

Game Bird Program Update By Theron Terhune

UP, DOWN, ALL-AROUND. That pretty much sums up last year's quail hatch. Fall population densities from the Red Hills region to the Carolinas followed suit (some properties were down as much as 25% while others were up as much as 25%), and as a result the same variability in hunting success among regions was observed this past hunting season. Much of this variation, up or down, was linked to varying weather or, more specifically, rainfall during the summer — if you got it, the hatch was fair to good, but if you didn't, the hatch was severely impacted. You can read more about last year's hatch in the 2014 Quail Hatch Report (on page 2).

We only just finished the first quarter of 2015, and already some marvelous things have been happening this year in the Game Bird Lab. Currently, we are monitoring more than 800 radio-tagged bobwhites in in six different states. And, in January, we recaptured a male bobwhite that was originally banded in 2009 making him close to 6 years old — an epic feat no doubt! We also put the first ever GPS transmitter on an Osceola Wild Turkey this year on a Wildlife Management Area near Gainesville, Florida. The Game Bird Crew at Tall Timbers, Albany and Dixie Plantation should also be commended for their remarkable efforts translocating birds this year — we moved more than 680 birds to properties in more than 6 different states! This included the 3000th bird we have translocated in the last 10 years.

Moreover, we started three new research projects this year: a translocation project in North Carolina; a restocking project in the Mid-Atlantic; and, a hardwood reduction and “new ground effect” study on Dixie Plantation. In doing so, we recently added three new graduate students to the Game Bird Lab: Kristen

Malone, Kaili Stevens, and Brad Roberts.

In this issue of the *Quail Call* we recap the 2014 quail hatch, give an update on preliminary results for a few of our current research projects, and introduce a new mobile app we developed here at Tall Timbers to track invasive species on your property. We greatly appreciate your support!



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TALL TIMBERS AND ALBANY QUAIL

2014 Quail Hatch Report

By Clay Sisson and Theron Terhune

Albany Area

In our last hatch report, we discussed the success from the 2012 and 2013 seasons along with the high carry over into the spring of 2014. The closing comment was, "This spring's breeding population puts us in a very good situation . . . IF we have good spring survival and another good hatch." As it turns out we had neither, at least in the general vicinity of our study area south of Albany.



The spring of 2014 was cold and wet, which delayed covey break-up and the beginning of nesting season by several weeks. Our radio-tagged birds were still in coveys in early May when they should have started nesting already. This weather also delayed the northern migration of overwintering hawks and owls, which had an impact on our spring survival. This was, in turn, magnified by the crash of our cotton rat population following two years of increasing numbers. Combine all these factors and the result was very high spring mortality prior to what was an already weather delayed nesting season.

In addition, our study area experienced a severe drought during June, July, and most of August. Fortunately for many, while this drought was very severe where it occurred, it was also much more localized and not a regional, large-scale drought. In fact, one local property reported that it was the driest ever recorded for that time period. This directly impacted the hatch during the heart of the summer and the prime breeding period. By the time the weather broke in late August, we felt like there was still time to be "bailed out" by a late hatch. Unfortunately this did not occur either. It was as if the radio-tagged birds had simply given up for the year and did not even try to nest. Our birds were coveyed up by late summer, much earlier than normal; something we had not experienced before.

This chain of events resulted in significant population declines in the general vicinity of our study area in northern Baker County. Smaller average covey sizes and fewer total covey numbers impacted overall hunting success. Even with

all this the fall population density remained between 1.5 and 2 birds per acre on these areas as we were coming off of two very good years in terms of quail numbers. We had suspected and hoped through the summer that this was a localized event, and turns out it was to some degree. We heard reports of, and observed ourselves, more favorable weather in other parts of the region during the summer. Many of the local managers were seeing plenty of birds and felt our radio sample was not indicative of what was happening on their properties. After conducting covey counts on 18 properties this fall, as well as getting early season hunting reports, this notion seemed to be holding. As you get away from this locally impacted area, the populations held up much better. It appears the properties to the north and west of Albany have roughly the same numbers of birds as the previous year; some were even up a little. If you are in the Albany area and were in this situation, feel fortunate.

Red Hills Region

Similar to the Albany area, birds stayed in coveys well into late-April and early-May, which resulted in a delayed start to the nesting season in the Red Hills. However, unlike the Albany area, survival in the Red Hills region wasn't nearly as impacted.

We did observe an increase in mortality associated with the raptor migration around burning season akin to the Albany area, but not quite as drastic. One big difference between the properties in the Red Hills and Albany area is that the clay-based soils in the Red Hills are much more forgiving to lack of rainfall; in these soils less moisture is needed to grow cover and cover grows back much faster as a result. In addition, where parts of the Albany area suffered from localized droughts, more of the Red Hills properties received intermittent rainfall consistently throughout the summer than did not.

As a result of consistent rainfall, the cover responded favorably and bobwhite breeding season survival on Tall Timbers, 37%, (Figure 1) was only slightly below average, 42%. This afforded ample opportunity for birds to nest and resulted in above average nest production (Figure 1); but, due to high meso-mammal predator numbers on Tall Timbers, our number of hatches per hen (Figure 1) was lower than our long-term average. In contrast, on Dixie Plantation survival was well below average at 15%, as a result of heavy large avian mortality associated with dense hardwood ham-

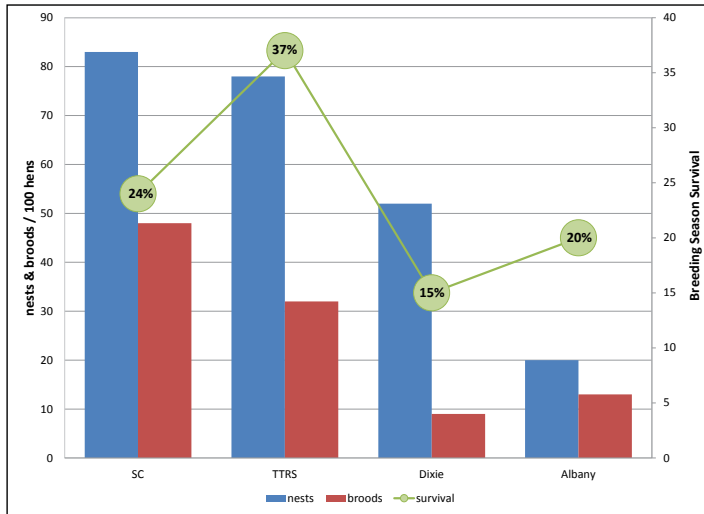


Figure 1

mocks interspersed through the study area. Much like Tall Timbers, Dixie's hatch success was not very good, but this may be an artifact of having a small sample size to start with last breeding season.

Thankfully, there were very few heavy (>1") rainfall events during the summer of 2014, in the Red Hills region, which resulted in good chick survival for those that did manage to hatch, and subsequent good fall recruitment. Thus, for Tall Timbers, the combined lower than average survival and good nest production, but poor hatch rate, resulted in a slight decrease in fall density. The good news is for those properties receiving decent rainfall and implementing meso-mammal predation management likely observed a stable to increasing population, but where those were lacking fall density likely declined last year.

South Carolina

In the Lowcountry of South Carolina, bobwhite survival was fabulous early in the breeding season, which resulted in a quick, big nesting push early. And, since rainfall was good and the cover responded well, we were anticipating good survival later in the season as well and hoping for a good late hatch. This didn't happen. Instead, increased mortality late in the breeding season (July-September) resulted in an overall lower than average survival.

This meant that fewer individuals survived long enough for second and third nesting attempts, and only a moderate late season hatch ensued. Despite low breeding season survival, the early reproductive output translated to a healthy population increase of about 8-10% for many South Carolina properties.

In Summary and Looking Forward

Like a ping-pong ball bouncing across the landscape, the variable rainfall occurring geographically, and localized droughts dictated a lot of how the quail hatch played out last year, and that directly influenced fall density and hunting season trends as compared to previous years. Some places were up, some were down and some remained about the same—it seemed to be the only consistent story all-around. In fact, some properties were down as much as 25% whereas others were up as much as 25%.

One take home message from last breeding season is the significance of adult survival on the hatch. For each of the four properties monitored, survival played an important role in the success of the hatch, as well as the trending fall population, but each in a different way. Dixie had a high large-avian presence associated with habitat; Albany areas lacked rainfall to provide quality cover for protection; South Carolina had good early season survival resulting in a reproductive boon early, but then suffered poor survival late in the breeding season; and, Tall Timbers suffered some mortality from the raptor migration early, but then improved having the best overall survival, which allowed for consistent reproductive attempts throughout the season and a quality late hatch.

So, how does this paint the picture for this breeding season? One of the big demographic parameters we measure every year is overwinter survival (October 1–March 31), which has averaged 49% for the Albany area since the study began in 1992, 55% for the Red Hills region, and ~53% for the Lowcountry of South Carolina. In the Albany area, this year's survival was a little above average at 55%. This is good news, especially for those areas impacted by the severe localized drought in 2014, and means spring breeding populations (April) are in good shape. However, overwinter survival at Tall Timbers and the Lowcountry study sites was slightly lower than average but not egregious. As you know, March/April has been warm and wet. This triggered a couple of things; it delayed and spread out burning but also triggered the migratory hawks to go back home sooner than normal. We believe both of these have helped the quail survival since the end of hunting season. Survival so far in April has been good on all our study sites as well, but it is far too early to tell what is in store for the upcoming months. Obviously we are all hoping for a good growing season and a good hatch—we definitely could use it after last year! 🐔



Surviving the Odds By Theron Terhune, Bill Palmer, and Bud Bostick

Over the past 47 years the Game Bird Program has been capturing, banding and releasing wild quail, which marks the longest running band-recapture study of any game bird in the world. Since 1968, more than 28,000 quail birds have been leg-banded on Tall Timbers. From that dataset we have observed that, on average, annual survival for a population of quail is about 20% in good habitat or that approximately 80% of the population dies each year. Here in the Game Bird Lab, year after year and week after week, we pick up radio-tags that once were fitted to a live bobwhite, which is a persistent reminder that quail are simply good at dying. I recently heard it put this way, “On average a one-year old quail has been dead for quite some time.” Indeed, only a small proportion of quail make the first year, even amidst high-quality habitat. But in January 2015, we discovered that some quail can and do beat the odds.

On Tall Timbers, we recaptured and released a male bobwhite, known in the lab as 091406, its unique band ID (see photo), which was initially banded in 2009, making him >6 years old. In more than four decades of capturing and banding northern bobwhites we know this has occurred in the Red Hills only one other time to our knowledge. The other incident occurred on Willow Oak Plantation, when



a male bird (band ID: 98315) was harvested during a hunt on February 14, 2004. This bird was originally banded in 1998, on Pebble Hill Plantation. So, not only did this bird survive the odds—it crossed property boundaries as well. This makes only 2 birds surviving more than 6 years out of more 31,000 banded birds on properties in the Red Hills, since 1968. In fact, we calculated the odds of surviving and we found that only about 1 in every 3 birds makes it to one-year of age, 1 in every 25 birds makes it to 2 years, 1 in 100 makes it to 3 years, 1 in 500+ makes it to age 4, and only 1 in 2,500 make it to 5 years of age. Alas, the odds of making it to 6 years of age are slim—about 1 in 12,000! To put that into perspective, National Geographic states there is about a 1 in 3,000 chance that you will be struck by lightning in your lifetime. This means you are 4 times more likely to be struck by lightning in your lifetime than come across a 6-year old quail bird. This truly is a testament to not only Bobwhite’s ability to survive and beat the odds, but also a tribute to quality habitat management stemming from dedicated land-owners’ exemplary land stewardship in the Red Hills region.

Our long-term research has helped us to understand what drives quail populations and continues to shed light on how best to manage for these short-lived, illustrious game birds. We can only hope to have more birds hatch like 091406 and 98315! 🐔

Bobwhite Parent-reared Chick Research: a Potential Restocking Technique?

By Bud Bostick and Theron M. Terhune

For ten years now, since 2005, the Game Bird Program at Tall Timbers has been developing, testing and implementing a restocking technique known as the Parent-reared Chick System (PCS). Analogous to translocation of wild quail, this technique is designed to restore quail populations on sites that have very few or no quail, but have “quality” habitat. However, different from translocation, the PCS has the merit of economy and the potential for larger-scale releases. The goal of both translocation and the parent-reared chick system is to release birds on sites where habitat has been newly developed or improved to boost current bird numbers with the intent of creating a self-sustaining wild quail population.



What is the Parent-reared Chick System?

Previous studies have shown that run of the mill pen-raised bobwhites are poor survivors in the wild; of those individuals released in the fall less than 5% typically make it to the following breeding season. Although pen-raised birds that do manage to survive to the breeding season can successfully reproduce in the wild, their parenting skills are deficient and result in young being left on their own to develop and learn to survive in the wild. This is where the parent-reared chick system has shown promise. Notably, this technique is not completely novel. Herbert L. Stoddard was one of the first to experiment with artificial propagation of bobwhites in the mid-to-late 1920s. Stoddard used bantam chickens as brooders, cock-birds as foster parents, and liberated the

birds to the wild; he called this process “the adoption system of rearing.”

Our process involves using wild-strain chicks (known as F1 birds or first generation removed from true wild stock) that are hatched in an incubator, and within a few hours are placed with an adult bird that readily adopts the chicks. We typically see adoption rates of 40-60% by parent birds. A group of 15 – 20 chicks is considered “adopted” when a parent bird is observed making an effort to brood chicks and keep them warm. The adoption is the most critical part of the PCS because the chicks are incapable of thermoregulation on their own. Upon successful adoption, broods and their new adoptive-parent are moved to large outdoor pens. The outdoor pens are maintained by encouraging old-field type vegetation in attempt to mimic real-world habitat conditions. A high protein diet is provided in the pens with minimal human interaction. After 5-7 weeks, adult birds are removed and chicks are wing-tagged and released on sites demonstrating sufficient, high quality habitat during July, August, or October, depending on latitude and coinciding with natural peaks in hatching in the wild.

What have we learned?

In order for the parent-reared chick system to be successful, chicks must survive to adulthood and successfully reproduce the following breeding season. Chick survival in the pens and up to six weeks of age can vary greatly depending on weather conditions (e.g., rainfall, temperature), but generally under good weather conditions about 65-70% of chicks survive to release. To evaluate survival following release in the wild, we attached 3-gram radio-transmitters to 6-week old parent-reared chicks. Over the course of 3 breeding seasons we deployed more than 200 chicks with radio-tags on a peripheral section of Tall Timbers. This isolated site was chosen because it is not historically part of the original core area of Tall Timbers, separated by a large drainage. In addition, this area was recently brought into the fold of intensive quail management undergoing a timber thinning and prescribed burning, and the quail density was low.

Mortality during the first few weeks was very high—much higher than anticipated. Based on evidence at the mortality site, mammalian predators (e.g., raccoons, opossums, foxes, bobcats) seemed to be the main culprits with bobcats being a leading mortality agent. However, about four weeks post-release, mortality leveled out and survival from that point was good (see Figure 1). This pattern has been commonly observed in most of our releases of parent-reared birds.

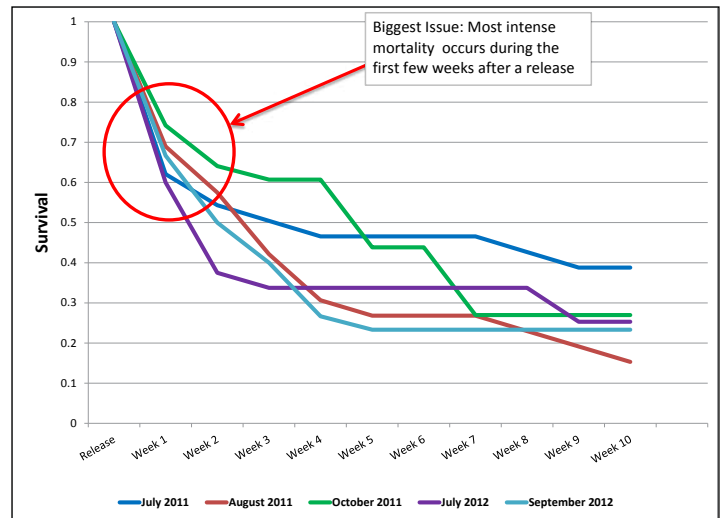


Figure 1. Survival of parent-reared chicks from time of release to 10 weeks post-release on Tall Timbers during 2011-2012.

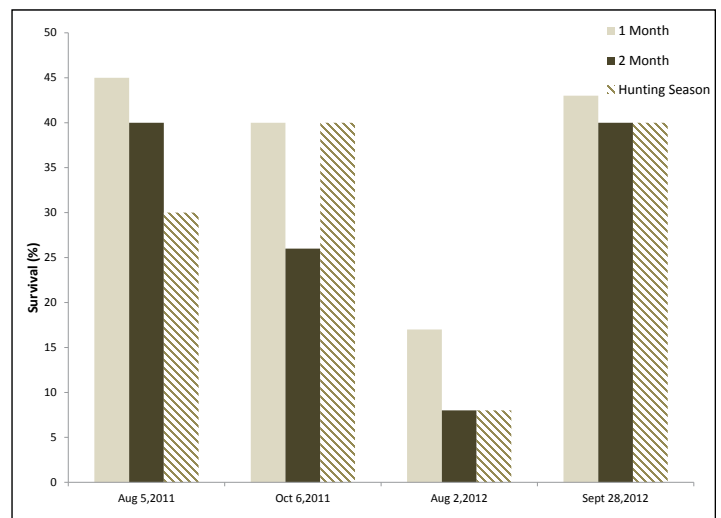


Figure 2. Survival of parent-reared chicks from time of release to hunting season on a private site in South Carolina during 2011-2012.

On a property in South Carolina, we observed slightly higher survival following release; and, these data indicated that the timing of chick release (month and year) may have an impact on survival post-release (Figure 2). This variation is most likely associated with differing weather conditions, which may impact chicks directly by mortality or, more likely, indirectly by impacting vegetation growth and overall brood habitat in fields and woods (post-fire). For example, adequate rainfall during the spring and early summer provided ample cover in brood fields during 2011, which resulted in good survival during both releases. The spring and early summer of 2012 were dry, impeding vegetation growth and yielding lower quality habitat and overall less usable space for broods, which resulted in decreased survival for chicks released in August (2012). Rainfall picked up during the late summer months, and the cover responded considerably in late August through September. In turn, chicks released in late September benefitted from improved habitat conditions



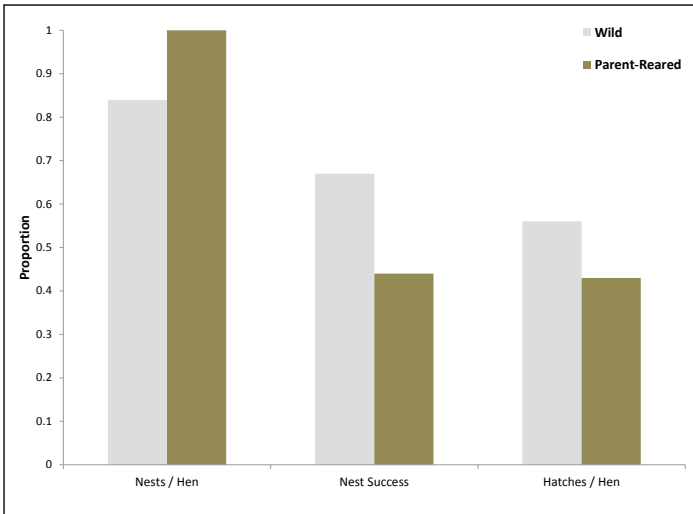


Figure 3. Reproductive effort of parent-reared bobwhites surviving to the following breeding season as compared to wild bobwhites on Tall Timbers.

and ample usable space, resulting in relatively good survival to hunting season.

An important factor determining the success of parent-reared chick releases is the overall recruitment of chicks to fall. On average, survival was 29% from time of release to the fall (hunting season) on all our study sites combined. Once parent-reared released individuals made it to the fall, survival was similar to wild birds during the over-winter time period. Overall survival from time of release to the following breeding season is 10-15% on average, but on one site in South Carolina we observed survival as high as 26%.

The more compelling part of the story is what we have observed during the summer following release when birds become reproductively viable. During the spring, we recaptured a subset of parent-reared hens and fitted them with full size (6 gram) radio-transmitters to better understand reproduction. We found that their production, in terms of nests produced per hen and broods produced per hen, was similar to wild birds being tracked simultaneously (Figure 3). Not only were parent-reared birds nesting at a high rate,

they were successfully hatching chicks! We captured several of these broods and most had high survival rates from hatch to ten days old. This is likely a result of adult birds displaying proper parenting of chicks.

Take Home Message

The jury is still out on whether or not this technique can be a part of the solution to bring back or reestablish quail. We have seen some mixed results with parent-reared releases over the last several years, from not working at all to working very well. The most variable and concerning factor is survival of birds post-release, which can be heavily influenced by weather from the time of release up to three weeks post-release. However, reproduction of those birds that do survive to the following breeding season seems favorable.

Most of the properties where we have experimented with parent-reared chick releases had very few bobwhite quail on them, if any, prior to release. Several of these properties observed an increase in whistling activity the following fall and spring seasons, which is encouraging. Much of the successes observed are surely a result of hard work, commitment and dedication by land owners, managers and property staff implementing quality habitat management prior to release. Further experiments are necessary to determine the comparative merits of release age, nutrition and timing. Until that time, we remain cautiously optimistic. 🐦



Bobwhite Survival, Hunt Success and the Continental Field Trial at Dixie Plantation

Project Collaborators: Clay Sisson, Theron Terhune, and John Michael McCormick

There has long been a debate about the prospect of field trials affecting the behavior and survival of wild bobwhite coveys, and whether hunting quality following these trials endures. The gifting of Dixie Plantation to Tall Timbers a little over a year ago put us in a position to objectively entertain both sides of this debate — we are continuing to host the Continental Field Trial in late January, and we started a wild quail hunting-lease operation, while actively conducting research on the property. The bottom line was that the lease hunters were concerned about the field trial affecting the hunting and the field trailers were concerned about the hunting affecting the field trial.

We monitored movements and survival of coveys on Dixie before, during, and after the trial, and compared these data to radio-tagged birds on three other study areas (Tall Timbers, Albany, South Carolina) being monitored at the same time. In addition to research monitoring, staff at Dixie kept up with hunt information during the 2014–15 hunting season. The core study area is about a 1,600-acre block right in the middle of Dixie. The field trial courses go through this area both morning and afternoon. We had radio transmitters on birds in ~20 different coveys spread throughout the core research area, which were monitored 2–3 times per week throughout the winter, with special attention given to tracking birds just prior to, during, and immediately following the Continental Field Trial. The Continental Trial is a big one. It is a horseback bird dog trial with close to 150 entries that lasts anywhere from 13–15 days. There is a morning and afternoon course; each is about 15 miles long, run every day throughout the trial. We were very interested to monitor how this repeated activity with bird dogs and dozens of horses would affect quail covey movements and survival during these two weeks in late January.

Without going into a lot of detail, the Field Trial was essentially a “non-event” from a quail standpoint. Given the nature of this trial, with all age, big running dogs combined with a high-density (>1.75 birds per acre) quail population, not a single covey was repeatedly disturbed. Therefore, we did not observe any drastic changes in movement patterns or habitat use among radio-tagged coveys. Regarding quail survival, we did observe a dip in survival (see red line on Figure 1) during late January, but we are not convinced this was a result of the trial, because the same thing was observed at Tall Timbers, (our closest study site to Dixie), where there

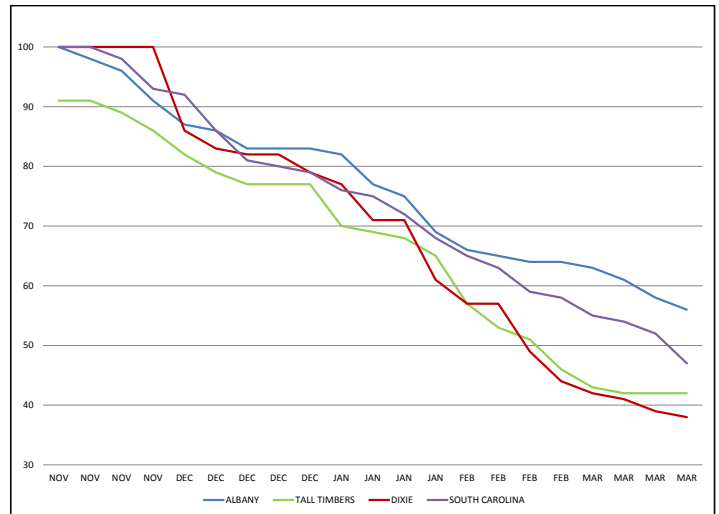


Figure 1. Overwinter (November–March) survival for bobwhites on Albany, Tall Timbers and South Carolina study sites during 2014–15.

was no field trial. As such, we attribute this dip in survival to an influx in migratory raptors during that time.

We were also interested in whether this heightened activity during the field trial had any effect on subsequent hunt success or vice versa. Some of the field trial participants arrived apprehensive about the bird numbers and their ability to be located, as well as their “wildness” since the property had been hunted prior to the start of the trial. These concerns turned out to be unwarranted as it was evident right away that there was plenty of good quality bird work during the trial. The same apprehension was felt by the lease-hunters hunting after the trial concluded; these concerns were soon relieved as well, because hunting quality at Dixie before and after the trial was very similar (see Figure 2).

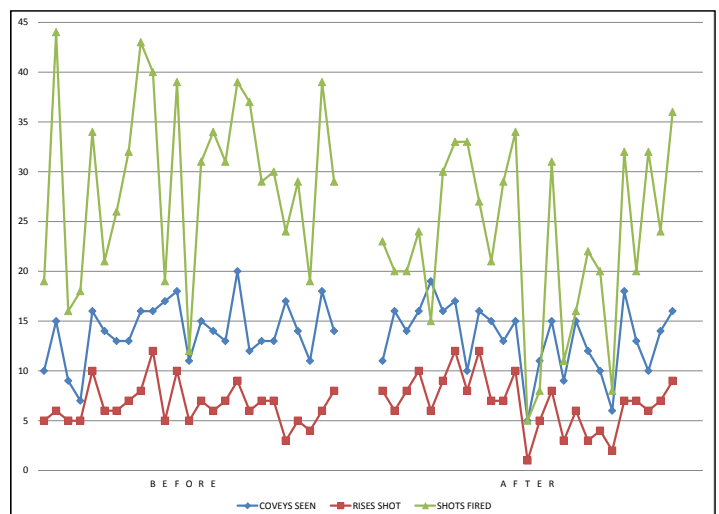


Figure 2. Hunt success (based on coveys seen, covey rises shot, and shots fired during a half-day hunt) on Dixie Plantation before and after the Continental Field Trial during the 2014–15.

Dixie Plantation continued from page 7—

Hunting quality peaked in late December, and then gradually tapered off through the end of February. But, this same pattern occurs throughout the plantation belt during most years. In looking at the numbers, hunt success was similar before and after the Field Trial: total coveys seen (per half day of hunting) before the trial was 13.8, and 13.3 after; number of covey rises shot into before was 6.6 (47%), compared to 6.8 (51%) after; and, the number of shots fired before was 29, and 23 after.

These results are indeed compelling, but we caution that it is only one year of research, and we hesitate to draw too

many definitive conclusions at this time. We will continue to study these topics in years to come, and build a body of evidence that we can have confidence in.

We thank the Board of Directors of the Continental Field Trial Club, and the field trial participants for their good work this year in donating funding to Dixie Plantation, which directly contributes to continued improvement of the property. Thanks as well to the lease-hunters at Dixie, as they also generate a large percentage of our operating budget. Our hope and expectation is that these two groups can peacefully co-exist, and we look forward to our future partnerships with both. 🐦

Using Thermal Imagery to Estimate Neonate Survival of Bobwhites

Project Collaborators: Theron Terhune, James Martin, and Bud Bostick

Little is known about the survival rates of bobwhite chicks during the first few weeks following hatch. In the past, we have been able to track radio-tagged birds rearing broods to infer habitat use, as well as capture and flush broods at 9 and 21 days of age, respectively; however, uncertainty exists in the accuracy of flush counts to assess chick survival. For example, all the chicks may not readily flush, resulting in an incomplete count and therefore an underestimation of survival. The primary objective of this study is to test a novel technique using Forward-Looking Infrared (FLIR) technology to count bobwhite chicks from time of hatch through 21 days of age, and to better estimate survival.

Brooding adults are roosted at night, tracked at sunrise using radio-telemetry and gently bumped off the roost. During this time, FLIR videography is used to capture heat signatures of the bobwhite chicks as they scatter upon being bumped. The video footage is then played back while being slowed down to obtain a count using the individual heat



Figure 1. FLIR videography of bobwhite chicks (heat signatures) scattering from roost at early-sunrise.



Figure 2. Chin dots on three-day old bobwhite chicks.

signatures captured (Figure 1). Repeating this process at regular intervals allows us to track brood size through time and estimate chick survival. However, this process is obscured somewhat as a result of bobwhites exhibiting a relatively high amount of brood amalgamation (i.e., mixing of chicks from two or more broods). Therefore, and as part of a larger band-recapture study, we are capturing bobwhite chicks and marking them under the chin with permanent, colored markers and patagial wing-tags at three and nine days old, respectively, to assess the magnitude and prevalence of brood mixing (Figure 2 and 3).

A second objective of this study is to evaluate factors influencing chick survival. We believe that the inability of bobwhite neonates to effectively thermoregulate makes them more susceptible to heavy rainfall and reduced temperature events. Thus, heavy rainfall events common in this part of the world during spring and summer can have a major impact on chick survival and fall recruitment. As such, we are collecting weather data and vegetation information to evaluate how

variation in precipitation and temperature influence survival of bobwhite chicks. For example, heavy and/or extended rain events (e.g., tropical storms, hurricanes or deluges of rainfall) may affect normal roosting patterns by brooding adults. Knowing which habitat(s) are used by broods during variations in weather and their associated thermoregulatory response through habitat selection will help to inform habitat management by increasing our understanding of what constitutes quality brood habitat and roosting sites.



Figure 3. Patagial wing band on nine-day old bobwhite chick and the chin dots from three-day capture are still visible.

Year One Results

During the 2014 breeding season (May–October), 43 broods were monitored. It took a bit of trial and error to figure out the best angle to approach the birds and the least invasive bumping technique. The type of vegetation the birds chose to roost in made quite a difference in our ability to detect their heat signatures. Broods located in broad-leafed vegetation were harder to detect than birds in more narrow leafed or thin vegetation. Hickory leaves that overlap each other, for example, are more difficult to try and catch a glimpse of scattering chicks than through blades of grass or other plants with smaller leaves and more gaps between vegetation.

However, when we had a clear view, it was easy to count the number of parent birds and get a reliable chick count. In addition, to getting a good count, the FLIR technology increases brood capture efficiency by allowing us to detect chicks potentially hiding under thick, dense cover. In addition, FLIR enables us to pinpoint the exact location of the radio-tagged bird during roosting, which improves ability to identify common vegetation characteristics at roost sites.

Of the 18 broods we captured, we noted a 33% rate of amalgamation among the chicks. It is difficult to say if true mixing occurred in all instances because five of the six broods that were “mixed” had two or more parents present during the brood capture. These are preliminary results; further analysis of the daily infrared chick counts should clarify when and how much true brood-mixing occurs.

We also looked at weather as a factor influencing chick survival. It appears that large precipitation events (>1" rain) has the greatest effect on chicks six days and younger

(Figure 4). This could be for a number of reasons. First, the younger they are, the more chicks there are. They compete with each other to get a dry/warm spot underneath their parent's wing, so more chicks equal more competition for heat. Another reason could be that they are more vulnerable than older chicks to heat loss if they happen to get wet during a rain event. Chicks are not able to effectively thermoregulate on their own until they are around 21 days of age, which could explain why we see rainfall events having a larger impact on chicks 6 days of age and younger.

Depending on whether it rains during the day or night also has an impact. Rain events that occur during the day restrict feeding time, which is vital for a growing chick, compared to rain events that occur at night when they are already roosted. Further, when extended rainfall events occur and the sun does not come out for several days, survival of bobwhite chicks is not very good. Anecdotally, it seemed as though the broods that roosted at the base of pine and hickory saplings weathered evening/overnight rain events better than those that chose other vegetation types like grasses or forbs. We have also observed that chicks raised in element-exposed pens are affected by heavy rainfall events even up to the age of five weeks, revealing the vulnerability of bobwhite chicks to inclement weather.

A lot was learned this past field season as we tweaked our videography skills and technique, and experimented with different ways to approach and bump the broods off their roost. We look forward to this breeding season, and continuing our data collection, to get a more complete picture of bobwhite chick survival and those factors that influence them! 🐣

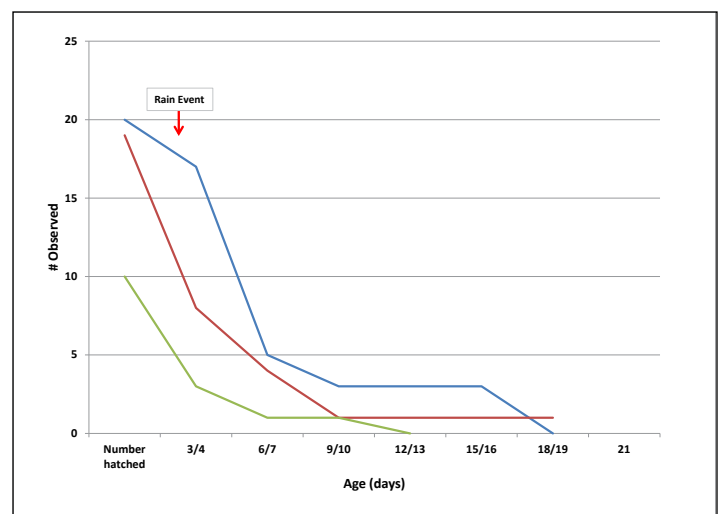


Figure 4. Bobwhite brood survival during a heavy rainfall event representing three broods being tracked with FLIR and the rainfall event occurred when chicks were between 3 and 4 days of age.

Evaluating the Effect of Edge and Cover on Northern Bobwhite Survival in Relation to Hunt Success: Year Two of Three

Project Collaborators: Seth Wood, Theron Terhune, James Martin, and Bud Bostick

In the last issue of *Quail Call*, we discussed the preliminary results from the first field season of the study on how edge and cover affect Northern Bobwhite survival in relation to hunt success. The following is an update with results from the second field season.

Overview

To recall, grid blocking via mowing or chopping is a common management practice used on intensively managed quail plantations which may serve multiple goals. However, grid-blocking certainly may have negative consequences on quail survival, their movements and behavior which may also impact overall hunt success (coveys seen or shot into per hour). Since conventional grid-blocking may reduce cover by as much as 35% and increase the amount of edge by as much as 65%, understanding how this management activity influences quail survival and hunt success is important.



Year Two Results

Similar to last year, we observed an interesting and counterintuitive trend regarding over-winter survival on our blocking treatments (see Figure 1). Survival on the moderate treatment (90'x90' distance between mowed lanes) was

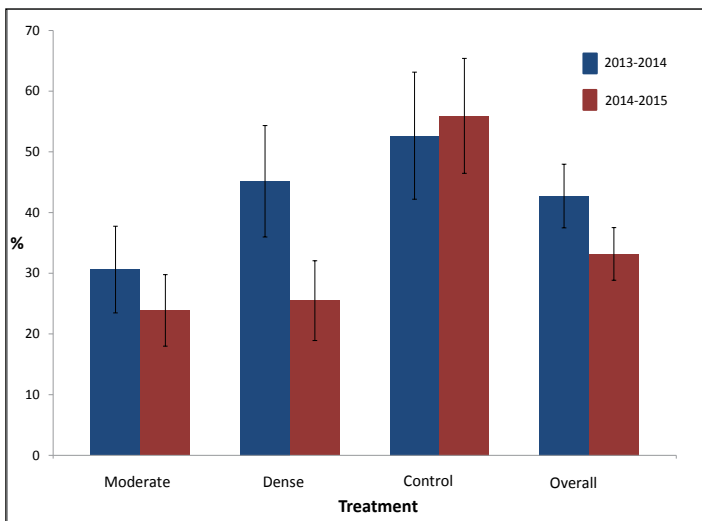


Figure 1. Northern Bobwhite survival delineated by treatment type on Tall Timbers for the 2013–14 season and 2014–15 season.

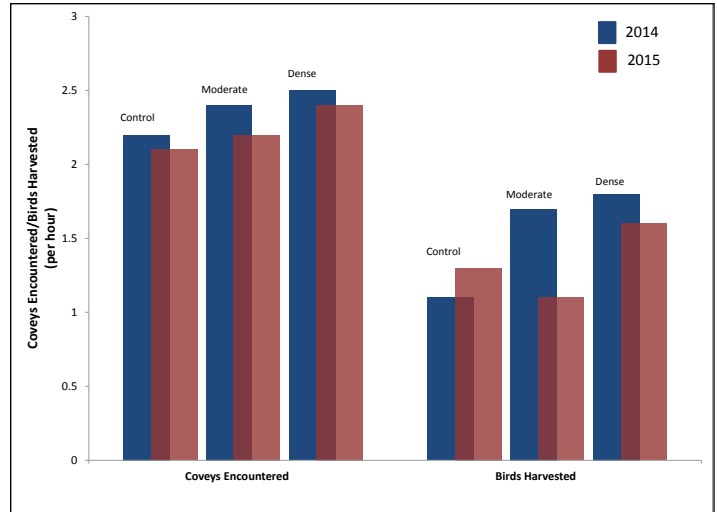


Figure 2. Hunting Success delineated by treatment on Tall Timbers for the 2014 and 2015 seasons.

slightly lower than on the dense (30'x30') treatment. Also similar to field season one, we observed the highest survival on the control (no grid blocking) area.

In terms of hunt success, we observed very similar results this season compared to last season (Figure 2). The total coveys moved and the total coveys pointed per hour were similar between the control and the treatments, but the harvest was lowest on the moderate treatment. In comparison, last season the number of birds harvested per hour was substantially lower on the control, while the coveys moved per hour was similar between the control and treatments.

By monitoring dog and hunter effort during hunts, we found that the bird dog and hunter rate of movement (11.2 MPH and 1.7 MPH, respectively; see Figure 3 & 4) were both fastest on the moderate treatment and slowest on the control (8.2 MPH for dogs and 1.5 MPH for the hunter, see Figure 3 & 4). Not surprisingly, the lack of grid-blocking affected both hunter and bird dog given the tougher cover conditions, which ultimately impacted hunt success in terms of coveys encountered per hour. The increased rate on the moderate treatment this season may suggest that the dogs were moving too quickly, not covering the course as effectively to point coveys, compared to the dense treatment.

Implications

After two field seasons now, we are definitely beginning to see some patterns emerge such that hunt success (coveys moved per hour) improves with grid-blocking (i.e., dense mowed lanes result in more coveys encountered) up to the



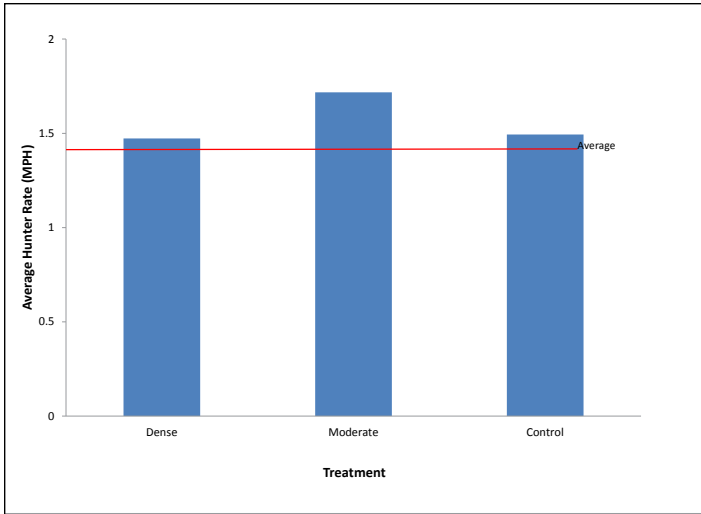


Figure 3. Hunter rate of movement delineated by treatment on Tall Timbers during the 2014–15 hunting season.

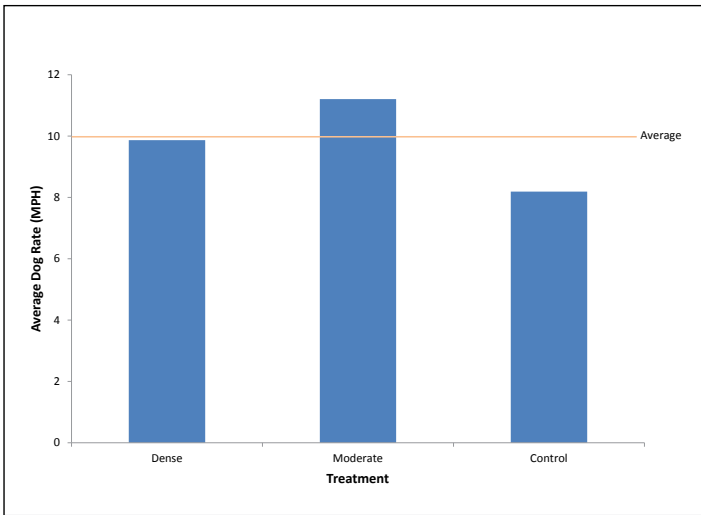


Figure 4. Bird dog rate of movement delineated by treatment on Tall Timbers during the 2014–15 hunting season.



Gerti, a Deutch Drahthaar, wearing a GPS tracking collar during a hunt to measure dog effort. Photo by Seth Wood.

conventional 30'x30' spacing between mowed lanes. However, the increased amount of edge created and overall reduction of cover as a result of conventional grid-blocking does seem to have a negative impact on quail survival beyond direct mortality associated with harvest. Yet, we are less certain as to whether improved hunt success is a result of increased rate of movement and access to coveys (by birds dogs and humans), a reduction in cover (and, thus, hiding places), course coverage by bird dogs, bird dog scenting efficiency amongst treatments or a combination thereof.

Similarly, we are still evaluating how grid-blocking influences daily movement patterns and home ranges of bobwhites, which may shed light on the reduction in survival associated with grid-blocking. Therefore, we are looking forward to the final field season next year to determine whether the benefits of grid-blocking outweigh the cost. 🐦

Are You Turkey Hunting During the Peak of Gobbling Activity?

Project Collaborators: Aaron Griffith, Theron Terhune, Dave Buehler, Danny Caudill, and Roger Shields

Last year we began a collaborative project between Tall Timbers, the Florida Fish and Wildlife Conservation Commission (FWC), and the University of Tennessee, investigating the effects of supplemental feed for quail on the movements of wild turkey. Other objectives of this project are to determine when the peaks in gobbling activity are occurring and investigating the relationships between these peaks and nest incubation by hens, and hunter pressure. This winter we captured turkeys with rocket nets and equipped them with GPS and/or VHF (radio) transmitters. We instrumented 11 hens and 4 gobblers on Tall Timbers, and 22 hens, 3 jakes, and 4 gobblers on Wildlife Management Areas near Gainesville.

—Gobbling activity continued on page 12



Graduate student Aaron Griffith holding a wild turkey gobbler captured on a Wildlife Management Area near Gainesville, Florida in 2015.



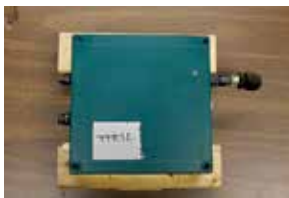
Gobbling activity continued—

The GPS units record seven locations four days a week, and one location three days a week. Recording 31 locations on a turkey each week will provide an enormous amount of data, that will give us great insight into how turkeys are moving across the landscape, and if the use of supplemental feed for quail is influencing their daily movement patterns and home range on plantations being managed for bobwhite quail. The use of GPS units on wild turkeys is a relatively new technological advancement and provides great advantages over traditional VHF technology. A traditional study using VHF transmitters would usually facilitate the gathering only around seven locations a week per individual, due to manpower constraints.

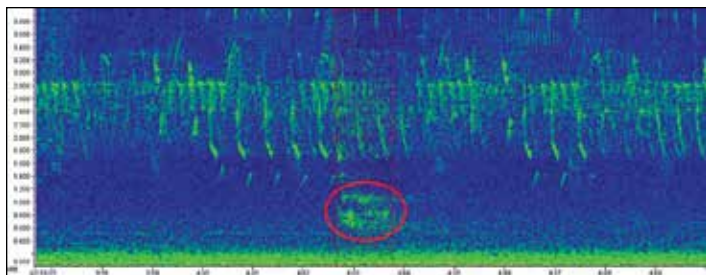
We used SongMeter recording devices to record gobbling activity on each of our five study areas. The units record intermittently around sunrise each day for a total of one hour of recordings. By analyzing the spectrograms of each recording we are able to visually identify when gobbles occur, and the rate of gobbling activity during a given time period. And, by stringing together this gobbling activity for all SongMeters we are able to develop a gobbling chronology (timetable) to ascertain peaks in gobbling.



Backpack GPS (as seen here) or VHF units are placed on wild turkeys to track their movements, assess home range and habitat use, and determine survival.



SongMeters are used to record gobbles during early morning to determine gobbling activity and chronology in relation to nesting activity and to compare across study areas.

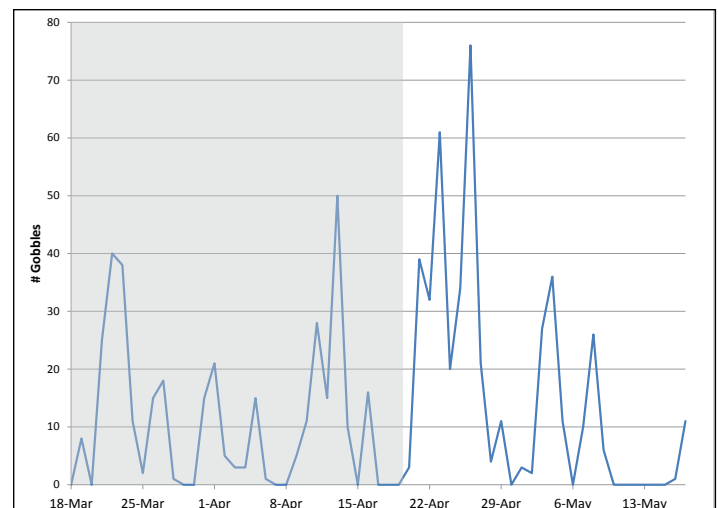


Special software is used to analyze the audio files and create a spectrogram for each recording so that individual gobbles can be identified (see red-circled region).

Last year our recordings indicated that the highest peak in gobbling activity at Tall Timbers occurred just after the turkey season concluded. Traditional theory on gobbling activity presumes a two-peak gobbling model, with the first peak occurring during winter flock break up and the second

peak occurring during the peak of nest incubation by hens. Wild turkey biologists for state agencies try to set the seasons so that the hunting season falls during the second peak in gobbling for two reasons. First, if the season falls during this second peak in gobbling activity, hunter success and satisfaction will presumably be higher, and the majority of the hens will have already been bred. Determining the peak in gobbling activity is not always an easy task, because during some years, weather can hasten or delay the timing of peak gobbling.

As it turns out, last season (2014) the hunting season was closed in Florida during the peak of gobbling activity. However if you recall, the weather during February and March last year shifted from cold to warm several times, which seemed to delay everything by about two weeks, including the onset of nest incubation for turkeys and quail alike. This variable and late cooler weather may have delayed gobbling activity last year, which underscores the importance of collecting data for multiple years. As we gather more data on nesting dates and more gobbling recordings this year, we anticipate a valuable data set to help guide the timing of wild turkey hunting seasons in the areas of study, and help to ensure that you have the opportunity to hunt turkeys during prime gobbling. 🦃



Wild turkey gobbling chronology recorded using SongMeters for Tall Timbers during March–May 2014. The gray-shaded region indicates the 2014 Florida turkey season.



BEYOND THE RED HILLS

Finding What You Can't See: Research Shows Bobwhite Covey Finding is Similar in Dense Grass Vegetation

Project Collaborators: Diana McGrath, Theron Terhune, James Martin

Most anyone that has experienced a slow day of quail hunting on a horseback or buggy has had the feeling that the birds just completely left the property or somehow dug trenches to escape—it brings a whole new meaning to trench-warfare! The uncertainty of not knowing where the birds are on those days, and for the sake of bird dogs everywhere (they get called liars too often), we set out to investigate covey detection and group and individual-bird behavior during hunts.

Stribling and Sisson in the late '90s had a similar study. They found that only 53% of coveys were detected during any given hunt. However, they only monitored birds that were within the “hunt party zone of availability.” Specifically, if we assume that a dog can smell a covey 20 feet away (more on this below), that area around the dog is the zone of availability (Figure 1). But what if the dogs don't cover the entire course? Or, what if a covey moves away from an approaching hunting party as an evasive technique, keeping a covey out of the zone of availability? These behaviors reduce the probability of a covey being available for detection during the hunt. We calculate the overall probability of seeing a covey on any given course by multiplying the probability of detection (POD) and the probability of availability (POA) together. For example, if POD is 0.50 and POA is 0.50, then

the overall probability of any given covey being seen by hunters during a hunt is 0.25; or, said another way, only 25% of coveys will be seen on a course during any given hunt.

During year one of our covey detection study we evaluated scenting distance in various weather conditions and vegetation structure. We conducted scent trials, where a set of pen-raised quail were placed in a designated area and a bird dog was handled to work towards the birds' location, and we recorded the distance and time to point. Trials were conducted throughout the site and season; and average scenting distance was calculated to be around 20 feet.

The intent of this study was to evaluate how dense vegetation influences the detection of coveys using bird dogs. After two years of horseback riding and tracking birds on hunts, we found a detection rate (which is the proportion of coveys seen/observed by hunters) of about 52%—eerily similar to previous research.

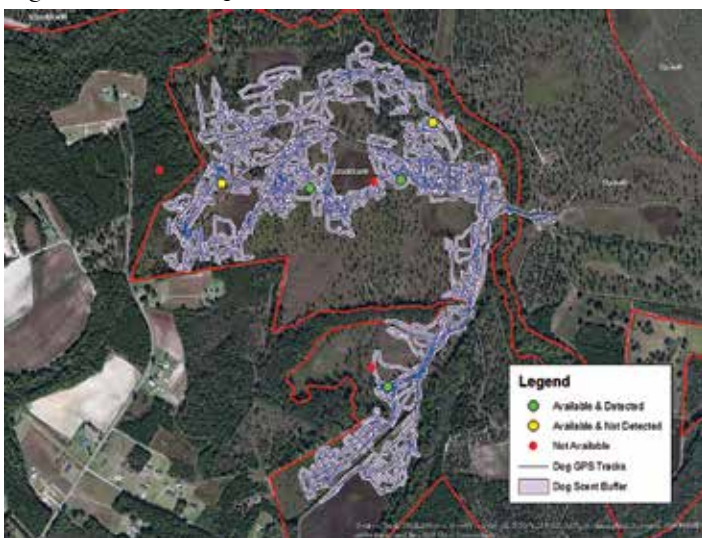


Figure 1. Results of availability and detection of one quail hunt on the study site in coastal South Carolina. The blue lines represent the path of the dog tracks during the hunt while the red, yellow, and green dots are the real time covey locations. Dog tracks are buffered by the average scenting distance (20 feet), and these buffered paths represent the “zone of availability”. Holes in course coverage can be identified by identifying areas that lack a buffered dog path.

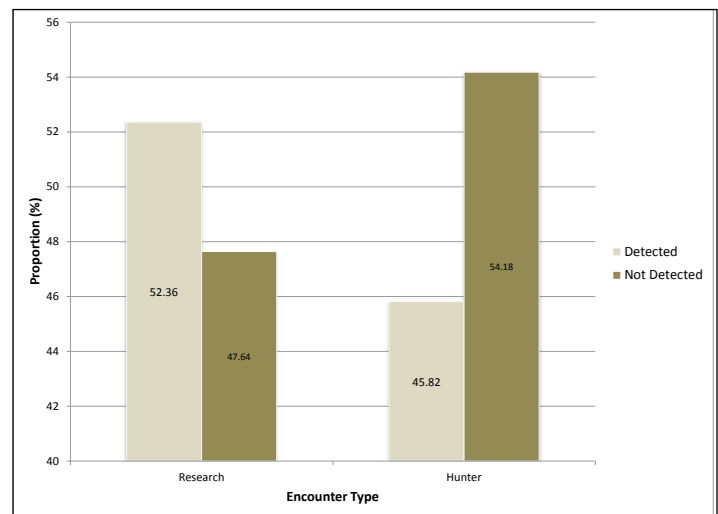


Figure 2. Detection rates of all radio-tagged coveys for two field seasons (2013/2014 and 2014/2015) from both the researcher's and the hunter's perspective. Detected coveys include coveys that were either pointed or flushed wild.

The encounter rate (proportion of coveys encountered by hunters based on radio-telemetry information) determined by researchers was 52% while the observed detection rate by hunters was 45% (Figure 2). The difference in encounter rate and detection rate stems from coveys known to be detected through direct observation via hunters and those known to be encountered using radio telemetry but not observed as

—Covey finding continued on page 14

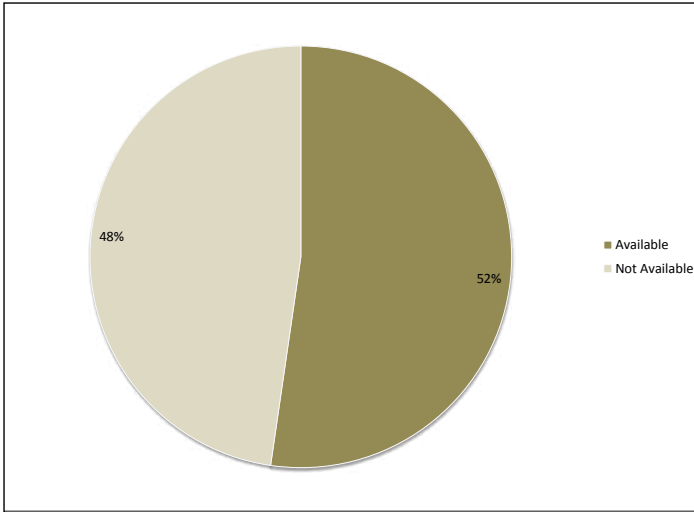


Figure 3. Covey availability of all radio-tagged coveys (n=221 locations) during quail hunts for two seasons.

Covey finding continued—

detected by the hunters. This 7% difference would have been incorrectly called unproductive points by hunters, when in reality the birds were there but just not seen. We told you dogs get called liars too often! These birds use various behavioral strategies to evade detection such as: suicide bird, divide and conquer, running and holding or a combination of multiple strategies.

Using telemetry locations of coveys and GPS tracks of bird dogs during hunts, we determined covey availability (whether a covey was available to be detected based on the average scenting ability [20 feet] of a bird dog). On average, only 52% of all radio-tagged coveys on a given course were “available” for detection during a hunt (see Figure 3). Of those “available” coveys, 73% were detected by bird dogs, whereas the other 27% avoided detection by employing various behavioral (evasive) tactics (Figure 4). Taken collectively, the probability of observing (physically seeing) a covey on any

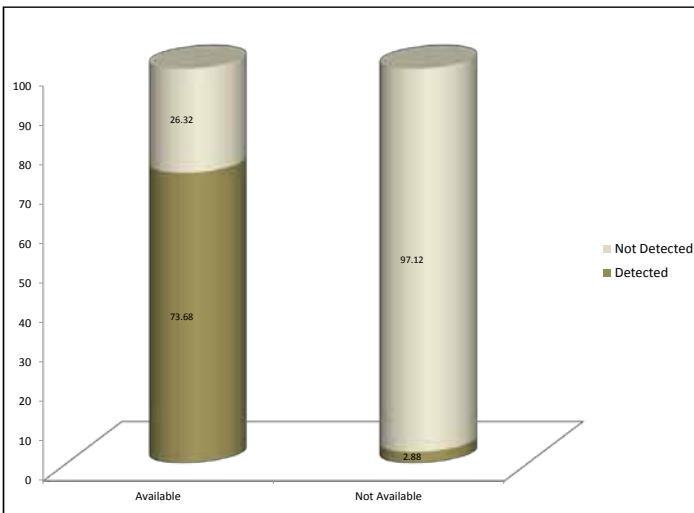


Figure 4. Detection rates when considering availability across two hunting seasons.

given course during a hunt is only ~38% (PODxPOA) or, on average, for every 4 coveys we see, we pass by 6 others.

Implications

While there are several factors that affect covey-availability during a hunt that are primarily due to chance (i.e., randomness attributed to a dog’s path, weather conditions), there are still ways to improve covey availability and, therefore increasing one’s chances to achieve a higher level of hunting success (number of coveys seen). One way to improve availability is by increasing your overall course coverage; the more ground dogs cover, the higher likelihood that they will encounter a covey location just due to chance. In fact, by analyzing GPS tracks of dogs and hunters we found that, on average, only 33% of a course is covered when using 2-dog braces, leaving >65% of the course not covered, and potential areas where birds may escape to during a hunt. And, using 3-dog braces, course coverage improves to 41%, but doesn’t substantially improve the number of coveys detected.

Of course, another way to improve hunting success is to know (perhaps by plotting) where coveys exist, and hunting more keenly in those areas, as well as learning specific covey evasive strategies in order to counteract their evasive movements. (See *Fall 2014 eJournal* article.)

In the future, we will be looking at how vegetation composition and structure fold into the detection of coveys. 🐦



Epic Year for Moving Wild Bobwhites

Project Collaborators: Theron Terhune and Clay Sisson

In the last issue of the Quail Call, we briefly discussed the history of translocation and how the Red Hills and greater Albany regions have been a reliable source of wild birds, not only for private lands there, but well beyond the confines of the Ochlocknee and Aucilla Rivers. This March, the Game Bird Program translocated 686 birds in less than 2 weeks to properties in 5 different states. Of those birds released, 320 were radio-tagged as part of 2 different, on-going research projects. Every property receiving birds has been undergoing intensive habitat management for several years leading up to translocation and currently has a minimum 3-year management plan in place to ensure quality year-round habitat going forward.

The translocations this year included the first ever translocation to the states of Maryland, Alabama and New Jersey. This also brings the total birds translocated, to date, to more than 3,000 birds since 2004. And, the total acreage impacted is estimated at more than 70,000, where bobwhite populations have been restored using translocation! Again, none of this would be possible without the landowners who have generously donated wild quail to these properties. You know who you are — we dearly thank you! 🐔



Barren No Longer

Project Collaborators: Theron Terhune, Chris Williams, Will Macaluso, Kaili Stevens, Dan Small, John Parke, and John Cecil

It was a quick count of one ... two ... three, and the lid of the first transport box was opened — then out boiled ten radio-tagged bobwhites from South Georgia on a cool, brisk morning in the New Jersey Pine Barrens. This was a monumental moment because it marked not only the first ever interstate translocation to New Jersey, but also the 3000th bird the Tall Timbers Game Bird Program has translocated since 2004. Furthermore this was an epic moment for the state of New Jersey, where only a few bobwhites are known to still remain statewide, and to this point it is believed the Pine Barrens of New Jersey have been devoid of the distinctive “Bob-White” call for the past 40+ years.

In total, 80 radio-tagged bobwhites were released the last week of March 2015, as a part of a 3-year cooperative project where the Tall Timbers Game Bird Program is working with the Center for Environment and Society at Washington College; Chester River Field Research Station,

University of Delaware; New Jersey Audubon; New Jersey Division of Fish and Wildlife; and Maryland Department of Natural Resources. The study site is a privately-owned property (>14,000 acres) located near Chatsworth, New Jersey. The property has been implementing a timber thinning and prescribed burning plan for the past several years, which has resulted in a core area of quality habitat. The Pine Barrens are comprised of a mixture of pitch and shortleaf pines and are a unique and prized ecosystem in New Jersey. These pine stands respond favorably to thinning and frequent burning, however the vegetation response is not nearly as quick as southern pine systems. But the good news is, once the habitat is created, the degradation of the habitat is not nearly as rapid either, which means that quality habitat should remain intact longer following management.

Indeed we are pushing the envelope in our restocking efforts here in New Jersey, and are uncertain as to whether it will work, but one thing we do know is that at the moment, the Pine Barrens are *barren no longer* when it comes to bobwhite quail. However, the question remains as to how

—Barren no longer continued on page 17



TOOLS & TECHNOLOGY

An ongoing challenge of land managers is ensuring quality habitat for quail and other wildlife among varying soil types, weather conditions and landscape contexts. On the thousands of acres we peruse each year, we have seen an explosion in invasive and non-native, exotic plants over the past decade. Invasive species are one of the largest threats to our terrestrial, coastal and freshwater ecosystems—it truly is a global issue. In addition, invasive species are a leading cause of native species extinction and degradation of habitat in some areas, by causing severe and sometimes permanent damage to the habitats they invade.

They can also have considerable economic consequences, with the estimated damage from invasive species worldwide totaling more than \$1.4 trillion. Closer to home, invasive species can reduce the quality of quail woods and the cost to control or eradicate them may be in the thousands of dollars, depending on the invasive plant and extent.

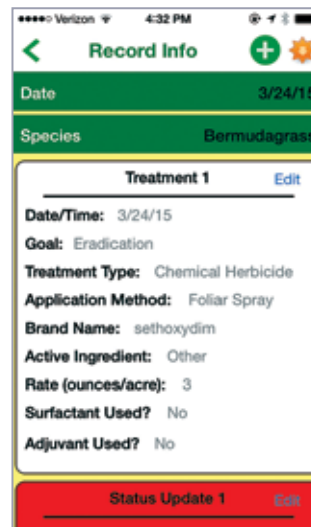
Several invasive species apps already exist, but none afford the ability to easily track the application of treatments and management status toward the control of undesirable, invasive plants. As a result, the Game Bird Program at Tall Timbers developed the **InvasiveTracker** app to provide an easy-to-use tool for landowners, land managers, and biologists to record and track invasive species on their properties.

InvasiveTracker is an app designed for iOS devices (iPhone, iPad) to allow landowners and managers to easily report and track their invasive species. The **InvasiveTracker** app provides numerous functions, including:

- Identify Invasive – scroll through pictures of common invasive plants;
- Add a Report – records an occurrence of an invasive;
- View Active Reports – view, on map, all reports of invasive plants for an individual user;
- View Archived Reports – view, on map, all archived reports of invasive plants for an individual user;
- Add Treatments – keeps track of management action applied to control invasive; and
- Add Status Updates – tracks management and control of the invasive.

All the data collected using the app will be secure and password protected by individual users; however, in the future, as more users track management and control of invasive plants, building a large database, we will use the treatment information to develop best management practices for specific invasive species.

InvasiveTracker will be available to download for free, if you are a Tall Timbers member, in the App Store by August 2015. If you have any questions or comments about this app please contact Theron via email: theron@ttrs.org.





Barren no longer continued from page 15—

long this will endure, and whether translocation following quality habitat management can serve as a conservation tool for the Mid-Atlantic region. We will monitor the birds released to determine survival, reproduction and population response on this site. This project would not be possible without the generous donation of wild quail from an anonymous landowner—thank you! 🐔

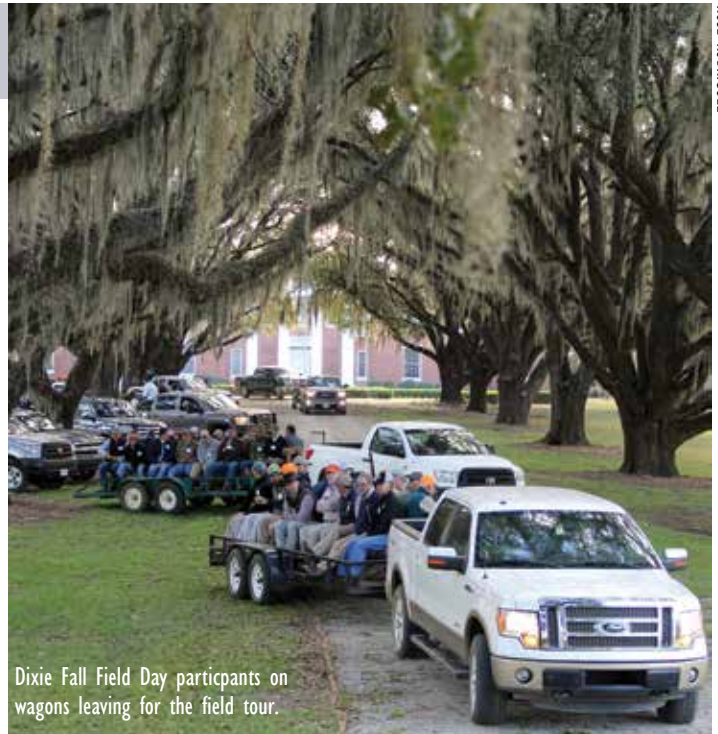
OTHER NEWS

Fall Field Days

We had two spectacular Fall Field Days in 2014. On October 24, 2014, we held the 29th Annual Fall Field Day at Dixie Plantation in Jefferson County, Florida. Dixie is a diverse 9,100-acre property located in Jefferson County, Florida and situated on the outer banks of the Aucilla River. The gift of Dixie to Tall Timbers, by the Geraldine C. M. Livingston Foundation in December 2013, provided participants a unique opportunity to see how bobwhite ecology can be applied on a working hunting plantation.

The “Livingston way” was always rooted in traditional quail hunting, whereby high regard was given to wild bobwhites and bird dogs. As such, Dixie has been managed for bobwhites through conversion of agricultural land to forest lands with an emphasis on regeneration of longleaf pine. However, small scale farming still exists and is an important, economic staple for its everyday operation. In the 1930s, Dixie became home for the Continental Championship Field Trial and is recognized by the field trial community as one of the premiere field trial sites in the country, acclaimed for its preponderance of wild birds. The stalwart conservation ethic and precedent set by the Livingston family provide the underpinnings of how Tall Timbers will use the property in the future. We are truly blessed to have such a wonderful property to manage and conduct research on.

The morning started off with Bradley’s sausage and coffee as folks piled in from all over the Red Hills and Albany areas and even beyond; we had a great turnout for the event with more than 300 participants attending. We would like to sincerely thank Randy Floyd and the Dixie staff for hosting



Dixie Fall Field Day participants on wagons leaving for the field tour.

ROSE RODRIGUEZ

the event. Dr. Bill Palmer welcomed everybody, followed by Dr. Theron Terhune and Clay Sisson who provided an update on the 2014 hatch, predictions for the upcoming hunting season, and research updates.

Then everyone loaded on wagons and enjoyed a magnificent view of the live-oak canopy covered driveway from the big house at Dixie, as we departed for the field tour. The wagons meandered through the property and passed excellent examples of quail woods while making four stops to discuss various topics. At the first stop, an overview of management and research was provided, and there were discussions about how farming and longleaf planting on Dixie were interwoven into the quail woods. This was also the core quail study area, where current and future quail research was discussed.

—Fall Field Days continued on page 18



Fall Field Days continued—

From there we moved onto the next stop where we discussed conservation easements, native ground cover management, and implementing covey call counts. Other discussions on the tour included Randy Floyd, Theron Terhune and Clay Sisson covering topics on timber management, hardwood cleanup and the “new ground” effect, as well as Eric Staller giving an excellent overview on herbicide treatments for controlling Bahia grass in the quail woods. We concluded the day with a fantastic lunch sponsored by Ag-Pro. Tall Timbers and the Game Bird Program would like to thank all who attended the field day for making it such an enjoyable event. We hope you will plan to join us for the 2015 Fall Field Day, which will be tentatively held October 23, 2015.

Carolina Fall Field Day

On November 7, 2014, the Game Bird Program held the 6th Annual Carolina Fall Field Day at Walworth Farms near Eutawville, South Carolina. Walworth Farms is a 4,000-acre property owned by MeadWestvaco (MWV), with prior ownership managing the property as an active cattle farm. After recovering from Hurricane Hugo, MWV transitioned the management objectives from a working farm to a productive timber operation, with a keen emphasis on wildlife management. Tall Timbers has been working with MWV on this property for several years, and it was great to be able to showcase the tremendous management effort being undertaken for wild birds. We thank MeadWestvaco for graciously hosting and sponsoring the fall field day!

Under the tent, John Stuart with MWV provided an overview and history of management of Walworth Farms. Dr. Theron Terhune then provided an update on the 2014 quail hatch from Florida to North Carolina. Theron presented to Nat Ruth (a plantation manager in the Lowcountry of South Carolina) the Firebird award, recognizing him for his outstanding efforts in land management and championing Tall Timbers’ research efforts in the Carolinas. Nat is a true pioneer in South Carolina for wild bird management, and helped Tall Timbers Game Bird Program substantially in recovering wild bobwhites in this region. Congratulations Nat!

During the field tour, Doug Parker and John Stuart with MWV and Dr. Theron Terhune discussed how MWV has worked diligently over the past few years to enhance the native quail population on the property, by employing extensive timber thinning, quality vegetation management, creation of brood fields, and fine-tuning of the prescribed fire program. Dr. James Martin, an Assistant Professor at



the University of Georgia, along with Theron, discussed chick ecology and brood habitat management. In addition to habitat management, attendees were able to see firsthand the everyday operations of a limestone quarry. Other discussions included Theron talking on translocation and restocking, and David Poole discussing the use of F1 parent-reared birds to restock a property. The use of F1 parent-reared birds helped to shift from an occasional encounter with a few birds here and there, to commonly flushing large coveys on Walworth Farms. This property is a prime example of how hard work and persistence can pay off in the Lowcountry of South Carolina— outside the traditional quail plantation belt. 🐔

2015 GA/FL Turkey Invitational: Turkey Hunters Once Again Help Raise Funds for Tall Timbers Game Bird Program

On March 27, the 10th Annual GA/FL Turkey Invitational kick-off dinner was held on the Beadel House lawn overlooking Lake Iamonia at Tall Timbers Research Station & Land Conservancy with a glorious sunset backdrop. Donny Richards of ‘Come Heah Tuh Me’ Custom Turkey Calls talked to the crowd and demonstrated some old and new calls such as the “spit and drum.”

The next morning, 45 teams hit the woods before daylight in hopes of bagging the biggest, oldest gobbler. Despite his wife being pregnant and due at any moment, Judge Rickey Lackey, National Wild Turkey Federation Biologist, killed a bird that morning and then conducted the weigh-in at Seminole Plantation. What dedication — thanks Rickey!

It was a cold, brisk morning and gobbling reports seemed down compared to other years, but this depended



on where you were, as some reported great gobbling activity. As usual, participants spit and drummed up turkey stories during the late-morning and at lunchtime, as some had close encounters and others had missed opportunities; more than 20 birds were bagged.

By the flash of a turkey fan, Team Phillip Watt and Robbie Green won the overall invitational bringing in a great gobbler. They also won the Calcutta for having the heaviest bird at 21.5 pounds. With less than $\frac{3}{4}$ point separation, Team Travis Sherman and Donald Smith took second place, and third place went to Team Greg Hager and Mike Ross. We had seven youth teams this year. Christopher Watt won the Youth Division for the fourth time and also took home the Mossberg shotgun donated by South Georgia Outdoors! Team Reagan and Abbi Sherman was a very close second, and Team Hillman Smith rounded out the youth category at third place.



Many thanks to Seminole Plantation for hosting us at lunch, and to the steering committee members John Daniels, Bryan Knox, and Robbie Green for helping to pull together another great year! We also thank George Simmons and the North Florida Animal Hospital for sponsoring lunch, Gordon Mooney with Ag-Pro for sponsoring dinner, South Georgia Outdoors for donating a gun for the youth winner, Tarva Plantation for donating a turkey hunt, and Lynch Turkey Calls for donating calls for all first place winners. After experimenting with a Friday dinner/ Saturday event and receiving feedback this year, we will likely return to a Thursday dinner/ Friday event next year. 🦃

2015 Game Bird Research Team

Theron M. Terhune, PhD, Robert C. Balfour, Jr. Game Bird Management Research Fellow
Bud Bostick, MS, Biologist
William E. Palmer, PhD, Director of Research, President/CEO
Eric Staller, MS, Natural Resources Coordinator

Albany Quail Program (AQP)

Clay Sisson, Director
Adam White, Wildlife Technician

Dixie Plantation

Randy Floyd, Land Manager
John Michael McCormick, Wildlife and Land Management Technician
David Sisson, Wildlife and Land Management Technician

Research Associates

David A. Buehler, PhD, University of Tennessee
James A. Martin, PhD, University of Georgia
Katie Sieving, PhD, University of Florida
Chris Williams, PhD, University of Delaware
Skip Van Bloem, PhD, Clemson University

Project Collaborators

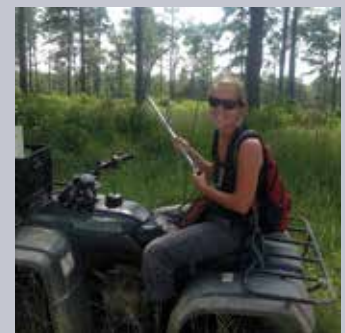
Danny Caudill, MS, Florida Fish and Wildlife Conservation Commission
John Cecil, New Jersey Audubon
Andrew Cox, PhD, Florida Fish and Wildlife Conservation Commission
Bob Long, MS, Maryland Department of Natural Resources
John Parke, New Jersey Audubon
Dan Small, Chester River Field Station, Center for Environment and Society
John L. Seidel, PhD, Washington College, Center for Environment and Society
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James Garret, MS Student, Clemson University
Aaron Griffith, MS Student, University of Tennessee
Ryan Haley, MS Student, Delaware State University
Alex Jackson, MS Student, University of Georgia
Kristen Malone, PhD Student, University of Florida
Mark McConnell, PhD Candidate, Mississippi State University
Diana McGrath, MS Student, University of Georgia
Will Macaluso, MS Student, University of Delaware
Kellie Phillips, MS Student, University of Georgia
Brad Roberts, MS Student, University of Georgia
Kaili Stevens, MS Student, University of Delaware
Seth Wood, MS Student, University of Georgia

Research Interns

Justin van Gorder
Beth Foley
Cody Gregory
Cassie Griffith
Hunter Lewis
Kyle Lunsford



Research Intern Beth Foley

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Quail Management Research Needs Your Support

Tall Timbers has a long and rich tradition of leadership in quail research. Beginning with Herbert Stoddard's, study of quail life history nearly 80 years ago, Tall Timbers has led the charge to gain new knowledge that can be used to improve quail management. Today, novel research is greatly needed to better understand how to deal with the many new challenges and obstacles faced when managing for bobwhites. The Game Bird Program continues to be an innovative leader in research and management of bobwhites, and serves as an important resource for those who value the future of sustainable populations of wild birds. The Game Bird Program now encompasses both the Tall Timbers Quail Management Research (QMR), which conducts research on Tall Timbers, Dixie Plantation and surrounding quail properties; the Albany Quail Project (AQP), which conducts research on quail lands around the Albany, Georgia area; and the South Carolina Quail Project (SCQP).

We hope you will consider making a contribution to the Game Bird Program. Our fundraising goal is \$650,000 in 2014 to support the QMR, AQP, and SCQP projects. If you have supported these programs in the past, please continue to do so as these programs depend greatly on your annual donations. Please earmark your contributions for the appropriate program. 



Nat Ruth holds the Firebird award. He was recognized for his outstanding efforts in land management and championing Tall Timbers' research efforts in the Carolinas. See page 18.

