

Table 3. Known annual deer removal as a percent of various population estimate methods, Central Peninsula W.M.A. 1952-65

| Year | Deer Removal As A Percent Of Census Methods |              |               |                 |                   |                                 |
|------|---|--------------|---------------|-----------------|-------------------|---------------------------------|
|      | Removal By Gun and Trap                     | Sex-Age-Kill | Lincoln Index | Percent of Kill | Minimum Fawn Crop | Standing Crop Plus Trap Removal |
| 1952 | 122   | 7.9          |               | 10.0            | 7.1               | 11.6                            |
| 1953 | 572   | 19.1         |               | 23.9            | 23.9              | 28.2                            |
| 1954 | 731   | 27.2         |               | 25.5            | 30.6              | 31.4                            |
| 1955 | 990   | 33.1         | 24.8          | 23.8            | 38.3              | 36.8                            |
| 1956 | 1,229                                       | 42.5         | 36.2          | 23.7            | 46.5              | 45.8                            |
| 1957 | 1,535                                       | 54.9         | 30.6          | 22.4            | 61.3              | 61.4                            |
| 1958 | 1,079                                       | 71.7         | 35.4          | 23.0            | 68.6              | 64.6                            |
| 1959 | 691   | 43.6         | 26.4          | 23.4            | 60.3              | 67.4                            |
| 1960 | 329   | 28.1         | 19.1          | 16.9            | 28.6              | 49.3                            |
| 1961 | 191   | 15.8         | 14.4          | 10.9            | 14.1              | 28.3                            |
| 1962 | 246   | 18.4         |               | 10.9            | 17.1              | 29.2                            |
| 1963 | 274   | 11.3         |               | 11.0            | 21.0              | 29.7                            |
| 1964 | 705   | 28.0         | 40.4          | 22.7            | 45.8              | 67.6                            |
| 1965 | 384   | 16.0         | 13.5          | 16.6            | —                 | —                               |

Table 4. Known deer harvest as a percent of "best" census estimates, Central Peninsula W.M.A., 1952-65

| Year    | Best Herd Estimate | Known Annual Harvest |                 | 10 Percent Non-hunting Mortality Plus Percent Known Harvest |
|---------|--------------------|----------------------|-----------------|---|
|         |                    | Number               | Percent of Herd |   |
| 1952    | 1,220**            | 122                  | 10.0            | 20.0  |
| 1953    | 2,390**            | 572                  | 23.9            | 33.9  |
| 1954    | 2,860**            | 731                  | 25.5            | 35.5  |
| 1955    | 3,989*             | 990                  | 24.8            | 34.8  |
| 1956    | 3,394*             | 1,229                | 36.2            | 46.2  |
| 1957    | 5,009*             | 1,535                | 30.6            | 40.6  |
| 1958    | 3,043*             | 1,079                | 35.4            | 45.4  |
| 1959    | 2,614*             | 691                  | 26.4            | 36.4  |
| 1960    | 1,716*             | 329                  | 19.1            | 29.1  |
| 1961    | 1,321*             | 191                  | 14.4            | 24.4  |
| 1962    | 2,240**            | 246                  | 10.9            | 20.9  |
| 1963    | 2,470**            | 274                  | 11.0            | 21.0  |
| 1964    | 1,744*             | 705                  | 40.4            | 50.4  |
| 1965    | 2,826*             | 384                  | 13.5            | 23.5  |
| Total   | 36,836             | 9,078                |                 |   |
| Average |                    |                      | 24.6            | 34.6  |

\* Lincoln Index

\*\* Percent Kill

## DRIVE-TRAPPING WHITE-TAILED DEER<sup>1</sup>

STEVEN STAFFORD, C. T. LEE, AND LOVETT E. WILLIAMS, JR.

*Florida Game and Fresh Water Fish Commission*

Suite 21, 412 N. E. 16th Avenue  
Gainesville, Florida 32601

Most methods of trapping white-tailed deer (*Odocoileus virginianus*) are based on the idea of enticing deer into confined spaces, such as large wooden boxes, by baiting them with one of their preferred foods. Baited box traps have been used with some success in northwestern

<sup>1</sup>A Contribution of Federal Aid to Wildlife Restoration Program, Florida Pittman-Robertson Project W-41-R.

Florida but generally deer in Florida have been reluctant to take baits such as corn, apples, hay, salt, or sweet potatoes. Many varieties of vegetables and fruits have been tried without notable success. Of several species of green, leafy, native plants tried, only mistletoe (*Phoradendron flavescens*)<sup>2</sup> was taken by the deer. On the other hand it has been apparent that Florida deer have a striking affinity for well fertilized winter grasses such as oats, wheat, and rye grass and for summer legumes, especially peas.

We have attempted during three winters of trial and error approaches in conjunction with the routine winter deer trapping program to develop a method of catching deer on food plots in Florida. The method described below promises to be more effective in the peninsula of Florida than other methods based on the presentation of artificial baits. It may be of some use elsewhere in the southeast.

## TECHNIQUES USED

### Trapping Areas

Initial trapping operations were conducted on an approximately 12,000-acre game preserve in Duval County near Jacksonville, Florida. Some of the more conspicuous flora are longleaf pine (*Pinus palustris*) and turkey oak (*Quercus laevis*) on the higher sites and slash pine (*Pinus elliottii*), cabbage palm (*Sabal palmetto*), and gallberry (*Ilex glabra*) in low areas. The soil is sandy. These habitats are broken up with hammocks and dense bayheads. It is rather typical deer range for the northeastern peninsula. Food plots of various types have been planted annually for several years. The deer population density approaches one deer per 15 acres, overall.

After the net trap had been essentially developed, it was tested on Bradwell's Game Farm in Liberty County during the spring of 1965. The soils there contain some clay and alluvial silt from the Ochlockonee River and the woods are a general mixture of deciduous hardwoods and loblolly pine (*Pinus taeda*). The owner carries on an intensive food plot planting and artificial feeder program for deer. The deer population density on the 2,000-acre preserve is about one deer per four acres. It is enclosed by a deer-proof fence.

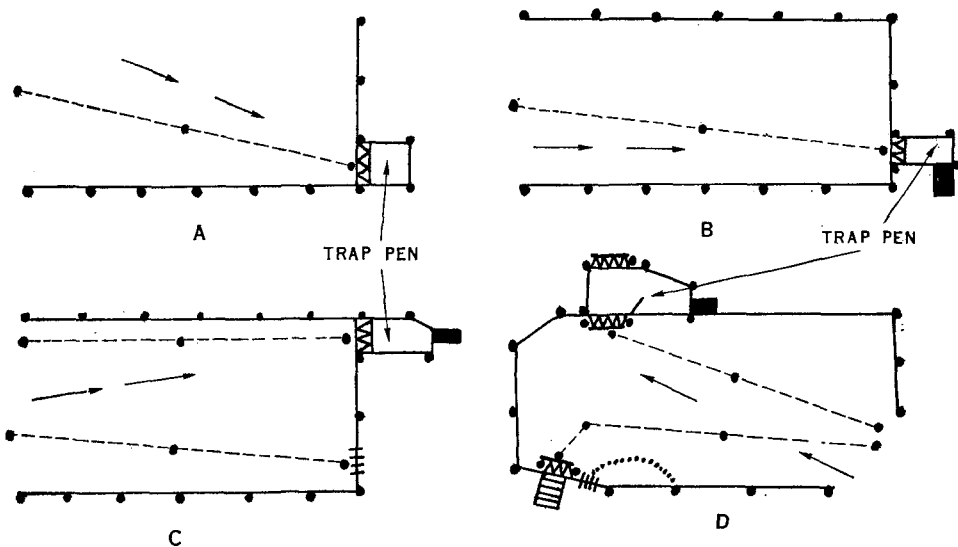
### Trap Design

The prototype trap (Fig. 1A) in this study was of wire. After the first few trials it was altered (Fig. 1B). The "wings" were extended to prevent deer escapes, a squeeze-chute was added to the rear of the trap pen, and the length and width of the trap pen were reduced to limit deer movement. Further alterations included a funnel-shaped trap pen and a sliding deer entrance gate near the trap pen (Fig. 1C).

Other trap designs were used and altered as necessary. A partition was extended across the corner of one wing to eliminate the 90-degree angle where deer tended to pile up, a partition was placed inside the trap pen to create a maze effect, a box trap was constructed and placed at one wing, and an additional wing was added. After these alterations, the basic wire trap used during the winter of 1964-65 was produced (Fig. 1D).

The wings of the standard wire trap (Fig. 1D) consisted of two 47-inch-high woven wire fences, for a total height of seven feet and ten inches. Cypress poles and treated pine posts ten feet in length and spaced ten to 15 feet apart were used as fence posts. The trap pen was made of "weld-wire" six feet high with a strand of 36-inch "hogwire" fence placed above the weld-wire to give a combined height of nine feet. The drop-doors were tripped by hand by means of a strand of No. 12 electrical wire with one end attached to a tree or pole near the opening to the food plot, and the other end to a pole supporting the sliding drop doors. A three-foot by four-foot by six-foot squeeze-chute of one-inch by four-inch treated lumber confined the deer sufficiently for handling. This trap can be constructed by five men in one day, with the total cost of materials being approximately \$250.00. The trap required minor repairs from time to time, depending upon the amount of use it received.

<sup>2</sup> Plant names follow Small, 1933.



#### LEGEND

- CYPRESS POLE
- WELD WIRE AND HOG WIRE
- - - TRIP WIRE
- ..... ROPE TO CLOSE ENTRANCE GATE
- SQUEEZE CHUTE
- ▤ BOX TRAP
- ▨ DROP GATE
- ▧ ENTRANCE GATE
- DIRECTION OF DRIVE

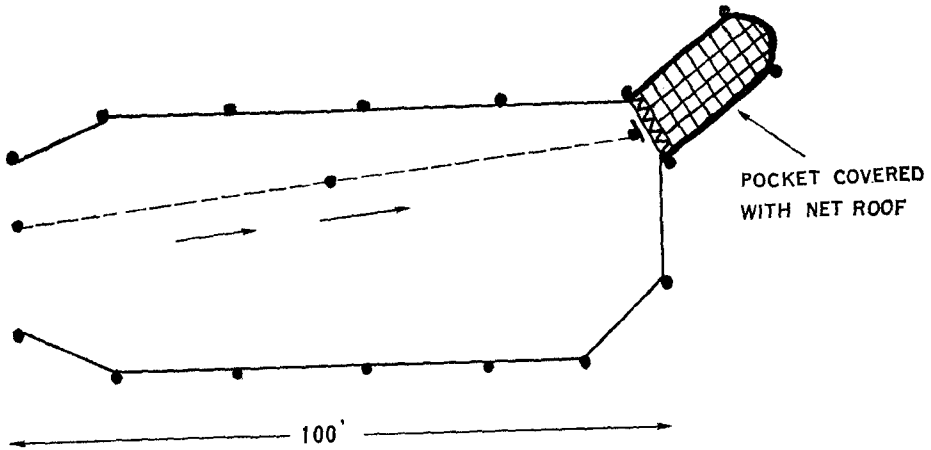
Figure 1. Prototype wire trap designs.

After the winter of 1965, the wire traps were discontinued because of the high deer injury and mortality rates and the permanent nature of the traps. A portable cloth net trap replaced the wire of the former designs and proved to be a better trap than one of wire. After several trials with old fish netting, a custom-made net trap was constructed (Fig. 2). The trap consisted of 400 feet of No. 15 netting wings and a No. 18 net "pocket" which was secured to the floor and fastened loosely to the top so that it would fall at the impact of the deer. The method of construction and size and shape were similar to the wire designs, except that the squeeze-chute was eliminated and entrance gates were not necessary since the net could be rolled up from the bottom to allow deer to enter.

The initial cost of the custom-made net trap was \$650.00 (price includes "weather-proofing"). It could be erected by five men in less than three hours. Though the cost of the net trap was considerably higher than the wire design, the ease of handling, portability of the entire unit, savings in time required for erection, and reduced injury and mortality rates more than warranted the price.

#### Trapping Plots

One- to three-acre game food-plots were planted to attract deer to the trapping sites. Traps were constructed over portions of the plots, confining deer to a smaller plot within a larger one. Ruff (1939) de-



#### LEGEND

- CYPRESS POLE
- NUMBER 15 CLOTH NETTING
- NUMBER 18 CLOTH NETTING
- - - TRIP WIRE
- ▨ DROP GATE
- DIRECTION OF DRIVE

Figure 2. Diagram of custom-made net trap design.

scribes a similar confinement of deer on alfalfa plots. From experience it was learned that an oblong plot was best because it offered depth for conducting drives. Mistletoe was sometimes used to lure deer closer to the trap pen. Ruff (*ibid*) used mistletoe to attract deer to box traps.

A mixture of oats and rye grass proved satisfactory as winter crops on both trapping areas. Various varieties of peas were planted by the Liberty County game preserve landowner for spring and summer crops.

#### *Trapping and Handling Technique*

Wildlife technicians have employed various techniques to herd large animals into traps. Couey (1949) describes the use of an airplane to herd pronghorn antelope into large net wings which funneled them into a corral trap. The method described by Ruff (1939), in which men on foot slowly moved deer along "drift-fences" into box traps, is similar to ours.

In January 1964, attempts to drive deer into wire traps during daylight hours were not successful. Deer became too excited at the approach of the drivers and would often injure or kill themselves by running into the wire enclosures. Daytime drives have been conducted on net traps with less injury to the deer, but several have died from exhaustion and shock. It does not appear advisable to conduct drives during the daylight hours in the traps described here.

Several hours before trapping time, traps were prepared and inspected. Gates to the food plots and trap pens were opened and sometimes baited with mistletoe. At night, a four-man trapping crew would enter a food plot and close all wing entrance gates to begin the drive. Two men in a pickup truck with hauling boxes stood by until the deer were corralled. The trapping crew, with flashlights, would slowly drive the deer toward the trap pen. When several deer entered the pen, the gate was released by pulling a centrally positioned trip wire. Occasionally, a deer would enter the trap pen but immediately come out again. Often the same deer would re-enter the pen sometimes with others. Deer that attempted to escape by running along the wings could often be caught by hand or with a hoop net, similar to a fish landing net. (R. E. Murry, personal communication, has used such nets in connection with an oral tranquilizer capture method.) While awaiting arrival of the hauling crates, one or two deer would be moved into a squeeze-chute or detained by hand. Captured deer were then taken to a central location and held overnight in hauling crates. Usually, two or three drives were conducted per plot per trapping night.

Two types of ear tags were used to mark captured deer. Plastic, yellow Jumbo Ear Tags (National Agricultural Supply Company, Inc., Fort Atkinson, Wisconsin) with large numbers stamped on them were used. An ear punching tool was used to pierce the animal's ear so the tags could be inserted. The numbered portion of each tag was placed on the inside of the ear with the number facing outward. Number 29 Monel Metal Self-Piercing Tags (National Band and Tag Company, Newport, Kentucky) were also used. Deer marked with the plastic tags were readily identified in the field. Plastic tags cost about twenty-five dollars per 100 and metal tags cost ten dollars per 100.

After processing, deer were placed in hauling boxes and loaded into a metal trailer, capable of holding 15 to 20 individual boxes, for transportation to release sites. The trailer has a rear door attached for swing or drop opening; the top extends the full length of the trailer and is removable; and electric brakes were installed for additional breaking power. Deer were retained in the hauling boxes so that individual releases could be made and to select proper buck to doe ratios for release, but up to 30 deer can be hauled loose in the trailer.

## DISCUSSION

Since the beginning of the drive-trapping trials in January 1964, a total of 262 deer have been captured: 214 on the Duval County preserve in 28 nights of trapping; an average of over nine deer per trap day for a four- or five-man crew. By comparison, 251 deer were trapped with wooden box traps in Arkansas during 370 trap days with an average of 27 traps in use daily (Wood, 1944). Approximately \$9,250.00 was spent to trap 262 deer—an average cost of about \$35.00 per deer. Table 1 contains the estimated costs of wire and net trapping methods.

### *Mortality Rate*

Trapping wild animals involves the risk of loss of animals by physical injury and shock. During the 1964 trapping, 111 deer were handled in four wire traps and 21 died as a result of trap injury. In 1965, 140 deer were trapped in two wire and two net traps. Nineteen died as a result of trap injury or apparent shock and two died from an overdose of experimental drugs. No mortality as the result of trap injury was experienced with the net traps, but several deaths from exhaustion or shock occurred. Clover (1954) reports success with his portable net trap and reveals a loss of only one deer in a total of 115 trapped. Four deer were lost from a total of 86 trapped in a wooden paneled corral trap (Baker and Crump, 1953). Ruff (1938) reports the loss of two deer out of 253 captured with 164 box traps.

## ACKNOWLEDGMENTS

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TABLE 1. APPROXIMATE COST OF DEER TRAPPING, 1964 TO 1965.

| Item                                      | Number     | Time                     | Rate                                    | Approximate Amount |
|---|------------|--------------------------|---|--------------------|
| Salaries and Wages                        | 5 men      | 40 man-days <sup>1</sup> | \$400.00 per month per man <sup>2</sup> | \$4,000.00         |
| Travel Expenses                           | 5 men      | 40 days                  | \$9.00 per day per man                  | 1,800.00           |
| Operation of Equipment                    | 4 pick-ups | 40 days                  | \$75.00 per month per vehicle           | 600.00             |
| Wire Traps <sup>3</sup>                   | 4 traps    | —                        | \$250.00 per trap                       | 1,000.00           |
| Net Traps                                 | 1 trap     | —                        | \$650.00 per trap                       | 650.00             |
| Other Materials and Supplies <sup>4</sup> |            |                          | \$600.00 per year                       | 1,200.00           |
|   |            |                          | TOTAL COST                              | \$9,250.00         |

<sup>1</sup> Twenty man-days equal to one month.

<sup>2</sup> Average for total salary of all personnel.

<sup>3</sup> Includes complete trap with squeeze-chutes; and average cost of all traps.

<sup>4</sup> Includes injectable tranquilizers, materials for hauling boxes, experimental baits, and miscellaneous materials and supplies for two years' work.

methods described. Thanks are due Mr. J. E. Davis for permitting us the use of his Dee Dot Ranch and its facilities for this work.

### SUMMARY

A new method of trapping white-tailed deer employing cloth net drive-traps on planted foot plots was developed. It is considered especially useful where deer eat planted crops in preference to artificial or cereal baits.

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## MANDIBULAR CAVITY TISSUE AS A POSSIBLE INDICATOR OF CONDITION IN DEER <sup>1</sup>

MAURICE F. BAKER  
*Alabama Cooperative Wildlife Research Unit*  
and  
FRANCIS X. LUETH  
*Alabama Department of Conservation*

### ABSTRACT

Preliminary data suggest that the fat content of the soft tissue in the cavity under the grinding teeth of the mandible might be a useful indicator of condition in deer. Seven physical characteristics were measured on 85 deer. Statistical treatment of these data suggest a strong relationship between the fat content of the mandibular cavity tissue and the condition of the deer. Three of the five best correlations were between mandibular cavity tissue fat and other characteristics related to condition. Simple means of mandibular cavity tissue fat separated out three condition classes of deer effectively. Further research on the subject is suggested.

### INTRODUCTION

The word, "condition," is commonly used by deer biologists to refer to the general state of health and well being of a deer or a deer herd as indicated by the extent of build up or depletion of fat reserves. The average condition of a herd may be used as an indicator of the adequacy of the herd's environment, to compare one herd with another, or to compare the same herd from year to year. Condition may be estimated during the hunting season by examining deer carcasses at checking stations. A common practice is to classify individuals in one of several

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