



# QUAIL-NEWS

THE QUAIL-TECH ALLIANCE NEWSLETTER  
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Quail-News: Issue 10.0

## What's Been Going On?

By Dr. Brad Dabbert

As usual, spring and summer have been extremely busy; still finding us wearing both our research and construction hats. We completed 506 whistle count points during the months of May and June and were pleased to see an upward trend. We detected an average of 2.1 northern bobwhite males per point during spring 2013. Although this number is less than our 2010 estimate of 2.7 northern bobwhite males per point, it is a movement into the right direction from the 1.7 males per point average in 2011 and the 1.6 males per point average in 2012. Given the extreme drought that inhibited reproduction over most of the Rolling Plains during 2011 and the mortality that has occurred over winter (2011/2012), I am encouraged to hear birds in reproductive condition during the 2013 nesting season. Many hens we are monitoring using radiotelemetry have already hatched their first nest. And, we are hearing reports of broods seen in many areas of the Rolling Plains. While it is encouraging to see an increase, and we are again recording in excess of 10 males per point at a few points, there are still a lot of points where we are detecting no birds. The June rains have been good, but we need the moisture to continue for real recovery to occur.



A covey crosses the road on the 6666 Ranch

The Quail-Tech Alliance has reached some new milestones this spring and summer seeing our first Master's degree students graduate. Alicia Andes, Byron Buckley, Chadd Malone, Paul Woods, and Sean Yancey are the first Quail-Tech Alliance graduates. They have all done a terrific job and we are grateful for their hard work. Educating new biologists for the future is one of the missions of the Quail-Tech Alliance and we are extremely proud of this accomplishment. This graduation means a changing

of the guard and that we are reloading with some new students and new projects. Drew Arnold is a new Master's student who has started studying the effects of the environment on quail immune system function. Byron Buckley is staying with us to start a Ph.D. Byron and fellow Ph.D. student Peter Schlichting have started to examine genetic diversity of quail populations across the Rolling Plains. Sean Yancey is also staying with us to start a Ph.D. and has initiated a project to develop methods of translocating wild bobwhites and scaled quail from South Texas to the Rolling Plains. Thomas Warren is in the final stage of completing the M.S. Degree and is still writing his Master's thesis this summer, but has started data collection for his future Ph.D. project evaluating differences in survival, movement, and reproductive success of bobwhites and scaled quail in the Texas Panhandle. This newsletter contains articles describing all of these various new projects and why we have started them.

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We will also be reinitiating the supplemental feed study on the historic 6666 Ranch during September 2013. Having seen great success for increasing survival and reproductive success of supplementally fed birds (see previous newsletters for the spreading technique, we are going to continue the study. This new study will compare our previous feeding rate with a reduced feeding rate in an attempt to determine if we can reap the survival and reproductive benefits at a reduced feed cost. Additionally, we will be monitoring the broader ecological system of predators and prey to better understand the relative increased nutritional benefits and reduced predation risks provided by in-habitat supplemental feeding. We will have one to two new Master's students starting this fall to work on this project.

You will recall from previous newsletters our efforts to produce wild-strain, parent-reared chicks. We are collaborating with the Tall Timbers Research Station in Tallahassee, FL (who developed this rearing method; see newsletter issues 6.0 and 7.0) to develop our parent-reared chick program. See newsletter issues 5.0 and 6.0 for an explanation of the differences between parent-reared chicks and conventional pen-reared chicks. After our pilot release effort of 2012, Mark Thomas is directing this work as part of his Master's degree. The goal of this program is to place birds on the ground on our anchor ranches where habitat has been modified to be suitable for quail, but where drought or isolation have prevented timely colonization by wild populations. We are increasing our efforts during 2013, building more chick pens, and looking to greatly increase the number of wild-strain, parent-reared chicks that we release into the wild. The first chicks will be released during late July 2013. Look for reports on this project in future newsletters.



A demonstration plot at the Quail-Tech Research Facility with an excellent growth of Bamert Seed Company's Native Treats seed blend. Many thanks to Bamert for the seeds donated for our research projects.



Quail tracks found during call counts

Though we have seen improvement in this year's reproductive efforts, it is important to look at the reality of our situation. We are only 2 year's past what is probably the worst drought on record and the corresponding reproductive failure of 2011. Environmental conditions improved during winter and spring 2012 allowing an improved 2012 reproductive effort. So far, 2013 appears to be decent with reproductive effort underway and improving range conditions. It is important we keep a cautious management approach.

Finally, we could not do what we do without the generous support of our Anchor Ranches and donors. We wish to thank the 6666 Ranch, Bamert Seed Company, the Burnett Foundation, the Hill Country Chapter of the Quail Coalition, and Texas Parks and Wildlife who have all provided support for our work. We deeply appreciate your support.



# TRANSLOCATING QUAIL

## SURVIVAL, MOVEMENTS, HABITAT USE, AND REPRODUCTIVE SUCCESS OF NORTHERN BOBWHITE AND SCALED QUAIL TRANSLOCATED FROM THE SOUTH TEXAS PLAINS TO THE ROLLING PLAINS OF TEXAS

By Sean Yancey and Dr. Brad Dabbert

We are all too aware of the declining quail populations in the Rolling Plains. Severe drought has caused additional localized loss of populations in some areas. Over time, these areas can be recolonized, but translocation of wild birds trapped from donor sites can speed up this process. Translocation of wild quail from donor populations to newly managed lands has been a successful technique for revitalizing or establishing new quail populations in the Southeastern United States. This technique might also be successful in the Rolling Plains of Texas. However, properties in the Rolling Plains might not harbor sufficient numbers (especially during or after drought) of northern bobwhites to be a source population to attempt translocation, and scaled quail are not readily available. Populations in South Texas appear to be more stable because of more frequent precipitation and related plant growth. Properties where northern bobwhites and scaled quail are abundant in South Texas might be donors for properties trying to re-establish populations following drought or habitat improvement. However, it is unclear if quail locally adapted to South Texas conditions can survive and reproduce in the Rolling Plains. A successful protocol for translocating wild quail from South Texas to the Rolling Plains would certainly be greatly beneficial.



A northern bobwhite male receives an injection of vitamin E and selenium to help mitigate any complications from its long transport.

We started a pilot study to test initial responses of northern bobwhites and scaled quail in March 2013. A small sample of quail (27 bobwhites and 25 scaled quail) were captured in Jim Hogg and Webb counties in South Texas and transported 582 miles (to Collingsworth County) in chambers modified to minimize stress and isolate them from humans. Birds were also treated with an intramuscular injection of vitamin E and selenium to mitigate potential transport myopathy complications. The birds made the trip with no mortalities and were released in late March at 5 separate release points on the Mill Iron Ranch in Collingsworth County in the eastern panhandle of Texas. Birds were released in coveys of at least 8 birds. Fourteen bobwhite hens and 17 scaled quail hens were radiomarked so that we could monitor their movements and survival. Initial losses within the first 2 weeks after release were minimal. However, multiple severe winter weather events (in particular 0.6 inches of freezing rain) coupled with avian predation have since drastically reduced survival. All radiomarked scaled quail have either succumbed to weather and predation or could not be relocated. Currently, 2 radiomarked northern bobwhite



A scaled quail leaves a holding box after a 582 mile translocation ride.

hens (14% survival) are alive and exhibiting normal behavior. Due to movement to adjacent properties one individual cannot be closely monitored. However, the other individual was observed paired with a male upon observation during the last week of June. We plan future translocation efforts with greater numbers of birds during Fall 2013 and Spring 2014. These future translocation attempts will implement supplemental feeding (see previous newsletters) in an attempt to curb mortality rate. Supplemental feeding is a standard practice for translocation projects in the southeastern United States and we have found it effective with native populations of northern bobwhite in the Rolling Plains of Texas. This experimental approach will hopefully yield data that will allow development of an effective wild bird translocation protocol for the Rolling Plains of Texas.

# TEXAS ROLLING PLAINS QUAIL GENETIC DIVERSITY

By Byron Buckley, Peter Schlichting, and Dr. Brad Dabbert

In the spring of 2010 we began trapping quail on Quail-Tech Anchor Ranches in an effort to evaluate the health of the Rolling Plains quail population. To accomplish this effort we collected blood samples (See photo 1) from each quail trapped and released since the spring of 2010 to date. So far, we have analyzed some of these samples to screen for possible disease exposure. This work is currently ongoing. Our objective beyond learning about disease exposure, is to determine the genetic diversity of the quail in the Rolling Plains of Texas. Genetic diversity can be an important telling sign for survival and adaptability of a species. High genetic diversity in quail will reduce the chances of inbreeding and ensure reproductive vigor. As natural habitats undergo drastic changes and weather patterns fluctuate widely, the ability for a species to adapt is paramount. As habitats change and grow more fragmented across Texas, bobwhite populations have potentially become isolated from one another. This isolation could lead to a reduction in genetic diversity, which could compromise future generations of bobwhite and scaled quail.



Quail blood samples from wild birds ready for analysis.

Currently, we have approximately 650 blood samples from various Quail-Tech ranches combined of both bobwhite and scaled quail which we will be analyzing this summer. We hope to identify landscape variables that prevent or facilitate movement of quail across the landscape. This information can be used to inform managers about strategies for connecting quail populations. High levels of connectivity decrease the risk of inbreeding and other negative impacts of small population size. We also will be analyzing genetic diversity within each ranch. Low genetic diversity is a warning sign that more drastic management might be necessary, such as translocation of new birds into an area. Finally we will be looking for the presence of bottlenecks within the population as a result of the recent drought.



Scaled quail trapped on the source site in South Texas

We are using genetic analyses for several reasons. Genetic analyses can examine questions that cannot be answered by traditional methods. Genetic methods can examine long term movement and connectivity between populations that traditional radiotelemetry techniques cannot capture. Genetic diversity is another aspect that can only be gained via genetic analyses. It is nearly certain that bottlenecks have been caused because of the recent drought conditions, but we will also examine where these bottlenecks were largest and estimate their effect on the population as a whole. These analyses represent extra tools for managers to evaluate how quail have responded to management actions and may help to guide actions in the future.



# Comparison of Survival Rate, Movement, and Reproductive Success of Sympatric Northern Bobwhites and Scaled Quail

By Thomas Warren and Dr. Brad Dabbert

Examination of the Texas Parks and Wildlife Department Quail Roadside Counts reveals a steep decline since 2007 in the Rolling Plains of Texas. Biologists only detected 3.52 bobwhites per counting route in 2012. This number is a record drop (counts started in 1978) below the long-term mean of 21 birds per route. Scaled quail populations are in a similar state of decline. Texas Parks and Roadside counts of scaled quail in the Rolling Plains of Texas indicate a population that suffered a sharp decline in 1987 from which the population never recovered to previous levels. While counts were greater than 5 birds per route 8 of the 9 years between 1978 and 1987, the same routes revealed averages less than 1 bird per route 56% of the 25 years since 1987. Scaled quail numbers in the Rolling Plains have averaged 0.05 birds per route during the past two years. These data are regularly verified by many landowners in the Quail-Tech Anchor ranch system who talk about scaled quail populations that once inhabited their properties but are now gone. We sometimes detect a covey or two of these birds that remain as isolated remnants. This pattern suggests that bobwhites are somehow out competing scaled quail or that some environmental or habitat conditions may favor bobwhites. We are investigating this pattern by comparing survival rate, movement, and reproductive success of sympatric (occurring together) northern bobwhite and scaled quail hens on the XL and Kritser Ranches.



A scaled quail hen captured and released back onto the XL Ranch in the Texas Panhandle.

Trapping for this project commenced in mid-February 2013 and concluded in early April. The final count totaled an impressive 217 quail captured - 105 scaled quail and 112 bobwhites. Breaking the numbers down further, of the 105 scaled quail captured 75% were juveniles while 61% of the 112 bobwhites were juveniles. These percentages indicate successful reproduction during the 2012 season. These are surprising numbers considering the most recent U.S Drought Monitor map released by the USDA indicates the west-central Texas panhandle remains under the most extreme drought stage.



A scaled quail hen hides with her brood on the XL Ranch in the panhandle of Texas.

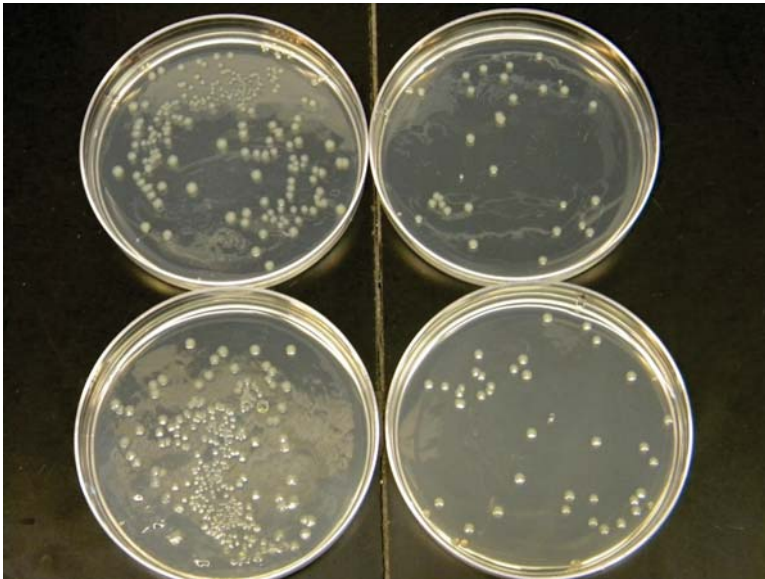
All hens of both species in good body condition were fitted with radio transmitters - 49 scaled quail and 62 bobwhite - to allow us to monitor their survival, movements and reproductive efforts. Despite drought damaged range conditions and freezing temperatures extending into early May, survival remains high for both species this spring. As of early July, 82% of bobwhite hens and 75% of scaled quail hens managed to survive to breeding season. There was a flurry of activity during the weeks of late spring and early summer as the birds broke from coveys and began forming pairs. Thus far 43 nests have been located - 25 scaled quail and 18 bobwhite - with 59% of scaled quail nests successfully hatching and 53% of bobwhite nests. To date two scaled quail and one bobwhite have initiated a second nest attempt, hopefully with more to follow! We are excited about comparing the demographics and habitat use of these two sympatric species over the next two years and hoping to learn what may be negatively influencing scaled quail populations.

# MEASURING IMMUNE FUNCTION IN QUAIL

By Dr. Brad Dabbert and Drew Arnold

A common statement I hear from landowners is that “We saw significant quail populations present in August and September, but few to no quail in November.” This apparent rapid reduction in bird numbers has led to a lot of discussion concerning the hypothesis that diseases can limit the growth of quail populations. There are currently several good investigations of disease exposure in quail; including our own screening for West Nile Virus that has been mentioned in previous newsletters. However, identification alone will not be sufficient to advance our knowledge of the disease hypothesis, or to most effectively develop strategies for dealing with potential problems. While it is possible to develop vaccines for individual disease pathogens (I did this for bobwhite against Avian Cholera, see Dabbert et al. 1996a), it is probably not feasible to deliver this to wild quail populations, much less predict which pathogens will be a problem during each year. Consider the admirable, but variably successful efforts of the Center for Disease Control and its annual flu vaccine for humans. Thus, the second prong of our effort will be to increase our understanding of the influence of environmental factors (e.g. weather, nutrition, etc.) and life history factors (e.g. molt, reproductive cycle) on the quail immune system. If disease processes play a role in limiting quail population growth, it is also likely that environmental factors reduce the ability of the quail immune system to function properly making them more susceptible to infection with disease agents that they encounter or carry.

In fact, the disease hypothesis has been a long-term interest of mine since I co-authored a review on the subject in 1993 (Lochmiller and Dabbert 1993). I have adapted a number of assays to measure the immune function of northern bobwhite chicks and adults (see the literature cited below), but will not bore you further with the details. New Quail-Tech Alliance Master's student Drew Arnold is busy optimizing some new assays which we will quickly start using to evaluate immune function of quail in both the laboratory and field. He has just finished optimizing an assay which measures the ability of quail blood samples to kill bacterial cultures (See Photo). This assay evaluates the innate immune system of bobwhite and scaled quail. Early analyses suggest this arm of the immune system is sensitive to daily changes in hormone concentrations as has been reported in a variety of vertebrates. We are excited about this line of study and the information it might provide us concerning how environmental factors alter quail immune function. Look to hear about more results in the future from this new effort.



These agar plates are the results of a bacterial killing assay that measures the innate immune function of quail. The two plates on the left are bacterial control cultures. Plates on the right are the same bacterial cultures mixed with serum samples from quail. The reduced number of colonies on plates on the right is the result of antimicrobial proteins present in quail blood that killed a portion of the bacteria.

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