# Assessing Bobwhite Response to the Environmental Quality Incentives Program Implementation in the Rolling Plains of Texas

United States Department of Agriculture

Natural Resources Conservation Service

August 2009

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**Acknowledgments and disclaimer**

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Acknowledgments

Information in this publication was adapted from field research of Ben D. Taylor working under the direction of Drs. Dale Rollins, Nova Silvy and Dean Ransom, Department of Wildlife and Fisheries, Texas A&M University College Station, TX 77807, and Dr. Fred Smeins, Department of Rangeland Ecology and Management, Texas A&M University College Station, TX 77807. Funding for this project was provided by the USDA NRCS Agricultural Wildlife Conservation Center (AWCC). Eddie K. Lyons, Drew McEachern, John McEachern, Matthew Kaufman, Corbin Neil, and Brandon Wilson assisted with field work. The landowners of Bowen Ranch, Triangle Ranch, Hemphill Ranch, Knox Ranch, and Hendricks Estate provided access to their properties as study sites. John Tate, Alan Heirman, and Ricky Linex assisted with access to study sites. The landowners of Rio 42 Ranch and Stasney's Cook Ranch provided lodging for student interns.

Photos provided by Dale Rollins and Ben D. Taylor, Texas AgrLife Research.

# Assessing Bobwhite Response to the Environmental Quality Incentives Program Implementation in the Rolling Plains of Texas



The Rolling Plains of northwest Texas is one of the last bastions for viable northern bobwhite (*Colinus virginianus*) populations, but even here populations are declining about 3.5 percent annually. The decline of bobwhites in its traditional strongholds (i.e., Southeastern United States) has heightened landowner awareness of the plight of quail in Texas. As ranchers and absentee landowners see the value of quail increase, their interest in participating in habitat restoration for quail has concomitantly increased. Farm Bill programs such as the Environmental Quality Incentives Program (EQIP) have been very popular in Texas, and, purportedly, can be used to improve bobwhite habitat. Researchers evaluated bobwhite response to EQIP-sponsored brush management at intervals 2 to 4 years post-implementation during 2005 to 2007. They used paired control-treatment plots in three counties to assess impacts of mesquite and prickly pear cacti control on bobwhite abundance, and used spring call counts to estimate breeding capital and simulated nests to evaluate impacts on nesting habitat. An array of vegetation measures (e.g., nest site availability, forb species richness) were monitored to assess floristic impacts of brush management as it relates to quail habitat. Results showed that mid-term impacts (3–5 years post-implementation) of brush management tended to increase call-counts. For sites where more than 12 paired plots were monitored, brush management increased call counts by an average of 29 percent over control sites. Although treatments positively affected breeding capital, whether such an increase in breeding capital parlays into greater quail densities during the fall hunting season needs verification. Bobwhite abundance tended to become progressively greater on treated areas over the 3 years of the study. Brush control has been a common practice in the Rolling Plains, frequently targeting control of mesquite, juniper, and prickly pear. Although large-scale brush control is detrimental to quail, more judicious approaches can benefit quail. Moreover, the benefits of strategic brush management extend beyond the short term. However, brush management appeared neutral for enhancing nesting habitat. Incentives for grazing deferment (as is currently permitted in the Rolling Plains Quail EQIP program) are more likely to benefit nesting habitat than brush management alone.

TECHNICAL NOTE

# Assessing Bobwhite Response to the Environmental Quality Incentives Program Implementation in the Rolling Plains of Texas



The Rolling Plains of northwest Texas are one of the last bastions for viable northern bobwhite (*Colinus virginianus*) populations (fig. 1). The decline of bobwhites in its traditional strongholds (i.e., Southeastern United States) has heightened landowner awareness of the plight of quail in Texas. As ranchers and absentee landowners see the economic value of quail increase, their interest in participating in habitat restoration has concomitantly increased. For example, 19 percent of Texas Quail Unlimited members purchased property specifically for quail hunting during the decade of the 1990s (Rollins 2002). Landowners have also become more conscious of how rangeland management may impact quail populations (Rollins and Cearley 2004) (fig. 2).

Conservation programs administrated by the U.S. Department of Agriculture (USDA) under the Farm Bill have tremendous potential to impact wildlife habitat and populations on private land. In 1996, two new programs were added to the Farm Bill: the Wildlife Habitat Incentives Program (WHIP) and Environmental Quality Incentive Program (EQIP). EQIP is the primary cost-share program for assisting farmers and ranchers to address natural resource issues (Berkland and Rewa 2005) by paying up to 75 percent of cost of implementing a conservation practice for up to 3 years. Although EQIP does not mandate that enrolled landowners establish wildlife as a priority, many of the conservation practices funded by EQIP can benefit wildlife (Berkland and Rewa 2005).

Farm Bill programs like EQIP have been very popular in Texas, and purportedly can be used to improve bobwhite habitat. The Rolling Plains of Texas is one of three EQIP emphasis areas focused on bobwhite habitat concerns. Bobwhites are a priority species

*Figure 1. Bobwhites represent an important economic resource over much of Texas (Photo credit Dale Rollins).*

*Figure 2. Landowner planning a brush control treatment on a pasture in the Rolling Plains of Texas (Photo credit Dale Rollins).*

for EQIP in 58 counties of the Rolling Plains. Texas received $78.6 million and $90 million in EQIP funds in 2004 and 2005, respectively. The most frequently adopted EQIP-funded conservation practice in fiscal year 2003 was brush management (CPS Code 314), which accounted for 26 percent of the $46.5 million of EQIP dollars expended.

Brush (e.g., honey mesquite [*Prosopis glandulosa*] and pricklypear [*Opuntia* spp.]) are key components of bobwhite habitat in this region (Slater et al. 2001; Hernandez et al. 2003a, b). Although references in the literature concerning the response of wildlife to EQIP are limited (Esser et al. 2000), brush management in Texas is believed to be (or at least can be) beneficial to bobwhite habitat (Rollins and Cearley 2004). Researchers tested the hypothesis that brush management, if done in moderation, enhances bobwhite habitat and promotes greater bobwhite abundance in the Rolling Plains. They evaluated bobwhite population and habitat responses to EQIP-sponsored brush management (CPS Code 314) at intervals 2 to 4 years post implementation.

Study sites were located in three counties along a latitudinal gradient in the Rolling Plains ecoregion (Coleman, Cottle, and Shackelford Counties) (fig. 3). (Note: some study sites (n = 4) were located in Foard County, which lies adjacent to Cottle County, but in this report, they are referred to as Cottle County). The Rolling Plains ecoregion of Texas encompasses approximately 24 million acres and has an annual rainfall that ranges from 20 to 32 inches. Mesquite was the dominant woody vegetation across all sites. Pinochot's juniper (*Juniperus pinchotii*) was common on the Cottle County site. Pricklypear was common, especially on the sites in Coleman and Shackelford Counties.

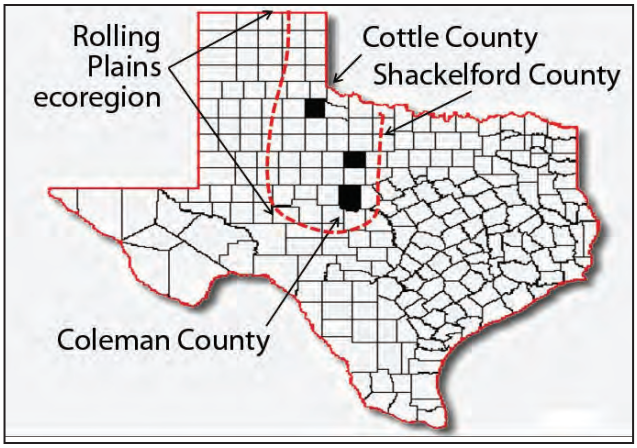


*Figure 3. Location of study sites in the Rolling Plains ecoregion of Texas.*

Study sites were selected based on four criteria:

- Brush control practices were conducted from 1999 to 2003.
- Sites were either enrolled in EQIP, or were utilizing EQIP- approved brush management practices.
- Control sites, where no brush management had been conducted during the past decade, were present in the immediate vicinity (≥1.0 miles).
- Grazing practices were similar between treated and untreated sites.

Brush management practices typically consisted of (a) aerially applied herbicide (a 1:1 mixture of triclopyr and clopyralid [McGinty et al. 2000]) for mesquite, (b) mechanical control (grubbing) for mesquite, and (c) aerially applied herbicide (0.5 lb/acre picloram) for pricklypear. Stocking rates (cow-calf enterprises) were considered moderate for Coleman and Shackelford Counties, and heavy on Cottle County sites.

### Sampling Protocol

A transect line (1,320 yd long) was established to bisect the center point of each site (treatment and control), and served as the central reference point for establishment of sample protocols. At each treatment and control site spring call counts, nest habitat evaluation (i.e., potential nest sites/acre, vegetation height), and predator activity (i.e., simulated

nest success) were conducted in a 200-acre buffer around the established center point. GIS and GPS technology were used to create polygons overlaid on digital aerial photography to create a map of the treated area.

Researchers used spring call counts at the center point of each paired study site (i.e., a unique treatment and control) to assess relative abundance of bobwhites (fig. 4). Call counts began at official sunrise and were repeated three times at each site from mid-May to mid-June. Simulated nests situated along transects were used to assess relative nest predation (Slater et al. 2001). Simulated nest transects consisted of 4, 220-yard transect lines every 330 yards along the main transect line. Four artificial nests, consisting of three chicken eggs, were placed at 55-yard intervals down this lateral line. Nests were situated in suitable nesting clumps of grass or pricklypear and checked at 14 and 28 days.

*Vegetation dynamics*

Researchers estimated the density of potential nesting sites using a belt transect (2 yards in width) overlaid on simulated nest transects (Slater et al. 2001). A Robel pole was used to estimate vegetation height (i.e., screening cover) (Robel et al. 1970) (fig. 5). Forb species richness was recorded at each visual obstruction sample point by recording the number of different forbs within a 1.2-square-yard quadrat. Each paired site (treatment and control) had a total of 60 samples taken for Robel and species richness estimates with four subsamples at each sample point (four cardinal directions with Robel pole, and four quadrats). Samples were taken on alternating sides of the transect, and a random number chart was used to determine the distance off of the transect line for the sample.

**Results**

*Brush management treatments*

Study sites were less homogeneous than desired. Coleman County sites were aimed primarily at pricklypear control (18 of 24 treatment sites), whereas mesquite was the primary target species (24 of 24 sites in Cottle and 21 of 27 sites in Shackelford Counties). Mechanical control (grubbing) was the most common treatment in Cottle County (21 of 24 treated sites), whereas chemical control was the most common treatment in Shackelford County (15 of 27 treated sites). Additionally, there was a mix of block treatments and more sculpted patterns (fig. 6) especially when mechanical clearing was employed.

*Figure 4. Spring call counts were used to assess bobwhite abundance on treated and untreated areas.*

*Figure 5. Vegetation height (i.e., screening cover) was assessed by taking measurements with a Robel pole.*

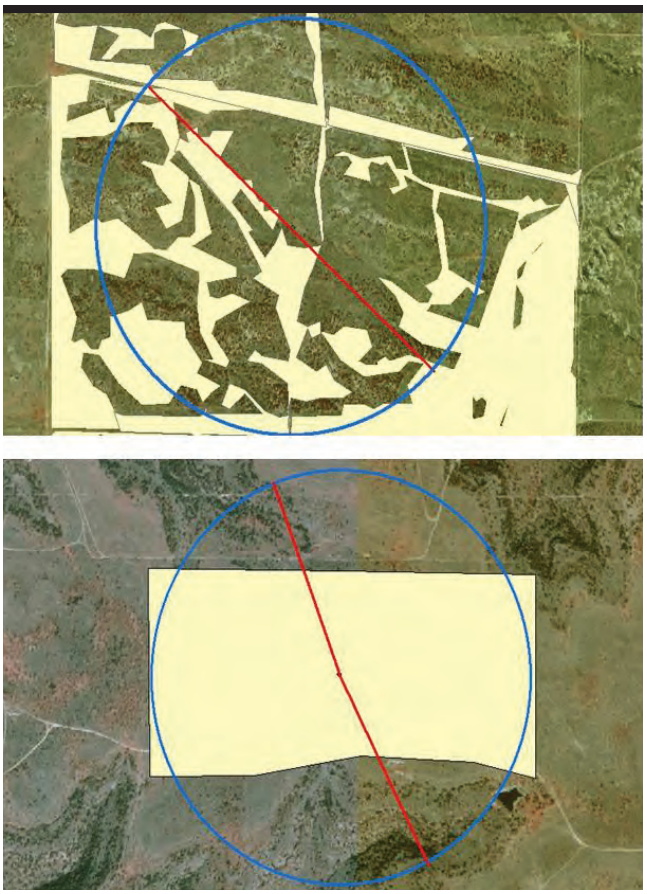

*Figure 6. These two treatment sites in Cottle County indicate the difference in a block pattern (bottom) photo and a more sculpted design (top photo). The circle represents a 200-acre buffer around a central point used for call counts.*

*Population estimates*

Researchers did not detect any consistent patterns relative to bobwhite abundance across treatments, years, or sites (table 1). Relative abundance of bobwhite varied across years and sites. Therefore, data were analyzed from each year-county independently. Consequently, some comparisons are based on small sample sizes (≤6 sites/county/yr) and should be cautiously interpreted. Effects of brush management treatments on spring call counts were analyzed within each county to account for site effects. Because of low sample sizes in some treatment classes, researchers only compared sites if n was greater than 6.

*2005*

Coleman County had higher calling rate than any other county in 2005 (7.4 birds calling/stop vs. 3.8 in Cottle and 3.2 in Shackelford (fig. 7)). Call counts on mesquite-chemical sites in Shackelford County were higher than control sites. In 2005, there were no differences in call counts between control and treatment sites in Coleman or Cottle Counties.



*Table 1. Mean number of calling bobwhite point ( $\bar{x}$ ) and standard error (SE) for spring call counts in three counties in the Rolling Plains of TX, 2005–2007.*

| | Parameter | 2005 | | 2006 | | 2007 | |
|---|---|---|---|---|---|---|---|
| | | $\bar{x}$ | SE | $\bar{x}$ | SE | $\bar{x}$ | SE |
| **Overall** | | 4.77 | 0.21 | 3.65 | 0.13 | 4.13 | 0.23 |
| **Coleman County** | Control | 7.58 | 0.39 | 3.75 | 0.19 | 4.33 | 0.78 |
| | Mesquite/Mechanical | 3.67 | 0.88 | 3.67 | 0.88 | 2.33 | 1.20 |
| | Mesquite/Chemical | 7.33 | 0.33 | NA[1] | NA | NA | NA |
| | Pricklypear | 7.89 | 0.51 | 4.00 | 0.33 | 6.60 | 0.78 |
| | Overall | 7.44 | 0.31 | 4.04 | 0.20 | 4.90 | 0.53 |
| **Cottle County** | Control | 3.71 | 0.32 | 3.50 | 0.33 | 3.83 | 0.45 |
| | Mesquite/Mechanical | 4.05 | 0.31 | 4.52 | 0.37 | 4.52 | 0.45 |
| | Mesquite/Chemical | 3.67 | 0.33 | 3.67 | 0.88 | 2.67 | 1.33 |
| | Overall | 3.85 | 0.21 | 3.96 | 0.24 | 4.06 | 0.31 |
| **Shackelford County** | Control | 2.74 | 0.29 | 2.37 | 0.29 | 2.70 | 0.33 |
| | Mesquite/Mechanical | 3.83 | 0.70 | 3.33 | 0.72 | 4.00 | 1.09 |
| | Mesquite/Chemical | 3.87 | 0.26 | 3.53 | 0.34 | 4.40 | 0.78 |
| | Pricklypear | 3.17 | 0.65 | 4.50 | 0.72 | 5.17 | 1.08 |
| | Overall | 3.22 | 0.20 | 3.04 | 0.22 | 3.60 | 0.34 |

Note: These sites were unavailable after the 2005 season.

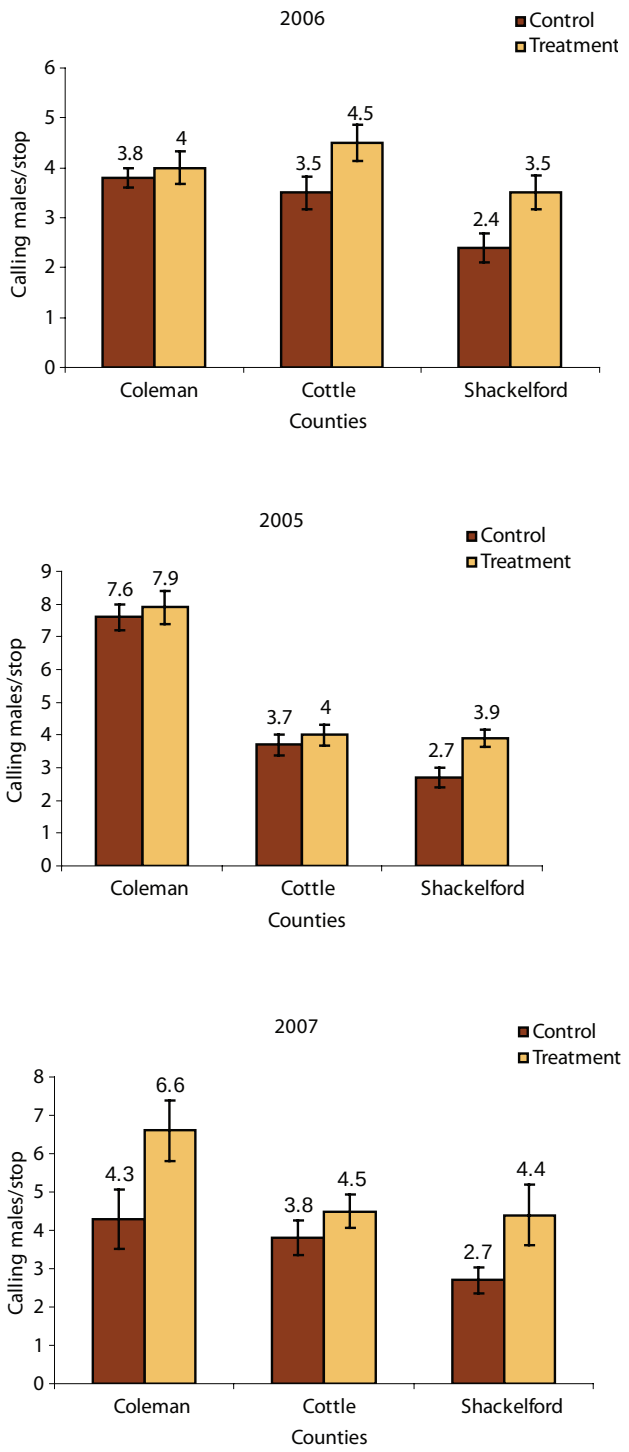


*Figure 7. Bobwhite abundance (number of calling males +/- SE) relative to brush management treatments (Coleman—pricklypear; Cottle—mesquite/mechanical; Shackelford—mesquite/chemical) in three counties in the Rolling Plains of Texas, 2005–2007.*

*2006*

As in 2005, differences existed among counties. Shackelford County had a lower number of calling birds than Coleman and Cottle Counties. There were no differences in call counts between Coleman and Cottle Counties, data was pooled on treatment type from these two counties. For Coleman and Cottle Counties, both mesquite treatments had higher call counts than control sites. Treatment type also had a significant effect on call counts in Shackelford County.

*2007*

Call counts in 2007 differed between Coleman and Shackelford Counties. Counts were similar between Coleman and Cottle Counties, and Cottle and Shackelford Counties. Sites treated for pricklypear in Coleman County had higher call counts than control sites. In Shackelford County, mesquite-chemical and pricklypear treated sites had higher call counts than control and mesquite mechanical sites. There were no differences in call counts between treatment types in Cottle County.

*Selected treatment comparisons*

Because some sites had limited sample sizes (n<6) for some treatments, researchers examined those treatment comparisons where sample sizes were more meaningful (i.e., n>12) (fig. 8). Pricklypear treatments in Coleman County over all years increased call counts by 17.8 percent. Grubbing mesquites in Cottle County increased call counts by an average of 18.2 percent. The largest increase was observed from herbicidal treatments of mesquite in Shackelford County, where sprayed sites had 51.3 percent more bobwhites calling than control sites. Across all counties and years, treated sites averaged 29.0 percent more calling males.

*Simulated nest survival*

There were no differences in simulated nest survival at 14 or 28 days, across years (table 2). Nest survival at 14 days was higher in Coleman County compared to Cottle and Shackelford Counties. However, by 28 days, there were no differences among counties in nest success.

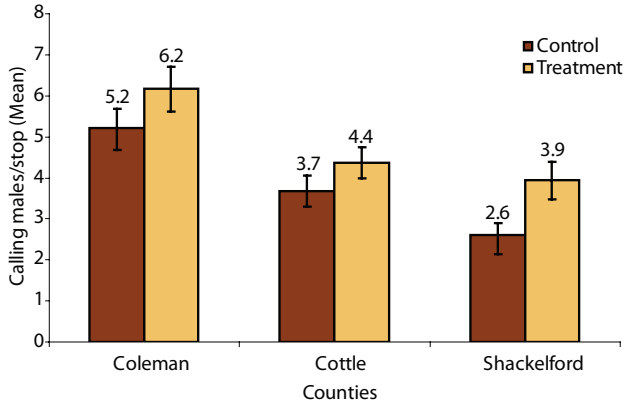


*Figure 8. Bobwhite abundance (+/- SE) for selected treatment comparisons averaged over 3 years, 2005 to 2007. Treatments were (a) pricklypear spraying in Coleman County; (b) mechanical mesquite control in Cottle County; and (c) herbicidal control of mesquite in Shackelford County.*



*Table 2. Mean simulated nest survival and standard error at 14 and 28 days in three counties in the Rolling Plains of TX, 2005–2006.*

| | | 2005 | | 2006 | |
|---|---|---|---|---|---|
| | **Parameter** | $\bar{x}$ | **SE** | $\bar{x}$ | **SE** |
| **Overall** | 14 days | 0.53 | 0.04 | 0.55 | 0.04 |
| | 28 days | 0.40 | 0.02 | 0.38 | 0.03 |
| **By county** | | | | | |
| 14 days | Coleman | 0.63 | 0.04 | 0.66 | 0.06 |
| | Cottle | 0.51 | 0.07 | 0.41 | 0.08 |
| | Shackelford | 0.45 | 0.04 | 0.57 | 0.06 |
| 28 days | Coleman | 0.38 | 0.03 | 0.41 | 0.03 |
| | Cottle | 0.33 | 0.06 | 0.28 | 0.05 |
| | Shackelford | 0.36 | 0.03 | 0.43 | 0.06 |
| **By treatment type** | | | | | |
| 14 days | Control | 0.53 | 0.05 | 0.56 | 0.06 |
| | Mesquite/Mechanical | 0.51 | 0.09 | 0.49 | 0.09 |
| | Mesquite/Chemical | 0.46 | 0.06 | 0.54 | 0.13 |
| | Pricklypear | 0.60 | 0.06 | 0.60 | 0.10 |
| 28 days | Control | 0.35 | 0.04 | 0.38 | 0.04 |
| | Mesquite/mechanical | 0.39 | 0.07 | 0.33 | 0.07 |
| | Mesquite/Chemical | 0.34 | 0.06 | 0.38 | 0.09 |
| | Pricklypear | 0.35 | 0.04 | 0.42 | 0.07 |

*Nest site availability*

Nest site availability (i.e., potential nest sites/acre) differed between 2005 and 2006 and among counties in 2005 and 2006 (fig. 9). Nest site availability was about 40 percent less in 2006 than in 2005, with the most dramatic decrease observed in Coleman County. Cottle County sites had fewer potential nest sites compared to Coleman and Shackelford Counties in 2005. Shackelford County had more suitable nest sites compared to Coleman and Cottle Counties in 2006. Treatment types were pooled within counties to account for small samples sizes. In 2005, brush management had no effect on nest site availability. However, in Cottle County, treatment sites had almost twice as many suitable nest sites as control sites. In 2006, treatments had no effect on nest site availability in any county. No relationships between simulated nest survival at 14 and 28 days and nest site availability were detected.

*Vegetation dynamics*

Height of herbaceous vegetation (e.g., grass and forbs) was higher in 2005 than in 2006 across all sites (12.9 ± 2.2 in vs. 8.15 ± 1.69 in) (fig. 10). Treatment sites had taller herbaceous vegetation in Coleman and Shackelford Counties; whereas, control sites in Cottle County had taller vegetation. In 2005, all treatment sites had taller herbaceous vegetation than control sites. Forb species richness in 2005 was greater than in 2006 across all counties and sites (2.5 ± 0.6 species and 1.2 ± 0.2 species, respectively) (fig. 11). Cottle County (treatment and control sites) exhibited greater forb species richness than Coleman and Shackelford Counties in 2005. Control sites in Coleman County had a higher index of forb species richness over treatment sites, primarily Cuman ragweed (*Ambrosia psilostachya*, and croton (*Croton* spp.). No other differences between treatment and control sites were observed. Cottle County exhibited

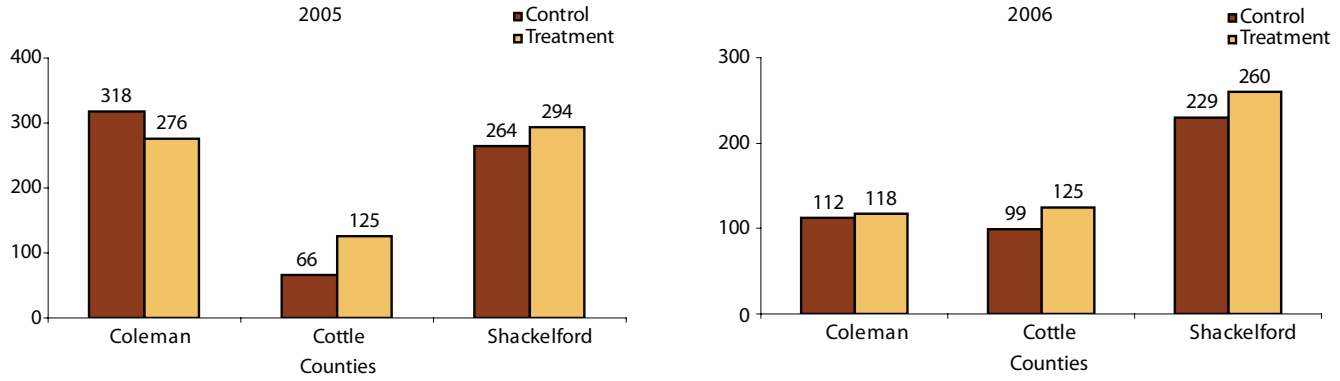


*Figure 9. Available nest sites per acre at three sites located in the Rolling Plains of TX, 2005–2006.*

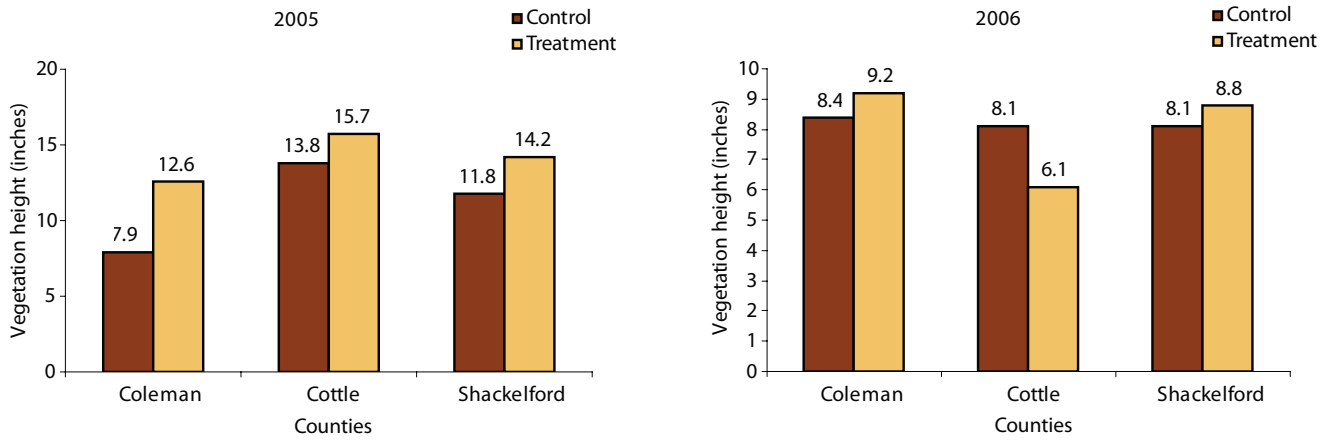


*Figure 10. Average vegetation height (in) for study sites located in the Rolling Plains of TX, 2005–2006.*

lower forb species richness for both treatment and control sites (0.77 ± 0.08 and 0.74 ± 0.05 respectively) in 2006.

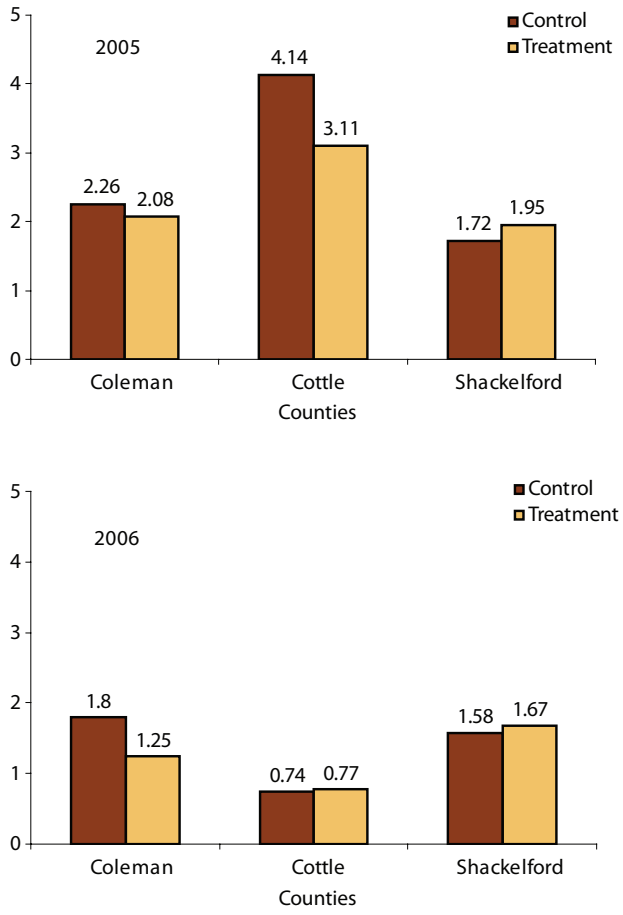


*Figure 11. Average forb species richness for brush-managed versus control sites at three sites in the Rolling Plains of TX, 2005–2006.*

**Summary**

Brush management had positive impacts on bobwhite abundance at the three sites (counties) monitored from 2005 to 2007. For sites where more than 12 paired plots were monitored, brush management increased call counts by an average of 29 percent over control sites. Although treatments positively affected calling males, whether such an increase in breeding capital parlays into greater quail densities during the fall hunting season needs verification. Spring cock-call counts are an inexpensive way to index quail populations (roosters/mile) over an extensive area, but results vary on whether spring cock-call counts are effective predictors of hunting-season quail abundance. Future studies should consider distance sampling techniques from helicopters to compute density estimates and provide georeferenced locations for coveys relative to proximity of brush treatment interfaces.

Precipitation often drives bobwhite abundance in semiarid regions like West Texas, thus the results are confounded by annual variation in precipitation. Precipitation was above average in 2004 and 2007, average in 2005 and below average (especially for latter half) of 2006 (fig. 12).

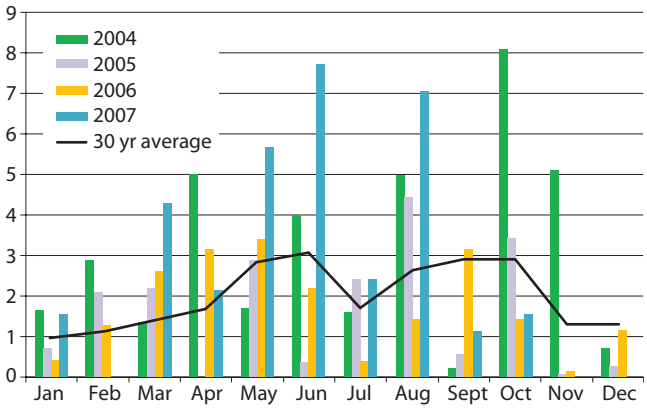


*Figure 12. Monthly precipitation (in) received at Abilene, TX, 2004–2007.*

Bobwhite abundance increased on treated areas as the study progressed. Above average rainfall in 2004 promoted the greatest bobwhite abundance across the Rolling Plains since 1993 (Texas Parks and Wildlife 2007 (fig. 13)). Spring call counts across a number of counties in the Rolling Plains (n = 13 for 2005, n = 9 for 2006),) averaged 5.6 and 3.5 males calling/stop, respectively (K. Reyna, Texas A&M University, unpublished data). These numbers suggested similar bobwhite abundance occurred across the ecoregion during the study period. The inertia of such a high population likely carried forward into the first treatment year (2005) and may have masked any potentially positive population accruals due to brush management.

Precipitation also impacts quail habitat, especially nesting habitat (i.e., bunchgrass density) and forb diversity. Suitable nesting sites (specifically bunchgrasses) declined 40 percent during 2006 due to lower precipitation. It is also possible that cattle grazed treated areas preferentially, especially if prescribed burning was a component of the particular treatment (Fuhlendorf and Engle 2001).

Conservative stocking rates, like those observed in Shackelford County in 2006, afford better nesting cover for bobwhites during dry years. Lusk et al. (2007) concluded that habitat manipulations aimed at improving habitat conditions during dry periods, such as reducing livestock stocking rates, could provide ground cover similar to that available in wet periods. The data suggest brush management may provide similar benefits.

Populations of gamebirds can attain their density potential when individuals can use any part of a pasture at any time. This philosophy has been called maximization of space time (Guthery 1997); the "usable-space" philosophy serves as the basis for brush management recommendations. Brush control can be positive, negative, or neutral for wildlife habitat, depending on several factors. Bobwhites need areas where more than two vegetation types are interspersed in order to forage while remaining close to cover. While prescriptions for bobwhite habitat are subject to "slack," Guthery and Rollins (1997) recommended the following guidelines when sculpting brush to enhance bobwhite habitat.

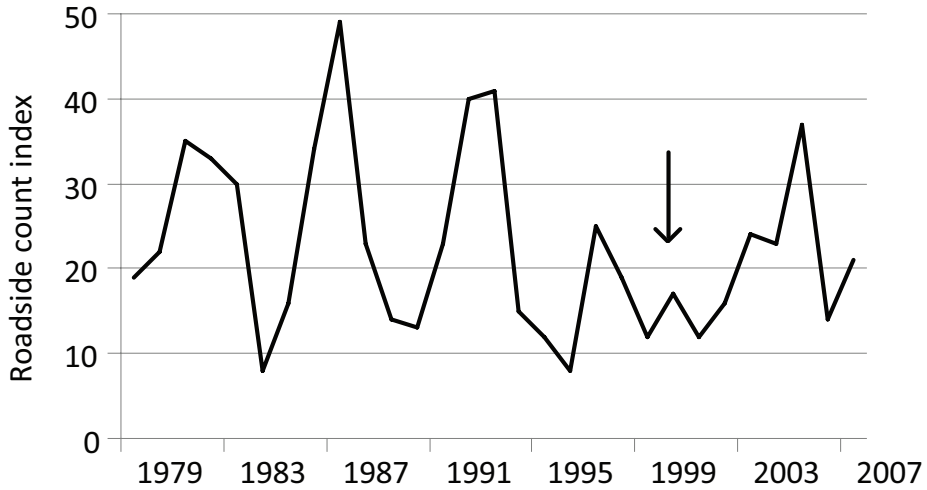


*Figure 13. Bobwhite abundance as indicated by summer roadside counts, 1979–2007 (TPWD 2007). Dashed line represents long-term mean for this ecoregion.*

- Sites that are cleared should be no more than about 80 yards wide; this keeps all points within 40 yards of woody escape cover.
- No more than 80 percent of the pasture should be treated.
- Areas of woody cover to be spared from clearing should be more than 10 square yards in size.
- Preserve mottes, not just single trees; any mesquite with other shrubs growing under it should be retained.
- Retain patches of taller-growing brush as they are more effective as summer coverts.
- Brush retained as loafing coverts should be no greater distance apart than the sustained flight capability of bobwhite (~1/4 mi).

Post-treatment grazing management is another important management consideration. Quail inhabiting areas with more brush cleared, or less productive sites, are more sensitive to grazing management. Bunchgrass densities of about 300 clumps/acre are recommended for bobwhite nesting habitat in the Rolling Plains (Slater et al. 2001). Bunchgrass densities approached this threshold in Coleman and Shackelford counties in 2005 and in Shackelford County only in 2006. Pricklypear should be maintained in areas when bunchgrasses are limited (Slater et al. 2001).

Brush control has been a common practice in the Rolling Plains, with mesquite, juniper, and pricklypear being the species most commonly targeted for control. Although large-scale brush control is detrimental to quail, the data suggest that more judicious approaches can benefit quail. Dense stands of mesquite are not attractive to quail or hunters. Brush sculpting can also be used to enhance huntability (i.e., increasing accessibility or harvest efficiency). Rollins (2007) recommended that reducing brush canopies to perhaps 15 to 20 percent (on grazed rangelands) and 5 to 10 percent (on ungrazed rangelands) will maintain (or improve) habitat while enhancing hunter access. Clearing may be accomplished in strips or in a motte pattern (which may be aesthetically more pleasing). However, mottes are typically more expensive to implement; additional research is warranted to see if such patterns actually increase bobwhite abundance.

Broadcast herbicide applications are generally less desirable than mechanical brush control methods because they are less selective. Findings suggest that herbicides can be used as an effective tool; herbicidal control of mesquites enhanced call-counts in Shackelford County.

Pricklypear infestations present a dilemma for quail managers in the Rolling Plains (Slater et al. 2001). Although pricklypear serves as a key nesting habitat (Hernández et al. 2003a; Slater et al. 2001), dense stands limit access to forage by livestock and huntability by bird dogs. Hernandez et al. (2003b) found that nesting success and breeding-season survival were similar on sites treated 2 to 4 years earlier with picloram. Researchers found that call counts on sites treated with picloram in Coleman County averaged 18 percent higher than untreated sites.

Care should be taken when the spray mixture includes herbicides such as picloram that result in more broad-spectrum control of woody plants. Including picloram in a mesquite-spray mixture will kill desirable shrubs like netleaf hackberry (*Celtis laevigata* var. *reticulata*) and can decrease key food plants for bobwhites (Hernández et al. 2003c).

Researchers observed greater forb species richness in Cottle County, where grubbing was the treatment of choice, in 2005 (a wet yr), but results were more similar to the herbicide-treated sites in Coleman and Shackelford Counties during a drier year (2006). However, these differences could have been related to edaphic or other factors.

Researchers intentionally selected study sites that had been treated 2 to 4 years prior to the monitoring efforts. It is logical that the forb bloom following brush control (specifically via mechanical methods) could benefit bobwhites in the short term. The data suggest that benefits of strategic brush management extend beyond the short term. Longer term monitoring would be desirable to establish a treatment-response curve for bobwhites for various site-treatment combinations.

Landscape effects of brush management on bobwhite abundance in an area may require some threshold treatment patch (i.e., scale of treatment) to produce a meaningful increase in usable space for bobwhites. Roseberry and David (1994) observed that Conservation Reserve Program fields had little effect on bobwhite populations if the total land area in CRP was less than 6 percent. Hiller et al. (2007) described optimal bobwhite cover in the northern Rolling Plains (Roberts County, Texas) as an area with 30 to 60 percent mixed-shrub cover, with the balance in grass upland and sand sagebrush (or a similar structural homologue), and with cover dispersed such that no point was less than 33 yards from mixed-shrub cover. Suitable prescriptions are needed for the more common mesquite-grassland habitat type that dominates the Rolling Plains.

**Management Implications**

The data suggest that EQIP CPS Code 314 (Brush Management) can effectively enhance breeding capital (i.e., calling males) of bobwhites on Texas rangelands. Mesquite control via grubbing and herbicides at the scale practiced by landowners in this study appeared to be sufficient to elicit a population response, at least for breeding males. Brush management appeared neutral for enhancing nesting habitat; therefore, incentives for grazing deferment (as is currently permitted in the Rolling Plains Quail EQIP program) are more likely to benefit nesting habitat. Providing an incentive to encourage landowners to document quail response to brush management practices, as is currently implemented for CP-33 (Habitat Buffers for Upland Birds), would expand the knowledge base for different treatment types and in different ecoregions.

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**Texas Cooperative Extension—Texas A&M University**
**Red River Quail Symposium**
**October 13, 2006**

Dr. Dale Rollins (Professor and Wildlife Extension Specialist at the Texas Cooperative Extension Service) and Ben Taylor (graduate research assistant at Texas A&M University) hosted a USDA NRCS Bobwhite Restoration Project Field Day in conjunction with the Red River Quail Symposium (RRQS) on October 13, 2006, in Wichita Falls, Texas. The RRQS featured topics on historical vegetation changes in Texas, role of brush and grazing management to enhance bobwhite habitat, economic impacts of quail hunting, State and Federal financial incentives for accomplishing habitat management, and how to get started in quail management. The RRQS included field tours of two local ranches managed for quail where attendees learned how to identify plants important to bobwhites, use EQIP brush control practices to enhance bobwhite populations, and treat individual plants chemically and mechanically to create desired bobwhite habitat structures. Additional sessions focused on the interactions of quail, quail hunters, and bird dogs while in the field and an open discussion on improving lessee and rancher relations. About 140 people attended the event from seven States (figs. 1 and 2). Exhibitors included Bamert Seed Co., U.S. Bureau of Land Management, German Roasted Nuts, USDA NRCS, Quail Forever, Quail Unlimited, Rolling Red Prairie Kennels, Texas Cooperative Extension—Team Quail, Texas Brigades, The Noble Foundation, Texas Wildlife Association, and USDA NRCS.

*Figure 1. Dr. Dale Rollins (Texas Cooperative Extension) provided introductory remarks and an overview of the Field Day sessions. Approximately 140 resource professionals and private landowners attended the Field Day and Red River Quail Symposium.*

*Figure 2. To illustrate the importance of the interspersion of bobwhite cover relative to food sources, participants engage in the popular and educational Run for Your Life exercise of the Bobwhite Brigade. Participants were required to "forage" in ever decreasing amounts of escape cover while both avian and mammalian "predators" loomed nearby.*