CURRENT STATUS OF THE NORTHERN BOBWHITE

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Abstract: I assessed the current status of the northern bobwhite populations, habitat, management, research, and public interest. Northern bobwhite populations have been declining throughout most of the species' geographic range for at least the past 30 years, and perhaps as long as the past century. In the few places where population declines have not occurred, stable trends can be attributed to intensive management (such as on private hunting plantations in southern Georgia and northern Florida) or land uses that are compatible with bobwhite habitat requirements (such as the coastal rangelands in the Rio Grande Plain of Texas). The status of northern bobwhite habitat is not fully known, although continuing widespread loss of habitat is thought to be the primary culprit behind most ongoing population declines. The status of northern bobwhite management is not well documented. Most efforts at northern bobwhite management are isolated and meager, probably because effective habitat management for this bird is one of the most expensive (>25-100 dollars per acre per year) forms of wildlife management in the world. The current status of northern bobwhite research seems to have improved during the past decade, compared to the 1980's. Despite the widespread declines (or perhaps because of the declines) interest in bobwhites remains high. Several states in the Southeast and Midwest have initiated high-profile education and outreach programs, many of which are linked to research initiatives at major universities. Support for non-governmental organizations such at Quail Unlimited and Tall Timbers Research Station continues to increase. Current and future opportunities for high-quality northern bobwhite hunting experiences are almost exclusively limited to wealthy individuals with access to extensive tracts of private lands and the ability to sustain huge management costs.

Introduction

Five years ago, I wrote a short paper on the status of northern bobwhite quail in the United States for the first Texas Quail Short Course (Brennan 1994a). The proceedings of this 1999 North Texas Quail Symposium provide an opportunity to reexamine some of the material I compiled 5 years ago and (1) assess whether the status of bobwhites has changed and (2) assess how my perspective on the bobwhite situation has changed. Webster's dictionary defines "status" as "a state of affairs or situation." Therefore, my objective is to assess the current state of affairs with respect to bobwhites in the United States. My approach will be to provide the opinions of one wildlife biologist, and, where convenient support some of these opinions with facts. I will cover various topics such as bobwhite populations, habitat, management, and research, as well as myths and misconceptions, that I think are important to understanding not only the current status of bobwhites, but also the future of this important game bird.

Status of Populations

Perspectives on Long-term Trends

The decline in northern bobwhite population abundance has been ongoing for nearly a century (Schorger 1946; Guthery personal communication) in some parts of the country. In other regions, there has been no decline in bobwhite numbers over the past 100 or so years (Brennan 1999). Thus, whether bobwhite populations are declining, how long they have been declining, and the extent to which they have been declining, is related one's geographic location, and the time perspective that one is willing to consider. Like most things in life, what you see is largely determined by where you stand. However, a flexible amount of open mindedness is important when considering just about all issues related to the current status of bobwhites. Otherwise, if the only tool in your box is a hammer, then the rest of the world begins to look like a nail.

Most commonly, the majority of people interested in game birds consider bobwhite population trends in terms of a human generation. Not surprisingly, humans have a propensity to observe and understand dynamic changes when such changes occur during some subset of an average human life span.

Data from a variety of sources confirm what many die-hard bobwhite hunters have experienced over the past 25-30 years. Bobwhites have declined significantly throughout virtually every state where

native populations exist. In many states, these declines have been huge (>95%) and swift. Mississippi hunters, for example, bagged more than 2 million wild bobwhites during the early 1980's; today that number hovers between 100,000 and 200,000 birds.

The recent bobwhite declines have been greatest in the Southeast (Lee and Brennan 1994) and less severe in the Midwest (Brennan 1991, Church and Taylor 1992), and seem to be continuing.

Texas as a Macrocosm

The bobwhite situation in Texas is a classic example of how "where you stand affects what you see." Although statewide population trends tend to show wide year-to-year variation and no evidence of a decline, geography plays a significant role behind this pattern. Bobwhite trends in eastern Texas are typical of the steep declining population trends observed in the Southeastern states; panhandle Texas mirrors Midwestern bobwhite population trend--significant declines, but not as severe as those in the southeast. South Texas is a notable, and significant, exception with respect to the bobwhite decline. Bobwhite numbers in south Texas do not show long-term declining trends. Rather, they show a wide annual fluctuation, apparently in relation to variation in rainfall and temperature (Fig. 1).

What About Areas Where Declines Have Not Occurred?

There are two relatively large (>100,000 ha) areas where bobwhite populations do not show long-term evidence of declines: south Texas and the hunting plantation lands between Tallahassee, Florida and Thomasville, Georgia. Both of these areas have the potential to teach us important lessons about bobwhites and factors responsible for the declines experienced elsewhere throughout the geographic range.

South Texas: Bobwhites and Land Use

In my opinion, private land grazing management on the big ranches of south Texas provides a classic example of how land use can influence bobwhite populations. The combination of "moderate" grazing pressure (which creates ground and vegetation disturbance), and intermittent pulses of moisture from the Gulf of Mexico, combine to create a favorable (though not always predictable) set of habitat conditions for bobwhites. In this environment, the amount of favorable versus hostile habitat space can change rapidly (Guthery 1997), which in turn can produce "boom and bust" population numbers.

Role of Management

The region between Tallahassee, Florida and Thomasville, Georgia has been managed as a continuous cluster of private quail hunting plantations for nearly 100 years. Most of the shooting plantations maintain game books that record long-term records of bobwhite abundance in relation to hunting effort. Data from these game books show that bobwhite numbers have remained relatively stable, in some cases for more than 80 years. Where bobwhite numbers on certain properties have not remained stable, it is usually a function of some change in management effort or attention.

Stable bobwhite numbers in the Tallahassee-Thomasville region are a function of management, the likes of which often defy comprehension (Brennan 1994b). Annual management costs on a private shooting plantation can range from $25-100 per acre per year, which is probably some of the most expensive wildlife management in the world.

Status of Habitat

Unlike the myriad sets of population trend data from agencies, non-governmental organizations, and private hunting estates, objective, quantified data on the status of bobwhite habitat is rare and elusive. Therefore, the status of bobwhite habitat can probably only be inferred in a qualitative, and cursory manner until a comprehensive inventory is conducted.

It is probably safe to say that since bobwhite populations are declining, and since most bobwhite biologists attribute the bobwhite decline to loss of habitat, then habitat is declining as well. This line of reasoning is, however, based on assertion and circular logic, at least to some extent. Although we know that bobwhite numbers in south Texas and in Tallahassee-Thomasville are stable, and that maintenance of habitat via compatible land use and management is probably responsible, what about the status of bobwhite habitat in other areas and regions?

It would be extremely useful to organize a comprehensive inventory of northern bobwhite habitat, and use this inventory to track trends in the areal extent of bobwhite habitat over time. Such an inventory will be included as part of a developing plan for northern bobwhite management and research in the

Southeast (R.W. Dimmick, personal communication).

Status of Management

Like habitat, the status of northern bobwhite management is also not well documented, and needs to be quantified in a systematic manner. Therefore, we must rely on various snippets of information to document what we think we know about the extent of northern bobwhite management based on casual observations.

Fear of Fire

Prescribed fire is an essential tool for northern bobwhite management. We have known this to be axiomatic for more than 7 decades (Stoddard 1931). However, the use of fire as a land management tool in the southeastern U.S. is mostly isolated and limited (Brennan et al. 1998). For example, in the southeastern states, only Georgia and Florida regularly burn more than 1 million acres per year. Although this seems like a lot, this represents only about 2.5% of the land areas of either of these states. Most other southeastern states such as Alabama, Mississippi, and the Carolinas, only burn about 0.3% of the total land area on an annual basis.

Landowner Incentive Programs

Despite the best intentions of policy makers, legislators, and resource agency biologists, landowner incentive programs, such as the Conservation Reserve Program, have done essentially nothing to reverse the northern bobwhite decline in the Southeast. The recent inclusion of incentives for landowners to plant longleaf pine may have a positive impact on bobwhites; however, it is too early to tell. Also, if use of prescribed fire is not included in the context of longleaf pine plantings, then this incentive program will also not be useful for bobwhites.

There are a number of reasons why landowner incentive programs have not benefitted northern bobwhites. First, many of the subsidized conservation program practices, such as planting sod-forming grasses and high-density loblolly pines, are not "quail-friendly" practices.

Second, stewardship-based soil disturbance management techniques, which do not produce erosion, such as strip-disking, are either discouraged or not implemented on a widespread basis. Third, many program administrators at the county and local levels simply have little or no knowledge or incentive to promote management actions that will help bobwhites and provide landowners with cost subsidies.

Red-cockaded Woodpecker

Habitat management for the endangered red-cockaded woodpecker (RCW; *Picoides borealis*) will continue to be a high priority on many public lands in the Southeastern Coastal Plain. Under the right circumstances (i.e., use of prescribed fire on a 1-3 year return interval, intensive removal and control of hardwood midstory trees), management for RCWs can also be beneficial for bobwhites (Brennan 1991, Brennan et al. 1995). Nevertheless, my impression is that many people with interests in hunting northern bobwhite on public land fail to see the connection between RCW and northern bobwhite management.

Status of Research

Recent Surge of Interest

Research on northern bobwhites experienced a period of doldrums during the 1980's, but has resurged during the decade of the 1990's (Fig. 2). Like many circumstances in the arena of wildlife management, there is nothing like a long-term population decline to spur a surge of research interest, along with the money to pay for it.

Not only has the quantity of northern bobwhite research increased during the past decade, but it is my opinion that the quality of information from this research has increased as well. The widespread application of radio-telemetry has played a role in some of these developments. Recent studies tend to be more quantitative and tend to use *a priori* experimental designs, rather than trial and error. Despite the resurgence of northern bobwhite research during the 1990's, nobody has produced a body of work during the past decade that can surpass the insights on northern bobwhite population ecology provided in the monograph by Roseberry and Klimstra (1984).

A systematic application of modeling concepts also appears to be a fruitful avenue of research (Guthery 1997). For example, using a simple modeling approach, Guthery can demonstrate that during times of drought in south Texas, the area of habitat that can be occupied by northern bobwhites effectively becomes zero at a certain temperature threshold. Such an analysis helps explain why bobwhite populations crash during drought, and how

no amount of habitat, predators, or supplemental feeding management can reverse such a population trajectory.

State Programs and Agency Support

Much of the resurgence in northern bobwhite research during the past decade has been based on initiatives developed by state wildlife agencies in Georgia, Mississippi, Missouri, Oklahoma, Virginia, Wisconsin, and Texas. Several initiatives have been developed to have a research component that is linked to a major university, and to have an extension component as well.

Status of Interest

Support from the Private Sector

In addition to the interest in northern bobwhites shown by numerous state resource agencies, there is also considerable interest (and subsequently support) among non-governmental organizations. For example, during the 1980's and 1990's Quail Unlimited grew from zero to >50,000 members. Also during the 1980's, Tall Timbers Research Station raised funds for an endowment to support a research position devoted exclusively to quail management research. Private sector funds also play a major role in supporting university faculty positions in Oklahoma and Texas. A comprehensive analysis of economic impacts of bobwhite hunting would be an extremely useful tool for developing priorities and policies related to bobwhite management.

Myths and Misconceptions

The status of myths and misconceptions related to northern bobwhite biology and management is alive and well, even after Stoddard wrote a classic chapter on this topic in his monograph in 1931 (Brennan 1993).

High quality well-designed research is, and will continue to be, important. However, there is a critical pressing need to educate people about fundamental factors related to northern bobwhite biology and management. For example, many people instantly blame predators as the main factor responsible for the quail decline, when habitat deterioration and loss are most likely far more significant factors. Myths about pen-raised quail (i.e., that they can successfully repopulate an area void of quail) persist. Some myths (i.e., wild turkeys and cattle egrets are major predators of northern bobwhite chicks) take on epic and legendary proportions, while others may or may not be myths at all (i.e., the fire ant controversy; Brennan [1993]).

Educational programs like the Bobwhite Brigade, if continued, should have a long-term, positive impact on eradicating myths and misconceptions related to northern bobwhite life history and management (Rollins, this symposium). Nearly all the state agencies with northern bobwhite programs have produced, or are planning to produce, some kind of easy-to-understand video that describes the essential elements of northern bobwhite life history and management. Bobwhite management videos are a great way to reach the sector of the populace that is not interested in reading material from sources such as the new *Birds of North America* series (Brennan 1999).

Whether such approaches will actually stamp out myths and misconceptions, of course, remains to be seen.

Future Status of Bobwhites

Stoddard's Grand Opera Prediction

About 40 years ago, Herbert Stoddard predicted that northern bobwhite hunting was headed in the direction to become "Grand Opera." He argued that, like opera, hunting wild bobwhites would become the exclusive domain of the wealthy. He predicted that virtually all of the working classes of people would become shut out from opportunities to hunt wild bobwhites because huntable populations would not be supported by prevailing or land uses. The only way that huntable numbers of wild bobwhites would be maintained would be through management, and such management (and the land base needed for such management to be effective) was far beyond the financial means of all but the most wealthy individuals. Stoddard was right.

The bobwhite hunting community has evolved into two major groups: (1) the "haves"(i.e., those who own or have access to private plantations and big ranches and gauge their success in terms of number coveys flushed per hour of hunting) and (2) the "have nots" (i.e., those who continue to make die-hard efforts at hunting bobwhites on public lands and gauge their success in terms of finding any birds at all. How long the "have nots" will continue to hang on, and maintain interest in northern bobwhite hunting, remains to be seen. Most of the people in this group have already

switched to field trials and hunting situations that use released, pen-raised birds.

The Effectively Zero Prediction

In an earlier paper (Brennan 1991), I predicted that the Christmas Bird Count index for northern bobwhite population abundance would "effectively be zero by 2005" based on a statistical projection of the trend line from those data. One of the great things about being a scientist is having the opportunity to be proven wrong, although most of my colleagues in the wildlife profession would probably disagree. I hope my prediction is wrong. It may be over simplistic, and somewhat naive. Or it may be based on a faulty statistical assumption, such as trying to fit a linear trend line to data which may not be linear. Time will tell.

State and Regional Plans

The 1990's saw an unprecedented amount of interest in developing plans and strategies to reverse the northern bobwhite population decline. Some of these planning efforts are largely conceptual (e.g., Brennan 1993), while others have tried to take a more concrete, measurable approach, such as the one outlined for the state of Virginia, or the one being developed for the southeastern region. Whether these plans will have the desired effect of reversing bobwhite population declines remains to be seen.

Realism or Pessimism?

Any realistic assessment of the future for northern bobwhites should, in my view, involve a fair dose of skepticism, if not pessimism. There may some positive developments on the horizon. Filter strips and field borders may be useful for incorporating bobwhites into modern agricultural environments. There is tremendous interest in longleaf pine management and restoration. New methods of hardwood control in old-field pine stands, using a combined integrated approach with fire, herbicides, and mechanical disturbance, show promise for managing bobwhite habitat in these environments.

Are We "Bucking the Sun"?

Anyone who has driven a long automobile road trip knows what it means to "buck the sun" depending on the direction you are driving at sunrise or sunset. When you are driving and your trajectory is directly against the majority of the rays of the sun, there is nothing you can do to solve the problem, except quit driving, which means you have the luxury of time on your side (Doig 1996). With northern bobwhites, I believe that we are, in many ways, "bucking the sun" when it comes to reversing the bobwhite decline in the context of most prevailing land uses. Do we have the luxury of time on our side that will let us pull off the road until the light again becomes favorable to drive? It depends. We certainly do not, at broad landscape scales, have the luxury to practice economical and affordable management at this time because northern bobwhite management is neither economical nor affordable for most people. So the decline continues. Habitat fragmentation increases. Distances between viable populations increase. Populations undergo local extinctions at hundreds and thousands of places across the landscape. When, or if, they will ever return, remains unknown. So the decline continues. We continue to buck the sun, and forge ahead against hostile land use practices, but to no avail. For example, foresters have developed a "total control" herbicide application strategy that eliminates *all* not just *some* competing vegetation in pine plantations. With total control management, pine plantations evolve from being marginal habitat to becoming totally unsuitable habitat for northern bobwhites. More and more old fields and farm lands are taken over by suburbia and urban sprawl. Fire is removed from the landscape. We buck the sun by thinking that, somehow, there must be a way to incorporate economical bobwhite-friendly management schemes in the modern landscape. I think we may be fooling ourselves. Only the small minority who can afford Grand Opera economics have the luxury to pull off the road and stop bucking the sun so they can purchase or lease an adequate land base, and pay the freight for effective northern bobwhite management.

In Summary

During the past 5 years, it seems like the status of northern bobwhites has not changed much. The widespread declines continue. Research seems to be increasing, perhaps in response to these declines. My perspective on the status of bobwhites has, however, changed considerably during the past 5 years. This change in perspective has largely been a function of working in the Tallahassee-Thomasville area since 1993 and seeing the outrageous management costs that must be paid to maintain huntable numbers of wild bobwhites in southern pine forests. When I was hired to work on solutions to the bobwhite decline in Mississippi during 1989, I was optimistic that some kind of economic and affordable solution could be

found. Now, a decade later, I'm not so sure. Hopefully Texas will continue to remain something of a bright spot on the bobwhite horizon. Parts of Texas represent some of the few remaining areas where land uses (i.e., appropriate levels of cattle grazing) are compatible with the production of wild bobwhites.

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