

# IS THERE A PLACE FOR PREDATOR CONTROL IN QUAIL MANAGEMENT?: A POINT

DALE ROLLINS, Texas Agricultural Experiment Station, 7887 U.S. Highway 87 North, San Angelo, TX 76901-9714.

**Abstract:** The bobwhite we cherish today is a function the threat of predation. Bobwhites have adaptations that permit them to stay afloat in a sea of predators if the "playing field" is level. However, I submit that the playing field is no longer level. Fragmented habitats and higher predator populations (raptor and mesomammals) may be overwhelming the bobwhite's ability to cope with predation. There is considerable debate among biologists whether predation is a proximate or ultimate factor in the decline of bobwhites. Most biologists were trained to accept predation as a natural, density-dependent process that should be managed only via habitat manipulation. I propose that predator control should be evaluated as any other tool in the quail manager's repertoire, yet currently predator control is a politically taboo research topic. Further, the role of predator control should be re-examined in the light of current land use practices, not those present in the 1930s.

I bear no personal grudges against any species of predator. I probably hold greater reverence for coyotes than anyone in the audience today (with the possible exception of Wyman Meinzer). I have probably killed 250 or more coyotes, maybe 150 raccoons, and lesser numbers of foxes, skunks, and opossums. Likewise, I bear no grudge against bobwhites, but I've probably shot over 2,000 over the last 30 years, and I hope to bag that many more if the "quail decline" doesn't rob me of the opportunity.

Several years ago at a departmental retreat for the TAMU Wildlife & Fisheries Sciences colleagues, my fellow presenter Nova Silvy presented information on the demise of the Attwater prairie chicken. He stated that (per my recollection) only 3 out of 100 eggs result in an adult prairie chicken. Given the direness of the situation with the Attwater prairie chicken's status (poised on the brink of extinction), I asked if any thought had been given to predator control as a tool in the restoration effort (i.e., "nuking the nest predators"). Every card-carrying ecologist in the department shot a condescending glance at me, reaffirming their diagnosis of me as a true redneck for even suggesting such heresy.

Wildlife ecologists have a strong "anti-predator control" meme that I suggest may be just as vitriolic as that of Bubba's "catch'em and stretch'em" predator control meme. Will we sit smugly with our Leopoldian logic (e.g., "*you can't love game and hate predators*") and watch the lesser prairie chicken of the Texas panhandle go down in a cloud of smoke like the Attwater's? As quick as we are to point to population control for minimizing undesirable impacts from white-

tailed deer, there's something about taking a similar philosophy for varmints that sticks in our collective craw. Is it the process that we find distasteful, or the procedure (e.g., traps and poisons)?

But, back to the predator meme. May 1997 was an interesting month for me. I was chastised for being at different ends of the predator continuum simultaneously. While some folks from Mason were calling for my resignation for being too soft on predators that impact sheep and goats, I was dodging barbs and darts from some quail biologists at a quail symposium in Florida for implying that predator control deserves mention as a tool in quail management. Either I'm darn fickle, utterly confused, ecologically dyslexic, or I recognize that different perspectives and situations may call for a continuum of thought about predator control. At the same conference, and again at Quail Unlimited's annual convention in Springfield, MO (the 'show me' state), Lenny Brennan from Tall Timbers Research Station in Florida presented (almost apologetically) data which showed substantial increases in quail abundance over 4 years as a result of predator control.

## In praise of predators

While my position in this debate is the "point" argument that predators are a problem in quail management, I am quick to praise the effect that predation has had on the evolution of quail. The behavior and anatomy of the bobwhite we cherish is a product of thousands of years of predation, or at least the threat of predation. Simultaneous covey flushes and strong-flying wild birds are traits which have

served the bobwhite well against Cooper's hawks and bobcats.

I read Aldo Leopold as much as anyone here, and I have read his classic essay *Thinking Like a Mountain* until I can nearly recite it from memory. His observation that "*only the mountain has lived long enough to listen objectively to the howl of the wolf*" reminds me that one's perceptions are susceptible to change over time. And that to every action there are multiple reactions, despite what Sir Isaac Newton reckoned.

I enjoy being on an e-mail listserve coordinated by Fred Guthery called generically the "Quail Crew." The communiques are sometimes irreverent about what we (as quail managers) hold dearly, e.g., Leopold's Law of the Edge. But the discussions serve as shock therapy for some of us who sometimes get mired in our dogma. A while back, Dr. Guthery correctly asserted that a strong meme exists for controlling predators. Most of the time his anti-predator control comments are aimed at me as I am (by admission) the most rednecked person relative to predator control. His jabs and others of the Quail Crew towards predator control as a legitimate tool for quail management require some critical thinking on all of our parts.

I think predator control may have a place in game bird management; indeed Tapper et al.s' (1982) work in Scotland, and evidence from the prairie potholes with

waterfowl, gives more than just passing credence to the efficacy of predator control under a given set of site-specific conditions. Where we err is our tendency to extrapolate and stereotype predator control (management) as an "all or none" phenomenon. Is grazing good for bobwhites? What about fire? What about hunting? Ah, the infamous Texas Tech Theory of Relativity ("*everything is a function of 'it depends'*") rears its omnipresent head.

Opponents of predator control espouse (correctly I think) that a management practice results in higher densities of bobwhites only when it increases usable space, which is site- and time-specific (Guthery 1997). I submit that "prescribed predator control" can and does increase usable space under given site situations, at least for a short period of time. I hypothesize that short term, intensive predator control as a means of reducing mesomammals can increase nest success.

Guthery (1995) points out that a bobwhite hen with a 30% chance of hatching any individual clutch of eggs has a 66% chance of success if she renests at least 3 times. But does Guthery's model assume zero mortality among nesting hens, i.e., that the hen survives 3 nesting attempts, or at least 2 and lays eggs that might be subsequently incubated by a willing rooster? What if the hens suffer mortality attributed to nesting of 20%? 40%. Let's see what happens now:

Hen mortality (%)	No. hens nesting successfully			
	1 <sup>st</sup> attempt	2 <sup>nd</sup> attempt	3 <sup>rd</sup> attempt	Total
0	30	21	15	6
20	24	15	10	49
40	18	9	6	33

The above assumes (a) all unsuccessful hens indeed reneest 2 additional times, (b) nest success remains constant across the nesting season, and (c) no multiple clutching of the successful hens; surely all 3 assumptions are suspect, but we don't know to what degree.

So, while bobwhites do have some recourse to nest depredation, I doubt if it is as powerful a defense as Dr. Guthery suggests.

We usually revert to our block answer that "habitat

is the key . . . if the habitat is in good shape, predation won't be a problem." Does that paradigm have bounds on it? Guthery (1995) concedes that predator control may be a legitimate tool in fragmented habitats, but that predator control over vast west and south Texas is meaningless.

The past 2 summers my graduate students and I have conducted studies to evaluate "surgical strikes" (short-term intensive mesomammal control via cage traps) to provide an "open window" nesting opportunity with a lower density of nest predators (see

Frost et al., this volume, for a summary of one study). One of these studies, conducted in Sterling County suggested about a 30% increase in (dummy) nest success in areas that were trapped. Costs were \$0.83/ac without amortizing the cost of the traps over a 10-year lifespan. But others, like Frost et al.'s, failed to document any increase in nest success or hen survival.

While findings are equivocal, I think there may be a place for "prescribed predator control" just like there is for prescribed grazing, disking or burning.

### **Predators in a changing world**

There is much speculation that predator communities (density and/or species diversity) have changed over the last 20 years. Factors that may be implicated in this change include:

- a) mesomammal release,
- b) fragmented habitats,
- c) deer management (supplemental feeding),
- d) elimination of organochlorine pesticides.

"Mesomammal release" is often mentioned as phenomenon of the demise of the fur market in the 1980s, but little data are available to examine population trends of furbearers. Fragmented habitats include not only habitat loss to exotic species like coastal bermudagrass, but also overgrazing. The booming interest in deer management, especially supplemental feeding has likely fostered populations of raccoons. Finally, raptor populations have increased considerably since the 1970s (Sauer et al. 1997; Figure 1). Could it be these trends collectively have tipped the scales in favor of the quail's enemies.

### **Coyote's role in quail predation**

This seems like a no brainer. I'm confident that a coyote will eat every quail it can catch, and destroy every nest it finds. But think for a moment where quail numbers are highest in Texas, i.e., Rolling Plains and South Texas. Now superimpose that map against coyote abundance, and lo, it's the same 2 regions. Now look at an area where bobwhite numbers are historically well below other sites in west Texas, i.e., the Edwards Plateau. Where are coyote numbers lowest? Ditto.

So is the relationship between coyotes and bobwhites merely correlation, or cause and effect? And if it is the latter, what is the mechanism involved? The following explanation is mostly speculation on my part.

Raised in southwestern Oklahoma, i.e., an area with abundant coyotes, one had to go to the Red River or its tributaries if you wanted to hunt raccoons. They just didn't seem to occur in any numbers away from the riparian areas. Contrast that with the Edwards Plateau where raccoon tracks are omnipresent in roads and stock trails across the landscape. Not only does this area, relatively devoid of coyotes, have higher raccoon densities, but the raccoons have "escaped" from their position on the landscape and apparently roam the uplands freely. I don't know how important coyotes are as predators of raccoons, but I suspect they "restrict" them to those parts of the landscape dominated by trees tall enough to serve as escape routes (i.e., riparian areas) if pursued by coyotes.

Inverse relationships also occur between coyotes and other potential quail predators such as gray foxes and feral housecats. Studies in the Prairie Pothole region suggest that nest success is higher in those areas with higher coyote populations than in regions with higher red fox populations.

### **Summary**

I submit that "to every meme there is an equal and opposite meme", and for every quail hunter anxious to implement QU's "catch'em an stretch'em" policy, there's a wildlifer wringing his hands and extolling a sometimes romanticized view of predators.

Predator communities have changed. Landscapes have changed. We're not in Kansas anymore, Toto. Thank goodness for common broomweed to periodically predator-proof our Rolling Plains quail populations every 5 years or so. To every action there are many reactions . . . some apparent, some transparent. Let us remain objective on the role of predator control as a management tool, and examine the bounds under which it may or may not increase quail populations.

### **Literature Cited**

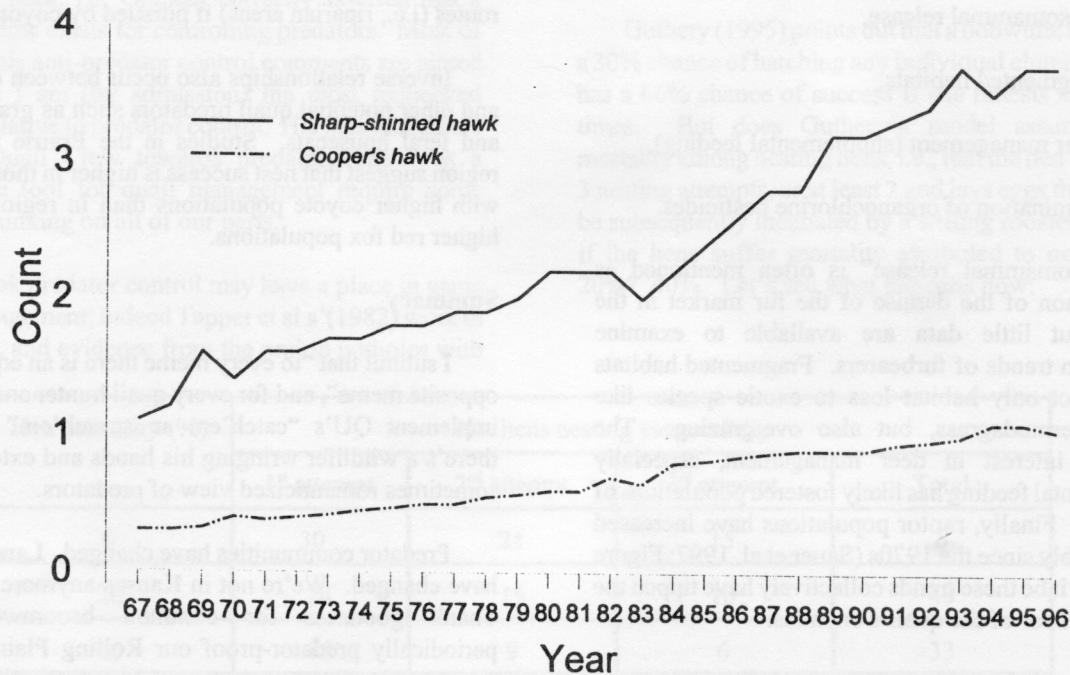
- Guthery, F.S. 1995. Coyotes and upland gamebirds. Pages 104-107 in D. Rollins et al.(eds), Coyotes in the southwest: a compendium of our knowledge. Texas Parks and Wildlife Department, Austin.

Guthery, F.S. 1997. A philosophy of habitat management for northern bobwhites. *Journal of Wildlife Management* 61:291-301.

Sauer, J.R., J.E. Hines, G. Gough, I. Thomas, and B.G. Peterjohn. 1997. The North American Breeding Bird Survey Results and Analysis. Version 96.2.

Patuxent Wildlife Research Center, Laurel, MD.

Tapper, S.C., R.E. Green, and M.R.W. Rands. 1982. Effects of mammalian predators on partridge populations. *Mammal Review* 12:159-167.



Breeding Bid Survey data

Figure 1. Population trends of the two most important avian predators of bobwhites, i.e., sharp-shinned and Cooper's hawks (Sauer et al. 1997).