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Quail Research In South Texas: A Legacy Spanning Four Generations

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South Texas is the Last Great Habitat that supports extensive populations of wildlife on a vast expanse of relatively unspoiled rangeland. This is particularly true for wild quail, especially the Northern Bobwhite (*Colinus virginianus*), hereafter bobwhite. A recent Geographical Information Systems survey indicated that there are about 11 million acres of habitat that supports wild bobwhite populations in the South Texas Ecological Region (Brennan et al. 2014). This is more bobwhite habitat than exists anywhere else within the species' distribution. Given the widespread and ongoing declines of bobwhite populations throughout their geographic range, this is an important factor when it comes to bobwhite conservation.

Graduate research assistant Carter Crouch poses with a captured bobwhite in Karnes County. His research is focused on documenting the influence of bobwhite habitat restoration in areas formerly dominated by bermudagrass. Photo Credit: Carter Crouch

Former undergraduate researcher Blake Martin, traps and radio-marks a Scaled Quail in LaSalle County, 2012. Scaled quail have been declining in Texas for at least the past 2 decades. Our research is focused on understanding the factor(s) contributing to this decline Photo Credit: Eric Grahmann

There is a unique set of circumstances that resulted in South Texas becoming one of the Last Great Places for quail, and as a result quail hunting. These circumstances involved

Graduate research assistant Michelle Downey releases a bobwhite in Shackelford County. Her study is focused on the translocation of wild bobwhites as a way to augment population declines. Photo Credit: Michelle Downey

Graduate research assistant Kelsey Davis attempts to locate a radio-marked scaled quail in Dimmit County. Her research is focused on understanding the impacts oil and gas exploration may have on both bobwhite and scaled quail. Photo Credit: Eric Grahmann

Former graduate research assistant Andrew Olsen searches for parasites in the intestinal tract of a northern bobwhite. Our knowledge of quail parasites is relatively scant compared to knowledge on other aspects of their ecology and life history.
Photo Credit: Ben Olsen

compatible land use trends, as well as economic and cultural factors, that came together in such a way that one of the results was a major and sustained research initiative on wild quail in South Texas. The primary objective of this research initiative is to develop a scientific basis for the sustained management of wild quail populations in South Texas. Because of their generous financial support over

CKWRI Assistant Professor of Research Eric Grahmann, performs a call-back survey for Montezuma Quail in the Davis Mountains. He and his graduate research assistant Zack Pearson are working on updating the known geographic distribution of this secretive quail species in Texas. Photo Credit: Fidel Hernandez

Graduate research assistant Josh Pearson poses with a captured bobwhite in Real County. His research is focused on quantifying patterns of bobwhite habitat use in the Edwards Plateau where few studies have been conducted. Photo Credit: Josh Pearson

South Texas Natives program director Forrest Smith poses with a handful of seeds being used for a restoration project for northern bobwhites. Over 32 plant releases have resulted from this program and are being used to restore quail habitat across Texas.
Photo Credit: Eric Grahmann

Graduate student locating a radio-marked bobwhite. Telemetry has revolutionized our understanding of many basic aspects of Northern Bobwhite life history during the past 25 years. Photos: Leonard A. Brennan Collection

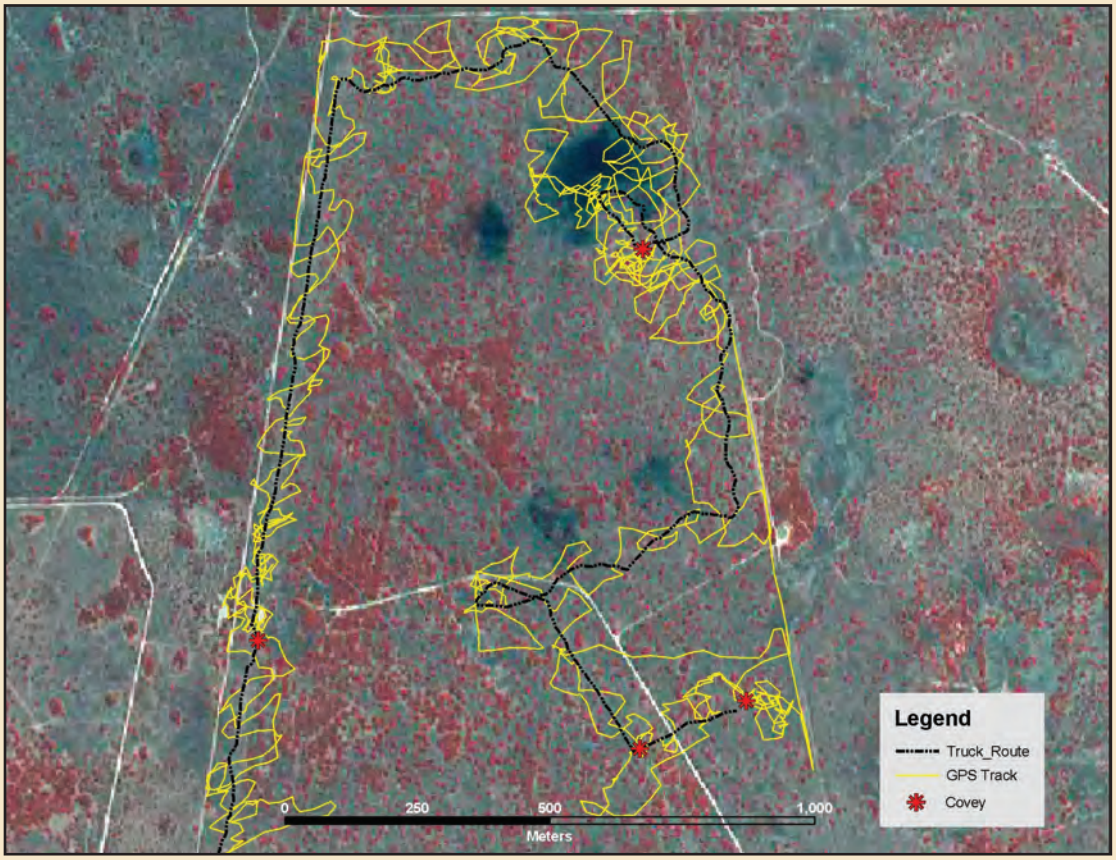
many decades, hunters have been a fundamental component of quail research in South Texas. However, the quail research conducted in South Texas during the past eight decades also represents a massive contribution to applied ornithology. The purpose of this essay is to provide an overview of the factors that have led up to the current state-of-the-art of quail research in South Texas.

A **Happy Accident** of Land Use Trends

South Texas encompasses about 8,080,000 hectares or 20,000,000 acres that are dominated by a diverse array of rangelands. Soils are predominately deep sands, heavy clay or exposed limestone ridges, and, for the most part, are not suitable for row-crop agriculture. These relatively poor and in some cases very

Banding a female bobwhite and preparing to attach a radio-transmitter. Photos: Leonard A. Brennan Collection

Pointing dogs with GPS units attached to their collars. This technology has allowed us to quantify many aspects of bobwhite hunting and better understand how to manage hunting pressure and sustain wild quail populations in South Texas. Photos: Leonard A. Brennan Collection



Track-log map of a bobwhite hunt in South Texas. Note the vast amount of area not covered in the middle of the pasture. This information will allow a manager to direct the next hunt to focus on the middle of the pasture, rather than re-hunt along fence rows and pasture edge. Photos: Leonard A. Brennan Collection

shallow soils have ended up being a blessing in disguise for quail and wildlife conservation because for the past two centuries livestock ranching was pretty much the only economically viable land use for most of the South Texas Region. The Rio Grande Corridor has been lost to agriculture, and several hundred thousand acres of blackland prairie west of Corpus Christi are farmed for cotton and sorghum, otherwise, the vast majority of South Texas remains in native rangeland vegetation that supports diverse and abundant populations of wildlife.

The livestock ranching community of South Texas developed some unique cultural aspects that have had a profound influence on quail and wildlife conservation in this region. Because property ownerships relate back to large Spanish Land Grants, ranch sizes were large (40,500 to >325,000 hectares or 100,000 to >800,000 acres), and many of these historic large ranches remain intact today. The poor soils and unpredictable rainfall in this semi-arid, subtropical region also meant that large tracts of land were required to develop and sustain economically viable cattle herds. After World War II, oil and gas exploration in South Texas resulted in additional sources of income that allowed many of the large ranches in this region to remain intact, and still produce relatively large herds of cattle. None of these factors were intentionally planned. They were an accidental by-product of what the land would produce for the people who settled there.

Starting in the 1970s, a system of fee-leasing for hunting access started to develop in South Texas. Ranch owners began to realize that

Counting quail from a helicopter using a laser range-finder. Helicopters are an efficient and effective platform for collecting distance-sampling data that can be used to estimate bobwhite population densities in large South Texas pastures. **Photos: Leonard A. Brennan Collection**

along with cattle, oil and gas, leasing hunter access to game animals could be an additional source of significant income. Today, lease fees for hunting are an important economic driver in the region. Hunters typically fly in to South Texas on private jets from urban locales such as Houston, Dallas, San Antonio and elsewhere. They readily pay up to $38.00 per hectare or $15.00 per acre per year for hunting leases that range from 400 to >20,000 hectares or 1,000 to >50,000 acres in size. Cattle production, by contrast, nets about $13.00-15.00 per hectare or about $5.00-8.00 per acre per year in this region. It is not uncommon for hunters to also purchase grazing rights along with hunting rights so that they, rather than the landowner, make the decisions about how many cattle, if any, are present on the pastures that they lease for hunting.

In this current socio-economic situation, ranchers have become both motivated and pressured to destock pastures in order to either restore or maintain nesting cover and other habitat components for bobwhites. In many cases, the native bunchgrasses that quail prefer for nesting are the same grasses that cattle prefer to eat. While cattle and quail can certainly co-exist, it is usually not possible to maximize stocking rates and still produce abundant quail numbers for hunting, especially over the long-term. Thus, during the past 15-20 or so years, many ranches have either completely destocked, or have dramatically reduced stocking rates.

THE CULTURE OF QUAIL RESEARCH IN SOUTH TEXAS

Modern quail research in South Texas began eight decades ago when Val Lehmann was hired by King Ranch as a wildlife biologist in the 1940s. Lehmann spent four decades collecting and synthesizing information on bobwhite populations and bobwhite management in South Texas. His book "*Bobwhites in*

Male bobwhite roosting in a mesquite tree during middle of the day. Although bobwhites roost on the ground at night, during periods of peak summer heat during the middle of the day they roost 1-3 meters above the ground in woody vegetation to mitigate heat stress. **Photos: Leonard A. Brennan Collection**

the Rio Grande Plain of Texas" Lehmann (1984) contains more than a dozen chapters on bobwhite life history in the semi-arid, sub-tropical portion of its geographic range as well as an array of chapters on management that cover topics such as inventory, brush management, grassland restoration, fire, harvest regulation, and so on. This information was not just gleaned from his activities on King Ranch, but also from information from more than a dozen other ranches in South Texas over the years.

Lehmann's conclusion about predator control and quail management is particularly interesting because he considered that it was largely a waste of time because annual variation in precipitation swamped any difference that might accrue from the reduction of predators. This conclusion was borne out by comparative field experiments, and sophisticated systems modeling. Lehmann's message of the importance of habitat for quail conservation took root and spread throughout South Texas. You can find his book is in the living rooms and-or offices of ranches across South Texas.

The two editions of "*Beef Brush and Bobwhites*" by Guthery and Hernández and Guthery provide a wealth of material that documents management for bobwhites in South Texas. The first edition of "*BB&B*" is long out of print; many tattered copies were

Hunters are a fundamental component of bobwhite conservation in South Texas. They have contributed millions of dollars to fund research that is developing a scientific basis for quail conservation in South Texas. **Photos: Leonard A. Brennan Collection**

Bobwhite habitat is the key to bobwhite conservation. Maintaining large blocks of native range land with tall grasses and a mix of weeds and woody vegetation provides habitat for scores of other species of grassland birds, small, medium and large mammals and iconic reptiles such as the Texas Tortoise. Photos: Leonard A. Brennan Collection

bleached out by sun from years of riding on the dash boards of pickup trucks. The second edition updates facts and perspectives learned over the past two decades, and contain a case-history of Laborcitas Creek Ranch, which is arguably one of the state-of-the-art quail operations in South Texas today. The second edition of "*BB&B*" was recently recognized with an Outstanding Publication Award from the Texas Chapter of The Wildlife Society.

The encyclopedic "*Texas Quails: Ecology and Management*" summarized virtually everything known about wild quail in Texas up to the first decade of the 21st century. The chapter on quail management in South Texas by Hernández et al. and managing a South Texas hunting camp by Howard also document the legion of habitat management efforts directed at benefitting bobwhites in South Texas that are rooted in a deep tradition of classic wildlife research. The chapter by Howard is particularly compelling because only about a third of it pertains to actual hunting camp management; the rest is about habitat and what their hunting camp operation does to keep it in shape for quail, even though they only lease, and do not own, the 12,000 hectares (or 30,000 acres) of pastures where they hunt.

Few people realize that quail research and management has developed a continuous eight-decade track record in South Texas that spans four generations of researchers who have been dedicated to developing a scientific basis for sustaining wild populations of quail. Lehmann was the first generation quail researcher in South Texas (1940s to 1980s), followed by Guthery (second generation; early 1980s to 1997), then third-generation Hernández (1999-present) and Brennan (2000-present), and now a fourth generation scientist hired by the Caesar Kleberg Wildlife Research Institute in 2013 (Grahmann).

SOUTH TEXAS QUAIL RESEARCH TODAY

The Richard M. Kleberg, Jr. Center for Quail Research at the Caesar Kleberg Wildlife Research Institute (CKWRI) at

Texas A&M University – Kingsville is home to the largest research program in the world that is focused on the habitat and population ecology of wild quails. During 2012, the Quail Research Program at CKWRI received the Group Achievement Award from the National Bobwhite Technical Committee. Background and details related to this award can be found at: http://bringbackbobwhites.org/newsroom/fact-sheets/doc_view/148-2012-nbtc-proceedings

DONOR SUPPORT

Consider the following endowment support ($4,750,000 and growing) from private individuals interested in quail conservation in South Texas:

Endowed Center for Quail Research	$2,500,000
Endowed Chair for Quail Research	$1,000,000
Endowed Quail Professorship	$ 500,000
Endowed Quail Fellowships (3)	$ 750,000

Annual donations that support our research operating expenditures for quail research are typically in the range of $200,000 to more than $300,000 per year. During the past decade and a half, we have garnered more than $4,000,000 in grants and contracts for quail research projects from state and federal resource agencies and private foundations. The Quail Associates Program, which is a network of private donors, contributed more than $700,000 to quail research and related activities. (Brennan 2011).

The overall track record of quail research productivity in South Texas has been remarkable by any standard. In addition to six books from academic presses, well over 100 peer-reviewed scientific journal articles have been published by quail research scientists in South Texas. The results of these articles have been made accessible to managers through magazine articles, extension publications and newsletters.

We presently have three full-time faculty members with Ph.D.s dedicated solely to quail research, five other faculty who often use quail as their model species for research, 2 post-doctoral scientists, and 20 graduate students who are all active with quail and quail-related research projects and initiatives throughout South Texas. Important focal research areas include the role of exotic grasses, habitat restoration, habitat improvement in the context of brush management, grazing management, water management, oil-and-gas development and molecular genetics.

Study locations for all of these research projects occur on private landholdings in South Texas. Consider, for example, the recent paper by Tri et al. that documents the relationship between rainfall and annual quail production in South Texas. The data in this paper came from 31 private ranches in 16 counties who contributed more than 72,000 quail wings over eight years.

IN SUMMARY

South Texas clearly represents the Last Great Habitat with respect to bobwhites, and as such has been recognized as a Legacy Landscape for Northern Bobwhite Conservation by the National Bobwhite Conservation Initiative. The legacy of quail research in South Texas was an important component of this designation. While bobwhites continue to be the main focus of quail research in South Texas, we are also undertaking important research projects on Scaled Quail and Montezuma quail in order to understand factors limiting their populations. Additional details about quail research in South Texas as well as lists of publications can be found at http://www.ckwri.tamuk.edu/research-programs/richard-m-kleberg-jr-center-for-quail-research/

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