ROLLING PLAINS QUAIL RESEARCH FOUNDATION

2020 ANNUAL REPORT

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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."

Photo by Joseph Richards

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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 — DIRECTOR OF OPERATIONS
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

A RETURN TO NORMALCY?

Dale Rollins
Executive Director

I began hunting quail when I was 13 years old—that was 52 years ago. My quail odyssey was constrained to half-section places here or 80-acre haunts there, all in Harmon Co., OK (the southwestern most county in Oklahoma bordered by Collingsworth Co. to the west and Childress Co. on the south). For the first half of that time span, I think I could count the number of "poor" years on a few fingers, at least prior to 1990 (e.g., 1984). But increasingly since that time it seems that the odds have flip-flopped. Granted, we've enjoyed several boom years (1997, 2005, and especially 2015 and 2016) but we've also endured some bad busts (e.g., 2011-12, 2017-19).

"Normalcy" is a noun that has been used ad libitum in 2020. As that teenager growing up in Hollis, OK, there was a convenience store that had a sign on one wall that read "it's not the ups and downs that bother me, it's the jerks." Jerks as used here can take many forms. Seems we're all weary of the jerks that have arisen in 2020. The COVID pandemic (and its far-reaching tentacles), politics, drought, low cattle prices, empty shelves of ammunition, and a third consecutive year of disappointing quail hunting. Is there a light at the end of the tunnel? Are we poised to return to normalcy in our quail pursuits? I think we are.

So, what can we be thankful for over the past year? For our Foundation's sake I'm surely glad that the Park Cities Quail Coalition was able to have their record-setting banquet in early March, just a week before the pandemic canned such gatherings. Second, we were blessed with excellent rainfall . . . until May 1 at least, providing a seasonal surplus that helped us survive the other 7 months of hardly any rainfall. Lastly, we actually have some momentum on the quail front; our November helicopter counts were up 46 percent and our intensive trapping-banding effort (also conducted in November) showed a 30 percent increase.

I often characterize our boom-bust cycles as "drought cocks the hammer and rain pulls the trigger." We're locked and loaded on that front provided that the Climate Prediction Center's ominous forecast of La Nina conditions persisting through the spring prove erroneous. Bobwhite populations in the Rolling and High Plains ecoregions tend to show the "most cyclical" population behavior among various parts of Texas, and it's typically exhibited on a 5-6 year cycle, so we're "due" right now. Let's hope history repeats itself.

We were saddened to lose two members of our team: A.V. Jones and Alec Ritzell. A.V. had served as a founding member of our Board for its entirety — his counsel will be missed. Alec was a promising graduate student working on a research project involving RPQRF — he died after a valiant struggle with brain cancer.

I hope you enjoy our annual report and appreciate the time, money, and sweat equity that brings these projects to bear. May the various jerks take a back seat this year and let us return to normalcy. Thanks for your continued interest and support and please contact me (drollins@quailresearch.org) if you have questions about any of our projects.

Dale Rollins

Dale Rollins
Executive Director

Photo by Joseph Richards

THE YEAR IN REVIEW

AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

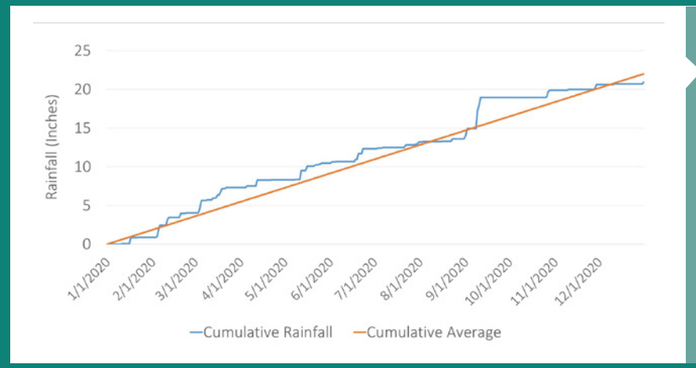
Daniel King
Director of Operations

As with the rest of the world, RPQRR's 2020 was an odd one. We began the year unseasonably warm in January. Despite the relatively warm temperatures (which typically reduce trapping success), our January small mammal trapping provided a good omen with a nearly three-fold increase from 2019. In addition, those warm temperatures brought with them above average rainfall and an early green up. So early that I noticed the first "spring" blooms on February 3rd. By the end of our spring trapping session in early March we were sitting comfortably with about 5.2 inches of rainfall (more than double the year-to-date average). The unfortunate side effect of the welcome rain and temperatures was a tremendous flush of cool-season grasses (e.g. bromes). Those choked out much of the warm-season grass production (e.g., silver bluestem).

Our first nest (of a radio-marked bird) was initiated by a bobwhite hen around May 1st with 12 more to follow in May. To accompany that nesting effort, spring call counts began on May 15th with a resounding chorus of 9.64 birds per stop. Calling rates decreased thereafter, with the final count at the end of June showing a paltry 2.36 birds per stop. Our nesting efforts followed closely with that trajectory adding only 7 more nests in June (most of them in the first two weeks).

After June 25th the water really dried up—we only received 1 inch of rain between June 25th and August 31st, and only 2 hens initiated nests. This closed our nesting season up with a total of 22 nests initiated (by the 35 hens radiomarked on May 1), 14 of which hatched chicks. The dry spell finally broke with a torrent of 5 inches in the first week of September leaving us to conduct roadside counts in the mud. Those counts indicated no change in abundance from 2019 at ~2.5 birds per mile. Rainfall once again fell off after that first week of September until we added some moisture by way of an early freeze and accompanying ice storm the last week of October.

Our covey call counts and helicopter survey offered some optimism, indicating a 22% and 46% increase in abundance from 2019 respectively. We trapped 600 unique individuals during our fall trapping session (a ~30% increase from 2019) despite another round of unseasonably warm temperatures. Preliminary analysis of those trapping data provided a density estimate of a bird per 4.5 acres. These numbers, paired with good overwinter survival, will hopefully have us poised for a nice start going into next breeding season.



Annual rainfall for 2020 at RPQRR vs. the long-term (10-year) mean. We completed the year about three inches below "normal."

LONG-TERM DATA COLLECTION

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 fulltime staff, interns, technicians, and 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, leg-band, 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 in contrast to the typical 2–3 year duration of most studies. The following sections provide a summary of our long-term data collection efforts. These data have been used to support many graduate student projects over the years and various in-house scientific publications. You can find our growing body of research archived on our website (www.quailresearch.org).

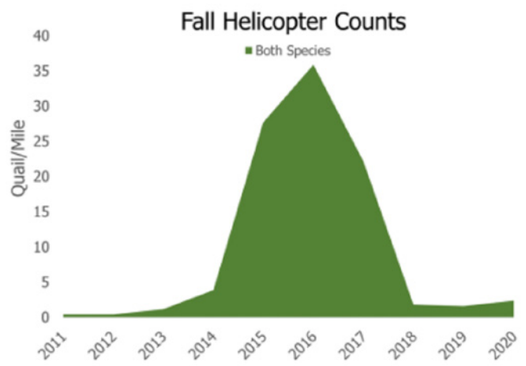
Photo by Joseph Richards

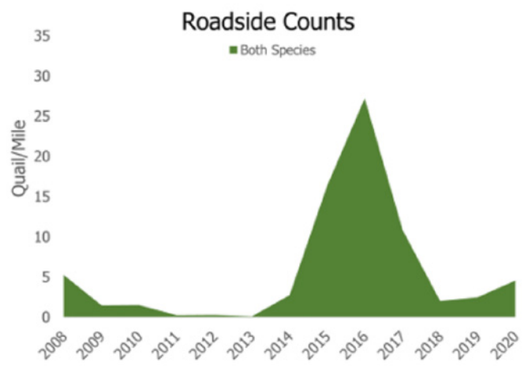
MONITORING QUAIL ABUNDANCE

AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

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.

Photo by Joseph Richards





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

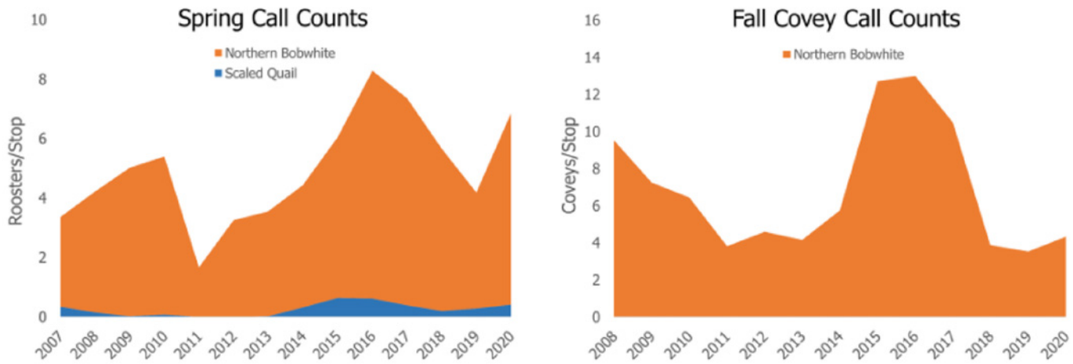
Graphs in green (■) represent indices where both species (bobwhite and scaled quail) are combined, orange (■) represents northern bobwhites, and blue (■) represents scaled quail. Population index data collected in 2020 showed small gains in abundance of both northern bobwhites and scaled quail. Population index data collected in 2020 showed small gains in abundance of both species at the Ranch.

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 identifying 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.

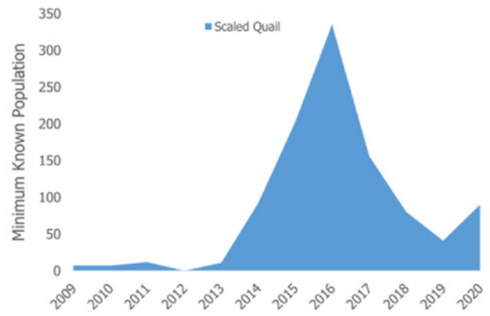
SPRING CALL COUNTS

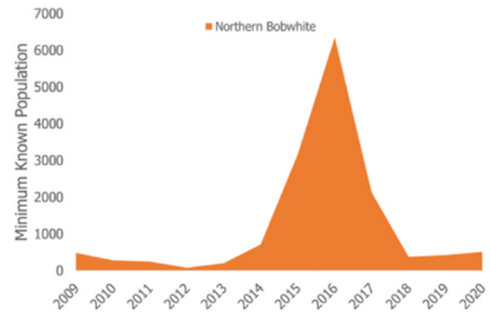
We use spring call counts as an index of spring abundance. Counts of bobwhite and scaled quail are conducted twice weekly from May–June. Our data approximately reflect the changes in abundance over time. Based on these data, an average of >7 bobwhite roosters per stop indicates high abundance, while counts averaging <3 bobwhite roosters per stop indicates low abundance. Scaled quail call counts are likely best used as an indication of presence/absence only due to the low calling rates of this species.

FALL COVEY COUNTS

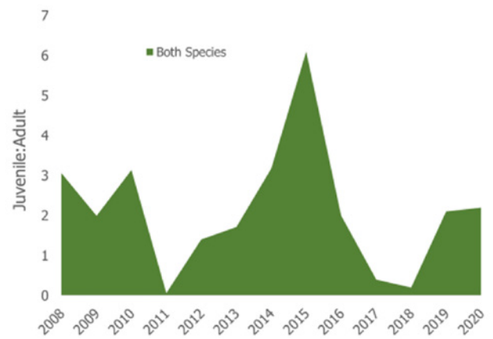
In October, we measure bobwhite abundance by listening at dawn for covey calls. Covey call counts are the most time intensive measure of relative abundance because researchers can only listen at one site per day.

For a comparison of our various metrics for counting quails, see Kubecka et al. (2019).





Minimum known population (MKP) of bobwhite and scaled quail on RPQRR from 2009–2020. MKP is the number of uniquely banded individuals we captured during the fall trapping session. Populations of both northern bobwhites and scaled quail rebounded slightly in 2020 following the lows of 2018 and 2019. Scaled quail abundance was likely influenced by a small scale translocation in 2020 to boost numbers.



Production (measured as a juvenile:adult) at RPQRR from 2009–2020. Production in 2020 was roughly equivalent to 2019. However, the 2019 values were likely inflated as a result of high adult breeding season survival. We often observe higher survival when hens put less effort into nesting. Juvenile:adult ratios are sensitive to changes in adult survival as well as production.

TRAPPING AND BANDING DATA

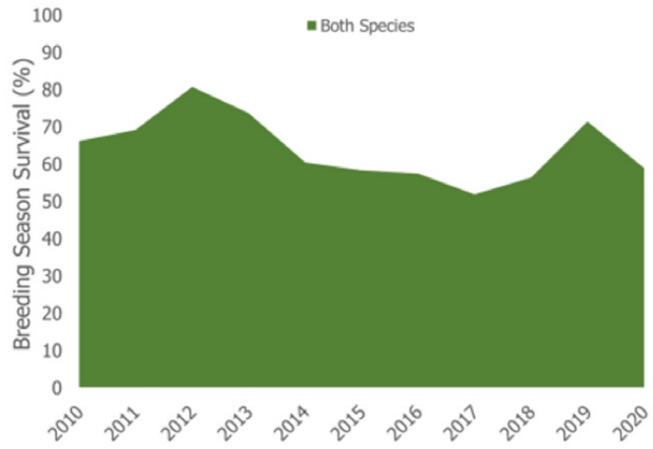
We trap quail on the Research Ranch intensively twice annually to: 1) affix radio-collars to monitor survival and reproduction, 2) monitor abundance, and 3) evaluate annual production (i.e., juvenile to adult ratio). Our trapping data documented the bobwhite population explosion the Rolling Plains ecoregion experienced in 2015-16 and the subsequent decline.

MONITORING QUAIL SURVIVAL

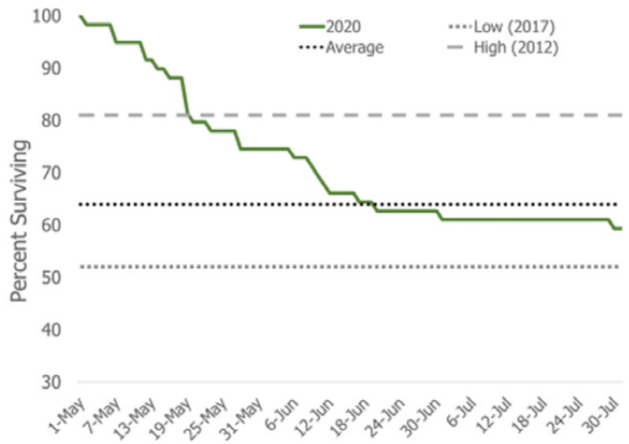
AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

Our primary source of information on quail survival at RPQRR is collected via radio-telemetry. Bobwhite and scaled quail are fitted with 6-g radio-transmitters 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 telemetry data are costly and time-consuming to collect.

Photo by Joseph Richards



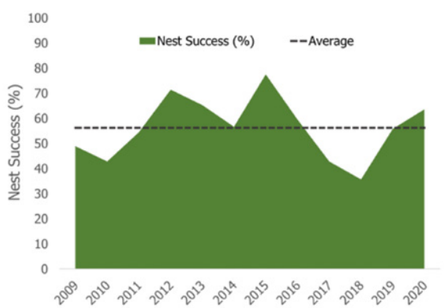
Breeding season survival in 2020 was roughly equivalent to average survival from 2010–2020.



NESTING SUCCESS

AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

Each radio-collared hen is monitored throughout the breeding season. Homing 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.



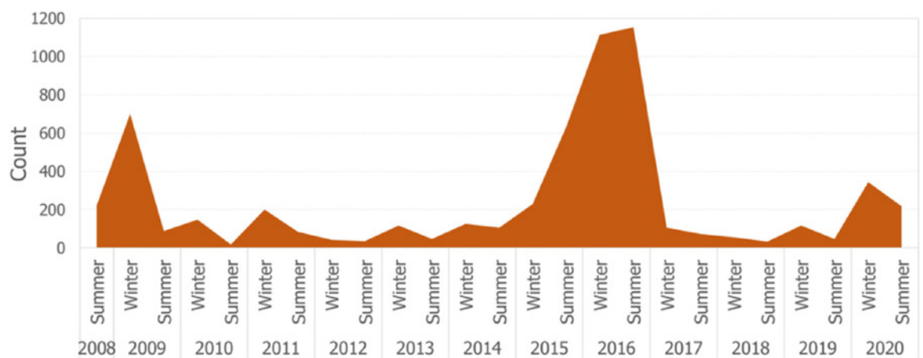
Year	Hens Entering Breeding Season	Nests Initiated	Nests per Hen	Successful Nests	Nest Success (%)	Hen Survival (%)	Production (J:A)
2009	79	47	0.6	23	48.9	--	2.0
2010	50	21	0.4	9	42.9	66.2	3.1
2011	73	11	0.2	6	54.5	69.2	0.1
2012	11	14	1.3	10	71.4	80.8	1.4
2013	27	23	0.9	15	65.2	73.7	1.7
2014	37	30	0.8	17	56.7	60.5	3.2
2015	41	49	1.2	38	77.6	58.4	6.1
2016	70	42	0.6	25	59.5	57.5	2.0
2017	34	35	1.0	15	42.9	51.9	0.4
2018	48	14	0.3	5	35.7	56.5	0.2
2019	33	34	1.0	19	55.9	71.5	2.1
2020	59	22	0.4	14	63.6	59.0	2.2

Nesting success in 2020 was a little above average. Early season precipitation improved range condition, but dry conditions prevailed through the end of breeding season. Percentages above 45% are considered excellent nest success. Most nests were initiated early in the year and no nests were initiated after July 10th. In previous years, we have observed nest initiation through the end of August.

SMALL MAMMALS

AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

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 dynamics. We believe that the small 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). Since 2008 we have documented 11 different species of small mammals at RPQRR. The most common species across all years has been the Hispid cotton rat.

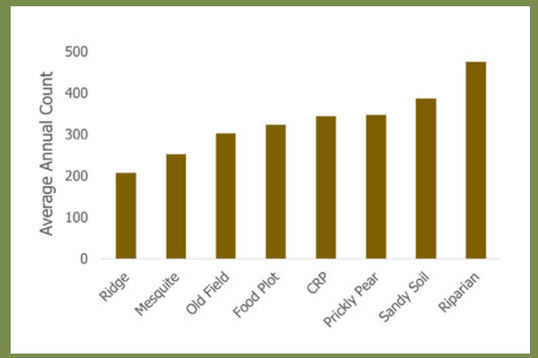


Changes in small mammal abundance at RPQRR from 2008-2020. Our index of small mammal abundance showed a slight increase in 2020 similar to quail populations.

ARTHROPODS

AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

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. We collect data using both pitfall traps and sweepnets. 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).



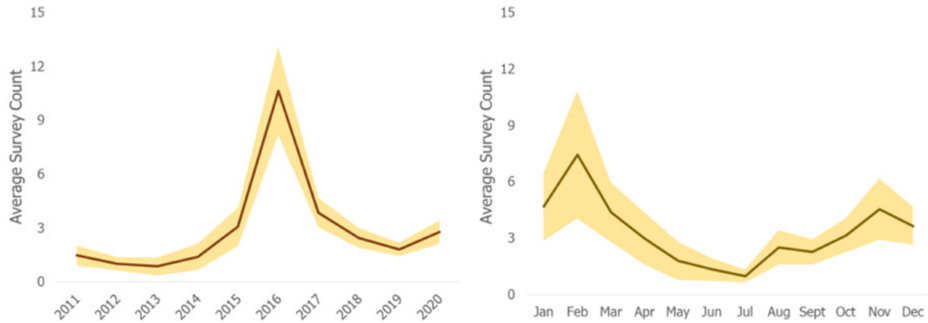
Indices of arthropod abundance at RPQRR, 2011-2019. These data include counts of individuals from 11 different Orders of arthropods found on the Ranch. Overall, riparian areas are the most productive habitats.

Photo by Joseph Richards

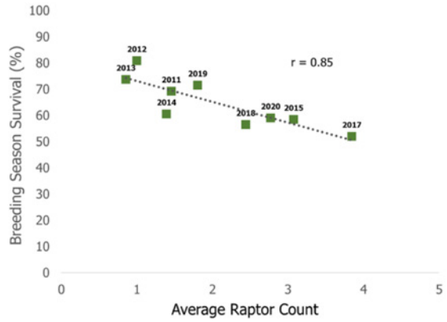
RAPTOR POPULATIONS

AT THE ROLLING PLAINS QUAIL RESEARCH RANCH

We conduct bi-weekly raptor count surveys on the Research Ranch. Raptors are important predators of quail and a major contributor to overwinter mortality. Much of that mortality occurs in the months just prior to breeding season when raptor abundance is at its peak in the Rolling Plains. The best (only) way to insulate quail populations from the threat of raptor predation is through proper habitat management (i.e., adequate grass and well-interspersed brush coverts). Research at the Ranch has shown that quail select the densest and largest individual shrubs for cover when pursued by a raptor. Shrubs such as catclaw acacia, lotebush, algerita, elbowbush, etc. form the best escape cover.



Annual raptor abundance at the Research Ranch peaked during the boom year of 2016. Raptors are a highly mobile species and can be expected to shift their distributions in response to abundant prey resources. On the Research Ranch, that means quail and small mammals. Peak raptor migration in the Rolling Plains occurs during Oct–Mar. Raptors are the greatest contributor to over-winter mortality in quail.



Despite raptor abundance being at its lowest during the breeding season, we still find that breeding season survival of quail is negatively correlated with raptor abundance during that time.

SPRING CALL COUNT ANALYSIS

Becky Ruzicka
Research Assistant

Hailey Wright
Technician

Spring call count surveys (a.k.a. cock call counts) are the most common method used by private landowners for measuring northern bobwhite abundance. Indices of abundance are used to gauge the true abundance of bobwhites on a property. True abundance is defined as simply the 'true' (usually unknown) number of animals on the landscape. By using an index, we are not measuring true abundance directly. We are measuring 'something' that we think is reflective of the true population abundance and, inherently, making the assumption that the 'something' will change in proportion to true abundance. In the case of spring call counts, that something is the number of roosters heard calling during a defined amount of time from a point location or listening station. Indices of abundance are used commonly by researchers and land managers because they are easier and often less costly to implement. However, to be useful the index of abundance must be an accurate reflection of true abundance.

Protocols for landowner monitoring programs, such as the Texas Quail Index, typically recommend 7-10 listening stations per route spaced 1-mile apart and to count those stations 3 times per year during peak calling (i.e., May – June). At the Research Ranch, we conduct spring call counts at a much higher intensity. There are 25 listening stations distributed evenly across the ranch and we conduct 8 counts per year at each station. One of our interns listens for 5 minutes at each station recording the total number of roosters and calls heard. We know that at this level of effort our spring call call count index is highly correlated with estimates of true fall abundance (r = 0.83; Figure 1); however, that level of monitoring effort is unattainable for most land managers. We sought to determine the minimum number of call count listening stations and surveys per year needed to accurately predict true fall abundance.

We first estimated true abundance using capture-recapture data (i.e., banding data) collected on the Research Ranch from 2011-2018. We then simulated different call count route scenarios using our full dataset of 25 listening stations and 8 counts per year. We varied the distance between listening stations resulting in scenarios where a landowner might conduct a survey with 2, 3, 4, 5, or 10 miles between listening stations (compared to the standard 1 mile between stations). Each of these scenarios resulted in a call count route with 13, 9, 7, 6, and 4 listening stations, respectively. For each of those route scenarios, we simulated varying numbers of call counts per year, by randomly drawing 2, 4, 6, and 8 counts from our full dataset. This resulted in 24 different simulated datasets of varying levels of effort. We correlated the spring call counts in each dataset with true abundance estimated using capture-recapture.

We found that even at the lowest effort (4 listening stations and 2 counts) there was no difference in correlation (r = 0.82) compared to the full effort (25 listening stations and 8 counts; Figure 2). Thus, we concluded that land managers can use the lowest effort we simulated and still get accurate counts. We estimated that the lowest effort scenario only requires approximately 5 staff-hours per year, while full effort requires 43 staff-hours per year (Figure 3). The data used to simulate these call count scenarios were conducted on approximately 4,500 acres of the Research Ranch, thus the conclusions here are likely only applicable at that scale. For instance, on a 13,000 acre property managers should consider tripling the amount of listening stations (i.e., 12 stations) to sample at the same intensity spatially.

Two other caveats associated with this analysis are worth considering. One, is that indices of abundance are best only when used to evaluate trends on the same property over time and when conducted using the exact same protocol. That leads to the second caveat: these simulations were pulled from data on only one property. The number of calling bobwhites at each listening station is very similar when averaged across years. In other words, the Research Ranch is all quail habitat. Properties with spatial variation in population abundance may need more listening stations to accurately capture that variation.

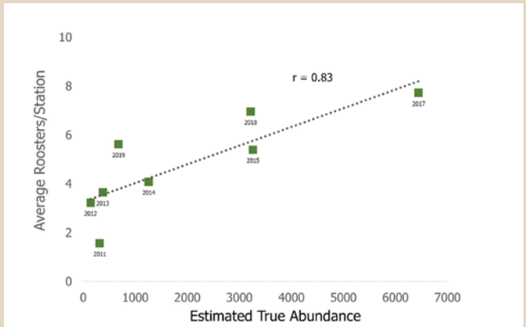


Figure 1. Correlation between average roosters per listening station and fall bobwhite abundance estimated from capture-recapture data on the Rolling Plains Quail Research Ranch, 2011-2018.

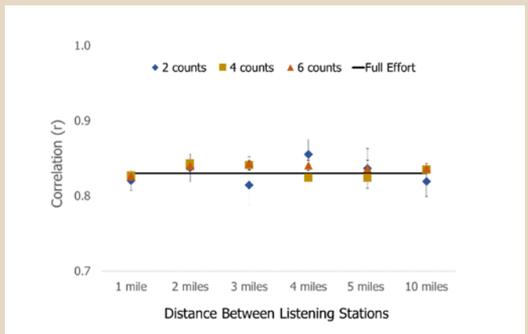


Figure 2. Correlation between spring call counts and fall abundance of bobwhites at varying levels of call count effort.

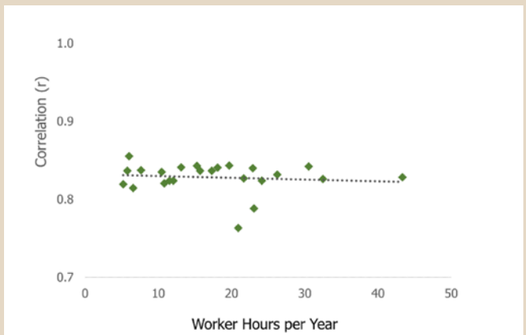


Figure 3. Spring call count monitoring effort measured in worker hours per year versus accuracy gained measured by correlation between average spring call count and fall abundance.

SCALED QUAIL AND DROUGHT

Becky Ruzicka
Research Assistant

Drought is a natural occurrence and historically common to the Great Plains. It is a part of the natural and human history in this region. Native species in this region have evolved to cope with drought often by shifting their distributions in response to a landscape mosaic of varying habitat quality. However, fragmented landscapes prevent these natural shifts and may cause populations to become locally extinct. It is under this paradigm that we have used translocation to reestablish quail in isolated, but formerly occupied, high quality habitats. These translocations include the reintroduction of scaled quail to the Research Ranch.

Scaled quail are thought to be more drought resistant than northern bobwhites because of the aridity of their native range. Yet many studies have anecdotally attributed between year variation in survival to changes in vegetative cover due to precipitation. These conclusions would seem to be at odds with one another. We used a 6-year capture-recapture dataset (collected during our bi-annual trapping) to evaluate the influence of drought conditions, seasonality, age, and sex on the reintroduced population of scaled quail on the Research Ranch from 2013-2019.

We found scaled quail survival is negatively impacted by increasing drought severity (Figure 1). The strength of this relationship was driven largely by two years: one with severe drought (2018) and one with very wet conditions (2015). We also found that scaled quail, similarly to northern bobwhites, experience lower over-winter survival compared to breeding season survival (Figure 2). This difference is most likely driven by large influx of migrating raptors in the Rolling Plains during winter season.

Our findings provide evidence that translocated populations, despite being small and isolated, can persist if weather conditions are favorable at the outset of reintroduction or reinforcement. Additional habitat loss and higher drought frequency will place greater importance on population restoration tools such as translocation and successful mitigation of drought impacts in small populations. This analysis is one of the most comprehensive ever on scaled quail survival and highlights the need for multi-year and year-round monitoring to inform effective conservation decisions.

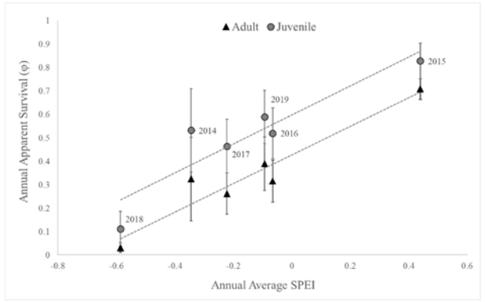


Figure 1. The relationship between annual apparent survival of scaled quail and annual average Standardized Precipitation Evapotranspiration Index (SPEI) at the Rolling Plains Quail Research Ranch, 2013–2019. SPEI incorporates data on precipitation, temperature, and potential evapotranspiration. Positive SPEI indicates wetter conditions and negative values indicate drier conditions.

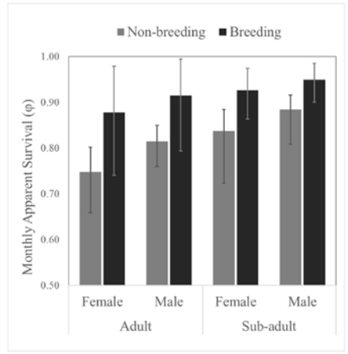


Figure 2. Apparent monthly survival of scaled quail by age, sex, and season in the Rolling Plains Quail Research Ranch, 2013-2019..

Photo by Joseph Richards

HABITAT MANAGEMENT AT OUR RESEARCH RANCH

RPQRF'S MANAGEMENT PHILOSOPHY

Daniel King
Director of Operations

Photo by Joseph Richards

At the Research Ranch we approach habitat management with the goal of maximizing usable space for quail. We attempt to maximize the quantity of habitat that meets the needs of quail prior to pursuit of the "ideal" habitat. We apply this concept by rating the habitat quality of various portions of the ranch on a scale of 1-10 (1 = pitiful, 10 = perfect). Our approach then is to manage to maximize the acreage that is at a 6 or higher. After that acreage is maximized, we shift focus to improving habitat to greater quality. We evaluate our habitat based on three basic habitat needs of quail: nesting cover, food, and escape cover.

The principal tools that we use to manipulate the habitat are soil disturbance, prescribed fire, and brush sculpting. The first tool, soil disturbance, sets back vegetative succession resulting in an increase in forbs (which produce food for quail) and insects on the landscape. We use cool-season prescribed burns in areas that we deem the relative proportion of bare ground has become too low, relative abundance of forbs has become too low, or previous years' grass growth has become too thick (often these three happen in conjunction). The third tool, brush sculpting, is used to create a habitat interspersed with brush in a way that allows quail to escape quickly from their predators. The final component of our approach to habitat management at the Research Ranch is the interspersion of the three quail needs. Essentially, we want a quail found at any point on the property to have access to all three of these habitats. We believe that through our efforts we have maximized usable space.

Photo by Joseph Richards

FOOD PLOTS

We focus most of our food plot attention 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 planted narrow, alternating strips (3-10 acres between terraces) of winter wheat and milo. We believe this method maximizes the usability of these food plots and stretches their impact across more acreage. This approach also creates a series of either wheat- r disced strips which do double duty as firebreaks during our prescribed buring efforts. We used this same methodology in planting strips of Sorgum almum across the ranch. We broadcasted Sorgum almum from the tractor as we pulled a 12-foot disc plow along a meandering path through each pasture. Meandering strips allow us to add supplemental forage (and travel corridors) to a large number of adjacent acres. The rainfall we received in early 2020 ensured that our winter wheat produced very well. However, that rain shut off before we could make a decent milo crop. We did finally have a small amount of seed production after a good rain in early September. 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."

SOIL DISTURBANCE

Bobwhite and scaled quail thrive in a mid-successional vegetative environment. One of our most valuable tools to maintain this stage of plant succession is soil disturbance. We use a 12-foot disc plow to accomplish most of this. By disking we hope to trigger the germination of plants like annual sunflower, increase the relative abundance of seed-producing forbs, and promote an increase in insect abundance. This year we plowed narrow strips in our former CRP fields between terraces intermixed with check strips and planted strips. We staggered the timing of disturbing these strips from January to April in hopes of stretching out the effects of the soil disturbance. In addition to the former CRP fields, we disked meandering strips through each pasture across the ranch. We also disturbed 24 small plots (0.5-2 acres) to create "brood patches". Unfortunately, a lack of rainfall during key points of the growing season caused our soil disturbance efforts to be disappointing. Production of our three key target plants (western ragweed, annual sunflower, and common broomweed) was low overall and not much better in the disturbed plots.

SUPPLEMENTAL FEED

While not technically a habitat management activity, supplemental feeding is a common management practice for many quail managers. Historically, Dr. Rollins's official stance on supplemental feeding has been "if you want to feed, and you can afford to feed, then feed". The Research Ranch has maintained a number of stationary, gravity fed "Currie Quail Feeders" for several years. These feeders are simply a steel barrel with a lid and several small holes drilled around the bottom. We have maintained feeders in 4 of our pastures at a relatively low density (about 1 feeder per 60 acres). In 2020, the combination of untimely lack of rainfall resulted in low forage availability. In a year like 2020, we recommend supplemental feeding.

To address the low forage availability, we have recently implemented a more intensive supplemental feeding program. We placed stationary feeders at a density of 1 per 20 acres on 25% of the ranch and began broadcast feeding on another 50%. We designated 1.7 miles of feed route per 100 acres on the about 2,000 acres we are broadcast feeding. We are broadcast feeding at two rates (65 lbs per mile, and 130 lbs per mile) on 25% of the ranch each. We hope that this feeding program will bolster over-winter survival and maintain sufficient breeding capital into the nesting season.

Photo by Joseph Richards

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. Our doors are always open, so stop in for a tour!

LIKE MANY OF YOU, WE FOUND OURSELVES A LITTLE CLOSER TO HOME THIS YEAR AND HOSTING FEWER VISITORS. NEVERTHELESS, OUR OUTREACH ACTIVITIES FOR 2020 INCLUDED:

- Booth at Dallas Safari Club convention
- Presentations at Texas Chapter of the Wildlife Society Meeting
- T. Boone Pickens Sportsman of the Year Banquet
- Quail release event in Erath Co.
- Property visits (consultations by Dr. Rollins)
- TPWD's Upland Game Bird Advisory Committee participation
- Annual "Bug Day" involving students from Tarleton State University and other volunteers
- Presentations at The Wildlife Society's National Conference
- Park Cities Quail Coalition's "State of the Quail" event

GO TO WWW.QUAILRESEARCH.ORG TO SIGN-UP FOR THE MONTHLY EQUAIL NEWSLETTER OR READ ARCHIVED ISSUES!

DR. DALE ON QUAIL PODCAST IN 2020

- 12 episodes available on Apple or Android
- 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
- If you have any suggested topics, please email drollins@quailresearch.org

DOCUMENTARY MOVIES

Over the years we have been fortunate to have our work featured in many documentaries. Several new documentaries are available to watch online. Scan the QR codes below with your smartphone camera to watch!

2019 Lone Star Land Steward Award: Rolling Plains Quail Research Ranch

YETI Stories from the Wild: Canary of the Prairie

Americana Outdoors: Quail Hunting in West Texas Under a Rollercoaster of Conditions

SOCIAL MEDIA PRESENCE

FACEBOOK@RPQRR FACEBOOK.COM/RPQRR
FOLLOW US ON INSTAGRAM AT **RPQRF**

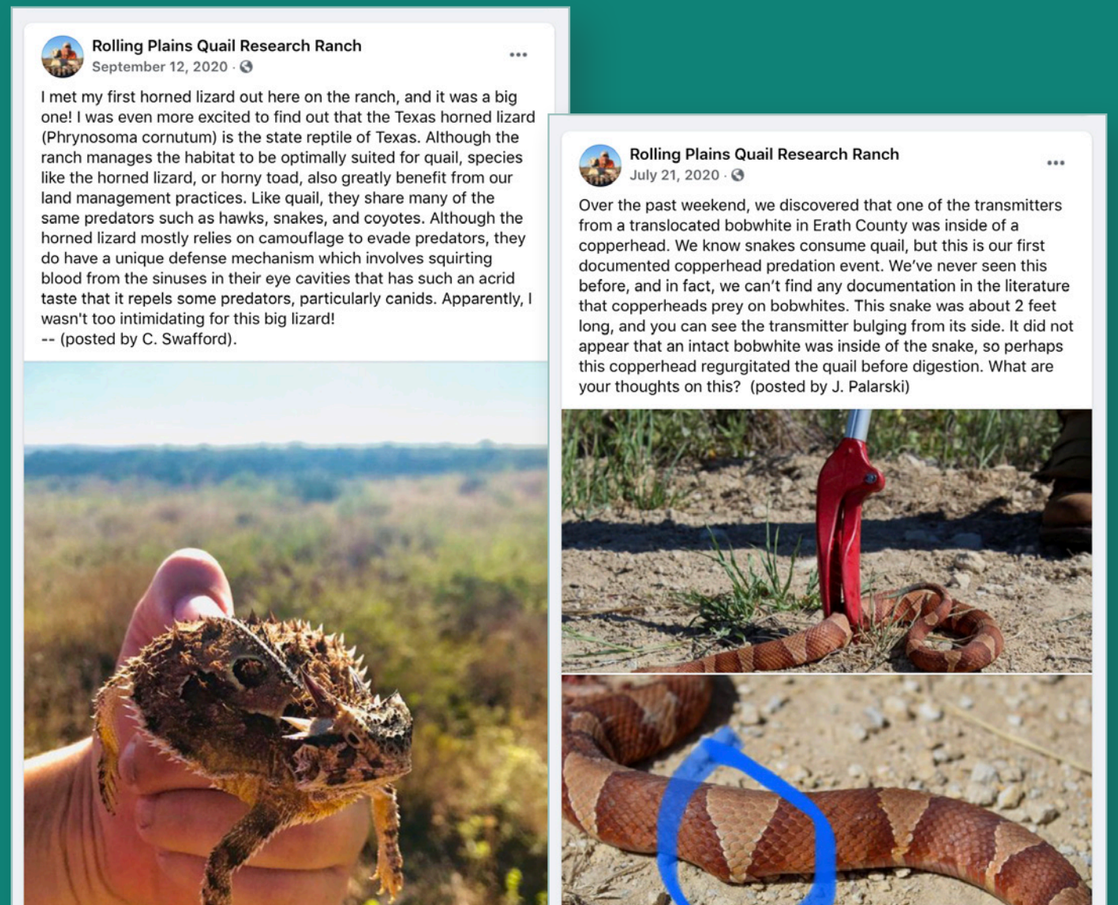
BY THE NUMBERS:

Year to Date Followers: **8676**

Total Daily Page Engaged Users: **52,595**
(number of unique users who engaged with the page)

Cumulative Daily Reach: **456,335**
(number of unique users who saw content)

TOP POSTS FROM 2020



EYEWORM PARASITE SURVEILLANCE

ANNUAL SURVEILLANCE

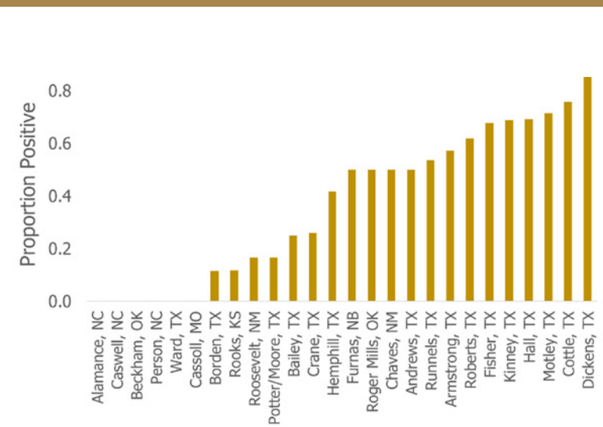
Becky Ruzicka
Research Assistant

Daniel King
Director of Operations

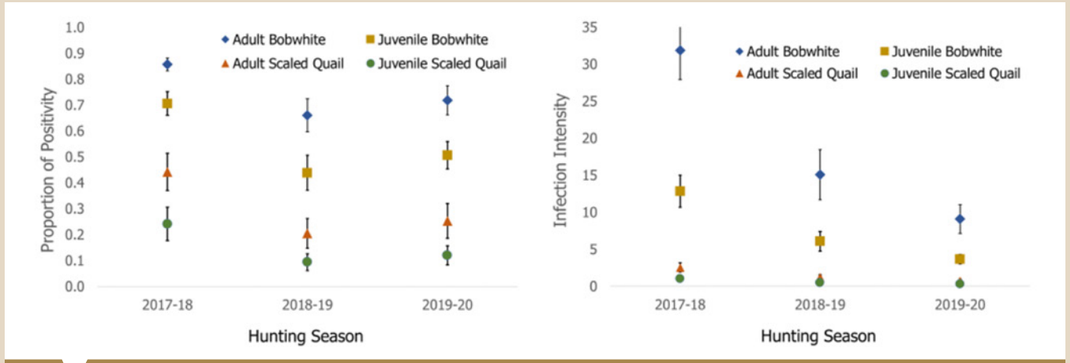
After the close of RPQRF's Operation Idiopathic Decline, the Foundation initiated a statewide parasite monitoring program. Each year, we solicit samples in the form of quail heads and wings from hunters and perform necropsies on those specimens to document parasitic infection by eyeworms (Oxyspirura 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 2019-2020 hunting season was our third year collecting and processing samples from quail hunters. We received and necropsied 466 quail heads (379 bobwhite, 87 scaled quail) from 30 counties. Most of the samples originated from Texas, but we also processed samples from New Mexico, Oklahoma, Kansas, Nebraska, and North Carolina!

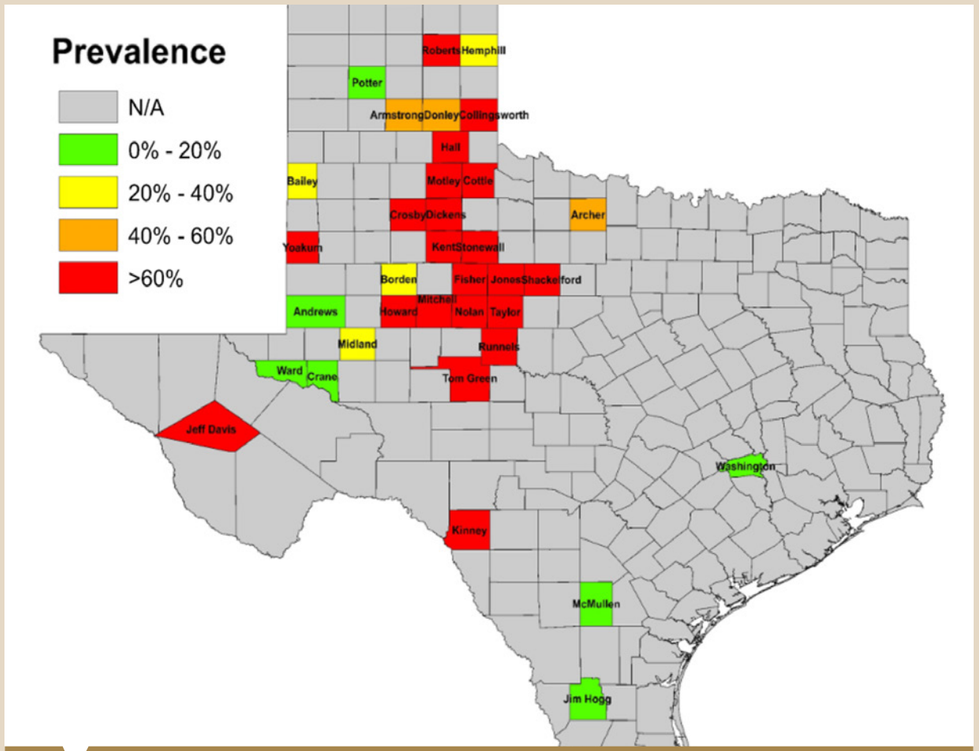
We are continuing our monitoring program in 2021 and look forward to examining your samples (instructions for submission can be found at www.quailresearch.org).



Prevalence of eyeworm infections in samples collected during the 2019-20 hunting season.



Comparison of prevalence (measured by proportion of positivity) and intensity of eyeworm infections by age and species of quail during the last 3 hunting seasons.



Prevalence of eyeworm infections in bobwhite and scaled quail statewide pooled over 2017-2020 hunting seasons. Maps by John 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 https://www.quailresearch.org/research-projects/).

Photo by Joseph Richards

DIFFERENCES IN VITAL RATES BETWEEN TWO SUBSPECIES

OF TRANSLOCATED NORTHERN BOBWHITE IN NORTHCENTRAL 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 of northern bobwhite has emerged as a viable conservation tool to augment existing populations and reintroduce individuals to native range from which populations have been extirpated. Due to limited mobility and immigration rates, natural recolonization may not be sufficient to rescue populations or recolonize restored patches of habitat. As a result, translocation may be the only efficacious mechanism of dispersal whereby managers can rescue populations and recolonize habitat patches. However, bobwhite populations across semiarid rangelands in Texas follow irruptive population cycles, creating challenges for obtaining sufficient founders to translocate from any one ecoregion in a given year. Thus, it may be necessary to source bobwhite from different ecoregions and thereby different subspecies. To better understand how source population affects demographic parameters, we translocated individuals from two subspecies – Colinus virginianus taylori (northwest Texas) and C. v. texanus (south Texas) to a 1,100-ha site in northcentral Texas in March 2019 and 2020. The C. v. taylori subspecies geographic distribution includes northcentral Texas. We predicted that bobwhite sourced from populations in northwest Texas would have better breeding season survival and reproduction compared to bobwhite sourced from populations in south Texas.

Source	Year	# Translocated	# Radiomarked	# of Nests	Nests Per Hen	Nest Success	Clutch Size	Home range (acres)
Northwest Texas	2019	64	56	5	0.33	60%	15	348
	2020	46	46	25	1.31	44%	12	
South Texas	2019	103	55	4	0.24	50%	12	279
	2020	191	64	27	0.73	41%	13	

Summary of northern bobwhite translocation statistics comparing two source populations.

In 2019, we translocated 167 bobwhite and radio-marked 111 with VHF transmitters. In 2020, we translocated 237 bobwhite and radio-marked 110 bobwhite (Table 1). In both years, we employed a delayed release strategy where we sequestered bobwhite for 1–4 weeks prior to release using Surrogators®. Beginning immediately after release, we monitored and located bobwhite daily to evaluate survival, dispersal, and reproduction. We analyzed the data using a multistate model framework to account for imperfect detection and estimated breeding season survival (1 April – 1 Sept) in 2019 and 2020. We evaluated the effects of age, sex, source, linear within-season time trends, and year. We found that mortality varied by year and that mortality increased slightly over breeding season. Mortality rates were higher in 2019 than 2020.

The majority of radio-marked bobwhite (85% in 2019 and 79% in 2020) dispersed <0.6 miles from the release point. Home range sizes pooled for both years were large compared to estimates from other studies, but did not differ between source populations (Table 1). We located 9 nests during 2019 and 52 nests in 2020. High mortality limited nesting in 2019; however, nest initiation rates in 2020 were comparable to stable populations (Table 1). Notably, pooled across both study years, hens from northwest Texas produced 48% more nests per hen than those from south Texas. Pooled across years, nest success was similar for nests incubated by bobwhite sourced from northwest Texas and south Texas. Mean clutch size was also similar for both subspecies when pooled across years.

To further distinguish, differences in demographic parameters between source populations, we will extend our study to a third year of translocation in 2021. Our results suggest that source populations farther from release sites (and of a different subspecies) might limit the success of northern bobwhite reintroductions through reduced reproductive success. However, future research should examine other demographic parameters, such as overwinter and chick survival, to better understand how differences between source populations may affect population recovery.

Release of translocated wild-caught bobwhites in Central Texas, March 2020. Photo credit: Elizabeth Brogan.

RESTORING WILD SCALED QUAIL

TO THE ROLLING PLAINS QUAIL RESEARCH RANCH

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

The reintroduction of scaled quail to the Research Ranch has been our most unequivocally successful translocation to date on all fronts. All of our various metrics of abundance on the Ranch indicated that the scaled quail population had disappeared between 2011 and 2012. After a release of just 88 birds over two years we were able to document high survival and reproduction (short-term metrics), as well as a marked increase in abundance. Preliminary results from genetic analyses show that the birds in the population now are the direct descendants of those birds we released. Seven years after the first release a population of scaled quail has persisted on the Ranch. However, they are still a small, isolated population affected by the same regional weather conditions that have negatively influenced bobwhite populations in the Rolling Plains. This year, we decided to supplement our Ranch's scaled quail population for two reasons. First, our population likely has low genetic diversity with just 88 founding individuals and little outside dispersal. Animal populations with higher genetic diversity are typically more robust and better able to adapt to environmental conditions. Second, translocation research across all species indicates that efforts with multiple releases over time are more likely to be successful in the long term. This translocation also gives us an opportunity to study how successive translocations to the same release site impact both demographics and genetic diversity.

Source	Males	Females	Total	Juvenile:Adult
Edwards Plateau	21	25	46	5:4
High Plains	11	8	19	2:1
Total	32	33	65	4:3

Table 1. Summary of February 2020 translocated individuals.

Sixty-five scaled quail, 4 large coveys, were trapped and translocated to the Research Ranch this spring. The birds were sourced from two properties, one in the Midland/Odessa area of the Edwards Plateau and the other in the High Plains. The birds were held 6-weeks in surrogators prior to release in late March. From our research on best practices, we found that a longer holding period is beneficial for scaled quail because it reduces their dispersal post-release. We think that the biological mechanism that makes soft release beneficial has to do with the social nature of these birds. The holding period perhaps allows them to develop social relationships prior to release, both with surrogator mates and resident birds outside, making the new habitat more appealing. Keeping large covey groups together is part of maintaining and promoting those social relationships.

Only a small subset of hens were radio-collared (n = 10). We did not find a difference in annual survival between the translocated quail and resident radio-collared scaled quail hens. We estimated annual survival probability for both groups at 0.14 (SE = 0.007). This estimate (equivalent to 14% annual survival) is a little lower than we would like to see, but coincides with the late season drought conditions we experienced on the Research Ranch. In general, survival above approximately 25% is desirable. The primary methods of measuring the impacts of this translocation over time will be through subsequent genetic analysis, intensive bi-annual banding and trapping, and, ultimately, abundance. We documented an increase in abundance of scaled quail this fall compared to 2019. Three individuals captured this fall were descendants of our first translocated scaled quail and originally banded in fall of 2016! We will continue monitoring the population closely.

Radio-collared scaled quail ready for transport to the Research Ranch. Twenty radio-collared hens from this group will contribute information to our long-term database on translocated scaled quail demographics

BREEDING SEASON HOME RANGE AND RESOURCE USE OF TWO SUBSPECIES OF TRANSLOCATED BOBWHITE

Elizabeth Brogan, John Palarski, and Heather Mathewson
Tarleton State University, Stephenville, TX

Dale Rollins
Rolling Plains Quail Research Foundation, Roby, TX

Brad Kubečka
Tall Timbers Research Station and Land Conservancy, Tallahassee, FL

The decline of the northern bobwhite has resulted in regional extirpation across its range. Within the Cross Timbers ecoregion of Texas, this decline is evident and only remnant populations exist across a fragmented landscape. Translocation has emerged as a possible solution to restock remnant populations in restored habitat. In some cases, individuals for translocation may need to be moved long distances (e.g., >200 km) and sourced from different subspecies. As a result, differences in natal environments may influence resource use on release sites. Woody cover is an important component of bobwhite habitat, but its use varies geographically. Furthermore, large movements post-release may influence survival. Our objectives were to 1) quantify home range size of two subspecies of translocated bobwhite, and 2) compare use of woody cover for each subspecies. We hypothesized that bobwhite from south Texas (C. v. *texanus*) would use a greater percentage of woody cover (fourth order selection) due to its greater abundance. During March 2019 and 2020, we translocated 167 and 236 wild-trapped bobwhites, respectively, to a 1,100 ha area in central Texas. Bobwhite were sourced from populations in south Texas and north-west Texas (C. v. *taylori*). We radiomarked 111 (n = 56 C. v. *taylori*; n = 55 C. v. texanus) and 110 (n = 46 C. v. *taylori*; n = 64 C. v. *texanus*) individuals with VHF transmitters in 2019 and 2020, respectively. We documented no difference in the home range size or the percentage of woody cover within the home ranges of either subspecies. For bobwhite sourced from north-west Texas, the odds of selecting a site decreased by 38.8% for every 1% increase in woody cover at the location scale. For bobwhite sourced from south Texas, the odds of selecting a site increased by 26.5% for every 1% increase in woody cover at the location scale. Our data suggest that bobwhite select for habitat similar to their natal environment, which could affect demographic parameters post-release.

Photo by Joseph Richards

Photo by Joseph Richards

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

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W. B., Jr. and Sherry Wright

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 critical funding that has allowed our research efforts to flourish.

They are truly the wind beneath our research wings.

PARK CITIES QUAIL

Photo by Joseph Richards

P.O. BOX 220
ROBY, TEXAS 79543

214-498-1234
PLAMB@QUAILRESEARCH.ORG

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