0.0	0.0	0.0
Total Waterfowl	778.9	1035.2	115.3	200.0	58.9	88.4
Total Trap Days	199	145	807	145	808	147

Trap constructed of 2 x 2 5/8 inch mesh welded wire generally caught more ducks per 100 trap days than those built with 1 x 2 inch mesh welded wire (Table 2). However, there was no significant difference detected between the two mesh sizes.

Star traps proved to be the most productive trap for capturing Lesser Scaup and puddle ducks ($P<.01$). Most of the American Coots were also taken with the star trap, but no significant difference was detected. Clover-leaf traps and box traps ranked second and third, respectively. Star traps captured 822.4 Lesser Scaup per 100 trap days, clover-leaf traps 100.2 and box traps 57.3 per 100 trap days (Figure 3). Puddle traps, and 3.7 in box traps. Star traps caught 16.3 American Coots per 100 trap days, clover-leaf traps caught 3.4 per 100 trap days, and box traps caught 2.7 per 100 trap days. Star traps had an overall daily catch seven times greater than that for clover-leaf traps, and 13.5 times that of box traps.

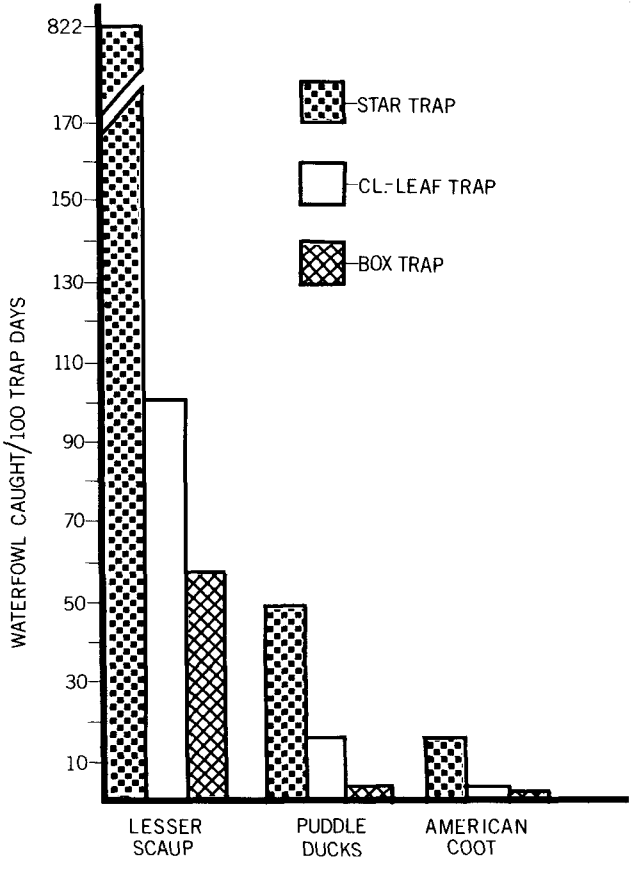

Figure 3. Comparative trapping success using three trap designs in coastal Louisiana.

DISCUSSION

The greatest expense of any banding operation is the cost of man-power. We therefore converted our catch data to show the number of trap days required to capture one bird in each of the three categories. The best bait for capturing Lesser Scaup was whole corn or wheat (Table 3). Wheat consistently caught more puddle ducks of each species than any other bait except for Mottled ducks. Therefore, we feel that wheat is the most effective bait for capturing puddle ducks. It was also most effective for American Coots.

No difference in trapping efficiency of wire mesh size was detected statistically, but we found several advantages of each. Traps built with pheasant wire caught slightly more ducks per trap day than with 1 x 2 inch welded wire. It is also cheaper, costing $11.39 per 100 foot roll compared to $21.34 for the smaller mesh wire. Pheasant wire traps are lighter, easier to handle, and take slightly less time to build. However, pheasant wire traps do have several major drawbacks. A number of ducks drowned during the study. All such mortality occurred in pheasant wire traps when the birds became entangled in the wire, often resulting in drowning. Pheasant wire was also less durable than 1 x 2 inch wire; they were easily bent out of shape, and began separating after several months of use, and continuous patching was required. We believe that the strength and durability of traps built with 1 x 2 inch mesh wire, and the lack of mortality in the, outweighed the disadvantages of greater weight and cost. Therefore, we recommend that welded wire with a 1 x 2 inch mesh be used for trap construction.

The star trap proved to be much more efficient than the other two traps tested. They required fewer trap days than the clover-leaf or box traps (Table 3) to catch the same number of Lesser Scaup, puddle ducks, or American Coots. We recommend star traps over the other two designs, for capturing waterfowl.

Star traps are completely portable. The net top permits the entire trap to be folded into a unit 5 feet long, and 3 feet wide. We have carried as many as three of these traps and their supports in a pirogue at one time. The catch boxes were simply box traps attached to one arm of the star and were transported separately. Addy (1956) describes a collapsible box trap that could be used instead, to make the complete unit entirely portable. A star trap requires 5 to 10 minutes to set up or take down each time it is moved. It also takes longer to build than a clover-leaf or box trap. We could build a star trap in 5 hours, a clover-leaf trap in 1½ hours, and a box trap in 1 hour.

In conclusion, we recommend star traps built with 1 x 2 inch mesh welded wire and baited with wheat, for trapping puddle ducks in coastal Louisiana.

Table 3. Comparison of the number of trap days required to capture one bird in coastal Louisiana.

BAIT OR TRAP	LESSER SCAUP	PUDDLE DUCKS	AMERICAN COOTS
	Trap Days/Bird Captured		
Whole Corn	0.56	4.56	18.64
Wheat	0.61	3.20	6.83
Rice	0.92	4.66	51.25
Milo	1.29	8.54	15.77
Star Trap	0.12	2.07	6.37
Cl.-Leaf Trap	0.99	6.26	28.85
Box Trap	1.75	28.08	35.37

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A STUDY OF IMMATURE ALLIGATORS ON ROCKEFELLER REFUGE, LOUISIANA

by

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ABSTRACT

A telemetric study was conducted on immature alligators (*Alligator mississipiensis*) on Rockefeller Refuge from 27 March, 1973 through 5 March, 1974. Thirty alligators, 17 females and 13 males, were captured, tagged, marked for identification, and outfitted with color-coded neck-collar radio transmitters. A directional receiving unit was used to follow their daily movement. The size of the animals ranged from 3'6-1/4" to 5'10-3/4". Minimum home range sizes, daily activity patterns, and habitat preferences were determined for the alligators under investigation. Readings taken during the winter dormancy period indicated that immature alligators were considerably more active during cold periods than were adult alligators.

INTRODUCTION

Aldo Leopold (1933) in his classic treatise on Game Management related, "The maximum population (game species) of any given piece of land depends; therefore, not only on its environmental types or composition, but also on the interspersion of these types in relation to the cruising radius of the species. Composition and interspersion are thus the two principal determinants of potential abundance of game range." The best method for determining "cruising radius" and habitat preference and then relating these two factors to interspersion of environmental types is through radio telemetry.

Various studies have documented alligator movement patterns and habitat preference under natural conditions (Chabreck, 1965; Joanen and McNease, 1970, 1972). Murphy and Brisbin (1972) described the distribution of alligators in response to thermal gradients in a reactor cooling reservoir. However, these studies were not involved specifically with immature animals.

Using guideline information provided in the previously mentioned studies and applying this information to the basic concepts outlined by Leopold, an investigation was initiated to monitor immature alligators with radio telemetry gear. The objectives of the study were to:

1. Monitor daily and seasonal movements of individual alligators.
2. Relate movements and activity patterns to habitat preferences.
3. Determine the minimum home range of individual alligators.
4. Develop management recommendations.

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