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## Radio-handicapping: dodging predators with a wing tied behind your back

by [Dean Ransom, Jr., PhD, Research Scientist, RPQRR](#)

From the beginning of wildlife management as a recognized discipline, biologists have relied on their observational abilities to understand the natural world.

Over time, advancements in technology have improved the ability of researchers to peer into the detailed lives of the organisms that we study. But with improved abilities to capture, mark, measure, and observe the animals we're concerned with, there are also consequences and responsibilities. For instance, it is commonly accepted now that the manner in which capture techniques are implemented for pronghorn (*Antilocapra americana*) is critically important to prevent excessive stress and capture-related mortality in a species that is high-strung— even when at rest and undisturbed. Capture-related stress and mortality are side-effects of research that biologists must be diligent to prevent.



One of technological advancements that has helped quail biologists understand the behavior of bobwhites is the development of radio-telemetry, which involves a small micro transmitter that emits a monotone pulsed radio signal (e.g., 'beep') that the biologist can track using a receiver and antenna. Transmitters are affixed to the bird in different configurations, but the two most common attachments for bobwhites have been the backpack arrangement and the necklace arrangement. Necklaces are the currently accepted method of choice. This decision is predicated on the notion that bobwhites are used to carrying additional weight (i.e., a full crop of food) in the neck region. The weight of the transmitter package is the most important consideration and has implications on battery size and operational life. The general rule is usually < 5% of body weight for mammals and < 3% for birds, although there are no empirical data behind these numbers. For bobwhites, most necklace transmitters weigh 5-7 grams, with a battery life often approaching 11 months. A wild bobwhite in west Texas weighs about 170 grams at adulthood.

In recent years there have been concerns about the use of radio-telemetry 'radio-handicapping' bobwhites, that is to say the attachment of a transmitter to the bird somehow handicaps or increases the birds vulnerability to predators. This concern was based initially on telemetry-derived survival rates that were too low to realistically sustain a population of quail.

The first strategy to address radio-handicapping was the use of an adjustment period, to allow the birds to get used to carrying the weight. This adjustment period would allow biologists to censor out from the respective data analysis those quail that did not survive beyond a certain time period and thus likely died due to effects related to the weight of the transmitter, or the method of attachment. There is no biologically relevant period that has been empirically

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### Bird Dog Census

RPQRR's 4th Annual Bird Dog Census is slated for October 22-23, 2010 (Friday-Saturday).

We would like to have about 20 teams for both days; those will be invited on a first-come, first-served basis. Bring your Polaris, Kawasaki, Bad Boy, or walking boots, and the beverage of your choice; we have pastures to accommodate all. If you have an Astro GPS collar, please bring it, but we have some if you don't have one.

Over the past year, we have burned about 1/3 of the ranch, so prickly pear is less abundant in most areas.

We will be serving hamburgers on Friday night, and a light lunch (Mikulik sausage & tortillas) on Saturday.

Orientation set for 3 p.m. Friday at the HQ (10 miles W of Roby on US 180). For more information [[Click Here](#)].

### In the News

RPQRR's Dr. Dale Rollins and Lloyd LaCoste will speak at an upcoming Quail-Wildlife Appreciation Day on September 21 at the

determined, but the time frames commonly used by researchers have been 7 and 14 days; these are primarily matters of convenience on the part of the biologist. Birds surviving past this censor period are presumed to behave, and survive, like a "regular" quail would.

The validity of the radio-handicapping hypothesis has been debated among bobwhite researchers for the last several years. Drs. Fred Guthery and Jeff Lusk at Oklahoma State have argued that telemetry-derived survival rates should be suspect, because *prima facie* and empirical evidence indict the estimates for potential negative bias. In two articles, one each in the the Journal of Wildlife Management (2007) and the Wildlife Society Bulletin (2004), Guthery and Lusk conducted an analytical review of published telemetry-derived survival rates, and found that many of the telemetry studies produced unsustainable survival rates. In essence, the study populations should have gone extinct before the study was finished. [Ooops . . . researchers hate it when that happens.] The best example they offered was a 10-year study of bobwhites on the Packsaddle WMA in western Oklahoma in which the bobwhite population should have gone extinct in year 4 of the study based on telemetry-based survival estimates.

The other side of the issue also has a compelling argument. In 2007, Drs. Bill Palmer and Shane Wellendorf published results from a 6-year study (1999-2004) in the Journal of Wildlife Management which found that radio-transmitters had essentially no effect on survival of bobwhites on the Tall Timbers Research Station in northern Florida. In that same journal issue, Drs. Theron Terhune, Clay Sisson, James Grand, and Lee Stribling presented results from an 8-year study of bobwhites conducted in Georgia by the Albany Quail Project and the University of Georgia. This long term study essentially mirrored that of Palmer and Wellendorf in failing to demonstrate a negative effect on bobwhite survival from the use of radio-transmitters.

So, the research seems to be conflicted on the issue, or perhaps it is analogous to supplemental feeding in the sense that some sites in some years show a feeding response, but overall feeding is a neutral effect. Radio-handicapping may operate in a similar manner, seriously manifesting itself in some environments and habitats, and not in others. In the end, the responsibility is that of the researcher(s) to scrutinize their telemetry-derived survival data, and weight their conclusions accordingly in order to ensure reliable knowledge.



Fortunately, not all aspects of bobwhite behavior appear to be directly influenced by the handicapping bias, if and where it occurs. Telemetry allows biologists to monitor another important demographic, that being nest success and habitat attributes associated with nest site selection. From a population maintenance and viability perspective, nest success—which is a measure of the number of quail chicks produced—is an important demographic parameter; the more that are hatched, the more that are recruited into the fall population. Nest success can also shed light on predator effects and grazing management.

Furthermore, even when handicapping occurs, biologists have other means to offset its effects. The various survey methods used to enumerate bobwhite populations are usually independent of telemetry effects and can provide unbiased estimates of survival. Several such methods are currently employed at RPQRR. Direct estimates of density, such as line transect counts (currently known as distance sampling) can be conducted in the fall and the following spring, thereby providing telemetry-free estimates of overwinter survival. Such counts are logistically taxing, but are a rigorous method to obtain empirical estimates of absolute density. Recent technological developments have

Matador Ranch. [[Click Here](#)] or call Ryan Martin, 806-347-2733 for additional details.

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### Ask Dr. Dale

**Q:** I live in Mississippi and have been very fortunate to hunt quail in Texas since 1991. I have hunted in Colorado City , Roby ,Rotan, Garden City, all around Gail and King Ranch in the south among other places. Of course the first thing we notice is that nearly nothing from my place in Hot Coffee, MS is the same, e.g., food sources for quail. Could you recommend one textbook that I could purchase about west Texas (or all of Texas) habitat, specifically pictures of the plants, berries, etc. that bobs and blues feed upon, where they grow and what time of year quail use them. We usually check the craws and I don't know what I'm seeing. Your help would be greatly appreciated. By the way we love the monthly newsletter. – DL

**A:** There's no single book that provides all you seek, but there are several good books, including:

- *Texas Quails: Ecology & Management*; edited by L. A. Brennan (Texas A&M Univ. Press); about \$25 on Amazon.com;
- *Texas Bobwhites: a Guide to Their Foods and Management* by J. Larsen et al.

provided the ability of conducting distance sampling from a helicopter, which greatly increases the efficiency of these counts.

Why does handicapping matter, if only as theoretical construct? It matters from an animal welfare perspective, since biologists should be concerned with the welfare of their study subjects. Outward appearances to the lay public can have far-reaching effects on the credibility of wildlife research if the biologists are less than judicious in their concerns for the wildlife they study. Second, it matters from a management perspective. Radio-handicapping, if and where it exists, can seriously bias the data collected from radio-tagged animals, which can then affect management decisions. If for example, a biologist using telemetry to monitor over-winter survival of bobwhites records excessively low survival, and does not consider the handicapping effects, then s/he might recommend an intensive short-term predator control program, or extreme or controversial habitat management measures, both of which would be a costly and unnecessary decision based upon biased data. If we are going to turn the tide on the bobwhite decline, we shouldn't make it more difficult by tying our own hand behind our backs with biased data. So, understanding the radio-handicapping bias is important, given the heavy emphasis that quail researchers have placed on radiotelemetry in studying bobwhite populations.

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### Cadence call (Conservation cadences from the [Bobwhite Brigade](#))

You better be a habitat manager,  
 Take good care of your quails' needs.  
 You better be a habitat manager,  
 Learn to know your plants and seeds.

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### Save the Date!

Mark **Friday, October 1 as the 3<sup>rd</sup> annual field day** at RPQRR. The theme for this year's gathering is "Axe, Plow, Cow, Fire, and Gun as Tools in Quail Management." These are the 5 tools identified by conservationist Aldo Leopold in his 1933 class "Game Management." Last year's attendance topped 200, and we hope to break 250 this year! The day's activities will highlight ongoing research relative to:

- patch-burn grazing;
- quail-friendly cacti management;
- surgical strikes with helicopter-applied herbicides;
- seasonal burning strategies to enhance forb diversity;
- predator-avoidance strategies of bobwhites;
- arthropod response to management practices;
- enhancing CRP contracts for bobwhites;
- and more.

Program will run from 9 a.m. to 2:30 p.m. Pre-registration is \$10 (by Sept. 24); \$20 thereafter and at the door. Registration includes lunch and refreshments. Students may attend for \$5 per person. Three Continuing Education Units will be available to persons with Private Applicator's licenses.

For more information, please contact [Rachel Vega](mailto:rrvega@ag.tamu.edu) (rrvega@ag.tamu.edu; 325-653-4576) or [Dale Rollins](mailto:d-rollins@tamu.edu) (d-rollins@tamu.edu).

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### Roadside Counts on RPQRR by Lloyd LaCoste, Research Technician, RPQRR

(Univ. of TX Press) is available for about \$25 (paperback); [\[Click Here\]](#) for ordering info;

See also these booklets which can be downloaded in pdf form:

- Jackson, A. S. 1969. Quail Management Handbook for West Texas Rolling Plains. [TPWD Bull. No. 48](#);
- R. Cantu et al. [Scaled quail in Texas](#). TPWD; .

Finally, the Noble foundation's [Plant Image Gallery](#) is a handy online reference.

As you discover seeds you cannot identify, send them to me and I'll help you. I recommend scanning them on a color flatbed scanner at 300 dpi then e-mail a jpeg to me at [drollins@ag.tamu.edu](mailto:drollins@ag.tamu.edu). Same goes for plants.

See article below on the "Digital Plant Press."

### Did you know?

How many teeth does a quail have? Say what?? Actually, a quail does have one "tooth", the "egg tooth" on the end of its beak. The egg tooth helps "cut" the chick out of the egg, then disappears a day later.

### Blues Bros.

The Desert QuailMasters class convened last month in Truth or Consequences, NM to tour two of Ted Turner's ranches: the Ladder Ranch and the nearby Armendaris Ranch. Cool weather and lots of things to see proved to be a winning combination. We also field tested, and continued to fine-tune, a new habitat evaluation exercise for scaled quail habitat.

### By the Numbers

**405** That's the number

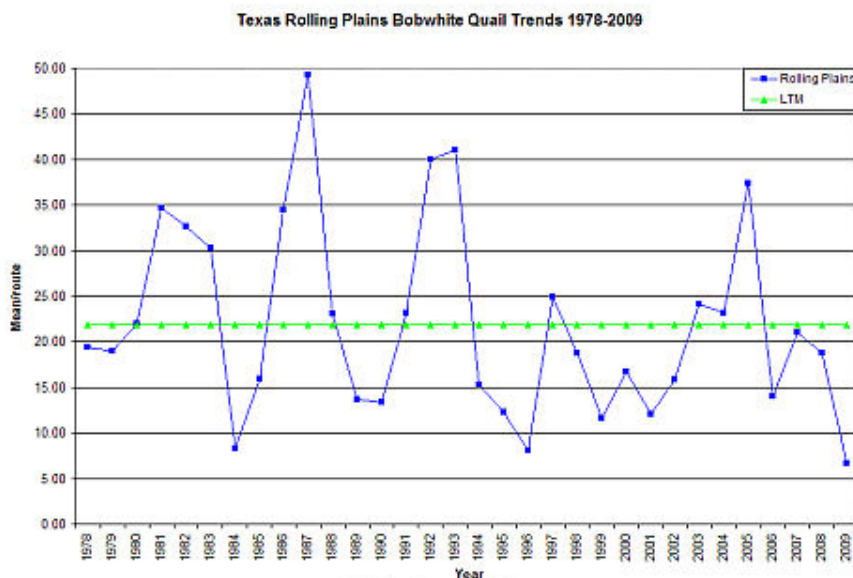
Since RPQRR was started in 2007, we have implemented various ways to monitor quail abundance over time; these efforts include helicopter surveys, whistle counts (spring and fall), mark-recapture (using leg-banded birds), radiotelemetry, dummy nest survival, and fall roadside counts. We seek to determine which of these provides reliable estimates relative to the time and expense of conducting the 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 the first two weeks of September; two during morning hours and two during afternoon hours. 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 west and south Texas. See TPWD's website for more details and historical trends for your region at [http://www.tpwd.state.tx.us/huntwild/hunt/planning/quail\\_forecast/forecast/](http://www.tpwd.state.tx.us/huntwild/hunt/planning/quail_forecast/forecast/).

The graph below shows the average (mean) number of birds seen per 20-mile route by TPWD biologists in the Rolling Plains ecoregion. The long-term mean (green line) is just over 1 bird observed per mile (21 birds/route). Note that bobwhite abundance in the Rolling Plains (a) is somewhat cyclic, with peaks occurring about every five years, and (b) since 1993, only five of the past 16 years have been at, or above, the long-term mean. Last year's counts were the lowest observed since counts began in 1978.



Click for full image

At RPQRR, we count along two 10-mile routes, i.e., an "east" and "west" line to give us greater resolution. Our habitat is quite different from one side of the ranch to the other, with the western half having considerably less brush (i.e., "quail houses") than the eastern part of the ranch.

We observed an average of 26.5 birds per 20-mile route in 2008, but only 4.7 birds per route in 2009. The table below compares TPWD'S mean number of quail per 20 mile route to RPQRR's.

Mean Number of Birds Observed per 20-mile Route		
Year	TPWD	RPQRR
2008	18.7	26.5

of fans receiving weekly updates on RPQRR's Facebook page. See [www.quailresearch.org](http://www.quailresearch.org) to subscribe (you don't have to be a member of Facebook to receive the posts).

**MBATR**

(That's Meanwhile Back at the Ranch) Things are less crowded, and quieter since the summer interns left in mid-August. We've been collecting quail over the past few weeks as part of a new parasite project; most of the juvenile birds we're encountering are from 8 to 10 weeks old (as of 20 Aug) indicating that indeed the peak hatch here was in mid-June. Roadside counts will be conducted over the next two weeks.

2009

6.6

4.7

There are some differences between RPQRR's and TPWD's count routes; TPWD's uses county roads while RPQRR's uses "ranch roads"; it's possible that the wider right-of-way on county roads (usually with a borrow ditch comprised of sunflowers or johnsongrass) is more attractive to quail than a "2-track ranch road." But overall, RPQRR's counts track TPWD's regional counts pretty well to date.

We are also conducting roadside counts on various properties in the Permian Basin as part of a study on scaled ("blue") quail to see how these data compare with other count techniques. We will report on these counts in the November issue of e-Quail.

We encourage you to set up a route on your quail property and record the number of quail you see per mile to keep track of your quail production and trends over time. What better way to spend a morning or afternoon than counting quail and enjoying the great outdoors? Count protocols and data sheets are available at <http://teamquail.tamu.edu/TexasQuailIndex.htm>.

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### Plant of the Month: The Digital Plant Press by [Dr. Dale Rollins](#)

In 1974, Paul Simon had a hit song with a refrain that begged "Mama don't take my Kodachrome away." What Mama might not have confiscated, digital technology did. While I'll miss those little plastic 35 mm film containers (they were good for at least a hundred different uses, not the least of which was making a high-tech wingbone turkey call), I'm a big fan of digital photography. One more step towards instant gratification I reckon.

During the QuailMasters 2005 class, our group struggled with the best way to take good close-up photos of seeds. We tried some of the members who had \$3,000 digital cameras and macro lenses and got decent results. We also used less expensive cameras and took our photographs through a magnifying glass, and it worked okay. But as the QuailMasters 2007 class began their quail odyssey, we discovered a better way—at a fraction of the cost.

Actually it wasn't a new technology—this one's been around for twenty years or so—just a new application. We used a flatbed color scanner, and the results are pretty incredible. Scanners aren't very expensive—you can purchase one for less than \$100.

As far as I know, the credit for using a scanner to make prints of plants belongs to Martha Bowlin, MJB Ranch, near Weatherford, Texas. Martha and her husband Mike started making a coffee table book of plants on their ranch and used the scanner. Martha came into the Weatherford NRCS office and showed Danielle Carter, Soil Conservationist, some of her scanned images. Danielle showed Ricky Linex some of the plant scans. As far as Linex knows, this is the first use of a color scanner for this purpose.

Armed with one of today's printer-copiers and some photo paper, you have the makings of your own "*Field Guide to the Plants of Yours Truly's Quail Ranch.*"

Here are some tips for good scans:

1. When scanning small items, like seeds, be sure and include something that provides scale for the viewer. A six-inch flat plastic ruler or a coin (e.g., dime) beside the seeds will facilitate identification and presentation.
2. For plant photographs a resolution of 300 dpi seems to be adequate; scans at 600 dpi are better for small seeds (remember the higher resolution results in huge files).
3. Once you get your image scanned and saved to your hard drive, you can use graphics software (I use Google's free Picasa software a free download from Google - <http://picasa.google.com>);
4. Catalog your images with an appropriate viewer for easy storage and retrieval.

As you begin to assemble your digital plant collection, you can easily share them with friends and colleagues via e-mail. Once you get the plants and seeds identified you can print them off on photo paper with appropriate text (e.g., common and scientific names, uses for wildlife, ethnobotany) and you've got the start of your own customized field guide. I use PowerPoint to assemble the

images and text onto a single page.

Summer intern Amanda Moyer scanned about 60 plants and seeds as one of her summer projects; these will be posted soon to the RPQRR website. As an example of Amanda's efforts, see how many of the following quail plants you can identify just by a single leaf!

If you can ID

3 or less...do not go into the quail woods alone

4-6...you are on your way to being a quail manager

7-9...you are an above average quail manager

10-12...you are a quail genius!



Answers posted on the RPQRR Facebook page, [www.facebook.com/rpqrr](http://www.facebook.com/rpqrr).

We've been using the "digital plant press" for the past three years at Bobwhite and Buckskin Brigades; try it, you'll like it. And, here's a deal. If you'd like such a customized book, but would rather have someone else put it together, why not contract with a Bobwhite Brigade cadet? Contact me for more details.

As you run across plants you don't know, e-mail them to me ([d-rollins@tamu.edu](mailto:d-rollins@tamu.edu)) and, if I don't know them, I'll refer them to appropriate regional experts. .

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