PRACTICAL WILDLIFE MANAGEMENT INFORMATION

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Clover – Still the One

By Dave Edwards and Ryan Bassinger

Introduction

It is well proven that properly managed food plots can significantly benefit wildlife and play a role in the success of your wildlife management program. Food plots serve three primary purposes – 1) increase the nutritional plane of the property for wildlife by providing high quality food sources throughout the year; 2) supplement natural food sources, particularly during periods of low natural food availability such as late summer and late winter; and 3) attract wildlife to your property to provide opportunities to observe or harvest wildlife. Although most hunters and landowners would claim they plant food plots for all three reasons, most plant food plots in the fall with the primary purpose of attracting

Crimson Clover

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wildlife for hunting. The goal of this article is to provide guidance that will not only help you attract wildlife to your property or specific areas of your property, but simultaneously provide high quality forages that will promote healthier, more productive wildlife populations.

As a consulting wildlife biologist, I have the opportunity of providing guidance to landowners and hunters on how to manage their properties for wildlife. One of the most common recommendations I provide to increase available nutrition for wildlife and enhance hunting opportunities is to create and manage year around quality food plots. In most cases, my clients already have food plots in place but are not doing an adequate job optimizing their nutritional value for wildlife. Because part of my role is to help them grow bigger and better wildlife (usually deer and turkey), including higher quality food plot forages is often needed for the added nutrition. Through this experience, I have found clovers to be quite beneficial and easily incorporated into a food plot program. The most successful food plot programs often include a combination of annual and perennial (year-round) clover plantings.

Benefits of Including Clovers

Food plots will be of little benefit to wildlife if your plantings do not meet specific seasonal needs or are not available when they need them. Unfortunately, there is no single food plot species that can provide a completely balanced nutritional diet for all types of wildlife. However, including clovers into your food plot program will provide added attraction and enhanced nutrition for wildlife without much additional work on your part.

Enhanced Nutrition

In general, clovers are more nutritious than many commonly planted food plot species. Among other nutritional benefits, most clovers have a higher percentage of digestible protein, which is needed for many biological functions and bodily processes in wildlife. Digestible protein in clovers generally ranges from 15% to 34% depending on time of year, growing conditions and soil properties. Thus, adding clovers to your program will increase the nutritional quality of your food plots.

An additional consideration is the indirect nutritional benefits clovers provide for game birds such as quail and turkeys. Most clovers mature and flower from spring through late summer, depending on the species. These flowers, as well as the tender leaves of clover, attract amazingly high numbers of insects which provide a dependable source of protein for turkey poults and quail chicks.

Arrowleaf Clover

Free Fertilizer

Clovers are part of the legume family. Legumes have the ability to convert atmospheric nitrogen to useable nitrogen. This process is known as nitrogen fixation. Nitrogen is absorbed by nodules on the root systems, which is then supplied to

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Durana Clover

Ladino Clover

the plant. If properly managed, clovers often produce more nitrogen than they can use resulting in increased nitrogen levels in the soil that can be used by other plants. Hence, planting legumes such as clover will provide additional nitrogen for other food plot species, such as cereal grains and chicory, which will reduce the amount of nitrogen you will have to buy to properly amend your soil to desirable levels. With the ever-increasing prices of fertilizer, clovers are a good choice.

Extended Food Plot Life

Adding annual clovers to your fall plantings will increase the length of time food plots provide quality forage. Most annual clovers experience a burst of growth in early spring when other food plot species begin to mature or die out. Clovers will continue actively growing and providing benefit to wildlife through early to mid-summer and help bridge the gap between the native plant growth lull that occurs between late winter and spring green up.

Free Seed

Some clovers are excellent re-seeders. Re-seeding annual clovers planted in fall food plots grow vigorously through early to mid-summer, produce seed, then die. Seed produced by these clovers falls to the ground and remains dormant until the following fall. If conditions are right, seed produced during summer will germinate the following fall and produce another good stand of clover. Thus, if the food plot is properly managed, you will not

have to purchase and plant annual clovers each year. Perennial clover plots may last several years with proper management, which will also save you on seed costs.

Hand-sowing clover seed

Year-round Nutrition

Perennial clovers grow throughout the year and generally provide a high quality food source for 8-11 months of the year depending on the severity of drought and heat during late summer. Depending on management intensity and weather conditions, perennial clover plots may persist for many years. Ensuring quality food sources are avail-

able for your wildlife is particularly important during summer, particularly late summer, when natural food sources are limited. Many biological processes are happening in wildlife during the summer. Deer are raising fawns, lactating (producing milk), and growing antlers which result in high nutrient demands. During this same period many other wildlife species such as turkey, quail, and rabbits are raising young. Managing perennial clover plots that are very productive during summer provide an excellent source for this much needed nutrition.

Including Clovers in your Food Plot Program

Before you run out and buy clover seeds to add to you food plot mix, there are a few things you need to know. Clover seed is very small and requires a smooth seed bed and delicate planting techniques to ensure optimal seed germination. Once germinated, most clovers are more pH sensitive than other commonly planted forages and require a relatively balanced pH, thus amending the soil with lime to neutralize soil pH is essential for success. In other words, planting and managing clover in your food plots is a bit different than the normal planting techniques, but will help optimize your plot's wildlife and hunting value. The following are things you need to know before including clover into your food plot program:

Annuals vs. Perennials

There are a gazillion clover species out there. Most fall within two major groups – annuals or perennials. Annual clovers generally germinate and grow rapidly, produce seed, then die. Some annual clovers are commonly referred to as re-seeding annuals. This means they grow, seed out, die, and then regenerate from the seed produced the previous year. Examples of re-seeding annual clovers include crimson, arrowleaf, and subterranean. Annual clovers grow rapidly after germination and are very attractive to wildlife. These clovers make great additions to fall food plots for deer and turkeys and can be managed so that the clovers regenerate each year. Perennials, on the other hand, continue growing after they produce seed and generally persist throughout the year. Unlike annuals, perennial clovers spend more energy establishing a root system during their first year of growth and generally do not produce abundant visible growth until the first spring following establishment. However, perennials can actively grow and produce abundant high quality forage for several years with proper management. Due to their management needs, perennial clover should be planted as a stand alone crop or in a mixture with other perennials, such as chicory.

Soil Preparation

Proper soil preparation is very important for successful clover establishment and management. Most clovers are pH sensitive and grow best in soils in the 6.0 – 7.0 pH range. Because the pH of most soils in the south is normally much lower than this (generally 4.0-6.0 pH), growing healthy clover plots will require amending the soil adequately with lime. Because it can take several months for lime to significantly change the soil pH, I recommend collecting soil samples and apply-

ing/incorporating (disking in) required lime amounts in the spring (prior to planting in the fall).

Preparing a smooth, firm seed bed before planting is also important when planting clovers. Once required lime has been incorporated, the basic steps in seed bed preparation include breaking the ground thoroughly, harrowing the field to eliminate grasses and weeds (herbicide is often used), and cultivating or smoothing the field (leveling). A cultipacker is an excellent tool to use for final smoothing and packing in seed. The end result should be a smooth, firm seed bed ready to plant. Smooth is the important word here. I know smooth is relative and you will not have "table top" precision, but smooth your planting area the best you can to ensure planting depth is consistent across the plot which promotes optimal germination and growth. Without a smooth planting surface, many seeds are covered too deep and will not germinate. Again, if you don't own a cultipacker, invest in one – it's an invaluable tool for smoothing and firming the seed bed prior to planting and packing in seed afterwards.

Planting

Clover seeds are VERY small. Although many people use grain drills to plant clover seed, I prefer to broadcast it, then cultipack to press seed slightly into the soil. My experience with using grain drills to plant small seeds like clover has not been good and may be partly due to the operator! I've planted (or at least thought I've planted!)many acres with a drill not realizing the seed tube was clogged and wasn't dropping any seed. And I'm not convinced that a tractor/drill running across plowed ground has the capability of planting tiny seed precisely at ¼ inches deep. I will say that I plant a lot of clover using a grain drill, but pull the tubes off the small seed box to allow seed to essentially broadcast while drilling larger seeds (wheat, oats, winter peas, etc) in the same pass. I know many managers that successful-

Liming truck

Perennial clover field

ly plant clover with a grain drill; I simply wanted to share my experience/opinion when planting clovers. In most cases you can broadcast clover seed with a smaller ATV spreader or a hand spreader. I like the comfort of being able to see the seed hit the ground and having total control of how much seed is being planted. If you are planting an annual food plot that has larger seed in the mix, such as winter wheat or oats, plant the larger seed first, drag or disk the seed in, then broadcast clover over the plot. I generally follow this by cultipacking the field to ensure good seed-to-soil contact. Under no circumstances should you "disk clover in". This is the best way (besides having a very rough seed bed) to bury clover seed too deep. If you do not have access to a cultipacker, use a very light drag (piece of chain-link fence or a tree top) to cover the seed, or simply broadcast clover directly on top of the ground and allow rain to work the seed in (ensure rain is in the forecast and/or soil moisture is adequate at the time of planting).

Managing Clovers

Before addressing management strategies for clover, we must first clarify whether we are managing annual clovers or perennial clovers. Each requires different management techniques.

Managing Annual Clovers

Again, annual clovers (e.g., crimson, arrowleaf) refer to those that are added to fall food plot mixtures of small grains that will grow

rapidly, seed in early summer, then die. Once planted, annual clovers require little maintenance (unless undesirable weeds are problematic). Simply allow the plots to grow through late winter. Once spring arrives, generally right at spring green up, mowing the plot will release clover from the towering wheat, oats and other weeds that are beginning to mature and seed out. You are not cutting your yard. The goal is to mow wheat, oats, or other weeds, but not the clover by simply raising the mower deck to the desired height. Forget about the plot for the rest of the summer and allow clovers to flower, seed out, then die sometime around June or July depending on the species planted and your local climate. A few weeks prior to your fall planting dates, mow the plot (that is now covered in summer weeds) as close to the ground as possible. In a week or so, spray the field with glyphosate (RoundUp) to kill the weeds in preparation for planting your fall plot. Just before planting time when weather conditions are favorable, lime (if you haven't already done so), fertilize, lightly disk, and drill in wheat and oats. If feasible, burning the plot after the herbicide has killed the weeds is a great option that will really clean the plot up and often stimulates the annual clover seed to germinate. If you don't have access to a drill, simply broadcast cereal grains prior to disking. Seed from clovers planted the previous fall will germinate naturally.

Annual Clover Management/ Maintenance Schedule:

- March: If needed, mow plots to release clover from winter wheat and other grasses/weeds.
- April - May : Allow annual clover to produce seed heads. Do not mow. Turkeys and poults will eat insects attracted to the flowers, and deer will continue using plots to rebound from winter.
- July-August: Clover plants will gradually die. Leave the plot fallow until about 3-4 weeks before estimated fall planting dates. At that time, mow weeds/grasses,

Planting clover

allow weeds to start re-growing (about a week or so), then spay plots with Roundup to kill existing weeds.

- Planting time: Fertilize plots. Lightly disk to incorporate fertilizer, stimulate clover seed and promote seed-soil contact (seed from previous clover plot). Broadcast or drill small grains such as winter wheat and/or oats. That's it. The seed from last year's annual clover will germinate and the cycle begins again. Note—you will need to add small grains each year.
- NOTE: Plan ahead. Do not plan to plant summer annual crops (soybeans, corn, peas, sorghum, etc) in the same areas you plant annual re-seeding clovers. If you disk and plant these areas in summer crops such as corn or beans, you will lose all the "free" seed produced from clover you planted the previous fall.

Managing Perennial Clovers

Perennial clovers refer to those that are planted as a stand alone crop or in a combination with other compatible perennial species. Perennial plots also can be very cost effective because they often do not require replanting each year and often last 3-5 years or longer. The key to successfully growing perennial plots over several seasons is planting them in moist areas that receive partial sun (such as the east or west side of a field that is surrounded by tall trees that block direct sunlight), and controlling competing weeds and grasses. Once planted in the fall, perennial clover requires no management until the following spring (unless cool season weeds are an issue). It is important to note that most perennial clovers, such as white clovers, devote much of their energy during the first year establishing their root system and are relatively slow to get established (at least above ground). Thus, it is important to include an annual crop species in the mixture during the initial planting to provide a quality food source until the perennials establish. Once spring arrives, weeds will be poised to take advantage of your hard work and fertilizer in an attempt to out compete the perennial clover. Although mowing at this time will help clover out compete weeds by setting them back, applying a post-emergent herbicide will kill weeds and provide clover more protection. Spring is also the time to fertilize perennial clover plots. Because clover produces its own nitrogen, do not apply fertilizer containing nitrogen. Extra nitrogen will only feed weeds and grasses, making them more aggressive. Management for the remainder of the year is focused on monitoring the presence of undesirable weeds and grasses and applying management (mowing or herbicide) as needed. Once established, clover will create a "closed canopy" effect which reduces sunlight on the ground and will reduce weed germination.

Perennial Clover Management/ Maintenance Schedule:

- March – April: Spray a selective post-emergent herbicide to control undesirable broadleaf weeds or grasses.
- April: Apply fertilizer. Do not use fertilizers with nitrogen. Adding nitrogen will only feed grasses and increase weed problems. 0-20-20 is a common fertilizer used on clover plots. Use soil tests to determine fertilizer rate.
- April – August: Monitor plots. If grasses & weeds exist, mow the plots. Do not mow plots low. Cutting height should be just over the clover (6-10"). If mowing does not control weeds and grasses, spray plots with the appropriate herbicide. It is often necessary to apply a "tank-mix" of both grass & broadleaf herbicides. This will significantly enhance clover plots and reduce the need to mow. Do not wait to spray plots. If weed problems appear inevitable, spray earlier in the summer. Mowing is used to help knock the grass and weeds back to allow clover a chance to out-compete and overcome the weeds. Herbicide kills the weeds which takes them out of the game.
- September- October: If clover plots successfully made it through summer, fertilize according to soil test results.

Conclusion

Quality food plots can certainly benefit wildlife on your property, assist in meeting your long term wildlife management goals, and allow more enjoyment of your property. Although other quality forages can add value to your food plot program, incorporating clovers will enhance the wildlife value of your food plots by increasing nutritional quality, prolonging the period in which they provide high quality forages, and if managed in perennial clovers, provide a year-round quality food source.

I wouldn't be doing my job if I didn't stress to you the importance of understanding that improving food plots should not take the place of native habitat management or population control. It is the combination of all of these activities that creates a "wildlife haven". I hope the information provided here will be useful in helping to manage quality food plots on your property.

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

Lynx rufus: The Silent Predator

By Kevin Patterson

The name bobcat (Lynx rufus) is an abbreviation for bob-tailed cat, referring to the animal's short tail with its dark rings. The first part of the scientific name, Lynx, is a Greek word given to lynx-like cats; it comes from two Greek roots meaning, "in lamp" and "to see", and may refer to the bright eyes of the animal as seen in reflected light. The second part, rufus, is the Latin word for "reddish," describing the general body color. The common name refers to the short or bobbed tail. Other vernacular names include bay lynx, barred bobcat, pallid bobcat, catamount, lynx cat, wildcat, loup-cervier (French), lynx roux (French), pichou (French Canadian), chat sauvage (French), gato monte (Spanish), and red lynx.

In the wild, bobcats may live to 10 or 12 years of age and in captivity up to 25 or more years. Adult bobcats usually weigh 20 – 30 pounds but have been known to exceed 40 pounds. Bobcats have a very strong odor, and their dens also develop this characteristic smell. The secretion from anal glands may be used along with urine as a scent marker. Marked fluctuations, related to their food supply, often occur in bobcat populations. They are very capable of swimming and readily cross streams and small rivers.

Home range size of bobcats increases as food abundance decreases. Adult male bobcats have an annual home range of approximately 18 to 28 square miles, depending on locale. They are more active and move more in winter and spring than summer and fall with the most restrictive range occurring during the hot months of July and August. Transient males have considerable larger home ranges and may make extensive movements of up to 40 miles. Females have a home range of 5 to 12 square miles from January to March. In spring and summer they live in a more restricted area because they are caring for kittens.

Unlike coyotes, there is little social interaction between individual adult bobcats. Depositing of fecal matter and urine is used to establish boundaries of their home range. These scents serve to prevent encounters of resident individual bobcats and to notify transients that a range is occupied. Within these home ranges, some individuals travel between 3 and 7 miles a night and often move distances of 2 to 7 miles between resting places. Their greatest movement occurs when food is scarce or, for males, during the mating season.

Even though bobcats are seldom seen by people, they are both nocturnal and diurnal with most hunting occurring around sunrise and sunset. Bobcats can and will kill animals as large as adult whitetail deer by biting the throat at the esophagus or jugular vein, eventually suffocating the animal. Whitetail fawns are a preferred prey and are often preyed upon by bobcats. Bobcats gorge themselves when food is plentiful, and may not feed again for several days. They waste considerable meat and may kill more than they eat.

The breeding season of the bobcat varies with latitude, longitude, altitude, and climatic variations. However, breeding season normally begins in December and may extend into June with usually a peak in March. After a 50 to 70 day gestation period, 2 or 3 (with extremes of 1 and 5) young are born. Litter size is normally

higher for adult females than for yearlings. Most litters arrive from mid-May to mid-June, but some are born as late as September or October. Weaning of the kittens occurs around 2 months of age, but the young stay with the female until fall or even later. Females mate when 1 or 2 years old, but males do not breed until approximately 2 years of age. Bobcat kittens are born blind and remain so for approximately 3 – 11 days. The kittens are raised by the female. The adult male bobcat provides no parental care.

Young bobcats start accompanying the female when 3-months old. At 6-months of age, bobcats will travel alone, but always close to the den. Early bred female bobcats may have a second litter late in the year. Young bobcats disperse before the next litter is born.

The following parasites are known to occur on or in bobcats: fleas, mites, lice, ticks, roundworms, flukes, tapeworms, spiny-headed worms, and protozoa. The known diseases that bobcats contract are distemper and rabies. The bobcat is also the known host of a fatal disease (Cytauxzoonasis) of domestic cats.

Coyotes can be detrimental to wildlife populations, especially whitetail deer. However, bobcats are grossly underestimated in their capabilities as predators. One wildlife research project in South Carolina reflected where one adult male bobcat had killed eight (8) adult white-tailed deer prior to its neck-attached radio transmitter ceasing to properly function.

Wildlife managers should recognize the importance of having a well-rounded wildlife management plan. Predator populations (i.e. bobcat) have to be controlled and maintained in order for prey populations (i.e. deer, turkey, quail, rabbit, etc.) to stay healthy and viable. If one aspect of a wildlife management plan does not exist; the entire goal of the plan will suffer negative affects.

Wildlife game/prey species are most vulnerable to predation during the spring and summer months. This is because the young are born in early to late spring and are less able to provide defenses for themselves at such a young age. As earlier stated, bobcat kittens are weaned from their mother's milk at approximately 2-months post birth. This means that they will immediately need red meat in their diets. In addition to teaching their kittens how to hunt on their own, the female bobcats will also provide meat for their young.

Bobcats are mostly solitary and hunt with stealth-like precision. They are visual predators, typically approaching prey in utter silence, pouncing upon them in a burst of speed, and killing swiftly by applying a crushing bite directly to the head and neck. With retractable claws on their hands and feet, bobcats can latch on to the shoulders of large prey and steady themselves for the accurate, killing bite. Excellent hearing, and the ability to climb, adds to their hunting efficiency.

Bobcats tend to live their lives in and around natural cover. Bobcats prefer grassy and brushy areas, while mature stands of pine and oak are avoided. They inhabit a variety of environments, including subtropical swamps in the southeast, arid areas in the northwest and temperate forests in the north. Habitat preferences throughout the year strongly reflect prey abundance. In winter, habitat selection is greatly influenced by snow conditions, and bobcats prefer low elevations, south-southwest facing slopes, rocky terrain, and open areas.

During my predator control work, I find that almost every wildlife manager is amazed at the actual population of bobcats on their property. As stated, bobcats live their entire lives in and around natural cover. Therefore, they are not often seen by humans, such as coyotes and red fox, which are most comfortable with open-type terrain. It is my experience and profes-

sional opinion that bobcat populations have dramatically increased in most areas since the 1980s.

I find that a lot of trappers think that bobcats do not have a good sense of smell. However, my experience has taught me that bobcats actually do smell very well. When conducting professional trapping instructions, I always instruct my students to place their sets as close to the bobcat's normal travel route as possible. This is not because I think bobcats cannot smell well; it is because bobcats travel in a lackadaisical fashion while mostly utilizing their sense of sight and hearing. Once they have located a point of interest (i.e. prey, lure, etc.), they tune in to their sense of smell upon approach.

As most any seasoned trapper will tell you, one has to think like a bobcat in order to become proficient at catching them. It has been many years since I caught my first bobcat and I have grown to respect this animal as being one of the most effective and prolific predators that exist in North America.

Kevin Patterson *is C.E.O. and president of Predator Control Systems, LLC. He has a B.S. in Wildlife Biology and has 30 years of experience in predator control work. He conducts predator control work throughout the south, southeast and Midwestern United States.*

Fish Attracting Structure for Sport Fish Ponds

By Kedric Nutt

My colleagues and I are frequently asked about designing or installing fish attracting structure in ponds. We are commonly asked to consult with a pond contractor to direct or design the installation of structure during the construction of new ponds. This is certainly the best time and most efficient way of constructing and installing fish attractors.

During these endeavors, we are often asked questions of a technical nature. Pond owners typically want to know how many attractors is best, what type of structure material is best, number per acre, etc.

The answer to most of those questions is that there are no technical answers. Surprisingly, or maybe not so surprisingly, there has been very little actual research on fish attracting structure in sport fish ponds. In fact, there has been so little and of such poor quality, it is safe to say there has really been no research on this subject.

Therefore, fish attracting structure in sport fish ponds is a subject of art and experience, rather than science. In this article, as in consulting with our pond owner clients, I can relate what we have observed as effective and what we have experience with. Again, though, there is no scientific research to rely on to tell us how many attractors you need per acre, how large, etc.

One of the critical aspects of fish structure in sport fish ponds relates to the depth of the water where the structure is placed. Related to this is how far off of the bottom the structure reaches up toward the surface – how far below the surface it is.

Most pond owners and pond contractors initially think, "Well, we've got to put the structure in deep water, because that's where all the fish will be, especially in the summer when it's hot. So we piled up all the stumps and brush and pushed into the deep water down near the dam." Well, that's just as wrong as it could be.

Now, just take a second to think about this and consider common sense points about fish ponds and fishing. First, consider a somewhat biological fact about bass and bluegill. Bass and bluegill both are shallow water, shoreline – 'littoral' is the technical term – oriented fish species. They are not open, deepwater species – 'pelagic' – like striped bass, for example.

Why in the world would structure out on the bottom of the pond in the deepest spot of the pond attract and hold bass and bluegill? You're right – it won't. Except, of course, in the dead of winter, during the coldest time of the year

Heavy equipment used to install large structure in pond

Use of entire tree to make good structure along shoreline

when bass and bluegill go to the deepest water because it is the warmest water in the pond at that time of year. But you aren't going to be fishing then… are you? Of course, you aren't. You might be hunting or doing other things, but you're probably not going to be fishing when it's cold enough for the water to freeze in your line guides.

This is another perfect example of how there is so much hearsay, folklore, superstition, old wives' tales and old fishermen's tales about ponds and pond management. You may have heard ol' Billy Bob, the local pond builder or the local 'expert' bass fisherman, say that fish structure in ponds had to be thus and so, but the fact is ol' Billy Bob probably knows as much about pond management as he does about brain surgery. And I'm quite sure you wouldn't want ol' Billy Bob performing a complex brain surgery on you or one of your children.

So, to begin at the beginning, where do we put all or most of our fish structure ? Well, you put it where the bass and bluegill are going to be anyway, particularly during the time of the

year you are going to be fishing. You should locate most of the structure in the shallow water, along the shoreline, which, by default, will be in water depths of probably no more than 5 to 6 feet, depending on the lay of the land on which your pond was built.

Simply think about this: you will do most of your pond fishing in the late winter through the spring and into the early summer. Where are the bass and bluegill going to be during this time ? Exactly….in the shallows. This is during the pre-spawn, spawning and, in general, the warm season. It is before it gets truly hot and fish move offshore - though not necessarily to 'deep water' - to avoid the uncomfortably hot water of the shallows.

Still, it is certainly productive and effective to place structure in 'offshore' areas. Notice I did not say 'deep'. Again, this goes back to where the fish are going to be. If you do place structure in offshore areas, make sure it is a large item which reaches from the bottom all the way to the surface, breaks the surface or is near enough to the surface that you can easily locate it. For example, in a deep water area, an entire tree can be used as an attractor. We have used this with great success and production in many ponds.

A key consideration for pond structure is how many are necessary. Pond owners often ask if there is a certain number of structures per acre to provide good fishing. The short answer is no. To my knowledge, no research has ever been conducted on that subject at all. Like many things in life, with fish structure, you need not too much, not too little, just enough. Again, I can offer no guidance on number per acre based on research.

In particular, avoid too much structure and large areas of too dense structure material. I make the analogy between fish attractors and hunting food plots. The trick with creating fish attracting structure in ponds is to make a reasonable number of isolated structures to concentrate the fish in high density. I refer to it as 'shooting fish in a barrel within a barrel'. The result is the majority of fish in your pond are concentrated in these 'barrels' with a corresponding large area of open water volume basically devoid of fish. But that's what we want,

isn't it ? We want to go to our pond and catch a bunch of fish in a relatively short time, not go fishing and hunting for fish all day and catch a few.

For example, I have seen large areas – one to several acres – of dense standing timber/brush or tightly compacted brush (such as in large windrows) where the fish were simply too spread out, not concentrated in a relatively small area. The result was poor fishing, just as if there were no structure present.

Regarding materials to use for fish attractors, it can be somewhat a matter of taste, but the natural materials – trees, tree stumps, brush, etc. – are as or more effective than man-made or artificial materials. Personally, I prefer the appearance of the natural materials since they produce a naturalistic setting. However, man made materials which we have used and observed to be very effective include wooden pallets, rip-rap piles and piles of other large sized stones or concrete pieces.

Items and materials which I have personally observed over the years to not consistently hold fish include standing timber, large isoloated boulders, in-place tree stumps and Christmas trees (of a variety of species). In addition, the traditional practice of creating large windrows of the cleared timber, brush, stumps produced during pond construction just has never been shown (to me at least) to consistently hold bass and bluegill. Whenever consulted, I strongly advise against them.

Whatever the material used, there should be large enough void or spaces in the structure so both bass and bluegill can swim into, through, under and around the structure. This is so it can provide cover from predators, hiding places for the predators, shade from sunlight, etc.

One good thing about creating and installing good, productive fish attracting structure – it can be done before or after the pond is built and filled. If you have an existing pond with little or no structure in it, do not despair. One man can install very productive fish attractors using brush, small trees or shrubs which can be picked up and dropped into a pond along the shoreline, which is, as we already discussed, the most productive area for structure anyway.

Of course, for a large pond using large materials, it is best to make use of the heavy earth moving equipment present during construction to install structure. In that case, large stumps and whole trees can be manipulated and set in place.

The creation and installation of productive fish holding structure is not a complex or complicated management issue. With a little elbow grease, an adequate amount of the proper materials and a little common sense, a pond owner can create productive fish reefs where he can regularly go to 'shoot fish in a barrel within a barrel'.

Kedric Nutt *is co-owner and operator of Southeastern Pond Management. He lives and works in Auburn, Alabama.*

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Baiting for Deer in 2007: An Update

By Stephen Ditchkoff

One of the most contentious issues among deer hunters and biologists is the issue of harvesting deer over bait. The issue seems to resurface annually in deer camp, public forums, and even state legislatures. If baiting is legal in a state, then it seems that those opposed to baiting are continually attempting to make it illegal. Similarly, in states where baiting is not legal, interest groups are constantly working to make it legal.

To be perfectly frank…what gives? Is baiting good or bad? Should it be legalized, or is it so detrimental to wildlife populations that we should go so far as to strike it from the history books? In this article we'll review the legal status of baiting in the Southeastern states, describe some of the major arguments that are used in support and opposition to baiting, and provide an objective comment on some of these arguments.

For a bit more background on baiting, and a more thorough description of some of the arguments for and against baiting, you should read the two-part series previously published in Wildlife Trends that described the pros and cons of baiting. These articles can be found in Volume 5, Issues 4 and 5.

Current Status of Baiting in the Southeast

States in the Southeast fall into one of three categories with regards to the legality of hunting over bait for white-tailed deer. First, there are those in which the practice is strictly illegal. An example would be Alabama. According to Alabama law, "No person at any time shall take, catch, kill, or attempt to take, catch, or kill any bird or animal…by means, aid or use, directly or indirectly, of any bait". Other states in which it is illegal to hunt over bait include Georgia, Mississippi, Tennessee, Missouri, and Virginia. It is legal to hunt over bait in North Carolina, Florida, Kentucky, Louisiana, Arkansas, Oklahoma, and Texas.

Finally, there are two states that I would describe as hybrids. Hunting over bait is not entirely legal, nor is it illegal. What I mean, is that in some parts of the state it is legal to hunt over bait, while in other parts of the state it is illegal. For example, In South Carolina, it is legal to hunt over bait in counties that are found in the coastal plain: these tend to be the southeastern counties. It is illegal to hunt over bait in the northern and western counties.

Similarly, in West Virginia, there are different rules in different counties. Just a few years ago, it was legal to

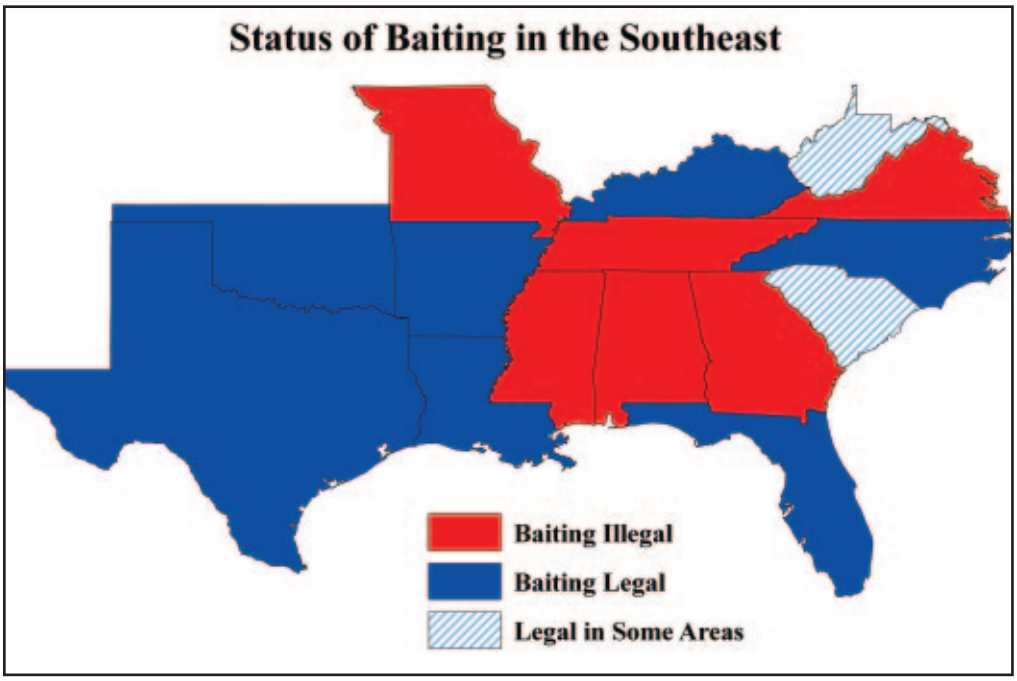

Figure 1. Legality of baiting in the southeastern United States. Baiting is legal in states shaded in blue, and is illegal in states shaded in red. In South Carolina and West Virginia (hatched in blue) baiting is legal in some locations and illegal in others.

hunt over bait in every county in West Virginia. But in 2005, Chronic Wasting Disease was discovered in Hampshire County in the eastern portion of the state. At this time, baiting was banned in northern county in an attempt to contain the disease, and reduce or eliminate its spread to other portions of the state.

In most cases, bait includes any sort of supplemental food, such as corn, soybeans, or pelleted feed. In some states, it is also illegal to hunt over mineral supplements. It is legal to hunt over planted food, such as corn, wheat, or other agricultural crops that have been grown using normal agricultural practices.

Arguments in Opposition to Baiting

First, let me state right at the outset that I am not opposed to the harvesting of deer with the aid of bait. I began hunting in a state where baiting was legal, and my earliest deer hunting experiences took place over bait piles. Three of my first four deer were harvested over bait, and each of them brings back fond memories. In my opinion, at the end of the hunt, whether the deer is harvested on a food plot, under an oak tree, or approaching a bait pile, the result is the same: a dead deer. But, the hunting experience that is most attractive to me at this stage in my life does not include a bait pile. For that reason, I choose not to hunt over bait when I am hunting in a state where it is legal. But, I will forever support the rights of a hunter to harvest deer over bait if it is a legal practice.

There are numerous arguments that are cast in opposition to baiting. First are the moral arguments. A segment of the population (some hunters included) believes that the harvest of deer over bait is immoral. They argue that fair chase does not apply when hunting over bait, and they choose to force their moral beliefs on others. I am not going to get into a moral debate concerning baiting for deer, but will try and describe some of the scientific arguments that are common in the "Great Bait Debate".

The argument in opposition to baiting that carries the greatest weight in my opinion is the potential for bait sites to serve as a focal point for the spread of disease. The discovery of bovine tuberculosis in white-tailed deer in Michigan and chronic wasting disease in white-tailed deer in Wisconsin can be linked to baiting, or supplemental feeding. While the presence of a concentrated food source was the not what caused these diseases to spring up in these areas, supplemental food has undoubtedly contributed to their spread.

Bait piles and supplemental feeders serve to concentrate deer in tight groups when feeding. It is not uncommon to have ten deer feeding within five feet of one another at a feeder (at winter feeding sites in the north, you can find 100 deer or more at one time). Any disease that is spread by animal-to-animal contact will ben-

Figure 2. These bucks are using a free-choice feeder filled with a pelleted ration, which can also be used to bait deer to a location while hunting. Of the 280+ images taken at this and other feeders on this property over a 2-day period, only 6 were during daylight hours.

efit from a situation such as this. Diseases that can be spread by aerosol transmission (particulates in the breath or saliva that enter the air when sneezing, breathing, coughing, etc.) are easily passed from animal to animal when in close proximity. Additionally, at bait piles, animals frequently consume food that has entered the mouth of another individual and fallen out. Whether it be corn at a bait site, or a sugar beet at a winter feed site (common in the north during winter), the result is that disease-laden saliva is readily passed from animal to animal.

Those who support baiting argue that this situation does not differ substantially from a food plot. However, I disagree. To argue that a food plot has the same potential to spread disease (because of animal-to-animal contact) as a bait pile is an exaggeration. While deer may come to the same food plot day after day, they are using an area that can best be described in acres as opposed to square feet. Although the same routes of disease transmission can operate on a food plot, the risk is much less. Similarly, baiting proponents often argue that mast crops (acorns and soft fruits) concentrate deer in a similar manner to supplemental feed sites. However, these concentrations are temporary.

Figure 3. Timed feeders are generally used for baiting as opposed to feeding. The benefit to this type of feeder is that deer use of these feeders is very predictable because feed is distributed only at regular predetermined times.

Scientists and biologists opposed to baiting will throw out additional arguments, but to be honest, I tend to believe that most other arguments are designed to make feeding seem more sinister than it really is. Each of those other arguments undoubtedly has validity, but in reality probably has very little negative impact on deer or the habitat in which they reside. For that reason, I won't spend any more time reviewing them. For a thorough review of these arguments, see the article by

	Baiting	No Baiting	% Difference
Total deer harvest (deer/mile2)	15.00	11.50	30.4
Doe harvest (deer/mile2)	7.54	5.57	35.3
Buck harvest (deer/mile2)	7.45	5.98	24.5
Doe:Buck harvest	1.01	0.92	8.3
Hunter effort (man days/hunter)	16.2	20.1	19.4
Hunter success (man-days/deer harvested)	8.18	8.57	4.6

**These data were taken from the website of the South Carolina Department of Natural Resources. www.dnr.sc.gov/wildlife/deer/baitingweb8106.pdf*

Table 1. Deer harvest data in portions of South Carolina where baiting is legal, and where baiting is illegal.

J.E. Miller in Wildlife Trends in 2005 (Volume 5, Issue 4).

Arguments in Support of Baiting

One of the arguments that is often espoused in support of baiting is that it will ensure that deer have adequate nutrition during all times of the year. In most cases, it is legal to supply feed to deer outside of the hunting season, but feed must be removed a certain period of time prior to hunting season. However, I struggle with the contention that deer "need" this feed. If a deer herd needs supplemental feed or bait to be able to be in good condition (meaning that they will be in poor condition without it), then herd density needs to be reduced (for a discussion of this issue, see the previous article entitled "Deer Management: Back to the Basics" in Wildlife Trends in 2007, Volume 7, Issue 1). If a manager has the herd in good condition, and is then providing supplemental feed to further improve condition and development of the herd, then the provision to supplementally feed or bait during hunting season would undoubtedly be beneficial.

Probably the most common argument used in support of baiting focuses on the impact it may have on deer harvest: specifically doe harvest. One of the biggest pushes in deer management in the last 20 years has been antlerless harvest. Most baiting proponents contend that legalizing baiting will serve to help increase doe harvest to desirable levels. In my opinion, this is an incredibly shallow argument. First, is there any indication that states where baiting is legal have been more successful in getting population density to, or maintaining density at, desired levels than states where baiting is illegal? Is doe harvest greater in states where baiting is legal? Is hunter effort per harvested doe less in states where baiting is legal?

South Carolina provides as an excellent opportunity to examine data on questions such as these. In the northern half of the state, baiting is not allowed, but it is legal in the southern half of the state. Because both of these areas have similar deer densities, age and sex structures, and hunting pressure, it is possible to get a glimpse into the effect that baiting has on deer harvest. In the area where baiting is legal, hunter success, doe harvest, buck harvest, and deer harvested per unit time (e.g., effort) are lower. Every single parameter that was measured suggests that it is more difficult to harvest deer when baiting is legal than when it is not legal. So, if baiting will make doe harvest so much easier, how is it and other measures of deer harvest worse in those parts of South Carolina where it's legal?

I, and others, speculate that many hunters tend to develop a reliance on baiting when it is legal, and the result is that their hunting skills decline over time. When hunting over bait, a hunter does not have to consider the biology and behavior of white-tailed deer when selecting a stand location. As those skills diminish, hunters become less successful and less confident when hunting away from bait, and they tend to become even more reliant on baited hunting sites. And because hunters are easily patterned at bait sites, hunting success declines. Young and inexperienced deer (fawns and yearling bucks) are seen regularly on bait piles during daylight hours, and the impression is given that lots of deer are moving.

But the deer that hunters want to harvest tend to stay away from bait piles until after dark. Considerable data have been compiled that show that adult deer tend to visit bait piles after dark, and as a result, hunters tend to have a difficult time harvesting deer at bait sites.

However you cut it, the fact is that the best data available indicate that hunting over bait diminishes hunter success…even though it goes against simple logic. But, if you really think about it, it makes a lot of sense. If you keep in mind what these deer do for a living (they stay alive), and you accept that they are pretty good at what they do, and that we educate the heck out of them each year, then you would expect hunting success to be low at locations where we continually advertise human presence…such as at bait piles.

A Few Final Thoughts

Whether you support, or are against, baiting, I think you should keep in mind a few things. First, understand the biology of deer, and how baiting, or not baiting, influences deer behavior and life history. Without question, there are some positives and negatives to bait piles. But in most cases, the arguments that you hear are exaggerations of reality. More importantly, keep in mind that baiting is primarily a moral topic, not a biological one. We try and use biological arguments to argue for or against baiting, and the fact is that most of the arguments are somewhat shallow. As a hunting fraternity, we need to hold our brothers close, regardless of whether they have different hunting philosophies. There are enough attacks on hunting from outside the fraternity that we don't need to help their cause by fighting amongst ourselves.

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

A New Wildlife Real Estate Trend

By Ron Haaland

Many of us can remember when finding a good place to hunt simply required asking permission from a landowner. Permission was usually granted with a few reasonable rules of land use and often a location of the best opportunity for game. Unfortunately, this once common practice is rare or even obsolete. Many factors have contributed to this situation. Unlike Montana that has 30 million acres of public land; many states have very little public land available for hunting. Furthermore, the limited amount of public land is usually heavily utilized.

As the population has grown, the quantity and quality of private hunting land has declined. In addition, rural land values continue to rise being driven by hunting or recreational trends rather than agricultural production potential.

SPORTING COMMUNITY CONCEPT

One answer to the hunting land dilemma is a shared ownership concept I call a Sporting Community. Several people own lots in a rural subdivision that is a part of a larger hunting and fishing property. The subdivision is usually located in some aesthetically favorable area; perhaps around a lake or on a bluff overlooking the hunting ground. Each owner purchases a lot in fee and has shared ownership in all remaining land. Although this is not a completely new concept (I developed Dunaway, a 3500 acre project in TN nearly 20 years ago), it is becoming more prevalent. Sporting Communities have been developed in several states in recent years. White Oak Valley Plantation (WOVP), a 2,850 acre project near Birmingham, Alabama exemplifies many of the things that need to be included when developing a highly productive Sporting Community.

LOCATION

A Sporting Community has to be developed in an area that works for people as well as wildlife. Just any old piece of land won't do the trick. WOVP developers took into consideration such things as climate, topography, water, habitat, aesthetics and convenience. Located about 30 miles south of Birmingham, it lies at the south end of the Appalachian Mountains. The moderate climate and beautiful lay of the land make it both aesthetically pleasing as well as productive wildlife habitat.

GOALS AND PROJECTIONS

WOVP, like other Sporting Communities, was developed to offer a limited number of people an opportunity to enjoy hunting and fishing at a level not obtainable on public land. WOVP was specifically designed for 29 owners. In addition to providing a beautiful building site for each owner, a major goal of the developers is to offer the best deer hunting in the South. Turkey and quail hunting as well as trophy bass fishing and horseback riding are also part of the master plan.

HIGH FENCE OPTION

A high fence around 2250 acres not only

WOVP is a large watershed in itself and it has several year around streams that are well dispersed. This adds to the aesthetics of the property as well as the functionality of the habitat.

High Fence

provides security for the property but offers the opportunity to use enhanced deer genetics and management techniques.

The deer in this region of Alabama include white tail genetics introduced from several northern states and Texas in the 1950's. No deer have been brought into the project from out of state. However, new genetic lines from the best deer breeding programs in the USA have been introduced into WOVP using artificial insemination. Using the Maxbo (362" at 6 years old) genetic line from Texas, it is expected that WOVP deer will score 160 at 4.5 years

Maxbo

Yearling

Clover Field

and 170 to 200 at 5.5 years.

The high fenced property also allows controlled nutritional management for the deer herd. High quality forages such as white clover and alfalfa have been planted throughout the habitat and additional protein is supplied with strategically located feeders. Mast producing trees and shrubs have also been planted throughout the property.

All hunting within the high fence area meets Safari Club International's fair chase requirements. Results to date have been up to owners' expectations.

The results of managing your deer herd.

Habitat and terrain are perfect for turkey on WOVP. Several flocks roam the grounds utilizing the extensive mast as well as planted chufa.

Quail habitat is being developed on ridge tops and in convoluted open areas. Longleaf pine is being planted to enhance the quail habitat and add value to the land.

A high fence virtually stops trespassers and poachers. This gated community security amenity adds value to a project like WOVP.

WATER

Water is a critical component of a Sporting Community. Ample water will enhance the wildlife population on any property. It can also be a design component in a master plan. In addition to well dispersed streams on WOVP the topography of the property lead to the development of two lakes and one pond.

The design signature of WOVP is the newly constructed 60 acre Blue Buck Lake. It was a time consuming component of the project because it required Army Corps of Engineers

East lake

approval. Extensive rock structure, reefs, channels, etc were added to provide maximum habitat for fish.

The lake is stocked with 50,000 Georgia Giant bream, 50,000 threadfin shad, 50,000 fathead minnows, 50,000 mosquito minnows, 2,000 pounds of crawfish, 1,000 pounds of frogs, 5,000 hybrid crappie and 2,500 F1 Tiger Bass.

Blue Buck Lake will yield trophy bass in 4 to 5 years but more importantly, it is where the subdivision containing 29 five acre lots is located. This design concept provides owners with a great lake front location for their cabin or home yet leaves the majority of the land for

Lake bottom

Log home

wildlife.

SPORTING COMMUNITY MANAGEMENT

The right location and limited membership are the keys to successful management of a Sporting Community. If the location is not suitable for top notch wildlife habitat it will take a lot of extra physical input to bring it up to a productive level. If there are too few members, the per member cost to maintain the project may cause friction between members. On the other hand, if there are too many members the wildlife resource may not support the activity level envisioned.

The developers usually maintain management control until the project sells out. Thereafter, a landowners association takes over management decisions regarding how the land is to be used and maintained. In the case of WOVP, the developers have put together a team of wildlife, forestry and land management experts to guide the project through its initial phases.

Covenants and guidelines are normally put in place to maintain development and land use continuity. For example, on WOVP, only log or stick built homes will be allowed using earth tone colors for trim. In other words, a retreat cabin on Blue Buck Lake can not be a white columned mansion.

Land use guidelines protect the property from overuse and abuse. For example, allowing four wheelers to go off road or off trail will lead to degradation of habitat and wildlife populations as well as erosion problems. Uncontrolled activity of this type also contributes to noise pollution; one of the things most people are trying to get away from. However, allowing only electric or oar powered boats on the lakes enhances the sense of tranquility while fishing or hiking.

Hunting and fishing guidelines will result in optimum wildlife populations that can be enjoyed by all owners for many years. On WOVP guidelines are established based on detailed analysis by the professional management team. Deer census data obtained by digital cameras throughout the property is used to monitor herd size and health. WOVP allows one 5.5 year old trophy buck per owner plus several does and management bucks if needed. The guidelines are changed as data dictates.

Deer census

Rainbow trout

Fishing guidelines are simple; eat what you catch and stick to state limit regulations. One exception is the WOVP lodge pond. This 2 acre pond is stocked each fall with 5 pound rainbow trout. These fish offer great sport through the winter and are fished out by spring because they can not tolerate the warm summer water temperatures.

With the landowners association monitoring the guidelines, they ensure the common interests of the group are met. If an owner is out of line such as harvesting too much game or wanton disregard for aesthetics, the association would have covenant protocols that would address the situation. Usually a discussion with an owner solves the problem but fines

may be necessary.

The main advantages of being an owner in a Sporting Community are all owners share equally in the purchase price of a large land area and in operating costs. For one person to own and manage the same amount of land is often prohibitive because of cost, skill and time management issues.

Lake Construction

PROJECT MANAGEMENT; START TO FINISH

Developing a Sporting Community like WOVP is more challenging than developing a city subdivision. Everybody has to follow regulations governing subdivision development. Often, subdividing in a town or city entails clearing off the vegetation, surveying in streets and utilities and registering a plat followed by curb and street construction.

Surveying, road and utility development, etc in a Sporting Community development have to be considered in relation to the habitat potential and aesthetics of the land. For example, on WOVP, roads follow contours to minimize erosion and are lined with sawtooth oak and clover to improve wildlife food production.

A well-maintained road system

In rural areas where most Sporting Communities are developed, septic systems and individual wells provide two critical utilities. On WOVP, each lot is evaluated by a professional soil scientist who stipulates the specifications for the septic system.

Power may be above ground or buried depending on terrain. The main power line on WOVP, which is several miles long, is overhead but the feeder lines to residences are underground. This improves the looks of the community while the overhead lines provide perch points for doves and other birds.

Ponds and lakes are an asset to any property. They increase both the monetary as well as habitat value of the land. Topographic maps of a property will give a good indication of where a pond or lake could be located. However, if the lake has much size to it the Army Corps of Engineers will have to evaluate the site, an archeological review will be required and dam construction engineered and approved. This process took over a year before construction of Blue Buck Lake could be started. The construction process is very detailed and time consuming. Fortunately, WOVP had ample clay near the lake site that could be used

Here's a great place to drop a line

for coring the two dams needed for Blue Buck Lake.

Lake management starts before water accumulates. Lime was spread at 5 tons per acre and structure developed before the dams were built. This will ensure good fish habitat from the start. Fish were stocked when the lake was approximately 30 percent of full pool.

If habitat is present and managed properly from the time the Sporting Community project is conceived, it will be easy to get potential owners interested in the project. If habitat has to be developed from scratch it will be much more difficult to make a sale.

Although WOVP had excellent habitat to start with, the management plan calls for continued improvement. Mulchers were used to thin unwanted vegetation. This opened up areas for more productive deer, turkey and quail habitat. Plus, it improved the looks of the land.

Mulching

Inevitably it takes longer and costs more to develop a Sporting Community than one anticipates. As with all projects, delays can be due to weather, materials, regulations, etc. If tasks are completed in the proper order, it is possible to bring prospective owners to the project and get them oriented. Prospects with a bit of vision will have chosen the most desirable lots, moved in and be hunting and fishing before the project is complete.

Dr. Ron Haaland *is president of Haaland Company, a land management and resource development company. He can be reached at ronhaal@bellsouth.net.*

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Management Calendar

October/November

Attend Wildlife Trends Field Day

This year's Field Day will be held in Oglethorpe County, Georgia, about 15 miles out of Athens. This year's topics include Food Plot Preparation, Quail habitat improvements, Chemical usage in Pine Stands and more. This is a great opportunity for you to hear from some of the nation's top wildlife biologists and land managers on a 182 acre piece of land.

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 makes 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 a camera census to assess the status of your deer herd to make sound/educated deer harvest decisions before your 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 censuses) is essential because it 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 census 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. Pictures from a census will help reduce "mistakes" when judging bucks in the woods while hunting (where judgments are often made in seconds while your heart is racing 200 beats per minute!) The best time to conduct a camera census is early fall or late winter because natural food availability is often at its lowest during these periods. If you are using the census to make buck harvest decisions in addition to determining all the other population information, early fall is when you need to conduct it. We generally try to conduct our censuses soon after bucks shed velvet but before the majority of acorns start to drop.

Conducting a camera census is more than simply putting out a few trail cameras. A true camera census, one that is used to determine

population characteristics of a deer herd, requires a census site (place that is baited and used to take pictures of deer) density of 1/100 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 (baited before the cameras are activated – before the census) for at least 2 weeks. 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 determine the population characteristics. 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, their age, and plugging this information into mathematical formulas. Although some landowners conduct camera censuses themselves, most consult with or use a wildlife biologist to com-

Here's one of the best ways to manage your deer herd.

plete a census. For more help in understanding how to conduct a census contact Wildlife Trends.

Food plot preparations should be well underway

It is difficult, if not impossible, to establish successful food plots without preparation. Planting quality food plots is a process that may span over several months, not a weekend. There are several factors that influence the success of a food plot program. Among the most important are establishing a well thought out food plot plan, ensuring proper soil fertility and pH, preparing a firm, smooth seed bed, only planting under favorable conditions, and controlling weeds. Each of these activities plays an important role in the success of your food plots. Don't fall into the trap of planting too early. Unfortunately, many landowners and hunters plant in early-mid September. This is often a very dry period across the Southeast which will lead to food plot failure. However, if you receive adequate rain, food plots may grow

rapidly which will result in very high food plots by the time hunting season arrives. There is also a higher chance of army worm problems if temperatures are still warm. Early-mid-October is the ideal period to plant fall food plots in most areas of the Southeast. This is when we start getting regular cold fronts that bring rain. Planting "later" (meaning in October) will also result in young, tender food plots that are very attractive to deer and other wildlife.

The primary deer management tool during the fall is a bow or rifle.

Harvest deer. Although biologists provide deer harvest recommendations, the hunter is the deer manager. Remember that each time you pull the trigger you are making a deer management decision. In fact, not harvesting deer is a management decision. Unfortunately, I see many landowners with goals of producing trophy bucks that are allowing the deer herd to overpopulate because they like to see 20+ deer when they go to a stand. This situation often results in a poor quality deer herd with significant dispersal of deer to surrounding properties, less reproduction and fawn recruitment, and ultimately poor quality antlers. If your goal is to manage for a quality of trophy deer herd, harvesting an adequate number of deer each year is essential to keep your deer herd and habitat healthy. A true camera census (not simply scouting with cameras) is a great way to assess the status of your deer herd to make sound deer management decisions. A camera census will provide insight to the deer population size, buck age structure and quality, adult sex ratio, and fawn recruitment. Knowing this information will make achieving your goals relatively easy. With the right information, deer management is easy. Photographs from a camera census are also an excellent tool to make buck harvest decisions before you head to the woods.

Flood duck ponds to "full pool" by early-mid November.

Allow ponds to slowly flood to "full pool" as November approaches. Ideal water depths for dabbling ducks such as mallards, gadwalls, wood ducks, etc is 12-18" with pockets of 4"-6" depths. The reason to have your ponds flooded 2-4 weeks before the hunting season opens is to give ducks a chance to find your ponds and get used to using them. Flooding too early (more than a month before the season) may result in seed deterioration resulting in less food later during hunting season. For best hunting, do not over-hunt your duck pond and allow a "rest" period between hunts. If you have several duck ponds, designate one as a "no hunt area" to provide a place for ducks to loaf. This will keep them on your property.

Where possible, leave field borders and/ or summer crops standing for additional winter cover.

Deer, turkeys, and quail will use these areas for loafing, escape, bedding, and nesting cover. There may also be some seeds left from the summer crops that will provide additional food sources during the winter for turkeys and quail. Standing dead summer crops such as grain sorghum, corn and millets provide additional edge habitat and can be used to create "soft edges" along areas where food plots or fields abruptly meet mature forests.

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

Hunting pressure and disturbance on a property significantly impacts the hunting quality or number of deer you will see. We 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 spooked 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 the remains of 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 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 of debris 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. I've had stands that I was dying to hunt but had to wait weeks for the right wind. Have you ever seen one of those guys in a hunting magazine with the whole side of a barn full of trophy buck mounts? I've worked with some of these guys and I promise you they have hung stands that they have never hunted because they were waiting on the right wind! Hunting a great spot at the wrong time can ruin the spot. 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.




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[1]Hurst, G.A. and B. Watkins. 1998. Vegetation following imazapyr for site preparation. Southern Weed Science Proceedings. 41:201.
[2]Witt, J.S., A.S. Johnston, K.V. Miller, J.J. Brooks, P.M. Dougherty, P.B. Bush. 1993. Response of wildlife food plants to site preparation in the Georgia Piedmont. In: Forestry and Wildlife Workshop: Technology and Environmental Issues. Clemson University. September 1-3, 1993.