ROLLING PLAINS QUAIL RESEARCH FOUNDATION

2019 ANNUAL REPORT

TABLE OF CONTENTS

About Us	2
Director's Message	4
Long Term Data Collection	7
Habitat Management at The Ranch20	b
Extension and Outreach Activities24	4
Parasite Surveillance20	6
Translocation Research Initiative	9
Collaborator Research	6
Scientific Publications of the RPQRF 2017-2019 40	6
Donors	7



ABOUT US

The Rolling Plains Quail Research Foundation (RPQRF) is a 501(c)(3) nonprofit focusing on one thing: understanding and managing bobwhite and scaled quail in West Texas. Everything we do centers around quail and quail hunting, as reflected by our mission:

TO PRESERVE TEXAS' HERITAGE OF WILD QUAIL HUNTING FOR THIS, AND FUTURE, GENERATIONS

The Foundation and its Research Ranch were established to provide a living laboratory to devise land management strategies for the benefit of quail and also as an exemplar property to demonstrate the best methodologies and techniques to other "students of quail."

Board of Directors

JUSTIN TRAIL -- PRESIDENT JOE CRAFTON DAN CRAINE RUSSELL GORDY STEPHEN HOWARD A.V. JONES, JR. STEVE SNELL RICK SNIPES

Staff

DR. DALE ROLLINS – EXECUTIVE DIRECTOR 325-650-0311 DROLLINS@QUAILRESEARCH.ORG

PHIL LAMB — DIRECTOR OF DEVELOPMENT 214-498-1234 PLAMB@QUAILRESEARCH.ORG

DANIEL KING – RANCH MANAGER 325-276-2187 DANIEL.KING@QUAILRESEARCH.ORG

BECKY RUZICKA – RESEARCH ASSOCIATE 661-618-3956

BECKY.RUZICKA@QUAILRESEARCH.ORG

Contact

MAIN RANCH HEADQUARTERS PHONE: 325-776-2615

MAILING ADDRESS:

P.O. BOX 220 ROBY, TEXAS 79543 RANCH ADDRESS: 1262 U.S. HIGHWAY 180 WEST ROTAN, TEXAS 79546

BLOOD, SWEAT, AND TEARS

DIRECTOR'S MESSAGE

Dale Rollins Executive Director

If you're a fan of classic rock, perhaps you remember a group from the 1960s called "Blood, Sweat & Tears." Some of their more popular songs included "And When I Die", "You've Made Me so Very Happy", and perhaps their biggest hit "Spinning Wheel." Seems this band has pretty well nailed my thoughts on our "quail odyssey" over the past year or so. The first two bespeak of the good times and fond memories, ala 2016. The last sets the tone for my requiem for this past year.

"What goes up, must come down . . . spinning wheel got to go round. Talk about your troubles it's a crying sin, ride a painted pony let the spinning wheel spin."

Note that "odyssey" is defined as "an adventurous trip or voyage, often characterized by sudden turns of fortune." Booms eventually bust as we can all attest to over the past two years. Our various quail metrics (e.g., roadside counts) accurately diagnosed the pending paucity of bobwhites. But where to point the finger? Some argue hot, dry weather (especially post July 1) while others champion parasites (eyeworms and cecal worms), too many feral hogs or hawks, or simply too much broomweed (i.e., dogs can't sniff the birds out). And then you also realize that the cotton rats (and most other rodents) are on hard times too, and their presence begets bobwhite abundance. I haven't heard anyone lament poor habitat this year; have you ever seen West Texas look any better for quails? "Usable space" appears to be maxed out, just mostly vacant of birds. Folks would probably run me out of Texas if I argued for a cotton rat



At RPQRR, I consider all of these factors to have some merit, but trying to prioritize them, and decide where to invest your first dollar, is where it gets tricky. We faced a similar dilemma in 2010; that's when we put our heads together and came up with the 'Operation Idiopathic Decline" saga. Since 2011, our Foundation has invested over \$4 million, and other partners (especially Park Cities Quail Coalition [PCQC] and Texas A&M



RPQRF Dale Rollins

Agrilife Extension Service's Reversing the Decline of Quail initiative (funded via Upland Game Bird Stamp funds) to conduct the most comprehensive disease research ever conducted on bobwhites.

As a result of those efforts, we eagerly await the FDA's approval and subsequent availability of "QuailGuard,"—the first-ever de-wormer for wild birds, which is being developed by Dr. Ron Kendall and our partners at the Wildlife Toxicology Lab at Texas Tech University. QuailGuard will control both

eyeworms and cecal worms, each of which can be problematic for quail. Hopefully it will be available by the time I write this report next December. The long-range weather forecast calls for "El Nino neutral" so perhaps "average weather" will prevail over the next six months (for whatever "average" means!).

Meanwhile, the spinning wheel got to go round. We continue building our long-term (11 years) databases of quail abundance, and the various "strings" attached thereto (e.g., raptors, rodents, insects). Our staff is in the field daily monitoring radio-marked bobwhite and scaled quail, taking a pulse on their survival and "cause-specific mortality" (i.e., whodunit). We continue to analyze quail heads for the presence of eyeworms so send us some specimens if you do some late-season hunting (the epicenter for last year's infections was a bullseye on Fisher County).

By all measures our numbers are down across West Texas. But at least one of our indices (our Fall trapping session) was a little better than I was anticipating—we trapped and leg-banded 425 bobwhites and 41 scaled quail in November. Hopefully these birds will enjoy decent survival until next May and we can begin to pull out of our rut.

On other fronts, we have some great news! With special funding from PCQC, among other donors, we are announcing a face-lift for RPQRR. I always welcome visitors here and then say "there's nothing opulent at RPQRR except the quail habitat." By the next Field Day (late-May) I hope I'm modifying that to say "and our soon-to-be-finished new building complex." This new headquarters will include research and office facilities, an education center, bunkhouse and a small guest cabin. The bunkhouse is being built to accommodate a new venture "Operation Quail Warriors" where, again with funding from PCQC, we will provide training for veterans to equip them to work as support staff for hunting ranches (especially quail ranches of course!). Stay tuned for more information on this unique program.

We're also proud to crow about our outreach efforts. Since last year, we've been featured on two outdoor shows and in several magazine articles. Our social media is flushed with success—our Facebook page sports over 8,000 "friends" We launched a new podcast series "Dr. Dale on Quail" and the first seven episodes have been popular with "Students of Quail" across the world (check it out at <u>quailresearch.org</u>). The monthly e-Quail Newsletter and assorted webisodes (short videos on YouTube) round out our "spinning wheel." Our efforts were recognized last April when RPQRR was honored by the Texas Parks and Wildlife Department as a Lone Star Land Steward for the Rolling Plains ecoregion.

It takes force to start, and keep, a wheel spinning. To that end we appreciate those of you who have put your shoulder to the wheel via your contributions. See page 47 for a list of our donors. Special thanks to PCQC who has been, and continues to be, the wind under our research wings. If you haven't purchased your ticket to "Conservation's Biggest Night" where PCQC will be honoring Carl Allen as the T. Boone Pickens' Lifetime sportsman Award", see parkcitiesquail.org.

Finally, 2019 will be remembered as the year we lost Mr. T. Boone Pickens. Texas' great tradition of quail hunting owes Mr. Pickens a lot—he was the quintessential advocate for quail. We are forever grateful for his incalculable contributions to quail conservation and hope whoever winds up purchasing his Mesa Vista Ranch loves quail just half as much as he did.

Dale Pollins

Dale Rollins Executive Director

LONG-TERM DATA COLLECTION

7

AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

Through the generosity of the Richard King Mellon Foundation and The Conservation Fund, a 4,720-acre ranch in Fisher County was purchased in October 2006. Our Research Ranch makes RPQRF the only conservation group in the world with its own property dedicated exclusively to understanding quail through science. It is the heart of our organization. Our full-time staff, interns, technicians, and team of graduate students work year-round to develop the best practices for quail management, prescribed burning, predation management, and fine-tuning ideal quail habitat. We also trap and study as many as 5,000 quail annually.

One luxury of owning our own dedicated Research Ranch is the ability to build data sets spanning 10+ years, instead of the much shorter durations of other studies. The following sections provide a brief summary of our long-term data collection efforts. These data have been used to support many graduate student projects over the years as well as in-house scientific publications. You can find our growing body of research archived on our website.



THE YEAR IN REVIEW

AT RPQRR

Daniel King Ranch Manager

Our Research Ranch started 2019 as most of the southern Rolling Plains did-sopping wet from the "monsoon" of late 2018. Still sloshing through the mud in January, our small mammal trapping showed a rodent abundance half of the long-term average at 118 individuals captured. We were drying out quickly with below average rainfall during our quail trapping efforts in February and March. Those efforts proved disappointing with a paltry 192 unique individual birds captured. The Ranch experienced an unprecedented mortality event during April in which we began discovering intact birds that had died of an unknown cause. That mortality event resulted in one-third of our collared birds dying between April 1st and April 30th. Despite thorough examinations and necropsies by state and federal labs, no definitive conclusion was identified. At that juncture in the year, our optimism for nesting season was tempered, but we've come through tougher times than that at the Research Ranch

In mid-April we started to receive steady rainfall that left us 3.78 inches above the cumulative average by June 18th with 13.91 inches total. The warm temperatures and rain kicked off our nesting season early with our first evidence of nesting on April 12th. The first nest by one of our radio-marked hens was initiated on May 13th and was followed by 33 additional nests found over the nesting season. The combination of the rain at the latter end of 2018 with the well-timed rain from April to June produced a magnificent flush of wildflowers in May and a dense stand of common broomweed across the ranch. This promoted a surge in grasshoppers, setting us up to record our highest ever abundance in the sweep net transects done in June. Our winter wheat grew well and was headed out by early May. The milo we planted in late April sprung up quickly and was chest high and producing seed by mid-June. The ranch was covered with annual sunflowers along every road, in every ditch, and every disturbed site. The habitat on RPQRR looked as good as it ever has.



Summary of cumulative 2019 rainfall.

But after June 18th the rain shut off. We received only 3.32 inches of rain from June 19th to November 1st compared to an average rainfall of 9.65 inches during that time. This acute lack of moisture accompanied by high temperatures in August and September was detrimental to western ragweed seed production and halted our nesting season in early August. Roadside counts in September and covey call counts in October were well below average at 2.23 quail per mile and 3.54 coveys per stop, respectively. We were finally blessed with a 2.18 inch rain on November 7th that triggered flowering of common broomweed, saw-leaf daisy, and other fall blooming species. The results of our Fall trapping effort were better than we had anticipated, but still low at 466 unique individuals captured. Our population is similar to that of the 2013-2014 season. This thought, along with the final cumulative rainfall for 2019 coming in at 22.22 inches, leaves us wishing things were better, but also knowing they could be much worse.

So while we reflect on 2019, we are already looking forward to 2020. We will keep studying, researching, trapping and tirelessly working to find the answers that will help us restore bobwhite and scaled quails across the Rolling Plains ecoregion and beyond.



MONITORING QUAIL ABUNDANCE

Since RPQRR was established, we have implemented various ways to monitor quail abundance. These efforts include helicopter surveys (spring and fall), call counts (spring and fall), mark-recapture (using leg-banded birds), and fall roadside counts. Our goal in collecting these data over time is two-fold. Primarily, we track changes in the population over time and investigate factors that may be influencing those changes. Secondarily, we strive to determine which of these provide reliable indices of the population relative to the time and expense of conducting counts to provide landowners with guidance for monitoring quail on their own properties. It is important to keep in mind that the best use of relative abundance indices, such as call and roadside counts, is for comparing quail populations on the same property over multiple years. Details of these methodologies for monitoring quail abundance follow.





These graphs provide a snapshot of the results from our population monitoring efforts that track changes in bobwhite and scaled quail abundance.

Graphs in green represent indices where both species (bobwhite and scaled quail) are combined.

HELICOPTER COUNTS

We fly 52 miles of helicopter surveys in the fall (November) and spring (March). Both species of quail (bobwhites and scaled quail) are combined in these data due to the difficultly separating the species in flight. We average the covey size across all observations each year, then use the average covey size to calculate an abundance index.

ROADSIDE COUNTS

We conduct roadside counts annually in September during morning and late afternoon hours. Based on our work at RPQRR, roadside counts are one of the most accurate indices and easily conducted for predicting fall hunting abundances.



Orange represents bobwhites and blue represents scaled quail. Data from 2019 indicate that abundance is similar to 2018 and still low overall.

SPRING CALL COUNTS

We use spring cock call counts as an index of spring abundance. Counts of both bobwhite and scaled quail are conducted twice a week starting mid-May and continuing until mid-July. Our data approximately reflect the changes in abundance over time. Based on these data, an average of >7 bobwhite roosters per stop indicates high abundance, while counts averaging <3 bobwhite roosters per stop indicate low abundance. Scaled quail call counts are likely best used as an indication of presence/absence only.

FALL COVEY COUNTS

In October, we measure bobwhite abundance by listening at dawn for covey calls. Covey call counts are the most time intensive measure of relative abundance because researchers can only listen at one site per day. 13



Minimum known population of bobwhite quail at RPQRR, 2009-2018, based on fall trapping (i.e. number of uniquely-banded individuals captured).



Production (measured as a juvenile:adult) at RPQRR from 2009-2019. We observed an increase in the juvenile to adult ratio in 2019, however this was likely in part due to poor early season adult survival (see The Year Review). These ratios are sensitive to changes in adult survival as well as production.

TRAPPING AND BANDING DATA

We intensively trap quail on our Research Ranch twice annually to:

- 1) affix radio-collars to monitor survival and reproduction,
- 2) monitor abundance, and
- 3) evaluate annual production (i.e. juvenile to adult ratio).

Our trapping data documented the bobwhite population explosion the Rolling Plains ecoregion experienced in 2015-16 and the subsequent decline.

Minimum known population (MKP) of bobwhite and scaled quail on RPQRR from 2009-2019. MKP is the number of uniquely-banded individuals we captured during the fall trapping session. Data from 2019 indicate a continual decline of scaled quail and a slight increase in bobwhites from the previous year.

QUAIL SURVIVAL

Our primary source of information on quail survival at RPQRR is via radio-telemetry. Bobwhite and scaled quail are fitted with 6-g radiotransmitters each year during November. We radio-collar additional birds throughout the year to maintain sample sizes so we can evaluate fluctuations in survival year-round. We also use our massive trapping and banding dataset to estimate annual apparent survival. Biologically, apparent survival is the probability that a bird survives and stays on site. As such, the estimates we get from trapping and banding data are less accurate because they combine two demographic processes: survival and dispersal. Our telemetry data provide more accurate and precise estimates, but it is costly and time-consuming to collect. We are working to combine these two datasets to gain a clearer picture of quail survival throughout the year.



Comparison of survival throughout the breeding season (May 1 – Aug 1) over the last 4 years. 2019 was higher than the previous 3 years. This may reflect the early end to nesting we experienced after a dry late summer (see Year in Review).



Breeding season (May 1 - Aug 1) survival from 2010-2019.



Apparent survival at RPQRR of bobwhite and scaled quail. Estimates are averaged over 2008-2019. The differences between groups are small. However, in general, scaled quail survive at a higher rate than bobwhites, males survive at a higher rate than females, and adults survive at a higher rate than juveniles.

NESTING SUCCESS

AT RPQRR

Each radio-collared hen is monitored throughout the breeding season. Zeroing in on and recording the hens' locations daily enables us to document when they initiate nests. Once a nest is initiated, we observe it until it is hatched or depredated, and record other parameters of interest along the way, such as nesting substrate, clutch size, and number of eggs hatched.



Nesting success and number of nests initiated from RPQRR, 2008-2019. In the nesting seasons that resulted in boom years (2015-2016) we observed both large numbers of nests initiated and high survival. Previously, in years where few nests were initiated we contrastingly observed high survival





SMALL MAMMALS

AT RPQRR

Small mammals exhibit the same irruptive population growth as quails. and both communities appear to be driven by the same environmental factors. In fact, small mammal abundance and bobwhite abundance are highly correlated. We monitor small mammal populations at RPQRR to learn more about the link between the species' population mammal community at our Research Ranch may serve as a buffer against predation on quails (i.e., predators focus on small mammals thus reducing predation pressure on quails). For more research by our collaborators at the University of Florida on page 42. Since 2008 we have documented 11 different species of small mammals at RPQRR. The most common species across all years



Changes in small mammal abundance at RPQRR from 2008-2019.



Small mammal abundance at RPQRR is highly correlated with bobwhite abundance

ARTHROPODS

Arthropods (e.g., insects) are a source of protein, moisture, and essential amino acids required for egg laying, feather production, and growth of nesting hens and chicks. Pitfall traps tend to represent communities of ground-dwelling arthropods (e.g., ants, beetles) whereas sweep-nets tend to represent arthropod communities preferring the canopy of herbaceous plants (e.g., grasshoppers).



Indices of arthropod abundance at RPQRR, 2011-2019. These data include counts of individuals from 11 different Orders of arthropods found on the Ranch.



Abundance of orthopterans (e.g., grasshoppers) is highly correlated (r = 0.89) with juvenile bobwhite abundance. Grasshoppers represent a critical food source for broods during mid-summer.



RAPTOR POPULATIONS at RPGRR

Raptors typically account for 20-40% of our "identifiable" mortalities of quail. Predation by raptors is typically greatest from Oct-Apr when the Research Ranch is inhabited by migrating raptors or winter residents. During these times of the year our most valuable habitats are the areas with the densest brush cover. Research on our Ranch has shown that quail being pursued by raptors (versus other predation threats) choose to take refuge in the largest and most dense shrub species that are available to them. Native brush species such as algerita, catclaw acacia, hackberry, littleleaf sumac, and Englemann's prickly pear were found to provide the best cover for quail fleeing raptors. Providing adequate cover for quail is of utmost importance because there is little else that can be done to mitigate the influence of raptor predation. (Note: Trapping, killing, or otherwise harming raptors is illegal at the federal level under the Migratory Bird Treaty Act of 1918.)

Buteos (especially red-tailed hawks) are our most commonly sighted raptors. Resident redtailed hawks are our most common hawk. While they do prey on quail, they are typically less of a threat than harriers and accipiters. However, research from South Texas shows that increased abundance of red-tailed hawks was correlated with a decrease in bobwhite survival. As our dataset at the Ranch grows, we would like to be able to apply those data to answer questions about how raptor abundance influences quail survival in the Rolling Plains and what threshold of brush density is adequate on a landscape level to mitigate predation pressure from migratory raptors.



Raptor abundance at RPQRR during 2019. Our counts reflect the peak raptor migrations in spring and fall. Raptors are the greatest contributor to overwinter mortality in quail.

HABITAT MANAGEMENT AT OUR RESEARCH RANCH

RPQRF'S MANAGEMENT PHILOSOPHY

Daniel King Ranch Manager



21

We approach habitat management with the goal of maximizing usable space for quail. Quail have demonstrated the ability to exist in a wide array of habitat types across their range. We attempt to maximize the quantity of habitat that meets the needs of quail ("usable space") prior to pursuit of the "ideal" habitat. We apply this concept by rating the habitat quality of various portions of our Research Ranch on a scale of 1-10. We then strive to maximize the acreage that is at a 6 or higher. After that acreage "maximization effort," we shift our focus to improving the quality of the habitat.

We evaluate our habitat based on the three basic habitat needs: nesting cover, food, and escape cover. The principal "tools" that we use to manipulate the habitat at our Research Ranch are soil disturbance, prescribed fire, and brush sculpting. Disturbing the soil sets back plant succession, resulting in an increase in lowersuccessional species (i.e., quail-friendly forbs) on the landscape. Some example species that proliferate after soil disturbance are western ragweed, common broomweed, and annual sunflower all of which provide great food for quail. The resulting increase in diversity of forbs also promotes increased insect abundance - more food for quail. In addition to soil disturbance, we supplement the quail food on the landscape by planting food plots where we have arable land (i.e., former CRP fields).

The second tool, prescribed fire, can be one of the best tools in a quail manager's toolbox. If used improperly, however, prescribed fire is dangerous and can negatively impact the habitat. When we believe prescribed fire will be beneficial, we use cool-season burns in areas we deem the relative proportion of bare ground has become too low. relative abundance of forbs has become too low. or grass growth has become too thick (often these three happen in conjunction). In these areas, and under the right conditions, a prescribed burn will promote forb production and diversity, promote healthy bunchgrass growth from species such as little bluestem and silver bluestem and increase bare ground in areas that may be "choked" with old growth.

The third tool, brush sculpting, is used to create a habitat interspersed with brush in a way that allows quail to quickly escape predators. We strive to have "quail houses" (a shrub about the size of a pickup) every 40-60 yards (i.e., a softball throw) apart with smaller shrubs intermixed. In order to achieve this, we have planted woody species (in spreader dams), half-cut mesquite trees, built man-made quail houses (brush piles), and simply let desirable brush species like netleaf hackberry and elbowbush grow. An important part of our brush management is an eye for the future. Before we eliminate any brush, we think about whether it adds value to the habitat now or will add value in five years, ten years, etc.

The final component of our approach to habitat management at RPQRR is the interspersion of the three quail needs. This means we keep in mind where these three habitat components (nesting cover, food, and escape cover) are in relation to one another. Essentially, we want a quail found at any point on RPQRR to have access to all three of these items. Therefore, we avoid implementing any single treatment over large acreages and do not allow woody species to take over the landscape. Once we include and achieve this final component, we have truly usable space. We believe that through these efforts, we have maximized usable space on our Research Ranch. Even so, we still work year-round to maintain that maximum and increase the overall quality of the habitat and will continue to do so.

FOOD PLOTS

We plant food plots where we believe supplemental forage may increase the area's usability to quail. Many of our food plots are planted in fields that were formerly in the Conservation Reserve Program (CRP). These fields often exhibit dominance by grass species (e.g., kleingrass) and subsequently low relative abundance of seed-producing forbs. In these CRP areas, we plant narrow, alternating strips (3-10 acres between terraces) of winter wheat, hairy vetch, and milo. We believe this method maximizes the usability of the food plots and stretches their impact across more acreage.

We have used this same methodology in planting strips of sorgum almum across the ranch, as well. Sorgum almum is broadcasted from a tractor as we pull a 15-foot disc plow on a meandering path through each pasture. These "meandering strips" provide suitable travel corridors and allow us to add supplemental feed to a large number of adjacent acres. We selected sorgum almum for its propensity to grow quickly and produce seed and it did not disappoint this year.

The abundant rainfall we received in October to December 2018 also ensured that our winter wheat produced very well, and rainfall we received from April to June in 2019 allowed us to produce a decent crop of milo (for our area). We planted two varieties of milo: (a) white milo called hegari (or "hi-gear) and a hybrid grain sorghum. While the grain sorghum produced abundant leafy forage, seed production was low. We will be planting hegari from now on. In addition to our food plots in the CRP fields we planted three larger tracts for use as dove fields with alternating tracts of winter wheat, hairy vetch, milo, and Turner Seed Company's Dove Mix. As an added bonus to our crops, the combination of tillage for planting and well-timed rain provided us an abundant annual sunflower crop in all the areas we planted.

SOIL DISTURBANCE

Bobwhite and Scaled quail thrive in a midsuccessional vegetative environment in West Texas. This means they need seed-producing plants for food, as well as bunchgrasses for nesting and higher-successional woody plants for cover. However, plant succession slowly pushes the vegetation toward the higher end of the spectrum as grasses take over forb-dominated areas and woody species encroach on grass-dominated areas. At RPQRR one of our most valuable tools to "set back" this succession is soil disturbance. We use a 15-foot disc plow to accomplish most of this. By discing during late-winter we trigger the germination of plants like annual sunflower, increase the relative abundance of seed-producing forbs, and promote insect abundance. This year, we plowed narrow strips between terraces in our former CRP fields, intermixed with untouched strips and planted strips. We staggered the disturbance of these strips from January to April in hopes of stretching out the effects of the soil disturbance. We also disced meandering strips through each pasture across the Ranch and disturbed 24 small plots (0.5-2 acres) to create "brood patches." as well. These patches grew up with thick stands of annual sunflower, kochia, and American basketflower and were teeming with grasshoppers. We avoid disturbing too much of any single tract. This maximizes the usability of these disturbed sites (keeping birds close to cover) and increases the total acreage impacted by the treatment.

SPREADER DAMS

In 2011, we installed 40 "spreader dams" or "quail oases" on our Research Ranch. Each dam was built by excavating (using a bulldozer) "a divot" (20-25 foot diameter) next to a dirt road and constructing a berm across that road (or using an existing terrace) to funnel runoff water into the divot. This creates a micro-habitat with a much higher functional rainfall amount within the spreader dam than that of the surrounding area. This micro-habitat has greater vegetative production, higher plant species diversity, and higher insect abundance. However, plant succession has taken over many of the spreader dams after their first seven years. In many of these instances, the vegetative composition has become grass-dominated rather than the seed-producing forbs we desire.

To combat this issue in 2019, we used a reartine PTO-driven tiller to disturb the soil in approximately 33% of our spreader dams. This effort succeeded in retarding plant succession and producing the vegetative composition we desire. We also broadcast various mixes of Maximillian sunflower, and Illinois bundleflower over some of the "renovated" spreader dams. We had great annual sunflower production in the spreader dams, but low rainfall in July-September prevented our Maximillian sunflower and Illinois bundleflower from doing well.



EXTENSION AND OUTREACH ACTIVITIES

Our mission dictates that we generate new research involving the "quail equation," but we also have a responsibility (and desire) to share our findings with our stakeholders. Our Research Ranch is always busy with visits from various groups, from our annual field day to much smaller groups (e.g., Master Naturalists). We also partner with many other conservation-focused organizations, including Texas A&M AgriLife Extension Service, Texas Wildlife Association and Quail Coalition. At RPQRR, our doors are always open, so stop in for a tour!

OUR OUTREACH ACTIVITIES FOR 2019 INCLUDED:

- Booth at Dallas Safari Club convention
- Hosted TPWD video crew for Lone Star Land Steward award
- Presentations at Texas Chapter of the Wildlife Society Meeting
- T. Boone Pickens Sportsman of the Year Banquet
- Hosted Texas Tech's Prescribed Burning class (4 sessions)
- Rolling Plains Prescribed Burn Association
- Quail release event in Erath Co.
- Property visits (consultations by Dr. Rollins)

- Guest lecture at Prairie Oaks Master Naturalists Meeting
- TPWD's Upland Game Bird Advisory Committee participation
- Annual field day; see <u>www.quailresearch.org/</u> <u>resources/</u>
- Upland Bird class from Sam Houston State University
- Rolling Plains Bobwhite Brigade
- Presentations at Reversing the Quail Decline Initiative Symposium
- Annual "Bug Day" involving students from Tarleton State University and other volunteers

- Presentations at The Wildlife Society's National Conference
- Big Country Chapter of Texas Master Naturalists
- Park Cities Quail Coalition's "State of the Quail" event
- Permian Basin chapter of Quail Coalition's inaugural banquet
- Cross Timbers Chapter of Quail Coalition's annual banquet
- Wildlife ecology class from Abilene Christian University

AND CHECK OUT OUR NEW WEBSITE (QUAILRESEARCH.ORG) TO FIND:

- New "Dr. Dale on Quail" podcast series (8 released in 2019)
- E-Quail Newsletter (12 issues)
- Television features: "Wildlife Heroes" (Nov 2019)

AWARDS & RECOGNITIONS:

- Lone Star Land Stewardship Award from Texas Parks & Wildlife Foundation
- Dr. Rollins inducted into Texas Conservation Hall of Fame (2018)

We also launched our new podcast "Dr. Dale on Quail," this year and appreciate the positive response.

We have released nine episodes to date:

EPISODE 1: ALL ABOUT RPQRF

EPISODE 2: DR. DALE'S QUAIL ODYSSEY

EPISODE 3: HOW MANY QUAIL ARE OUT THERE?

EPISODE 4: WHEN, WHERE, & WHY QUAIL BUILD NESTS

EPISODE 5: WHO ARE THE MAJOR PREDATORS OF QUAIL?

EPISODE 6: HAWKS AND ROADRUNNERS AND QUAIL, OH MY!

EPISODE 7: 2019-2020 QUAIL HUNTING SEASON: WHAT'S AHEAD?

EPISODE 8: BLUE QUAIL IN TEXAS

EPISODE 9: IF WE MAKE IT THROUGH DECEMBER

NOTABLE DATA:

- These nine episodes have been cumulatively streamed 10,352 times (or 5,176 hours of audio).
- While most of our audience is from the United States, we also have many listeners from around the world, including Mexico, the United Kingdom, Australia, Japan, Spain, Norway, Germany, Greece, France, South Africa, Sweden and the Dominican Republic.
- Special thanks to our co-host, Gary Joiner of Texas Farm Bureau, and our sponsor, Gordy & Sons Outfitters, for their support in making Dr. Dale on Quail possible.
- We plan to release a full slate of episodes in 2020, so if you have any suggested topics, please email drollins@quailresearch.org.



Our 2019 Field Day was attended by more than 100 Students of Quail. Photo by Joseph Richards.

RPQRF PARASITE SURVEILLANCE

ANNUAL SURVEILLANCE

Daniel King, Ranch Manager Kellieann Nemec, Technician Becky Ruzicka, Research Assistant

After the close of RPQRF's Operation Idiopathic Decline, the Foundation initiated a statewide parasite monitoring program. Each year, we solicit samples in the form of quail heads and wings from hunters and perform necropsies on those specimens to document parasitic infection by eyeworms (*Oxyspirura petrowi*). These passively-collected samples allow us to build and maintain a database by ecoregion, county, and property (depending on the number of heads submitted). We are able to evaluate two metrics: prevalence and intensity. Prevalence is the occurrence of parasitic infection or the percent of infected individuals in the sample population. Intensity is a metric of the infection load or the number of nematodes per infected individuals. These combined metrics provide a snapshot of parasitic infection in the quail population.

The 2018-2019 hunting season was our second year to collect and analyze samples from quail hunters. We received and necropsied 308 quail heads (223 bobwhite, 85 scaled quail) from 19 counties (see statewide maps). Both prevalence and intensity were similar to the 2017-18 hunting season, with the exception of juvenile bobwhites, which exhibited lower prevalence and intensity of eyeworm infection for the 2018-19 season compared to 2017-18.

We are continuing our monitoring program in 2020 and look forward to examining your samples (instructions for submission can be found at <u>www.quailresearch.org</u>).





Prevalence of eyeworm infections in adult and juvenile bobwhites in the 2017-18 and 2018-19 hunting seasons



Prevalence of eyeworm infections in bobwhite and scaled quail in the 2017-18 and 2018-19 hunting seasons.



Intensity of eyeworm infections in bobwhite and scaled quail statewide during the 2018-19 hunting season. Maps by John Palarski.



Prevalence of eyeworm infections in bobwhite and scaled quail statewide during the 2018-19 hunting season. Maps by John Palarski.

SOCIAL MEDIA PRESENCE

FACEBOOK @ RPQRR FACEBOOK.COM/RPQRR



BY THE NUMBERS:

Year to Date Followers: **8,427**

Total Daily Page Engaged Users: **106,500**

(number of unique users who engaged with the page)

Cumulative Daily Reach: **814,699**

(number of unique users who saw content)

FOLLOW US ON INSTAGRAM @**RPQRF**

TOP POSTS FROM 2019



Rolling Plains Quail Research Ranch Published by Dale Rollins [?] · February 24 · Ø

Keep your friends close and your enemies closer. Pictured is coyote scat containing hackberries. "Mast", i.e., fruits of woody plants is generally in the "Top 3" of coyote food items at RPQRR. In the past this predator was deemed a threat to quail. Research conducted on the ranch (and elsewhere on ducks and pheasants in northern plains) finds them to rarely eat quail. Instead these omnivores aid in taking out mesopredators such as raccoons and skunks which forage for quail eggs during nesting season. We believe that coyotes do more good then bad on the RPQRR. (posted by K. Nemec)



Rolling Plains Quail Research Ranch Published by Dale Rollins [7] - June 12 - S

It doesn't get much better than this! One of our bobwhite hens in Erath County hatched her first clutch successfully today; 16 eggs in total! Bobwhites are precocial, meaning their young are mobile immediately after hatching. They are able to leave the nest shortly after hatching to begin foraging. In contrast, all songbirds and raptors produce altricial young that are incapable of immediately departing from the nest and need to be fed by their parents. We have more active nests on our research site and are hoping to have more hatches soon! (posted by J. Palarski)



RPQRF TRANSLOCATION RESEARCH INITIATIVE

Since 2013, one of RPQRF's major priorities has been translocation research. Our goal is to improve the effectiveness of translocation as a management tool to reestablish wild quail populations. We have conducted three translocations each of bobwhites and scaled quail, including a reintroduction of scaled quail to RPQRR. Our current effort is a bobwhite translocation in Erath County. We are also wrapping up analysis on the large-scale translocation of scaled quail in Knox County conducted in 2016 and 2017.

The following pages summarize this year's translocation efforts both in the field and through data analysis (an overview of our translocation work can be found at www.quailresearch.org/research-projects).



TRANSLOCATION OF NORTHERN BOBWHITE IN CENTRAL TEXAS

John Palarski and Heather Mathewson, Tarleton State University, Stephenville, TX Dale Rollins, Rolling Plains Quail Research Foundation, Roby, TX Brad Kubecka, Tall Timbers Research Station and Land Conservancy, Tallahassee, FL

Objective: Assess the effects of source population on survival, dispersal, and reproduction of translocated bobwhites.

Translocation is the intentional movement of a living organism from one area to another. It is frequently used to either introduce individuals to areas outside its native range, reintroduce individuals to parts of its native range from which they became extirpated, or re-stock individuals to rescue an existing population. Translocation has been used successfully to accomplish introduction, reintroduction, and re-stock many different species of game birds. Despite numerous success stories, however, the effects of source population in game bird translocation is not well understood. We translocated 167 bobwhites from west (n = 64) and south (n = 103) Texas to a 2,200 acre site in central Texas during March 2019 to better understand the impacts of source population. We radio-marked 111 individuals (n = 55 south Texas, n = 56 West Texas) to monitor survival, dispersal, and reproduction. Cumulative survival was poor, but similar for both source populations (Fig. 1). Most of the mortality occurred in the first 30 days post-release. We observed 17 individuals disperse off site (minimum known dispersal = 1 mile) and we located 9 nests (5 West Texas hens, 4 South Texas hens). We will translocate individuals from west and south Texas again during 2020. Findings from this study will inform managers who wish to translocate bobwhites on the effects of source population.





Release of translocated wild-caught bobwhites in Central Texas, March 2019. Photo credit: Elizabeth Brogan.



SHORT-TERM MOVEMENTS OF TRANSLOCATED NORTHERN BOBWHITE IN CENTRAL TEXAS

Elizabeth Brogan, John Palarski, and Heather Mathewson, Tarleton State University, Stephenville, TX Dale Rollins, Rolling Plains Quail Research Foundation, Roby, TX Brad Kubecka, Tall Timbers Research Station and Land Conservancy, Tallahassee, FL

Objective: To describe short-term movements of translocated bobwhites post-release.

The decline of the northern bobwhite has resulted in local, regional, and statewide extirpation across its range. Within the Cross Timbers ecoregion of Texas, this decline is evident and remnant populations exist across a fragmented landscape. Translocation has emerged as a possible solution to restock remnant populations in restored habitat. Site fidelity post-release is crucial to the success of a translocation effort. Although mostly sedentary, bobwhites possess the ability to make large movements that can lead to decreased survival over time. In April 2019, we released 167 wild-trapped bobwhites on a 2499 acre area in Erath County, Texas. We fit 5 males with backpack-style GPS transmitters. Our objective was to describe shortterm movements of translocated bobwhites. The GPS transmitters obtained daily fixes at 0800, 1530, 1930, and 2200 hrs CST for 3 weeks post-release. These times represent morning foraging, afternoon loafing, evening foraging, and roosting. Moreover, this information allowed us to monitor initial movement patterns of translocated bobwhites upon release. Individual core home ranges varied from 6.7 to 30.3 ha for all 5 birds, and they did not move more than approximately 400 m from their release site (Figure 1). Mean daily movement did not exceed 400 m for any of these individuals. We found that translocated male bobwhites, employed under a soft release, maintained high site fidelity within the first 3 weeks post release. This suggests that a soft release may be beneficial for translocated bobwhites in terms of reducing their dispersal off-property.

33



Monitoring radio-marked translocated bobwhites in Erath County.



50% Kernel density estimates for 5 translocated male bobwhites fitted with PinPoint GPS transmitters, Erath Co., TX, 2019.

EFFECTS OF SOURCE POPULATION AND RELEASE STRATEGY ON REINTRODUCED SCALED QUAIL MORTALITY AND DISPERSAL

Becky Ruzicka and Dale Rollins, Rolling Plains Quail Research Foundation, Roby, TX

OBJECTIVE: To determine 1) the appropriate length of time to hold translocated scaled quail prior to release and 2) if the source population influenced mortality or dispersal post-release.

Scaled quail have declined across their range even more sharply than northern bobwhites leaving previously occupied ranges depopulated, particularly in the Rolling Plains. As such, scaled quail have been the recent focus of reintroduction efforts. At RPQRR, we were able to reestablish a population of scaled quail using a soft (or delayed) release. Research at the Matador WMA indicated that delayed release was more effective at increasing the number of birds that survived and remained on site compared to a hard (or immediate) release. Additionally, research on both bobwhites and scaled quail indicates that quail translocated within the same ecoregion tend to perform better than quail translocated from outside their native ecoregion. However, the Edwards Plateau represents a much more stable source of birds for translocation efforts aimed at repopulating the Rolling Plains.

We translocated 888 scaled quail to a 100,000+ acre site in Knox County in 2016-17. We varied the holding times from 1-9 weeks and sourced birds from two distinct habitats: Rolling Plains and Edwards Plateau ecoregions. This allowed us to evaluate how mortality and dispersal varied with the length of holding time and/or differed between source populations. We used a multi-state mark-recapture model with state uncertainty to determine these effects.

We found that as the length of holding time increased, mortality increased slightly, but the dispersal off site decreased. We also found that the average level of both mortality and dispersal were higher in a drought year compared to a wet year, however mortality was disproportionately higher. As a result, we found that the optimum holding time was 8 weeks in a drought year and <9 weeks in a wet year. We did not find any influence of source population on either mortality or dispersal. This indicates that the Edwards Plateau is a suitable source population for reestablishing populations of scaled quail in the Rolling Plains.







The probability that a scaled quail hen survived and remained within the core release area (apparent survival) was higher in 2016 compared to 2017. Additionally, we observed an increase in apparent survival with increased length of holding time in the surrogator prior to release.

COLLABORATOR RESEARCH

AT RPQRR

Every year, the Rolling Plains Quail Research Foundation collaborates with many different researchers and graduate students at institutions across the state of Texas and beyond. Additionally, our Research Ranch serves as a living laboratory for more than just quail research. Since our inception in 2006, we have facilitated research on monarch butterflies, horned lizards, roadrunners, raccoons, coyotes, and more! The following pages summarize our collaborative efforts for 2019.

If you are interested in an opportunity to use our Research Ranch as a study site, contact Dr. Dale Rollins (<u>drollins@quailresearch.org</u>).



Our research on the Research Ranch and elsewhere is done in collaboration with and supported by the Natural Resources Institute as Texas A&M University.



QUAIL AND RAINFALL:

DOES MANAGEMENT MATTER?

Alec D. Ritzell, Fidel Hernández, and David Wester, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville John T. Edwards, Cross Timbers Consulting, Inc. Dale Rollins, Rolling Plains Quail Research Foundation

Objective: To evaluate the relative effects of rain and management on bobwhite density and to determine whether management can stabilize bobwhite populations in the face of variable rain.

Rain is a strong driver of quail populations on southwestern rangelands—populations dramatically increase during wet periods and drastically decrease during drought. Quail managers have attempted to regulate these boom-and-bust fluctuations via management such as conservative grazing, supplemental feeding, predator control, and other practices. However, given that rain can account for up to 70-90% of the variability in regional quail abundance, the effectiveness of quail management has been questioned. We are building on current research to create a 5-year dataset (2014-2019) of quail density that will be used to assess whether management can sustain quail density and reduce its variability on Texas rangelands. Helicopter surveys are being conducted in the Rio Grande Plains and

Rolling Plains ecoregions of Texas during winter (December-January) of each year to determine quail numbers on 15 study sites. We will quantify quail management on each ranch via landowner surveys and document annual rain. We will use these 3 sources of data (quail density, management intensity, and rainfall) to evaluate the importance of management in maintaining quail densities on rangelands subject to variable rain. Our preliminary analyses suggest that management can increase quail density beyond that of less intensively managed properties. However, management has not completely eliminated inter-annual bobwhite population variability. Rain appears to be a less influential driver of quail populations at the ranch scale. Thus, management may be an effective practice for increasing quail density at a local site beyond that of non-management properties despite the strong influence of rain on quail populations at the regional scale. —

Comparison of mean bobwhite density on sites with varying quail-management intensity in the A) Rio Grande Plains, and B) Rolling Plains, Texas, 2014-2018.

RECOVERING THE MASKED BOBWHITE

Lacrecia Johnson, Rebecca Chester, United States Fish and Wildlife Service, National Wildlife Refuge System, Southwest Region

Objective: The masked bobwhite is a charismatic endangered subspecies of America's favorite game bird, the northern bobwhite. We aim to establish viable populations of the masked bobwhite within its historic range, reclassify the bird, and provide increased recreational opportunities to the public.

In the United States, the masked bobwhite was extinct in the wild by 1900 and its status in Mexico is uncertain. Past recovery efforts have left room for improvement. In 2017, the Masked Bobwhite Recovery Program was reorganized and refocused, leading to significant progress toward recovery goals. The release of captive-reared masked bobwhites to establish wild populations has had mixed results over time. In the late 1970s and early 1980s, United States Fish and Wildlife biologists led the development and implementation of conditioning techniques with encouraging success. After many years of abandonment, we are again employing this successful technique in combination with an accelerated habitat restoration effort. Conditioning techniques assist birds in learning to respond correctly to their environment. In our case, we use a wild northern bobwhite captured in Texas, some of which come from the RPQRR. as the parent. They are vasectomized, fitted with a radio transmitter, and paired with about 15 masked bobwhite chicks each. Following a short bonding period in captivity, the parent and chicks modified version of the Texas Quail Index. Birds are tracked to better understand survival, movement and habitat preferences.

Based on our data, recovery goals for the masked bobwhite are achievable. Following the first year of releases, we estimated annual survival at just over 20%. Scores from the modified Texas Quail Index, combined with remote sensing and telemetry data, show multiple locations on BANWR are suitable for supporting populations of masked bobwhite and that they can be expanded and connections improved through our habitat restoration work.

The United States Fish and Wildlife Service, in conjunction with our partners, has demonstrated the ability to establish masked bobwhite through captive stock and the foster parent approach with a survival rate equivalent to other wild bobwhite populations. In addition, we continually implement habitat restoration guided by the best available by limited literature. We have reached the upper bounds of what that information provides and strive to better understand how masked bobwhites utilize the habitat to better guide restoration efforts that will increase nesting success and survival and movements allows for the refinement of our release techniques in regards to timing, location, parent:chick ratio, age at release, and

A captive male masked bobwhite stands tall in the sunshine at Buenos Aires National Wildlife Refuge in southeastern Arizona. Photo courtesy of Paula O'Briant

Marked with a radio for monitoring survival a vasectomized Texas bobwhite foster parent exits a release box with his adopted masked bobwhite chicks on the Buenos Aires National Wildlife Refuge. *Photo courtesy of Paula O'Briant*

DO INSECTS BIAS STUDIES OF COYOTE DIETS?

Hong Seomun, Melody Harrington, Phillip Gipson, John Baccus, Department of Natural Resource Management, Texas Tech University

Objective: to determine sources of bias in studies of coyote diets.

We have utilized the analysis of coyote scats to investigate seasonal diets of coyotes in relation to availability of animal and plant foods on the Rolling Plains Quail Research Ranch since April 2018.

Our dietary studies are based on analyzing the contents of coyote scats collected each month since April 2018. We noted a marked and unexplained variation in the seasonal occurrence of scats, suggesting a bias that potentially impacted the credibility of the content of scats as indicators of coyote diets. Something appeared to influence the number of scats that were available seasonally for analysis. During the last 14 months we have monitored the number of scats available on the same transects.

The seasonal differences in the availability of scats surged from lows of 42 in May, 20 in June, and 36 in July 2019, to highs of 138 in August, 97 in September, and 139 in October 2019. This is a 3.81 fold increase. We have no evidence that the home ranges of coyotes shifted substantially from summer to fall or that there was an influx of coyotes into the area during fall that might help explain the change of abundance of scats. There were, however, numerous fragments of scats and discolored spots where scats had been present during the summer collections. It appeared that some scats had been consumed or removed from the transects.

Care was taken during the summer to ascertain what was happening to scats. A major cause of scat disappearance appeared to be consumption or other utilization by insects. Figure 1 is a scat that was recently discovered by dung beetles, with 2 beetles starting to utilize the scat. Figure 2 is a scat nearly consumed with more than 35 dung beetles, numerous butterflies and two species of flies on the remains. Figure 3 shows the remains of a second coyote scat that contains numerous exoskeletons of dung beetles and other insects that may have been utilizing an earlier coyote scat where the second coyote consumed that scat along with the beetles utilizing it, thus completing a cycle from a scat produced by a coyote, utilized by dung beetles, then the beetles in that scat were consumed by a second coyote that in turn, produced a scat that contained their exoskeletons. Within two to four days, no evidence of the scat remained.

We hypothesize that consumption of coyote scats by insects during summer accounts for the disappearance of a substantial portion of scats. If the attraction of insects to scats is related to the consumption by coyotes of particular foods, then the remaining scats, not consumed by insects, may represent a biased sample of foods actually consumed by coyotes. We are designing a rigorous sampling protocol to allow us to determine the fate of scats containing representative foods available to coyotes on a seasonal basis.

The evaluation of factors such as selective consumption of scats by insects, that may introduce significant bias into the use of scats in determination of coyote diets is important because of the widespread acceptance of scat contents as credible indicators of foods consumed by coyotes.

Coyote scat recently discovered by dung beetles.

A scat nearly consumed with more than 35 dung beetles, numerous butterflies, and two species of flies on the remains.

Remains of a coyote scat that contains numerous exoskeletons of dung beetles and other insects that were present in another scat that was consumed by this coyote. The remains are from insects that were utilizing the previous scat when it was consumed by the coyote.

FACTORS INFLUENCING TWO PRIMARY CONSUMER POPULATIONS

Katie R. Hooker, University of Florida, Department of Wildlife Ecology and Conservation **Robert A. McCleery,** University of Florida, Department of Wildlife Ecology and Conservation **Theron M. Terhune,** Tall Timbers Research Station and Land Conservancy, Tallahassee, FL

Objective: To determine the environmental factors that drive long-term Northern bobwhite and cotton rat population fluctuations across their southern geographic range.

Cotton rats and Northern bobwhite coexist across their geographic range. Many times, their population fluctuations are synced, indicating that similar factors may be driving both populations. Some speculate that the main driver is predators; however, this has never been tested in the southeastern United States with cotton rats and bobwhite.

Using long-term bobwhite and cotton rat density from sites at Rolling Plains Quail Research Ranch, Tall Timbers Research Station in Florida, and the Jones Center at Ichauway in Georgia, we will model how seasonal vegetation, precipitation, and temperature and prescribed fire influence annual bobwhite and cotton rat densities.

We predict that both bobwhite and cotton rat populations will be sensitive to rainfall and vegetation. We also predict that the reproductive flexibility of cotton rats will allow them to respond opportunistically to favorable conditions and breed throughout the year, while bobwhite are more sensitive to specific seasonal variation related to their defined breeding season.

Understanding the drivers of these bobwhite and cotton rats can inform gamebird species management decision-making and hunting regulations. Additionally, the ability to identify how seasonal variation impacts bobwhite and cotton rat populations can help us predict future trends and adjust management decisions accordingly.

Hispid cotton rat (Sigmodon hispidus). Photo: K. Hooker

Northern bobwhite hen with chicks. Photo: Tall Timbers Research Station

ECOLOGICAL AND ENVIRONMENTAL FACTORS

IMPACTING FLEA-BORNE TYPHUS IN TARRANT COUNTY

Abigail Cheney, MPH, Epidemiology and Health Information Division, Tarrant County Public Health

Objective: Describe the epidemiological and environmental features of a newly emerging vector-borne infectious disease in Tarrant County. With the increase in reported cases and geographic expansion, we will analyze potential factors such as housing stalk, vegetation, and reservoirs.

Multiple jurisdictions in Texas have noted an increase of murine Typhus, including Tarrant County. In 2017, 26 cases were reported, a record for Tarrant County. Fewer than 5 cases per year were reported in Tarrant County prior to 2016. The increase was sustained in 2018 with 30 cases. Murine Typhus, a flea-borne disease often transmitted to humans through contact with rats, opossums and cats, is endemic to south Texas and California. A sustained increase of murine Typhus cases in north Texas represents a possible expansion of the area of endemic Typhus fleas. Compare trend data for small mammal populations with the temperature trends and Typhus cases. Increasing temperatures in north Texas appear to be contributing to an increase in small mammal populations, and specifically the vectors animals carrying R. typhi.

Photo by Joseph Richards

MONITORING TEXAS HORNED LIZARDS

IN THE ROLLING PLAINS OF WEST TEXAS

Bradley Lawrence, Dallas Zoo Department of Herpetology, Dallas Zoo Management, Inc.

Objective: We began preliminary data collection in the summer of 2010 and have continued through the 2018 active season, which is typically May through October. Our goals have been to determine Texas Horned Lizard population density estimates, determine habitat preferences, and gather basic life history traits including movement patterns, environmental preferences, behavior and spatial relationship with Harvester Ants.

The Texas horned lizard has disappeared from 60% of its former habitat. It is listed as a threatened species in Texas. Leaning what we can about the population at RPQRR will hopefully help us in our conservation efforts for this species as it relates to stopping the disappearance or even translocating animals to good habitat where they used to occur.

Our current method of collecting data consists of road surveys or "road cruising." The wellestablished system of roads at the RPQRR allows us to efficiently sample many habitats and cover many acres in a reasonable amount of time. Once spotted, the lizard is captured by hand. GPS coordinates are taken along with environmental conditions, UVB exposure, morphometric data, behavior, and potential prey interactions. The lizards are then marked with an electronic tag (PIT Tag), a tool used to determine population density through mark and recapture. In addition, we are collaborating with Drs. Dean Williams and Amanda Hale, Biology department of Texas Christian University, in their efforts to determining fine scale sex biased spatial distribution patterns of this population as well examining the overall Texas Horned lizard genetic diversity in the Rolling Plains and across Texas. This is accomplished by opportunistically taking DNA samples from capture animals with a cloacal swab.

To date we have spent over 1100 hours sampling roads resulting in more than 2000 captures. Approximately 1300 have been PIT tagged and 200 have been recaptured at least once. In addition to our normal data collection, this year we were able to have a more direct impact on the wild populations of Texas horned lizards. We brought 5 gravid female horned lizards back to the zoo. Once they laid eggs, we returned the females back to the exact location at which they were captured. All offspring hatched from these females, 72 total, were released at Mason Mountain Wildlife Management Area in conjunction with Texas Parks and Wildlife. The genetics from RPQRR represent wide genetic diversity and will be part of a great "seed" project at Mason Mountain WMA. Texas Parks and Wildlife have done an incredible job preparing the property for horned lizard reintroduction over the past few years. This area once supported horned lizards on its own. There is good vegetation, habitat and food source (harvester ants), and oh yes, QUAIL. Next year we hope to get more clutches from wild ranch lizards. Animals reproduced at the Dallas Zoo will be released at Mason Mountain WMA as well.

We intend to keep collecting data and monitoring the population at the RPQRR as well as supplementing the reproduction at the Dallas Zoo with additional eggs hatched from animals at RPQRR for release efforts with Texas Parks and Wildlife.

SCIENTIFIC PUBLICATIONS

OF THE ROLLING PLAINS QUAIL RESEARCH FOUNDATION, 2017-2019

Bruno A, A.M. Fedynich, D. Rollins, D, Wester. 2018. Helminth community and host dynamics in northern bobwhites from the Rolling Plains Ecoregion, U.S.A. *Journal of Helminthology* 1–7.

Bruno, A., D.B. Wester, D. Rollins, and A.M. Fedynich. 2019. Helminth Survey of the Northern Bobwhite (Colinus virginianus) from the Rolling Plains of Texas, U.S.A., *Comparative Parasitology* 86:10-16.

Downey M.C., D. Rollins, F. Hernandez, D. B. Wester, and E. D. Grahmann. 2017. An evaluation of northern bobwhite translocation to restore populations. *Journal of Wildlife Management* 81:800-813

Dunham, N.R., C. Henry, M. Brym, D. Rollins, R.G. Helman, and R. J. Kendall. 2017. Caecal worm, Aulonocephalus pennula, infection in the northern bobwhite quail, Colinus virginianus. International *Journal for Parasitology: Parasites and Wildlife*, 6:35–38.

Fedynich, A.M., K. Bedford, D. Rollins, and D. B. Wester. 2019. Helminth fauna in a semi-arid host species—Scaled Quail (Callipepla squamata). *Journal of Helminthology*: in press.

Keiter, D. A., and R. E. Ruzicka. 2020. Predator visits to acclimatization pens: implications for the soft-release of gallinaceous birds. *Oryx* 54:84-89

Kubecka, B., A. Bruno, and D. Rollins. 2017. Geographic survey of Oxyspirura petrowi among wild Northern Bobwhites in the United States. *National Quail Symposium* 8: 84

Kubecka, B.W., A. Bruno, and D. Rollins. 2018. Host specificity of Oxyspirura petrowi in wild turkey, *Southeastern Naturalist* 17 554-559.

Kubecka, B.W., N.J. Traub, V.V. Tkach, T.R. Shirley, D. Rollins, and A.Fedynich. 2018. Mesocestoides sp. in wild Northern Bobwhite (Colinus virginianus) and Scaled Quail (Callipepla squamata). *Journal of Wildlife Diseases*: 54:612-616.

Kubecka, B.W., J.T. Edwards, L.M. LaCoste, D. Rollins, F. Hernandez, and H.L. Perotto-Baldivieso. 2019. An evaluation of population indices for northern bobwhite. *Wildlife Society Bulletin* 43:291-301.

Martin, J.A., R.D. Applegate, T.V. Dailey, M.C. Downey, B. Emmerich, F. Hernández, D. Rollins, et al. 2017. Translocation as a Population Restoration Technique for Northern Bobwhites: A Review and Synthesis. *National Quail Symposium* 8:1-16.

Oldeschute, D.L., A. Halley, M.W. Wilson, D. Rollins, et al. 2017. Annotated draft genome assemblies for the Northern Bobwhite (Colinus virginianus) and the Scaled Quail (Callipepla squamata) reveal disparate estimates of modern genome diversity and historical effective population size. *G3: Genes, Genomics, Genetics:* 7:3047-3058.

Ruzicka, R. E., and D. Rollins. 2017. Effects of source population and release strategy on survival and dispersal of translocated. *National Quail Symposium* 8:388.

Ruzicka, R. E., Campbell, K. B., Downey, M. C., Rollins, D., Kubecka, B., Poole, M., and Ruthven, D. C. (2017). Efficacy of a soft release strategy for translocating Scaled Quail in the Rolling Plains of Texas. *National Quail Symposium* 8:.389-394.

Ruzicka, R.E., D. Rollins, and F. Hernandez. 2018. Predation on bobwhite and scaled quail by snakes in Texas. *The Southwestern Naturalist*: 63:268-289.

Xiang, L., Guo, F., Yu, Y., Parson, L. S., LaCoste, L., Gibson, A., Presley, S. M., Peterson, M., Craig, T. M., Rollins, D., Fedynich, A. M. and Zhu, G. 2017, Multiyear survey of Coccidia, Cryptosporidia, Microsporidia, Histomona, and Hematozoa in wild quail in the Rolling Plains Ecoregion of Texas and Oklahoma, USA. *J. Eukaryot. Microbiol.*, 64: 4–17.

Zhang, M.A., S. Zhenyu, D. Rollins, W. Fales, and S. Zhang. 2017. Pilot study of antimicrobial resistance in Northern Bobwhites (Colinus virginianus). *Avian Diseases*: 61:391-396.

Zhang, M.A., Yang, M., Su, H., Rollins, D., Zhang, S. 2017. Lactobacillus colini sp. nov., isolated from Northern Bobwhite (Colinus virginianus). *International Journal of Systematic and Evolutionary Microbiology* 67:325-329

Zhang, M., M. Yang , D. Rollins and S. Zhang. 2017. Differentiation of Corynebacterium uropygiale strains from Northern Bobwhite (Colinus virginianus) and Turkeys (Meleagris gallopavo). *Poultry, Fish, and Wildlife Science* 5:2

2019 DONORS

THANK YOU TO THE MANY GENEROUS DONORS WHO SUPPORTED THE ROLLING PLAINS QUAIL RESEARCH FOUNDATION

EAFTCA 20th Century Fund

Ag Crop Insurance Agency Inc.

Al Johnson

AM & BW Mixon Private Foundation

Bass Pro Shops

Big Covey Chapter Quail Coalition

Bob and Janice Allen

Bradley Ribelin

Charles and Beverly Caddell

Christopher Landherr

Cross Timbers Quail Coalition

Curtis Green

David Carothers

Dennis Mcfall

Dick McCallum

Dorrace Haynes And Elizabeth Lyckman

Elam Enterprises

Evan and Kaleigh McMordie

Fidelity Charitable

Gary Cooney

Gary Horton

George Allen

Glenn Davis

Guinn Crousen

H.A "Bud" Smith

J Marc Myers

Jack Owens Jan Richardson Jeffrey and Valerie Palarski John C. Oliver John F. Perez John Shackelford John Thornhill Jordan Pichanick Justin Trail K. Suzanne Brown **Katy Hoskins Keith Bonds** Kenneth and Becky Hansen **Kevin and Leslie Cariker** Larry Hensley Larry Hughston Lisa Stewart Livestock Weekly Liz Tobin-Tyler Lonestar Outdoor News Foundation Marcy Huntsinger **Marty Griffith** Mason King **Maurine Tobin** McClaren Resources Inc. Mike and Kittie Davis **Mike Karnes** Mitzi Bain Neal, Jamie and Noah Hawks

Network for Good Park Cities Quail Paul Lea **Phillips Wagner** Quentin Wilke R.L. Orth Randy and Pam Kuiper Raymond Kimbell **Richard Long** Robert Klasing Robert L. Myers **Ronald Stringer Russell Gordy** Scott Longmore Sidney R. Clark III **Revocable Trust Susan Parsons** T. Scott Hickman Ted and Colleen Langworthy **Terry Hancock** Thomas Prehn Todd Olsen Wallace Emerson Wavne Schoettle Welch Ranch & Cattle Company LLC Wild Wings Ranch Will Tyler William and Mary Scott **Texas A&M University Natural Resources Institute**

We would especially like to thank Park Cities Quail Coalition for their significant contributions to RPQRF since our inception.

Over the last decade, PCQC has provided <u>\$4.6 million</u> in critical funding that has allowed our research efforts to flourish.

They are truly the wind beneath our research wings.

