Cearley, Kenneth A. 2008. Bobwhites in the desert. Pages 18-23 *in* J. Brooks, ed. Proceedings of the 2008 Texas Quail Study Group. Texas A & M University Agricultural Research and Extension Center, San Angelo.

Bobwhites in the Desert

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Abstract: Management of northern bobwhite quail (*Colinus virginianus*) populations in arid areas such as the Trans-Pecos eco-region of Texas presents significant challenges, some of which are essentially insurmountable. Bobwhites prefer more mesic conditions than those usually in existence there. Consequently, habitat features are progressively less favorable to bobwhite survival with movement west and the associated decreasing average annual rainfall. Between the eastern extent of scaled (blue) quail (*Callipepla squamata*) range and the western extent of bobwhite quail range the two species are sympatric, their distributions overlapping. In this region managers face the prospect of enhancing one or both species in their management efforts. Successful marketing of quail for consumptive (hunting) and non-consumptive (observation) purposes can be enhanced by the presence of both species on a given piece of land. Rainfall and grazing management largely determine which species is most abundant annually. Compared to scaled quail, bobwhites favor somewhat denser vegetation and less bare ground. Inventory of populations, habitat monitoring, habitat manipulation, and harvest records contribute to varying degrees the success of efforts aimed at concurrently managing for both species.

Introduction

Northern bobwhite quail (*Colinus virginianus*) and scaled (blue) quail (*Callipepla squamata*) distributions overlap (Figure 1) on the eastern edge of the more arid western portion of Texas (Sauer et al 2007). The 100th meridian, generally the route of US Highway 83 along the eastern edge of the Texas panhandle, delineates the line east of which mostly bobwhites reside, west of which blues hold force in greater numbers. Bobwhite and blue quail ranges overlap as far west as the Pecos River (Cantu et al 2006, Silvy et al 2007). Blue quail populations are believed to expand eastward into traditional bobwhite range during drought. However they are not as productive during normal precipitation years as bobwhites. Blues tend not to decline as quickly as bobwhites during dry years, but neither do they increase as quickly as bobwhites during wet years (Rollins 2000). Along this varying line both species exist together, sharing the same region or having sympatric ranges.

Over the past few years bobs like blues have suffered overall declines, a trend that continues downward (Sauer et al 2007). Loss of habitat through changing land use and fragmentation, and

rangeland deterioration of remaining habitat due to overgrazing are considered the chief causes (Kuvlesky et al 2002, Silvy et al 2007). Little evidence exists to support the hypothesis that changing precipitation patterns are responsible (Silvy et al 2007).

Both species population levels vary in the short term mostly in response to rainfall and resultant habitat condition improvements (Bridges et al 2001). Scaled quail populations in this shared area tend to bounce back more slowly after favorable rainfall conditions return, than do bobwhites which tend to respond more quickly (Rollins 2000).

Bobwhites are blamed for effectively out-competing blues and taking over their habitat, moving farther west over time. On study sites in the South Texas Plains, Edwards Plateau, Rolling Plains, and High Plains, Reid et al (1979) found that bobwhites and blues appeared to select different breeding habitat in all but the High Plains, and found little or no direct competition between the two species.

Quail managers often contemplate how to manage species in areas that do not possess ideal habitat for their survival. Such is the case with deliberately aiming efforts at bobwhite management in arid west Texas. Scaled quail have a hard enough time thriving even with their specific adaptations to drier climes. This paper assumes the land in question provides habitat for both species, and will deal with the challenges and opportunities related to bobwhites in the desert.

Why Manage for Bobwhites in the Desert

Since significant obstacles exist relative to managing for bobwhites in arid regions, an assessment of the advantages of nonetheless pursuing such an effort is advisable. Several considerations should be taken into account before proceeding.

First, quail hunting makes a significant economic contribution to local communities and to landowners and operators. Having both species available in huntable populations in their sympatric range increases the attractiveness from a marketing standpoint of a particular ranch. When one species waxes, likely the other will wane, and vice versa. Making the quail hunting opportunity more stable, although the species in greatest number will differ from year to year, largely depends on rainfall.

Second, a direct affect of managing land to benefit bobwhites is usually an increase in range condition which better enables water infiltration, lessens erosion, increases plant species diversity, and improves forage abundance and availability long-term for livestock as well as wildlife. Good range management is good wildlife management, as a general rule. The kinds of management practices involved in quail habitat management will often enhance the habitat for many other bird species as well as other animals.

Additionally, many of the management options for either species, blues or bobs, benefits the other as well. Examples include nest site and loafing cover provision. In essence, sound quail management broadly benefits both.

Feasibility of Managing for Bobwhites in the Desert

Doggedly managing for bobwhites in arid regions will likely be a disappointing endeavor. Shared range, suitable for both species, is however more likely to produce acceptable outcomes for the efforts expended.

Ironically, though, some of the highest populations of bobwhites in Texas (TPWD 2007) usually exist in a "desert", namely the South Texas Plains eco-region, formerly called the Wild Horse Desert. Though not as arid as far west Texas—the Trans-Pecos and the southern end of the High Plains eco-region—the western side of the South Texas Plains experiences average annual rainfall similar to the eastern edge of what is traditionally considered to be the driest part of the state. Blue quail and bobwhites reside here together, much like the region east of the Pecos River. Here both species provide huntable populations in some areas.

Utmost in consideration of strategies and objectives for managing the two species together is the necessity to determine which occupies priority position. In most areas which have both species, one is more suited to the most common conditions, the other to the lesser. Simplifying the decision is the contention that good land stewardship, i.e. good range management, holds the greatest promise for enhanced habitat conditions for quail, whichever species holds priority. It follows then that good management for scaled quail is also good management for bobwhite quail.

Bobwhites seem to prefer heavier cover, and blues do well in areas with less dense cover and more bare ground. Certain exceptions have been documented, though. For example, Reid et al (1979) found where sympatric with blues, breeding bobwhites selected the more open, taller vegetation types, while scaled quail selected the dense, shorter shrub height. He explained that shrubland was negatively correlated with breeding scaled quail numbers in the Trans-Pecos in his study not because it was unimportant but because mixed mesquite shrubland associated with wetter areas was of even greater importance.

Bobwhites need a minimum of ~250 suitable nest sites per acre, ideally in the form of bunchgrass, for optimal nesting cover and often utilize grasses such as bluestems. Blues nest in a variety of habitats, generally more sparse in vegetation as would be expected in more arid climes, and prefer substrates such as tobosagrass (Buntin 2004).

Inventory

Knowing how many of each species is present is the starting point for management efforts. An understanding of the population trend over time of each of the two species can aid planning for habitat manipulation and grazing management. The two species share range, but have different preferences and demands, as outlined briefly above, but one can be preferred over the other in range management schemes if desired because of a perceived unalterable trend in one direction or the other. Rollins et al (2005) outlines protocols for acquiring useful, timely, and appropriate inventory of quail populations.

Monitoring

Without a continued, conscientious effort aimed at monitoring the impact on quail populations of management efforts and other variables, an understanding of appropriate future direction will be cloudy. Only by objectively measuring the response of bobwhite populations to management efforts aimed at enhancing them will it be possible to determine which if any should be continued and which are feasible. Additionally, marketing of the coming year's hunting opportunity is enhanced by knowledge about the existing quail population. Fall covey counts (Rollins et al 2005), for example, can provide crucial information in that regard.

Monitoring habitat features that have a bearing on bobwhite survival is also an important activity for quail managers. In some arid situations it may be revealed that it is a losing proposition to continue to expend efforts aimed at enhancing bobwhite populations. The area may be much more suited to scaled quail. Using the most appropriate tools is crucial in achieving useable results in monitoring rangeland for quail. See Wright et al (2005) for the most appropriate and feasible tools and activities that can be used for practical application by quail managers.

Habitat Manipulation

The types of habitat alteration/enhancements that come to mind to the experienced bobwhite quail manager, such as prescribed burning, brush sculpting, etc., may have less relevance or useful applicability in arid regions. Low rainfall, low humidity, and the resultant relative lack of vegetative cover, of course, combine to make conditions less favorable for some practices. Lessening, through mechanical or chemical means, the density of invasive brush which occupies most of the sympatric range will likely favor blue quail, not bobwhites. A better approach might be to utilize proven techniques (Wright et al 2005) to assess and qualify existing habitat in relation to its provision for the needs of bobwhites. Then concentrate on bobwhites in the more suitable areas.

It is likely that sympatric range could only be feasibly moved in a direction more favorable for blues by fostering more open space and more bare ground. That would involve overgrazing, though, which is not generally advisable. To move sympatric habitat in the direction of being more favorable for bobwhites consider lessening grazing density, which, given adequate rainfall, will result in less bare ground and more grass cover, a situation which is less favorable for blues and more favorable for bobwhites.

Harvest Records

The success of the current year's reproductive effort can be determined by the ratio of juveniles to adults at harvest (Cain and Beasom 1983). A large number of "birds of the year" indicates a good breeding year—a large percentage of young added to the population, and apparently successful nesting, brooding, and rearing. A large number of adults in relation to juveniles would indicate a reproductive "bust"—overall failure of the breeding activity of the year and low accumulation of breeding capital on which to bet the future.

Keeping accurate harvest records can aid in the decision making process relative to setting species priorities, i.e. whether blues or bobs will hold pre-eminence. Results will also contribute to marketing activities since managers can forecast to some degree the upcoming hunting opportunity given adequate moisture and grazing conditions for the coming breeding season.

Expectations

Generally, bobwhite quail cannot be expected to thrive in arid regions. They may subsist on the eastern edge of such areas in Texas where historic rainfall conditions are marginally adequate to provide their habitat needs. Their presence is a blessing when they prosper in these areas in a given year. But don't expect a relentless movement westward with certain habitat modifications and management practices. In overlapping range the more rain, the more bobwhites you can expect, all other variables being equal—the less rain the fewer bobwhites. In overlapping range heavy grazing pressure generally favors blues, lighter grazing favors bobwhites.

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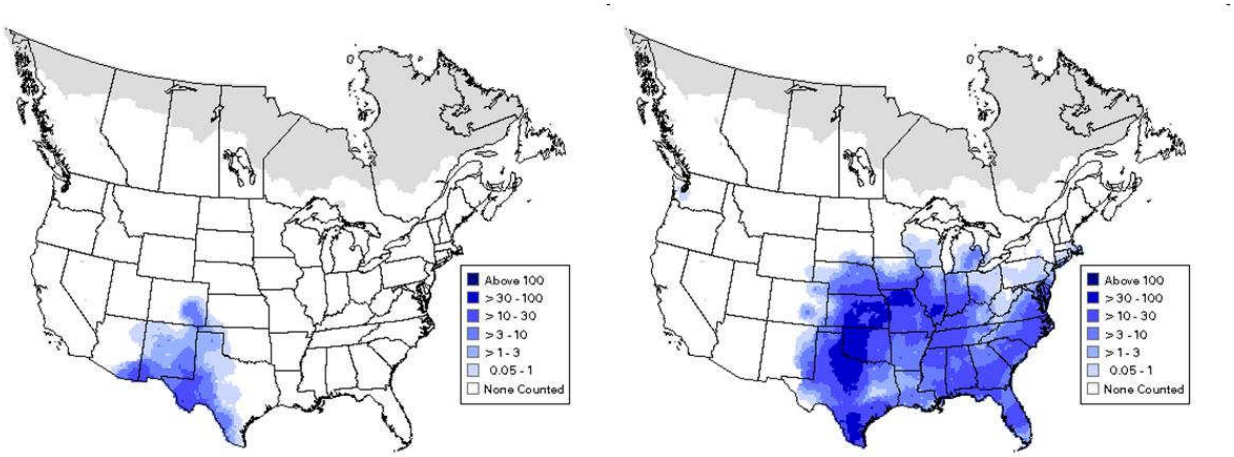

Figure 1. Scaled quail (*Callipepla squamata*) (left) and northern bobwhite (*Colinus virginianus*) (right) summer distributions 1994-2003, North American Breeding Bird Survey.