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The Science of Gobbling

By *Bryan J. Burhans*

It's the second week of spring turkey season and I can't find a bird that will gobble. Aliens have either abducted them, hunters have killed them all, they have moved out of the area, or the breeding season is over. Except for the alien hypothesis, these are all reasons I hear from hunters for why turkeys seem to stop gobbling mid-season. But, for the most part, the gobblers are still here.



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Ultimately, the length of the day, referred to as photoperiod, triggers the wild turkey's mating behavior: gobbling, strutting, spit and drum and mating. However, there are other factors that will affect breeding behavior and provide plausible explanations for why you may not hear much gobbling at times. Breeding season, weather and hunting pressure all play a role.

Gobbling is the mating call produced by all male turkeys with the goal of attracting hens to the gobbler. This fact by itself puts the turkey hunter at a disadvantage. A gobbler expects the hens to come to his gobbling and he would rather not have to go to the hens. The "spit and drum" sound gobblers make is a close-in call used to attract hens that are already close to the gobbler. Fortunately for the turkey hunter, gobblers will at times go to the calling of a hen. But don't feel bad when the last thing you hear from that old longbeard is a few gobbles as he moves away from you. It's probably not you....he just expects you to follow him.

But how many times have you stood in the predawn darkness listening for that long anticipated gobbling only to hear nothing? You heard the birds gobbling a week ago, but nothing now. Let's look at some reasons for this common problem.

No birds!

Despite how common turkeys are across the Southeast, it's not uncommon to have birds leave your property for some "greener pastures." This happened to me on a lease I recently joined this past spring. I scouted the property in March but found little turkey sign. There was plenty of sign from the winter so I know the birds were in the general area. There were some great looking hardwood bottoms and most of the timber in the uplands was older. I was the only person that turkey hunted the property, so I was sure no other hunters had molested the birds. I looked and listened for the birds. Although I had heard some gobbling in the weeks preceding opening day, I could not find one gobbler after opening day. In fact I had even located two gobblers the day before the season opened, but by the next day they vanished.

I hunted that 1,300-acre property for the entire season, and except for a couple of hen tracks and an occasional hen sighting, I never saw or heard the first gobbler. However, the reason for the lack of birds became apparent when I started to talk with surrounding landowners. Unfortunately, compared to the land around my hunting lease, the land I was hunting offered poor spring turkey habitat. There was plenty of large timber, but the food plots were abandoned for several years, the pine timber had never seen any prescribed fire, and no new clearcuts were availing to provide good feeding areas for the turkeys in the spring. Instead, they migrated across the creek to a property that had well-managed food plots, pastures, and some well managed timber.

I have worked with many landowners that complain that during the fall they have so many turkeys scratching in the woods they can't hear themselves think. But come spring, the birds leave. Well, likely the birds did leave and found better spring-time habitat nearby. And for

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but not by much."**



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turkeys in the spring, they like things “green and growing.”

Hunting pressure

Anyone who has spent time hunting public-land birds intimately understands that even a little hunting pressure will reduce gobbling. And research supports this observation (Kienzler et al. 1995). Last year, for example, I waited for daylight seated against a tree in an area on public land that I suspected turkeys were roosted. As the sun finally painted the sky, I heard two gobblers sound off several hundred yards in front of me. Just as they started getting cranked up, I heard a truck coming down a road behind me. The truck stopped, a door opened, and the hunter owl hooted trying to elicit a gobble – the duo did not respond. I heard the truck door shut, the engine started and away the hunter went, probably confident there were no birds in the area. It was 15 minutes before the birds started gob-

bling again.

Most turkeys see you before you see them, and usually you never even know it. Many hunters call too frequently, don't sit still, and are not patient. This often results in gobblers that figure out real fast that the seductive hen calls he hears may actually be trouble. After being bumped by hunters, they usually switch to caution mode; elicit a few gobbles, and walk the other direction.

It's difficult to almost impossible to hunt birds without occasionally bumping one. But you can reduce pressure on the birds by working with your hunters. Encourage them to sit still, or if they can't sit still, use a blind. Be patient with a gobbling bird. That gobbler doesn't have a schedule he just wants a girlfriend. And if he already has some with him, it may take a while before he checks you out. Call sparingly to gobblers, and never call before the season opens. Don't get too close to the birds when they are on the roost. Most turkeys



fly down well after daylight...if it's not pitch dark, they will see you moving through the woods, especially in early season prior to leaf out. Instead, try to figure out where the birds will go, and set up to intercept their travel.

How many turkey hunters use your land can also make a difference. Turkey hunting is not like deer hunting. You can't just turn out 15 hunters on 1,000 acres and expect a good hunt. Most of the 15 hunters chasing turkeys will eventually end up hunting the same one or two groups of birds. One or two individuals may have a good hunt, and after a few days of this kind of pressure, the birds will become very quiet.

Most properties in the Southeast are managed with deer hunting as the primary focus. Turkey hunting is often thought of as an added perk for hunters come spring. But with the recent explosion in turkey hunters over the last 10 years, landowners and hunting clubs should focus more attention on managing for a quality turkey hunt. And quality means offering hunters enough room to hunt, and keeping pressure on the birds to a minimum. This will require some creative techniques. Breaking the property into large blocks (> 500 acres) and only allowing one hunter (or pair) in at one time, or limiting the number of hunters allowed to turkey hunt can go a long way towards maintaining a quality hunting experience.

Timing of breeding cycle

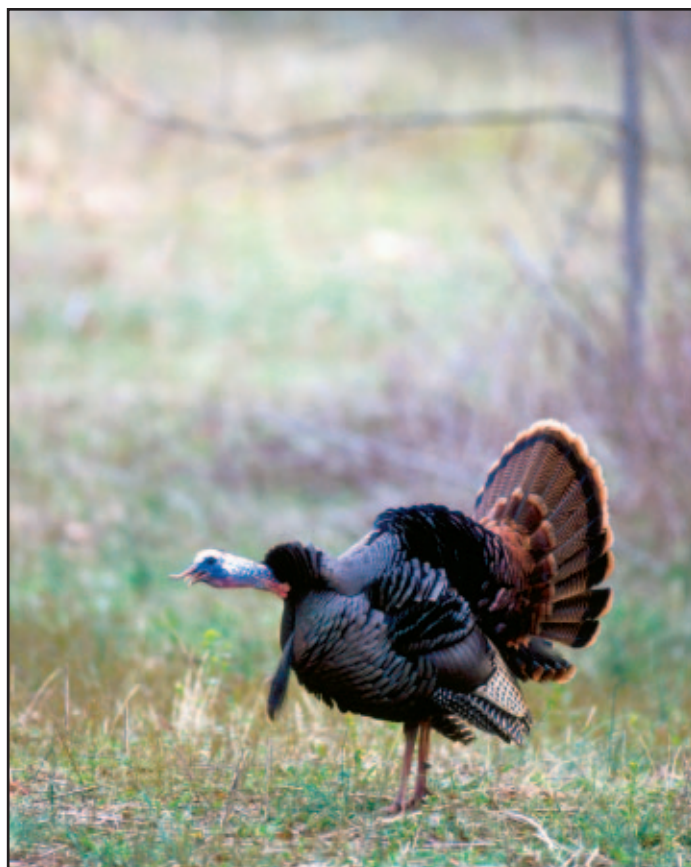
There are typically two peaks in gobbling activity. The first peak usually occurs just as mating starts. In many states, this is just prior to the opening of turkey season or at the beginning of the season. The second peak usually occurs later in the season and some research suggests that the second peak is a response to hens leaving the gobblers to start incubating their eggs. In Piedmont South Carolina, for example, the first peak occurs in mid-April and the secondary peak in late April (Bevill 1975). The secondary peak of gobbling is usually less intense. However, if hunting pressure is high, you may never even notice the second peak. And although timing of breeding plays a large role in gobbling, another factor that will change gobbling intensity is weather.

Weather

In general, the best mornings to hear gobbling are when the sky is clear, there is a light breeze and a heavy dew – clear, cool mornings. Gobbling is less intense on rainy and windy mornings. And yes, a tom will gobble in bad weather, but your odds are much better when the weather is nice. There is no doubt that some bad weather can really turn gobblers off for a day or two.

Weather can also influence the timing of the breeding cycle. Early warm springs can advance the breeding cycle, often by a week or two, whereas cold, wet spring weather can delay the breeding cycle (Vangilder et al. 1987). However, for much of the Southeast, an advanced or delayed breeding cycle will rarely ruin a turkey season. I have heard this reason over and over from hunters claiming, “they are already done for the year.” Surprisingly, I have even heard this comment in February here in South Carolina. Obviously, their hypothesis was incorrect.

You will likely hit at least one if not both



gobbling peaks during your turkey season. State fish and wildlife agencies specifically structure turkey hunting seasons to maximize hunter success and protect nesting hen turkeys. If your turkeys see hunting pressure, you likely may never hear a peak in gobbling.

Conclusion

Science will never completely unravel what makes a gobbler tick. Any experienced turkey hunter will tell you that, just when you think you have them figured out, the rules seem to change. Hoffman (1990) makes the following generalizations about gobbling activity:

- Some toms gobble a lot, some don't. Gobblers are individuals, some like to gobble a lot and some don't. In addition, if there is a dominate gobbler in the area, the less dominant gobblers may not want to gobble for fear of a butt whooping.
- Adults gobble more than jakes. But jakes do gobble, and as the season progresses many get very good at it.
- Gobbling is more common in the early morning
- Birds gobble more on the roost than when they are on the ground
- Toms gobble more when there are no hens with them

There is really no mystery to having quality turkey hunting on your land. First and foremost, you must provide habitat that turkeys are looking for in the spring. If your property is primarily forested and your neighbor has pasture, guess where the turkeys will hang out? Look for every opportunity for food plots on your land. Two plantings, clover and chufa, are at the top of the list for turkeys. Turkeys are driven by availability of food. If you have abundant food sources on your land, you dramatically increase your odds of keeping turkeys on the property.

Manage your timber! Don't become too preoccupied with your food plots and ignore the most important habitat on your property – your forest. Get input from a biologist and forester to help guide you on timber management. Appropriate use of prescribed fire, timber thinning, selective herbicides, controlling invasive plants and clearcutting are requisite

tools to keep turkeys on your land. Many properties in the Southeast have less than 5% of the property in wildlife openings. Don't ignore the other 95% of the property.

Once you have the turkeys sticking around and you are managing hunter pressure, it's all up to nature from there. You can't control the weather, you can't control when breeding will take place, and you will never completely figure out why or why you are not hearing gobbling. Just enjoy the frustration we call turkey hunting.

Literature cited and suggested readings:

Bevill, W.V., Jr. 1973. Some factors influencing gobbling activity among wild turkeys. Proc. Ann. Conf. Southeast, Assoc. Game and Fish Comm. 27:62-73.

Hoffman, R.W. 1990. Chronology of gobbling and nesting activities of Marriams's wild turkeys. Proc. Natl. Wild Turkey Symp. 6:25-31.

Kienzler, J.M., T.W. Little, and W.A. Fuller. 1995. Effects of weather, incubation, and hunting on gobbling activity in wild turkeys. Proc. Natl. Wild Turkey Symp. 7:61-67.

Additional resources available through the National Wild Turkey Federation

Every turkey hunter should have James G. Dickson's book, The Wild Turkey Biology and Management, published in 1992 by Stackpole Books. In addition, periodically, scientific papers from researchers across the country are gathered together in the National Wild Turkey Symposia. Symposia 1 – through 8 are now available on one CD Rom. Between Dickson's book and the 8 symposia, there is a wealth of information available. To order, contact the National Wild Turkey Federation at 1-800-THE-NWTF or check out their website at www.nwtf.org.

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Changing Predator Dynamics and Implications for Bobwhites

Part IV: Putting knowledge to practice & “Lessons Learned the Hard Way!”

By Jason Paramore, Brant Faircloth, and Theron M. Terhune

Thanks to the advent of new state laws providing the opportunity for landowners to obtain year-round trapping permits in many southeastern states, predation management has become a valuable tool for bobwhite quail management. In the previous 3 parts of this predation management series, we have discussed the history of predator populations and management, the life histories of individual predators, and various factors influencing predation management and bobwhite abundance on specific types of properties. In this installment of the series, however, our intentions are to provide you with some insight – based on lessons “learned the hard way” – on how to put your knowledge to practice and get started managing mammalian predators on your property. We will discuss the types of traps used and the benefits and limitations of each; provide some tips and techniques that have worked for us; give you a general idea of trapping effort versus trapping efficiency; and help you develop a trapping plan relative to the timing (i.e., season or months) and duration of trapping in order to obtain your desired goals.

Developing a trapping strategy is important and can save time and money when conducted objectively. Some questions that should be asked include: How much time will be available for trapping? What time of the year can trapping occur? What are the target species for management? Where does the trapping need to occur? Are quail predators or nest predators of greatest concern? How much money do you have budgeted for a trapping program? Can I monitor the effectiveness of my trapping efforts? Answering the previous questions will provide a good start to developing a trapping plan – one that should prove effective and beneficial when applied correctly.

Getting started: Terminology and Techniques

Types of traps and their utility

There are two main types of traps currently being used by trappers for predation management among properties managed for quail: leg-hold (or “steel”) and cage (i.e. box, live) traps. The decision regarding which trap type optimally fits your trapping plan depends on several factors: (1) available funding; (2) time availability – for setting traps and running a trap-line; (3) time of the year; (4) climate; and (5) target species. There are other factors that may affect this decision, but these are the most important.

The initial purchase and maintenance of traps (cage or steel) are typically the more costly factors associated with the start of a predation management program. Cage traps can be expensive up-front when compared to steel traps which cost approximately one-fourth that of cage traps. However, this shouldn’t be the determining factor; cage traps have some distinct advantages over steel when used in certain situations. The time (which most of us know equates to money) required to set and maintain a steel trap-line, in many cases, exceeds the upfront cost of purchasing cage traps. Furthermore, weather is not typically a limiting factor with the use of cage traps, however weather, namely rainfall, can drastically affect the utility of leg-hold traps. A single afternoon thunderstorm, which is all too common in the South during the summer, can erase an entire day’s work of setting steel. Conversely, cage traps will remain set and effective as long as the bait has not washed away during summertime rain showers. Soil type and conditions will also limit the effectiveness of steel, while cage traps can be set on



There are numerous different types of cage traps that you can purchase and have success with. Yes, indeed that is a spotted skunk in the third picture (photo provided courtesy of Don Walls); they are still around. The picture on the left is a homemade cage trap and the other two trap styles were purchased.

various soil types including dry-sandy soil; mud; or hard, dry-red clay in about one-sixth the time with the main caveat being that the cage trap needs to be somewhat stable.

Steel does have the advantage of being easy to transport and store, due to its small size, when not in use, but the added labor associated with dyeing and waxing steel is very time consuming and essential for steel to be effective. Waxing and dyeing helps to preserve traps, provides traps a


more natural look (dyeing), allows mechanical parts to move faster, and prevents excessive rusting. However, dyeing traps seems to be more important than waxing. For more information on how to wax and dye traps visit your extension office websites (or see: www.npwrc.usgs.gov/resource/mammals/furtake/prep.htm).

Steel also facilitates capture of adult bobcats and coyotes, neither of which is commonly captured when using cage traps, but this does occur on occasion. However, the capture of these animals may not be an issue where common nest predators are the species targeted for control (the predator composition is frequently skewed towards nest predators anyway). In fact, on 2 different sites we observed that capture rates were highest for raccoons, opossums, and armadillos (see Figure 3). Thus, it may be beneficial to focus trapping efforts on nest predators using cage traps 2-3 months prior to utilizing steel when targeting the capture of coyotes, bobcats, and foxes. Otherwise, raccoons and opossums will likely inhibit the effectiveness of their (bobcats, coyotes, and foxes) capture by either being captured themselves in the leg-holds or stealing the bait without being captured.

The efficiency of steel is greater than cage traps in terms of animals caught per trap night. We have observed a capture rate of approximately 30 % using steel whereas only a 2 to 6 percent capture rate has been observed when using cage traps. In addition, when the trapping opportunity or window is short, leg-hold traps may be the best option. However, experience

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has shown that a five month nesting season with abundant rainfall and/or extremely dry weather will make for a long trapping season because much time will be spent resetting steel. Notably, for optimal predation management among landscapes managed for bobwhites, we recommend the combined use of steel (leg-hold traps) and cage traps whereby cage traps can be used to capture nest predators and leg-hold traps can be utilized to capture other target species (e.g., bobcats and coyotes).

Utility of Baits and Lures

There are numerous commercial baits and even more homemade concoctions used by today's trapper, but the list of summertime baits is comparatively short. The type of bait used depends on how much time one can spend both making or preparing the bait and setting the traps. Soured corn, eggs, and sardines are popular, easy, and efficient choices for year-round trapping. We have experienced that many commercial baits and lures are more effective during the traditional trapping season (i.e. winter). Fire ants are also a limiting factor when choosing summer bait(s). We have discovered that sugar-based or meat-based baits will be devoured by ants in a short period of time (often within 24 hours). There are also some fruit-based baits that we've used with moderate success, but we have also observed that it's hard to beat an egg that's been ripening in the sun for a week or more in terms of capture success. A single chicken egg provides a visual as well as an olfactory stimulus, particularly when left to "ripen" a few days. Eggs don't have to be left in the sun for a few days before being placed in the trap, but if you choose to use ripened eggs, care should be taken during handling. Corn that has been soured in water and/or granular molasses works well but can be messy and time consuming to prepare. A can of sardines placed under the trigger platform, or under the trap itself, will catch raccoons and opossums for a few days, but as the bait is consumed by ants and gradually replaced by grubs and worms, the chance for capturing an armadillo increases. Sardines should be replaced after roughly ten days or so depending on the weather and thieving occurrence(s). We have noticed that if a cage trap catches an armadillo, it would be wise to leave the trap and simply reset it where it

is because the chance of capturing another armadillo appears to increase dramatically. The olfactory glands of armadillos are quite large – in fact they are about 3 times the size of their brain – and a natural scent trail leading to a trap is a good one to have.

The efficacy of scents and/or lures during the summer is only moderate, whereas their use during the fall and winter is much more beneficial. If time can be given to using a variety of different baits and lures then we suggest you do so. However, if time is limiting, we suggest you stick with the more popular choices of soured corn and sardines. It cannot be emphasized enough that: experience goes a long way towards being an effective trapper so be patient, be persistent, keep good records, and learn from your mistakes and successes.

Trapping Effort and Trapping Efficiency

Timing and Duration for Optimal Trapping Efficacy

A good starting point in terms of timing, for capturing nest predators, is January or February (see Figure 1). Larger quail predators (bobcat,



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fox and coyote) can be caught for several reasons during this time: food has become scarce and greater distances must be traveled to sustain them through cold nights and breeding/mating. In the Southeast, bobcats begin breeding and, as a result, they expand their home ranges in order to find a mate which renders them more vulnerable to capture. Similarly, other smaller mammalian predators such as raccoons and opossums (see part II of this series) are also beginning to mate and thereby increasing their home ranges which renders them more susceptible to capture. Further, the weather this time of the year allows for the use of meat-based baits and lures which, when used in conjunction with steel, captures both predators of adult quail and bobwhite mammalian nest predators. This jump-start on nest

predator removal is beneficial because March and April are popular months for other types of woods work including burning, mowing and timber harvest and these activities may interrupt trapping. In addition, April and May are known to mark the onset of mating, nest building and incubation (beginning in late April), for bobwhites. Thus, the more predators removed prior to this point in time, the greater the chance of increasing nest success and productivity through predator management.

We have also observed that predator capture success is relatively low during much of the bobwhite breeding season (Jun – Sep; see Figure 1). This may be caused by either: lower overall predator abundance during this time of year as a result of trapping effort and success during January – May or the availability of alternate food resources

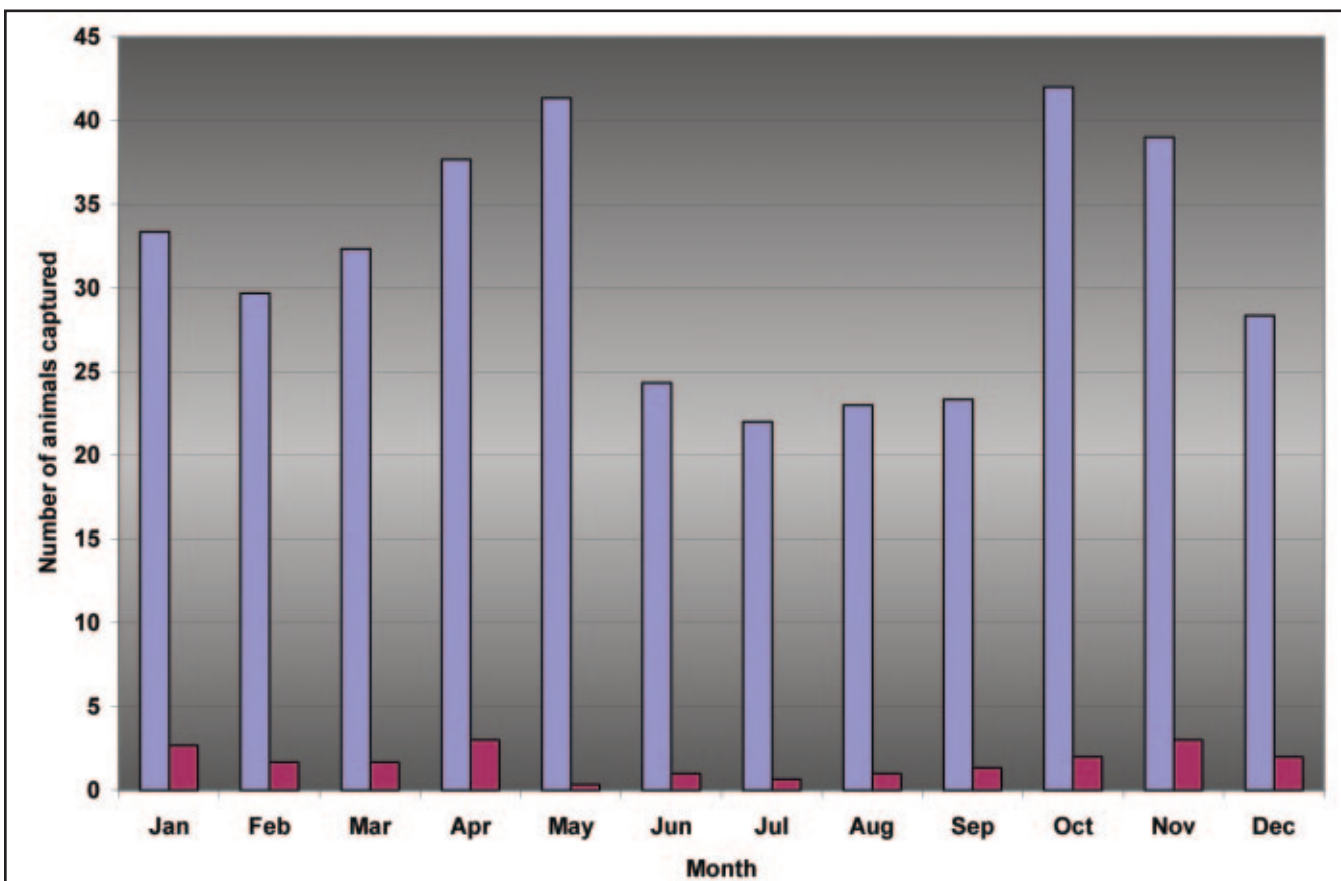


Figure 1: Capture data delineated by month. Increasing trapping efforts during January through May will help to remove numerous predators prior to the peak of nesting activity and potentially increase reproductive success. Blue bars represent the primary mammalian nest predators (raccoons, opossums, and armadillos) and the maroon bars depict the relatively less important mammalian nest predators, respectively. Note that during much of the nesting season (June – Sep) overall capture rate is low relative to other months.

(e.g. soft-mast, quail eggs) for predator consumption, although it is likely a combination of both.

Based on data collected from 2 different sites (Figure 2), we recommend implementing an annual predation management program (when permitted via state regulations). We have observed that both small isolated properties and large properties surrounded by other similarly managed properties warrant continual predation management to keep predators at a threshold which optimally benefits bobwhites. Figure 2 illustrates this necessity for continual annual predation management whereby even after 3 years of management (trapping) >400 critters were removed on each site.

As time and working conditions permits during the spring, cage traps should be set to begin the reduction of nest predators. While



We have caught pretty much everything in cage traps ranging from wild hogs to black vultures.

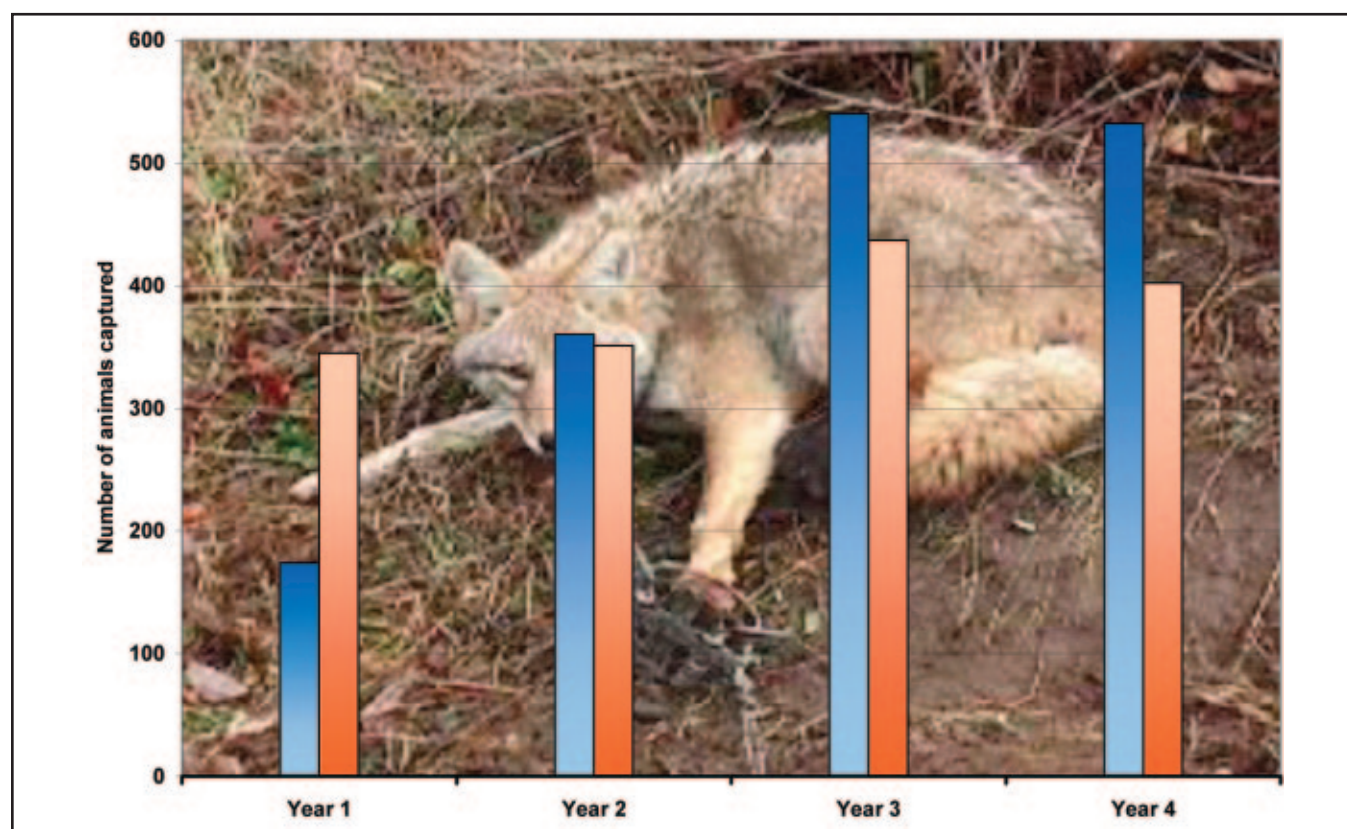


Figure 2: Mammalian predator trap/capture data for two different sites during a 4-year period. The blue bars represent a large (>10,000 acres) property (site a) that is located adjacent to several other properties with similar management objectives and the orange bars represent a small (<3,000 acres), isolated property (site b) and does not benefit from similar management objectives of neighboring properties. As you can see from the number of predators removed during all four years on each site, predation management is a continual process; even after more than 1,000 animals were removed on each site during the first 3 years more than 400 critters were removed during the fourth and final year.

running cage traps in the spring, a certain amount of planning should be done to avoid ongoing habitat management-related work. Cage traps don't stand a chance against a harrow, mower or tire of any size, and once damaged, it's hard to repair a cage trap and have it function properly. In order to keep track of your traps, you may find it beneficial to mark trap locations using a GPS unit or aerial photographs. Marking trap locations will help to

ensure that each trap is checked (note: traps must be checked daily, once every 24 hours, according to most state laws) when running your trap-line, and it will make it easier to remove traps from an area when necessary. Much to our chagrin, we speak from experience when we say that failure to plan properly may result in high trap loss, which equates to increased costs (i.e. purchase of new traps) and effort. Furthermore and perhaps more

importantly, the more traps that are damaged means the fewer trap nights and fewer animals caught. To offset woods-work and other spring projects while still maintaining some trapping effort on your property, try setting traps in both wet areas that don't typically burn and other locations where no activity is planned (e.g. drains, oak hammocks, &c.). This will help to "keep the pressure on" and, hopefully, continue to decrease the predator population during the breeding season.

As temperatures increase, so does the activity of fire ants which is why meat- or sugar-based baits are marginally effective at best during late spring and summer. If time is limiting, it is best to stick with soured corn and/or eggs for baiting traps. At a minimum, we recommend that trapping effort continue throughout nesting season. By doing so,

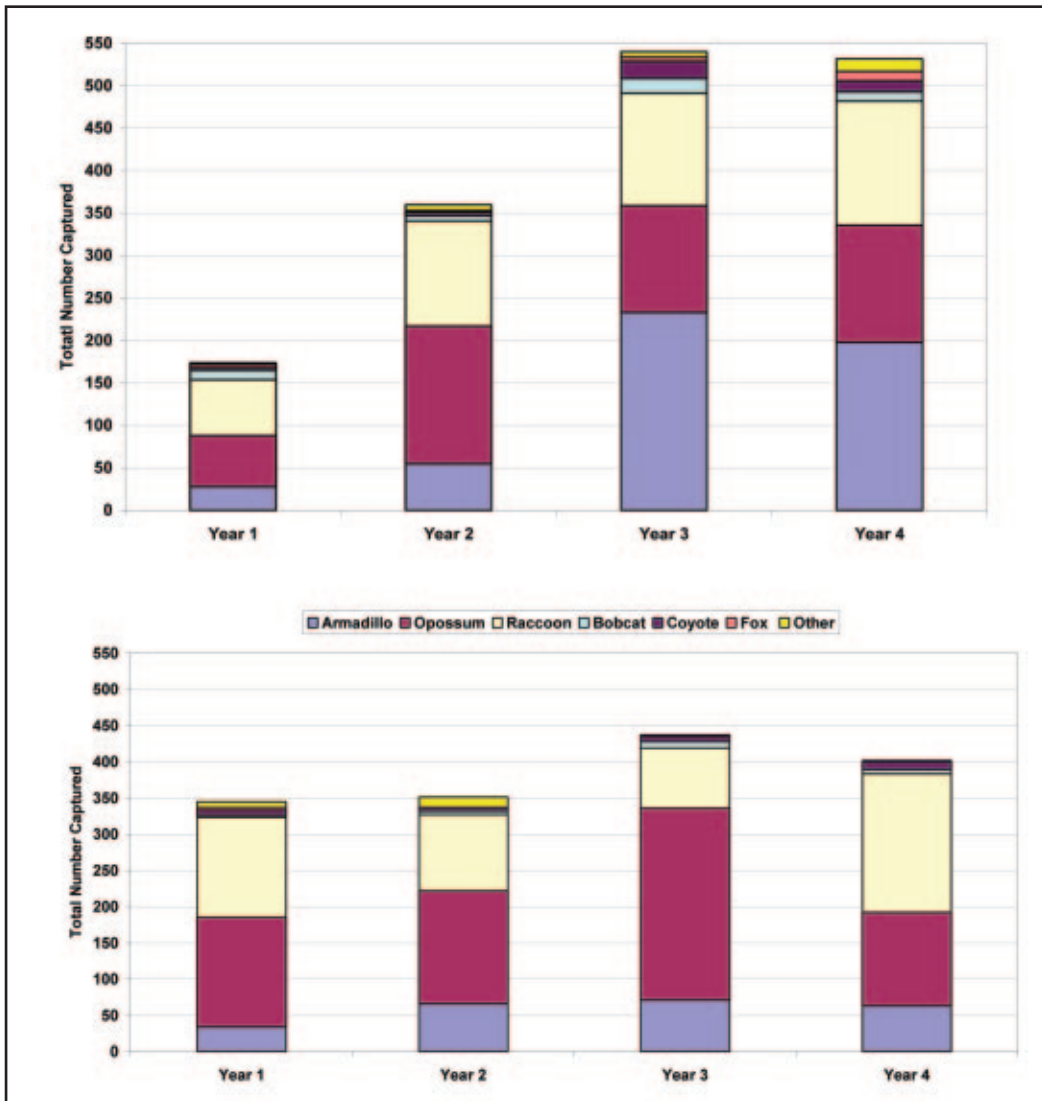


Figure 3: The above two graphs depict the specific predator capture composition delineated by year. The top graph is site a (a large property surrounded by similarly managed properties) and the bottom graph is site b (a smaller, isolated property). Close examination of these two graphs indicate that 3 predators comprise the bulk of the overall capture: raccoons, opossums, and armadillos. You may also notice how the predator composition dynamics fluctuates from year to year and among sites based on previous capture proportions.

predator populations will be better managed (compared to no trapping during breeding season) during the critical reproductive season – potentially producing higher nest production and success thereby rendering a higher probability for a bobwhite population increase.

Fall woods-work in preparation for hunting season and habitat management endeavors marks the end of trapping for many. However, fall and winter trapping with steel helps to “keep the pressure on” because there will likely be an influx of animals onto a site taking the place of those removed during the summer in addition to the growth of on-site predator populations resulting from offspring produced by predators. Resident adult predators can be removed during this time as well.

During the quail hunting season, leg-hold traps will need to be pulled or triggered, to avoid ensnaring a bird dog – one trick you might try is to place buckets over the leg-hold traps, keeping them set, during hunting hours and pull the



Now that's trap efficiency! While capturing 2 critters in one trap is not a common occurrence, it is not entirely uncommon either; we have done this a few times with both raccoons and opossums. Nevertheless, consider yourself lucky if you capture 2 of anything in one cage trap.

“Lessons Learned the Hard Way”

- Cage traps don't always have to be washed after a capture unless substantially soiled with blood.
- Random placement of traps is not the best option for optimal capture success; use your knowledge of species habits and life-history information for optimal trap placement.
- Baits and lures that are sugar-based or meat-based are not very effective during summer months due to ant consumption.
- Wise use of scents and lures can be effective whereas imprudent use (such as excessive amounts) may inhibit their utility and your overall success.
- Keep vegetation from growing into cage traps.
- Cleaning the ground with a hoe or rake prior to setting a cage trap will increase trap success – we don't know why, but it works!
- If a raccoon or other surreptitious critters steals your bait from beneath your trap, try placing logs or other “natural” debris behind and around your trap.
- Some opossums and raccoons are small enough even to sit directly on the trigger without releasing the trap door; thus by setting the trap door on the very edge of the trigger-hook you will improve your chances of capture and help to prevent them from stealing your eggs or other bait.
- If you see varmint tracks close to your trap and don't capture it, try turning your trap 180° where the entrance is facing the opposite direction - again, we don't know for sure why this works, but it does!
- Do NOT move a cage trap if you catch an armadillo, reset it where it is - we have experienced that this will often lead to multiple armadillo captures on consecutive nights.
- Pick up all cage traps in areas where woods-work and/or logging is taking place. Failure to do so will likely result in flattened traps.
- Larger cage traps, in general, tend to catch more animals.
- Bright, shiny traps seem to be less effective than more natural colored traps. Thus you might want to dye traps or spray-paint them (cage traps) black or brown.
- When setting steel traps during extreme cold conditions (i.e. frozen ground) you may want to cover your traps with your own sand mixture – we have found that using a mixture of 3 parts sand with 1 part potassium chloride or pickling salt will render sufficient results.

buckets when hunting ceases. This trick will save a lot of time by preventing the triggering and re-setting of leg-holds – not to mention the human scent factor involved with resetting traps.

Monitoring Trapping Efforts

Perhaps one of the most overlooked tech-

“Good Areas for Trap Placement”

- Drains, small creeks, hardwood hammocks, and bottomlands.
- Road intersections.
- Soft-mast producing trees, vines, and shrubs such as plums, persimmons, muscadines, mayhaws, american beautyberry, and blackberries during mast production and maturation.
- Creek – road intersections
- Water-holes, or even water puddles in roads.
- The base of hollow trees.
- Ecotones – where two different habitat types come together (the edge).
- Close to any hog traps and/or deer feeders.
- Fence rows and property boundaries.

niques in a predation management program is monitoring the overall success and the effects predator trapping has on predator abundance. Is predation a limiting factor of bobwhites on your property? Are your trapping efforts good enough to improve bobwhite reproductive success and survival? Is your current trapping effort adequate or do you need to increase your efforts? These are just a few of the questions you can answer by implementing a simple predator index. Although a predator index is not an adequate means to completely enumerate (census) predator populations, it does provide a relatively good representation of the overall predator abundance and composition for a particular property. Furthermore, a predator index allows you to evaluate the efficacy of your trapping program by comparing predator indices through space and time.

The general idea of conducting a predator index is to place scent stations (a sand and mineral oil mixture sifted onto the ground in circular shape, about 1 meter in diameter, with a scent tablet in the middle; see a picture of a scent station in part 2 of this series) throughout your prop-

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erty. Predators investigate these scent stations by smelling the scent tablet, and sometimes even eat the scent tablet, leaving behind their track(s). Calculating the percentage of scent stations “hit” during a five day period will give you an overall index to predator abundance on your property. In general, a visitation rate of <10% indicates that predation is not likely a limiting factor, whereas a predator visitation rate in excess of 20% may indicate predation is a limiting factor of bobwhite populations, and thus, predation management is warranted or predation management efforts should be increased. This data will also allow you to assess the relative predator composition and provide a means to alter your trapping efforts to focus on those species most prevalent on your property. For more information on conducting (how and when to implement) a predator index visit Tall Timbers Research Station and Land Conservancy’s website: <http://www.talltimbers.org/research/gamebirdpe.html>.

Pursuit of Success – Developing a Trapping Strategy

If the amount of time available to trap is limited then contracting with a professional trapper might be an option to explore. Likewise, it may be beneficial to hire a professional trapper to kick off the breeding-season trapping efforts and to get a jump-start on predator reduction prior to the onset of bobwhite nest building and egg-laying.

Predator trapping is a continual process that has no end, unless of course the benefits observed don’t out-weigh the costs of a trapping program. Given just two years with little-to-no trapping effort, nest predators can repopulate even the largest land holdings managed for quail. In certain habitats, raccoons have been documented as having large home range sizes (see part II of this series) and have been known to disperse as far as 70-80 miles. Thus, it’s easy to see the importance of seasonal or, better yet, annual trapping pressure is to keeping these varmints in check. The monitoring of predator abundance will provide you invaluable information to assessing your trapping efforts and will help to best guide your predation management program.

Habitat type and tract size will dictate the



A picture of an armadillo in a cage trap.



Leg-hold traps, while time consuming, are much more effective at capturing predators especially bobcats, coyotes, and foxes. However, we do on occasion capture bobcats, coyotes, and foxes in cage traps (i.e. box traps). We suggest using a combination of leg-hold traps and box traps to more efficiently manage your property for predators and bobwhites.

number of traps needed to implement an effective trapping program. Unfortunately, there is not a magic formula stipulating that “x” number of traps is necessary to effectively manage predators for “y” acres. However, we have found that a general rule is to have approximately 80 – 120 cage traps (box traps) and 20 – 30 leg-hold traps for every 1000 acres being managed. The number of traps will also be

dependent on the amount of roads, firebreaks, and trails you have to run a trap line.

We have found that running 1 cage trap every 8-12 acres (depending on landscape and habitat) and 1 leg-hold every 40-50 acres can yield respectable results. On large areas (> 3000 acres), we recommend breaking the property into smaller parcels (500-1000 acres) and alternating trapping implementation amongst parcels to focus efforts on smaller areas – thereby increasing trapping efficiency. In addition, another strategy that works well after a property has already been trapped intensively for 1-2 years is to saturate areas close to property boundaries and alongside drains, hardwood hammocks, and other late-succession habitats with cage traps while setting leg-hold traps dispersed throughout the remainder of the property (the core).

Oak hammocks, wet bottoms, ponds, creeks and river edges are good places to start. Any place that holds water for a week or two during the summer will be productive in a number of ways. Raccoons and opossums will use

hollow trees, if available, as cover and with available water this habitat becomes favorable. As water holes and wet bottoms dry up, armadillos will dig in the soft soil for grubs and worms increasing the chances of that first catch.

When starting a predation trapping program the lessons learned from trial and error will go a long way towards making the program efficient. The best thing to do if you're serious about bob-white quail and predation management is to buy some traps and get started. Effectiveness and success will come with time as the program is fine tuned for a particular location. but the most

Theron Terhune and Brant Faircloth are Ph.D candidates at the University of Georgia (UGA) studying genetics in wildlife ecosystems with an emphasis in upland game bird ecology. To learn more about their research and current projects check out their website: <http://gamebird.forestry.uga.edu/research/>. **Jason Paramore** earned his B.S. degree from Auburn University in wildlife science and is currently the assistant land manager and trapper for Pineland plantation near Albany, Georgia.

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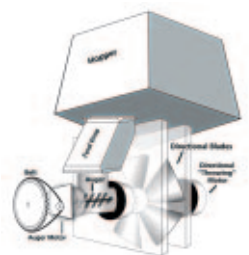
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Protecting Your Property - Gates

By Keith Gauldin

Many landowners and managers spend countless hours and dollars implementing various wildlife management techniques, supplemental food programs and other habitat management efforts but often overlook one very important component of their property: the entrance. Controlling access is a vital component in any land management plan that will have direct implications on its success.

For some landowners, the entrance to their property sets an impressive tone through custom wrought iron gates, while others opt for a simple, more economical version to avoid attracting attention to their property. Unfortunately, the society in which we live has evolved into a legal playing field that sometimes favors those actually doing wrong, placing the burden and risk on the landowner. A well-designed and properly installed gate will assist in reducing liability from these unwanted guests. This article will provide the landowner or manager additional information and ideas that may assist them enhancing the security of their property.

Gate Design

Each landowner has to contend with varying degrees of trespass on their property. Unfortunately, if individuals are dead-set on entering your property, it will be a more than difficult task in keeping them out. The selection of a robust style of gate will lessen this threat or slow them to the extent that law enforcement assistance will be more apt to apprehend these individuals. The style of gate should be selected to address the severity of this threat.

Some landowners prefer an elaborate gate design to adorn the entrance of their property. Many custom metal fabricators are available and offer services to design and install these structures. It is always wise to ask for references and locations of gates that have been completed to see the final product of that particular fabricator and talk with that client about their experiences with the fabricator. When viewing the reference gates, thoroughly inspect the gate and more importantly, the methodology of the installation assuring that particular

company took the appropriate measures required to properly install the gate. Custom gates are typically heavier than the normal cattle gate and will require additional support to ensure that the gate will be secure and swing properly.

Many fabrication or welding shops typically have a basic gate design that they construct from medium schedule metal pipe. If a certain design is desired, most skilled welders can construct the gate from a rough



A simple and economical cattle gate.

drawing as long as the dimensions are specified. If trying to duplicate a gate, digital cameras are quite useful in illustrating the desired gate design. It is extremely helpful to the fabricator if a tape measure is visible in the digital images to assist the fabricator with scale. It is important that the gate receive an application of primer, at a minimum, to protect the gate from corrosion and extend its longevity.

Cattle gates represent an economical and easily attainable option for most landowners. These gates are usually constructed of thin-walled steel and painted with a rust-resistant paint or primer. This style gate is typically available at most Feed and Seed stores or Co-ops. These stores will usually have all of the necessary hardware required for mounting. They are available in varying schedules and thicknesses of pipe material, which will determine the robustness of the gate. On a general note, the thicker the gate material, the heavier and more expensive they become. This style of gate provides a very basic option for the landowner or manager.

There always seems to be that uncomfortable moment when one drives up to a gate and the occupants look at one another in decision of who will get out and perform gate duty. While most of the time, it will be the passenger's responsibility, unless there has been a modern modification to the gate. Automatic gate openers have become quite affordable, providing an attractive modification, especially during times of inclement weather. Opening the gate can be performed using a pin pad mounted on a stand-alone control box or by a remote similar to a garage door opener.



Cable gates, while quite common and cheap, should be avoided due to their high liability to the landowner.

Varying models provide either slide or swing opening actions, depending on the gate design and are reasonable in price. If the gate is located far from a power source, a solar power option may be required which is also reasonable in price. These units typically operate off a 12-volt battery source with the solar panel providing a constant trickle charge to sustain the battery. This unit would require a little maintenance in maintaining proper fluid levels within the battery but would provide an appealing modern convenience.

There is one historically and popular gate style that should be avoided. Cable gates have been installed at numerous properties throughout the nation using a variety of cable diameters and post attachment methods. The cable gate represents a high liability to the landowner, as many injuries or deaths have been documented from ATV or motorcycle impacts with this difficult to see gate. While most of these trespassers had no legal right to be on the property, the cable gate remains to represent a huge risk to the landowner. Unfortunately,

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A basic pipe-gate design positioned to prohibit vehicles from circumventing the gate.

many continue to use this style gate, due to their simplicity, low cost and ease of installation. In order to make them more visible, some have modified the design by sheathing the cable with a heavy schedule 2" PVC and painting them bright visible colors to improve their appearance. One last word on cable gates, avoid them if possible.

Locking Design

Landowners and managers should avoid the practice of using chain to secure gates. The practice of allowing loggers, foresters and



The simple pipe-gate design with a 6-lock system.

other legitimate contractors to cut a link out and insert their own lock should be avoided. Many times, after this practice is implemented, there will practically be more locks than links of chain remaining. The ownership of each lock will be difficult to ascertain, as well as the individuals that have access to your property.

The most effective multiple lock design prohibits individuals from incorporating their lock onto the gate without permission. These designs typically utilize a pin design that allows locks to be secured to portions of the pin or placed to prohibit the movement of the pin, thus securing the gate. Keep in mind that if the property intersects either natural gas or power-line right-of-ways, the proper utility company will require access for maintenance or emergencies. Their locks will typically be the brass variety and commonly be letter stamped with their name. If new gates are installed, it is good courtesy to inform these companies to allow them to get personnel on site to install their locks.

It is beneficial to select one of these gate designs that only allows sufficient lock movement to unlock the lock but not to the point where one could get bolt cutters around the hasp. Many gates incorporate a shroud or metal sideplates that make it difficult to access with bolt cutters and to protect the lock from adverse elements, including bullets. Just be cautious when opening the shroud-style gate due to the housing preference of many species of wasps. A liberal application of petroleum



A 6-lock gate design. The removal of one lock allows the heavy-duty pin to be pulled from the housing to open the gate. The pipe tube in which this mechanism is located makes it difficult to manipulate bolt cutters to the locks.



A 4-lock system on a pipe-gate design using drilled metal rods as the locking mechanism.

jelly or heavy grease to the internal ceiling of this section will reduce this problem. Avoid getting these substances around the locking area that has to be handled because it can

cause quite a mess.

Dimensions and Considerations

The width of the gate is a critical dimension to consider when designing and installing an entrance gate. Various land management practices require the use of heavy transport trucks, log trucks and other heavy equipment, which are usually rather wide. Typically, an inside dimension of at least 14' should be adequate for most equipment. When having heavy equipment contractors in your property, it is always a wise practice to include language in the work contract of repairing to original state or replacement of gates damaged during the contracted operation.



Protective lock plates incorporated into this pipe-gate design to prevent bolt cutter access.



A simple pipe-gate design with a 4-lock system.

The location of the gate should also be carefully considered. Large semi-trucks have difficulty navigating tight turns, which also impedes the driver's visibility resulting in damaged gates or gate posts. Place gates in areas that, for the most part, are straight and away from any tight



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turns to avoid this scenario. In addition, place gates far enough off the road to allow a low-boy rig (diesel semi truck with trailer) ample space to get completely off the highway to avoid accidental collisions while the driver unlocks/locks the gate.

Gate Installation

Utilizing a skid-steer loader or tractor PTO driven auger will provide a great asset in establishing deep placement of the gate support posts. A minimum of three feet should be calculated in the post design to be placed below ground level to establish a stable gate. Post hole diggers or a sharpshooter shovel can be used to dig the base of the hole into an urn shape to allow additional concrete to form at the base of the post for additional support. At a minimum, there should be room for at least two 80 lb. bags of pre-mixed concrete. This may sound like a lot, and it is, but it will assist in establishing a sturdy gate that will resist tampering. When setting the gate, it is best to perform this with the gate in a closed position and locked to assure that the gate posts are aligned correctly. Using a level to assure the posts are plumb will ensure a level swing to the gate. Avoid using the gate overnight, if possible, to

allow sufficient time for concrete to thoroughly cure. Incorporating turnbuckles on the gate posts to connect to adjacent posts can assist in fine-tuning the gate to swing properly.

Installing a custom wrought iron gate can be a more involved process and it would be beneficial to get a little advice from an architect or engineer. Although this may sound a little over the edge, this is money well spent considering the cost of a custom fabricated gate. Custom gates can weigh substantially more than the common pipe gate requiring extra support and stability at the mounting posts. Many utilize poured concrete posts that have footings incorporated into the design that is accomplished in one continuous pour, which increases the strength and stability of the post. Only the mounting locations, where the gate attaches and swings, will be protruding through the concrete. Utilizing cultured or native stone to veneer the concrete posts can lessen the visual impact of the concrete and assist in blending the posts into the native surroundings. Although a lot of work in the collection process, using native stone from the property can have quite attractive results. This style gate can get costly but can create an impressive entrance to

the property. While these entrances are impressive in their own right, it is important to remember that these showy gates will attract attention to your property, possibly from the wrong crowd, leading them to wonder what's behind those gates!

If the gate style is a single pipe, it is recommended to set the height of the main bar to prevent the access of ATV's or motorcycles in traveling under the gate. Also, additional posts should be set at the sides of the gate in locations



A good example of a custom fabricated heavy-duty gate that has utilized native rock to veneer the concrete posts in order to allow the gate to better blend into the surroundings

that will prohibit ATV's or other vehicles from circumventing the gate. Many times, ATV's will meander through the woods to travel around the gate to gain access into the property. If this becomes a problem and the landowner has granted permission, select trees can be cut and felled so that they intertwine which will create a formidable barrier making access difficult for these individuals.

Locks

Locks play a vital role in the secureness of any gate. While a \$30 lock may seem expensive, it protects your property from unwanted visitors and their associated liability. One should not go through the effort to install a well-designed gate and then use a sub-standard lock. Locks, like gates, come in countless designs and costs. The quality and weather resistance will typically have a direct relationship to their costs.

Avoid regular laminated locks that do not specify as being weather-resistant. Locks using solid one-piece brass bodies seem to exhibit the best weather-resistance and durability, that's what utility companies have used for years. Also, confirm that the lock is constructed with internal bearings and tumblers of brass for additional weather-resistance. In addition, lock shackles or hasps of boron alloy will be much harder than hardened steel and will be the most cut resistant. Although the locks are labeled weather-resistant, an occasional application of a lubricant that also has water displacement spray properties, such as Rem-Oil (it works for locks as well as firearms) will assist in proper lock operation. These high-quality locks usually must be acquired at commercial lock dealers or locksmiths.

Summary

The selection of the gate to be implemented on a property will be an item that typically endures many years of use. Many times, I have been the unfortunate soul stuck in the passenger seat and endured many unpleasant gate opening experiences such as red wasps erupting from a gate shroud in the unlocking process, gates that had to be lifted and carried to get opened and closed and the ones that



Utilizing a chain locking system allows for easy bolt cutter access to locks and chain links. In addition, others can cut chain links and incorporate their lock onto the gate.

seemed to require the stretch of the chain to get the gate locked. While these situations do indeed add character to a property, it's a character that most can live without. When selecting a gate for your property, a properly operating gate will assist in protecting your tract as well as making these tract visits a much more enjoyable experience.

Keith Gauldin graduated from Auburn University with a B.S. in Wildlife Science. He has held professional positions with the USDA Wildlife Services, Florida Fish and Wildlife Conservation Commission, U.S. Fish and Wildlife Service and the Alabama Department of Conservation and Natural Resources. He recently started his own consulting company, Southern Resource Conservation, LLC, and can be reached at 334-567-1005 or keithgauldin@mac.com.

Wildlife Clearcuts – Another Tool for Creating Quality Wildlife Habitat

By Dave Edwards

What is ideal whitetail deer habitat? Regardless of where you are in the whitetails' range, ideal habitat for deer will include a complex of many habitat types of various ages that provide adequate food and cover resources. Think about it. If you are an experienced deer hunter, where do you tend to concentrate your hunting efforts? Where do you see the most deer and deer sign? My vote would be near habitat edges or young habitats where cover exists, close to food sources, or between the two. Thus, if one of your property management goals is to manage for deer, you obviously want to create quality food sources (natural and supplemental) and adequate cover; ideally laid out in a way that promotes good hunting opportu-

nities. In addition to simply providing deer with food and cover, creating a diversity of habitats with lots of interspersion will create more edge and in turn result in better deer habitat.

Over the past several years, the value of quality food resources has been stressed to deer hunters and deer managers and rightfully so. Nutrition plays a significant role in fawn production, antler development, and overall deer health. The 3 primary factors that influence antler production are age, nutrition, and genetics (in my opinion- these are listed in the order of importance). If you are managing for a quality deer herd, you need to manage for and provide adequate high quality food sources. However, food alone will not produce a quality



deer herd. Because of the emphasis placed on providing food, primarily in the form of food plots, many deer managers have neglected the value of quality cover and habitat diversity. I often meet landowners or hunting clubs that claim they are aggressively managing their land for deer. When I meet them at their property, “aggressively managing their land” often means they are simply planting food plots. Nutrition is important, very important, but providing adequate quality cover is equally important and is often overlooked.

Simply stated, deer need cover. In fact, deer spend the majority of their time in or near cover. It is used for escape, loafing, bedding, feeding, and fawning. Again, ideal whitetail habitat consists of a diversity of habitats of various ages and quality food sources that are interspersed throughout the property.

All properties are unique and have their own set of strengths and weaknesses. One property may have more than adequate food for deer but not much cover, such as in a commercial agriculture situation, while another property may have the opposite scenario. To create ideal deer habitat or optimize the deer value of your property you must assess your property and address its weaknesses or limiting factors. Is it food, cover, or both? While it’s relatively easy for landowners to determine whether they need to increase or enhance food or cover on their properties, it is a good idea to bring in a professional wildlife biologist to provide specific guidance on where to enhance and how. In fact, doing such is usually our initial consultation with a landowner, land manager, or hunting club. If deer is the primary goal, our next step is to determine the status of the deer herd through a camera census and make



harvest recommendations for improvements. Deer management in a nutshell – create good habitat (food and cover) and manage the deer population (overall density, buck age structure, fawn production, etc) through harvest to promote a healthy herd or meet overall objectives.

If cover or habitat diversity is a limiting factor for your property, you may consider installing a series of wildlife clearcuts. Examples of properties that would benefit from clearcutting are those that are predominately mature bottomland hardwood forests, mature pine forest, mature mixed pine/hardwood, or properties with little or no “open” land. These properties are often very aesthetic from our perspective, but offer deer and other wildlife little in the way of quality food and cover. Incorporating small wildlife clearcuts across the landscape is a particularly useful tool for enhancing the wildlife value on properties where early successional habitat (the youngest stage of habitat before tree encroachment –old fields, food plots, pastures, etc) is limited.

Proper forest management, even intensive timber production strategies, provides quality wildlife habitat. In fact, little or no timber management often has detrimental effects on the wildlife value of a property. The key in balanc-



Remember to keep some mature trees when clear cutting an area.

ing timber management and deer value is to maintain good habitat diversity (species composition and age diversity) and habitat interspersions (how habitats are situated next to each other). Thus, if one of your property management goals is to optimize its value for deer (or wildlife in general), large clearcuts (> 50 acres) are less desirable because they result in

less habitat diversity and interspersions and often contain what I term “wasted space”. By wasted space I mean that most wildlife, particularly game species like deer, turkey, and quail are “edge” oriented and will primarily use the perimeters of large clearcuts. Large clear cuts do have lots of edge, but the middle of these clearcuts receives less use by wildlife and hence is “wasted space” and could be put to better use by a landowner primarily interested in managing wildlife. A similar example I often see on properties is having too much commercial agriculture, which can have the same effect on wildlife value. Although large clearcuts and large agricultural fields provide a tremendous amount of wildlife value, both usually have wasted space that are not efficient use of your property from a wildlife standpoint. Small clear cuts, on the other hand, are quite beneficial for wildlife and can provide exceptional bedding, nesting, escape, loafing, and foraging habitat for deer, turkeys and other wildlife.

What are Wildlife Clearcuts?

Everyone knows what a normal clearcut is, but what is a wildlife clearcut? Wildlife clearcuts are relatively small, irregularly shaped clearcuts that range from 1 to 20 acres. These cuts are strategically located and designed to enhance the wildlife value, as well as hunting opportunities on a property. Wildlife clearcuts are most effective, or provide the most benefit, on properties that have little habitat diversity and are primarily composed of mature forests or where neighboring properties exhibit these habitat characteristics. Mature forests normally lack year-round quality food and cover for wildlife. As a forest matures to canopy closure, little to no sunlight reaches the forest floor to stimulate plant germination. These areas are easily identified because the understory, or the forest floor (the part we are most concerned about when managing game species) will often have a “park-like” appearance and be open. I often work with recreational landowners whose properties are primarily composed of beautiful mature bottomland hardwoods along a river system. These properties are gorgeous, but other than providing acorns during the fall, mature hardwood forests often lack quality

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browse and cover habitat needed by wildlife. Thus, in this situation, installing a patchwork of wildlife clearcuts not only ensures adequate food and cover is available, but as a result, will likely increase the quality and abundance of wildlife using the property. Wildlife abundance and diversity are directly related to habitat diversity and interspersed. Therefore, landowners interested in managing their property for wildlife, particularly game species, should strive to maintain diverse habitat types that are irregularly shaped, which means increased edge and interspersed. The types of habitats that should be maintained vary depending on the species of interest as well as habitats on neighboring properties. In many cases, wildlife clearcuts can help achieve habitat diversity. For example, the landscape for deer and turkeys should include a mix of mature forest (mature bottomland, mature pine, mature pine/hardwood), mid-aged forest (10-20 year old hardwoods, pines, or mixed forest), and open land (agriculture, pasture, improved pasture, clearcut, managed roadsides). Hence, timber harvest and/or wildlife clearcuts are invaluable tools for the wildlife manager and play a significant role in achieving desired habitat types, diversity and interspersed.

Because each property is unique, the size and shape of a wildlife clearcut is often dictated by the specific needs and physical characteristics of the property. Characteristics such as topography, wetlands, roads and other land features are constraints that play a role in the size and shape of a wildlife clearcut. On large



A sendero food plot in a clear cut.

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properties (> 500 acres) composed of mature habitats and low habitat diversity, larger clearcuts (10 to 20 acres) may be needed to effectively enhance the wildlife value. Another option on a large property would be to install several to many small wildlife clearcuts (2 to 5 acres). Again, characteristics of the property may dictate which strategy is employed. On small properties (< 500 acres), installing a few relatively small wildlife cuts may be all that is needed to significantly enhance the wildlife value of the property. Each property is different and will require specific approaches to achieve the desired results.

Wildlife clearcuts do not necessarily have to be true “clearcuts”. I often recommend leaving many mature trees in the cut area. This method is not only more aesthetic but the remaining trees provide seed sources for the regeneration of future trees. Additionally, mature trees left in the cut will provide shade which will conserve soil moisture and often increases plant productivity and diversity. From a deer hunting standpoint, leaving several mature hardwoods in the cut offers the best of

all worlds – a clearcut with attractive/preferred deer browse, mature oak trees that will drop acorns, and adequate cover where deer will feel comfortable – and a place to hang a tree stand! Remember, one of the primary objectives behind installing wildlife clearcuts is to increase and enhance the food and cover on a property. To do this you simply need to take out enough trees and woody underbrush to allow abundant sunlight to reach the forest floor.

Management of Wildlife Clearcuts

Although Mother Nature will normally do the rest, we often influence the results through various habitat management strategies. These strategies vary depending on the habitat type and target wildlife species for the area. For example, if you were primarily interested in managing the area for quail, fire and selective herbicides that promote native warm season grasses and other desirable weeds would be applied. If our target species were deer and turkeys, we would use a selective herbicide(s) that would promote quality escape, loafing,



bedding, and nesting habitat and quality food sources such as legumes. If you plan to replant the area in trees, another management strategy that will prolong the effectiveness of a wildlife clearcut is to leave the area alone for a couple of years, then set it back with herbicide and/or fire to begin implementing your desired management. Planting a lower tree density (trees/acre) will also prolong the wildlife value of these areas. Under normal forestry practices, a clearcut will be prepared for replanting by applying herbicide, burning, roller chopping, etc. immediately so that the next crop of trees can be planted. If pines are planted, within 3 to 5 years the crowns of the trees will start reaching canopy closure and the wildlife value will diminish until the stand is thinned (usually around year 12-18). By procrastinating the "site prep" by 2 years, you have added 2 additional years of quality browse, cover, and hunting opportunities to the wildlife clearcuts. The key is to allow the site to sit natural as long as possible, but not so long that you will have a hard time "reclaiming" it due to tree encroachment (naturally regenerating trees are getting too big).

Enhancing Hunting Opportunities

Although the primary goal of installing wildlife clearcuts is to create better habitat that will attract, hold, and meet the needs of wildlife on your property, these cuts will enhance hunting opportunities as well. Have you ever hunted in a large breath taking beautiful mature hardwood forest? Sure you have. Where did you hunt? In the middle of the stand of woods? Probably not...unless you found a thicket created by a blow-down or other structure such as a creek bottom. Chances are that you found the most sign and hunted near the edges that tied into other habitats. Deer hunting is somewhat like bass fishing. Where do you find bass? Near cover or structure. Vast mature hardwood forests often have little structure or cover and resemble a large open lake. Installing wildlife clearcuts will provide the needed structure and cover to hold deer and provide great places to hunt. Most of us have sunk Christmas trees or created brush piles in our favorite lake. Installing wildlife clearcuts serves the same purpose for deer and other wildlife.

So where do you install wildlife clearcuts and how do you design them to enhance hunt-



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ing opportunities on your property? Because every property is unique with its own characteristics and constraints, this is not an easy question to answer without seeing the property. However, wildlife clearcuts will be the most productive for hunting if they are strategically installed to link or create natural travel corridors. Depending on their size and purpose, I often install wildlife clearcuts where I want deer to bed. This is often determined by food sources such as agricultural fields, food plots, mast crops, etc. Other factors to consider are predominant winds in the area, topography, other existing thickets or bedding sources, and which direction hunters will access the area. Because hunters will be situated between the food source and the wildlife clearcuts you obviously don't want to install a WC south of a food source if your predominant winds during hunting season will be out of the North. This would send their scent directly into the bedding area. Although every situation is different, I generally install wildlife clearcuts 200-300 yards from destination areas such as an agricultural field or food plot. This makes deer more vulnerable to hunters and gives them plenty of room to catch deer traveling between the two. While I wouldn't consider these true wildlife clearcuts, I often create bedding areas or thickets where they are needed by cutting trees out of very small areas (about the size of a house) with a chainsaw. Generally speaking, you may only have to cut 5 or 6 mature trees to create a desirable sized thicket to hold deer. This strategy creates a hole in the tree canopy that will result in a thick understory. Although there will be some food value, this method is mostly used to enhance hunting opportunities by creating structure or bedding areas within a block of woods.

The design, or layout, of a wildlife clearcut can enhance hunting opportunities as well. For the first 1 to 3 years, the clearcuts themselves will provide good hunting. The cut will have quality native browse and some cover. Position deer stands along the edge or use a tripod. However, as the wildlife clear cuts get too thick, you will not be able to see deer. Therefore, when designing the wildlife clearcuts keep the long-term picture in mind. What will the area look like in say 10 years? There are several

wildlife clearcut designs that will enhance hunting opportunities. The goal is to influence deer movements to benefit hunters. Some designs form long edges deer will travel along, some create coves or pockets of open woods between clearcut areas that deer will traverse, while other designs may direct deer traffic between two cut areas. If wildlife clearcuts are large enough and the situation allows for it, I have had great success tying in or installing Hub& Spoke food plots or senderos in the cuts. Regardless of the design or shape, try to maintain a few shooting lanes or fire breaks open along the edges. As the cuts mature, these will be great places to observe or harvest deer. See diagrams for wildlife clearcut designs that have worked well for me. Not all designs will work for every property. Again, characteristics and constraints of your property will dictate the appropriate design and size.

Conclusion

Habitat management comes in many shapes and forms and the strategies employed are as diverse as the properties they are being done on. Installing wildlife clearcuts is just one of the tools you can use to enhance the wildlife value and hunting opportunities of your property. If your property has good habitat diversity and interspersed, wildlife clearcuts may not be needed. However, if your property is a monoculture of even aged pines or mature hardwoods, wildlife clearcuts can provide much needed food, cover and hunting structure; not to mention a source of revenue – which is always good.

Dave Edwards is a consulting wildlife biologist with Westervelt Wildlife Services. Contact him at 800-281-7991.

Deer Management: Back to the Basics

By Stephen Ditchkoff

If you're reading this article, it's a good indication that you have a strong interest in the management of white-tailed deer. More than likely, you are reading this because, like me, you're passionate about white-tailed deer. Their majesty is beyond equal, and their pursuit is addictive. If you're like most deer hunters, you're hoping to unearth that magic nugget of information, that secret ingredient that will help you bag the big one or develop a herd that will be the envy of whitetail enthusiasts across the country. Well.....I'm not here to give you the golden ticket to white-tailed deer euphoria. Rather, I am going to try and provide a touch of sanity for this world of unregulated transmission of "expert" opinions within which white-tailed deer enthusiasts find themselves imbedded.

The world of white-tailed deer in the year 2007 is inundated with secrets about how to grow the big one. Almost every magazine or television show contains some shortcut that will supposedly catapult your deer management program beyond every other. Well, I'm here to tell you that this is a "Seller's Market" in which we find ourselves. All it takes is a fancy package for a product, or some claim of expertise by the author of an article, and WE BUY IT, without any confirmation of quality of the product we are buying.

I'm rather skeptical when it comes to taking advice, and as such, for me to "buy it" I need a bit more than just camouflage packaging to convince me that it's worth the money. Along these lines, I recall some of the most insightful words I ever read. I had finally scraped together enough money to start thinking about investing. In my attempt to try and educate myself in an area that I had no experience, I bought "Investing for Dummies". In that book, Eric Tyson suggested the following. If someone says they have a full-proof, guaranteed way to make money, why would they waste their time writing a book when they could be implementing their plan and making a mint?

Like Tyson, I don't have the secret, so I'm not going to try and convince you that I do, or

that my advice is better than the next person's when it comes to deer management. Rather, I am going to try and bring you back to the basics, and convince you that what you already know is probably adequate to develop a deer herd that is of extremely high quality. Also, I am going to suggest that some of the ideas that are often espoused in these days of the "Seller's Market" may not be as worthy as they may seem.

If we go back to the basics, we will remember that there are three things that contribute to antler size: nutrition, genetics, and age. Let's take a few moments to explore how the basics of antler development have been distorted in the "Seller's Market".

Nutrition

There is no question that there is more advice floating around about how nutrition influences antler size and growth in white-tailed deer than anything else. There is also no question that without adequate nutrition, large antlers are all but an impossibility. So how do we insure that nutrition is adequate? That's easy. We plant food plots, provide supplemental feed, fertilize oaks and honey suckle, use prescribed fire, and harvest timber in a manner that will increase the availability and quality of browse.



Here's what you get when you let 'em grow!

These are all prescriptive practices that I might recommend depending upon the goals and objectives of the landowner that I am advising. However, all of these recommendations will result in only limited increases in antler size if we fail to do one thing: reduce the number of mouths we are feeding. None of the recommendations for improving nutrition that are listed above are “solutions” to a problem.

I hear it all too frequently: “I need to improve the nutrition of my herd because there are so many deer.” I hope you see the irony in this statement. The habitat has only so many nutrients to sustain deer and every other animal existing on a particular tract of land. I propose that it is more economically, environmentally, and logically sound to reduce deer numbers to habitat carrying capacity (the number of deer that the habitat can reasonably sustain in good health), than to provide more food. Otherwise, your efforts are only getting deer to where they should be, and they will only be exhibiting the antler quality that deer at carrying capacity possess. First, ensure that your deer numbers are in balance with the habitat. Then you can begin to raise the nutritional plane of your herd by improving habitat quality and supplementing the foods that are naturally available.

Ultimately, I think you will be more successful in achieving your objectives by worrying about the number of mouths that you are feeding, than implementing supplemental feeding programs. There is no question that supplemental nutrition (e.g., food plots and supplemental feed) can improve the nutritional plane of your deer, as well as antler size. But, as it is so named, supplemental feeding is designed to be “supplemental”, not the foundation of a nutritional program. Far too many landowners think that the provision of supplemental feed will cure all ills. First, tackle population density issues, then implement a nutritional program, whatever that entails.

Genetics

What can be said about genetics? It ultimately dictates our potential, as well as that of the deer that we are managing. If the right genetics are in place, then the potential exists for the next world record deer. So it's simple: go out and

supplement your herd with genetics from some of the Arnold Schwarzenegger's that are available today. Or even more simple, just get genetics from some of the monster antler hotspots in the Midwestern United States. Wrong!!!!

This has to be one of the most misguided philosophies of the modern era of deer management. I contend that there is nothing to be gained by supplementing the genetics of your herd. In fact, the results, other than wasting money, may be to hurt your herd. If you are infusing genetics into your herd, you may be bringing in genetics that may not be immunologically sound for your area. In simpler terms, they may not have the genetic immunity to deal with the local parasites, diseases, and other pathogens.

Harry Jacobson, when he was working at Mississippi State University, tested this theory by comparing the resistance of Mississippi and Michigan deer to Epizootic Hemorrhagic Disease (EHD; bluetongue). He tested three strains of deer (Michigan deer, Mississippi deer, and Michigan x Mississippi crosses) and challenged each strain with EHD. In his experiment, all of the Mississippi deer survived, all of the Michigan deer died, and the crosses had approximately 50% survival. There were no data reported on antler development. Jacobson's experiment suggests that by infusing outside genetics into a herd of deer, we stand the chance of compromising immune health. Even if this does not result in death, it most likely compromises body and antler growth because of the competing demands of the immune system.

Genetic supplementation has no place in deer management at this time. Because our understanding of genetics in white-tailed deer is still in its infancy, and likely will be for a long time, selling genetics is like selling opinions. In each case, the owner claims they have the best, but we have no way of predicting what the consequences will be if we buy them. However, there is a way to improve the genetics of your herd naturally.

It has been suggested that by simply ensuring that a population of deer has a healthy proportion of mature males present, genetics will naturally improve. This theory is based upon

how male dominance relates to mate acquisition. First, we need to assume that every female wants to mate with the male that has the best genetics. I'll argue that it's in her best interest to mate with the highest quality male so that her offspring will have the best genetics. If she's successful, her offspring will have high survival, strong immune systems, large antlers, high reproductive success, etc. Of course, understand that when I speak of "quality" in this context, I mean genetics and not necessarily antler size. While preliminary evidence suggests that large antlers and high quality genetics are correlated, to date this has not been demonstrated scientifically.

So how does a female ensure that her mate has the best genetics? Well, the most dominant male normally gets the most mating opportunities, so she'll want to mate with the most dominant male. Now, imagine a bunch of yearling (1.5 years old) bucks competing amongst themselves to establish a dominance hierarchy. I equate this to a group of high school freshmen (boys) establishing a pecking order in gym class. The biggest bully in class will be the most dominant, but his dominance has nothing to do with his quality. Rather, his dominance will be a function of how early he hit puberty.

Now picture these same individuals 7 years later as a group of college seniors (men). The bully from 9th grade peaked early at 5 feet 8 inches and 175 pounds. One of the weaklings he used to dominate in gym class is now a starting strong safety for the football team and is 6 feet 2 inches and 218 pounds. Those extra 7 years enabled the weakling to demonstrate his superior genetics.

The same is true for deer. Yearlings are not able to sort out amongst themselves who has the superior genetics because there really is such little difference between high and low quality individuals at that age. However, give them 4 or 5 years and they'll meet their genetic potential and sort it all out, kind of like the example I gave above.

If you'll allow the males in your population to mature, which I'm confident that you are doing considering you're a subscriber to Wildlife Trends, then the deer will work out the genetics for you. The mature males will determine who

has the high quality genetics (we believe these to be the large-antlered males) and these individuals will do most of the breeding and pass on their genetics to the next crop of fawns. Over time, both genetic and antler quality will improve, resulting in a herd that is physically and genetically in tune with local conditions.

But if you can't wait for the deer to work it all out, go and buy some genetics. You may have some dandy deer until the next wave of EHD comes sweeping through, which happens every 4-5 years in the Southeast. Of course, you can just go buy more deer to replace the ones that died. But remember, this is a "Seller's Market".

Age

Age is THE MOST IMPORTANT FACTOR when considering antler size. Of course, this is not what you always hear because you can't sell age, like genetics and nutrition. But, there is no question that age makes a greater impact on antler size than any other factor. The best thing about age is it's also the easiest to control. However, I am continually amazed at the reluctance of deer hunters to use age to their advantage when developing a

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Persimmon Yellow Poplar

Crabapple Chickasaw Plum

Bald Cypress Pond Cypress

Green Ash Red Mulberry

Common Pear Allegany Chinquapin

Wiregrass

deer management program.

Now I'm assuming that as a subscriber to *Wildlife Trends* you already do a fantastic job of protecting your yearling bucks, and most likely protecting a good percentage of your 2.5 year old bucks as well. The proponents of Quality Deer Management have done a fantastic job of spreading this message, and most serious deer hunters have "bought in". This is one product that I think is a good buy. More than likely you have some combination of the following management strategies imposed on your property/lease: antler point restrictions, inside spread restrictions, fines for shooting young deer, etc. These management tools can do a wonderful job of protecting 1.5 and 2.5 year old deer. The result is a high harvest of 3.5 year old bucks, all of which were killed long before they had the opportunity to grow a good set of antlers. (NOTE: If you are perfectly happy with harvesting 3.5 year old deer and have no interest in growing older deer, then you can stop reading now.)

Now don't get me wrong. I have no problem with harvesting a 3.5 year old deer. A good 8-point with an 18 inch spread and long tines (~120 B&C points) would make me very happy as a hunter. But, if I'm serious about growing a 140, 160, or even larger deer, what in the world am I doing shooting a 3.5 year old deer that has yet to make it halfway to the age at which he will most likely display his largest set of antlers? The fact is that most deer will not achieve their largest set of antlers until 6.5-7.5 years old.

What I'm saying is this – those of us that really want to shoot a 150+ class deer but settle for a 120-130 class deer are no better than the guy who complains that he never sees any big deer but shoots 10 small bucks a year. The question is whether or not you have the discipline to pass up some good deer and shoot less bucks each year (or go several years between each buck you harvest), on the chance that the deer you pass up will be a few years older the next time you see him.

I think as hunters we tend to act very immature. I continually berate my students (the generation of young adults that are in their early 20's) for expecting instant gratification with everything they do. They want good grades, great jobs, high salaries, etc., but they don't want to have to come to class, study, or

demonstrate any sort of commitment to their education. I guess my question is this. Do we go to the woods to kill a big deer, or do we go to the woods to enjoy the hunt? Do we need the success of harvesting a 150 class buck to prove to everyone else that we're a man, or can we be satisfied with ourselves by knowing that we developed a deer management plan that would achieve a certain set of goals and we stuck with it? I tend to think that a hunt is a heck of a lot more enjoyable knowing that there are some dang good bucks out there, and I know that every time a buck is harvested from my hunting property that there is one less deer that could be a big one down the road.

Now don't misconstrue my comments as suggesting that anyone who shoots a 3.5 year old deer should be tarred and feathered. If a 100-120 class 3.5 year old buck is a wall hanger to you, or would put a big grin on your face, then you better shoot it. But, if that deer is just going to be added to your pile of antlers, then I contend that you're making a mistake.

My point is this. Establish some goals, and work towards achieving those goals. Be patient, and let the deer do some of the work for you. Because I can promise you this, it is a heck of a lot easier, cheaper, and environmentally sound to give your trigger finger a rest and let the deer get a bit older, than it is to try and beat the system with nutrition or genetics. Once you have the deer population at or below carrying capacity and the deer are allowed to reach the age at which they will grow a set of antlers that make you happy, then the genetics will begin to work in your favor and you can supplement the nutrition to give a boost to your program.

Or.....you can continue to buy all the gimmicks that come your way and fool yourself into thinking that you're doing a first-class job of managing your deer.

Stephen Ditchkoff is an Associate Professor at Auburn University. At Auburn, Steve teaches both undergraduate and graduate courses in Wildlife Science and conducts research with white-tailed deer and wild pigs. He can be contacted at 334-844-9240 or ditchss@auburn.edu.

Build a Deer Feeder

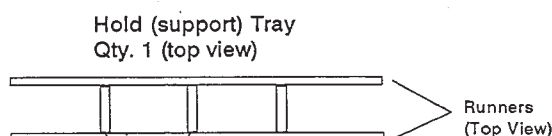
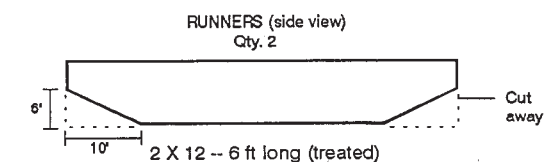
By Dr. Keith Causey

We have had numerous requests for a reprint of the following Deer Feeder by Dr. Keith Causey from Volume 1, Issue 3 of Wildlife Trends.

There are many designs of wildlife feeders on the market today and all have their good and bad points. The feeder that Dr. Causey used in his research on deer nutrition is a modification of a covered livestock trough feeder. This cov-

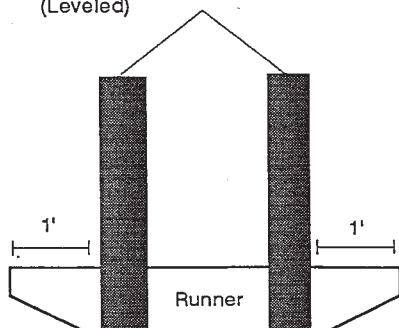
ered feeder is designed to feed grain, beans, or pellets in an open trough where deer can eat as much as they need without having to compete with other deer for a measured amount as they do with timed feeders. The feed trough is low enough to allow young deer access. The area between the feed trough and the roof is large enough to allow bucks with large antlers to feed.

Note: For a sturdier deer feeder, use carriage bolts and/or wood screws to fasten parts together.

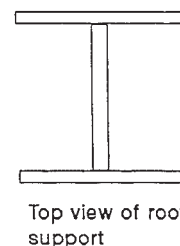
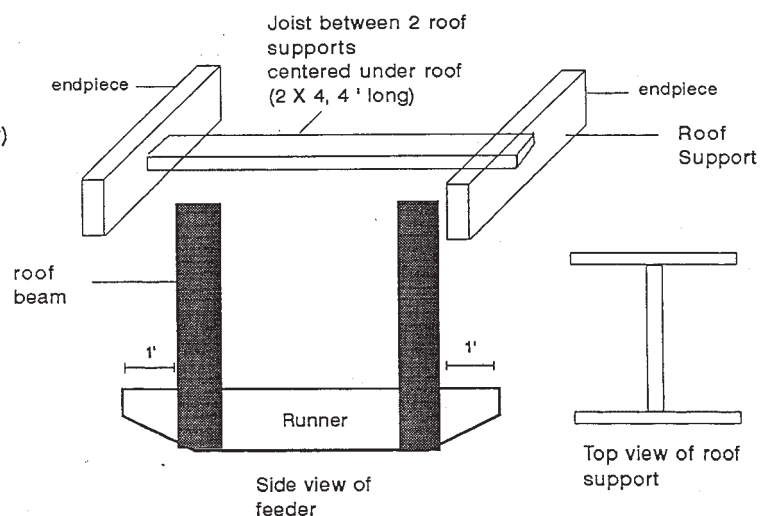
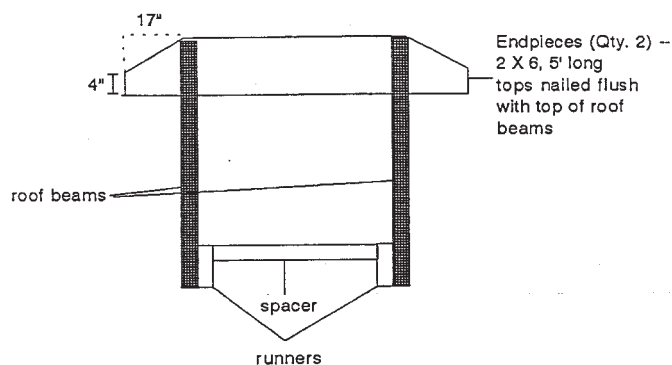


spacer joists
Qty. 3 -- 2 X 6, 20 11/16" long
and flush with top of runner

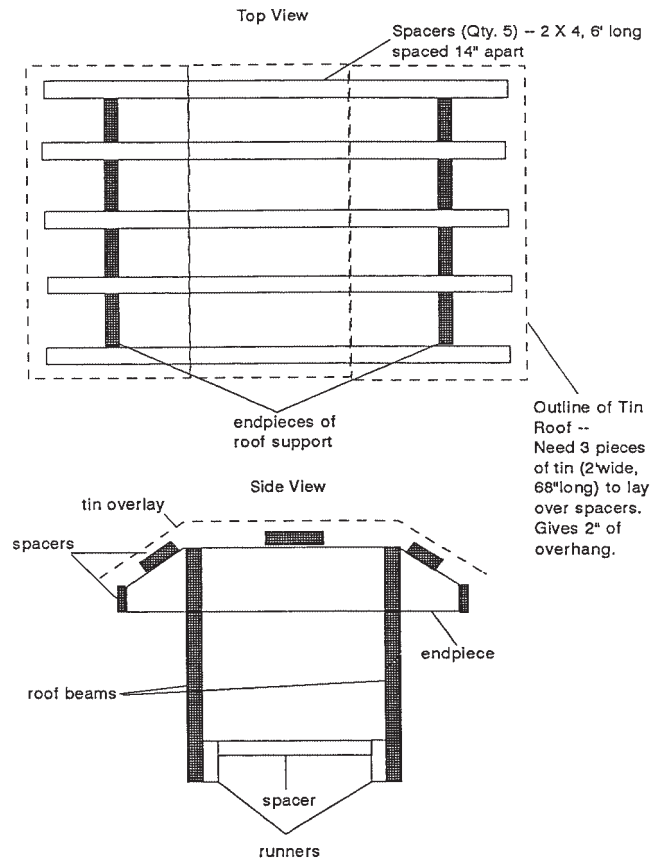
Roof Beams -- Qty. 4, 2 X 6, 5' tall (Side view)
(Leveled)



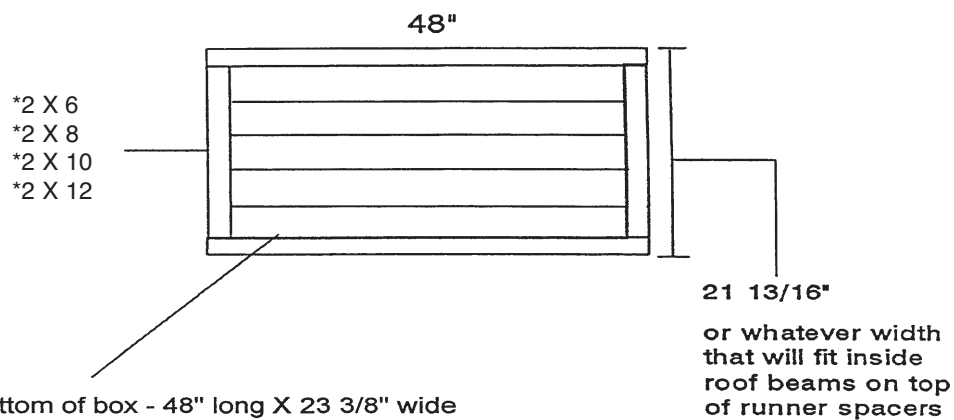
Roof Support



Roof



Feeder Box (Top View)



Bottom of box - 48" long X 23 3/8" wide
Use 5/4" X 6" treated decking. As decking dries spaces about 1/8" wide will form between boards which allows water to drain.

Cover bottom and inside of box with a nylon mesh feed/seed bag type material stapled to wood. This allows water to pass through but prevents feed/seed material from clogging spaces between boards.

* Volume of tray increases with board width by making the feeder box deeper -- we use 2 X 8's.



Management Calendar

February/March

1) Spring is a good time to check soil pH and lime food plots if needed. To check the soil pH, simply collect soil samples and send them to a soil laboratory (see previous Wildlife Trends article on how to properly collect soil samples). Your local farmers cooperative will often have soil collection bags and will also know where you can send the soil to be tested. Although there are exceptions, most crops grow best in a relatively neutral soil pH of 6.5 – 7.0. Thus, lime is often needed to enhance the soil (this is particularly true in sandy soils). Because it can take several months for lime to effectively change the soil pH, checking the soil in the spring will give you ample time to enhance the soil before the fall planting period. Remember, ensuring proper soil pH is often more important than what you plant or how much you fertilize. In fact, proper soil pH is essential for fertilizer to be available to the plants. Although lime can be spread anytime of year, applying it at least 6 months before planting will allow time for it to enhance the soil.

2) Make preparations for spring turkey season. One of the best ways to ensure you have gobblers in the spring is to manage your property throughout the year to promote quality nesting cover. Where do you think gobblers will spend much of their spring? Where the hens are. Where are the hens? Where the best nesting habitat exists. I have worked with landowners that claimed they had gobblers on their property except during the spring. After closer inspection, their property didn't have good nesting habitat and the hens had moved to adjacent properties carrying the gobblers with them. Quality nesting habitat is created by maintaining a patch work of early successional habitat throughout your property. Burning, herbicide applications, strip disking, timber harvest, and roadside management strategies are all tools that can help you create quality nesting habitat for turkeys. Besides the key element of creating nesting habitat, what are other things you can do to enhance turkey hunting on your property this spring?...something you can do now. Creating strutting areas in strategic areas around your property will help put turkeys where you want them to be. A bushhog is the tool of choice for this task. Creating strutting areas simply means mowing areas that will be attractive to turkeys for breeding courtships. I often create these areas between roosting and nesting areas and preferably near a food source such as

an old field, chufa patch, or food plot. Areas that often lend themselves well to creating strutting areas are powerlines, old fields, and roadsides. Lastly, mowing hunter access trails will help you slip into areas to hunt without making a bunch of noise. If these trails go through thick habitat, don't be surprised if turkeys use the same trails.

3) Start planning & preparing for summer projects. Good planning and preparation ensures you will have everything needed and be ready to initiate projects this summer. Planning also allows you to prioritize projects, create a budget for the up coming year, and develop timelines for completion. Many landowners simply tackle projects as they come up or as they think of them. This strategy can work, but without planning they may overlook or run out of money before addressing a more needed project. Spring is a busy time for us at Westervelt helping landowners determine their property's needs. We conduct what we call "property management reviews". During this consultation, we review projects that had been completed the previous year, review harvest data or other information that provides insight to how the wildlife we are trying to manage is doing, re-assess progress towards goals, assess the habitat and property in general to determine its limiting factors, and develop a prioritized list of activities that need to happen to help the landowner achieve their goals. While this is a professional service we provide, it is a process that I feel all landowners should go through each year, whether they hire a professional biologist or not, to keep them on track.

4) Plant supplemental fruit trees and/or other wildlife friendly plantings. Supplementing your property with plantings of oaks, chestnuts, pears, crabapples, plums, autumn olive, etc. is a great way to enhance both the esthetics and wildlife value of your property. Late winter through early spring (before spring green up) is the best time to plant most wildlife friendly trees/shrubs. Planting a variety of trees/shrubs will ensure that a variety of food sources are available throughout the year. The plantings should be strategically placed around food plots or fields, along roadsides/ intersections, or other areas that will receive adequate sunlight. If quail management is one of your goals, and your property has lots of open land, you may consider establishing hedgerows for additional quail habitat. Hedgerows

are often created using wildlife friendly plantings such as plums, drawf chinquapin or sawtooth oaks along with other shrubs. Hedgerows can be enhanced by planting adjacent strips of partridge pea or food strips of corn, Egyptian wheat, sorghum, or millets this spring/summer. The Wildlife Group is an excellent source for obtaining beneficial wildlife trees/shrubs as well as getting advise on planting strategies and tips.

5) Erect new wood duck boxes and/or clean out existing boxes in preparation for the nesting season.

Place 4"-6" of sawdust or wood shavings in the bottom of the box for nesting material (I prefer shavings verses sawdust because they do not absorb moisture as easily which causes rotting and mold – check with a wood shop that uses a planer for shavings. Cedar chips that are used for dog bedding can be good nesting material as well). Erect new boxes before February in highly visible areas near good brood rearing habitat. Adequate protective cover is essential for brood survival. Brood habitat should include a dependable source of water with plenty of shrubs and emergent vegetation for food and cover. Wood duck boxes should be cleaned out and inspected at least once per year. Word of caution – always be careful when opening wood duck nest boxes. Many other animals use the boxes. Animals that are commonly found in wood duck boxes include gray squirrel, flying squirrel, rat snakes, screech owls, and flycatchers.

6) Although deer season has just ended, February is the best time to scout for new deer hunting locations for next season.

Because deer have been exposed to a great deal of hunting pressure over the past few months, they are using areas that they are most comfortable in and feel safe. If you find out where they are "hiding" now, you will know where to find them next season once the hunting pressure builds and deer seem to disappear. During February the weather is still cool (or cold), leaves are off the trees, and buck sign such as rubs and scrapes is still fresh. Although you will have to touch them up before the season starts next year, late winter is a good time to trim shooting lanes around deer stands. Relocating stands now also allows deer to get used to seeing them over the summer.

7) Late winter is a great time to conduct dormant season prescribed burns.

As you probably know, prescribed fire is an exceptional tool for managing wildlife habitat. With the exception of longleaf pine/coastal plain areas, most understory burning in the Southeast is conducted during the winter dormant season. Acceptable relative humidity, temperature, fuel moisture, and steady, persistent winds often occur during this period. Try to conduct burns before turkeys start nesting (Mid-March in most areas). Cool season or winter burning is not only a

good way to reduce fuel loads and control undesirable hardwoods in a pine stand (which reduces the chances of a wildfire that can be detrimental), but is also a great way to stimulate new understory plant growth which will result in quality food sources for wildlife. Fire rotations (interval of time between burning the same area again) vary depending on your goals, habitat types, and property limiting factors but are generally every 2-5 years to promote quality wildlife habitat. It is also a good idea to strategically plan your burns to create a diversity of habitats across your property. Landowners often feel they need to burn large acreages to make a difference. This isn't so. Although larger burns are often initially needed to promote quality wildlife habitat, after the property is in shape, I actually like small burns of 5, 10, or 15 acres in size. These create great pockets of quality natural foods that are accessible by wildlife, yet leave close by quality cover. Always check local burning laws and consult with an experienced burn manager before lighting a woodland fire. The U.S. Forest Service or your state forestry commission are great sources for obtaining more information regarding burning in your area.

8) Leave duck ponds flooded until early spring.

Although duck season may be over, leaving your duck ponds flooded will benefit migrating waterfowl by providing energy rich foods for their flight back north. Pond drawdown and timing will vary depending on your management strategy (natural moist soil management or agricultural plantings). If you are planting agricultural crops for waterfowl, you will likely leave the pond flooded through early summer for weed control. However, if you are managing for natural moist soil plants, such as in a beaver pond, you will likely start pond drawdown in the spring. Slow drawdowns (over a 2-3 week period) are often desired because they will result in diverse emergent wetland species composition. Quick drawdowns result in decreased plant species diversity and are often composed of undesirable species.

9) Collect shed antlers.

By mid-March, most bucks across the country have shed their antlers. Collecting antler sheds can be a fun spring activity for the whole family. Shed collecting not only provides a great opportunity to spend time with your family, but also provides some insight to the quality of your deer herd. After a few seasons, compare the quality of sheds found from different years. If your program is moving in a positive direction, you will notice that the antlers are getting larger each year. Key areas to concentrate your searches include food plots, fields, around feeders, and along trails where deer must jump (over fences, ditches, etc). Unfortunately, many of us find them in our tractor tires!....which means you're doing something right!



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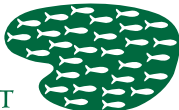


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¹Hurst, G.A. and B. Watkins. 1998. Vegetation following imazapyr for site preparation. Southern Weed Science Proceedings. 41:201.

²Witt, J.S., A.S. Johnston, K.V. Miller, J.J. Brooks, P.M. Dougherty, P.B. Bush. 1993. Response of wildlife food plants to site preparation in the Georgia Piedmont. In: Forestry and Wildlife Workshop: Technology and Environmental Issues. Clemson University. September 1-3, 1993.