Caesar Kleberg
WILDLIFE
Research Institute
Texas A&M University-Kingsville

Quail Associates Program

Ten Year Summary Of Accomplishments: 2001-2011

Leonard A. Brennan, Ph.D.

Professor and C. C. "Charlie" Winn Endowed Chair
Richard M. Kleberg, Jr. Center for Quail Research
Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville

About the Richard M. Kleberg, Jr. Center for Quail Research

The R.M. Kleberg, Jr. Center for Quail Research has two strategic, and focused, programs:

Quail Associates Program is a landscape look at quail management and productivity. This program is directed by Dr. Lenny Brennan.

The South Texas Quail Project is a long-term, site specific research program that has generated parallel findings on quail management and productivity. This program is led by Dr. Fidel Hernandez. Findings of the South Texas Quail Project will be presented in a seperate bulletin. Dr. Brennan and Dr. Hernandez work side-by-side in the design and implementation of projects and mentor the graduate students who are vital to the research mission in both areas.

Our Mission

The mission of the Richard M. Kleberg Jr. Center for Quail Research is to develop a scientific basis for the sustainable management and harvest of wild quail populations throughout south Texas and elsewhere.

Photo Credits

Cover. (l) Fidel Hernandez, (c) Timothy E. Fulbright, (r) Joseph P. Sands; Page 3. John Kelsey; Page 5. John B. Hardin; Page 6. (l) Timothy E. Fulbright, (r) Joseph P. Sands; Page 7. Fidel Hernandez; Page 8, (l) Fidel Hernandez, (r) Jason B. Hardin; Page 9. Fidel Henandez; Page 10. (l) Fidel Hernandez, (r) John B. Hardin; Page 12. Joseph P. Sands; Page 13. Joseph P. Sands; Page 14. (l) Jason P. Hardin, (r) Joseph P. Sands; Page 15. Timothy E. Fulbright

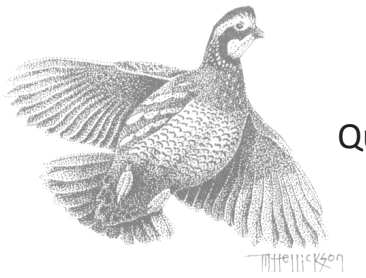
Letter from John Kelsey

John and Gaye Kelsey

For myself , the Advisory Board and the staff of the Caesar Kleberg Wildlife Research Institute, I am pleased to present the 10 - year annual report and summary of accomplishments of the *Quail Associates Program*. *Quail Associates* should be most proud because they have participated over these 10 years in what is one of the most comprehensive efforts at the landscape level to develop long term data to address the issue of survival of this precious bird. Our study area is blessed to be one of the few regions in the US in which such a study can be conducted.

During the last 10 years, we have collectively raised more than $685,000 to support quail research. In addition, many of our *Quail Associates* have given the time of their ranch staff in order to collect invaluable data directly from the field. We also want to thank the hunters for collecting birds and patiently participating in their weighing and documentation. *Quail Associates*, because of your valuable financial support, this long running program has been allowed to study the good, the bad and the ugly of quail populations. What this program has learned in the process could be the basis for new insights into preserving the future of our valuable quail.

I hope you will review the contents of this report and take pride in the volume and value of the research documented. *Quail Associates* is an organization open to hunters, landowners and leasees who treasure the chase of this world famous game bird. To join Quail Associates, contact Dr. Leonard Brennan at (361) 215, 2237 or leonard.brennan@tamuk.edu.



John W. Kelsey
Chairman,
Quail Associates Program

Quail Associates

Edward H. Austin, Jr.
Lee M. Bass
Albert M. Biedenharn, III
Lewis E. Brazelton, III
John Brent
Presnall Cage
Gus T. Canales
Lou A. Carter
John Charbonnet
Gus Comiskey
John Daugherty, Jr.
Bill Davis
Joe R. Davis
Bart Dupont
Cornelius Dupre
Bradbury Dyer, III
W. S. Farish
Jerry Finger
James Floyd
Michael Frazier
Bobby & Marcia French
Robin French, III
Robert Hewitt
Ned S. Holmes
Harvey Houck
George Johnson
Stewart Johnson
John W. Kelsey
Berdon Lawrence
Meredith Long
Robert McNair
Hilmar Moore
William Naylor
Walter Negley
William Osborn, III
Bobby Parker
Dexter Peacock
James Pettus
Ellen Randall
Bill Rauch
Randall Rollins
Clive Runnels
Ford Smith
Stuart Stedman
Mike Stude
Nick Swyka
Frances & Felix Tapp
Hollis Taylor
Cole Thomson
Ben Vaughan
William Vogt
Bryan Wagner
Jim Walton
Temple Webber, Jr.
Lacy Williams
Wallace Wilson

Ten Years of Accomplishments: 2001-2011

The Quail Associates Program at the Richard M. Kleberg, Jr. Center for Quail Research was designed and organized by John Kelsey and Fred Bryant in 2001. The Quail Associates Program was developed with two overall goals in mind: (1) create a network of "citizen scientists" who contribute data from hunter-harvested bobwhites for yearly landscape-scale assessments of quail productivity in South Texas and (2) raise funds to help support quail research. As you will see, the Quail Associates Program has succeeded at meeting both of these important goals during the past ten years.

We have organized a network of citizen scientists who help us assess annual quail productivity across the South Texas landscape. Additionally, Quail Associate Program members have contributed more than $685,000 to support our quail research activities since 2001.

Landscape Assessment of Quail Productivity in South Texas

The citizen scientists who have supported the Quail Associates Program by donating wing, weight and sex ratio of data from hunter-harvested birds have allowed us to do something that has never been done before: obtain a yearly, landscape-level snapshot assessment of bobwhite productivity for South Texas.

Over the past decade, three patterns of annual variation in bobwhite winter weights, sex ratios and age ratios have emerged. The variability in male:female ratios in the populations doesn't change from year to year; the proportion of male bobwhites during winter averages somewhere between 52% and 54% of the population, or about a 3.8% range of difference over the decade. This slight bias in favor of males is a reflection of female losses to nest predators during the breeding season.

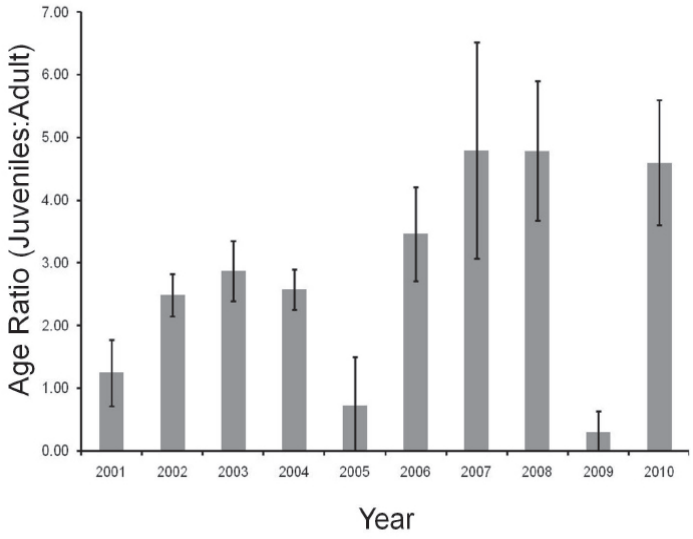


Figure 1. Northern Bobwhite age ratios in South Texas. Vertical axis is the ratio of juvenile to adult birds each year.

Ten Years of Accomplishments: 2001-2011, *continued*

Annual variation in over-winter weights is also extremely low, which seems surprising given that rainfall and habitat-food conditions can be so variable. Average over-winter weights of bobwhites in South Texas typically range from 156 to 160 grams, an average difference of about 4 grams or about 2.5%. This range of values has been observed during dry periods as well as wet ones, indicating that South Texas bobwhites, seem to maintain relatively stable weights despite large differences in density and abundance of food.

The largest and most dynamic population variable, by far, for bobwhites in South Texas is annual age ratios (Figure 1). Bobwhite age ratios, or the ratio of juvenile:adult birds in a population, is a direct indication of annual productivity. Age ratios are easy to obtain from wing plumage coloration that can be observed directly from hunter-harvested bobwhites. Over the past decade, annual bobwhite productivity has ranged from less than one juvenile per adult to more than eight juveniles per adult (Figure 1).

The link between bobwhite productivity and annual rainfall can be made by directly comparing annual age ratios with total April-August rainfall (Figure 2). Clearly, annual bobwhite abundance tracks rainfall in a hand and glove manner. These data can then be put into a statistical analysis called regression to derive a predictive equation that will allow us to estimate annual productivity – and hence whether we will have an excellent, fair or poor quail hunting season – because more than 90% of the annual variability in bobwhite productivity can be predicted by rainfall.

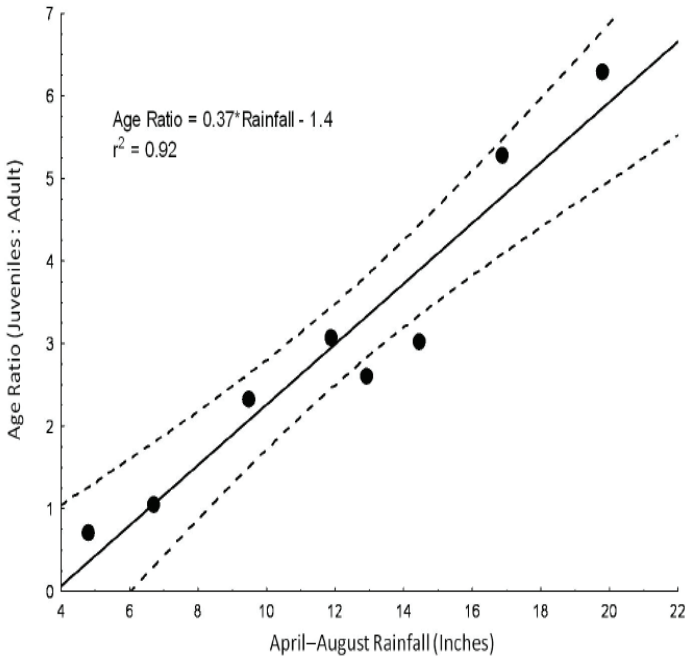


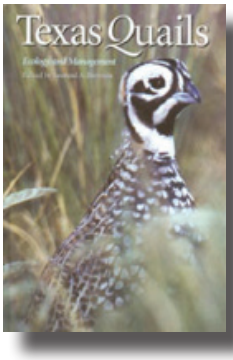
Figure 2. Relationship between annual April-August rainfall and Northern Bobwhite productivity in South Texas. Rainfall explains 93% of annual variation in Northern Bobwhite Age Ratios, which is an index of productivity. By knowing April-August rainfall, managers can then estimate what Northern Bobwhite productivity will be during that breeding season, which is an indication of whether it will be a good, fair or poor quail hunting season.

Research Accomplishments Supported by Quail Associates Donations 2001-2011

Publications

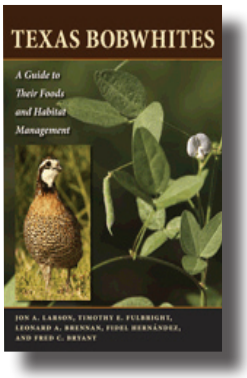
Publications are the gold standard by which university professors and research scientists are judged. Publication of scientific data, perspectives, and opinions creates a permanent record of scientific progress and accomplishment. The primary outlets used by professors and scientists are books, peer-reviewed scientific journal articles, along with extension and magazine articles.

Books



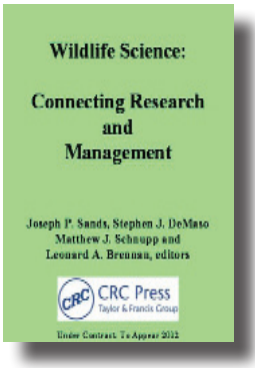
Texas Quails: Ecology and Management. Brennan, L.A. Editor. 2007. Texas A&M University Press, College Station. 491 pages.

Texas Quails is an award-winning compendium (see below for list of awards received) of nearly everything known about the four species of quails that are native to Texas.



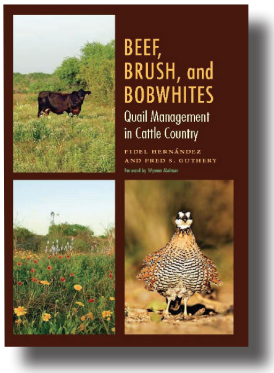
Texas Bobwhites: A Guide to Their Foods and Habitat Management. Larson, J. A., T. E. Fulbright, L. A. Brennan, F. Hernandez, and F. C. Bryant. 2010. University of Texas Press, Austin. 254 pages.

This book is a photographic guide to more than 90 of the most common seeds eaten by bobwhites in Texas. The other focus of the book is to provide people interested in quail management in Texas with a practical guide to habitat management that covers nutritional needs of the birds, general habitat relationships, and how invasive grasses impact bobwhite habitat in Texas.



Wildlife Science: Connecting Research and Management. Sands, J. P., S. J. DeMaso, M. J. Schnupp, and L. A. Brennan, editors. CRC Press, Taylor and Francis Group, Boca Raton, FL.

The objective of this book is to identify the reasons why there are many situations where people who implement wildlife management actions seem to ignore or overlook contemporary information from wildlife scientists. Numerous case histories are presented that illustrate where there is a gap between research and management in wildlife science, and how, in selected circumstances, we have been able to bridge this gap. The book will appear in April 2012.



The completely revised Texas A&M University Press edition of *Beef, Brush and Bobwhites: Quail Management in Cattle Country*, Fidel Hernandez and Fred Guthery have breathed new life into a classic work that for more than twenty years has been teaching biologists, managers, and ranchers to "think like quail." This book is due out in Spring 2012.

Research Accomplishments

Scientific Journal and Magazine Articles

The reputations of all scientists originate from the articles that they publish in the peer-reviewed literature. From 2001 through 2011, faculty and students supported by Quail Associates donations published 50 peer-reviewed articles that appeared in scientific journals.

Examples of scientific journal articles, as well as selected graduate student theses, dissertations, and resource agency reports upon which such articles are based, are listed in the "Research Firsts" section below.

Additionally, faculty and students supported by Quail Associates donations published 39 magazine articles in outlets such as Texas Wildlife Magazine and Quail Unlimited Magazine.

Presentations at Scientific Meetings and to Stakeholders

Presentations are the oral equivalent of publications; they provide a timely and immediate forum for professors, scientists and graduate students to present their findings to both the community of their peers, as well as their supporters. Presentations at scientific meetings provide an opportunity to present the results of a specific project in a way that allows them to ultimately develop such material into publications. In a university setting, presentations at scientific meetings are also an important forum for training graduate students in public speaking and presentation of their thesis and dissertation results.

From 2001 to 2011, faculty and students supported by Quail Associates funds made 122 presentations at state, regional, national and international scientific conferences. These same faculty and students also made 36 presentations to various Texas stakeholder groups with interests in quail conservation and management.

Awards and Recognitions

Texas Quails: Ecology and Management, edited by L. A. Brennan, 2007. Texas A&M University Press, received three awards:

- The Wildlife Society National Office: Outstanding Edited Book
- Texas Chapter of The Wildlife Society: Outstanding Edited Book
- Texas Section of The Society for Range Management: Outstanding Edited Book

Research Accomplishments, *continued*

The Caesar Kleberg Wildlife Research Institute Quail eNews and the *Quail Associates eNews* electronic newsletters received the Outstanding Electronic Publication Award from Texas Chapter of The Wildlife Society during their 2011 conference.

Four students working on projects funded by The Quail Associates Program received Outstanding Presentation Awards from The Texas Chapter of The Wildlife Society.

Undergraduate Student Awards

- McMonagle, C. S., et al. 2007. Survey of Cecal Worms from Bobwhites in South Texas.
- Sanders, D., et al. 2008. Buffelgrass Impacts on an Arthropod Community in South Texas.

Graduate Student Awards

- Wehland, E. M., et al. 2005. A Preliminary Survey of Genetic Variation in South Texas Populations of Northern Bobwhites.
- Brazil, K. A., et al. 2006. Landscape-scale Assessment of Northern Bobwhite Productivity in South Texas.

Research Firsts: Insights into Bobwhite Ecology and Management in South Texas

Research is a process of discovery. By definition, the concept of discovery, at least in science, means "to be the first to find, or uncover". We have been fortunate, in large part due to support from members of the Quail Associates Program, to be the first to find and/or uncover a number of important discoveries related to bobwhite ecology and management in South Texas.

Below are a few of the more significant examples of Research Firsts for bobwhites in South Texas that were supported by donations from the Quail Associates Program.

- **First assessment of the bobwhite nest predator context in South Texas.**

Nest predation is a somewhat contentious issue in bobwhite management. The relatively recent availability of infrared videography now allows us to film next predation events at night, when most of them take place. Thus, we now have a tool to determine the entire suite of bobwhite nest predators.

Rader, M. J., et al. 2007. Identifying Predators and Nest Fates of Northern Bobwhites in Southern Texas. The Journal of Wildlife Management 71:1626-1630.

- **First quantitative population models for simulating bobwhite dynamics for South Texas.**

Mike Rader's simulation model allowed him to examine the relationships among nest predator reduction (based on the predation events he filmed and published in the paper immediately above) weather, precipitation and habitat in relation to bobwhite productivity. His analyses indicated that removal of the top three nest predators provided a modest effect that mitigated against losses to heat and drought, but that reduction in nesting habitat had a far greater effect that predator reduction could not overcome.

Steve DeMaso's simulation model allowed him to examine the relative influences of fine-scale demographic variability in relation to bobwhite population dynamics and persistence. He found that a combination of variables such as nesting attempts, nest survival, and density-dependent reproduction had the greatest influence with respect to determining the fall population that would be available for harvest.

Rader, M. J., et al. 2011. Simulating Northern Bobwhite Population Responses to Predation, Nesting Habitat and Weather in South Texas. The Journal of Wildlife Management 75:61-71.

DeMaso, S. J., et al. 2011. A Population Model to Simulate Northern Bobwhite Population Dynamics in South Texas. The Journal of Wildlife Management 75:319-332.

- **First tests of hunter-covey interface models using field data.**

Quail hunting is a complex process that involves people, dogs, and of course quail, among many other things. Jason Hardin conducted the first field study that quantified the major components of quail hunting. He found that in South Texas, bobwhite hunters traveled at rates from 3 to 8.5 miles per hour and inflicted a bag-rate of about 2 birds per each covey contact, when hunting from trucks with pointing dogs.

Hardin, J. B., et al. 2005. Empirical Tests of Hunter-Covey Interface Models. The Journal of Wildlife Management 69:498-514.

- **First quantification of range of nesting habitat structure conditions in relation to annual productivity.**

The companion studies of Brazil and Rader noted below provide some of the first quantified estimates of bobwhite production

in relation to nesting habitat. Brazil found that during an average rainfall year, bobwhite production was greatest in habitats that have about 800-1,000 nest-clumps per acre. Rader found that bobwhites selected nest sites where grass clumps were larger, taller and denser than areas located at random.

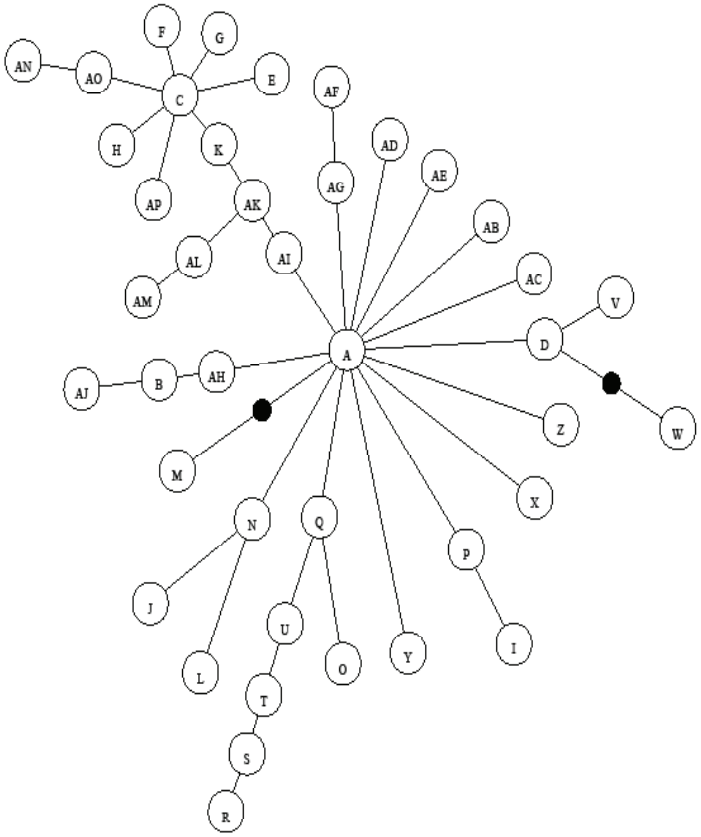


Figure 3: Phylogenetic relationships among Northern Bobwhite subspecies. Note the overall lack of clusters, which indicates lack of genetic differences among subspecies.

Brazil, K. A. 2006. Northern Bobwhite Productivity and Habitat Relationships in South Texas. Thesis. Texas A&M University-Kingsville.

Rader, M. J., et al. 2007. Nest-site Selection and Nest Survival of Northern Bobwhites in Southern Texas. Wilson Journal of Ornithology 119:392-399.

- **First assessment of population structure, genetic neighborhood size, effective population size, and genetic dispersal distance.**

Molecular genetics provides a tool to quantify aspects of wildlife population ecology that would otherwise be impossible to determine. Erin Wehland provided the first estimates of bobwhite population structure and genetic diversity for bobwhites in South Texas. Contrary to expectations, she found little evidence of population structure. (Figure 1) Damon Williford, in a companion study, found that genetic dispersal distances for bobwhites in South Texas can be greater than 30 miles, and that their genetic neighborhood may be as large as 200,000 acres. All of these results point to the fact that bobwhites move and disperse across the landscape of South Texas to an extent that is much greater than we ever imagined.

Wehland, E. M. 2006. Genetic Variation among South Texas Populations of Northern Bobwhite. Thesis. Texas A&M University-Kingsville.

Williford, D., et al. 2010. Landscape Genetics of the Northern Bobwhite in South Texas: A First Approximation of Effective Population Size, Minimum Habitat Area and Geographic Dispersal. Final Project Report, Texas Parks and Wildlife Department, Austin.

- **First assessment of northern bobwhite subspecies and bobwhite species using contemporary and museum specimen data.**

Despite being one of the most studied birds in the world, there has been no systematic assessment of whether the 22± bobwhite subspecies are biologically distinct. Using historic DNA extracted from museum

specimens, Williford has determined that there seem to be little genetic support for distinguishing bobwhite subspecies. (Figure 4) Companion studies for Scaled and Gambel's quails (the two other species of quails hunted in Texas) were also conducted as part of Williford's dissertation.

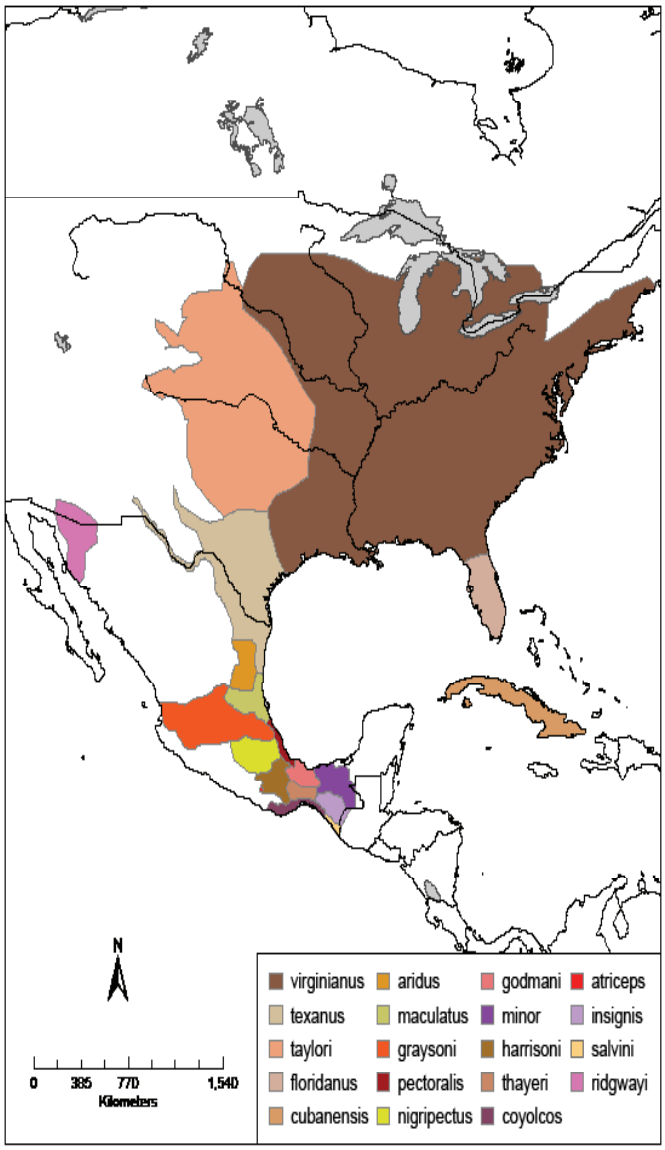


Figure 4: Map of distribution of Northern Bobwhite subspecies. There seems to be little support to indicate these subspecies should be considered unique management units.

Williford, D. 2012. Molecular Genetics of the Northern Bobwhite, Scaled Quail, and Gambel's Quail. Dissertation. Texas A&M University-Kingsville.

- **First assessment of how buffelgrass and tanglehead influence bobwhite nesting ecology and habitat use.**

While buffelgrass is exotic, and tanglehead is native (a point that might be debatable) both of these grasses act as aggressive invaders. In a set of companion studies, Sands and Buelow determined that bobwhites will readily nest in both buffelgrass and tanglehead, but subsequently avoid it as brood habitat, presumably because these areas lack appropriate structure and sufficient arthropods for bobwhite chicks and hens.

Sands, J. P., et al. 2009. Impacts of Buffelgrass on Forb Community in South Texas. Invasive Plant Science and Management 2:130-140.

Buelow, C. M. 2009. Effects of Tanglehead Grass on Northern Bobwhite Habitat Use. Thesis. Texas A&M University-Kingsville.

- **First field evaluations and comparisons of supplemental protein feed in South Texas.**

Although studies of supplemental feeding are legion in the bobwhite literature, all such investigations focused on use of energy-providing foods, rather than protein. Andy Tri conducted the first study to assess whether

provision of protein-rich rations (16 and 24% protein) could improve bobwhite productivity in the wild. His conclusion was that providing such rations had a neutral management effect and did not mitigate losses due to lack of nesting in relation to a severe drought.

Tri, A. N. 2010. Effects of a Commercial Protein Ration on Northern Bobwhite Nutrition in South Texas. Thesis. Texas A&M University-Kingsville.

- **First foundational surveys of bobwhite endoparasites in South Texas.**

Essentially nothing was known about the incidence and prevalence of endoparasites in bobwhites from South Texas until Clint McMonagle and Stacie Mahan conducted the studies listed below. Eye worms have yet to be detected in South Texas bobwhites, even though they are relatively prevalent (58 to 67% infection rate) in the Rolling Plains. Cecal worms are present in bobwhites from both

South Texas and the Rolling Plains, in relatively high prevalence (88 to 100% infection rate).

McMonagle, C. S., et al. 2007. Survey of cecal worms from bobwhites in South Texas. The 42nd Annual Meeting of the Texas Chapter of The Wildlife Society, Beaumont, Texas.

Mahan, S., et al. 2010. Assessment of parasites in northern bobwhites from the south Texas and Rolling Plains Ecoregions of Texas. The 46th Annual Meeting of the Texas Chapter of The Wildlife Society, Galveston, Texas.

PLEASE HELP US CONTINUE TO BE FIRST!

During the past decade, scientists and graduate students at the Caesar Kleberg Wildlife Research Institute (CKWRI) have developed the most comprehensive and productive quail research program in the country. By any standard, be it breadth of research topics, number of books and other scientific publications produced, number of graduate students awarded advanced degrees, our quail research program has developed the enviable reputation as being first among equals. As one example, CKWRI scientists and graduate students are authors on more than 25% of the papers being presented as part of the scientific program for the upcoming Seventh National Quail Symposium, which will be held in January 2012. When you consider than bobwhites are found in nearly 30 states, and there are six species of quails native to the United States, the fact that such a large percentage of scientific papers at a National Quail Symposium were contributed from one program is all the more remarkable.

The combination of financial support from the Quail Associates Program, along with a diverse portfolio of funding from Endowments, Foundations, State Resource Agencies such as Texas Parks and Wildlife Department and Federal Agencies such as the U. S. Fish and Wildlife Service and the U. S. Department of Agriculture Natural Resources Conservation Service have all helped put us at the forefront of bobwhite research.

However, the Quail Associates Program is only one part of the overall quail research program at the Richard M. Kleberg, Jr. Center for Quail Research. Numerous other projects and initiatives, such as the South Texas Quail Project that is led by Dr. Fidel Hernandez, research on invasive grasses by Dr. Tim Fulbright and his students, are also essential components of our contribute to our reputation for excellence. An article that summarizes all of the major findings from the Quail Research Program at CKWRI from 2000 to 2010 will be published in Texas Wildlife Association Magazine in December 2011.

Nevertheless, in conjunction with numerous other quail research projects, the support from the Quail Associates Program has been essential to helping the scientists, staff and graduate students create and maintain the leading quail research program in the U. S. Continued support from the Quail Associates Program will be essential to helping us maintain our leadership role in the world of quail research.

We continue to need your support. Whether you are an ongoing Quail Associate, a Quail Associate interested in renewing your lapsed membership, or you are interested in joining the Quail Associates Program for the first time, your support is critical for helping us continue to conduct the science that is so essential for conserving quail, and sustaining quail hunting, in South Texas.

A New Program for Monitoring Parasites and Diseases in South Texas Bobwhites

Background

Recent concerns about diseases and parasites being a potential factor in the morbidity and mortality of northern bobwhites in the Rolling Plains region of Texas have caught the attention of quail managers in South Texas. In South Texas, bobwhite populations made an impressive rebound in 2010 after the devastating drought of 2009. However, the economic, ecological, and cultural importance of wild bobwhite populations in this region of the state points to a pressing need to develop a system for monitoring parasites and diseases of bobwhites in South Texas.

Strategy and Tactics

We will seek to collect from 200 to 250 whole body specimens that will be used for complete necropsy that will screen for parasites and diseases. We will collect specimens during early hunting season (November; 10-15 bobwhites from 10± ranches) and late hunting season (February; 10-15 bobwhites from 10± ranches) for each hunting season for the next five years (2011-2012 through 2015-2016 hunting seasons). We will also seek to make a series of collections outside of the hunting season in order to get a representative sample of juvenile birds.

How You Can Help

Annual membership in the Quail Associates Program has been kept level at $2,000 per ranch per year since the program began in 2001. This contribution can be made either through the Caesar Kleberg Partner program where $2000 of a $5000 donation can be directed to Quail Associates, or by making a $2000 donation directly to the Quail Associates Program. In order for us to be able to undertake the Parasite and Disease Monitoring Program, we are asking Quail Associates Members to contribute an additional $1,000 per ranch per year to cover our costs. For more information, contact Dr. Leonard Brennan at (361) 215-2237 or leonard.brennan@tamuk.edu.

Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville
700 University Boulevard, MSC 218
Kingsville, Texas 78363-8202

(361) 593-3922

http://www.ckwri.tamuk.edu

TEXAS A&M UNIVERSITY KINGSVILLE

Caesar Kleberg Wildlife Research Institute is a component of Texas A&M University-Kingsville

printed on recycled paper