



TALL TIMBERS

Quail Call

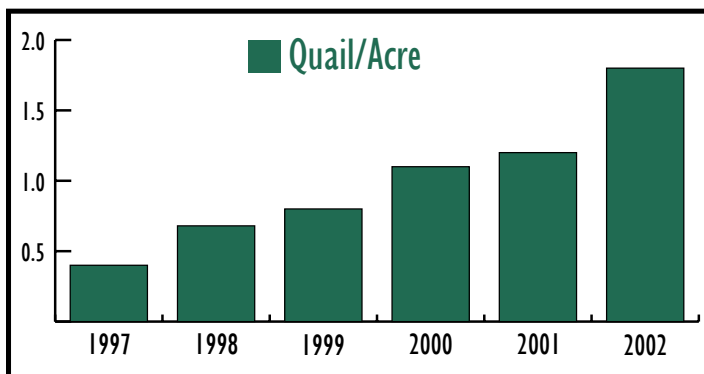


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Another record season

This year, we anticipate a better than average fall population of bobwhites. On our study areas south of Thomasville, we witnessed up to 50% increases in bobwhite abundance over last year's populations. On Tall Timbers Model Quail Course, our fall density was estimated at 1.8 bobwhites per acre, which was up from 1.2 birds per acre last year. Not since the early 1980s has our quail population been at this level. We attribute the regional increase in bobwhite numbers to an excellent carry-over of bobwhites from 2001-2002 hunting season and slightly below normal rainfall that maintained excellent habitat conditions throughout the breeding season. Therefore, we predict that many properties will have record years in 2002-2003.



Quail Management Plan to be developed in Florida

Northern bobwhite populations have declined steadily throughout the South since the 1970s. These declines are a result of habitat loss from development and changes in land use practices. Recently, the Florida Ornithological Society

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(FOS) petitioned the Florida Fish and Wildlife Conservation Commission (FWC) to list northern bobwhites as a "Species of Special Concern," under Florida's Endangered Species listing process. The Florida listing process bases decisions to list species on quantitative population trend information and specific decision criteria. According to FOS, northern bobwhites met one of these criteria. However, upon further review of the status of northern bobwhites (>20 million globally), FOS has requested the petition be withdrawn and the FWC has agreed to do so.

The petition withdrawal does not change the fact that northern bobwhites have declined on private and public lands across Florida. While the species is in no threat of extinction, these declines seriously threaten the future of bobwhite hunting and are a sign of poor habitat for many species. At the same time, research throughout the South has clearly documented that bobwhite populations can recover when habitat improves. Unfortunately, declines on public and private lands will continue without changes in how habitat is managed. We need to support all efforts to improve habitat for bobwhites by **timber thinning** to a reasonable density and by the expanded use of **frequent fire**. Burning every four to seven years to control fuels is not suitable for bobwhites or other species adapted to upland ecosystems.

In cooperation with the Southeast Quail Study Group, the FWC will be working to develop a plan to restore bobwhite populations to 1985 densities on some landscapes in Florida. Florida owns more than one million acres of potential habitats. Restoring suitable habitat to 1/5 this area could create another "Red Hills" in Florida. Contact the FWC commissioners and let them know you care about the status of bobwhites in Florida and encourage them to work toward reversing the declines on public and private areas throughout the state. This may be the last chance to save our sport in Florida.



New cooperative wild turkey research project on Pebble Hill

The Game Bird Lab at Tall Timbers Research Station (TTRS) is cooperating with the FWC, Georgia Department of Natural Resources (DNR), University of Florida, University of Georgia and the Florida Chapter of the National Wild Turkey Federation (NWTF) to develop a new turkey research project on Pebble Hill Plantation and surrounding properties. The goals of this project will be to test methods to estimate turkey population size using cameras at bait stations, develop simple measures of habitat quality to assist public and private land management, and to determine how burning affects gobbler and hen movements in the spring. Also of interest is the nesting ecology of turkeys. Turkeys will be leg-banded so please report any leg-banded gobblers harvested over the next several years to Tall Timbers.



Wild Turkey. Photo by Shane Wellendorf

How many fish in the pond? A new density record

Determining the population size of bobwhites has been a perennial problem for biologists. However, this information is important because it helps us to understand the factors that limit bobwhite populations. For instance, the issue of density dependency can complicate the comparison of populations at different densities. Density dependency occurs when quail respond differently to conditions because of the population density. When density dependency is present, a low population may respond to habitat management that a higher population will not respond to because the "pond" is already full.

Therefore, at what density will bobwhite populations be less likely to grow from year to year and therefore, new management may be fruitless?

The results from our study area on Sunny Hill Plantation have helped to shed new light on this issue. After burning this spring, a group of 12 observers walking transects across 160 acres flushed 755 quail. We walked in line through the cover with GPS units recording the outside edges of the flushed area. We also had one observer 100 yards ahead of the flush line to identify quail that were flushed more than once. We radio-collared a sample of 50 bobwhites to estimate the number of quail that evaded flushing (12%) and the number that we flushed more than once (25%). After incorporating the acreage that had been recently burned, and therefore was mostly uninhabited by quail, our estimate of density on our 900 acre study area was 3.1 bobwhites per acre. Of course, this is a very high density of bobwhites in April!

How dense can quail populations get and what are the implications of high density for population growth? It isn't everyday that the opportunity to study quail populations at this level occurs. So, this summer we began research to answer these questions. Our main interest was to determine if per capita reproduction was reduced because of the large number of breeding pairs. We were curious about this because until now we have not documented low per capita productivity on sites with spring densities of up to 2.0 quail per acre. What we found was the number of nests incubated by hens was only half that of hens on areas with lower densities. On this high-density study site, nesting by radio-tagged quail essentially ended after July while on lower density areas nesting continued into October. Adult survival, nesting success and other population parameters were normal relative to quail populations at lower densities. Therefore, it appears that nesting effort may decline as populations of bobwhites reach their "carrying-capacity."

Based on our estimates of recruitment from our radio-collared bobwhites ($n = 50$), we estimated the fall bobwhite density would be about five bobwhites per acre! The high numbers of quail entering the nesting season resulted in a large number of nests despite the low nesting rate! To verify this estimate we randomly placed six 30-acre grids across the study area, therefore we sampled 20% the study area. Using four observers at each 30-acre grid we identified coveys calling before sunrise within the grid then immediately flushed those coveys to count the number of quail in each group. The fewest number of coveys we found in a grid was 10 and the most was 15 coveys. In the grid with 15 coveys we flushed 245 bobwhites from the 30-acre search area. Average covey size was 16 quail. Overall, the survey resulted in an average density of six

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Eight + Quail/Acre

Figure: Grid 5 of survey shows the number of bobwhites counted from 15 coveys on a 30-acre grid. Coveys were first located using early-morning covey calls.

quail per acre, which was similar to our predicted result. **This is the highest documented density of bobwhites ever.**

It is important to point out that it was not the expressed goal of management on this property to achieve this record abundance, but simply that this is the outcome of excellent habitat management on a landscape suitable to bobwhites. This area had less than 0.25 quail per acre eight years ago prior to the application of frequent fire, hardwood removal, pine thinning and supplemental feeding. Our study area still has ample mature longleaf pine with excellent recruitment of young longleaf. There are large numbers of breeding Bachman's sparrows, gopher tortoises, and wintering songbirds. High-density quail management provides excellent habitat for most species that require habitats created by frequent fire and open upland pines.

Through this study we have also determined that for high density bobwhite populations, conducting 60-acre grid counts likely underestimates true density as the total number of coveys calling in 60 acres is more than four observers can hear! We recommend smaller grids when densities exceed three bobwhites per acre. We also believe that while this has shifted the density scale for bobwhites, researchers have perennially underestimated true bobwhite densities.

Update on predation study — natures way?

This was the third year of the cooperative seven-year "cross-over" experiment testing the effects of reduction of mammal

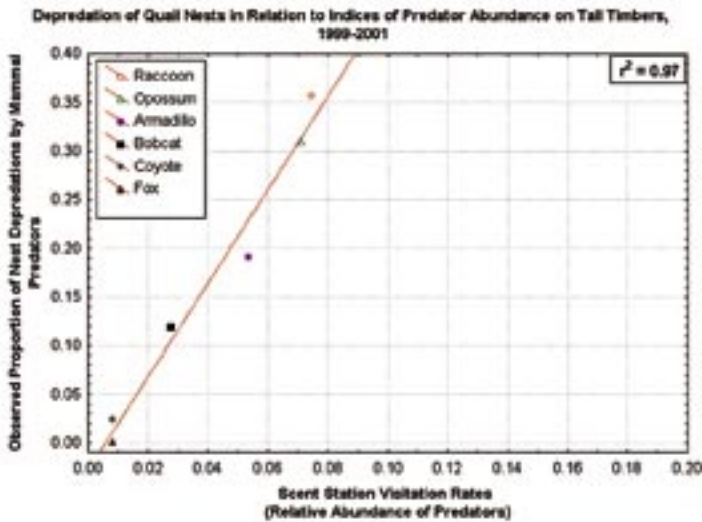
nest predators on bobwhite populations. However, there was an interesting twist this year. Both treatment and control sites had the same reproductive success. On Pebble Hill, the site where trapping has reduced the abundance of key nest predators, our radio-tagged sample of bobwhites produced a successful nest per two hens entering the nesting season. To put this into perspective, this was three times greater than pre-treatment levels. However, similar chick production was found on Tall Timbers. Also on Tall Timbers, without predator management, we had record high nesting success of 67% that was well over our long-term average nesting success of 45%. None of our other study sites where we monitored nesting success showed unusually high nesting success this year. So, what happened?

Our fall scent station indices for mammalian nest predators may have provided part of the answer. Our nest predator index was actually slightly lower on Tall Timbers than on Pebble Hill where trapping occurred this summer. Our predator indices at both sites were below the threshold level of predator abundance above which nesting success begins to decline. Again, what happened? This past winter and spring, we found carcasses of raccoons on our study area and some neighboring properties also reported finding carcasses. These animals tested positive for canine distemper, a viral disease. There appeared to have been a decline in raccoon abundance caused by a naturally occurring disease on our "control" area. At the same time, our second most important mammalian nest predator, the armadillo, has also declined in abundance. Scientists from Valdosta State University studying armadillos have maintained a long-term capture data set for armadillos. While their study was not set up to monitor armadillo populations per se, their capture rate has declined to a ten-year low. We suspect that the combination of long-term drought and recent disease outbreaks may have reduced these two predators on Tall Timbers and surrounding properties. In 2000 and 2001, we witnessed 20 depredations by these two species out of 54 depredated nests on Tall Timbers. This past year, we had no nests destroyed by these two species out of 36 nests monitored with video cameras.

We witnessed a natural reduction in some predators and the end result was a similar abundance of predators as resulting from the trapping effort. While we had very low depredations on nests, we still had all species of predators visiting our scent stations, just at lower rates than the past few years. These results suggest that even relatively intensive trapping does not lower predator populations below levels occurring naturally. Our results also provided additional support for our predator counts and how they relate to bobwhite demographics. Before undertaking expensive predator removals,

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we recommend monitoring the predator abundance on your property to determine the relative abundance. Contact Tall Timbers for more information on how to conduct your own predator surveys.



This graph shows that these predators are depredating quail nests relative to their abundance on Tall Timbers. This suggests that, on average, the most abundant predator, regardless of species, is responsible for most nest depredations over time rather than one particular species searching specifically for quail nests more than another predator species. This makes sense because all of these predators have a broad diet and are likely finding quail nests while foraging for other food items.

Habitat management is predation management

Predation issues tend to polarize people and this disagreement is fueled by misinformation. As too often is the case, complex issues like predation and habitat management are reduced to “sound bites” which rarely help to find solutions to problems.

Predation management, as promoted by the Game Bird Program at Tall Timbers, is science-based and practical approach that produces results for the bobwhite manager. Predation management is based on understanding how to minimize predation on bobwhites through indirect and direct management of predator and prey populations.

The goal of predation management is to maintain predator populations and habitat at levels where bobwhite populations can increase when habitat and weather conditions are favorable. *In all situations, managing habitat to minimize predation is the first and most important step.* While we, and our colleagues, are continually learning more about predation, the following techniques have been proven to increase bobwhite numbers on plantations in the Red Hills and elsewhere:

•**Thin mature pine timber to < 60 ft²/acre of basal area:** As timber becomes denser than this, the quality of the ground cover diminishes rapidly. Poor ground cover will increase losses of quail to avian predators. Heavy pine timber produces needles for burning, but can also shade out grasses. As trees become less dense, grasses become the dominant fuel. Grasses also provide wildlife habitat that needles don't! This year's record numbers of bobwhites is largely due to low mortality of adults over the previous fall and winter that comes from having good ground cover for bobwhites to hide in.

•**Thin planted pine stands aggressively:** If bobwhite quail are a priority, then thin planted loblolly pines to 100 trees per acre or less at the first thinning. This will provide several years of good ground cover before the pine canopy closes again. Standard thinning practices are wholly inadequate to produce good quail habitat. Thick pines also serve as roosting sites for Cooper's hawks from which they forage each morning and afternoon.

•**Significantly reduce hardwoods:** In uplands, remove unwanted hardwoods because their shade reduces grasses that fuel fire and they provide habitat for predators. Snake species that prey on bobwhite nests prefer hardwood trees, especially those with spreading branches like live oaks. Similarly, avian predators often use hardwoods for nesting and as feeding or plucking perches.

•**Thin hardwoods out of “false” drains and fencerows:** In the South, many hardwood “drains” are a result of past farming that created gullies and ditches where hardwoods were protected from fire and other disturbance. These hardwood thickets not only reduce quail habitat by negatively influencing burning, they reduce access to bobwhites during hunting and harbor many predators of bobwhites. Properties that have just completed hardwood cuts are experiencing record high bobwhite number and improved burning.

•**Think BIG to gain the new ground effect:** Rather than taking many small steps with habitat management look for big projects. Bobwhites respond quickly to properly planned timber harvests, even those that last through May. However, when conducting a big cut, leave 10-20% of the cover for the bird to hold in until the habitat responds. In spring burn areas where the loggers will operate and ask them to stay out of the unburned patches. When cover returns the quail will be the first ones back with few if any predators to reduce their reproduction. We have measured > 3 bobwhites per acre in November on large areas heavily cut the previous April and May.

•**Provide Supplemental feed during the entire year:** For small properties, feeding in winter will reduce emigration from the property helping you keep birds on your place.

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Hardwoods provide habitat for quail nest predators. Photo by Jim Solomon, Nature Photography of America.

Feeding during the spring and summer will not only extend the nesting season by up to 6 weeks but will also keep hens in better condition to recycle after a lost nest. This has the effect of reducing the impact of a clutch lost to predators.

•**Clean Up:** Clean up the brush piles, downed logs, thickets, that will harbor predators, especially snakes. Our research on movements of rat snakes has found they utilized structure for loafing and feeding sites. Reducing the habitat of detrimental abundance snakes may help to reduce their abundance.

These habitat management practices are predation management practices and vice a versa, two sides of the same coin. The properties in the Red Hills and Albany that have conducted these practices are enjoying record bobwhite populations. These very same management activities benefit a whole suite of upland species, including gopher tortoises, woodpeckers, songbirds and other species adapted to frequently burned open piney woods.

What About Trapping?

In some circumstances, however, a quail hunting property is located within a landscape where the abundance of predators is naturally high. Not all properties carry the same number of predators because of differing habitat conditions. Properties along rivers, or with more hammocks, tend to have higher abundances of armadillos, raccoons, and opossums than more upland sites. In these situations, removing hardwoods is not recommended because these are natural wetlands. Therefore, habitat management alone may not result in satisfactory increases in bobwhite populations if nest predators are overly abundant. Reducing the abundance of common nest predators, such as armadillo, raccoon, and opossum may be needed to increase quail reproductive success and fall populations.

We have developed a simple method to assess the abundance of predators and have related this to quail reproductive success. A simple, inexpensive scent station survey will provide the quail manager with information on the type and

relative abundance of key nest predators. If the abundance of key nest predators exceeds recommended levels, then investing in predator reductions may be necessary, assuming habitat management has been completed. A successful trapping program requires a lot of effort and expense. At least five months of full-time trapping is necessary to reduce mammalian predators sufficiently to affect bobwhite demographics. One or two weeks of trapping each fall is likely a waste of time.

Ecological consequences of reducing these mammalian predator populations are unknown but likely to be unimportant in the South. In fact, there is no information that indicates a “negative impact” on the environment from normal trapping efforts. Remember their natural predators have been removed long ago. Our measures of predator abundance can be similar with and without trapping, which demonstrates that predation management does not reduce predator populations to “unnatural” levels. Of course, we have only begun to scratch the surface of understanding the complexities of predator and prey in the Red Hills.

Brood mixing greater and earlier than expected

By capturing broods at three days of age and again at ten days of age, we are getting information on how much mixing of chicks occurs among bobwhite broods. This past season, on Tall Timbers, our genetics research team captured 44 broods at three days of age and 29 of these same broods at ten days of age. Surprisingly, 11% of three-day old broods and 52% of ten-day old broods included chicks from other broods. In most of these cases, only one or two adults were present during the brood capture. One chick was captured in three different broods in the same week. While the reason for brood mixing is unknown at this point, it is clear that adults may “loose” their young to other families as well as accidents and predators.



Within a couple days of leaving the nest, chances are good these chicks will be joined by unrelated chicks. Photo by Shane Wellendorf.

Patch planting longleaf on old field hunting areas

Planting longleaf in small patches on some old-field sites can result in high levels of loblolly and short-leaf pine competition. If care is not taken, these old-field pines can dominate patches of longleaf regeneration. Using frequent fire is the preferred method for controlling this competition. However, annual fire may not be possible on sites without the presence of perennial grasses.

A common recommendation prior to planting longleaf is to prepare the site using broadspectrum herbicides. In our previous research, we found that some herbicides reduced hardwood re-sprouts but also increased the presence of old-field pines and reduced grasses essential for complete burns.

Our goal for this research was to achieve reasonable longleaf establishment in patches small enough not to interfere with quail hunting activities and without sacrificing our ability to burn to control unwanted vegetation. Therefore, we set up an experiment that compares different forms of site preparation including, backpack spray, foam brush, broadcast Velpar, and mowing treatments. The overstory at each of our plots (about two acres each) was removed to create the patch opening. Prior to planting, we treated each plot with herbicide during the fall then planted in the spring. With the mowing treatment, we mowed our plots just prior to planting the longleaf. We plan to burn these plots next spring, the year after planting, and release individual seedling longleaf from herbaceous weeds using herbicide over the top of the seedlings.

Our preliminary results suggest mowing prior to planting longleaf is the least disruptive to maintaining annual fuels for burning. This should help us to control old-field pines in longleaf patches. After burning next spring we will be able to compare longleaf survival and competition control. Mowing has the second advantage of reducing the stature of existing old-field pine saplings. The photos below demonstrate the management problems that can come from dramatically changing the vegetation using herbicides when old-field pine competition is likely.



This backpack treated plot does not have the grasses needed to carry a fire.



This mowed plot will burn well next spring.



Herbicides have reduced the ability to burn this area. These sapling shortleaf are safe from fire for another year or two. Since shortleaf that survive two or three years re-sprout, this will be a long-term management issue for this stand.



Seedling shortleaf, next to planted longleaf, in a mowed plot. Fire will kill shortleaf seedlings now rather than having to mow saplings later.

Horseshoe Plantation hosts Fall Field Day — program rated one of the best

Wednesday, October 30, 2002, Tall Timbers held its annual Fall Field Day. Over 250 people attended the event that was held at Horseshoe Plantation this year. The evaluations and feedback from those who attended indicated that the program was one of the best given at a Tall Timbers Field Day.

The field tour presentations featured Ed Epp, manager of Horseshoe Plantation, who discussed bobwhite quail management, timber management and fire and quail on Horseshoe. Steve Shea, a biologist with the St. Joe Paper Company spoke about white-tailed deer management in the Florida Panhandle. Wild turkey management was discussed by Bryan Burhans, biologist with National Wild Turkey Federation. Scott Sanders, Biological Administrator with the Florida Fish and Wildlife Conservation Commission (FWC) spoke about the money and incentives available through the 2002 Farm Bill. Conservation Easements on Working Landscapes was the topic of Red Hills Conservation Coordinator, David Capps presentation. And, Bill Palmer, Tall Timbers Sr. Research Scientist, shared the latest on Tall Timbers' game bird research and gave his hunting season forecast.

During lunch, two presentations were given by FWC staff. Vic Heller, the Assistant Executive Director discussed the petition to list bobwhite quail as a "Species of Special Concern" and Tim O'Mera, Research Coordinator, discussed developing a Statewide Management Plan to help bobwhite quail.

Fall Field Day was made possible by the generous support of our sponsors. Many thanks go to Ausley & McMullen, BASF, Blackberry Patch, DFC, Flowers Foods, Jones Tractor Company, Lister's Outdoor World, Pennington, Plantation Security, R. B. Walker Mowing, Inc., Tallahassee Ford and *Wildlife Trends* for contributing to our program.

Finally, Tall Timbers would like to thank Fred Hamilton, Ed Epp and the staff of Horseshoe Plantation for their hospitality in providing a fabulous location for our 2002 Fall Field Day.



Fall Field Day registrants on the field tour at Horseshoe Plantation, October 30, 2002, listen to presentations on bobwhite management, timber management, fire and quail, and white-tail deer management on this tour stop. Photo by Rose Rodriguez.

2002 Game Bird Research Team

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David Turner, Research Intern

Lee Walston, Research Intern



Support Quail Research!

Quail Research Initiative

In 1994, Tall Timbers embarked on an ambitious three-year Quail Research Initiative (QRI). This project demonstrated overwhelming results that warranted continuation of this research. Our work has positively affected quail management throughout the Southeast. QRI is now a long-term research and conservation project.

Our annual fundraising goal is \$250,000 per year. We hope you will consider a gift. Remember, no gift is too small and is exclusively for quail research. If you love these birds as much as we do, please fill out the enclosed envelope and mail today!!

At left, Model Quail Course at Tall Timbers. Fall density of quail on the Model Quail Course was estimated at 1.8 bobwhites per acre. Not since the 1980s has our quail population been at this level. Photo by Eric Staller.



Thank you for supporting quail research at Tall Timbers.

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