




The Bobwhite Post

By Dr. Fidel Hernandez and
Dr. Lenny Brennan



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Richard M. Kleberg, Jr. Center for Quail Research
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Graduate Student Spotlight: Mike Rader

By Dr. Fidel Hernandez

We are pleased to introduce our most recent quail Ph.D. student, Mike Rader. He will be conducting his research under the direct supervision of Dr. Lenny Brennan.

Mike comes to South Texas with a broad perspective of the world, having lived in Alabama, Virginia, South Carolina, North Carolina, Hawaii, Great Britain, South Korea, and Nova Scotia. He obtained his B.S. in wildlife science at Auburn University. After serving 4 years in the United States Marine Corps, he earned his M.S. in Environmental Studies at Dalhousie University in Halifax, Nova Scotia. For his doctoral research, Mike will be examining the relationship between predators, habitat, and weather on the nesting success of bobwhites. He will be using video cameras to document the nesting ecology of bobwhites. Welcome aboard Mike!

The Eyes of Predators Are Upon Quail

By Dr. Fidel Hernandez

A couple of years ago, I remember seeing an interesting billboard sign while I drove along Highway 277 in west Texas. I caught the first glimpse of the sign as I came over a hill, giving it the impression of appearing out of nowhere. The road sign was intended to slow down speeding roadsters and discourage the slightest inclination of developing a “lead foot”, something which occurs quite often while driving on the desolate Texas highways. The sign was nothing fancy, just a close-up shot of the face of a Texas Highway Patrolman: cowboy felt hat, dark shades, no smile. To the side, the slogan played on the title of an old Texas song, and this wording appeared, “The Eyes of Texas Are Upon You.” Upon seeing the sign, my engine dropped a few RPMs, as my foot eased up a bit. Although I could see for miles ahead, I had an uneasy feeling that the eyes of a patrolman were upon me.

The high mortality of bobwhites makes me wonder if they also spend their lives with a similar uneasy feeling...“*the eyes of predators are upon us.*” It seems that almost everything is out to get bobwhites: coyotes, bobcats, foxes, raccoons, skunks, opossums, armadillos, hawks, snakes, rodents. And yet, for the most part,

they seem to be holding their own in the face of predation. How do they do it? Their great reproduction potential is one answer. Renesting helps to minimize the detrimental impacts that high nest depredation rates would otherwise have. Habitat also plays a role. Bobwhites select habitats with adequate woody and herbaceous cover to minimize their risk to predation. Given the high predation rates of bobwhites and the role of habitat in minimizing predation risk, we conducted an exploratory analysis of this relationship using data from the South Texas Quail Research Project (STxQRP).

The STxQRP provides a unique opportunity to evaluate the complex relationship between bobwhites, predators, and habitat (i.e., woody cover). First of all, the migration routes of numerous raptor species converge in South Texas both during their winter and spring migration. This results



Photo by Fernando R. Holschneider

The eyes of predators are upon quail. Bobwhites are vulnerable to numerous species of predators. However, habitat can help minimize the risk of predation.

in a high diversity and abundance of raptors during the fall and winter months. More than 30 species of resident and migratory raptor species are known to inhabit the area during the migration period. Further, the amount of woody cover varies in the 3 pastures that we use in our study. This setup provided the opportunity to compare bobwhite survival between areas with varying amounts of woody cover and in a region with a diverse and abundant raptor community.

In the Fall of 2000, we began to monitor the raptor community for the STxQRP study area. We conduct a raptor survey along a 15-mile road every 2 weeks throughout the year. We also maintain a sample of radio-collared bobwhites in each of our 3 pastures. The pastures (North Viboras, Loba, and Cuates) align north-to-south, with the amount of woody cover progressively decreasing. We used geographic information systems (GIS) to quantify the percent woody cover for our 3 pastures. We then used this information to assess the importance of woody cover to bobwhite survival.

Initially, there appeared to be no relationship between amount of woody cover in a pasture and bobwhite survival (Table 1). Although North Viboras had the greatest amount of woody cover and highest survival, our pasture with the lowest amount of woody cover (Cuates) did not have the lowest survival. However, because bobwhites may be using areas with higher amounts of woody cover than what is available at the pasture scale, we also compared survival to the amount of woody cover within the home ranges of bobwhites. Using this approach, an interesting trend developed. Namely, as woody cover within a coveys's home range increased, survival also increased (Table 1).

We further compared the amount of woody cover for bobwhites surviving the raptor migration period (Oct-

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Table 1. Comparison of northern bobwhite survival (Sep-Mar) between 3 pastures containing varying amounts of woody cover, Brooks County, Texas, 2001.

Pasture	No. Coveys	Survival	Percent Woody Cover	
			Pasture	Home Range (mean)
North Viboras	5	66%	32%	36%
Loba	9	43%	11%	10%
Cuates	4	63%	5%	24%

Mar) with those bobwhites killed during the migration. We found another interesting result. The home ranges of coveys that survived the migration period ($n = 8$) consisted of about 20% woody cover, whereas those killed during the migration period ($n = 6$) contained only about 9% woody cover.

We need to express some caution when interpreting these results. First, these results represent an exploratory analysis of our data, and thus involved only a small sample size. Also, sometimes our calculations of percent woody cover for home ranges were not always based on the entire area of the home range. If cloud cover occurred on the GIS vegetation map where a bobwhite home range was overlaid, then percent woody cover could only be calculated from the area not covered by the clouds, as the clouds obscured the vegetation. Therefore percent woody cover for a "complete" bobwhite home range could sometimes not be calculated, making our calculations somewhat inaccurate. We at-

tempted to minimize the use of home ranges that contained "cloud cover". However, this was not always possible.

This exploratory analysis has some interesting implications, if our results actually reflect reality. First, our typical recommendation of 5%-15% woody cover for bobwhites may be too low. It appears that bobwhites use areas with >20% woody cover. In 1998, Steve Kopp, Dr. Fred Guthery, and others also reported that bobwhites in South Texas preferred 20%-60% woody canopy cover. They reported that bobwhites selected habitat that reduced their vulnerability to attack from a raptor. If the trends continue in future analyses, this research will provide direct implications for bobwhite brush management. Not only will we be able to define bobwhite habitat selection of woody cover, but we'll also be able to link population performance (i.e., survival) to this selection, something rarely done in wildlife research.

The eyes of predators may be upon bobwhites, but they may have realized that safety is deep in the heart of Texas....brush, that is.



On Point



... and Counterpoint

PEOPLE, PREDATORS, AND PREY: AN ANCIENT RELATIONSHIP *Part two*

By Dr. Lenny A. Brennan

People have a complicated, and often conflicted, relationship with predators. This complex relationship is a direct result of our evolutionary history. Humans are both predators of prey and, occasionally, are eaten by predators. We have also domesticated predators and developed intimate relationships with them, both as working animals and as pets. Consider, for example, how we use trained dogs to protect and corral livestock, to hunt both large and small game, and to search for lost or fugitive humans. Look at the multi-billion dollar industry has developed around the breeding, care and feeding of domestic dogs and cats. We welcome domesticated predators into our homes. Predators sleep on our sofas and at the foot of our beds.

On the one hand, we coddle predators, and on another hand we hold them in contempt, especially when they either threaten our livelihoods or compete for the game we hunt. This is the ancient relationship that lies at the core of our human psyche. When we hunt, we return, temporally but fundamentally, to this ancient predator-prey relationship. As Jose Ortega y Gasset stated in his compelling book *Meditations on Hunting*, "...one does not hunt in order to kill...one kills in order to have hunted."

Quail managers and hunters need to take the moral high ground when it comes to predator management. Any philosophy that does not embrace a

moral, ethical, and scientific basis for predator management provides an opportunity for anti-hunters and animal rights activists to challenge our opportunities to not only hunt, but also to effectively manage wildlife.

Predator management is a tool for wildlife management. For predator management to be most effective, it should be conducted in the context of habitat management and providing the maximum amount of usable habitat space. Predator management is *not*, and should *never* be considered a substitute for habitat management.

During the past two decades, I have observed numerous quail hunters and managers who espoused a blunt, and frankly over-simplified view of how quail predators should be managed. This view, which boils down to "whack em and stack em" regardless of the species, context, time, place, or (*ahem*) legality misses some key points.

First, predator management is expensive. It is not cost effective, much less feasible, to conduct an across the board predator pogrom.

Second, a philosophy of across the board predator removal may potentially cause more harm than good. For example, the removal of one predator may result in the unforeseen increase in others, such as coyotes. While coyotes obviously prey on quail nests in

South Texas, they also eat tremendous numbers of wood rats, who are also quail nest predators. We need to understand how the system works before we tinker with it, and potentially do more harm than good.

Third, quail enthusiasts who espouse across the board predator removals give quail management a bad reputation with the general public. While the concept of killing one group of animals so that people can have more of another group to kill (i.e., quail) is rooted deep in the evolution of the human condition, present day mores and ethics call such an approach to wildlife management into question.

Fourth, quail hunters and managers need to appreciate that it has been the process of predation that has caused quail to develop the behavioral characteristics that we prize in these birds. The ability to freeze (or run!) when encountered by a pointing dog, the massive, explosive flight in all directions during a covey rise, the scattering of single birds across a complex of escape habitat made up of cacti, brush, thorns, mottes, and dense cover, are all predator-avoidance behaviors with which quail have evolved.

Without the behaviors quail have developed to avoid predators, quail hunting would be a rather boring, instead of exhilarating, pursuit.



Selected Reference

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Quail Quips:
Interesting findings in quail research

Instant Quail...Just Add Water

By Dr. Fidel Hernandez

"Bobwhite populations on southwestern rangelands are strikingly unstable. Densities change, virtually overnight, from relative scarcity to abundance..." wrote the late Val Lehmann in a 1953 article regarding bobwhite populations. These "boom and bust" populations are all too well known to hunters, managers, and researchers in the southwest. And so is the primary driving force....timing and quantity of rain. The fact is, however, this phenomenon is not limited to bobwhites. Other quails inhabiting semiarid environments also respond favorably to rainfall, such as California, Gambel's, Montezuma, and scaled quail. But how does rainfall cause these favorable responses in quail populations? Is the mechanism(s) direct or indirect? These questions have caught the interest of quail researchers for many years.

Several different theories have been suggested and tested. Everything from phosphorus deficiencies to water deprivation to stress hormones. Phytoestrogens (plant compounds) were once held liable. Phytoestrogens

in moisture-stressed plants have been documented to influence the reproductive ability of animals, and these compounds were found in plants consumed by California quail. However, future research did not implicate phytoestrogens.

Vitamin A deficiency also was investigated as a possible answer to the rain-quail mystery. Vitamin A is a degradation product of carotene. Factors such as drought and heat influence the carotene content of plants, with plants manufacturing less carotene during dry conditions. Vitamin A deficiencies were shown to reduce growth rates of bobwhite chicks and increase mortality. Further research, however, did not completely support the vitamin A deficiency theory.

More recently, heat has received considerable attention as a factor in the boom-bust phenomenon, although the effects of heat on bobwhite reproduc-

tion has been noted since the early 1900s. Extremely hot temperatures may limit reproduction by reducing egg hatchability, reducing the proportion of hens laying, and shortening the length of the nesting season. Research in south Texas has documented heat loads sufficient to kill embryos, chicks, and adult bobwhites, as well as cause bobwhites to go out of reproductive condition. Large expanses of rangeland become thermally unsuitable for bobwhites during the breeding season. The heat hypothesis remains tenable, but is still open to challenge.

Despite the strong relationship between quail and rainfall, proper management can still help maintain populations even during lean times. Once the habitat is in order, then the recipe is quite simple. Want instant quail? Just add water. Until next time--

Fidel Hernandez

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