



Photo by David Hewitt

FROM THE FIELD: A Biological Approach to Managing Bobwhite Harvest on Texas Rangelands



Photo by Fidel Hernandez

The northern bobwhite is one of the most popular game birds in the United States. Despite its popularity, this species has experienced a well-documented and precipitous decline in abundance over the past 80 years. The decline has generally been driven by habitat loss as a result of conversion to unsuitable agricultural practices and urbanization. As available habitat continues to decrease in size and increase in isolation, biologically

justifiable and sustainable methods of harvest will become increasingly important components of bobwhite management.

Harvest regulations for bobwhites are based on cultural influences that exist within recreational hunting. These include both state mandated bag limits (10–15 birds per day) and self-imposed limitations (limiting harvest per covey to 2–3 birds). Although measures such as these are intended to regulate harvest, they are

not designed to prevent overharvest of bobwhite populations.

Harvest theory for bobwhites has been evolving over time. For decades, the harvest of bobwhites was considered to be simply the taking of a “doomed surplus”. This concept arose from observations of quail populations in Iowa, Wisconsin, and Illinois. The theory suggested that a carrying-capacity threshold existed for bobwhite populations during the winter months and, when population densities exceeded this threshold, this excess represented a “doomed surplus” that would inevitably succumb to mortality.

The doomed-surplus concept has fallen out of favor with researchers who have instead adopted another paradigm of the nature of harvest, the additive-mortality theory. This theory suggests that bobwhite harvest will increase the overall mortality rate within a population. However, this increase is not 100% additive because some of the harvested bobwhites represent individuals which would have died from natural causes. Thus, harvest can only be 100% additive if the population did not suffer any natural mortality, which of course is not the case.

Research on the nature of hunting suggests that quail abundance appears to be the primary arbiter

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FROM THE FIELD

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of hunting pressure at broad spatial scales. The implication of these results is that wildlife agencies control quail hunting (i.e., effort, means, and methods) but not actual harvest. Thus, harvest regulations established by state wildlife agencies are appropriate for regulating quail hunting at broad scales but are not designed to manage appropriate quail harvest at small scales. Quail harvest should be managed at the same spatial scale of hunting especially on

intensively exploited populations.

So how should managers regulate harvest to maintain viable bobwhite populations? Sustained-yield harvest may be an option. The theory is based on the processes and factors that influence how populations grow. It's application is relatively straight-forward: a pre-determined proportion of the fall population is harvested in order to arrive at a breeding density of bobwhites that can sustain the population. Thus, to apply sustained-yield harvest in the field, managers must have knowledge of 3 variables: fall density, overwinter survival in the absence of hunting, and the minimum spring density necessary for a viable population.

The application of sustained-yield harvest remains mostly an untested alternative for bobwhites. Evaluating this method is necessary because if sustained-yield harvest could be successfully applied in the field, then managers would have a valuable tool for determining harvest quotas to sustain their population. It would also permit re-scaling harvest regulations from a statewide scale to actual harvest quotas at a ranch level and, in the process, guard against overharvest.

We are currently conducting research in South Texas and the Rolling Plains to evaluate the field application of sustained-yield harvest. It is a project funded by Texas Parks and Wildlife Department and conducted in collaboration with Dr. Dale Rollins from Texas AgriLife Extension. We use helicopter surveys to determine fall and spring densities of bobwhites on hunted pastures. We estimate overwinter mortality of bobwhites using radiotelemetry

on non-hunted pastures. Based on these data, we are developing a population model to determine the minimum spring density necessary to sustain a viable population. We have begun preliminary simulations in which we subject the hypothetical bobwhite population to a range of harvest rates (0 – 50%) over 25 years. Our preliminary findings suggest harvest rates of 10-20% result in a low (3%) probability of extinction. Harvest rates of 30%–40% increase probability of extinction to 27% and 47%, respectively. However, at 50% harvest, probability of extinction was 90%. These initial results indicate that harvest rates of 20% are sustainable for bobwhites in South Texas, but more extensive simulations are necessary.

Field use of sustained-yield harvest is promising but by no means perfect. However, such an approach to harvest management will provide a method of harvest that incorporates not only the biological principles governing bobwhite populations but also tailors harvest specific to a ranch. Identifying the sustainable levels of harvest will allow managers to maximize hunting opportunities while minimizing the risk of overharvest of the resource.

-Joey Sands and Fidel Hernandez

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STATUS OF SOUTH TEXAS QUAILS

Both the northern bobwhite and the scaled (or “blue”) quails are found in the lower triangle of Texas defined by an imaginary line drawn from Victoria to San Antonio to Del Rio. While both of these species have experienced widespread declines throughout their ranges, I submit that their relative status in South Texas may be somewhat different, and much more positive, than what we see elsewhere in the US. These positive differences are, in my view, a function of the relative availability of widespread and high-quality quail habitat. The presence of this habitat is the result of an increased level of conservation awareness and land stewardship that stems from the cultural interests of people who are willing to make excellent quail hunting on private lands a top wildlife management priority.

BROAD-SCALE TRENDS

Back in 1991 I published a paper in *The Wildlife Society Bulletin* titled “How Can We Reverse the Northern Bobwhite Population Decline?” At the time, few people in wildlife science and management seemed to know or care that a bird as common as the bobwhite had been declining for the past couple of decades at a rate of about 3% per year throughout most of its geographic range. However, these declines actually started back at the turn of the 20th century, or even earlier as noted by people like Aldo Leopold in now classic books such as *Game Management* and *Game Survey of the North Central States*.



Photo by Fidel Hernandez

WHY THESE TRENDS MAY NOT BE APPLICABLE TO SOUTH TEXAS?

While the broad-scale population indices in South Texas indicate a declining trend for bobwhites and scaled quail, I have the view that these trends may not be indicative for the landscape as a whole. This is because vast areas—literally millions of acres—of South Texas rangelands are not covered in the course of Christmas Bird Counts, Breeding Bird Surveys or Texas Parks and Wildlife Roadside Wildlife Counts. Although these broad-scale surveys indicate that quail and many other species of grassland birds are declining along the roadsides in South Texas, this may represent a biased assessment that should probably not be extended to the greater South Texas region. A series of cumulative factors such as widespread presence of invasive exotic grasses, encroaching

exurban settlement and resulting fragmentation, along with increased noise and disturbance from vehicle traffic, have combined to make these areas only marginally habitable for quail and grassland birds.

In contrast to the widespread declining trends that we have seen for quail in general, there is an emerging body of evidence that many ranches in South Texas are growing more wild quail than ever. For example, during the past seven years, the South Texas Quail Associates Program has collected data on quail productivity and quail hunting on a landscape scale. These data indicate that annual levels of bobwhite productivity, in some places, ranges well above the past published record of juvenile: adult ratios of 7:1, and in several places exceeds 10:1.

Additionally, when it comes to hunting, our Quail Associates members regularly report data from quail hunts where covey finds

ON POINT...

are greater than 4 per hour, which translates to a crude density of > 1 quail per acre. In contrast, this past fall, The Covey Rise newspaper summary of state-by-state quail reports noted that "...quail hunters in Mississippi can expect to find about 0.24 coveys per hour of hunting." This was not a typographical error. Extending the math here means that it would take a typical quail hunter in Mississippi about 4 hours to find a covey of quail. In South Texas, it typically takes less than 15 minutes for a quail hunter to find a covey.

THREATS AND CHALLENGES

The "quail glass" in South Texas is clearly more than half full, while at the same time the quail glass throughout much of the rest of the U.S. remains half empty or worse. While we are indeed seeing something of a renaissance of enlightened quail management in South Texas as we move into the 21st century, there are numerous threats and challenges of which we must be aware.

One of the biggest threats and challenges that quail managers

face in South Texas are problems brought by invasive exotic grasses. These plants, such as guinea grass, buffelgrass, along with Old World bluestems, are here to stay and will most likely continue to increase in both extent and abundance. How to manage these grasses, along with native grasses such as tanglehead that while allegedly native act ecologically like exotics, will be a challenge for years to come. The emerging fact that some of these grasses—such as buffel, guinea and tanglehead—provide decent nesting cover for bobwhites is a positive. However, the downside seems to be that the presence of these species greatly reduces—sometimes up to as much as 50% or more—the abundance of food-producing forbs and arthropods.

Another important threat to quail in South Texas is landscape fragmentation. Although the political death of the TransTexas Corridor could not have come at a better time, landscape fragmentation dynamics are alive and well in South Texas. Plans continue for the Interstate 69 corridor to enlarge existing highway

rights-of-way. Interstate on and off ramps attract developments like picnics attract ants. Neither situation results in much fun.

OPPORTUNITIES

Despite the threats and challenges noted above, it is important to understand that quail management in South Texas represents one of the most important opportunities in wildlife science today. Of course, the research opportunity presented by the natural laboratory of South Texas in which millions of wild quail function every year is most obvious.

The other South Texas quail opportunity is education. A lot of people are doing a lot of good things for quail in South Texas. The result is a lot of wild quail and, by extension, a lot of high quality quail hunting. Our collective job as managers, scientists, and students is to communicate the South Texas quail story to the rest of the world.

- Lenny Brennan



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