

The Bobwhite Post



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Cosmic Bobwhites: Part II

Being a quail researcher is almost like being a detective. I guess you could say an Inspector Gadget (that is literally, with all the technology--GIS, GPS--available to us). At the scene of the crime, the detective starts looking for clues and hints as to the causes of the crime. Whenever leads are found, the detective pursues them, often leading to a dead end, and sometimes, if they're lucky, stumbling onto major discoveries. This aspect of research is what keeps the monotony out of my job. I always have to be thinking, always on the look out for new theories, keeping abreast of the latest findings, and attempting to solve the mysteries of quaildom. And when one puzzle seems to be solved, another mystery arises from the question just answered. It's a seemingly never-ending cycle, yet one that I pursue with passion.

If you recall from the last newsletter, we were left with the mystery of the 1999-2000 nesting season. In 1999, the first hen to nest began incubation around April 3. Between April-October 1999, we located a total of 142 nests. By contrast, in 2000, we found our first nest on the 10th of May and located only 39 nests during this same time period. Although the number of nests found differed between years, nest charac-

teristics were similar between 1999 and 2000 (Table 1).

Table 1. Comparison of reproductive effort of bobwhites.

Variable	1999	2000
Nests	142	39
Avg. Clutch Size	13	12
Avg. Hatchability (%)	87	89
Successful (%)	66	72

There could be several reasons why the number of nests located in 2000 was lower than in 1999. These reasons could include differences in the number of breeders available to nest, the proportion of hens that at-

tempted to nest, the number of nesting attempts per hen, the reproductive condition of the breeders, and of course weather conditions, which affects all of the above. Let's take a look at each reason separately.

A simple explanation to this mystery is that we had fewer radio-collared hens in 2000. However, the number of radio-collared hens available to nest during April-October was similar between years (78 in 1999 vs. 79 in 2000). An interesting trend that arises though, is that juveniles comprised a higher percentage of the radio-collared hens in 2000. That is, juveniles comprised



Photo by Fernando Holschneider

Many factors can influence the reproductive effort of bobwhites. These include the number of breeders, the proportion of hens nesting, the reproductive condition of bobwhites, and weather.

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We appreciate your sincere interest in our natural resources, especially for bobwhites. Generous donations have been received from:

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29% of our sample in 1999, compared to 78% in 2000. Could there be a difference in nesting activity between juvenile and adult bobwhites? If juvenile bobwhites nested at a lower rate compared to adults, this could explain our mystery. Unfortunately, I was unable to find studies that reported on the nesting activity of juvenile and adult bobwhites. However, a difference in nesting activity has been reported for wild turkeys. Dr. Larry Vangilder reported in the 1992 book, *The Wild Turkey*, that a lower proportion of juvenile wild turkey hens (7-30%) attempted to nest compared to adults (75-100%). Further, this proportion was extremely variable between years, ranging from 0-75%. Of course, we have to acknowledge that we are comparing apples and oranges. However, the basis exists for at least questioning a difference in nesting activity between juvenile and adult bobwhites.

Closely tied to this concept is the idea that all bobwhite hens attempt to nest. In 1999, we had 60% of our radio-collared hens nesting at least once, compared to 46% in 2000. Researchers generally assume that 100% of the hens attempt to nest. However, in 1993, Willie Suchy and Ronald Munkel also documented that only 88 % of their radio-collared bobwhites attempted to nest in Iowa. In conjunction with differences in the proportion of hens nesting, we

also found dissimilarities in the reproductive effort between 1999 and 2000 (Table 2).

Table 2. Comparison of re-nesting attempts of bobwhites.

Variable	1999	2000
No. Hens	78	39
1st Nest	47 (60%)	37 (46%)
2nd Nests	31 (66%)	2 (5%)
3rd Nests	7 (15%)	0 (0%)
4th Nests	1 (2%)	0 (0%)

The reproductive condition of the breeders could affect the reproductive effort of bobwhites, and thus our dissimilar nesting patterns for 1999 and 2000. In 1986, graduate student Kristin Wood and Dr. Fred Guthery looked at the nutritional plane and condition of bobwhites in south Texas. They reported that the spring-summer diet of bobwhites consisted of 25% protein, 1.3% calcium, and 0.25% phosphorus. Their reported protein levels met the recommended 23% protein for maxi-

mum egg production. However, calcium intake by laying hens was > 40% below the recommended level of 2.3%. Also, phosphorus intake was about 75% below the recommended 1% for laying. Despite apparent deficiencies in the diet, the productivity in their study area was adequate. In our study, we do not monitor the nutritional condition of bobwhites. However, we do keep records of body weights. In 1999, the average weight of bobwhites was 164 grams (females) and 153 grams (males). In 2000, the body weights were lower during the nesting season. Females averaged 128 grams, and males weighed 122 grams. Judging by these weights, I wonder if bobwhites were in poorer body condition in 2000, and how body weight affected nesting activity.

The confidence in our results will rise and fall as the study progresses and our data set increases. We do have to keep in mind that our inferences are limited. A major assumption is that radio-collared bobwhites act identical to bobwhites that are not collared. Whether this assumption holds true is uncertain (see page 4). However, many questions will continue to be answered, and many more will continue to arise. This never-ending cycle is the heart and soul of science.....the rollercoaster that represents the joy ride for many researchers.



Quail Quips

During 1961-1972, Dr. Robert J. Robel and other researchers studied the effects of food plots on wild bobwhites in Kansas. During the winter and spring, bobwhites killed within 600 m of the food plots had heavier weights, higher body fat levels, and more metabolizable energy in their crops than birds killed farther than 900 m. Calculations based on field data indicated that bobwhites both close and far from food plots had sufficient energy to exist during January through April. Dr. Robel noted that the amount of energy above the existence requirement was greater for bobwhites near food plots.

On Point



... and Counterpoint

Dr. Jeckle and Mr. Hyde

Whenever hunting is discussed, it almost seems that hunting follows the story of Dr. Jeckle and Mr. Hyde. Depending on the story teller, hunting can be portrayed as either character. Dr. Jeckle appears when studies report that quail survival is the same in hunted versus non-hunted areas. However, Mr. Hyde shows up when hunting increases natural mortality. This two-face topic stirs up many questions. What effect does hunting have on bobwhites? Should the season be shortened? Are flexible seasons needed for poor and good years? Although there may not be clear-cut answers to these questions, recent research has shed some light on these issues.

The debate about additive and compensatory mortality has been pondered for a while. In 1945, Paul Errington speculated that fall populations of bobwhites moved towards a somewhat constant spring density. That is, the spring density of bobwhites was more or less the same from year to year. This idea led to the concept of an annual doomed surplus, meaning these surplus bobwhites could be harvested (to a point) without much harm to the population. Thus, hunting was considered a form of compensatory mortality, assuming that harvested quail were destined to die anyway.

The alternative view is that hunting is a form of additive mortality, suggesting that harvest mortality is in addition to the natural mortality incurred by bobwhites. So

which one is it?

Based on recent philosophy, it's a matter of perspective to an extent. For example, if you have 100 bobwhites and the season is only 3 days long, then hunting will be more than likely additive. The probability of bobwhites dying during this short time period is relatively small, and so any bobwhite harvested would be adding to the natural mortality. The longer the season, the higher probability of bobwhites dying, and the more compensatory that hunting becomes. Therefore the issue of time plays a factor, among others.

What about season length? Should agencies regulate harvest to account for poor and good production years? Dr. Markus Peterson and Mr. Robert Perez studied the relationship between August quail abundance and the number of hunters the subsequent season. They discovered that when quail abundance was low, substantially fewer people hunted quail. Likewise, when quail abundance was high, there were more people hunting quail. They stated, "*These data support the notion that Texas quail hunting, at the statewide scale, is regulated by quail*

abundance....it is unlikely that small, statewide changes in the hunting season length or daily bag limit will significantly influence the number of quail available to breed during the next reproductive season." Therefore, it appears that quail hunting is self-regulatory, at least in Texas.

A central issue concerning hunting is, "What harvest level will ensure a sustained population of bobwhites?" Dr. Fred Guthery, Dr. Markus Peterson, and Mr. Ronnie George attempted to answer this question. Using modelling, they were able to speculate that in southern latitudes, populations were sustainable under a 30% harvest rate at an autumn population size of 700 birds. In northern latitudes, populations could persist at 40% harvest rates with an autumn size of about 400 birds. However, these results need to be viewed cautiously. Habitat fragmentation could affect these speculations. Further, modelling involves speculations which need to be tested with empirical data.

Hunting is a complex question. Planned, follow-up experiments will be needed to understand the issue.



Selected References

- Errington, P. L. 1945. Some contributions of a fifteen-year study of the northern bobwhite to a knowledge of population phenomena. *Ecological Monographs* 15:1-34.
- Guthery, F. S., M. J. Peterson, and R. R. George. 2000. Viability of northern bobwhite populations. *Journal of Wildlife Management* 64:646-662.
- Peterson, M. J., and R. M. Perez. 2000. Is quail hunting self regulatory? *Proceeding of the Fourth National Quail Symposium*: 85-91.

Quail Queries:
New Ideas for Quail Research

The Radiotelemetry Tango: two steps forward, one step back?

Our knowledge of bobwhites has increased tremendously since the advent of radiotelemetry. The increase has been so noticeable that Dr. Dale Rollins, Texas Agricultural Extension Service, categorizes quail knowledge as "B.T." and "A.T.".... before telemetry and after telemetry.

Previously held beliefs have been challenged as a result of radiotelemetry. Beliefs dealing with the frequency of multiple brooding, monogamy between pairs, and long-distance movements have changed. An advantage that radiotelemetry offers is that researchers have been able to estimate survival and identify causes of mortality. However, how reliable are these estimates?

A major assumption of radiotelemetry is that survival, reproduction, and behavior are not affected by the radio transmitter. However, differences in survival, foraging behavior, and reproductive success have been documented for sharp-

tailed grouse, willow grouse, and least terns.

The effects of transmitters on bobwhites have not been studied extensively. Recently, Lori Corteville and Drs. Wes Burger and Lenny Brennan from Mississippi State University and Tall Timbers Research Station studied the effects of radio-transmitters on bobwhite body condition, harvest rate, and survival. Their preliminary results suggest that radio-marking may marginally increase bobwhite vulnerability to harvest and potentially predation.

Survival rates that radiotelemetry studies often report are sometimes not sufficient to maintain populations, leading researchers to question their accuracy. A study is needed to investigate the effects of radio transmitters on bobwhites at



Photo by Fidel Hernandez

various temperatures, to mimic the temperature extremes bobwhites often experience. These effects also need to be evaluated at various bobwhite weights, to compare effects between northern and southern latitude bobs (180 g vs. 160 g). An environmental chamber could be the perfect ballroom for the radiotelemetry tango. Until next time ---

Fidel Hernandez

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