

NOTES ON REPRODUCTIVE SUCCESS OF PEN-REARED BOBWHITE QUAIL EQUIPPED WITH RADIO-TELEMETRIC TRANSMITTERS¹

By PERCIVAL, H. FRANKLIN² and LLOYD G. WEBB³

ABSTRACT

Ten pairs of pen-reared bobwhite quail (*Colinus virginianus virginianus* L.) were studied in an effort to determine the mechanical effect of radio-telemetric transmitters on fertilization. Five pairs of quail were equipped with transmitters weighing approximately 24 grams and measuring approximately 2 x 2 x 3.7 centimeters. The remaining 5 pairs without transmitters were maintained under similar conditions. Records were maintained on production, fertility, and hatchability. Such data recorded at two-week intervals throughout the laying season showed that the radio-telemetric transmitters had no adverse effect on the reproductive success of pen-reared quail.

The South Carolina Wildlife Resources Department planned a study on the causes of mortality of bobwhite quail (*Colinus virginianus virginianus* L.) during the nesting season utilizing radio telemetry. In planning the investigation some questions were raised as to the possible mechanical or behavioral inhibition of fertilization by the "back pack" transmitters.

Thus pen-reared quail and transmitters were obtained so as to study the possible mechanical inhibition by such equipment on reproductive success of transmitter equipped quail.

The cooperation of Dr. Juan de la Cruz Solis, Poultry Science Department, Clemson University in providing valuable space in an incubator and advice on raising bobwhite quail is appreciated.

METHODS AND TECHNIQUES

Pen-reared quail (hatched August 1969) were procured in April 1970 from a commercial quail hatchery. Five pairs of these birds were equipped with radio-telemetric transmitters and an additional five pairs were utilized as controls. The quail were randomly selected from a flock of even-aged quail. Subsequently these birds were randomly mated and placed in individual breeding pens. Breeding pens were constructed of 1" x 4" wood framing and ½" hardware cloth with a 2' x 2' plywood box at one end to protect the birds and their food during inclement weather. All birds were maintained on a commercial medicated breeder ration throughout the study.

Model 802 "quail transmitters", constructed by Differential Electronics, Atlanta, Georgia, were attached to both male and female test birds. The transmitters weighed approximately 24 grams and had approximate dimensions of 2 x 2 x 3.7 cm. The transmitters were attached to the back of the birds with gum rubber tubing (0.125 in o.d.) which was tied around each wing. A 27 MH. loop antenna extended from the forward positions of the transmitter to form a loop around the neck of the quail.

Eggs were collected twice daily, coded on the large end with pencil, and stored in an egg storage room at 55°F. The eggs were set at biweekly intervals in a Petersine Model 4 incubator at 100°F and 77-80% relative humidity. Eggs were candled on the 7th day of incubation to determine fertility. The chicks hatched in 21-24 days after setting. Records were maintained on productivity, fertility, and hatchability.

¹ A joint contribution of the South Carolina Wildlife Resources Department and the Belle W. Baruch Research Institute, Clemson University.

² Belle W. Baruch Fellow, Department of Entomology and Economic Zoology, Clemson University, Clemson, South Carolina.

³ Research Project Leader, South Carolina Wildlife Resources Department and Associate Professor, Clemson University, Clemson, South Carolina.

RESULTS

Table 1 shows the reproductive data from the laying period April-August 1970. Total production, fertility, and hatchability were lower in the control group than in the group of birds equipped with transmitters. Test pair No. 1 did not produce any eggs but the total production of test quail (307 eggs) was still considerably higher than the controls (248 eggs). Of the eggs incubated (306 from test birds, 242 from controls), fertility was higher in eggs produced by test birds (83.01%) than those produced by the control group (77.27%). The same was true of hatchability, with 75.49% of test eggs producing young quail as compared to 57.44% of control eggs.

TABLE 1. Reproductive data (April-August 1970) for five pairs of pen-reared bobwhite quail equipped with radio-telemetric transmitters and five pairs without transmitters

		Eggs	Eggs *	Fertile		Hatched	
		Produced	Incubated	No.	%	No.	%
Control Pair No.	1	25	25	20	80.00	19	76.00
	2	89	86	72	83.72	59	68.60
	3	77	72	39	54.17	20	27.78
	4	33	33	32	96.97	28	84.85
	5	26	26	24	92.31	13	50.00
TOTAL		248	242	187	77.27	139	57.44
Test Pair No.	1	0					
	2	53	53	46	86.79	41	77.36
	3	71	70	46	65.71	38	54.29
	4	84	84	79	94.05	74	88.10
	5	99	99	83	83.84	78	78.79
TOTAL		307	306	254	83.01	231	75.49

* Several eggs were damaged in handling or by pecking by birds before collection.

Table 2 shows reproductive data for each pair of birds during each of the two week intervals. The egg production increased gradually from late April until June 19-July 2, this being the peak period of egg production. Thereafter the egg production declined until the cessation of laying that occurred during late August (Table 2).

DISCUSSION

It should be noted that the eggs from control pair No. 3 were noticeably thin-shelled and apparently influenced the lower total fertility and hatchability of eggs from the control group. It is also recognized that the number of birds utilized could have been too small. The data may have been more realistic had larger numbers of breeding pairs been utilized in both control and test groups. Even with the small sample size used, the data show that fertilization occurred between male and female bobwhite quail equipped with radio-telemetric transmitters of the design described earlier.

There is no reason why these transmitters should mechanically inhibit fertilization in wild quail. However, there is still the question of the effects of this additional burden on natural behavior, including mate selection and movements of the bobwhite quail. When the transmitters were attached to the birds, it was noted that a period of adjustment was necessary. For at least three hours the birds did not stand upright with the additional weight burden. In two instances, transmitters either came off the birds or the quail somehow managed to remove the device. Individual birds were observed pecking at the rubber tubing which was tied around their wings and they commonly removed the loop antenna

TABLE 2. Reproductive success of each bird as tabulated by two-week periods during the laying season, with the initial period beginning April 24, 1970

Breeding Pairs	BI-WEEKLY PERIODS														8/14-8/27 P %F %H
	4/24-5/7 P %F %H	5/8-5/21 P %F %H	5/22-6/4 P %F %H	6/5-6/18 P %F %H	6/19-7/2 P %F %H	7/3-7/16 P %F %H	7/17-7/30 P %F %H	7/31-8/13 P %F %H							
Control Pair No. 1	0	0	1 100 100	4 75 50	7 71 71	5 80 80	3 100 100	5 80 80	0	0	0	0	0	0	
2	0	4 75 75	12 50 17	11 100 82	14 79 64	14 100 79	12 92 92	10 90 70	9 78 78	0	0	0	0	0	
3	0	1 0 0	9 11 11	14 71 29	10 50 30	12 50 25	6 67 33	10 60 20	10 70 50	0	0	0	0	0	
4	0	0	5 80 40	5 100 60	11 100 100	7 100 66	0	0	0	0	0	0	0	0	
5	0	5 100 80	5 100 80	5 100 20	5 100 40	0	1 100 100	3 67 33	2 50 50	0	0	0	0	0	
TOTAL	0	10 80 70	32 53 28	44 89 57	47 79 64	38 82 63	22 86 73	28 75 50	21 71 62	0	0	0	0	0	
Test Pair No. 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	9 100 78	11 82 82	11 100 82	7 71 71	11 82 73	4 75 75	0	0	0	0	0	
3	10 0 0	9 0 0	2 100 50	9 100 78	12 75 58	12 100 82	8 100 75	8 75 75	0	0	0	0	0	0	
4	5 80 80	12 100 100	12 100 100	11 91 91	14 93 71	11 91 91	11 91 82	8 100 88	0	0	0	0	0	0	
5	7 100 100	14 100 93	8 100 100	12 100 100	14 93 93	13 92 77	11 64 45	14 57 57	6 33 33	0	0	0	0	0	
TOTAL	22 50 50	35 74 71	22 100 95	41 98 88	51 86 76	47 96 85	37 81 68	41 77 71	10 50 50	0	0	0	0	0	

NOTE: P -- eggs incubated; F--fertility; H--hatchability.

from under their necks. These observations lead the investigators to believe that the birds may not have adjusted to the presence of the transmitters.

It is not the intent of the authors to cast a shadow of credibility upon the use of radio-telemetric techniques. Radio-telemetry is a valuable research tool. However, it is believed that normal behavior of small vertebrates equipped with such devices can not be assumed. More extensive investigations of behavioral and physiological effects of these devices are indicated.

FOOD HABIT STUDY OF MALLARDS AND PINTAILS ON CATAHOULA LAKE, LOUISIANA, WITH NOTES OF FOOD HABITS OF OTHER SPECIES

By DEWEY WILLS

*Louisiana Wild Life and Fisheries Commission
Baton Rouge, Louisiana*

ABSTRACT

As a waterfowl wintering area, Catahoula Lake is of national significance and one of the most important natural wintering areas in the nation. It is the key to waterfowl abundance and hunting success in Central Louisiana.

For a ten year period from fall of 1960, through the winter of 1970, there was a yearly average usage of 20,000,000 duck days for Catahoula Lake (Louisiana Wild Life and Fisheries Commission, 1970).

Ducks found in greatest abundance were pintails and mallards.

A food habit study of mallards and pintails was conducted to determine foods eaten by these waterfowl. Notes were also made of the food habits of other ducks that use the Lake.

During the course of the study, gizzards were collected from 139 ducks and gullets were collected from the same birds when they contain food. Mallard and pintail predominated in the collection with 57 and 42 respectively, and six other species were represented in the 39 other gizzard/gullets.

Chufa, (*Cyperus esculentus*) was found to be most important waterfowl food on Catahoula Lake.

INTRODUCTION

Catahoula Lake provides a wintering area for large concentrations of waterfowl. It provides the most valuable waterfowl habitat in Central Louisiana and may winter between 150 to 400 thousand waterfowl annually. It undoubtedly has been a major waterfowl wintering area for many centuries as indicated by the abundance of waterfowl bones found in the Indian midden heap around the lake. Also, older residents of the area state that Catahoula Lake was an important source of waterfowl during the market hunting era.

This study was made to determine the food habits of mallards and pintails on this Lake and also provided information on the food habits of other species.

DESCRIPTION OF STUDY AREA

Location and Description

Catahoula Lake is located in Central Louisiana about 20 miles northeast of Alexandria. This important wildlife area is situated on the western edge of the Mississippi River alluvium in the complex Red River backwater area, and is a structural formation. It is a large, shallow poorly drained, flat, sump area that is subject to drastic seasonal water fluctuations. It is approximately 14 miles long, 3 miles wide and contains about 20,000 acres of open lake bed. At high water the