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Wildlife Trends JOURNAL

SEPTEMBER/OCTOBER 2012 VOLUME 12, ISSUE 5

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Earl Says...

A couple of weeks ago I had the pleasure to visit a beautiful property in South Carolina for a dove hunt. Now, I'm not exactly the best shot in the world but even I was able to take my fair share of birds because the landowner planted and managed a delicious food table for the dove. Through the searing heat the birds flew constantly because they had everything they needed right here around this field. I love a good bird hunt but these days I enjoy just as much checking out the management efforts it takes to have a successful piece of property.

Planting a quality dove field is like any other management effort on a property. It's a labor of love we all enjoy especially when you see the fruits of your labor when you can share your hunting experiences with friends and family. I talk to subscribers every day who say they don't even hunt that much anymore but mostly look forward to their kids and grandchildren having a good time with their hunting and fishing experiences.

On a personal note, I want to thank the Quality Deer Management Association for recognizing us as their *2012 Signpost Communicator of the Year* at their National Convention in Nashville, TN this summer. I am humbled and thankful for the award but mindful that it's the words and practical ideas of our article authors that make us look good. And a special thanks to my good friends J. Wayne Fears and Dave Edwards for nominating us.

Andy Whitaker
Publisher/Editor

Wildlife Trends
JOURNAL

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Wildlife Trends Journal is published to provide landowners, land managers and wildlife enthusiasts the latest research-based information in wildlife and game management. Article authors are carefully selected for specific expertise in their respective fields.Subscribers receive six bi-monthly issues and a handsome library binder to save their past issues.

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Cover photo by Dave Edwards

Forage Soybeans: A High Octane Food Plot Crop for Deer

By Jason R. Snavely

Jason R. Snavely is a consulting wildlife biologist from Pennsylvania and President of Drop-Tine Wildlife Consulting, a private food plot consulting and wildlife management firm that works with private and corporate landowners and hunting clubs everywhere white-tailed deer are found. More information about Drop-Tine Wildlife Consulting can be found at www.droptinewildlife.com. You can also contact Jason at (570) 204-4064 or by email at jason@droptinewildlife.com

There's little doubt that you have experienced the high draw that soybeans have on deer. Imagine a food plot that can cover the months of June, July, August, September, October, November, December, January and February. Does that sound too good to be true? It's not and in fact, deer managers across the whitetail's range are doing it with the help of **forage** soybeans.

At Drop-Tine Farms, my research and demonstration facility in Bloomsburg, PA, I get my forage soybeans in the ground in early to mid-May. After a few weeks of "down time" while the cotyledons pop through the soil and the young tender plants develop, my forage beans are off to producing several tons of high quality forage per acre. This forage producing machine continues longer than any single food plot crop available. Better yet, throughout the month of October and even into November, when I'm bow hunting my farm, I'm the only guy in the neighborhood with soybean

The Only Shop in Town! October 11, 2009 Drop-Tine Farms photo of actively growing Eagle forage beans planted next to a plot of agricultural beans. The forage beans remained green and continued to serve as an attractive forage throughout the Pennsylvania archery season.

fields that are still green.

As a private consultant I only get paid when my company produces results. We don't have time for pretty bags and confusion marketing but are more interested in what's inside. With whitetails being picky eaters with a limited amount of space in the rumen, we're continually seeking ways to ensure that deer only consume "the good stuff". To date, nothing has stepped up to this challenge better than forage soybeans produced by Eagle Seed Co. in Weiner, AR (www.eagleseed.com).

While visiting with clients or giving seminars I'm often asked: "If you could plant only one crop or forage for deer what would it be?" We are incredibly fortunate to have a full arsenal of different food plot crops that shine under different growing conditions, different seasons, different planting times, and across all regions of the whitetail's range. Although there is not one food plot crop that will perform year round, fill all nutritional gaps and thrive under all conditions mother nature hands out, forage soybeans are the closest I've found after 10 years of exhaustive research. You will have to trust me when I say that what follows will change your food plot program and the way you push nutrition to your deer herd forever…that is if you don't currently incorporate arguably the most impressive warm season food plot crop into your year-round nutrition program: forage soybeans.

Not to be confused with Roundup Ready® agricultural soybeans bred to have one main, combine friendly erect stem and grown for maximum bean production, forage varieties are designed to remain in a vegetative or pre-reproductive stage longer and therefore produce significantly more leaf & stem tonnage longer into the growing season. There is some misinformation out there that forage varieties don't flower and produce pods and grain. This couldn't be further from the truth. In fact, forage soybeans do complete the flowering stage and produce pods of grain. With soybeans, the flowers become the pods that contain the protein packed beans.

Forage varieties are bred to delay the flowering and reproductive stages. Why is this important? Those of you who already plant clovers, alfalfa, chicory and other food plot crops have experienced an increase in attraction immediately after a mowing. You know that attraction to deer declines as those plants mature. The reason for the sudden surge of deer activity after a mowing is because those maturing plants were in their reproductive stages (flowering) and the nutritional quality was dramatically declining. The plant was putting all of its energy into completing its reproductive stage taking away from its quality as a forage crop. By mowing the top portion of the plants you returned them to a pre-reproductive (actively growing) stage. Young and actively growing plants in pre-reproductive stages (prior to flowering & seeding) are much more nutritious. For food plot managers, this is old hat; however, some of you may not be aware of the indeterminate growth strategy of forage varieties resulting in much longer forage production while plants continue to grow by putting out new leaves very late in the season. This is vital.

Interestingly, a single forage soybean plant can produce pods at the bottom of the plant, flowering in the middle, and producing new growth at the top portion of the plant all at the same time. Conversely, with Roundup Ready® agricultural beans planted for grain production the whole plant is going through each stage at the same time. This is crucial because after the plant has put on new growth, flowered and starts producing pods, its maximum potential as a high quality forage crop for deer has passed. Sure, the high fiber content of the pod and the extremely nutritious beans are now available; however, wouldn't you rather continue producing more forage throughout the warm season as well? On my farms in PA and NY as well as those of our clients, we've target-

The explosive growth of forage soybeans is obvious in this picture. Equally important is the pod count on the forage beans; debunking the myth that forage soybeans do not produce pods of grain.

Forage soybean on bottom and Ag soybean on top pulled from Drop-Tine Farms on July 23rd 2012. Note that the Ag beans have already formed pods with maturing grain (past peak) whereas the forage bean is still performing as a high quality forage. Pods of grain will come later in the growing season.

ed, with assistance from Eagle Seed Co., different varieties of forage beans that produce pods of grain at different times throughout the growing season. Some begin early while others may never fully mature as optimal growing conditions wind down. This is ok and expected.

Soybeans originally came to America as a forage crop; however, this changed as demand for the grain (animal and human consumption) from a soybean plant increased. This demand lead to the breeding of smaller agricultural soybean plants with one main stem (easier to harvest with combines) that were also genetically engineered to mature much earlier in the year. It's the third week in July as I type this article and the Roundup Ready® agricultural beans planted by my local farmer have already reached their maximum potential as a forage for whitetails. As you can see in the above picture, the pods on his agricultural beans are formed whereas the forage soybean plant is still serving as a high quality forage as it remains in its pre-reproductive (actively growing) stage.

Soybeans require most of their moisture during the flowering period; therefore, the earlier you plant them and the quicker they mature the less susceptible they are to dry summer weather. This is the strategy when producing the soybean grain is the ultimate goal. Herein lies the problem for those of us who are interested in feeding whitetails by incorporating plants that keep putting out highly nutritious leaves as long as possible during the growing season. Although the earlier maturing varieties had initially proven to out yield late maturing varieties when it comes to the beans there is a tremendous advantage when forage is greener and better longer (4-8 weeks) that can still throw a respectable bean yield when it's all said and done. In fact many of the forage soybean varieties from Eagle Seed Co. in Arkansas have shown just as much potential to produce beans while producing a plant twice as large (and often larger) as a conventional agricultural soybean. There's another advantage to extending the length of time forage soybeans are green and growing. Since the plant continues to pack protein into the leaves, the older leaves contain higher amounts of protein. That's right, supercharged soybean plants that are taller offer far more biomass and protein, continue putting out leaves longer, possess many branches on one stem, stay greener longer and still produce a respectable, if not superior, soybean yield for late season attraction all in one plant!

When I was first introduced to Eagle Seed Roundup Ready® forage soybeans as an undergraduate student at Mississippi State University many years ago I didn't pay much attention. After all, soybeans are the king of deer nutrition, why mess with them? Little did I know they would play a significant role in the way I would manage deer herds for my clients many years later. While attending the 2007 Southeast Deer Study Group Meeting in Ocean City, MD it sunk in that agricultural soybeans planted for grain production were only highly nutritious as a deer forage during a relatively short window of time: in the early stages of their growth. A couple of papers presented at that conference brought this to my attention. I immediately recalled hearing about Eagle Seed Co. in AR and sought test plots for a personal observation.

Less than six months later I was on a magnificent property and test plot on the Eastern shores of Maryland. Being a skeptical wildlife biologist who just couldn't put his hands on any "real data", I had to get to the bottom of it. My mind raced and I quickly imagined these plants had to be drought tolerant

Leaf size comparison—forage soybean leaves are much larger, oftentimes 2-3 times larger. Apply this size difference across an entire plot and you realize the benefits of Eagle forage soybeans.

and equally had to offer the stiff competition against weeds that I had been seeking for client's properties and on our own properties. Considering the incredible amount of biomass above ground I suspected a large root system underground that would mine deep for soil moisture during dry periods. My thoughts turned to the Roundup Ready® technology allowing a food plotter to spray prior to planting and just prior to leaf canopy virtually eliminating weed competition for sunlight, soil moisture, space and nutrients. Further, once a canopy of broad soybean leaves is established, the soil surface is quickly shaded, minimizing the loss of valuable soil moisture through evaporation. I was almost sold.

I pulled plants from a side by side trial of agricultural soybeans of an unknown grower and forage soybeans from Eagle Seeds. The first thing I noticed was the incredible difference in both underground root mass and above ground leaf/stem mass. The Big Fellow variety from Eagle was head and shoulders out-competing the agricultural soybean in the same soil conditions only a few feet apart. Leaves of the forage soybeans were nearly three times the size of the agricultural soybean leaves. I was immediately thinking about how much high quality nutrition this product could offer does during lactation/fawn rearing and bucks during that critical antler growing period. At the time I didn't consider the bonus benefits of the soybean yield as a late season food source.

That research I was in need of...it's plentiful after all and even more so today. Dr. Rebecca Atkinson, a beef forage specialist from Southern Illinois University, reported up to 9.6 tons per acre on a dry matter basis and 29% leaf protein in varieties from Eagle Seed Co. Eagle also reports up to an incredible 42% leaf protein in Arkansas, their highest to date. I have seen fields of forage beans grow to over 6 feet tall with excellent seed yield. What will you plant next year as a warm season annual?

In a controlled penned study, South Dakota State researcher Kyle Monteith found that deer preferred Big Fellow soybeans from Eagle over a commercial variety and Large Lad. Kyle further detailed that "Females preferred Big Fellow 50% of the time, Large Lad 33% of the time, and the commercial variety 17% of the time". Finally, Kyle also reported that "Males preferred Big Fellow 49% of the time, Large Lad 18% of the time, and the commercial variety 33% of the time.

Perhaps some of the most impressive research was conducted in drought conditions on acidic sandy soils by Dr. Twain Butler of the Noble Foundation in Oklahoma. The test was conducted on sandy soils with a pH of 4.8! Only 2 inches of rainfall came during the hot, dry testing period. 90 days after planting, biomass data were taken from several products, including forage soybean varieties from Eagle Seed Co. The top three products were from Eagle. Two of those products, Whitetail Thicket and Large Lad produced 2,000 Lbs./acre! Keep the growing conditions in mind! Cowpeas and a different brand of Roundup Ready® soybeans came in around 1100 Lbs./acre with Lab Lab coming in well under 500 Lbs./acre.

Anyone who has planted big seeded warm season annuals has dealt with the tough decision of when to plant. Soil temps really need to reach 55-60 degrees for the go ahead to plant although it's safe to expect emergence in 7 days if soil temperatures have reached 65 degrees. Early planting experiments on our research and demonstration facility in Pennsylvania of late April sometimes took up to 2 weeks to emerge. For that reason early May is considered more conservative for planting on my Pennsylvania farm.

For those of you who have battled Boone & Crocket weeds while waiting for warm season annuals to germinate and develop canopy closure it gets better! Eagle Seeds offers Roundup Ready® technology to manage your weed problems. Planting early can be a gamble that has the potential of paying off big or backfiring. The 2009 season on our research fields displayed just that. As a result of a perfectly timed planting, our deer enjoyed increased plant height, tonnage and soybean yield. In fact, had we been standing in the middle of that 2009 plot just 4 feet apart we could hear each other talking but we could not see each other due to the amazing height of the soybean plants. Needless to say, we also had deer utilizing that plot as bedding and security cover. We firmly believe the results of our hunting season (and upcoming shed

September 12, 2012 photo of a utilization cage on Drop-Tine Farms PA. Just two weeks prior to when this photo was taken the soybean plot was high enough to make finding the utilization cage nearly impossible. A utilization cage is an excellent gauge, suggesting where you fall on the population size/food plot acreage scale. During years with poor growing seasons, the utilization cage details the level, as well as the timing, of nutritional bottlenecks. The heavy utilization of this 3 acre plot makes the author nervous about extending the life of this particular plot.

This trail camera photo was taken on a client's farm inside a high tensile reversible fencing project. Four acres were high fenced and gated to keep the deer out until the Eagle forage soybeans were established. With poor natural habitat conditions, this forage banking technique allowed the client to produce a high quality soybean plot on poor ground. Once the soybeans reached waist high, managers opened gates on each end of the fence to allow deer in. Gaining control of when and how long deer eat the soybeans is a step in the right direction.

hunting season) were in large part due to an overabundance of high quality nutrition (i.e. 151 4/8 clean 8 point). As late as February and March, deer and turkeys are still seen feeding in forage soybean fields planted back in April and May! That fact eliminates the false claim that late maturing forage soybeans don't produce pods of grain. The plot was extremely productive throughout all hunting seasons. Eagle has addressed concerns of late maturing varieties in the far northern reaches of MN, WI and the Dakotas by developing wildlife mixes with varieties bred for those growing seasons and conditions.

It's important to note that when growing deer forage, green is not always good. I'm here to assure you that the green on forage soybeans is highly digestible, extremely palatable, available for a longer period of time, and incredibly nutritious. There is a growing list of university research from around the country to back this up. While talking to Brad Doyle, General Manager of Eagle Seed Co., I was pleased to hear about their plans to conduct extensive total plant nutrient tests. While we were talking on the phone a few years ago, Brad pulled out some results from a September 2009 test. Crude protein, % Phosphorus and % Calcium were 29.25%, .35% and 1.13%!

For those of you wondering about the cost of forage soybeans. Research conducted by Marcus A. Lashley and Craig A. Harper at the University of Tennessee reported the total costs for seed, lime, fertilizer, herbicide (glyphosate), as well as man and tractor hours for a typical "co-op" agricultural soybean to be $175/acre. Those same costs for the forage soybeans from Eagle were reportedly $185/acre. As Dr. Joyce Doyle, daughter of Eagle Seed Co. founder, Dr. George Berger, puts it "Only $10.00 more for 1st class"!

Like other nitrogen fixing legumes including soybeans it's important to inoculate forage soybeans with an inoculant that is not expired and specific for soybeans. This is especially important if there is not a history of soybean crops in your field.

As with anything planted for deer that is highly nutritious and palatable, forage soybeans need to be protected from excessive over browsing in areas with high deer densities or in smaller plots. I have seen amazing production from Eagle's forage soybeans after being completely over browsed in poor deer habitats. In fact, they branch out rapidly and cover up what's been nipped off. However, severe pressure on young, highly nutritious seedlings (notably the cotyledons) prior to the root system establishing itself can result in a "failed plot". A small utilization cage or two in your plot will reveal how much your field is being browsed. Utilization cages are a great tool when studying the delicate balance between food plot acreage required and current deer densities on your hunting property. If your plots are lip high everywhere except in your utilization cage it's time to plant more acreage to food plots and/or remove a few does. Personally, I prefer to raise the nutritional carrying capacity by ramping up food plot acreage (size and number) as opposed to carrying less deer; my clients agree!

I have a 2.8 acre field on my farm where I rotate corn and forage soybeans. During good growing seasons, with plenty of moisture at the right times, the tonnage produced in this soybean plot swamps my local deer herd and yield is quite impressive. However, during drought years, when deer are nutritionally

Food plot insurance--Research in recent years has proven the effectiveness of electric/psychological barriers such as this Gallagher fence. Managers can now employ forage banking techniques on their properties with these easy to install fencing products. It's a much more cost-effective insurance plan for food plot programs.

stressed due to a lack of high quality forage availability elsewhere, this same plot receives heavy browsing. The Eagle forage soybeans in this plot still grow chest high during these dry years. The same situation occurs with pod/grain availability. During good years you will find deer and turkeys feeding on soybean grain right into the early spring months. However, during dry years, when that plot is the best buffet in town, my soybean grain is fully consumed by the end of December. The severity of our winters also plays a role in how long I can drag the productivity of this plot out each year. During years of heavy snow fall and prolonged cold spells the local deer herd hits it very hard. Although it's a great late season hunting location, I can't carry soybean grain into the late winter/early spring like I want to. This is where being a deer manager and identifying these factors comes into play. I've adjusted my plan by offering additional acreage planted in forage soybeans…problem solved!

Another excellent and proven strategy to gain control over when and how hard deer feed in your forage soybean plot is through a technique called "forage banking". A physical barrier of some sort, usually some form of fencing, will keep deer out during a pre-determined period of time. Many deer managers also refer to this technique as "reversible fencing". The best and most common time to protect your forage soybeans is immediately after planting them and as the initial growth (cotyledons) erupts from the soil. The cotyledons are the first two leaf structures to emerge from out of the ground at germination and they are extremely susceptible to being over browsed. If these cotyledons are nipped off at this sensitive stage the game is over for that soybean plant as they contain all of the energy and nutrients required to continue adding growth.

In years past we've employed the use of high tensile deer fence to exclude deer from our client's plots until they were established. This is a technique that has been used extensively on well-managed ranches in South Texas for many years. A few years ago I was finally convinced that the electric/psychological barrier fencing by companies like Gallagher and the Hot Zone Deer Exclosure System from Non-typical Wildlife Solutions, are just as effective as high fences. This new technique is significantly less expensive and the flexibility to expand and/or move the systems is extremely valuable. Like an insurance policy, these fencing systems allow you to protect ("bank") your investment of time and money by ensuring that your plots are far more productive for a much longer period of time. This technique also allows a manager to plant highly attractive crops, like forage soybeans, in small areas that otherwise would be over-browsed immediately after germination. I've personally assisted clients with using this technique to select certain plots that will serve to bank forage for times of the year that are generally known to be nutritional bottlenecks. This strategy has proven very effective for clients who are looking to maximize herd health and ultimately the hunting potential of their properties.

Another great benefit to using one of these systems, and my personal favorite, is the amount of control you gain while patterning deer you are hunting. Once your food plot can withstand browse pressure a "gap" is created by opening a section of the fence. When timed right with the hunting season, this gap serves to focus deer movements in a specific location that can then be monitored with trail cameras and ultimately hunted. This is one advanced hunting strategy that successful hunters have been employing more and more each year.

Eagle Seed Company is located in Weiner, AR. Please note that Jason R. Snavely does not work for Eagle Seed Company nor does he get paid by them. His reported results are a product of several years of independent research on Drop-Tine Farms-PA and on Drop-Tine client properties located throughout the country. To contact Eagle Seed Co. you can call Brad or Joyce Doyle at 870-684-7377 or look them up on the web at www.eagleseed.com.

Forage for Largemouth Bass

This largemouth bass swallowed a golden shiner that was almost too big!

By Scott Brown

Scott Brown started Southern Sportsman Aquatics & Land Management in Spring 2007 and now has clients from Texas to Florida. Scott can be reached at scott@southernsportsmanaquaticsandland.com or (214) 383-3223.

Largemouth bass are the most sought after fish in the country. The majority of landowners want BIG bass and lots of them to catch! "Trophy", "Quality" and "Big" are in the eyes of the beholder. To obtain quality/trophy size largemouth bass, numbers of bass must be reduced and forage present must be increased. The size your bass grow will max out based on length of growing season, genetics, habitat and available food. Some of these factors you cannot manipulate and some you can. Every waterbody has a carrying capacity which can be enhanced by improving water chemistry, habitat, harvest practices, natural forage present and through supplemental stocking. If you wipe out your fish population and start over, even largemouth bass genetics can be changed when restocked.

Today I will address forage for largemouth bass. This can range from either creating a naturally reproducing forage base or annually stocking, both in spring and fall,

species that together will provide a steady food source year round. Every waterbody is unique and there are a variety of methods that can either be performed independently or in combination to achieve quality growth rates on various budgets.

Both bass forage (numbers and size) and size of largemouth bass present influence growth rates. Largemouth bass growth rates can be accelerated with the decreased numbers of bass and increased forage. This statement is actually more accurate when talking about biomass (weight of individuals and total weight of all in a particular species or group). One big bass needs to consume large numbers of small forage to grow, but exerts lots of energy to gather that food, so it needs even more of that food source. Larger bass exert less energy when the forage size is larger and fewer are required to obtain the same amount of growth. This is important when analyzing largemouth bass size to forage size. These need to be addressed and properly matched. In other words, 10 lb. bass do not get that big if they are only chasing and consuming 1-2 inch minnows or shad all the time. The 10 lb. bass reaches that size when a steady diet of 6-8 inch and sometimes larger forage is consumed. We occasionally come across fish populations with several 4-6 lb skinny bass in a waterbody loaded with 1-3 inch forage, but we frequently come across bass populations with high numbers of 10-15 inch bass, no 1-3 inch forage and lots of large 9-11 inch bream/panfish. This is why electrofishing a lake is important, because all gaps can be identified and a proper management strategy developed addressing the entire fish assemblage and not just the top predator. Typically a stunted bream/panfish population with no large individuals present is the sign of a quality bass population. Whereas a quality bream population with lots of 8-10 inch or bigger bream is associated with a stunted bass population.

When creating or improving a largemouth bass forage base, having multiple species in different size groups present helps supply the forage required to grow trophy bass from birth. We always try to establish several species of forage for predators. This can allow some forage species, once greatly reduced in numbers, to bounce back if the bass have started targeting something else. A forage base of minnows, bream, shad and shiners as opposed to one species is best. This ensures bass at different life stages and sizes can readily have food available. The more forage available at all life stages, the better growth rates with uninterrupted growth as they move from one forage size and/or species to the next. This translates

Here's a largemouth bass and an almost five inch threadfin shad, which rarely obtain lengths greater than six inches. Trophy bass 10 lbs and larger need an additional (larger) forage choice.

into quicker growth and greater numbers of larger bass.

There are many kinds of largemouth bass forage species. This includes minnows, mosquitofish, grass shrimp, bream/panfish, golden shiners, shad (both threadfin and gizzard), Tilapia, trout, yellow perch and crayfish. There are instances where largemouth bass have been documented with small bass (cannibalism), crappie and catfish in their stomachs, but unless it's a unique situation these are not in a largemouth bass's regular diet nor would we normally recommend managing for or stocking any of these as a forage for bass. We have seen in a large private waterbody in Central Florida where the bass are feeding regularly on armored catfish (brown hoplo) due to the lack of more desirable forage. I will address later what we have begun doing to improve the forage base for the bass in that waterbody. On occasion, largemouth bass eat insect larvae, insects, frogs, tadpoles, snakes, turtles and ducklings, but these are not a steady food source and will not be covered in this article as viable or practical forage. These are consumed on occasions or during a short time period each year when the opportunity presents itself.

With most forage species, we recommend stocking only native species that have the opportunity to survive and naturally reproduce. Sometimes these species occasionally need restocking in the future if the bass reduce their numbers to where they cannot repopulate. There are only a couple of species that can be stocked that are not native, knowing the individuals that are not consumed will perish due to water temperatures either rising or falling.

The most frequently stocked and most common largemouth bass forage is bream/panfish, and usually bluegill. Bluegills are prolific breeders and can sustain a population even under heavy predation from a quality largemouth bass population. Their growth rates and the lake's carrying capacity can be increased through supplemental feeding. Once stocked, these species rarely need to be re-stocked, unless it is to jump start a stunted bass population with too many bass of one size, not growing into the next size class.

The second most frequently stocked forage for bass is the threadfin shad. It requires fair water quality, but if you want them to live more than a few months an algae bloom (green water) is required to keep them alive and to allow them to establish a self sustaining population, which is the same for gizzard shad. If you stock threadfin shad into a clear lake they will eventually die from lack of food, as they feed on the planktonic algae. If you understand they will need to be annually restocked and have the budget, (they are an expensive fish feed), then it is quite acceptable to annually restock threadfin shad. Threadfin shad are susceptible to thermal die offs when water temperatures get below 40^{o} F. Threadfin shad are generally targeted by small to intermediate size (bass up to 20 inches) as they usually have a maximum size of approximately four inches, but can reach six if in a nutrient rich environment. Gizzard shad grow much slower in the north than in the south. In the south, gizzard shad can reach sizes beyond what a trophy bass can consume and become a problem fairly quickly as opposed to a solution. If you have threadfin shad and gizzard shad 8-14 inches long, but not much larger, you have forage for all sizes of bass, including trophy (10-15 lbs) bass. I have observed 13-plus lbs largemouth bass with 15 inch long gizzard shad in their mouths. Big bass require big forage!

Another common self-sustaining forage is the golden shiner. These can be grown on small pellet fish feed and are common throughout the Mid and Southern states. Some landowners even build a separate shiner pond on their property where they grow and feed just shiners, remove annually by seining or cast netting, and stock into their "bass lake" as a forage source. If trying to establish a naturally reproducing shiner population in an existing bass population, you must stock both small and large individuals so the bass cannot consume them all before they spawn. Shiners, if established, can feed both small and large bass if the populations remain balanced.

Fathead minnows are a common starter forage stocked in a new pond situation for small largemouth bass or large bream if present. They are difficult to get established. If you have a lot of flooded timber and submerged logs they may begin to spawn, but generally they live until consumed. Since they do not get over three inches, they are only forage for small bass and become unimportant once bass individuals begin reaching 12 inches. In a new lake, once these are gone, restocking is generally not necessary if there are bream/panfish present.

Tilapia, yellow perch and trout stocking have become popular. These fish generally will die either from water too warm or cold depending on the species and where you are located. Tilapia are stocked in early spring, once water temperatures will remain above 55-60^{o} F. They will grow and reproduce until the following winter and die once water temperatures drop below 55^{o} F. During this time, largemouth bass are on full feed and will consume many of them. Yellow perch and trout are the opposite, where you stock them in the fall and they will die off from warm water temperatures (80 and 70 ^{o}F, respectively) in late spring/early summer. Although largemouth bass feeding does slow down as temperatures decrease, they will feed throughout winter and prior to these species dying off. Bass will consume many of them before switching over to another food source, which gives time for resident forage to spawn and grow before becoming a target. All these species will consume pellet fish feed during their respective times of year in your pond. Before engaging in

This gizzard shad is 17 inches total length, approximately seven inches deep and weighs approximately 2 lbs. This size forage is too large for almost any largemouth bass. Once this species reaches this size it becomes a liability rather than an asset.

Here are some bream/panfish that are the perfect size for small to intermediate bass. But bigger bass will have to find other forage to continue to grow at an accelerated rate.

the stocking of any of these species understand that it may be an annual event, and that your state's laws must be reviewed carefully on the stocking of such species, as a special permit may be required or the species may be banned.

Stocking crawfish has also become popular in some areas to supplement a waterbody's natural forage base. Although native in most areas, their reproduction and survival rate in a quality largemouth bass fishery is poor and they do require restocking once the bass have knocked the numbers down to levels from which they cannot recover. Use only native crawfish and please do not introduce species non-native to your area.

This Seminole Killifish is over six inches long and hopefully will spawn multiple times before being consumed by a largemouth bass.

Knowing the type of waterbody you have and what will survive there can help in finding a not-so-mainstream solution. As I mentioned earlier, that lake in Central Florida is now being stocked with Seminole killifish that are being legally commercially harvested from nearby lakes. The water chemistry, substrate and vegetative habitat indicate what species of fish not present or in low numbers may survive there. Collecting non-game fish requires a commercial license to harvest from public waters, haul and stock into private lakes. If a population can be established, it will be another forage species available to largemouth bass. As mentioned before, knowing the regulations and having all the proper permits is imperative for this type of work, but is an option when improving a fishery. Be very careful not to collect sport fish, exotic fish or Threatened or Endangered Species.

As you can see, there are many options for improving the largemouth bass forage in your waterbody. Multiple species and sizes are imperative to grow "Trophy", "Quality" or "BIG" largemouth bass. Variable sizes are as important as the species present. Some of these techniques are fairly inexpensive, and some are very expensive. The better your habitat, the more likely you are to have some of these species become established and naturally reproduce, eliminating or reducing future stockings. If a bass population becomes stunted, a combination of aggressive harvesting from the "bottle neck" size class combined with stocking a forage fish the proper size to jump start growth and move them into the next level should always be prescribed. Which species will work best and stocking rates for your particular waterbody should be discussed with your lake manager or the local hatchery.

Nature's Nano Technology - Biochar

How biochar can help your food plots and tree plantings

Biochar Properties – A One-Time Soil Amendment

Biochar is a lightweight, highly porous organic material – produced from biomass for use in soil: farms, food plots, tree plantings & gardens.

Biochar's unique physical and chemical properties have the potential to permanently improve soil structure, enhance water circulation, improve nutrient availability and enhance beneficial microbial interactions with plants. Biochar can change the soil's structure to allow compacted soil to breathe, and create homes for microbes. Its durable, stable nature continues to maintain soil quality for centuries. Simply put, biochar can build better soils.

Adding biochar to a field or to each tree planted can cut input costs and improve the nutritional quality of crops grown on poor soil. While biochar has many different effects on soil chemistry and biology, only some of its physical effects are easy to see.

Biochar Field Trials with James Madison University, Shenandoah Gardens, Shenandoah Valley, VA
***Left side** is control strip - No Biochar.*
***Right side** w/Biochar - Crops performed better, had better color with higher yields.*

Biochar can improve soil structure by attracting and binding particles into larger structures—known as "aggregates". Soils with better aggregation are properly aerated, are better able to let rainwater infiltrate and are less prone to erosion. In short, soils with better aggregation have better tilth. Such an effect is, however, unlikely to be visible in the short term—biochar needs time to interact with other soil constituents and its effect improves over several years after application.

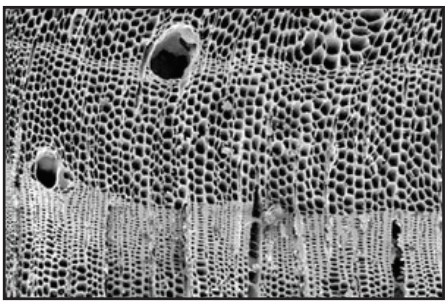
Biochar does not decompose like compost or manure, which disappear from soil within a few years, creating a steady need for annual re-application. Years after being incorporated into your soil, biochar keeps on working and some of its effects improve with time. As biochar matures to improve aeration, drainage, nutrient retention capacity and tilth, it fosters beneficial soil microbes that perform key roles in nutrient cycling. Biochar builds a permanent healthy soil.

Scientist studying Terra Preta in South American rainforest describe its teeming microbial communities as a "microbial reef." Like a coral reef does for sea-life, biochar does for the soil, supplying food and shelter. Instead of sheltering marine life, biochar supports an underground ecosystem of fungi, bacteria and other organisms—the base of the soil food chain. When times are lean, biochar is a reservoir storing bio-available nutrients. When times are full, biochar is a platform for microbes to launch a biological bloom of soil-enriching activities.

Can prescribed burns produce biochar?
In an oxygen-rich burn, only ashes remain after total combustion of biomass. Low temperature smoldering fires are a natural charring process in prairie and forest ecology. Pyrolysis (the process used to make biochar), develops wherever low - or no-oxygen conditions occur in fire's uncontrolled chaos.

Forest & prairie fires produce natural biochar though only at a rate of 1% due to the open-air environment that fuels it.

National Geographic called biochar a "soil within the soil." At plant scale, roots search the soil for water and nutrients. At a microbial scale, bacteria and fungi eat molecules retained in biochar pores to convert them into nutrients for plant roots. Biochar promotes resilience and diversity in this network of nutrient cycles.



Biochar's internal structure - magnified 1000x. Biochar consists of cavities that retain water & nutrients that are accessed when plants need them. What can be seen here are the larger pores of biochar, it also has pores that are too small to be visible at this magnification.

A land owner can let this "microbial reef" do the work of growing strong plants, while biochar also helps to buffer changing rainfall and water, unusual weather and fluctuations uncommon to soil. Land owners should see themselves as microscopic zookeepers—raising and sustaining vibrant communities of soil microbes. Growers should see soil as a complex living system—to be stewards of living microbial ecology.

"Despite their artistic pretensions, sophistication, and many accomplishments, humans owe their existence to a six-inch layer of topsoil and the fact that it rains."
~ Anonymous

Antler Growth and Mineral Nutrition: More Minerals Are Not Always Better

By Larry W. Varner, Ph.D.

Dr. Varner is a Wildlife Nutritionist and Wildlife Management Consultant for Purina® Animal Nutrition, directing research, development and testing of new wildlife feed products. He also consults with ranches, game farms, timber companies and leases across North America representing over two million acres.

What causes a buck to drop his antlers in late winter and then start growing another set fairly soon? Basically, it's all about day length. At the end of winter after the rut, a buck's testosterone level drops dramatically and this initiates the process of antler shedding. In the spring when days get longer, the pituitary gland in his brain is stimulated to produce hormones that control bone growth. The first bone growth area to be stimulated is the pedicle.

Antlers can grow half an inch/day or more and are one of the fastest growing tissues in the animal kingdom. We know that antler size is affected by age, genetics and nutrition. Although other factors like stress, especially in breeder deer, can have a big impact. Of these factors, nutrition is one of the easiest for a manager to control. If required nutrients are in short supply during the antler growth period, several things, all bad, can happen: (1) Antler growth rate slows down. Since antler growth

occurs only for a limited time (about 120 days), an antler growing at the rate of 25 grams/day is going to be larger at the end of that period than one growing at 15 grams/day. (2) Less dense antlers, which are more subject to breakage in rut fights. (3) Desirable characteristics which affect Boone & Crockett Score such as antler mass (volume and weight), number of points and beam circumference are negatively affected by poor nutrition.

Priority of nutrient use in bucks is of particular importance. After needs for basal metabolism, growth, activity, and reproduction are met, what is left supports antler growth. Therefore, it is important that they consume a highly nutritious diet during antler growth since a period of inadequate nutrition may adversely influence antler development for several succeeding years. It is probable that a buck preferentially uses body nutrient stores during antler growth vs. nutrients from his diet. This may be why it's so critical to have a buck in excellent body condition prior to the start of antler growth.

If a big buck grows 180 inches of antlers between March and the end of August, that's about like you cutting off your arms and growing them back in four months. In the last third of antler growth about two-thirds of the mineral is deposited. During that time a buck cannot eat enough in a day to get all the minerals he needs to mineralize his antlers. He "borrows" it from within his body. In a process similar to osteoporosis in humans, minerals are taken from ribs, sternum and skull and deposited in the antlers. Bone density may decrease as much as 30 percent. That is why mineral nutrition even after antlers are finished growing is important. He has to replenish the minerals in his bones so he has enough for next year when he does the same thing again. Hardened antlers are high in minerals, mostly calcium (about 20%) and phosphorus (about 10%) in addition to a lot of trace minerals such as zinc, copper and manganese. This illustrates the importance of having adequate minerals in the diet when antlers are growing.

Regardless of what you might have been told, after a certain point putting more minerals in the feed doesn't help. A buck can absorb only some much mineral each day no matter how much is in the feed. That raises the question "Should you feed a free choice mineral and if so, under what conditions?" My answer is yes because remember, a deer's digestive tract is relatively short so food passes through quickly. So even if you are feeding a high quality feed like our AntlerMax® it should be beneficial to have a consistent supply of supplemental minerals being consumed several times during the day. Minerals are utilized much more efficiently if they are "metered" gradually into the digestive tract throughout the day vs. a large amount at one time. It is even more important to feed a free choice mineral if you only have food plots or if you are feeding corn. If it is not in the soil, it won't be in the food plot and corn is extremely low in many critical

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minerals required for antler growth.

There are many nutritionally adequate deer minerals on the market. However, the challenge in many situations is to get deer to consume the mineral especially in drier parts of the country (approximately west of Interstate 35) and in areas where soil fertility is naturally high. In areas of poor soil fertility such as the southeastern US, getting deer to consume mineral is usually not as difficult. In parts of the country with low soil pH (less than 6.0) deer generally consume minerals with a higher salt content (>10% best). In areas of high soil fertility, sometimes deer will consume a lower salt (~ 5%) mineral better. Since every situation is different, you may have to try several things to get deer to consume mineral. If you have a low salt mineral, try mixing salt with the mineral at 1 part salt to 3 parts mineral. If that does not work, try mixing the mineral half and half with soybean meal, cottonseed meal, ground corn or rice bran, if it is available. Once the deer are consuming the mineral it is usually not necessary to continue mixing the mineral. Remember that deer have to find your mineral lick first, so make mineral licks where deer normally congregate or go to on a regular basis such as food plots, watering areas, next to an active game trail, etc. Spread some whole corn on top of and around the mineral lick in order to get them to stop and feed on and near the mineral station.

In many parts of the country I have had good luck with getting deer to consume our new Quickdraw® Deer Mineral. It is a low salt mineral (~5%) so in some parts of the country such as the southeast, it might be necessary to add some salt to get initial and consistent consumption. I would encourage you to examine the tag of any deer mineral that you are considering purchasing. I have seen deer minerals that are over 50% salt and others that are almost 20% calcium and around 1% phosphorus. Salt and calcium are extremely cheap as feed ingredients go, while phosphorus and most quality trace minerals are expensive. My opinion is that the ideal deer mineral for most parts of the country should have about twice as much calcium as phosphorus. I don't think the phosphorus level in the mineral should be more than 5%-6% since phosphorus tends to be unpalatable. Remember, a hardened antler contains about 20% calcium and about 10% phosphorus which is a ratio of 2:1, thus my recommendation for a mineral containing about 2 times as much calcium as phosphorus. This is also the ideal ratio of these minerals in deer diets. So if the deer mineral you are using has 10 or 20 times as much calcium as phosphorus, my opinion is that the mineral ratios are way out of balance.

When a new antler growth cycle starts, remember a nutrient dense, balanced, highly palatable diet, fed free choice is critical since a diet that is low or marginal in one nutrient, may limit antler growth even though other nutrients may be adequate. Remember, especially with minerals, more is not always better. The key is having enough in the right ratio with other minerals in the feed. Anything more just goes out on the ground.

Making a Case for Snakes

Red-tailed hawks eat many snakes, even venomous species. Credit: Public domain.

By Anna Huckabee Smith

Anna Huckabee Smith is a TWS Certified Wildlife Biologist® with Innovative Wildlife Management Services, LLC out of Mt. Pleasant, SC (IWMS_Smith@att.net). She has worked for both South Carolina and North Carolina state governments, first as the SC Department of Natural Resources Forest Stewardship Biologist and secondly the SC Comprehensive Plan Coordinator. She then moved on to become the NC Wildlife Resources Commission's first Urban Wildlife Biologist. Smith has a BS degree in Biological Sciences (1997), a Minor in Anthropology (1997), and a Masters in Zoology (2001), all from Clemson University. She is also a 2006 Fellow of the Natural Resources Leadership Institute (North Carolina State University, Raleigh).

As land managers, we know that every creature is ecologically important. Most species are tolerated fine, but snakes in particular tend to get a bad reputation based on misinformation as well as a cultural bias. Sure, they serve a valuable niche in the environment...but let one crawl too close for comfort and all logic and sympathy for the lowly serpent disappears in the flash of an axe blade or shotgun blast.

The Southeast is home to an incredible diversity of over 50 snake species that range in length from 5 inches to about 8 feet. A snake's skin is covered in scales made of keratin (like our fingernails) and is shed several times a year. There are a myriad of patterns and colors snakes can be, and variations can exist between juveniles and adults as well as within the same species. Most snakes lay eggs in late summer or fall, although pit vipers give birth to live young and stay with them to protect them for hours or even days. Most snakes are encountered in the spring when

the animals are actively seeking mates and first meals after winter dormancy.

All snakes are ectotherms ("cold-blooded") with an internal temperature typically around 86˚F. They can be nocturnal or diurnal, but their typical routine can change depending on the ambient temperature. Pine snakes and rat snakes are typically active during daylight hours whereas scarlet snakes are usually nocturnal. Corn snakes, copperheads, and watersnakes can be active at any time.

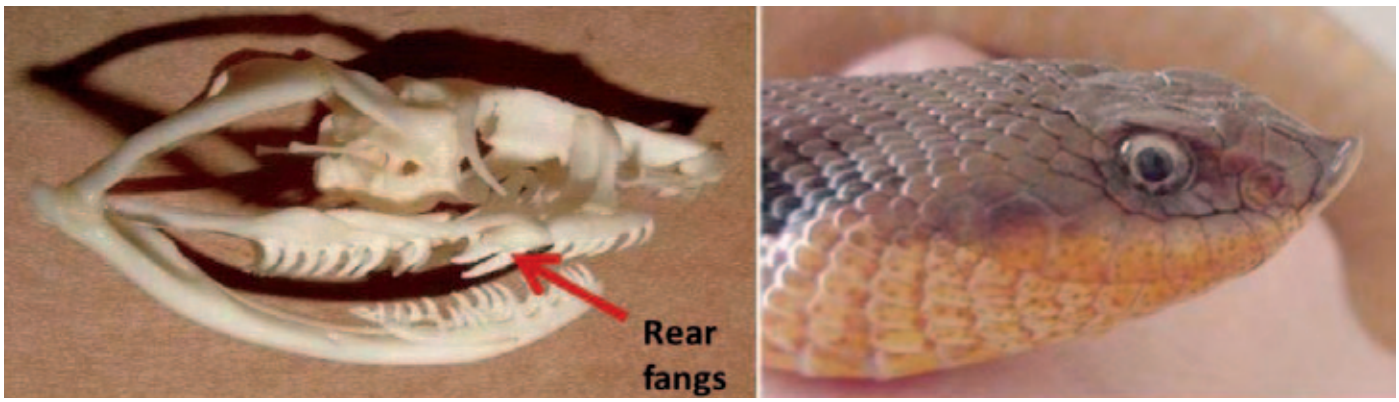
Feeding behavior varies from species to species. Some snakes such as the fast racer actively hunt for prey by sight, while pit vipers often wait in ambush (sometimes for days) for prey to pass within striking range. Watersnakes often hang over the water with their mouths open in the current, waiting until a fish touches it. Some snake species constrict their prey, some swallow it alive, and still others use venom or toxic saliva to subdue their prey. All prey is swallowed whole thanks to the ability of the snake to unhinge its lower jaw. Backward-facing teeth direct the prey toward the stomach.

All snakes have forked tongues which they use to "taste" the air for scent. The tongue is then inserted into the Jacobson's organ in the roof of the mouth where the chemicals are analyzed. Snake diets often consist of a wide variety of prey items such as small mammals, insects, amphibians, other snakes, eggs, birds, fish, and carrion. However, some species have very specialized diets. The worm snake eats mainly earthworms while the scarlet snake is a reptile egg-eater (especially lizard eggs). Crown snakes specialize in eating poisonous centipedes while crayfish snakes eat…you guessed it…crayfish! There is even a salt marsh snake that can tolerate brackish water where it feeds on fish and fiddler crabs.

On the opposite end of the spectrum, the black racer holds the distinction as North America's snake with the most diverse diet, eating everything from rodents to small turtles. Then there are a few species of note that go to extra lengths to supplement their diets. Canebreak rattlesnakes have a particular fondness for squirrels and will climb high into trees to get them. Cottonmouths will eat baby alligators while copperheads will climb trees to take out a noisy cicada or two. In turn, snakes are important food sources for raccoons, owls, hawks (especially red-tailed hawks), great blue herons, alligators, and large mammals. Even turkeys have been known to kill and eat such species as the pygmy rattlesnake.

Often it is what a snake eats that either earns him the ire or respect of landowners and wildlife enthusiasts. Anyone who has opened a bluebird box to find a rat snake instead of baby birds has probably not reacted positively to that snake's presence, to put it mildly! Then there are the quail managers who disapprove of those species that eat quail eggs, young, or adults (if they are lucky enough to catch them). Sometimes, though, the presence of one predator can help offset the damage caused by another more effective predator. For example, rat snakes do eat bird eggs and nestlings. However, they also prey heavily on rats which are significant predators of quail nests and compete with the birds for food. Based on captive snake feeding habits, one adult rat snake can eat approximately 78 rats per year. Corn snakes, kingsnakes, rattlesnakes, copperheads, and many more species also prey on rodents, helping to keep their populations under control. This not only regulates rodent predation on other species but also reduces the potential for the spread of diseases such as hanta virus and Lyme disease.

Some of the species with highly specialized diets also have a positive impact on humans. The rainbow snake, a species of watersnake, primarily eats American eels and even has a tail spine to help anchor it as it feeds on slippery eels and salamanders. Fishermen don't mind having this colorful snake around because otherwise eels would become a nuisance, stealing bait and eating more fish than even the snakes could catch. Watersnakes in general serve an important environmental purpose. As they eat dead and dying fish, they not only clean up the aquatic environment but also keep fish populations in check. As watersnakes eat, they ingest Mercury from their food making them great indicators of water quality.



This hognose skull (left) shows the backward-facing teeth typical of all snakes but also the rear fangs which are so important to this species for use in puncturing toads. The head of the hognose (right) shows the turned-up nose used for digging in loose soil to locate its prey. Credits: Wikipedia public domain.

Brown watersnakes often rest in bushes overhanging water. Because of their coloring and robust shape, they are often confused with the venomous Cottonmouth. Credit: J.D. Willson

For those people with a particular fear of venomous snakes, it may comfort them to know that kingsnakes are the champions at eating pit vipers and coral snakes as they are immune to the venom. Other species that eat venomous snakes include the indigo snake and the coral snake (it being venomous itself). Of course, sometimes the tables are turned and the would-be hunter gets swallowed by the prey!

For the land manager who is concerned that the diamondback rattlesnake, who feeds heavily on rabbits, as well as the squirrel-eating canebreak rattlesnake will have an impact on these important game species, fear not. The larger the prey item taken, the fewer times the snake must feed. It takes a while to digest such a meal, especially with the metabolism of a snake. Diamondbacks have been known to live off of only four or five large meals per year!

Perhaps it would surprise you to know that the venom of many snakes is currently being tested or already in use

The classic mouth gape threat display of the Eastern Cottonmouth. Credit: CDC

in the medical field to help save human lives. Site-specific proteins found in the various venoms have been used in blood pressure medicines, as clot busters, cancer treatments, and analgesics (pain relievers).

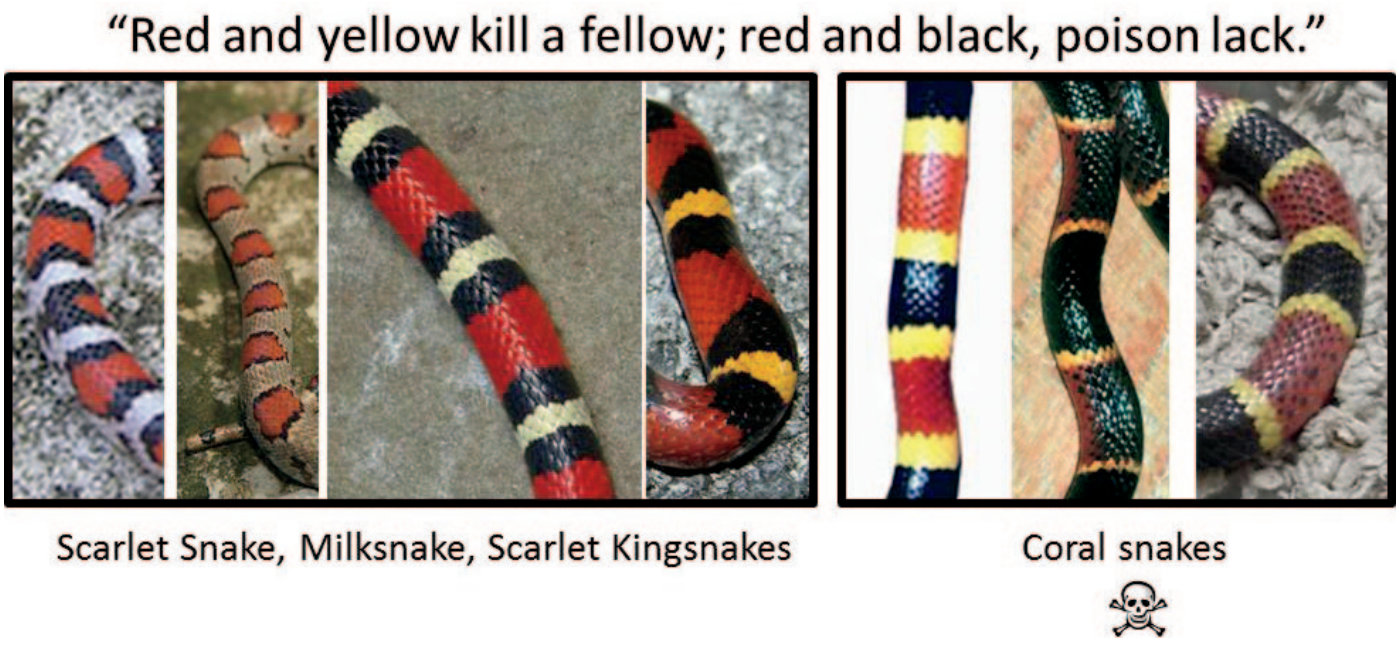
Of course, it is these venomous snakes most people fear. When going into a particularly good snake habitat or cleaning your property, arm yourself with these two things: knowledge and common sense. Invest in a good field guide and familiarize yourself with the Southeast's 6 potentially dangerous snake species. Wear leather boots for protection and don't put your hands into brush where a snake may be hiding. Common venomous

Rat snakes are adept at eating birds like this Northern cardinal. Credit: Public domain.

snakes include the copperhead, cottonmouth, timber/canebreak rattlesnake, diamondback rattlesnake, pigmy rattlesnake, and the coral snake. All but the coral snake are pit vipers. This means they have a heat-sensing pit between the eye and nostril. Their pupils are elliptical in shape (whereas nonvenomous snake pupils are round) and their heads are often triangular shaped. However, nonvenomous watersnakes also have large heads for catching fish. Pit vipers usually have fangs that flex forward and inject a mostly hemotoxic protein venom into their prey which destroys blood and tissue. There is also a single row of scales beneath the anal vent on the tail of vipers. Nonvenomous snakes have a double row.

The coral snake is a member of the cobra family and has no pits and round pupils which can mislead people into thinking it is nonvenomous. Because its coloration resembles that of the harmless scarlet kingsnake and other similar species, knowing a helpful rhyme can keep identification simple: "If red touches black, poison lack; if red touches yellow, it will kill a fellow." The coral snake has small, fixed fangs and chews on its prey to deliver its neurotoxin which inhibits breathing and other neurological functions. The tail scales of coral snakes are single like those of a nonvenomous snake.

Surprisingly, there are very few species of snakes that don't have some form of toxin in their saliva. This is because most snakes (except for the rat snake, kingsnake, and corn snake) have a modified salivary gland called Duvernoy's gland which is an evolutionary step towards a true venom gland. Some species like the crowned snake, flat-headed snake, pine woods snake, ringneck snake, and garter snake often chew on their prey in order to allow the toxins to subdue the prey. Hognose snakes are rear-fanged, although they don't inject toxins; the saliva runs down a groove in the teeth into their prey. They specialize in eating toads which they often have to puncture to deflate before swallowing. These and other spe-



cies of snakes are generally harmless to people unless someone has tendencies toward allergic reactions. Clean all snake bites well and apply an antiseptic.

Snakes have a variety of ways to avoid a confrontation with humans or potential predators. They can lie still and rely on camouflage to keep them hidden, make bluff strikes, release musk from the cloaca, feign death (hognose), puff themselves up to look larger, hiss, gape (cottonmouth), vibrate their tails (rattlers) or rub their scales to make rattling sounds (rat snakes), or flee to water or a hole. Snakes do not chase people. Venom conservation is crucial to many snakes and they don't want to waste it on a human. Most people get bitten when they unknowingly step on a snake or try to handle or harass one. Biting is a last defense and half of all bites are "dry bites." Warning signs given by a snake should not be mistaken for aggression. However, there are certain instances when a snake can be more aggressive than usual. During shedding, the vision is obscured making the snake feel more vulnerable. Juveniles are also more likely to strike out of fear. Female rattlesnakes found at their den site or with young can become defensive. Having a healthy respect for all snakes and keeping a safe distance (4 to 6 feet to stay out of striking range) is advisable.

Understandably, snakes are under many threats. Highways, pets, habitat fragmentation, predation (even from fire ants attacking their eggs), and persecution all take their toll. Some snakes are targeted simply for their similarity in appearance to venomous species. Watersnakes are susceptible to siltation and stream pollution which directly impacts their food source. Agricultural tillage inadvertently kills fossorial (ground-dwelling) snakes. Already, the indigo snake is federally and state (GA) listed as endangered while the diamondback rattlesnake's status is currently under review by the USFWS. Due to the loss of its primary habitat, longleaf pine savannahs, it may be headed for listing under the Endangered Species Act. Land managers can help maintain healthy snake populations by creating natural field borders, preserving a variety of habitats across the landscape, protecting winter den sites (rock piles, crevices, stumps, root holes), basking sites, and maintaining wetlands. Allowing vegetation to overhang water sources in some places will especially help improve watersnake habitat.

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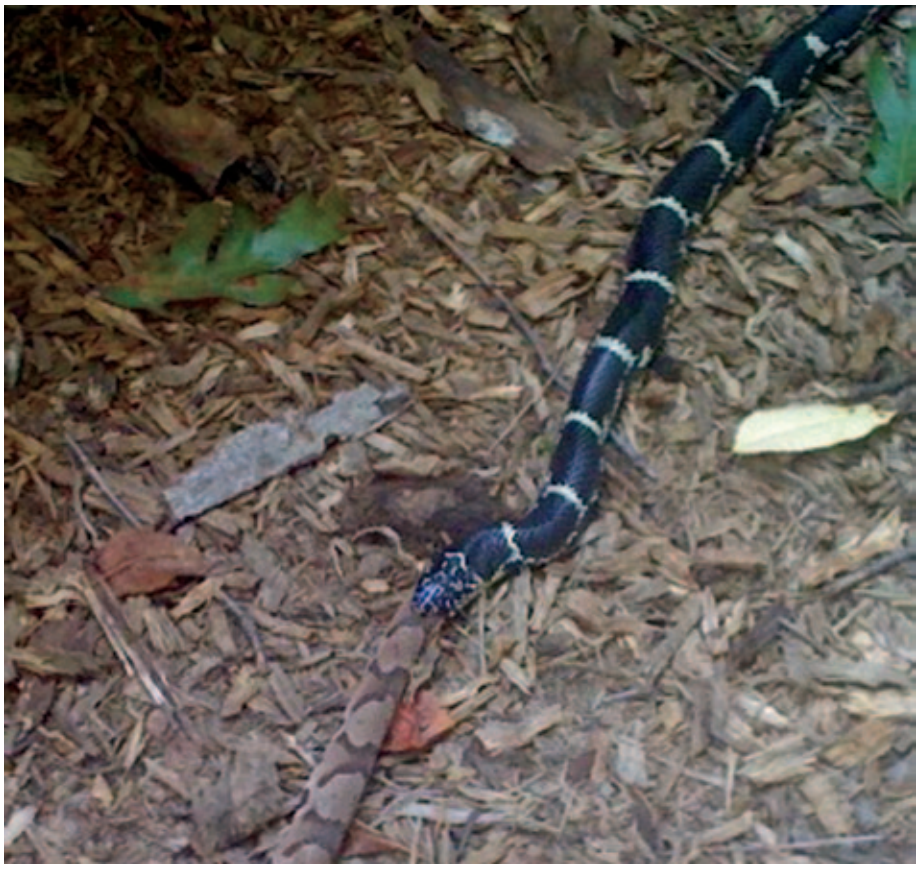


Eastern kingsnakes are admired for their ability to take on an consume venomous snakes like this copperhead. Credit: Public domain.

You Really NEED a Plan!

By Jim Walker

Jim Walker is Managing Partner of Blackjack Lands, LLC. He deals with consulting, construction and maintenance of recreational properties. Contact him at (205) 365-5205 or jim@blackjacklands.com.

You just left the lawyer's office and closed on the transaction you've been dreaming about for years. The getaway property you have always wanted is finally yours! Congratulations, you have BEGUN the process of owning a piece of recreational property.

The purchase of the property is just the beginning of the process in all aspects. Many more hours of planning and implementing plans are ahead as are many more dollars of investment in the project. Many buyers fail to realize that the purchase price is only a part of the financial investment that will eventually and inevitably be made in the property.

Depending on the piece of property, the purchase price could represent anywhere from 10% to 80% of the total expense of getting the property to approach the vision of the buyer. Never have I seen a purchase that was, as they say in the real estate

world, "Ready to move in". Many buyers spend, in the first year of ownership, an amount equal to the purchase price to get the piece the way they envisioned it. Improvements can be delayed for years; but, you will want them eventually.

It is strongly suggested that a buyer have at least a rough plan for the property before the closing of the purchase. Often your Real Estate professional can offer some help in an initial estimate of costs for some obvious improvements. However, without going through a thorough and detailed process, it is often not even clear what the real goals and visions of the buyer are. It has been said "if you have no idea of where you are going, how do you know when you get there?"

A plan for a newly purchased recreational property really consists of two plans. The first is a roadmap of how to get the property to the point of its being able to satisfy the reasons for the purchase in the first place. For example, if a buyer wanted, as one of his goals, to fish, then if there is not a lake on the property, one would need to be constructed. If hunting is a priority, steps would need to be taken to insure there is game, and the particular type of game, on the property to fulfill that desire. If the property is an overnight destination, is there a house, or does one need to be planned and constructed? Does the current road system suffice or will new roads need to be constructed and/or existing roads improved? This plan might be a one year plan or a five year plan according to the urgency of the owner and any financial barriers.

The second plan is a maintenance plan. Once the property is in a state to be able to provide the uses for which it was purchased, a plan must be devised and implemented to keep the property in a usable condition for its purposes. For hunting, food plots must be planted and nurtured each year. Horse or hiking trails must be checked, cleared from overhanging or fallen timber. Fields need to be bushhogged... The list goes on….

How to start

Get help. Even if a new landowner is a long time outdoorsman, an avid hunter, or fisherman, bringing in help from someone outside of the family is a good idea. There are a couple of options for this. A team could be put together managed and controlled by the land owner. Members of the team might consist of a wildlife biologist, a forester, an excavating company, a builder and others. The other option is to hire a professional who provides a comprehensive service involving all of the above disciplines. These consultants are usually "jacks of all trades and masters of...maybe one". They have a great deal of knowledge in most aspects of the development of rec-

Taking an inventory of a property's natural assets can uncover hidden gems. A waterfall offers a great destination when designing hiking or horseback trails.

reational properties and some are even licensed professionals in perhaps one field, but none are experts in all fields. They are, however, experts in putting a comprehensive plan together coordinating all the experts' input. In some cases, for example, the consultant may not need to bring in a wildlife biologist because his knowledge is sufficient for that particular landowners goal, but may need to bring in a forester for a more detailed valuation of the timber quality on the property. Others, who, perhaps, have a goal of developing a trophy-quality herd of deer, might need a wildlife biologist but not a forester. These professionals have the experience and database of contacts to put together the best team for the particular project. Time and money is saved by retaining the services of such a professional.

However the landowner decides to proceed, a good plan should consist of a clear and detailed description of the landowner's objectives for the property, a budget the landowner is comfortable with, a list of assets (what resources the property comes with), recommendations to accomplish goals within the given budget and implementation methods and schedules.

Identifying the goals and objectives is not as easy a task as one might think. All the users of the property should be consulted. The objectives of each should be merged and prioritized. Usually, a primary, a secondary and a tertiary objective are identified. Sometimes two of them might have some incompatibility issues. For example, some timber management practices may not provide the best habitat for whitetail deer. These incompatibilities can always be worked out by compromise and following the hierarchy of the objectives. But, they need to be identified and dealt with. Examples of objectives are Hunting (specific type or types), Fishing, Equestrian activities (specific type activities such as roping, cross country jumping, trail riding), Bird watching, Timber Management, Water Sports, Hiking, Rappelling, Canoeing, Wildlife viewing, and many more. There are as many possible objectives as there are people.

A new landowner should have in mind a total dollar amount he is willing to allocate to the property. As mentioned above, that determination should have been made prior to the purchase. A planner can help by providing realistic estimates based on past experience with similar projects. With this budget, the consultant can proceed to the next step with financial guidelines in mind.

After the objectives are identified and prioritized and a budget is decided on, the property should be analyzed to determine what assets the land naturally offers to provide for the objectives. As in the example above, if fishing is an objective, a lake or river is obviously necessary. Or, if hiking is an objective, are there natural resource assets such as waterfalls or scenic ridges that would make a good hiking trail destination? If Deer hunting is an objective is the property in an area of the state with high populations of Whitetail Deer or will extraordinary measures need to be employed to attract the Deer that are nearby? The assets (or deficiencies) are grouped with the objectives. Tools used to determine these assets include topo maps, aerial photographs, geological surveys, soil maps, and most importantly, many hours on foot traipsing through the woods, officially known as "field observations", usually the favorite part of the job for us consultants! Asset inventory could also include equipment and fixtures. Did any equipment come with the property as a part of the sale? Farm tractors and implements often come with a property that had been used for similar objectives. Buildings can also be assets. For example, a barn, if equestrian activities are an objective or not could be an asset for other uses such as storing 4 wheelers and tree stands.

With the objectives, assets and deficiencies identified, the planner can now merge this into recommendations for the property within the confines of the given budget. Each objective, beginning with the primary one, should be again defined, but this time within the parameters of the assets and budget. Then recommendations should be given in detail

for how to best meet the objectives. Higher weights of asset usage (physical and monetary) are given to higher objectives. This is the real meat of the plan. For example, a property with a primary objective of Bowhunting Whitetail Deer and a secondary objective of Equestrian activities (trail riding) would certainly contain, at least, the following items to consider:

Hunting

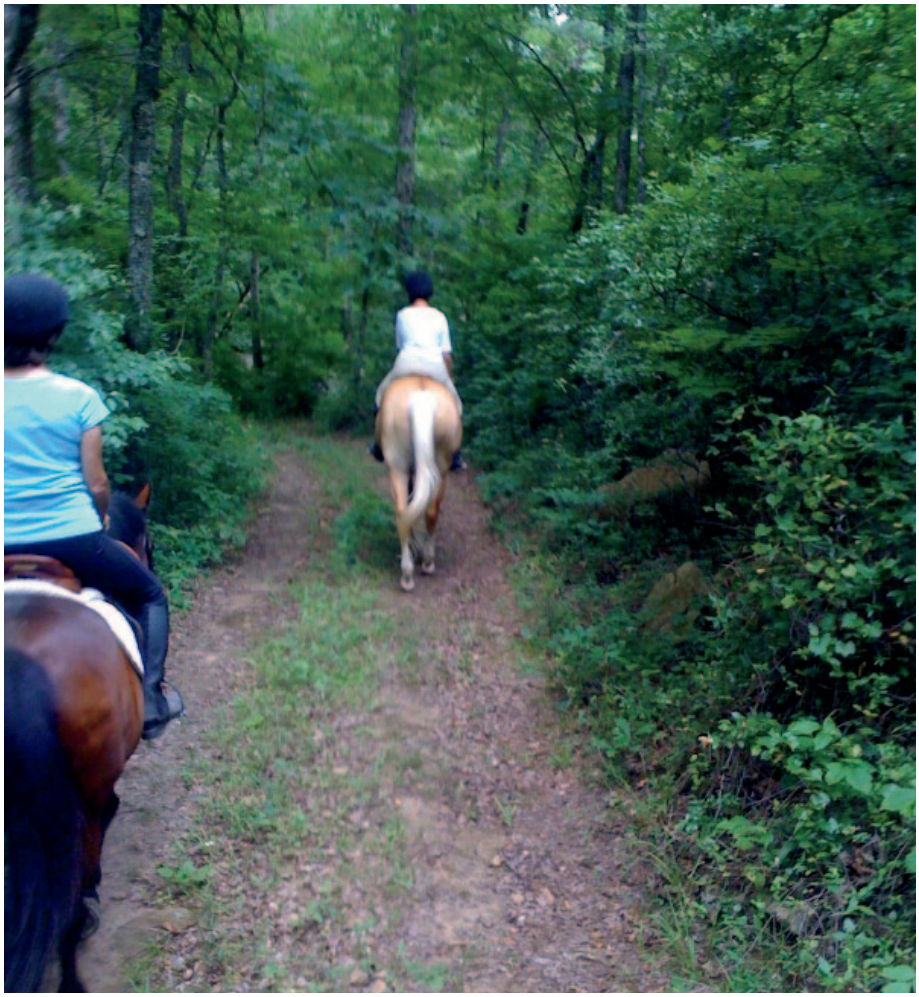
- Food Plots
- Quantity based on acreage, topography and deer movement patterns.
- Location of each on the property.
- Size and shape of each.
- Food offering - winter only or summer and winter. Specific crops.
- Shooting houses and Tree Stand locations based on patterns and wind.

Supplemental Feeding - (if necessary)

- Quantity and type of feeding apparatus
- Type of feed
- Mast producing trees and shrubs
- Roadside habitat

Harvest Recommendations

- Bucks - size or age and number



- Does - size and number
- Location and set up of processing (field dressing) equipment.

Equestrian Activities (trail riding)

- **Facilities**
  - Barn - or "run-ins" if a barn is not wanted
  - Farrier's station
  - Feed and/or Hay storage
  - Tack Room
  - Water Supply
- **Pastures**
  - Identifying logical location on property
  - Fencing
  - Food source - type of forage
  - Water source

This is just a small sample of the items to consider for this property and its objectives. It is also a good example of how two objectives can work together. In the above example, the choice for a forage crop for the horse pasture could and should complement the deer hunting objective. A mix of bahiagrass

WILDLIFE TRENDS JOURNAL RECEIVES QDMA AWARD

Owner, publisher and editor of Wildlife Trends Journal, Andy Whitaker received the Signpost Communicator of the Year Award from the Quality Deer Management Association at their National Convention in Nashville this year. "Deer Management is a key subject found in every issue, and the principles of QDM are evident in Wildlife Trends Journal. Andy has done an excellent job of turning research studies into understandable, usable information for landowners, land managers and hunting clubs when it comes to managing deer, turkeys, quail and many other game species."

and ladino clover for a horse pasture would be a better choice than bermudagrass. Even though bermudagrass has some qualities better suited to horse pastures, the primary objective of deer hunting would influence this decision.

All of the recommended improvements should be written clearly and in great detail. Aerial photos with color coded diagrams added are usually included to give the owner a picture of what items will go where and help him get an idea of the overall plan for the property.

The final stage of the plan is the implementation portion or how the improvement is to be made and a timeline for doing so. For example, will trails be cut with a bulldozer or with a mulching machine? Bulldozers are a bit cheaper and where terrain is an issue can make cuts into hills. Mulchers, on the other hand, create a finished product with one step (no debris to burn or bury) and are environmentally superior. If the property is wooded, food plots and pastures will need to be created by removing timber. If the timber is marketable, a cruise should be made to determine the value and a buyer/cutter engaged. This portion should also include estimated costs. The planner can rely on past experience and current quotes to determine costs of each improvement. The implementation schedule should be laid out in an orderly way much like a construction workflow document.

Depending on the scope, implementation of all the recommendations can take quite some time. Be prepared to be patient. Weather can play a big role. Dam construction for a water impoundment can be quite dependent on good dirt-moving weather not to mention the rain that will be needed to fill it. EPA and Corp of Engineers regulations and permitting can also slow the process of dam construction. Cutting timber is also very weather dependent. Food plots can only be planted at certain times of the year. Two seasons is a good rule of thumb for expecting your property to begin to resemble your dreams.

The implementation plan under way is a good time to begin working on your maintenance plan for the property. As mentioned before, this is the plan for keeping your property in a condition to be able to support your objectives. A maintenance plan should resemble the initial plan for the property in that the property owner's objectives should be laid out, recommendations made and schedules and costs determined. The difference is that this is an ongoing plan. Where the above plan and implementation probably called for some "big guns" such as excavators and construction professionals, the maintenance plan is on a smaller scale, usually involving farm tractors and attachments.

The biggest question here is how to accomplish all these periodical tasks called for in this plan. There are three choices here. One is for the owner to do it all himself or with help from family or friends. Many owners start out with these intentions but quickly find out it is much more an endeavor than was imagined. It may be fun for a year or two, but most of the time a different solution is sought eventually. The second choice is to hire a local farmer to be the "care taker". This is the most common scenario for recreational property owners and when the perfect person is found it is the best. You must find an honest, hardworking and knowledgeable person who also has time to tend to your property. The problem is there just aren't many people out there who fit that description. In the past there seemed to be plenty, but there aren't as many small farmers left and the ones still around have more to do for their own business and little time to devote to a neighbors' food plots. Both of these options require the owner to invest a good deal in equipment. A farm tractor big enough to do all the tasks efficiently and all the attachments necessary to do them is a minimum. These items alone could easily cost $150,000.

The third option is to hire a service company. Much like a residential landscaping company, these entities offer regular maintenance services to recreational property owners that may include bushhogging, planting food plots, fertilizing horse pastures, road maintenance, prescribed burns etc. These companies can be relied on to get the job done because it's their business, unlike the local neighbor who needs to tend to his own land first. The drawback is that they are not "down the street". They can't go by your farmhouse after a storm to check if the electricity is on or off and if the refrigerator needs to be emptied. They are in and out of your property very quickly and efficiently a predetermined number of times a year. Again, they are professionals at what they do so the job will be done right and at the right time, but they cannot be at the owners' disposal 24/7. The owner who goes this route often still wants to have a farm tractor around and that is fine and encouraged. A smaller tractor can be used to keep the yard cut with a finishing mower or to pick up a load of rock or dirt that needs to be moved or to transport a harvested deer out of the woods.

Whatever method is used a plan still needs to be developed and followed. Each owner has unique needs and personalities and will eventually migrate to a system that works best for him.

As with ALL of the most rewarding endeavors of life, owning a piece of recreational property is daunting. The rewards are great indeed. Time spent with family away from the fast paced daily grind or time alone in the woods listening for the faint sounds of deer rustling through the late fall leaves toward your tree stand is certainly worth the toil of ownership. The creation of your plans is time consuming and often frustrating, but as an act of love for the result, needn't be thwarted.

Good luck and have fun.

Wildlife Trends Journal Management Calendar

By Dave Edwards

October/November 2012

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Create a seed scale to ensure accurate seeding rates are applied when planting food plots.

How many times have you ever been in the woods planting a food plot and had to guess on the amount of seed to pour into the spreader for that particular food plot? Here's a tip that will help you more accurately measure the amount of seed to put in the spreader. Before going to the field, use a bucket (3 or 5 gallon size works fine) to weigh the various types of seeds/blends you are using. Once you are at the desired weight for each seed type (e.g., 10 lbs. of oats), use a sharpie to place a mark (and weight) on the bucket. It helps to use a clear bucket so you can see the outline of the seed from the outside. Due to the size and weight variations in different seeds or blends, you will need to follow this process for each of the different seeds or blends. For example, you may have a mark for 10 lbs. of oats and another for 5 lbs. of crimson clover. Once marked, the bucket can serve as an accurate "measuring cup" to measure seed being placed in the spreader. This will ensure proper seeding rates are applied on the acreage you are planting.

Coordinate food plot planting with desired soil conditions.

Generally speaking, October through early November are the best months to plant fall food plots in the southeast.

The goal is to plant when conditions are favorable for maximum seed germination and plant growth. Don't fall into the trap of planting too early. Unfortunately, many landowners and hunters plant in early-mid September. Some hunters, particularly hunting clubs, even pick a specific weekend that food plots will be planted well ahead of time and do not have a clue what the soil conditions will be like….but they plant anyway because "that's when we plant every year". This is often a very dry period across the southeast which will lead to food plot failure. If planted in September, and you are lucky enough to receive adequate rainfall, food plots may grow rapidly which will result in over mature (i.e., high/tall) food plots by the time hunting season arrives. This is very common during when an abundance of acorns are present (which seems to be the case this year in many areas of the southeast) because deer use of the food plots is limited allowing it to grow. There is also a higher chance of army worm problems if temperatures are still warm. In most areas of the southeast more consistent rainfall events begin in October as cold fronts move south. Planting "later" (meaning in October-November) will also result in young, tender food plots that are very attractive to deer and other wildlife during hunting season. Very young and growing food plots are very attractive to deer. When planted under the right conditions (adequate soil moisture), deer will begin using most fall food plot plantings within two weeks after planting. My point is to not feel rushed to get seed in the ground and focus on planting under favorable conditions. There have been several articles related to food plots and planting strategies in past issues of *Wildlife Trends*. Refer to these articles for more detailed information.

Build and install enclosures on your food plots.

Enclosures are simply small fenced structures that are placed on food plots to observe or monitor deer use of the plot and food plot success. The enclosure does not have to be big, just enough to prevent deer from eating a small area of the food plot. In general, enclosures are nothing more than a short length of 4 foot hog-wire fence that is "rolled" and fastened with either wire or zip-ties to create a tube with a 2-3' diameter opening. The enclosure can then be placed on a food plot and fastened to a stake. Enclosures are particularly helpful if you have a high deer density. I've often seen food plots in areas with a high deer density appear as though the plants never germinated. The landowner or land manager is beating himself up because he is thinking that he did not plant the food plot correctly, or that the particular seed mix he planted isn't growing well on his property. The fact is that deer have literally eaten the plot to the ground before it had a chance to grow (in this case, I would consider installing more food plots or, depending on your goals, planting lead to reduce the herd!). A food plot enclosure will help answer these questions.

Pre-measured seed weights marked on a bucket is a great tool in the field when planting food plots

Hold a preseason meeting with your hunting club or people that hunt your property to discuss the progress of the deer management program and harvest strategies planned for the upcoming season.

Holding a preseason meeting to discuss the deer management program and deer harvest plans for the upcoming season will ensure everyone is on the same page before the season kicks off and hunters head to the woods. Hopefully you have been collecting harvest, hunter, and population data regarding the deer herd. Use this information to assess the status of the deer herd and how the herd has or is responding to your management strategies. A preseason meeting is a great time to review this information, make harvest decisions for the upcoming season, and share with the group or hunters using the property. As a biologist, I often present this information to hunting clubs or landowners with recommendations for the upcoming season. These meetings are most effective if held just prior to hunting season to ensure the information is fresh on hunter's minds. This is also a great time to review general rules for hunting, discuss housekeeping items around the camp and property, and develop management and/or maintenance project lists. I often see these meetings tied into a work day or work weekend at the property.

Conduct a camera survey to assess the status of your deer herd to make sound/educated deer harvest decisions before you start hunting.

Monitoring the status of your deer herd is the backbone to the success of your program. Collecting and recording harvest data (weights, measurements, ages, etc), hunter observation data (number, sex, and quality of deer you see while hunting), as well as population surveys (such as spotlight counts or camera surveys) provides you information about the deer herd that will allow you to make sound deer management decisions and adjustments in strategies where needed to accomplish your goals. Without this information you are simply guessing. If you are like me, you spend way too much time, money, and energy managing your property to just guess on how many and which deer to harvest this season. I want to know. Conducting a camera survey is the best tool available to assess the status of your deer herd (number of deer, buck quality, fawn recruitment, etc) and make buck harvest decisions before you head to the woods. The best times of the year to conduct a deer survey is when natural food availability is at its lowest which is generally late summer/early fall and late winter before spring green up. Most managers conduct fall surveys (September through early November) because they also use the photographs to make buck harvest decisions before hunting season.

Conducting a camera survey is more than simply putting out a few trail cameras. A true camera survey, one that is used to determine population characteristics of a deer herd, requires establishing bait sites across a property at a density of 1 site/100 acres (this may vary depending on habitat quality and diversity). These sites are systematically established across the property and within all habitat types present. Each site is pre-baited for a week or so to attract deer to the site. Once deer are using the sites heavily, cameras are placed at each site and operated for 10-14 days or until no new bucks are being photographed. The photographs taken during this period are used to estimate the population and its charac-

Conducting a camera survey each fall provides information that can be used to determine harvest recommendations that produce desired results in a deer herd.

teristics. Analyzing the pictures is not as easy as simply counting the number of bucks and does photographed, it is a somewhat complicated process that requires counting total does and bucks photographed, identifying the number of unique bucks photographed, estimating their age, and plugging this information into mathematical formulas. Although some landowners/hunters conduct camera surveys themselves, most consult with or use a wildlife biologist to complete a survey. For more detailed information and help in understanding how to conduct a survey purchase "Deer Cameras: The Science of Scouting" from the Quality Deer Management Association.

Regardless of whether you conduct a full scale survey or simply use cameras to scout, photographs from trail cameras are a great tool to assess buck quality and make buck harvest decisions before the moment of truth in a deer stand. I have seen many young bucks with great potential make it another year because they were placed on a "do not shoot" list. If you are using the trail camera photographs to make buck harvest decisions late summer or early fall is when you need to deploy them. We generally try to conduct our surveys soon after bucks shed velvet but before the majority of acorns start to drop.

Calibrate deer scales before hunting season.

Whether the scales you use to weigh harvested deer at your hunting property are 10 years old or right out of the box, they should be calibrated each year before hunting season to ensure accurate weight data is collected. To calibrate scales, simply hang an object of known weight from the scale (e.g., 50 lbs bag of feed, tractor weight, etc), along with your gambril (normally a triangular metal hanger used to attach deer to scale), then adjust the scale to the known weight if needed. Although there are many makes/models of scales available most have a calibration screw that can be easily adjusted. Also note that it is not uncommon for a calibrated scale to read something other than "zero" when idle. Recording accurate weights from harvested deer provide insight to the health of deer on your property and will assist in making management decisions (herd and habitat) to achieve overall goals.

If you plant corn or lease to a farmer that plants corn on your property and you haven't already harvested it, consider leaving a section of standing or un-harvested corn to provide cover for deer and additional hunting opportunities.

Although in years past I never recommended planting corn for feeding deer, I now realize the "cover" value it provides for deer in the winter and how great it is to hunt in and around. I still

never recommend planting corn for feeding deer. It's simply not worth the farming time and effort when you can get more for your money out of a 50 pound bag of whole corn from the CoOp. However, if you have corn planted on your property, leave some standing for deer. Standing dead corn is not only attractive to deer from a food standpoint, but provides great travel corridors to connect woodlots or mature timber. In some situations, deer will "funnel" through mature woods to enter the corn as their travel path. This make for some fun hunting in the mature woods near the corn. Mowing a wagon wheel pattern or hub & spoke design in the corn also makes for some great hunting. This is particularly true on very cold mornings. Standing dead corn also provides great winter habitat for quail and turkeys. Leaving a border of standing corn around a field also provides valuable wildlife habitat and creates a soft edge.

Conduct pre-season projects that will help reduce or minimize deer hunting pressure and disturbance.

Hunting pressure and disturbance on a property significantly impacts the hunting quality or number of deer you will see. I have lots of hunter observation data that shows as more pressure is applied fewer deer (particularly mature bucks) are seen. Here are a few things that will help minimize hunting pressure: 1) Position stands around food plots so that hunters can enter and exit them without spooking deer. By this I mean place stands slightly inside the woods and/or plant a "screen" that will protect the hunter from being seen by deer in the field. Good screens include standing summer crops such as corn, Egyptian wheat, Sorghum Sudan. Other more permanent screens (which I prefer) include switchgrass, or evergreen type shrubs or conifers. Once stands are placed inside the woods, simply cut shooting lanes for hunters to see and

Saving leftover seed can save money! Simply store them in a dry/cool place until next fall then do a quick germination test to determine germination rate and adjust plantings accordingly.

Standing corn provides deer cover and a sense of security. Leaving matured corn standing then mowing shooting lanes through it in early fall is an exceptional hunting strategy - particularly for mature bucks.

harvest deer on the food plot. 2) Inspect stands to make sure they are safe, but from a disturbance standpoint, check for noises. Oil squeaky chairs, windows, doors, etc. Move around in the stand. Does it creak? Find the source and fix it. Ladders may simply need to be tightened. These little noises can ruin a hunt and disturb deer for future hunts. 3) Cut and clear trails for hunters to get to and from the stand without making a lot of noise. 4) Determine favorable wind directions for each stand and do not hunt the stand unless the wind is right. At my camp, we have a list of stands for each wind direction. We check the wind, review the list, and hunt accordingly. 5) Look at a map of your property and determine which roads will impact or disturb deer or other wildlife. Close these roads down before and during hunting season and only travel them on a "need to" basis. Besides properly managing the deer herd, the key to having high quality hunting experiences it to keep disturbance on the property to a minimum. For more detailed information on managing hunting pressure refer to an article titled "Steady Under Pressure" that was published by *Wildlife Trends (Volume 11, Issue 1).*

Save leftover seed from fall food plots.

If you have food plot seed leftover after planting this fall, save it. Some seed can remain viable for a long time and can be used next year; particularly if it is stored in a dry/cool place (I often use a walk in cooler to prevent problems with rats and bugs). When planting time comes around next year simply conduct an easy germination test to determine if the seed is still good. Take 10 seeds and place them in a moist paper towel in a window sill. Monitor and keep the towel wet over the next week to 10 days. If 6 of the 10 seeds germinate then your germination rate is roughly 60%. Adjust planting rates accordingly to ensure adequate coverage is obtained. Don't toss that old seed out - planting old seed can save you money.

Record and utilize deer hunting observations.

Quality deer management involves more than producing quality bucks. It should create quality hunting experiences as well. Collecting hunter observation data (where hunters record the number of deer and quality of deer they see while hunting) allows you to monitor the hunting quality of the property. Adjustments in management strategies can be implemented accordingly to promote quality hunting. Additionally, hunter observation data is a great (and cheap) method to help assess some parameters of the deer herd. Although a camera census is, by far, the most accurate way to collect information regarding the deer herd, trends in population parameters such as the adult sex ratio, buck quality, and fawn recruitment can be monitored with hunter observation data. However, for this data to be meaningful, it must be collected accurately each year to track trends in the data. Hunter observation data is also a good way to assess hunting strategy success.

Preparing for hunts now reduces last minute madness and frustrating opening mornings on the duck pond.

When recording this information, hunters generally record when and where they were hunting (e.g., PM-food plot, AM-woods, AM-clear cut, etc.) and what they saw. When the data is analyzed, it provides insight as to which hunting methods and which areas are most productive for the property. For example, through hunter observation data collected throughout the season, you may find that hunters saw more mature bucks per hunt in thinned pine stands in the morning verses the afternoon. Thus, you can adjust your hunting strategies to enhance the productivity of your hunting time.

Make final preparations for duck season.

By early November, flooding strategies on managed duck ponds should be well underway. Teal are generally the first to arrive in September followed by the fall migration of other waterfowl. In most areas the general duck season opens in November. There is nothing worse than looking forward to the first duck hunt and before daylight of opening morning realizing that your waders have dry rotted or that your duck blind is full of fire ants! Make preparations now to ensure you are ready to have a fun and successful hunt. While everyone's situation is different, a few items I recommend checking include waders or rubber boots, boats (lots of things to check here), paddles or push poles, lights, decoys and rigging, obstacles along paths to and from duck hunting blinds, the blinds themselves, platforms for dogs, and shotguns…to name a few. I say all these things from experience!

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