7th Annual Field Day Abstracts

Friday, Sept. 26, 2014

Restoration of Quail and Their Habitat

Ricky Linex

RPQRR's Vision: To sustain Texas' quail hunting heritage for this, and future, generations.

Mission statement: To provide land managers, and other stakeholders, with timely, relevant technology and management schemes for enhancing quail populations in the Rolling Plains of Texas.

Welcome Students of Quail!

We're glad you joined us for our 7th annual field day at the Rolling Plains Quail Research Ranch. This year's theme is "Restoration of Quail and Their Habitat." Hopefully you'll glean some ideas for how to improve your rangeland as quail habitat and increase your personal knowledge of quail and quail management.

This year's field day is dedicated to Mr. Paul Melton. Paul serves as the chair of RPQRR's Advisory Committee and helps us in so many ways. I first met Paul in about 1993 via a telephone call. It doesn't take long on the phone with Paul to recognize he's more than just a casual quail hunter. He's a fierce competitor and adroit on many subjects. His savvy with oil-related negotiations has been a real blessing to the RPQRR over the past two years.

Paul Melton
(*credit: Lynn Betts, NRCS*)

It's no stretch to say there wouldn't be an RPQRR today if naught for Paul. His passion for quail hunting, forward-thinking, hospitality, and ability to "carry the ball" were instrumental as we courted the Richard King Mellon Foundation for funding back in 2005 after a successful quail hunt on Paul's ranch just east of here. Paul has also hosted a " Brush Sculptors" field day (1997), serves as a frequent resource speaker on various quail meetings, and has hosted several of RPQRR's research efforts. Much obliged Paul!

The weather has surely been better this year than the previous three, but it's still not the recovery we need or had hoped for. We enjoyed perfect "quail-making" weather (cool, wet) during mid-May through June, but July and August proved such a reality check. Promise of a developing El Nino for this fall surely has a drooling for what next year's quail crop ***may*** be! Hopefully the worm has turned. A. S. Jackson might say we're seeing a "lateral increase" this year, and if met with favorable weather over the next year, we could see a "vertical increase" that would make us recall years like 1987.

We're especially pleased with our translocation efforts, and as you'll read herein, the translocated blue quail have enjoyed success in their first year. *Viva la Blues!* We're likely to see more pump jacks here at RPQRR (we've had 10 installed since last year). We see them as a mixed blessing for the Ranch; timely income, but a troubling footprint for our research efforts. Just what the future holds, or how further development impacts our mission, is yet to be determined.

We always value your feedback, formally (via the evaluation for today's tour) or informally, so please share your ideas with me or one of the RPQRR staff. Enjoy your day, make some new friends, enhance your plant ID skills, and make progress towards becoming a better "Student of Quail." If you're not a "friend" on our Facebook page or subscriber to our *e-Quail Newsletter*, I encourage you to sign up for both (see www.quailresearch.org) for details.

Dale Rollins

Executive Director

2014 Field Day Agenda

8:30 Registration & refreshments
CEU paperwork (Z. Wilcox)
Test your knowledge of key plants for quail (R. Linex and K. Mills)

9:00 Welcome and Introductory Comments – D. Rollins

Dedication
2014 Weather Year in Review – L. LaCoste

9:30 **Stop 1**
Monitoring Quail Abundance at RPQRR— L. LaCoste
Quail Oases—Water harvesting on rangelands – D. Rollins
Ragweed seed dynamics – Aaron Rives
Operation Blue Transfusion - Tyler Berry
2014 Nesting summary - Bradley Kubecka

10:15 **Stop 2**
What is "useable space?" –the SHET model – D. Rollins
Small mammal dynamics and why they matter – T. Berry
Enhancing useable space on former CRP contracts – L. LaCoste
Arthropod dynamics - How we measure at RPQRR—A. Rives

11:00 **Stop 3**
Cactus: a prickly paradigm for quail managers – D. Rollins
Results of 3-year study on prickly pear control and collateral damage to shrubs and forbs – L. LaCoste, Rachel McMath
Camera trapping to estimate predator abundance- R. McMath

Noon **LUNCH at Pavilion – Rough Creek Catering**

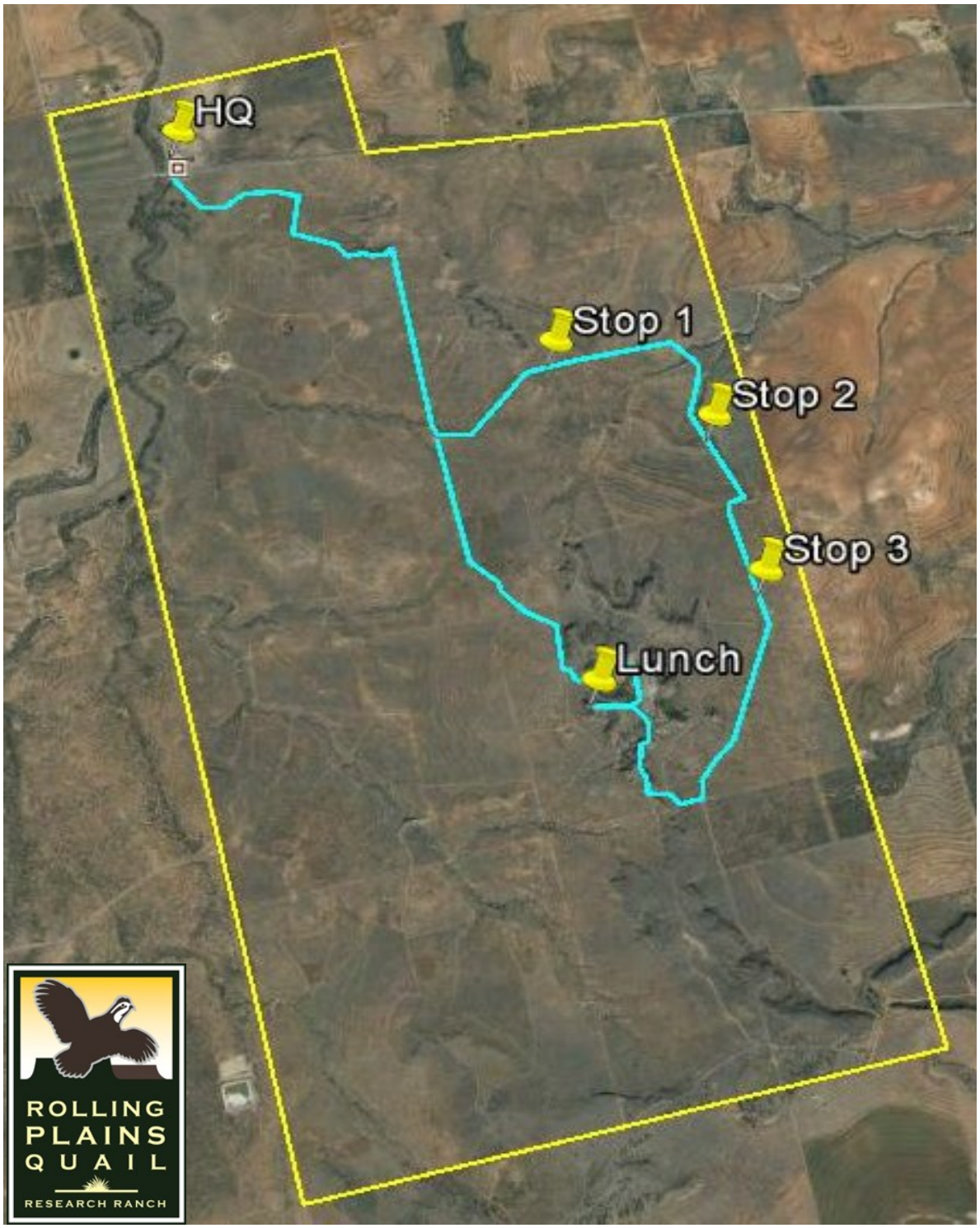
Recognition of Sponsors

1:00 **Research Updates**
Operation Idiopathic Decline – D. Rollins
Texas A&M Agrilife Extension Service's "Reversing the Quail Decline Initiative" - Becky Ruzicka
Texas Quail Index - B. Ruzicka
Operation Velociraptor – B. Kubecka
Complete evaluation

2:15 Depart for HQ

2:30 Results of Plant ID contest – R. Linex
Distribution of CEU certificates – Z. Wilcox
Adjourn

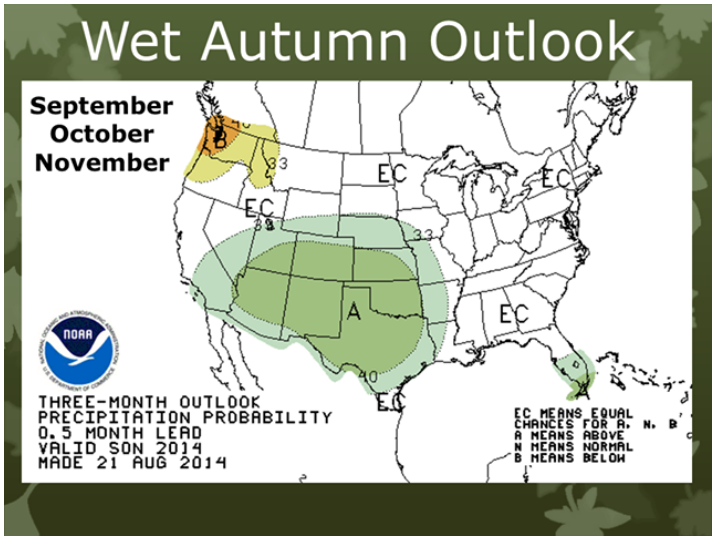
Field Day Route - 2014

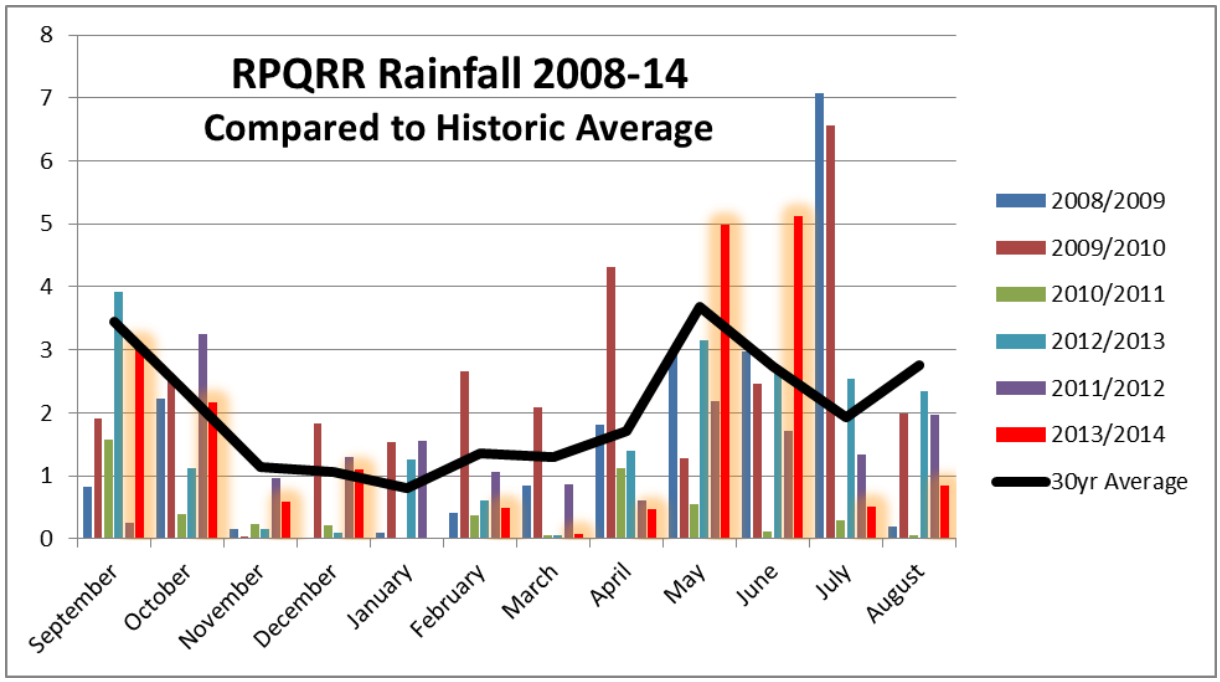


2014 Weather- The Year in Review

Lloyd LaCoste, RPQRR

Weather plays an important role in quail survival and a crucial role in quail reproduction. Rainfall (especially between the months of April through August) has a huge impact on quail reproduction. A cooler than normal spring and summer with plenty of rainfall usually will enhance quail reproduction. We had such weather for May and June but not prior or thereafter. The summer of 2014 had the fewest days (n = 11) where temperatures exceeded 100 degrees Fahrenheit. To compare this to other years in 2011 there were 79 days that topped 100 degrees. 2012 and 2013 had 38 and 13 days, respectively. The 30-year average rainfall for Roby, Texas is 24.22 inches. From September 2013 through August 2014 RPQRR received 19.39 inches of rain. This is 4.83 inches below the 30-year average. However we were blessed with above average rain fall in May and June which seemed to stimulate many nesting attempts. RPQRR received 10.11 inches of rain during the months of May and June 2014. This is greater than half of the rainfall we received for the year, and it seemed to come at a great time to stimulate quail reproduction. July and August rainfall once again was below the 30-year average. Hopefully the "El Nino" conditions that are predicted will take control of our weather patterns and produce some much needed months of above average rainfall, and the opportunity for our quail at RPQRR to continue their rebound.





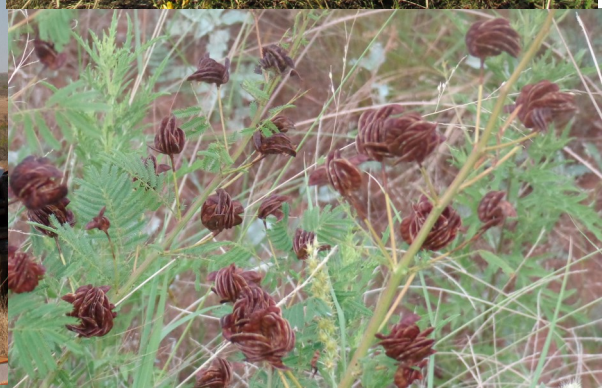
STOP 1

Quail trends

Quail Oases

Operation Blue Transfusion

2014 Nesting summary



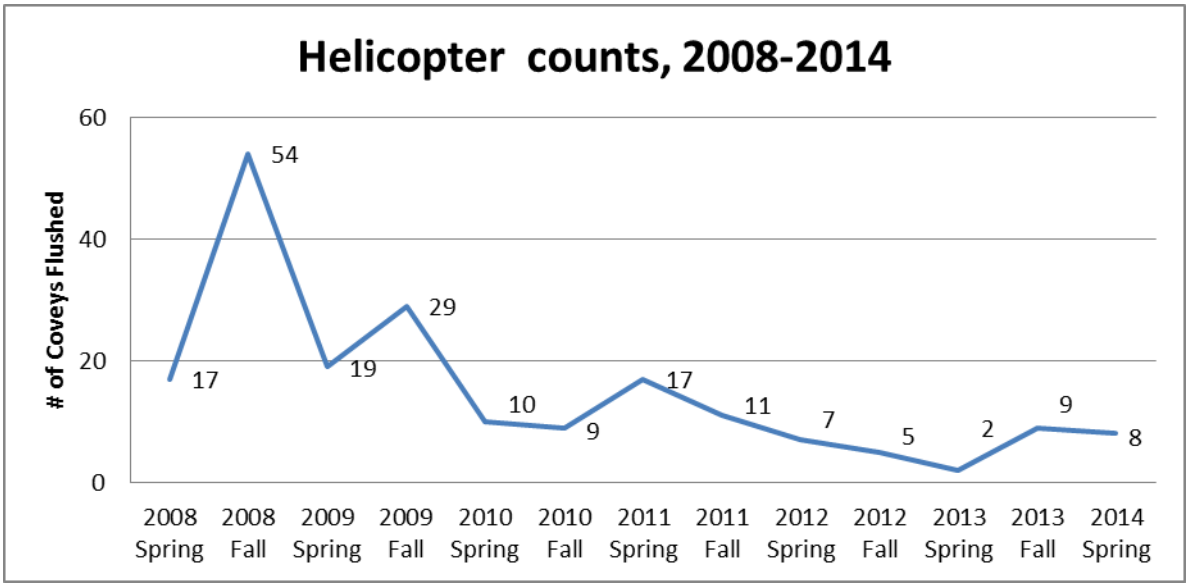
Monitoring Quail Abundance at RPQRR

Lloyd LaCoste, RPQRR

Since RPQRR was established in 2007, we have implemented various ways to monitor quail abundance over time; these efforts include helicopter surveys, call counts (spring and fall), mark-recapture (using leg-banded birds), radio telemetry, dummy nest survival, and fall road-side counts. We seek to determine which of these techniques will provide reliable estimates relative to the time end expense of conducting the counts.

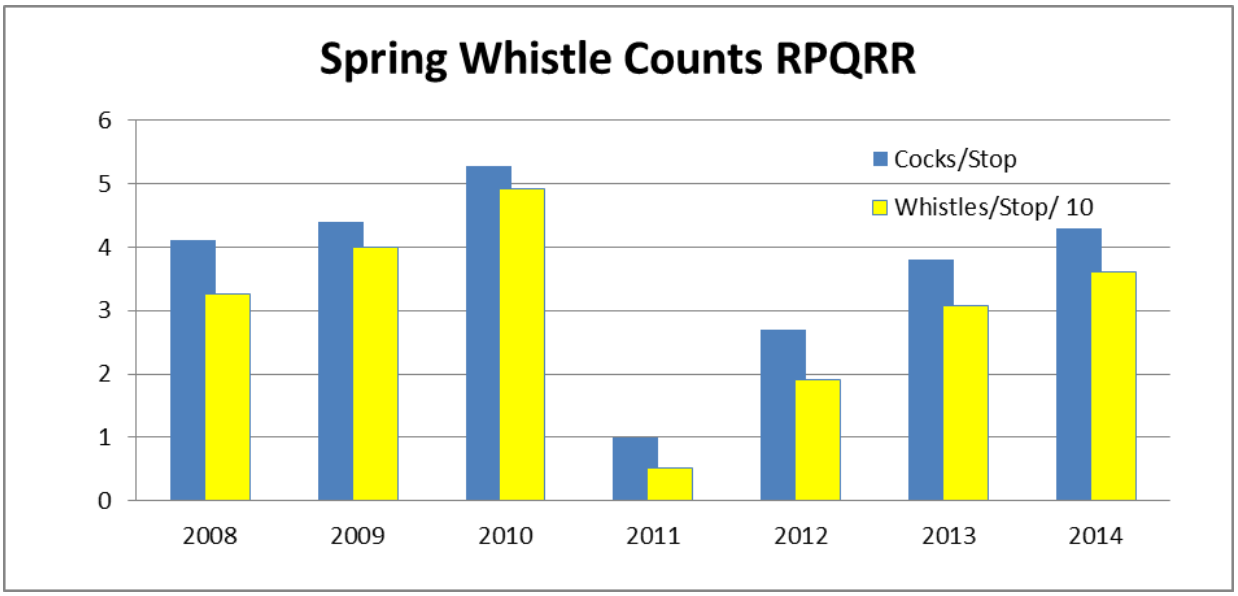
Helicopter Counts

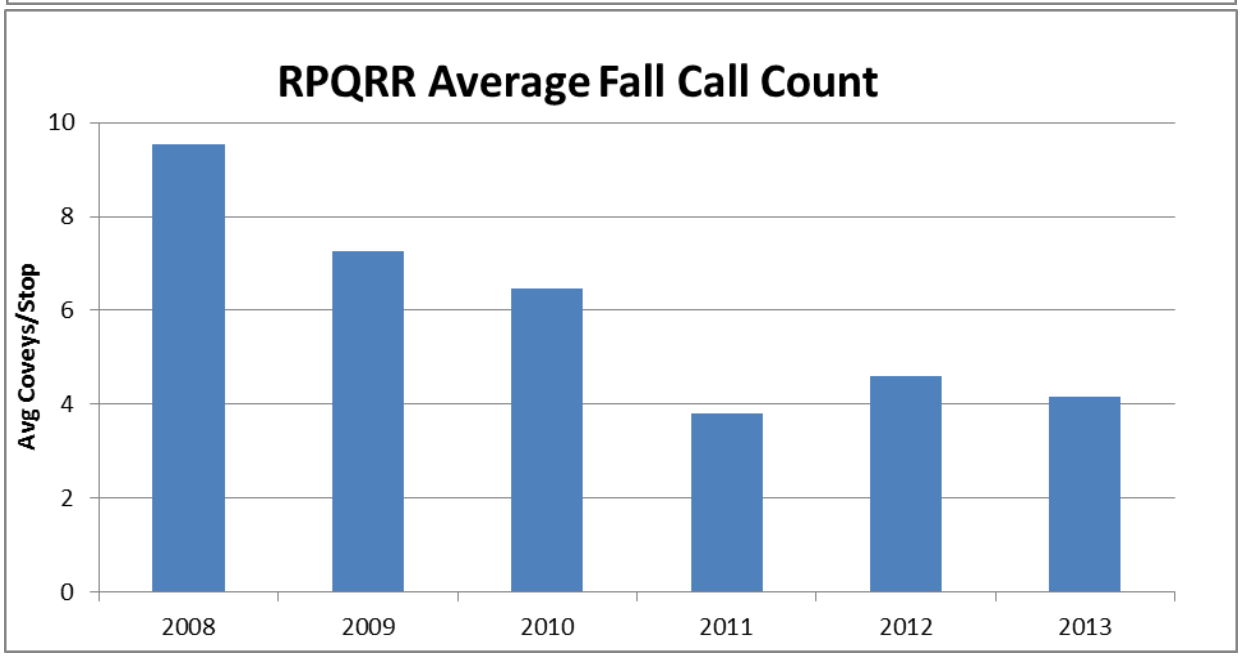
Every year we conduct two helicopter surveys: one in the fall (Nov.) and one in the spring (March). We fly the same GPS-transects with a total sampling effort of 52 miles. The spring survey for 2013 (6 March 2013) revealed the lowest number of coveys to date with a dismal display of only 2 coveys. Since then the surveys recorded 9 coveys in the fall 2013 (9 November 2013), and 8 coveys in the spring 2014 (13 March 2014). These numbers are an improvement over the past couple of years, and show that our quail population is starting to recover. We have tracked the number of coveys to a low of 2 during the spring of 2013. Now we look forward to this November's count to see if our numbers of coveys has rebounded somewhat and that our numbers have indeed "turned the corner."



Spring Cock-call Counts

Spring cock call counts or "call counts" can be used to index abundance of quail over time or at least an index to our breeding population. At RPQRR we conduct spring call counts at 25 "mile markers" that are spread out across the Ranch. The Ranch is divided into an East and a West transect. The west transect contains 13 mile markers and the east includes 12. This year counts were conducted twice a week starting 22 May 2014 and continued until 22 July 2014. These data are trending upwards from our lows during the 2011 drought. This year we heard an average of 4.3 cocks per stop with an average of 36.1 whistles per stop. Typically we hear about 10 whistles/cock/stop.





Fall Covey Call Counts

In October we measure covey abundance by listening at dawn for "covey calls". Due to the small window of opportunity our researchers can only listen at one site per day. We conduct fall covey call counts at all of our odd-numbered mile markers for a total of 2 counts, and record the number of different coveys heard. Most other sampling methods showed 2013 was an improvement for quail over 2012, but our fall covey call counts did not reflect this. The average number of coveys heard in the fall of 2012 was 4.6, and the average number heard in 2013 was 4.2. There are a number of variables that affect fall covey call counts such as cloud cover, relative humidity, temperature, and wind speed. There also may be some bias due to having different observers from year to year. This could explain why our fall covey call counts did not show an increase like many of the other techniques we use to track quail abundance. A crude index to bobwhite density can be estimated by dividing the mean covey call count by 10.

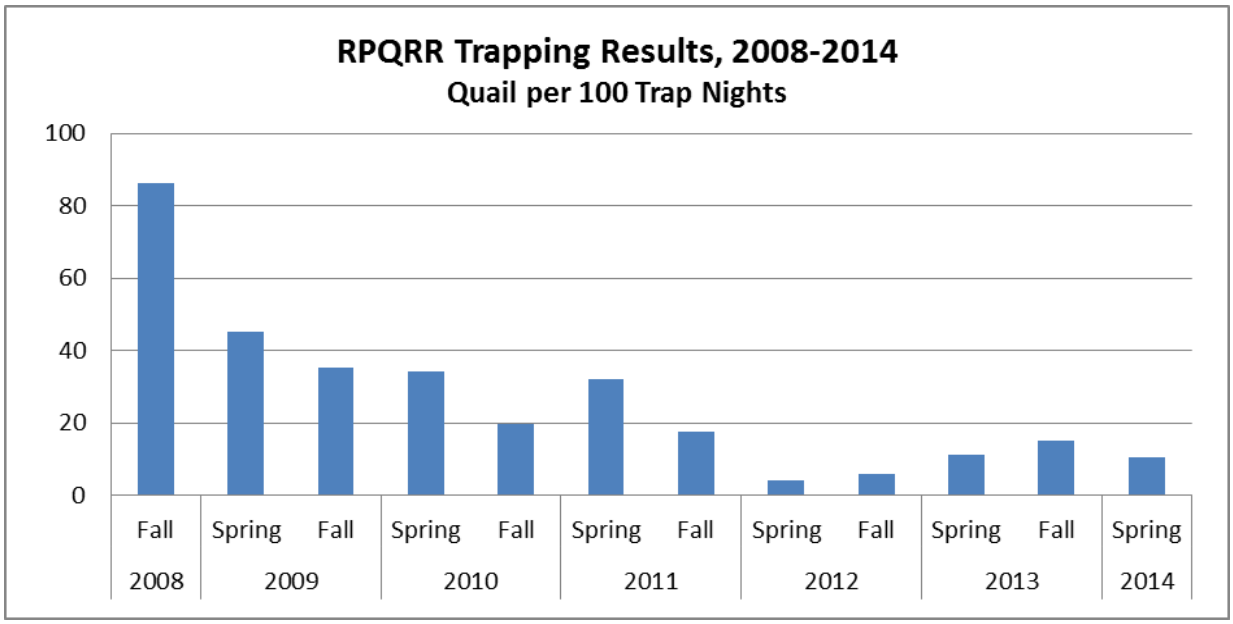
Roadside counts

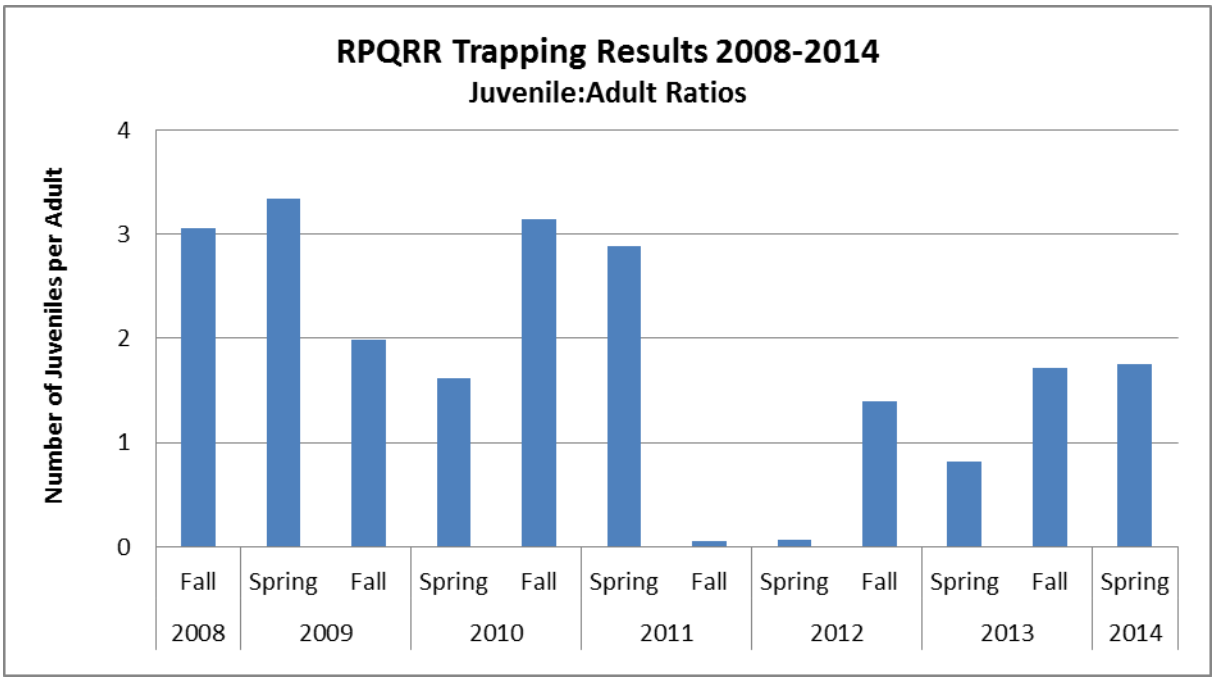
Roadside counts are easy to conduct. You simply drive a prescribed route during early-morning or late-afternoon hours and count the number of quail observed. We repeat our counts four times during September; 2 in the morning and 2 in the evening on both of our "TQI" lines. The number of birds observed per mile is an index to quail abundance. Each year during August, Texas Parks and Wildlife Department biologists conduct roadside counts on 20-mile routes across much of Texas. This table compares TPWD's mean number of quail for the Rolling Plains per 20 mile route to RPQRR's data.

Mean Number of Quail Observed per 20-mile route, 2008-2013		
Year	**TPWD**	**RPQRR**
2008	18.7	96.0
2009	6.6	25.2
2010	8.0	29.0
2011	5.3	8.8
2012	3.5	5.5
2013	2.9	1.8
2014	7.5	TBD

Trapping-banding

At RPQRR our primary purposes for trapping quail is to attach radio collars to allow us to follow the birds' movements and monitor survival and reproduction. We also use the information collected during trapping as an index of quail abundance and to assess juvenile to adult ratios. Trapping is conducted in the spring (Mar) and fall Oct-Nov) each year. We believe our trapping effort provides our most accurate count of quail because of its level of sampling intensity.

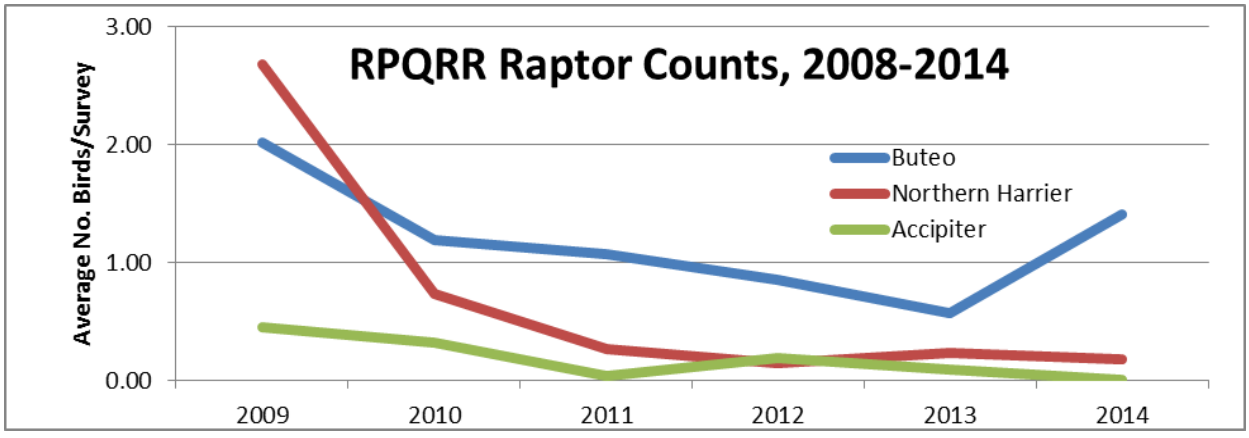




Raptor counts

Tyler Berry, RPQRR

Raptors are important predators of quail, especially during winter. We conduct weekly surveys along two 10-mile routes at RPQRR to record each raptor abundance. The chart shows the total number of raptors from January 1 through December 31 for each year an average of 52 counts. Raptor observations this far in 2014 compared to the last few years appear to be increasing. Our estimate of accipiters is likely biased low because they are more difficulty to detect (especially if not in flight). This could indicate that increasing prey abundance (quail and small mammals) has attracted more raptors into the area in search of prey. In order of decreasing importance as a predator of quail ("efficiency as a quail predator), we would rank them as (1) accipiter, (2) Northern harrier, and (3) buteos.



Nesting update — September 2014

Brad Kubecka, RPQRR

A sample of hens we trap during March are fitted with 6g neckloop radio-transmitters to document nesting ecology and survival throughout the spring and summer at RPQRR. On May 1, we had a total of 37 "native" bobwhites fixed with transmitters. Of those birds, 70% attempted a first nest and 11% a second nest. Of the 30 nests that have been initiated, 17 hatched and 11 were depredated; two nests were censored from the data..

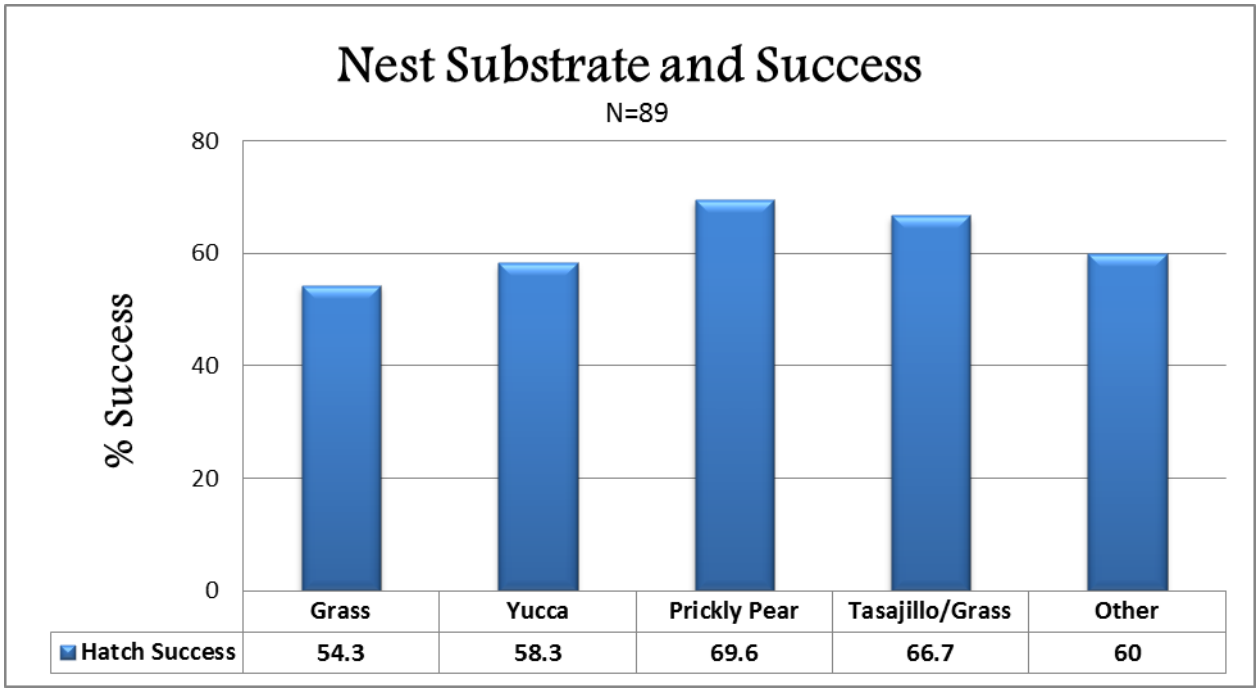
Nesting statistics of bobwhites on RPQRR, 2009-14.

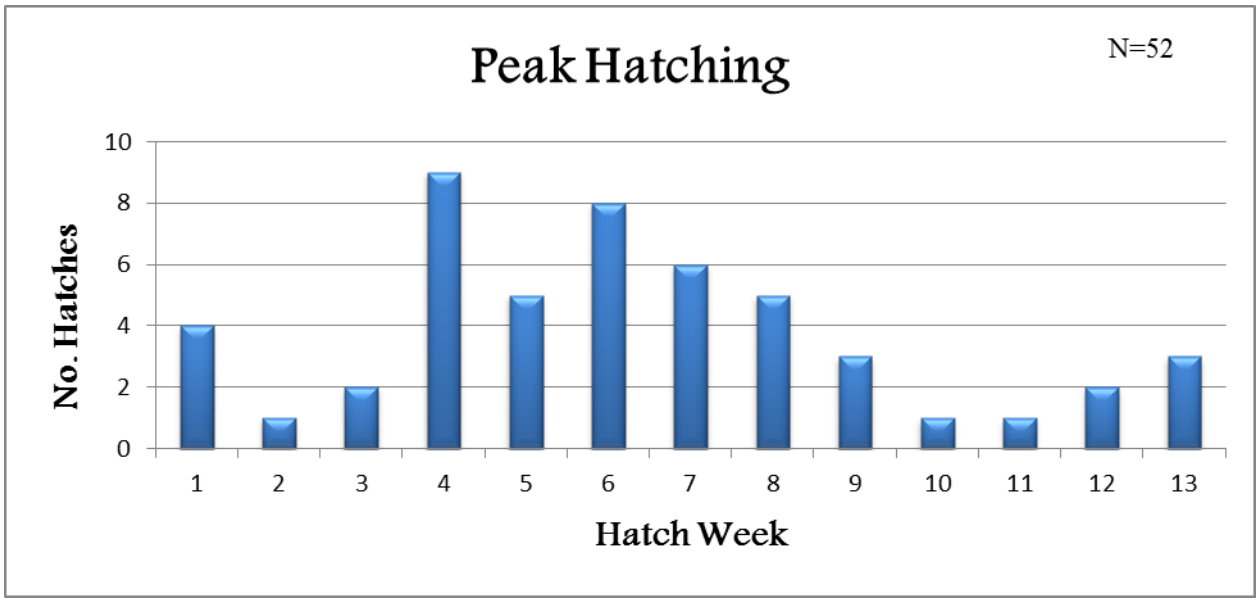
	% Hens Attempted Nest	% Hens Attempted 2nd Nest	Total Nests Attempted	Nests initiated per hen	Hens Alive May 1	Hens alive Aug. 1	% Hen Survival	% Nest Success
2009	41%	13%	43	0.54	79	27	34%	51%
2010	36%	4%	20	0.40	50	35	70%	45%
2011	14%	0%	10	0.14	73	43	59%	60%
2012	73%	27%	11	1.0	11	9	82%	73%
2013	55%	4%	16	0.56	27	19	70%	56%
2014	70%	11%	30	0.81	37	20	54%	61%

Translocated birds

This year RPQRR attempted to replicate last year's success on *Operation Transfusion* in which birds were translocated and released via a "hard release" on a research site in Stephens and Shackelford counties. RPQRR's endeavors sought to examine success of a "soft release" however. The soft release consisted of sequestering translocates in a "Surrogator" with water and laying ration (Layena) available *ad libitum* for 30 days. Birds were released after 30 days with all females being radio-marked. The following are the nesting efforts for surrogate bobs and blues.

	% Hens Attempted Nest	% Hens Attempted 2nd Nest	Total Nests Attempted	Nests Initiated per hen	Hens Alive May 1	% Nest Success
2014 Surr Bobs	56%	11%	18	0.67	27	65%
2014 Surr Blues	63%	24%	38	0.93	41	62%

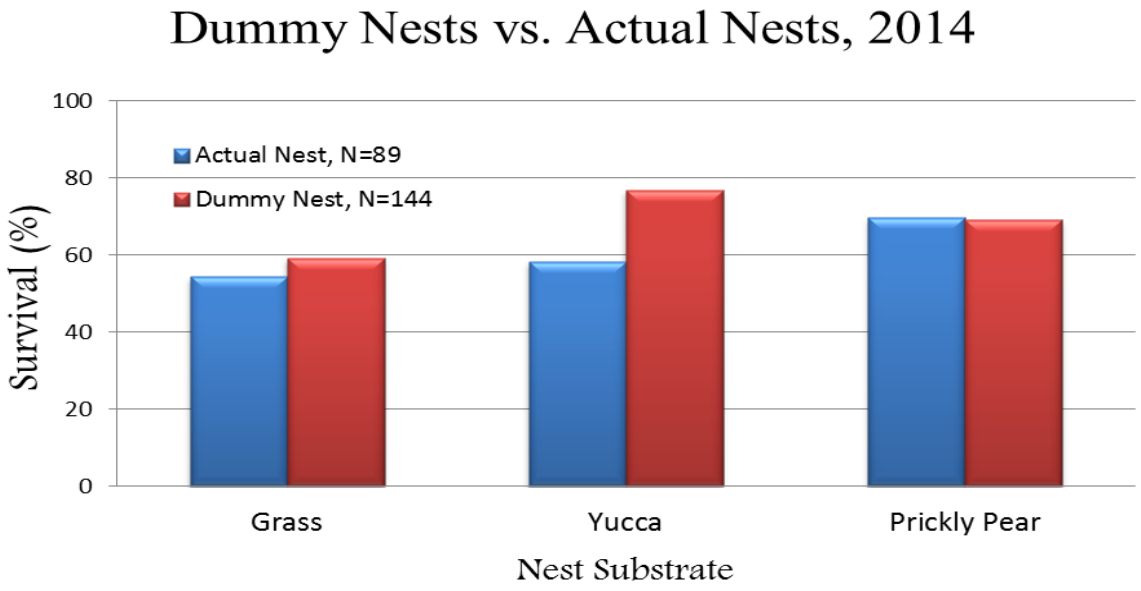

Nest Substrate and Success
N=89
% Success
80
60
40
20
0
Grass
Yucca
Prickly Pear
Tasajillo/Grass
Other
Hatch Success
54.3
58.3
69.6
66.7
60


Peak Hatching
N=52
No. Hatches
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Hatch Week

Dummy Nests

Ian Moorhead, RPQRR

We use "dummy nests" (i.e., 3 chicken eggs that simulate the approximate size of a quail nest) to estimate hatch rates of actual quail nests. Dummy nests are placed in suitable nesting cover (Bunchgrass, Prickly Pear, and Yucca) and are monitored at 14- and 28-days to estimate "nest success." This year was the 7th year to monitor the simulated nests. We employ a total of 144 nests; 72 in Rangeland and 72 in CRP; half of the Rangeland nests are situated in prickly pear and half in grass. Fates of dummy nests accurately indicated hatch success of actual nests for the 3 nesting substrates we monitored in 2014.



OPERATION TRANSFUSION: *Translocation of Wild Trapped Bobwhites into Recently Depopulated Areas*

Michelle C. Downey, Brad Kubecka, and Dale Rollins

Reproductive output appears to be lower this year than last, but this may be due to the fact that we suffered a higher number of radio collar failures in 2014 than 2013. We are currently visiting with the company about this matter. The nesting season has most certainly slowed down, but a few more nests may be produced in the next month. Survival was a little lower this summer than in 2013, but raptors accounted for the majority of the mortalities both in 2013 and 2014. Our percent change in quail observed per mile during helicopter counts indicates that the release ranch had a drastically higher increase in quail than the control ranch (which doesn't have any translocated quail released on it). However, the initial relative abundances were so low to begin with that it wasn't difficult to come up from there. I am anxious to see how the helicopter counts pan out this fall. This is a 3 year research project and therefore, we have one more translocation scheduled to take place in March 2015. In addition to the release of 200 wild bobwhites within 24 hours of being trapped, we will house 100 wild bobwhites in surrogators or "johnny houses" until the end of April. Housed wild bobwhites will be released just prior to the start of the nesting season in an effort to augment reproduction output by increasing the number of hens entering the nesting season. If you or anyone you know is interested in donating quail for the 2015 translocation, please feel free to contact me, and I can make arrangements to pre-bait areas from January 2015-March 2015.

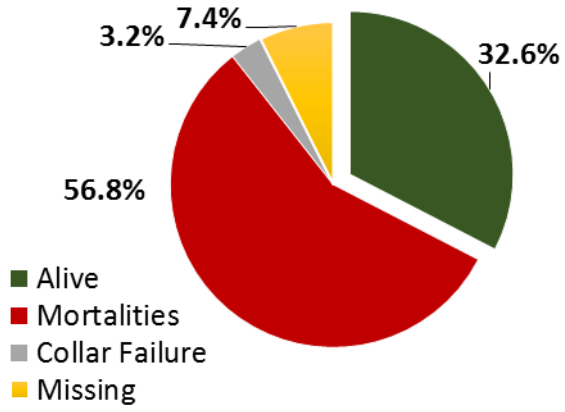
TRAPPING STATS	2013	2014
Total # Translocated	202	207
# Hens Radio-collared	95	91
# Source Ranches	6	7

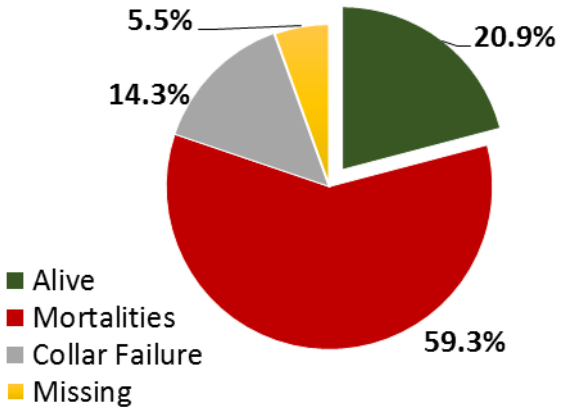
NESTING STATS	2013	2014 *
Hens Alive May 1st	62	57 **
# Nest Initiated	72	53
% Hens Nesting	77.4	71.4
Nesting Rate (nests/hen)	1.2	1.0
Nest Success (%)	41.7	51.0
Clutch Size (eggs)	12	12.5

* Nesting season still in progress
** 7 from the 2013 translocation, 50 from 2014 translocation

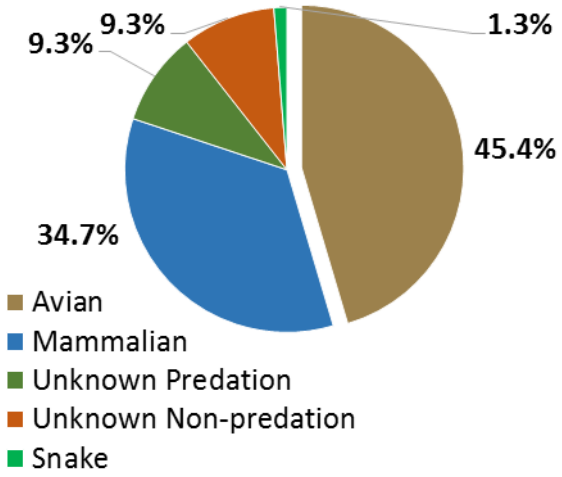
SURVIVAL

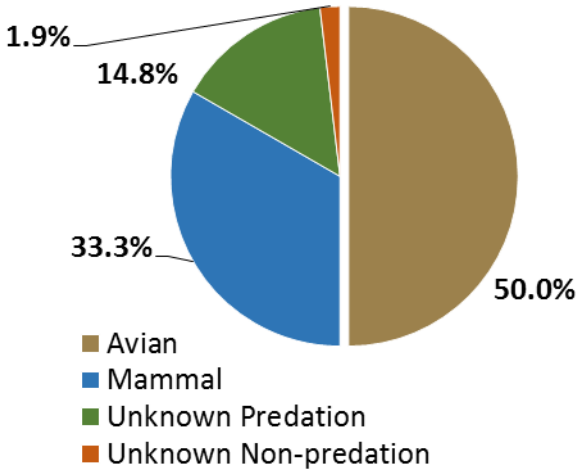
Status of 2013 translocated hens at August 2013 (left) and 2014 translocated hens at August 2014 (right).





Cause-specific mortalities of 2013(left) and 2014 (right) translocated hens.





Abundance

HELICOPTER SURVEY	Pre-translocation (quail/mile)	Post-translocation (quail/mile)	% Change
Release Ranch	0.19	1.60	742
Control Ranch	0.74	1.78	141

Pre-translocation helicopter data were collected March 2013 prior to the translocation of any wild bobwhites. Post-translocation data was recorded March 2014. The percent change in the quail recorded per mile surveyed was 742% between March 2013 and March 2014 at the release ranch. The percent change was 141% at the control ranch, which did not receive any translocated bobwhites during 2013.

FUTURE

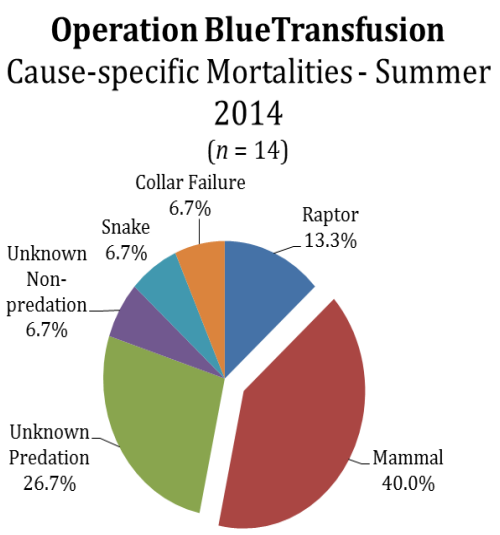
One more translocation is scheduled to take place in March 2015. We will continue to collect survival, reproduction, site fidelity and local relative abundance data in an effort to assess the efficacy of translocation.

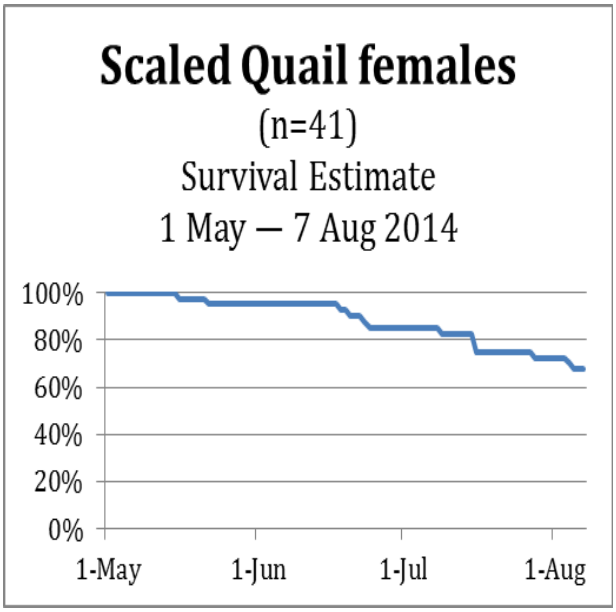
Operation Blue Transfusion

Tyler A. Berry and Dale Rollins

The objective of *Operation Blue Transfusion* is to determine the effectiveness of translocating Scaled "Blue" Quail into recently depopulated areas in the Rolling Plains of Texas. We trapped 79 scaled quail from 7 different ranches during the months of March and April 2014. Birds were then brought to RPQRR to be sequestered in "Surrogators" for 30 days in order to provide protection from raptors, acclimate the birds to their new surroundings, and try to improve fitness by providing a milo and protein ration. The 79 birds that were released at the ranch included 40 hens that were fitted with radio collars in order to measure survival, nesting success, and site fidelity. Our efforts to reestablish a population of Scaled Quail here at RPQRR have been successful as evidenced by a survival rate of 62.5%, and by the number nest attempts by the translocated hens (40). The hens had a productive nesting with an overall nest success of 61.5%. We will repeat this experiment in 2015 here at RPQRR and include another release site on the Matador WMA (Cottle Co.).

Funding provided by Texas A&M Agrilife Extension Service's Reversing the Quail Decline Initiative, West Texas Chapter Safari club International, and RPQRR.





Quail Oases: Water Harvesting on Rangelands

Dale Rollins, RPQRR

The climate of west Texas is sometimes characterized as "continuous drought interrupted by periodic flooding." Much of our annual rainfall comes in intense thunderstorms which results in much water being lost via runoff, accompanied by attendant erosion. The late Sherman Hammond of Ft. Stockton influenced me years ago with his water harvesting strategies to enhance habitat in the Chihuahuan desert for blue quail. His philosophy was simple: "I want to keep every inch of rain that falls on my property, and every inch my upstream neighbor sends to me." He used "spreader dams " (*aka* check dams, speed bumps, water bars) to divert runoff from his ranch roads into divots. Note his idea was not to provide drinking water for animals, but to create more mesic microclimates, or what I've coined "quail oases." At Hammond's ranch, these oases grew 24 times more grass and 5 times more arthropods than the adjacent uplands. We began installing spreader dams at RPQRR in November 2010, but didn't receive appreciable rain until a year later (8 Oct 2011). We plan to increase our number and coverage of spreader dams over the next two years. Natural succession occurs nicely on these sites as evidenced by annual sunflowers. On some sites we've broadcasted (by hand) forbs like Illinois bundleflower and alfalfa. The drier the resulting landscape is the more the quail oases "shine."

For more information, watch the webisode "Quail Oases" at https://www.youtube.com/watch?v=nTczFuDBvbo.

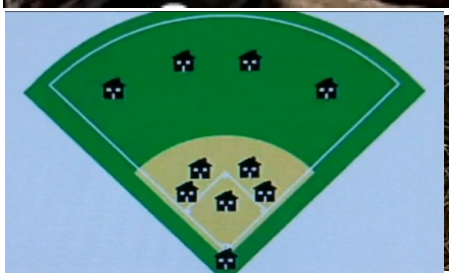
STOP 2

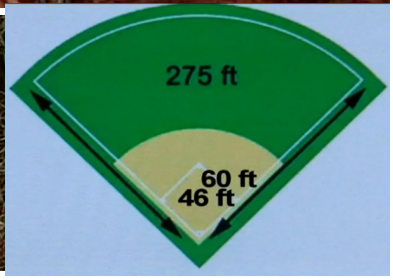
What is usable space for bobwhites?
Enhancing CRP pasture for quail habitat
Assessing small mammal and arthropod dynamics

“Useable Space on CRP Pastures — the S.H.E.T. Method”

Dale Rollins, RPQRR

The concept of “useable space” was popularized by Dr. Fred Guthery at Oklahoma State University; in its simplest terms it’s defined as “suitable, permanent cover” that allows a bobwhite to call a particular site “home.” Earlier, King Ranch biologists Val Lehmann said it this way “to supply most of the needs of high populations of quail, they must be assured *continuous* use of virtually every square foot of ground.” You maximize space–time when every square foot is usable by bobwhites every day of the year. In west Texas, saturating a landscape with space-time typically addresses brush canopy and grass cover, be it too little or too much. At RPQRR, we can use our various count records to suggest where we have useable space, and areas where we do not. When we find “voids” we ask “what’s missing here?” Generally it’s areas that are too open, i.e., insufficient woody cover, or at least insufficient escape cover (including “quail houses”). In rangeland settings, managing for useable space boils down to 2 options: (1) add or remove woody cover and (2) increase or reduce the density of herbaceous cover. For more information on Guthery’s thoughts on useable space, see *http://bollenbachchair.okstate.edu/USABLE%20SPACE--LIGHT%20VERSION.pdf.* For more information on the SHET technique for assessing quail habitat see the webisode at *https://www.youtube.com/watch?v=_xVPAVLymn0* .

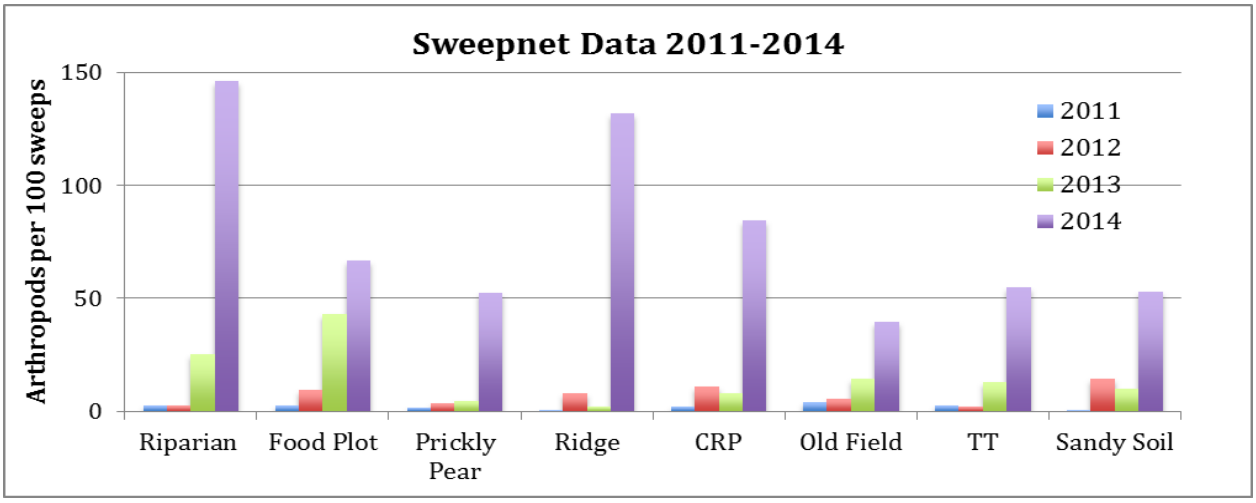


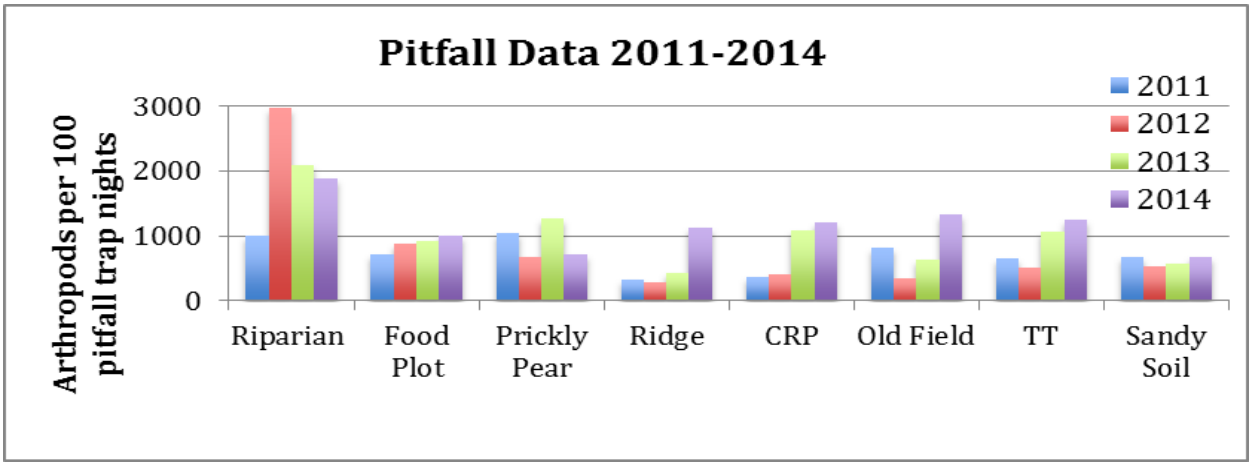


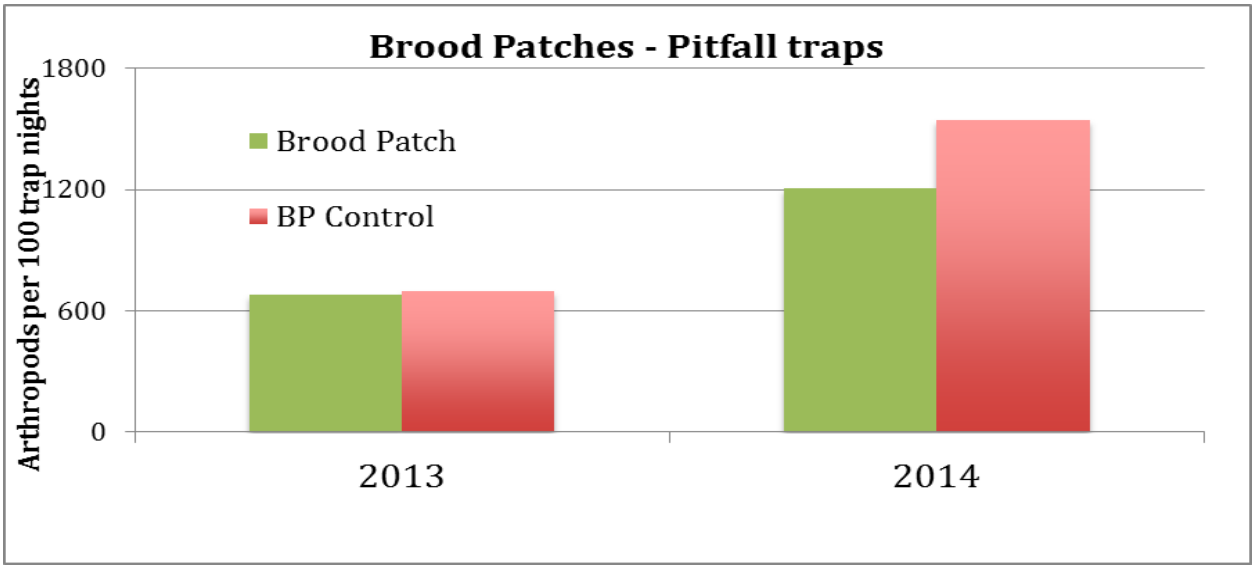
Arthropod Dynamics

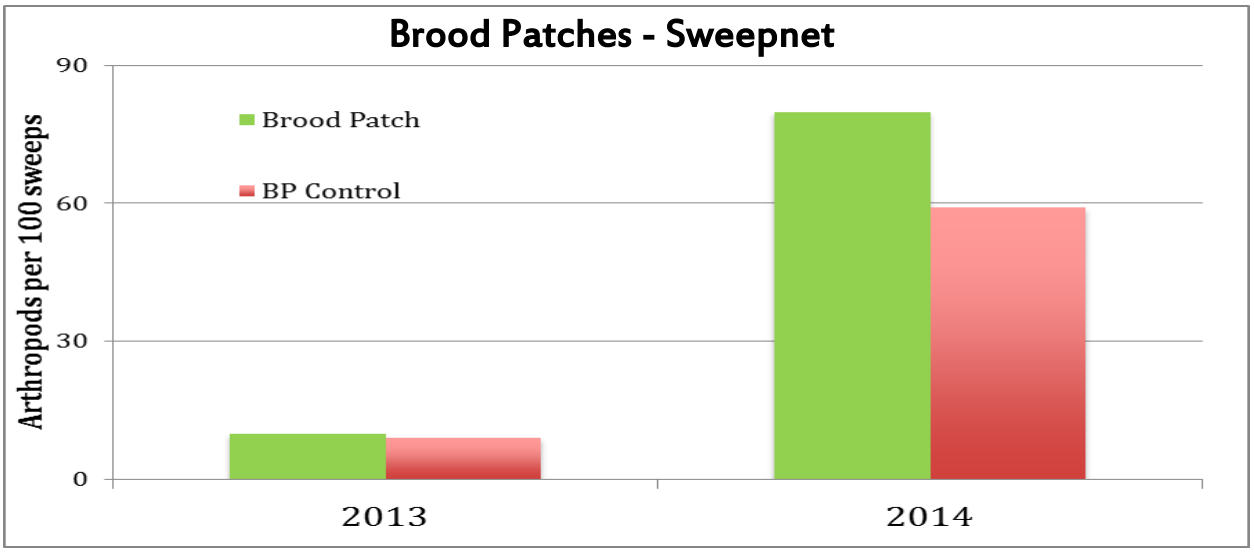
Aaron Rives and Rachel McMath, RPQRR

Arthropods (e.g., insects) are an important source of food to quail chicks and adults. We conduct annual surveys in July to get an estimate of the overall arthropod abundance across the Ranch. Our surveys include sampling from 8 different habitat types using pitfall trap and sweep net methods. Pitfall traps were conducted in a series of 6 traps in a line, with traps being checked every third day for a total of 3 checks. Sweep nets were conducted perpendicular to 4 of the 6 pit falls in a random direction for a total of 25 sweeps. From 2011 through 2014, riparian habitat yielded more arthropods than other habitats in both the pitfall and sweep net samples. In that time period, prickly pear and old-field habitats yielded the fewest arthropods in the sweep net samples, while ridge and sandy soil habitats yielded the fewest arthropods in the pitfall trap samples. 2014 showed a colossal increase in the amount of arthropods caught using the sweep net method, having 3 times as many arthropods caught than all previous years (2011-2013) combined. This large increase is likely due to increased rainfall in 2014. In addition to surveying across 8 habitat types, we also surveyed arthropod abundance in 2-5 acre areas disked in mid-November to increase forb production as well as set back plant succession. We call these areas "brood patches". Brood patches showed greater arthropod abundance than the control in sweep net samples, although the control had greater abundance in pitfall samples.






Brood Patches - Pitfall traps
Arthropods per 100 trap nights
1800
1200
600
0
Brood Patch
BP Control
2013
2014

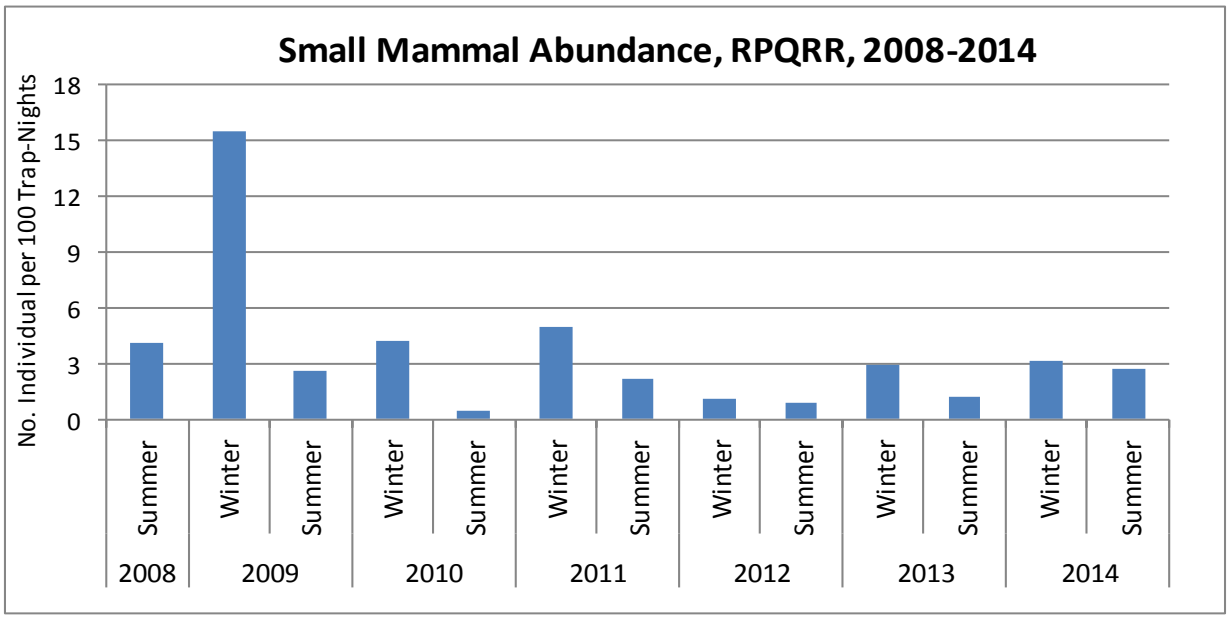

Brood Patches - Sweepnet
Arthropods per 100 sweeps
90
60
30
0
Brood Patch
BP Control
2013
2014


06/02/2014

Small Mammal Trends, 2008-14

Chad Goertz, Rachel McMath, and Tyler Berry, RPQRR

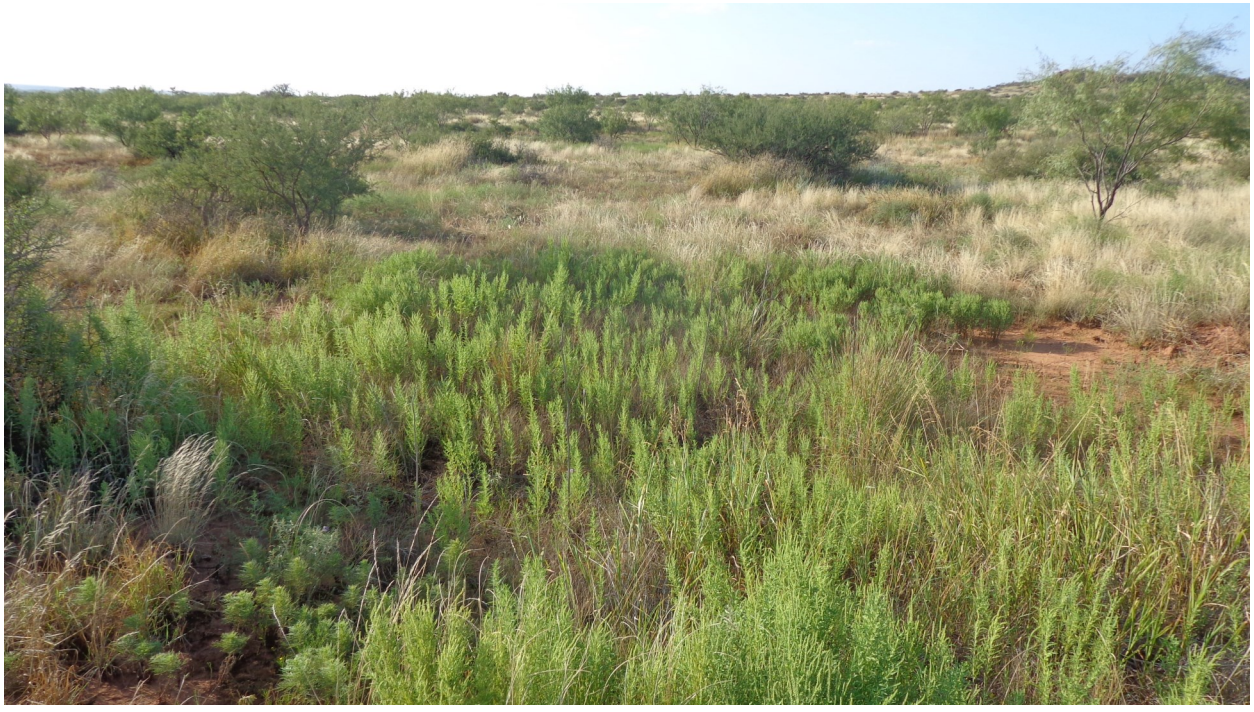
The abundance of small mammals (e.g., rodents) is believed to be an index of factors affecting quail abundance also. Rodents serve as a "buffer species" for potential predators of quail Each year, we use Sherman traps to estimate small mammal abundance in Winter (January) and Summer (July) across 8 different habitat types. We used Sherman Traps in a grid of 5x5 per location, with 5 locations per habitat type, and a total of 4 nights (a total of 500 trap-nights per habitat type per season; a total of 4,000-trap0nights per Season). Small mammal abundance has tended to remain fairly constant across years. Winter tends to suggest greater abundance, but some of this apparent difference between seasons likely reflects that rodents are trapped more successfully in Winter (when food supplies, and temperatures, are lower) than during the Summer.



Western Ragweed Seed Dynamics—Impacts of Spreader Dams

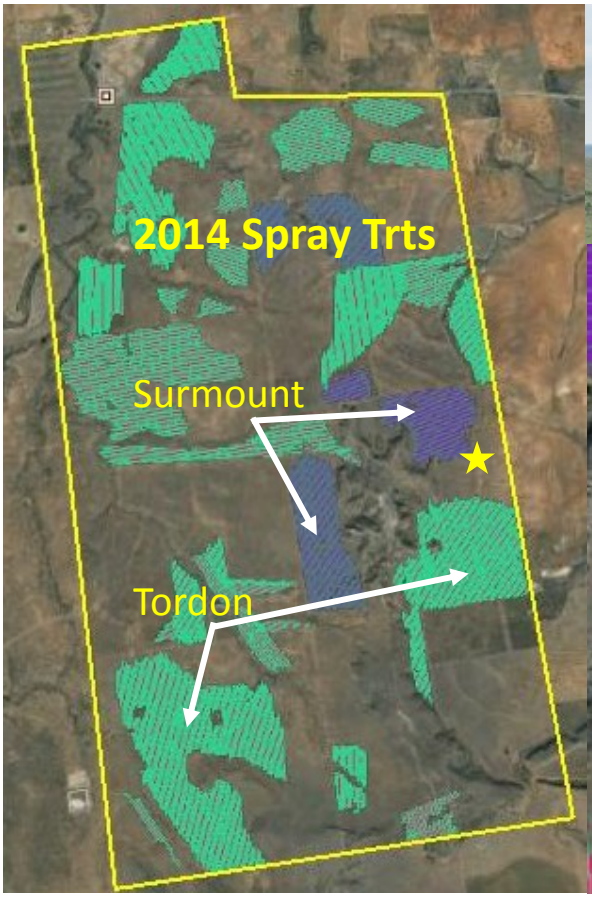
Lloyd LaCoste and Aaron Rives, RPQRR

Seeds of western ragweed (*Ambrosia cumanensis)* are a major component of the winter diet of bob-white quail. We measured seed production of western ragweed at RPQRR to determine if our spreader dams would stimulate ragweed seed production. We measured density of ragweeds and counted seed production on 60 plants inside and 60 plants outside the influence of the spreader dams. Seed production was similar between the 2 sites. Western ragweed plants located in spreader dams produced 23.6 seeds per plant while those located in the control sites produced 22.6 seeds per plant. However, there was a huge difference in the number of western ragweed plants that grew in the spreader dams compared to the adjacent upland control areas. Spreader dams produced 15.3 ragweed plants per square meter, whereas the adjacent upland control sites produced only 1.8 ragweed plants per square meter. When you look at western ragweed seed production our spreader dams produced 9 times more seeds per square meter than the adjacent upland control areas.



STOP 3

Cactus: a prickly paradigm for quail managers
2014 Herbicide control of cacti
Collateral damage to shrubs and forbs
Camera-trapping



Targeted Control of Pricklypear at RPQRR

Dale Rollins and Lloyd LaCoste, RQPRR

Cactus presents a "prickly paradigm" for quail managers. On the positive side, quail nest commonly in prickly pear, and such nests typically survive at higher rates than nests situated in bunchgrasses (especially until a threshold of at least 300 bunchgrass clumps/ac is achieved). Quail will also eat the fruits (tunas) and seeds therein. On the negative side, cacti (prickly pear and tasajillo) can be difficult for hunters and dogs to negotiate while afield. Prickly pear is abundant over much of the RPQRR, especially on clay-loam soils. Densities exceed 5 pads/m^2 which pose problems for bird dogs and hunters alike.

Since 2008, RPQRR has evaluated various control options in search of a "quail-friendly approach to prickly pear management" including prescribed burning (growing-season and dormant-season burns and "patch-burn grazing". These have produced varied results, but none were practical from 2011-2013 during historic drought. As RPQRR hopes to host a national bird dog field trial in 2016, we were charged by our Board to spray much of the prickly pear. We know that spraying will cause some "collateral damage", i.e., damage/mortality to selected shrubs and also "forb-shock". And these liabilities are being studied. These concerns are addressed in later talks

We delineated 1,550 acres of "dense" ("Category 2 or 3 on our scale) prickly pear and targeted these areas for aerial spraying in April 2014. The targeted areas were delineated with GPS and then sprayed via helicopter on 9 April 2014 with either Surmount or Tordon 22K. Rates and costs for these treatments were:

- Tordon 22K - 28 ounces plus 8 Herbimax plus application = $33.25/ac; 1,290 ac sprayed;
- Surmount - 48 ounces plus 8 ounces Herbimax plus application = $38.88/ac; 2,990 ac sprayed..

Herbicides were applied with 7.5 gallons of water/ac. We used a somewhat reduced rate as we would be satisfied with 70% control. Rainfall following the application was "good" (>7 inches) in May and June. Results will be monitored for the next two years.

Portions of the herbicide were donated by Crop Production Services and Dow AgroSciences.

Assessment of Non-Target Brush Mortality and Forb Response from Prickly Pear Herbicides

Lloyd LaCoste and Rachel McMath, RPQRR

Herbicides are frequently used for management of prickly pear. Aerial spraying, typically from a helicopter, is the most efficient method of herbicide application. However, such broadcast applications can be harmful to non-target, "quail friendly" species of forbs and shrubs. The objective of our study was to determine the mortality, or "collateral damage", of desirable shrubs and forbs following treatments of frequently used herbicides for prickly pear reduction. In 2010, we used four herbicides each applied in burned and unburned areas at 2 intensity levels for a total of 16 different treatments. We monitored mortality rates of desirable shrubs and occurrence of forbs within each treatment as well as in a control (non-treated) area adjacent to the treatment areas. We also recorded the density of prickly pear within the treatments and control for three years post treatment. The drought likely had a large impact on this study as was evidenced by the high rate of mortality (~35%) amongst tasajillo, wolfberry, and hackberry in the control areas. Summarized to the right is the relative susceptibility of shrubs in this study exposed to prickly pear herbicides.

"Quail Friendly" Shrub Species	Herbicide Susceptibility
Ephedra	Low
Catclaw Acacia	Low
Catclaw Mimosa	Low
Littleleaf Sumac	Low
Algerita	Moderate
Lotebush	Moderate
Hackberry	High
Wolfberry	High
Tasajillo	Very High

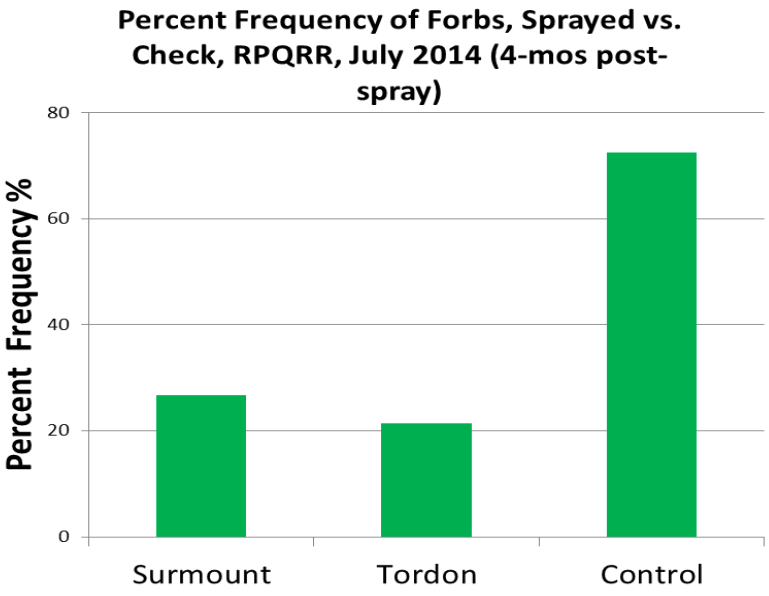
Herbicide	Cost	Application	$ per Acre
Tordon	$66.50/Gallon	2 pts/Acre	$16.63
		1 pt/Acre	$8.31
Surmount	$55.50/Gallon	4 pts/Acre	$27.75
		2 pts/Acre	$13.88
GrazonNext HL	$44.00/Gallon	1.5 pt/Acre	$8.25
		2.6 pts/Acre	$11.55
Chapparral	$90.00/pound	3.3oz/Acre	$18.56
Chapparal + 2,4D Ester	$27.66/Gallon	3.3oz/Acre (Chapparal) +1 lb/Acre (2,4D Ester)	$23.17

*The GrazonNext formulation has been changed since the plots were put out. You can no longer buy the GrazonNext that was used in the study. The formulation was changed to GrazonNext HL (High Load) which means lower use rates.

Forb Shock Study (Year 1)

Rachel McMath, RPQRR

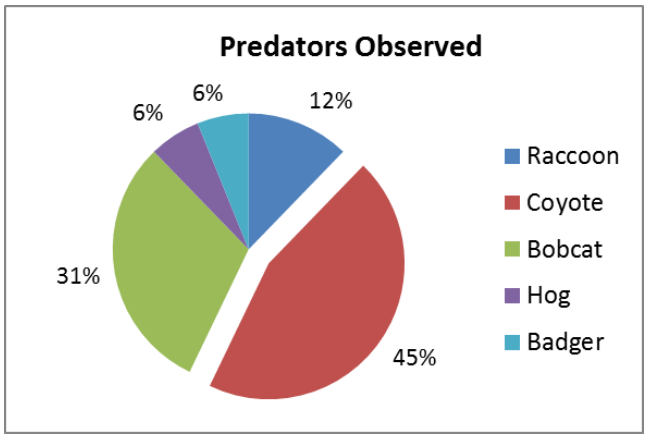
In April of 2014, we aerially-sprayed (via helicopter) different "polygons" (a total of 1,550 acres) which harbored heavy infestations of prickly pear. We used 2 herbicides, Surmount or Tordon, to decrease the amount of prickly pear. However, because these herbicides also kill forbs we sought to assess the degree of "forb shock", i.e., which species and for how long. I went out to designated polygons that had been sprayed, as well as some polygons in adjacent areas that had not been treated to act as a "check." I sampled for the presence of 8 species: sunflower, field ragweed, western ragweed, croton spp., common broomweed, Tx wintergrass, silver bluestem and prickly pear. In each polygon, I would take a round quadrat (i.e. hoola hoop) and throw it on alternating sides every 10 steps and mark whether there was a presence of one of the plant species we were looking for. I sampled about 1,000 points per treatment type. Forbs occurred about 26.8% and 21.3% of the time in the Surmount and Tordon plots, respectively . Check plots registered 72.5% forb frequency. We will continue this study for two more years.

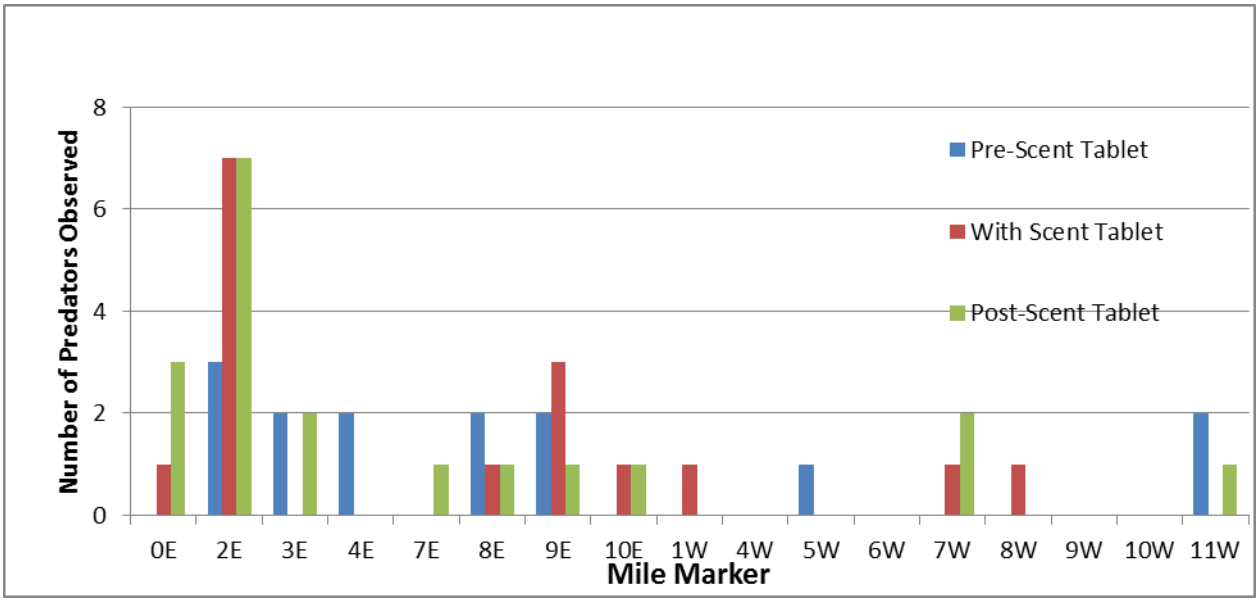


Camera-trapping to Assess Predator Abundance and Distribution at RPQRR

Rachel McMath, RPQRR

Game cameras are great tools to use in order to get an estimate of predator communities (i.e., species diversity) and population trends. We set up 17 game cameras at randomly-selected mile markers around the ranch this past summer. In order to be sure they were working properly, the cameras were set up and left running for a week (i.e.. Pre-trial). This also helped any predators in the area acclimate to their presence. Following the pre-trial cameras were "armed" the following three weeks, giving us a total of 357 trap nights. We tested to see if the presence of a "fatty acid scent tablet" (commonly used in predator scent station surveys) had an impact on photo-capture rate. The first week there was no scent tablet out in order that we might get a general sense of the predators in the area. We put out scent tablets the second week. Then, for the third week, we took the scent tablet away to see if anything visited sites more frequently. Our results showed that the presence of a scent tablet did not make a significant difference as far as "photo-trapping" predators. Over the 3 weeks the cameras were out, a total of forty-nine predators were caught; a third were bobcats, 45% were coyotes, 12% were raccoons, 6% were badgers, and 6% were hogs. The majority of "captures" occurred on the East Texas Quail Index line (i.e., eastern half of the ranch). We did experience camera malfunctions on 3 cameras where they did not take night pictures, so their data is likely biased low.





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We post game camera pics frequently on our Face-book page; "like" our page to stay updated.

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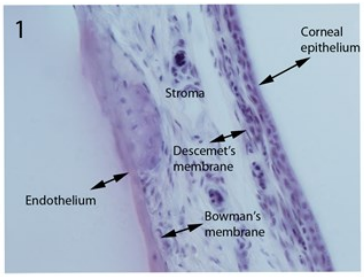
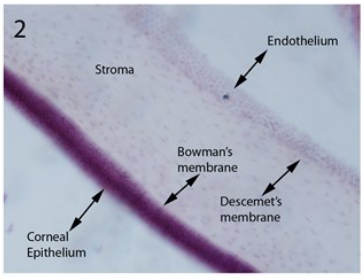
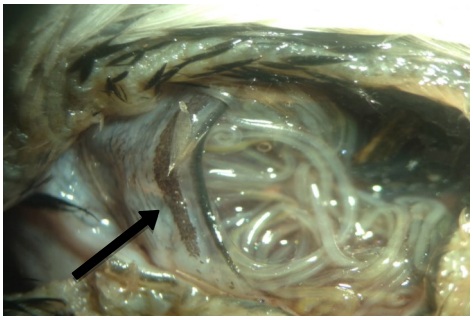
Operation Idiopathic Decline: Parasitic Infections of Northern Bobwhites Across the Rolling Plains

Andrea Bruno and Alan M. Fedynich, Texas A&M University-Kingsville
Dale Rollins, RPQRR

Factors regulating bobwhite populations across Texas are under intense analyses. Seldom do researchers consider parasites and diseases as a potential cause of decline. As a result, an intensive parasite and disease study began in 2011 to examine the possible link with the bobwhite population decline in the Rolling Plains, a region of Texas where quail are economically and ecologically significant. A total of 199 bobwhites was collected for helminth survey during 2011–2013 through trapping (n=97) and hunter donations (n=102). In trapped birds, eye and cecal tissue were taken from bobwhites to assess potential damage from parasitic infections. Additionally, live bobwhites were surveyed for *Trichomonas gallinae*, a protozoan causing disease in columbids. All 381 samples tested negative for *T. gallinae*. The helminth survey revealed eleven species of helminths, representing 25,788 individuals. The most commonly occurring (prevalent) species were intestinal worm *Aulonocephalus pennula*, eyeworm *Oxyspirura petrowi*, and proventricular worm *Tetrameres pattersoni*. Statistically, prevalence of all three species was significantly greater in adults than in juveniles (P=<0.001, P=0.005, P=0.002). Prevalence of *A. pennula* and *O. petrowi* were not significantly different by sex (P=0.22, P=0.09) and *T. pattersoni* prevalence was greater in males than females (P=0.041). Preliminary pathology indicated that eyes collected from an infected bobwhite displayed interstitial (stromal) keratitis and corneal scarring. This disorder is known to cause visual impairment. More eye and cecal tissue samples will be processed this coming year to further assess damage caused by parasites. The present study will provide current information on bobwhite parasites and diseases across the Rolling Plains ecoregion as well as provide data on pathological responses to helminth infection.







Descriptive statistics helminths from 199 northern bobwhites collected from August-January 2011-2013 in the Rolling Plains ecoregion of Texas and western Oklahoma.

Helminth Species	Prevalence n (%)	Abundance Range	Abundance ± SE	Total
Aulonocephalus pennula **S,L,C**	169 (85)	1–1,162	120.3 ± 11.1	23933
Oxyspirura petrowi **E**	34 (33)	1–67	6.6 ± 0.9	1310
Tetrameres pattersoni **P**	42 (21)	1–11	0.7 ± 0.1	134
Acanthocephalan **N**	23 (12)	1–60	1.0 ± 0.4	208
Physaloptera sp. **BM**	9 (9)	1–25	0.5 ± 0.2	102
Gongylonema phasianella **CR**	7 (13)	1–5	1.6 ± 0.3	21
Cheliospirura spinosa **G**	20 (10)	1–10	2.9 ± 0.6	57
Dispharynx nasuta **P**	2 (2)	1–6	2.7 ± 1.7	8
Cestode **S**	3 (2)	1	1.0 ± 0.0	3
Mediorhynchus sp. **S**	1 (1)	1	1.0 ± 0.0	1
Eucoleus contortus **CR**	1 (1)	1	1.0 ± 0.0	1

BM= breast muscle, C = ceca, CR= crop, G=gizzard, E = eye and nictitating membrane, L =large intestine, N = neck muscle, P = proventriculus, S = small intestine

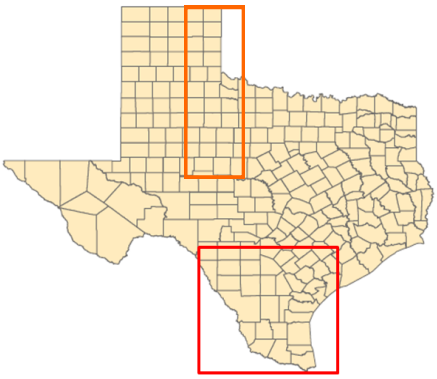
Eyeworms (Oxyspirura petrowi) in Northern Bobwhites from South Texas and the Rolling Plains

Andrew Olsen[1], Andrea Bruno[1], Alan Fedynich[1], and Dale Rollins[2]

[1]Caesar Kleberg Wildlife Research Institute, Texas A&M University - Kingsville [2]Texas AgriLife Research, Texas A&M University

Several pathogenic parasites are known to infect bobwhites, and there is limited knowledge of the occurrence of these parasites in bobwhites from South Texas and the Rolling Plains. To learn more, samples of 91 and 128 hunter-shot bobwhites were collected from South Texas and the Rolling Plains, respectively. Complete necropsies of these samples revealed 6 helminth (worm) species in South Texas and 8 in the Rolling Plains. Helminth infections were common with 85% of bobwhites from South Texas infected and 94% from the Rolling Plains infected. Noteworthy helminth species documented in both regions in Texas were the cecal worm, eye worm, and proventricular worm. Cecal worms were prevalent (85% in South Texas; 91% in Rolling Plains) and abundant in both regions, although more prevalent in the Rolling Plains. Bobwhites were often infected with 100+ cecal worms. The pathogenicity of this parasite is unknown. Eye worms were more prevalent in the Rolling Plains (66%) than South Texas (8%). Recent research indicates that eye worm infections cause tissue damage to the surface of the eye and glands associated with the eye. Proventricular worms, a known pathogen of bobwhites, were more prevalent in the Rolling Plains (24%) than South Texas (5%). All of the helminth parasites encountered in both regions usee intermediate hosts (e.g., insects) to complete their lifecycles. The regional differences in bobwhite helminth infections may be attributed to differences in habitat and subsequently insect abundance and species composition. Additionally, South Texas has a dynamic, harsh climate that may be less suitable for helminth parasites. Additional research is needed to determine the pathogenicity of eye worms and cecal worms and to determine the intermediate hosts of these parasites.

Region	Prevalence %	Intensity $\bar{x} \pm SE$	Abundance $\bar{x} \pm SE$
South Texas (N=92)	6.5	1.8 ± 0.3	0.1 ± 0.1
Rolling Plains (N=95)	44.2	14.6 ± 2.0	6.5 ± 1.1

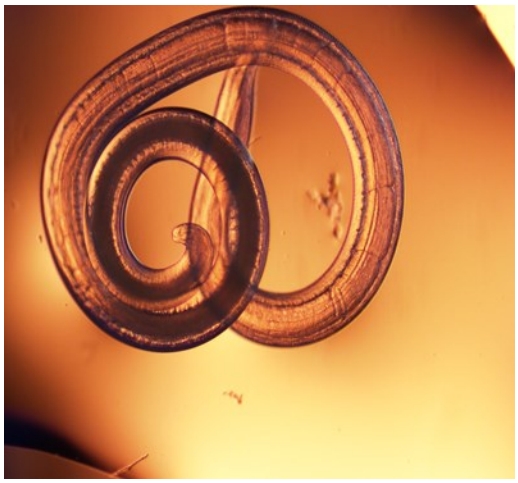


Funding provided by CKWRI and RPQRR.

Operation Idiopathic Decline: The Impact of Eyeworms on Northern Bobwhite Foraging and Flying Efficiency

Nick Dunham, Liza Soliz, and Ronald J. Kendall, Ph.D., The Institute of Environmental and Human Health, Texas Tech University

Northern bobwhite (*Colinus virginianus*) populations have been experiencing a dramatic decline throughout North America, which has been long associated with habitat loss, fragmentation and rainfall patterns. However, with optimal habitat and environmental conditions, dramatic fluctuations in quail population still exist. Minimal data has been reported on host-parasite interactions and their ability to regulate host populations and more specifically if eyeworms (*Oxyspirura petrowi*) negatively impact bobwhite survival. As a part of "Operation Idiopathic Decline", northern bobwhites sampled from West Texas had substantial eyeworm infection. In contrast, northern bobwhites sampled from South Texas showed almost no evidence of eyeworms. Because of the lack of data on the impact eyeworms have on northern bobwhite survival, a pilot experiment was conducted to determine if eyeworms could be removed from wild-captive northern bobwhite quail and transferred into pen-raised northern bobwhite quail in order to understand if eyeworms negatively impact vision. Live eyeworms were removed from quail, and immediately after removal, were transferred into the eyes of pen-raised birds at varying degrees of infection. During the pilot we observed eyeworms evading forceps, moving from eye to eye, and noticed that eyeworms grew within the new host's eye. With the success of our pilot experiment, submission of our large-scale foraging and flight efficiency study has been approved by the animal care and use committee, which will commence this fall. The large-scale study will test northern bobwhites navigation ability and their ability to find and secure food while infected with eyeworms at different levels of infection. In addition to infecting northern bobwhites, we have also been collecting eyeworms from the Operation Idiopathic Decline trapping initiative as well as other approved trapping sites in an attempt to document the infection rates and work out our methodologies. Currently, we are placing eyeworms in various media in order to keep them alive for extended periods of time which will allow us to document their lifecycle and/or raise eyeworms from eggs *in vitro*.



Funding provided by Rolling Plains Quail Research Foundation

Parasitological Survey of Scaled Quail from the Western Rolling Plains of Texas and Surrounding Areas

Kelsey A. Bedford, Alan M. Fedynich, and Dale Rollins

The scaled " blue" quail has been declining since the 1960s. Though studies have focused on habitat restoration and predator-prey relationships, little research has been conducted on the role of helminths (internal parasites). There are few parasitological surveys of scaled quail from Texas, pointing to a need for more information. Our objectives are to (1) document the helminth species of scaled quail occurring within the Rolling Plains ecoregion and surrounding areas, (2) determine helminth prevalence, intensity, and abundance, and (3) assess whether infections are influenced by host age, host sex, body weight, population density, location of collection, and precipitation. Twenty-eight scaled quail were donated during the 2012–2013 hunting season and 73 quail were donated during the 2013–2014 season. In cooperation with a regional bobwhite disease study called Operation Idiopathic Decline (OID), funded by the Rolling Plains Quail Research Foundation, 13 scaled quail were trapped in 2012 and 17 in 2013, which were also included in the study. Additional scaled quail will be attained during the 2014–2015 hunting season. Complete necropsies will be conducted at the Buddy Temple Pathology and Diagnostic Laboratory at Texas A&M University-Kingsville.

To date, all quail have been examined for eyeworms (*Oxyspirura petrowi*). Prevalence, intensity of infection, and mean abundance of infection appeared to be lower in the 2012–2013 sample than in the 2013–2014 sample, but the number of birds examined in the first period was low, precluding robust interpretation. Full necropsies are underway to determine helminth species after which statistical analyses will be performed for interpretation purposes. Upon completion of this study, we will have more information on the helminths of scaled quail including species currently found and whether any of these species are known to be harmful to quail.

Funding provided by the CKWRI and RPQRR.

Summary statistics of prevalence, intensity, and abundance of *O. petrowi* in hunter-shot and OID-trapped scaled quail.

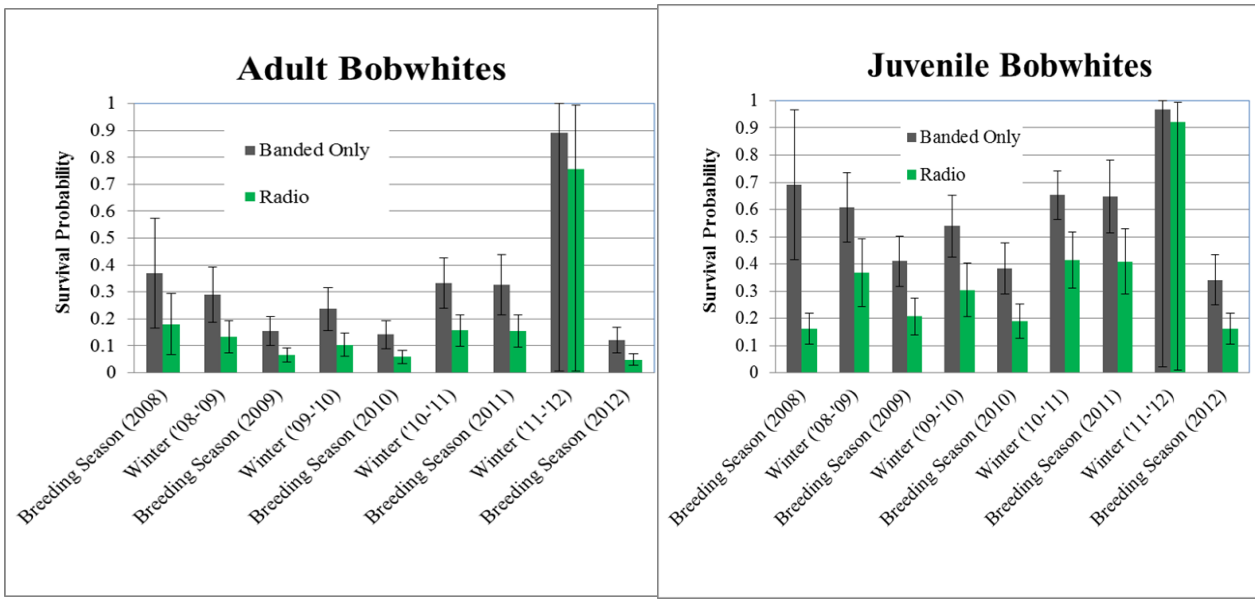
	Year	Sample Size	Prevalence	Mean Intensity	Range	Mean Abundance	Total
OID	2012	13	54%	4.8 ± 2.1	1–15	0.5 ± 0.3	24
	2013	17	24%	4.0 ± 1.0	3–5	2.0 ± 0.4	12
Hunter-shot	2012–2013	28	21%	2.7 ± 1.2	1–8	0.6 ± 0.3	16
	2013–2014	73	77%	6.1 ± 0.8	1–21	4.2 ± 0.7	309

Evaluating “radio-handicapping” of northern bobwhites during drought

Becky Ruzicka, Dale Rollins, and Lloyd Lacoste, Rolling Plains Quail Research Ranch

Fidel Hernández, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville

The negative effects of radio-tagging on northern bobwhite (*Colinus virginianus*) survival, i.e., “radio-handicapping” has prompted debate amongst scientists in the quail community. The central assumption of telemetry, that radio collars do not negatively bias survival, must be met in order for the survival estimates to be representative of the population. We investigated the season-long effects of radio-tagging on northern bobwhite survival over a 5-year period (2008−2012) on the Rolling Plains Quail Research Ranch, Fisher County, Texas. We hypothesized that effects on survival would mostly likely be manifested during periods of high stress; therefore we tested for differential influences on survival during times of drought. We modeled apparent survival for radio-tagged versus leg-banded only bobwhites that were trapped twice a year during the 5-year period. We used drought as a time-varying predictor in the Cormac-Jolly-Seber model of Program MARK. We found an effect of age, time, and radio-tagging on apparent survival and an effect of time on recapture rate. Overall, radio-tagging decreased survival in bobwhites by an average of 13% in adults and 20% in juveniles. There was no effect of drought on survival of radio-collared or banded only birds.



Operation Velociraptor: Are wild turkeys quail-killers?

Bradley W. Kubecka and Dale Rollins- RPQRR

The Rio Grande Wild Turkey is a large, gallinaceous bird known for its opportunistic and nomadic feeding habits. Some quail hunters (especially popular in KS and MO) insinuate that wild turkeys consume quail chicks and/or depredate quail nests. Given their opportunistic and nomadic feeding strategy, the objective of this study was to determine if, and at what frequency of occurrence, do wild turkeys consume quail eggs or chicks. We collected a total of 93 AHY turkeys on a large, well-managed ranch in Roberts County, TX beginning in May and ending in July. Crop contents were analyzed macroscopically and classified into 3 food groups: supplement [corn, milo, wheat, and protein], plant matter (to species), and arthropods (to Order). None of the 93 crops examined revealed any evidence of ingestion of quail. Internal, gastrointestinal examination of the gizzards will be examined in the future to further confirm absence of ingestion. The Top 15 food items identified are listed below.

		Frequency of Occurrence (%) (n)
Common Name	**Family/ Order/ *Scientific Name***	
Grasshoppers	Orthoptera	48 (55)
Corn		49 (53)
True Bugs	Hemiptera	35 (40)
Milo		34 (37)
Skunkbush Sumac	*Rhus aromatica*	31 (33)
Beetles	Coleoptera	29 (33)
Grasses	Poaceae	29 (31)
Caterpillars	Lepidoptera	27 (31)
Wheat		24 (26)
Russian Thistle	*Salsola iberica*	21 (23)
Netleaf Hackberry	*Celtis reticulata*	15 (16)
Unidentified Forb	N/A	14 (15)
Rushes	*Equisetum spp.*	8 (9)
Cicadas, etc.	Homoptera	7 (8)
Protein supplement	N/A	7 (8)

The Texas Quail Index

Becky Ruzicka and Dale Rollins, Texas A&M AgriLife Extension Service

The Texas Quail Index (TQI) is a series of hands on demonstrations organized by the Texas A&M AgriLife Extension Service. It is designed to educate land managers, hunters, and others about population dynamics, habitat requirements, and other factors affecting bobwhite and scaled quail in Texas. At the county level, TQI fosters landowner and community involvement and provides tools for interested stakeholders to assess the "quail-equation" in their community. Statewide, the TQI provides an important opportunity to use citizen-science to help monitor the abundance of quail and bring attention to their importance, plight, and needs. It starts by recruiting the Texas A&M AgriLife County Extension Agent (CEA) for a particular county to participate in the TQI. They in turn find a ranch or other suitable property willing to serve as the demonstration site. The CEA is also responsible to for recruiting other members of the team from their community. This team could be: the hunters who have a lease on the property, a former QuailMaster in the area, a former Bobwhite Brigade student, a Master Naturalist, agency personnel (NRCS or TPWD), and, ideally, a member of the local media. These teams are responsible for collecting data on quail abundance, predator abundance, and habitat quality on the participating site.

Funding provided by Texas A&M Agrilife Extension service's Reversing the Quail Decline Initiative and the Big Covey Chapter of Quail Coalition.

Members of the Rolling Plains Chapter of Texas Master Naturalists are conducting the Texas Quail Index in Wichita County along with Agrilife CEA David Graf. (back row, middle)

Monitoring Texas Horned Lizards in the Rolling Plains of West Texas

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

The Texas Horned Lizard, *Phrynosoma cornutum*, is perhaps the most recognizable species of Horned Lizard. It is the largest native species of Horned Lizard (Family: Phrynosomatidae) and has the widest distribution of any other Horned Lizard in the Unites States. Once extremely common throughout their range, Horned Lizards in general are now known to be in decline. The Texas Horned lizard perhaps the most threatened member of this group, with estimated population declines of greater than 30% across its range (Texas, Oklahoma, Kansas New Mexico, and northern Mexico) and even higher in its population epicenter, Texas (Linam 2008, Henke 2003). Currently the Texas Horned Lizard is listed by Texas Parks and Wildlife as a "Threatened Species". This status provides limited protection by prohibiting private ownership and/or collection from the wild without a TPW permit and outright banning any related commercial activity.

We began preliminary data collection ion THL abundance at RPQRR n the summer of 2010 and have continued through 2014 active season, which is typically May—Oct. 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.

Our current method of collecting data consists of road surveys or "road cruising." Once spotted, the lizard is captured by hand. 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 This is accomplished by opportunistically taking DNA samples from capture animals with a cloaca swab.

During the 2011 season we started using a smaller PIT tag allowing us to permanently mark a larger number of subadult lizards, lowering our minimum taggable size from 60mm snout to vent length (SVL) to 50mm. While this has not increased our total capture number as of yet, it allows us to expand the size of our permanently-marked group which provides more potential for positive identification upon recapture. To date we have spent roughly 720 hours sampling roads resulting in close to 1,200 captures. Approximately 750 have been PIT tagged and 105 have been recaptured at least once.

The total number of lizards captured in 2014, to date, is approximately 300. This is considerably higher than last year's count, but we have also logged more hours on the road so far in 2014, 117 hours vs. 84 hours in 2013. Our LPH (lizards per hour) is right at 2.5 this season, which is an improvement over last year and higher than our average, 1.67 LPH, since the beginning.

Overall we feel like this has been a good year for horned lizards at RPQRR. As for the expanded presence of oil-related disturbance, the impact is too early to assess. However, the numbers are good this year and we have found lizards close to oil wells already. They will likely return to "normal" when the disturbance is past and as the vegetation grows back. We will eventually have a very good before and after comparison with regard to the presence of oil wells on the ranch.

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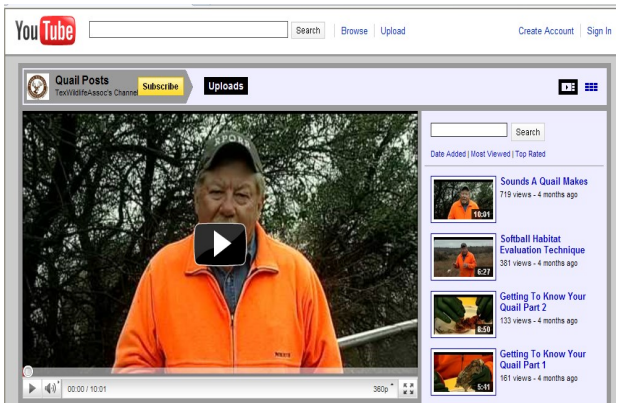

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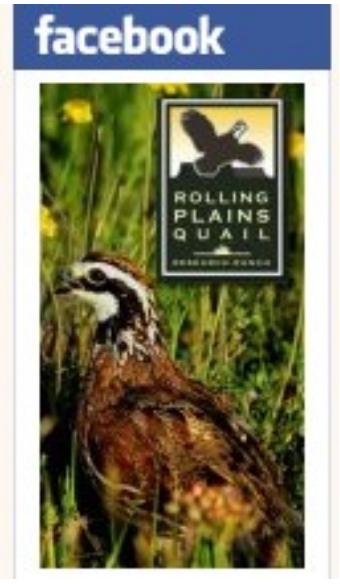

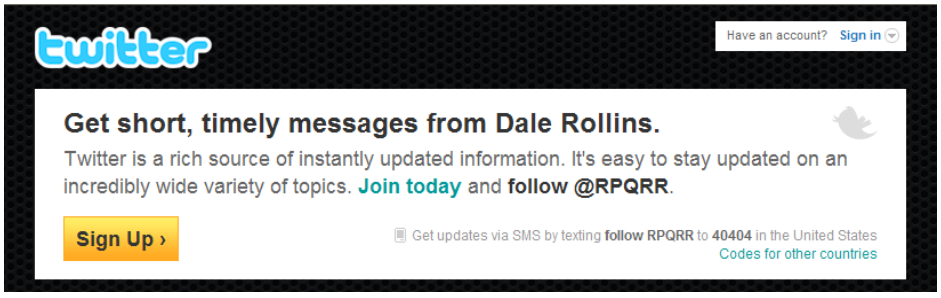

www.quailresearch.org

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