PRACTICAL WILDLIFE MANAGEMENT INFORMATION

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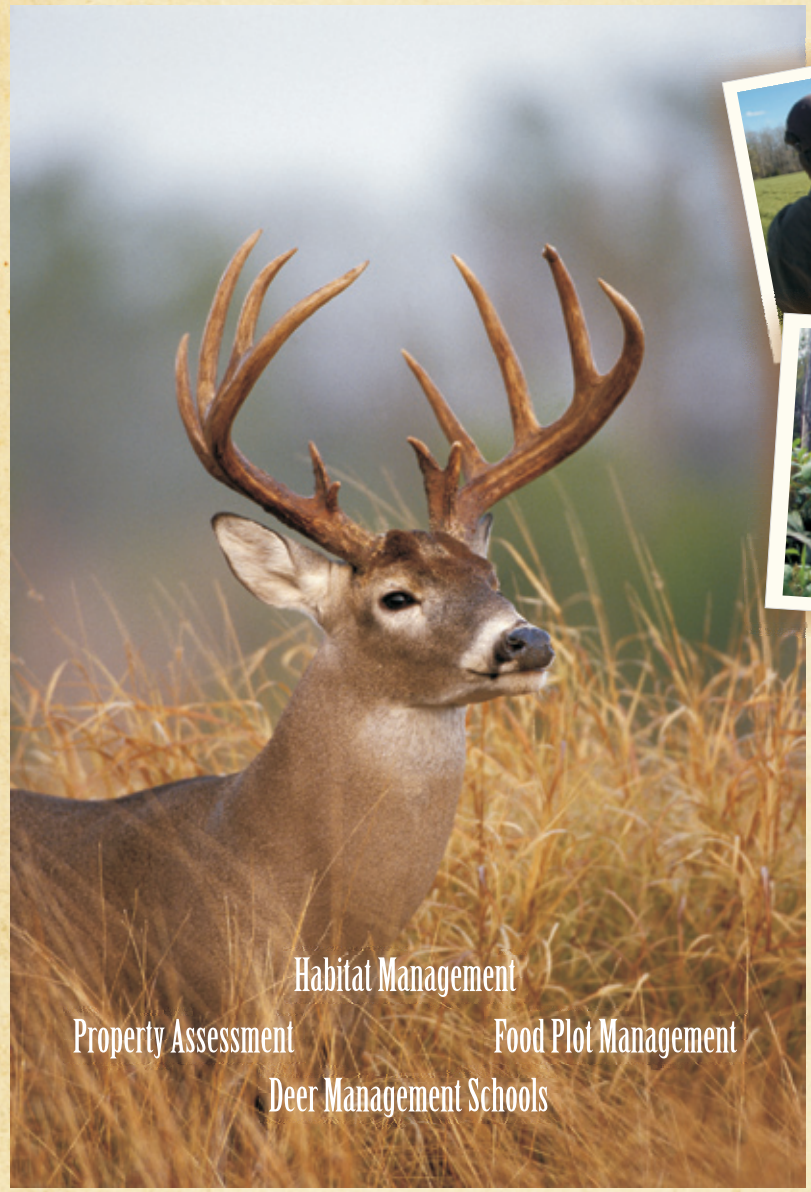

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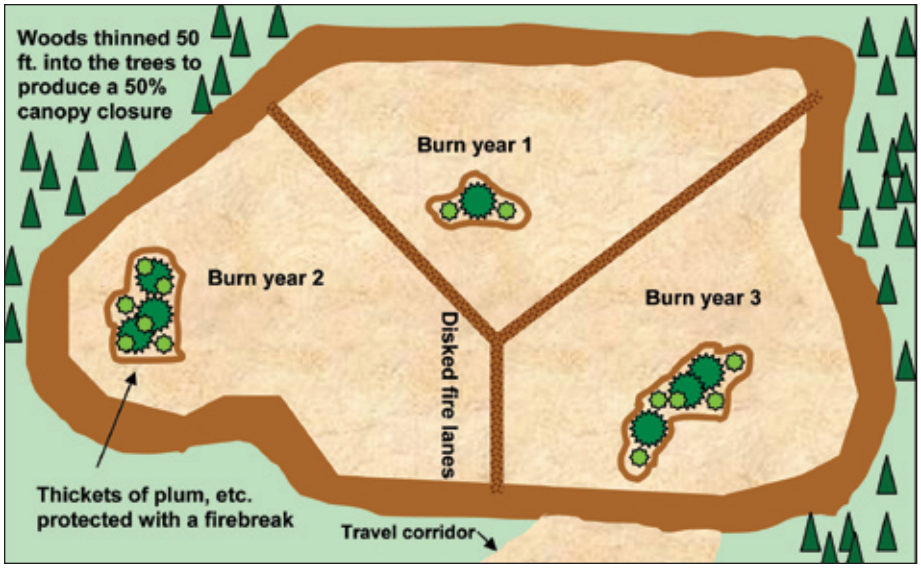

Figure 1: Example of a large field managed for native grasses through disking and burning. In subsequent years, the pattern can be created in other sections of the field such as inverting the Y-shaped disk lines. (Not to scale.)
Credit: Anna Huckabee Smith 2008

The diagram above is a corrected version of the one on page 17 of the March/ April 2008 issue in the article, "Southeastern Grassland Establishment for Wildlife". We regret the error.

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Cover photo by Tes Randle Jolly, Jolly Outdoor Visions, 334-727-4327.

Quail Corridors

One of the most important bobwhite habitats, the old-fashioned hedgerow, has just about disappeared from the American landscape.

By Monte Burch

Monte Burch grew up in the mid-Missouri quail country. He now resides on a farm in the Missouri Ozarks managed for wildlife. Monte has been a freelance writer since the early 70's and is the author of over 70 books including *Wildlife & Woodlot Management* available from www.monteburch.com.

Bobwhites were king in the 50's when I was growing up on a farm in central Missouri. Turkeys and deer hadn't yet been established, but we had lots of bobwhites. Next to bank fishing a nearby river for catfish, hunting quail was my dad's favorite pastime. Dad only had 40 acres, and my granddad an adjoining 90, but both places were loaded with birds. It wasn't unusual to get up a dozen big coveys during an afternoon hunt. Both farms were typical of farming practices of the time. Dad put out 20 acres of soybeans or milo and granddad always had several small patches of soybeans, but he usually grew corn for his pigs and cattle. The remainder of both places was in native grasses. A neighbor put out another 20 acres or so of small grains next to ours. At that time another adjoining neighbor had a couple hundred acres of native prairie. We often saw and heard prairie chickens as well as quail. The circumstances were just right for good quail production. But, there was another

major factor, quail corridors. A double hedgerow ran for over a mile in one direction, turned and continued to border the property. Another hedgerow ran along two sides of Granddad's property as well. These quail corridors were actually the key to good quail habitat. These areas allowed the birds plenty of access to the small grain fields as well as bare ground loafing spots and lots of roost areas in the native grass fields. When one hedgerow began to mature, Dad spent an entire summer felling trees and limbs to create a continuous brushpile. There were also a couple of long brushy draws that intersected the properties. Both Dad and Granddad raised cattle, yet they still had lots of quail. These days both farms are developed with homes. When I was growing up, it never occurred to me those places would eventually become home sites and the quail would no longer exist.

My wife and I purchased a farm in the Ozarks about 35 years ago. An abandoned dairy farm with lots of timber and worn-out grasslands, it didn't have much in the way of wildlife habitat. Like many others, we decided to do some management for wildlife, including quail and so began a study of quail needs. Quail do have some pretty specialized needs as we and other landowners have discovered. In the golden age of quail hunting, farming was done on a smaller scale than today. Farms were smaller. Fields were smaller too, and were separated by hedgerows, weed-filled fence lines and woodlots. The edges between fields and woods were wide and cluttered with fallen trees, blackberry thickets and shrubby plants such as sumac, plum and dogwood. The crops on a dairy or beef cattle farm typically included clover or other legume forages, warm season grasses like little bluestem and small plots of sorghum, corn and soybeans. Although this style of farming was practiced for decades, the appearance of a particular plot of farm ground changed constantly. Pastures were

Hedgerows and overgrown fencerows create corridors allowing quail to safety move between feeding, loafing, brooding and roost areas.

hayed or grazed, thinning out accumulated vegetation. Crops were harvested, leaving bare ground with lots of waste grain. These days many farms are dominated by fescue grass. The fences, hedgerows and brushy draws that once separated the fields and provided not only travel corridors, but lots of cover are mostly gone. The edges of fields are primarily razor thin, extending right up to roads, ditches and woods. As we discovered with our farm, to encourage quail, you'll have to recreate some of the conditions that made the 1950's style farms quail factories.

These days the primary crop of retired farm equipment dealer, Lamar Moore of Chillicothe, Missouri is quail. Moore bought the 400 acre farm as an investment, and to provide a place for family and friends to hunt and fish. The farm isn't typical of Livingston County, where rich soil and row crops dominate. Much of his acreage is too steep for row cropping. In the 1950's and 60's, farms like Moore's harbored coveys of quail in every brushy corner. Today most farmers are lucky to find one covey in the same acreage. But Moore has watched his quail crop grow from just a handful of coveys to a dozen or more. His secret? No secret, just good advice from the Missouri Department of Conservation and determination to make things happen. If you're interested in growing quail, the first step is to contact your local game and fish or conservation department, as well as the local NRSCS office. Lots of good advice, as well as some monetary help, is now available for developing quail habitat.

Moore learned how to increase wildlife cover. He converted fescue to native warm-season grasses with fire and herbicide. Along the edges of fields he let foxtail, ragweed and other natural vegetation take over. He also planted a greater variety of crops, including sunflowers and sorghum. He leaves several rows of these crops standing in the fall, to be disked under during the winter and spring. Besides providing food and cover for quail and other wildlife, these buffer strips around fields trap sediment, nutrients and agricultural chemicals, improving water quality in ponds and streams.

If you're starting with a fescue farm and/or one with clean farming practices, plantings of warm season grasses and small grain food plots are the first step. Disking strips of land adjacent to clean-farmed areas and along fencerows and planting these strips of land in oats or Korean lespedeza can provide both

As trees mature in the hedgerows and fencerows, the lack of sunlight slows the growth of shrubs and brush, a very important quail corridor factor. Thin out some of the bigger trees by girdling them and spraying the cut with Arsenal AC.

Another tactic for overgrown fencerows is to drop all the trees, leaving some hinged to create living brushpiles.

food and cover.

All of these patchwork habitat improvements are important, but more important is providing a corridor quail can safely use between these feeding, loafing, brooding and roosting areas. Moore replanted hedgerows to divide large fields into the kind of small patches of habitat where quail flourish. These fencerows provided new travel corridors, encouraging quail to travel between islands of cover on Moore's farm, instead of flying across the road to reach the nearest brushy patch. Quite often the biggest problem on many farms, however, is an overgrown hedge or fencerow with lots of mature trees, and little in the way of brushy cover. We have two such situations on our farm. The first separates two grass pastures. We are converting one pasture into warm season grasses, and both are hay and grazing pastures. The first step was to kill back a good number of the trees by girdling, then treating them with Arsenal AC herbicide. This allows for more sunlight to establish more brush. Quail need high-density stems they can travel through, but larger animals can't. The original barbed wire fence is still in place on one side of the fencerow. We utilize high-tensile electric fencing for any number of cattle-

The author used high-tensile fencing to protect this hedgerow from grazing.

Brushy, woody draws can grow up into large trees. Dropping the trees and allowing them to create brushpiles provides another corridor.

control areas on our farm and practice rotational grazing. Because the fence was fairly old, we ran a high tensile wire on the other side of the tree row, spacing it about 20 yards out. Not only did this help keep the cattle in the fields, we actually created a very good quail travel corridor. It has, however, created one problem. As the trees die back and limbs fall off, the electric fence needs to be continually maintained. Another tactic is the same one my dad used; simply drop some trees or cut off lower limbs and create continuous brushpiles along the hedgerow.

Another situation on our farm was a long fencerow that had grown up in mature cedar trees. It separates a grass field from a crop field. Although the cedars did provide some cover and protection, the ground beneath them was mostly in fescue and/or bare. The first step was to kill back the fescue by spraying it with Roundup and Plateau. If this is not done, the grasses become more dominant with the increasing sunlight. Then the trees were felled to open the area to more sunlight and create brush growth. Some of the trees were cut to create "living brushpiles." This is done by half cutting them and bending them over, but leaving the stump and cut tree connected. Not only does this create immediate cover and travel areas, but the increased sunlight in some areas allows for more brush growth.

Woody vegetation is constantly changing and growing and we often don't notice the subtle changes, for instance, of a brushy draw that has also become overgrown with mature trees. These not only don't provide adequate cover, but provide places for avian predators such as hawks and owls to roost. Cutting these trees, and again using some to create living brushpiles not only eliminates the hawk and owl perches, but provides important escape cover when quail are fleeing coyotes or other ground-based predators.

Another excellent area to create a corridor is along woodland edge. Called "edge feathering," this involves cutting down trees and overgrown brush, which is commonly stunted from lack of sunlight. Again, you can cut and drop some, build brushpiles with some and create living brushpiles with others. Cutting several acres of trees does take some work and a few tools. I have two chain saws, used specifically for different purposes. The first is a little Echo with a 12-inch bar. It's basically an "arborists" saw and is lightweight and easy to use for cutting saplings and brush. The second is a larger "farm" size Stihl that is used for felling larger trees and limbing them to create brushpiles. I typically spend a month or so each winter, using the chainsaw as a quail habitat management tool. If you

Woodland edges can also be turned into better corridors by edge feathering, or dropping trees on the outside edge and allowing them to create brushpiles.

Disking strips along fencerows, field edges and woodlands encourages weed growth such as ragweeds to create another type of quail corridor.

have a lot of trees to drop and want to use them to build brushpiles, one tool that is a great help is a "clipper." These are attachments for skid loaders and they can grasp trees up to 14 inches in diameter by the trunk, snip them off at ground level and then transport them and arrange them into brushpiles. Both tree removal and brushpile construction goes much faster with a tool that can cart whole trees around like saplings. Check local yellow pages for operators that do this chore. They typically charge $70 or more an hour. You can also sometimes rent the tools at local rental stores.

Missouri research has shown quail will spend most of their time close to woody cover, an average of 70 feet or closer. Woody shrubs and brush, downed trees and brushpiles are extremely important. And, it's important to remember maintaining quail habitat and corridors is an ongoing project. As woody vegetation increases with plant succession, and brushpiles degrade, you'll have to redo the chores.

One extremely simple practice that not only creates corridors, but also food, brooding and dusting areas is disking long strips alongside crop fields, food plots, fencerows and feathered woodland edges. The resulting strips grow up in ragweed and other weeds.

Regardless of the practices in creating quail habitat, however, keep one thing in mind—connections, or corridors. Whether warm season grasses for nesting, brooding and cover, food plots, grazing rotations or hay mowing, quail need brushy or weedy corridors to move between feeding, roosting, and brooding areas. Quail should be able to move safely and easily from one corner of your property to another without ever having to get out in the open.

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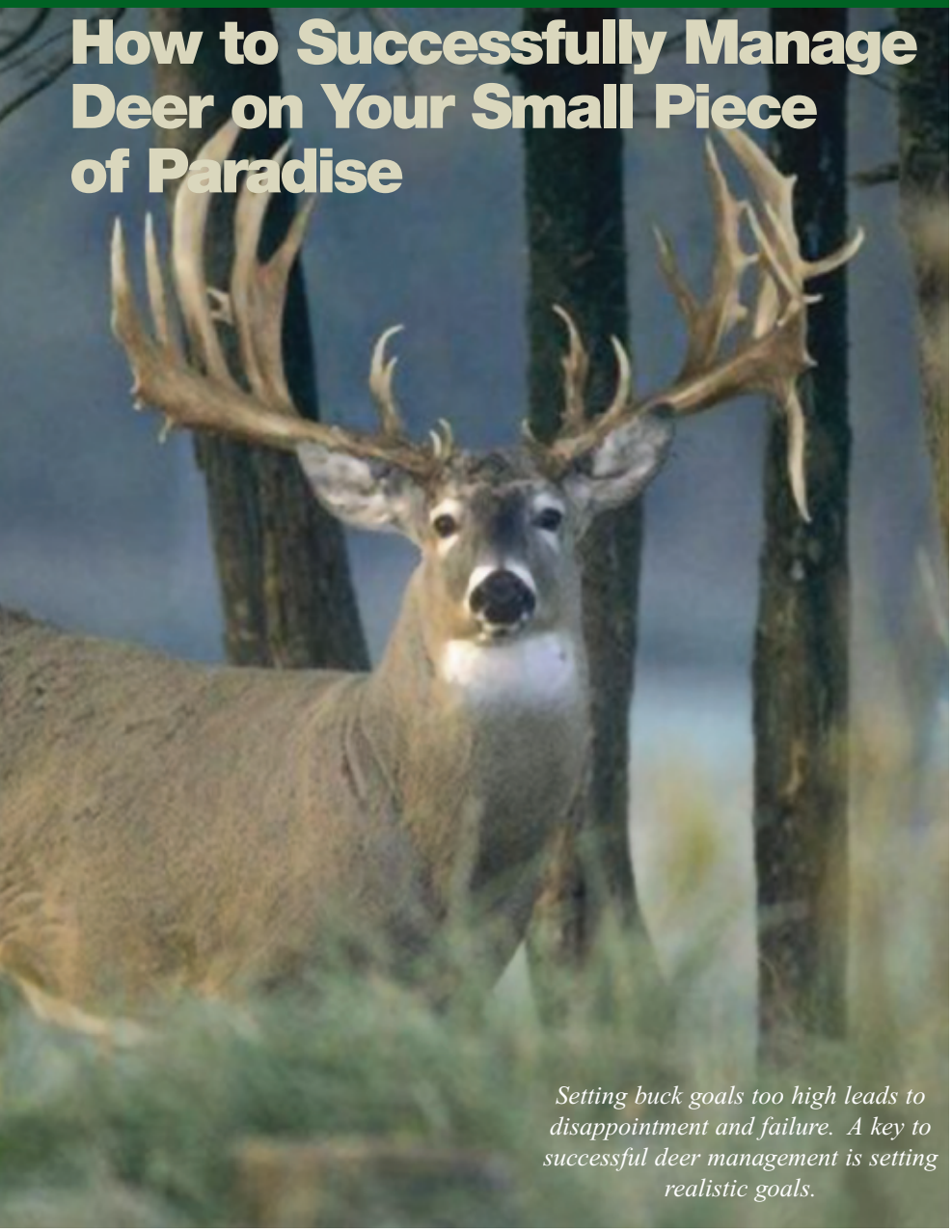
Optimizing Small Properties – How to Successfully Manage Deer on Your Small Piece of Paradise

By Dave Edwards

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



Setting buck goals too high leads to disappointment and failure. A key to successful deer management is setting realistic goals.

As a wildlife consultant, one of the most common questions I am asked by small landowners is "Is my property big enough to manage deer on?" and this is usually followed up with "am I wasting my time?" This is a tough question to answer without knowing more about the specifics of the property in question such as the size/shape of the property, wildlife habitat quality (food and cover resources), management on adjacent properties, resources/ability to apply management strategies, and of course what the person means by "manage"; that is, what their true deer management goal is.

First let's define what I consider a small property as it relates to managing deer. Deer home range sizes (the area a deer uses and lives in) vary throughout the country depending on the time of year, habitat type, habitat diversity, habitat quality, food resources, and other factors. As a general rule, home range sizes of deer are gener-

ally larger in poorer quality soils/habitats such as those associated with the lower coastal plain regions compared to that of deer in more fertile soil regions. Research has shown that the average home range of adult bucks varies from several hundred to a few thousand acres. Home ranges of adult does are slightly smaller. However, many studies have shown the average home range size of a whitetail deer is roughly a square mile or 640 acres. Research also indicates that most young bucks disperse one to several miles from their birth area between the ages of six and 24 months. Therefore, to have control over and manage a "deer herd", without depending on adjacent property management, you need at least several thousand acres. Even then you are still sharing deer with your neighbors. In fact, even if you own, manage, or hunt 10,000+ acres you will be sharing deer with your neighbors, but on a property of this size you will likely have control over the deer that use the core portion of the property. Having said this, I consider properties less than 1,000 acres to be small from a deer management perspective primarily due to the relatively large home range sizes of white-tailed deer and the dependency on neighboring landowner/hunter management. If your property is 1,000 acres or less, don't worry. There is still hope. Successfully managing deer on small properties simply requires a little more effort which often includes working closely with your neighbors to ensure they are on the same deer management strategies along with strategic habitat management strategies that will help you attract, hold, and grow exceptional deer. In fact, I work with many landowners and hunters that have successful deer management programs on less than 500 acres (some even smaller acreage).

There are essentially three key ingredients common to all successful small property deer management programs I've work with: 1) they strategically and aggressively manage the habitat on their property to meet daily life needs of a deer – not giving deer a reason to want to leave; 2) they have good relationships and form deer management cooperatives with surrounding landowners or hunting clubs where possible; and 3) they keep disturbance to a minimum and hunt smart.

Strategically and Aggressively Managing Your Deer Habitat - Where Do You Start?

The first step in improving the deer value of your property is to determine/establish your specific deer management goals. If your general goal is to manage for better deer, do you want to produce quality or trophy bucks? Specific goals usually dictate the level of management needed. The intensity of management and timeline of reaching your goals will also depend upon how much you need to do and on the resources (time and money) you can devote. Whichever may be the case, once you have established goals, an assessment of the property is in order. As part of the assessment, and with your specific goals in mind, you need to determine the strengths and weaknesses of your property as they relate to deer.

Although most hunters can conduct a general property assessment, you may need the assistance of an experienced professional wildlife biologist to determine the less obvious and often times overlooked strengths and weaknesses. The goal of the assessment is to identify the limiting factors of your property that will prevent you from reaching the deer management goals. Strengths and weaknesses (or limiting factors) are generally related to food and/or cover. On small properties, it helps to know the strengths and weaknesses of your neighbor's property. Although this doesn't sound very "neighborly", you need to know what your "competition" has to offer deer so that you can do a better job to attract and hold more deer. For example, if your neighbor's property is predominately mature bottomland hardwood or open agriculture with little cover for deer, you need to ensure your property has exceptional cover that will attract deer to your property.

With your deer management goals in mind and from this assessment, you and/or your wildlife consultant may develop a list of several to many man-

Successful deer management on small properties requires strategic management.

agement activities that will address limiting factors identified. Depending on the property, this can be a relatively short list or a very long list of activities that need to be addressed. Obviously, if your property is "raw" with few wildlife enhancements, you need to address the basics – food and cover. In fact, even the advanced fine tuning habitat management strategies are geared towards improving food or cover. Examples of habitat management activities often implemented to enhance small properties may include timber harvest, installing or enhancing food plots, thinning/fertilizing/applying herbicide in pine stands, managing hardwood habitats for increased mast production, creating more habitat diversity, increasing or decreasing the amount of open land or mature forest, initiating controlled burning, managing roadsides and field edges, creating more escape and bedding cover/habitat….the list goes on. As a landowner or land manager, the list of activities can be overwhelming.

Now that you have your "to-do list", where do you start? Many of these management activities may require significant resources (time and money), may be seasonal, or long-term oriented. The answer is simple. You prioritize the management activities and tackle them as you can. Prioritizing means that you are addressing the most important or value-adding activities first.

Below is a list of common habitat management activities/strategies that are commonly used to enhance the deer value of small properties:

Plant and manage quality year-round food plots

Developing quality food plots is certainly a good first step to adding wildlife value to your property. As a rule of thumb, I recommend devoting a minimum of 1% and ideally 10% of your property to food plots. On small properties, food plots will serve as an attractant for deer and should be managed for year-round production of quality forages. Year-round quality food plots consist of annual (summer and fall) and perennial plantings. Including annual and perennial clovers are a safe bet in most soils and will attract and benefit deer. If your goals include turkey and/or quail management, include areas of small grains and seed producing crops such as millets and sorghums. The residual stubble of these crops, particularly the taller crops such as Egyptian

wheat, often provides excellent fawning cover.

Manage Roadsides - Roadside management refers to actively managing roadsides to enhance habitat for wildlife. Examples of such management include mowing, disking, planting, etc. Managing roadsides is an exceptional way to add deer value to a small property. Even on relatively small properties, there are usually several miles of roads and many opportunities to significantly enhance wildlife habitat by simply managing the small areas on the shoulders of these roads. Managing these areas add up and can result in many acres of additional quality wildlife habitat and hunting opportunities on your property.

Daylight and fertilize native habitat around food plot edges or along roads

Deer are browsers meaning that they spend most of their foraging time eating leaves, stems, or buds of plants and trees. A common misconception is that deer are grazers – meaning they primarily eat grasses like a cow. When deciding where to improve natural browse areas along food plot or road edges, concentrate on areas that already have existing quality vegetation such as honey suckle patches, briars, and other desirable weedy species. Even if there is only a small amount of desirable browse species, daylighting and fertilizing normally results in an explosion of these plants. Daylighting simply refers to removing undesirable trees and brush that are competing with the quality, desirable plants for sunlight and nutrients. A chainsaw and/or selective herbicide applications are the tools of choice for this task. Fertilizing will increase forage production and nutrition levels of these areas as well as create excellent cover habitat.

Timber stand improvements (TSI)

Removing undesirable tree species in and around quality oaks to reduce competition and promote better tree growth and mast production. There are many methods for implementing TSI. Some of the most common include selecting individual trees to be removed and cutting them down (and spraying herbicide on the stumps to prevent future stump sprouting), killing the trees with herbicide (hack & squirt methods) and allowing them to fall on their own, and if the area and timber is large enough, commercially logging the undesirable trees (which means revenue!).

Clear the understory and fertilize quality oaks

Cutting down and clearing undesirable trees and shrubs under and around a mature oak will reduce competition for sunlight and nutrients which will enhance the growth and productivity of the oak. This is commonly referred to as "releasing" an oak. Fertilizing these trees will further enhance tree growth as well as mast production. Time released fertilizers are recommended as they will provide nutrients over the entire growing season. This is a great way to create a bow hunting honey hole for deer or great place for squirrel hunting. Since fertilizer is relatively expensive, I recommend selecting a few of the best oaks in key locations to concentrate fertilizing efforts. One high quality mature oak can produce a tremendous amount of acorns.

Install wildlife friendly oak and fruit orchards

Adding various fruit trees and shrubs in and around a food plot or along roadsides will provide additional food resources that will enhance their attractiveness. There are many fruit tree species that will benefit deer. Some of these include: sawtooth oaks, dwarf chiquipin oaks, chestnuts, persimmons, plums, apples, pears, and many other species. When deciding what to plant, try to incorporate multiple tree species that will fruit at various times of the year. This will ensure food resources are available throughout longer periods of time of the year.

Install and maintain supplemental feeders

For deer, supplemental feeding not only provides attraction, but will also provide additional nutrients and minerals for deer that will enhance body growth, reproductive success, and antler quality. There are many types of feeders available. I recommend trough type feeders because they allow the use of quality pelleted feeds that would fall apart if broadcast on the ground due to moisture and rain. If you are using feeders to attract deer for hunting, I recommend trough feeders with programmable feed drop systems. This allows you to condition deer to be there when you want them to be. Although it depends on the quality of your soils and habitat, one feeder per 100 acres is normally adequate. Just remember that supplemental feeding is not a substitute for proper habitat or herd management….it is a supplement.

Install and maintain mineral licks

In addition to providing supplemental feed in feeders, installing mineral licks may provide additional nutrients and minerals for deer if needed. Mineral licks should be created in early spring and monitored and refreshed as needed throughout the summer. One mineral lick per 150 acres is adequate for deer. There are many "pre-made" mineral licks on the market or you can simply create your own. A recipe I like is 50# Dicalcium phosphate, 50# Grandular Calcium Carbonate, and 50# trace mineral salt – plus a small amount of an attractant like "Deer Cocaine" or "Black Magic" (just something to get them interested in the site).

If needed, create a small water hole – Although most wildlife do not need free standing water to supply their body with daily water requirements, most find them attractive and will use water holes throughout the year, particularly

Keeping disturbance and hunting pressure to a minimum is important on small properties. Electric carts are a great low impact way to get around during hunting season.

during warm weather or droughts. Water holes do not need to be large. I've created many that were the size of a pickup truck. The key is to create them in a spot that will collect runoff from surrounding areas and will always hold water – particularly during drought conditions.

Use fire to create and maintain quality wildlife habitat

Prescribed fire is an excellent tool for creating habitat diversity and quality deer habitat on small properties. Burn areas do not have to be large to be beneficial. Areas of 1-3 acres are sufficient to be value adding and are easily burned in a couple of hours. To enhance habitat diversity, divide the area around a food plot into several units and schedule fire rotations for a different unit each year. That is, do not burn the same unit each year. Although it will depend on soil fertility, a 2-3 year burn rotation creates the best habitat for deer. Also, take advantage of the fire breaks. These are great places to plant food plots for deer or field border crops such as Egyptian wheat, sorghums, millets, and other small grains that will benefit turkeys and quail.

Install wildlife clearcuts

If quality cover and/or natural food is a limiting factor on your property, consider installing small 5-10 acre clearcuts. Properties where cover or natural food is a limiting factor are typically mature forests such as bottomland hardwoods, upland hardwoods, or old growth pine stands. Not only will this generate revenue, but it will add habitat diversity and provide quality food and cover for about 4-5 years. Consider creating hunting opportunities such as funnels, travel corridors, and bottlenecks while designing the shapes and layouts of the cuts. When considering where and what shape to make these small clearcuts, think about the area as if it were a lake that needed structure. Place the "structure" (meaning the clearcuts) in a way that will not only provide deer with the most food and cover, but in a way that will help you hunt deer as well.

The strategies listed above were just a few of the value adding management practices that can be used to create or enhance a small property for deer. Of course every property is unique, and the strategies you use will be dictated by limiting factors that exist on your property as well as your management goals. Again, the goals of a habitat management program on a small property is to meet the daily life needs of a deer, but more importantly make your property very attractive for deer (which is normally the result of meeting their daily life needs).

Deer Management Cooperatives

In most cases, successful deer management on small properties requires working with adjacent landowners or hunters to ensure similar herd management strategies are being applied. When several properties are working together towards common goals it is often referred to as a "deer management cooperative". Obviously the goal is to get as many landowners and hunters to participate as possible so that you have "control of the deer herd" over a larger area. Given the relatively large home range sizes of white-tailed deer, the more land under management the better, and any increase in acreage likely will improve management success.

The first step to establishing a deer management cooperative is to identify potential members. Properties immediately adjacent to your property are the most important, so concentrate initial efforts there. Sometimes, identifying the landowners and hunters on adjoining properties may be difficult. One of the best ways is to talk with key landowners who have lived in the area for many years. They often know who owns properties in the area. Other good sources include the ownership platt maps, county tax office, county agricultural extension agent, or your local private lands state wildlife agency biologist. Once all the landowners and hunting groups have been identified, contact each personally and invite them to a meeting to discuss the possibility of forming a deer management cooperative. Providing a BBQ dinner is always a good start.

Membership in a cooperative can be formal or informal. If you are only working with a couple of landowners or adjacent hunting clubs, a formal written agreement is not usually needed. However, if many properties and people are involved, I recommend developing a more formalized membership approach that includes a simple written agreement signed by each landowner and club representative indicating they will abide by the established guidelines, though they may enact more stringent requirements on their own property. Guidelines of the agreement should be simple, easy to understand, and include the goal(s) of the cooperative and minimum buck and doe harvest requirements. It is also a good idea to establish some formal acknowledgement of cooperative members such as property signs, vehicle decals, and membership cards. All will help identify members and assist with identifying trespassers and poachers.

A deer management cooperative benefits a deer herd in many ways. The most obvious benefit is that they enable landowners and hunters with small landholdings to harvest better quality bucks. Goals of deer management cooperatives are generally geared towards increasing buck quality, maintaining a relatively balanced adult sex ratio, and maintaining a desirable deer density; all of which promotes increased deer herd quality and improved hunter satisfaction. Other non-biological benefits of a cooperative may include sharing resources such as tractors, planting efforts, or other equipment and enhanced recreational value of all properties envolved. Many cooperatives save money by ordering bulk fertilizer, seed, and supplemental feed. Additionally, I've known of several great friendships that have developed through involvement in deer management cooperatives.

Once a cooperative is established, the challenge will be to keep it intact and moving in a positive direction. This is not always easy and will require work. The key is to keep it enjoyable and to keep members informed and involved. Annual meetings should be held to share annual harvest data, trail camera pictures and to assess the progress of the cooperative. Many cooperatives use a wildlife biologist to collect and analyze their harvest data and to provide harvest recommendations for the next season. Depending on the needs and size of the cooperative, a period newsletter is also a good way to keep members informed. Involving property or club representatives in the decision-making process for the cooperative will build ownership in and commitment to the program. Another great way to keep everyone involved and participating is to implement competitions, incentives, and awards for following rules and achieving goals. Possible examples include quality buck and doe contests, prizes for oldest deer, and most improved property. Other awards might include the property with the fewest number of button bucks or undersized bucks harvested or awards for individuals that have made significant contribu-

Without question, you share deer with your neighbors. Forming deer management cooperatives with adjacent landowners or hunting clubs is essential for successful quality deer management on small properties.

tions to the cooperative.

Almost without exception, a non-member group within or adjacent to the boundaries of the cooperative will create problems for existing members. These properties may range from those not hunted to those allowing the harvest of deer of any sex or age. Both situations can present real problems. Unhunted properties can be both a blessing and a curse. They are great places for bucks to seek refuge during the hunting season, which enables more to survive, but large, unhunted properties can make it difficult to harvest enough antlerless deer to maintain proper herd density and sex ratios on your property. Uncooperative neighbors that do not follow the deer harvest guidelines also can limit management success. Several years of success may be required to convince these hunters of the merits of the cooperative. Regardless, never give up hope and keep these landowners and non-member groups informed of the activities and successes of the cooperative. If all else fails, recognize that some losses to neighboring properties will occur and manage accordingly.

Quiet Please – Managing Hunting Pressure

Managing the disturbance and hunting pressure is particularly important on small properties to promote quality deer hunting experiences. Too much disturbance or pressure can curtail deer sightings (particularly mature bucks), or worse, could ruin the deer hunting on your property in short order. After devoting much time and many resources to properly managing the habitat and deer herd on your property, the last thing you want to do is run the deer off or force them to be strictly nocturnal (which is the most common effect).

Reducing the hunting pressure does not mean you have to hunt less. It simply means you need to hunt smart. Regardless of how large a property is, I feel that hunting smart to manage the hunting pressure is the key to consistently having successful and fun hunts. Hunting smart means you place stands in a way that allows hunters to access and exit them without disturbing the deer and you never hunt them unless the wind direction is favorable. With some planning and a little effort, this is easily accomplished. For example, do not place shooting houses or other stands directly on food plots. Rather, place them far enough in the woods that hunters still have a good view of the food plot, but are concealed from deer using the plot. If this is not possible, consider planting a portion of the food plot with a tall crop such as corn or Egyptian wheat to "screen" hunters getting in and out of the stand. Also think about the direction hunters will access the stand and avoid situations where the hunter has to walk across a food plot to get out. Stands in the woods

should be set up in a similar fashion considering where the deer will likely be such as a bedding area. As you learn where deer are and their movement patterns on your particular property, these decisions will get easier. Don't laugh, but on my hunting club, we actually rake trails through the woods to clear leaves and other debris to allow hunters to get to and from stands quietly. Surprisingly, it doesn't take a lot of effort or time to create the trails with a yard leaf rake or gas powered blower. You may be amazed at how effective and quiet you can slip through the woods along a bare dirt trail. Due to the quietness I suppose, deer often start using these trails as well!

If there was only one recommendation I could provide regarding reducing hunting pressure, it would be to ALWAYS hunt with the wind in your favor. The wind is your friend if you use it correctly, or it is your worse enemy if you disregard it. I've been fortunate to have worked and hunted with several hunters that take great bucks every year. These are the guys you see in the hunting magazines standing in front of a barn wall full of big bucks. There is a common strategy that all of them employ…they are obsessed with the wind and which direction it is blowing. Many of these hunters have hung stands they couldn't wait to hunt, but never sat in them all season because they never got the right wind. A deer's sense of smell is without question its strongest defense. I recommend making a list of stands on your property and determining which winds they can be hunted and post this at your camp. In fact, my hunting club has a rule, and a fine associated with breaking the rule, that states stands can only be hunted under favorable wind conditions. Here's a good self check to see if you hunt with the wind: If you know which stand you are going to hunt the day before arriving at your property, you are not hunting with the wind. In fact, if you know which stand you are hunting in the morning before you go to sleep, you are not hunting with the wind. Hunting with the wind is relatively easy on flat terrain, but can be quite tricky on properties with a lot of relief or rolling topography or near large bodies of water due to the eddies in wind flow, diversions, and drafts. If your property is hilly or on a large lake or river, take the time to learn how the wind reacts on different parts of your property. Hunting smart to reduce hunting pressure requires hunters to be students of the wind.

Reducing disturbance during hunting season is another way to reduce pressure on deer. Again, this is particularly true for small properties. Avoid gas powered ATV's such as 4-wheelers, mules, and rangers for joyriding or when accessing stands. There's not a deer in the Southeast that doesn't associate the sound of a 4-wheeler with something negative. Electric powered ATV's such as golf carts or simply using a truck is less intrusive and will allow you to be stealthier. Keep other disturbances such as target shooting, joyriding, or other activities to a minimum as well.

In some cases, reducing hunting pressure will mean hunting less. Even if hunters are "hunting smart", too much hunting will have negative effects on deer movement. I see this quite often on properties that have several different hunters using the property such as a hunting club or on small properties that are hunted by a single hunter that is obsessed and hunts every chance he gets (and who doesn't?!). I collect and analyze hunter observation data on many properties I manage. This is information hunters record each time they hunt such as date, stand, deer observed, etc. It amazes some hunting clubs to see the results. Hunting clubs often feel they do not apply heavy hunting pressure, but when all hunter observation data is combined and analyzed, results often show that someone in the club hunted nearly every day of the season! Individually, hunters may not be applying a great deal of pressure, however, collectively they are applying significant pressure that will effect deer sightings. A solution to this problem on larger properties is to break the property into hunting units and rotate hunting pressure throughout the season. That is, hunt area A & B during week one while area C rests. Then hunt area B& C during week two while area A rests, and so forth. This is an effective way to reduce hunting pressure and "rest" areas to promote better hunting. On small properties, however, rotating hunting areas is not an option and the solution is simply to reduce the amount of hunting allowed. For small properties, it helps to have additional properties to hunt to disperse your hunting pressure.

Dreams of big bucks, but only have a small property to work with…no problem. The keys to successfully achieving quality or trophy deer management goals and consistently experiencing quality hunts on small properties are strategic habitat management, working closely with neighboring landowners and hunting clubs, and managing the hunting pressure on your property. Strategic habitat management requires knowing and addressing the weaknesses or limiting factors of your property in a way that will make your property more attractive for deer relative to your neighbor's property. Because you are managing a relatively small property from a deer management perspective, you are going to need your neighbor's help. Forming deer management cooperatives with adjacent landowners or hunting clubs will promote better control of the "deer herd" due to the larger area being managed and will increase quality or trophy deer management success. Lastly, the combination of strategic habitat management and managed/reduced hunting pressure on your property will make your property the "property of choice" for deer and will result in exceptional hunting opportunities.

Belted Kingfisher – The Aerial Angler

Text and Photography By Tes Randle Jolly

Tes Randle Jolly is a freelance writer and photographer. Contact her at Jolly's Outdoor Visions, 334-727-4327 for forestry, wildlife and outdoor photography projects.

Stylishly feathered as if in a blue-gray dress suit or tuxedo the belted kingfisher is a remarkable and eye-catching denizen of aquatic environments. Unlikely to be confused with any other bird the kingfisher is distinctive, sporting a huge bill and large head with a shaggy, double pointed crest. Mature male pictured here.

If you're a water enthusiast you've likely witnessed the bomber-like aerial displays of this flashy feathered inhabitant of our wetlands and waterways. The bird's angling skills command respect and admiration if not a little envy from anglers. In action or at rest, the belted kingfisher is a remarkable and eye-catching denizen of aquatic environments, enhancing the natural appeal of our ponds, lakes, and waterways. Demonstrating one of Nature's most dramatic predator/prey encounters, the kingfisher launches from a lookout perch. Like a tiny helicopter hovering high over the water it scans the water's surface until it locates an unsuspecting fish. Zeroed in on its target the kingfisher commences a precise surgical strike. Wings fold back and suddenly it drops from the sky plunging into a dramatic, vertical, headfirst dive. Disappearing underwater in a splash, the bird stops the dive by opening its wings. The fish is captured in its bill with pincer-style action. Within seconds the kingfish-

er surfaces, prey firmly trapped in bill. Launching from the water on stout wings to land on a nearby perch, a watery trail marks the kingfisher's flight. The meal is immobilized with a few sharp raps on the perch then tossed in the air and swallowed headfirst.

Population growth has been stimulated by human activity in some regions, such as the digging of sand and gravel pits that provide nesting habitats. Of interest to anglers and private pond managers, questions arise concerning the kingfisher's impact on fish health and populations. To answer these questions experts provide useful information. First, let's take a closer look at this unique bird.

Kingfisher Facts

The kingfisher, (ceryle alcyon), is named for its preference for and skill at catching fish. The bird is generally solitary. A migratory, it's a common sight over much of North America and southern Canada's waterways, including Alaska, inhabiting a variety of aquatic habitats around lakes, ponds, mountain streams, coastal areas, mangrove, tidal creeks, swamps, rivers, garden ponds, and calm marine waters. Unlikely to be confused with any other bird the kingfisher is distinctive, sporting a huge bill, large head with shaggy, double pointed crest and unique coloring. Stylishly feathered as if in a dress suit or tuxedo, its handsome, stocky body measures 11-13 inches. Feathers are blue-gray; except for a white collar and belly and a gray chest in both sexes. The term, Belted, applies only to the female. Unlike most birds it is the female of the species that is conspicuously colored, having a chestnut band across the belly. The juvenile closely resembles the female in coloration. The head and bill are disproportionately larger than the body. This contrasts with the tiny legs and short tail, making the kingfisher appear top heavy.

The kingfisher's flight is strong, swift, and graceful, usually low, but high above treetop level when traveling. Usually there are five or six rapid wing strokes followed by a long glide on half-closed wings. The kingfisher is best known for its harshly vibrating, dry, mechanical rattle call. It's considered a less than musical song. If you're an angler or water enthusiast you've likely encountered a belted kingfisher. Human and wildlife intruders are greeted with vocal and physical displays of disapproval. If perched the bird tilts its short tail nervously up and down and raises and lowers its crest while emitting an abrasive, scolding call. Combined with impressive airborne displays the call is given at the smallest disturbance revealing the bird's fiercely territorial nature.

The bird's peculiar proportions and structure are beautifully adapted for the life it leads. The large beak and head form an effective spearhead for use in deep aerial plunges, well built to withstand the shocks of frequent diving. Unlike the osprey, it does not need to use its feet when capturing fish. Clear, still water and an elevated perch with an unobstructed view of prey are vital to the kingfisher for successful foraging.

Often a kingfisher patrols a regular route along a stream or lakeshore, stopping at favorite perches along the way to watch for suitable prey. It may hover like a kestrel or tern then plunge vertically from heights of up to 50 feet into the water, catching most fish within two feet of the surface. Fish are eaten headfirst. Other prey, such as crustaceans and insects are dismembered before being consumed. Kingfishers disgorge indigestible parts of prey such as fish bones and scales in pellet form, which accumulate under favorite perches.

As their name suggests, kingfishers subsist mostly on small fish, mainly less than 6 inches long. However, they occasionally consume other prey, including crabs, crayfish, squid, and terrestrial prey such as small birds, salamanders, lizards, mice, and insects. They've even been reported to eat berries when other food is unavailable.

Except during breeding and nesting season the belted kingfisher is generally solitary. At this time, however, the pair chooses a nest site together that is almost always near the top of a vertical sand or gravel bank. The male and female, after having chosen a suitable spot, cling to the bank like woodpeckers and set to work. Two of a kingfisher's toes are fused together. Short legs

Demonstrating one of Nature's most dramatic predator/prey encounters the kingfisher drops from the sky plunging into a spectacular vertical, headfirst dive under water to capture a fish in its bill with pincer-style action. Launching from the water on stout wings the bird flies to a nearby perch. The meal is immobilized with a few sharp raps on the perch then tossed in the air and swallowed headfirst.

Kingfishers disgorge indigestible parts of prey such as fish bones and scales in pelleted form, collecting under favorite perches.

and spade-like feet are very useful in scooping soil from the nesting burrow once it's loosened by powerful bills. Both birds participate in excavating a tunnel, taking turns in the burrowing duties. While one digs the other rattle calls to its mate.

When the hole has acquired a certain depth a widened nest chamber is formed. This is generally three to six feet from the entrance. Six or seven glossy pure white eggs are laid.

Incubation duties are shared by both parents. After 23 to 24 days the chicks hatch blind, naked, and helpless, a shapeless mass of reddish flesh, with a huge conical bill. A chick's eyes do not open for about two weeks. Within a week feather sheaths (pinfeathers) appear, and soon the young bird bristles with feather quills like a young porcupine. Both parents feed regurgitated food to the young. When the young bird is 17 or 18 days old, a remarkable transformation takes place within about 24 hours as the sheaths split and the juvenile plumage fluffs out all over the body. Fledglings leave the nest around 28 days and remain with the parents for approximately three weeks. During this time parents supplement the young kingfisher's diet as they learn to capture their own prey.

Fish Parasites and the Belted Kingfisher

Yolanda Brady, Ph.D., is Associate Professor of Aquatic Animal Health at Auburn University's Department of Fisheries, Aquaculture, and Aquatic Sciences. According to Dr. Brady the belted kingfisher is host to the black spot flatworm or grub. Dr. Brady describes the parasite as a very small, nearly microscopic, flattened worm-like animal that exhibits a forked tail in its free-living cercaria form. The parasite is found throughout North America in aquatic habitats. In its first stages it invades a snail and feeds off of the tissues. At a later stage, the parasite sepa-

rates from the snail and penetrates a fish, where it feeds on the fish's tissues. The fish is eaten by a kingfisher, within which the parasite develops through its sexual stage. Eggs are passed in the droppings of kingfishers. Of interest to pond managers and fish farmers is the fact that the "grub" form infects the skin of many varieties of freshwater fish. After boring through the skin a black spot appears around the cyst area. In heavy infections, a condition known as pop-eye occurs in which the fish's eyes bulge out from their sockets.

One creature is not wholly responsible for the occurrence of black spot. The belted kingfisher is just one of several avian hosts. True, the black spot flatworm/grub does have a negative effect on individual fish with heavy infections. However, Dr. Brady points out that due to their territorial nature, large numbers of kingfishers do not occur on any given water source, thus limiting the cycle of the black spot.

Wildlife/Human Conflicts

Pond managers, anglers, and fish farmers naturally question the impact of fish eating birds on the health and population of their fish. Human/wildlife conflicts are bound to occur. Frank Boyd, the Alabama state director for the USDA's APHIS (Animal & Plant Inspection Service) Wildlife Services handles complaints of bird depredation.

Human and wildlife intruders are greeted with vocal and physical displays of disapproval. If perched the bird tilts its short tail nervously up and down, raises and lowers its crest, and emits a harsh, mechanical rattle call.

Often a kingfisher patrols a regular route along a stream or lakeshore, stopping at favorite perches along the way to watch for suitable prey.

The term, belted, actually applies only to the female. Unlike most birds it is the female of the species that is conspicuously colored, having a chestnut band across the belly. The juvenile closely resembles the female in coloration.

Boyd states that the belted kingfisher is protected under the federal Migratory Bird Treaty Act that gives regulatory authority to the United States Fish & Wildlife Service (USFWS). Note: It is illegal to shoot a belted kingfisher nabbing fish from your pond or waterway!

Under the USFWS, the USDA's APHIS Wildlife Services handles wildlife/human conflicts. According to Boyd, fish farmers and sportfish pond owners must contact the USFWS to apply for control permits for bird depredation. Boyd reports that kingfisher complaints, unlike ones for cormorants, are nearly non-existent.

Boyd reports while the belted kingfisher feeds mainly on fish, much of the diet consists of small forage fish in shallow water. Kingfishers appear to be less susceptible to environmental contaminants than other fish-eating birds, possibly because their diet is restricted to smaller fish. He adds the bird's small size and fierce territorial nature limits the impact on fish populations. Happily most people understand and accept the kingfisher and its role in the ecosystem.

The Halcyon

The beauty and aerial grace of the belted kingfisher hovering under a bluebird sky over calm water is a memorable sight, its defending nature, admirable. The bird's conspicuous color, territorial spirit, and coarse call add splendor and wildness to our waterways. Nicknamed the Halcyon in ancient times of myths and fables, the kingfisher was said to build a floating nest on the sea, and to possess some mysterious power that calmed the troubled waves while the eggs were hatching and the young birds were being reared, hence the term "halcyon days;' meaning days of fair weather, a fitting tribute to the "king" of fishers.

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The Benefits of Predator Control in Wildlife Management

By Kevin Patterson

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.

Excessive coyote populations can and will negatively affect your wildlife management efforts. A strong predator control program will greatly benefit any wildlife management plan!

It was the summer of 1978 and my family and I had just moved from Tennessee to Memphis, Missouri; a small, rural farming community which is located in northeast, Missouri. While completing my sophomore year registration at Scotland County R-1 High School, I was told that my science and biology teacher would be Mr. Wagner. The other students told me that Mr. Wagner loved science and biology but most of all, he loved to talk about trapping and calling predators.

That fall, I quickly learned that Mr. Wagner was as obsessed with hunting and trapping predators as much as any whitetail deer hunter was about hunting deer. I also learned that in order to sustain healthy and viable wildlife populations, wildlife managers must provide an adequate and diversified habitat (i.e. nutrition/food, cover, water and space) as well as control excessive predator populations.

My introduction to predator population management was 30-years ago. As a mat-

ter of fact, I not only still predator trap, snare and call for fun, I make my living at it. However, you do not have to be a full time Predator Control Specialist to enjoy the benefits of predator control. Not only is predator control a proven and effective wildlife management tool, it's also a lot of fun! Individuals, who are managing for wildlife game species on their property such as whitetail deer, wild turkey, bobwhite quail, cottontail rabbits, etc., can and will benefit from incorporating predator control into their wildlife management plan.

Have you ever wondered if there was anything else you could do to receive the "optimum" level of benefits from your wildlife management efforts on your property? If you are committed to properly managing your wildlife resources, you should ask yourself the following question; **"If I am incorporating the financial resources and putting forth the efforts to establish a diversified habitat with an optimum food source, adequate cover and being responsible on harvest parameters, why am I not concerned with excessive predation of my wildlife resources?"**

My job takes me all over the southeastern United States and as far south as south Texas. Undoubtedly, the most rewarding aspect of my job is hearing from landowners and wildlife managers about the benefits they are experiencing due to continued predator control efforts on their property.

Mr. Johnny Kincey, President of *Whitetail Land Management, Inc.* (Auburn, Alabama), recently shared the following: "This past winter, we decided to take the beagles and see if we could get the boys on some good rabbit hunting. Wow! As you can see by the photographs, we had the best rabbit hunt that we have ever had. We harvested 41 rabbits in less than four hours. The dogs were worn out! This kind of rabbit hunting was not remotely possible before we incorporated a predator control program on our property".

Mr. Bill McKelvy, owner of *Whitetail Lakes'* properties in Pintlala, Alabama recently wrote, "We have for the very first time had a minimum of seven whitetail does with triplet fawns. Our whitetail fawn recruitment rate has easily doubled since we incorporated predator control into our wildlife management plan!"

Mr. Kincey and Mr. McKelvy are two of the most innovative and progressive wildlife managers in the southeastern United States and their statements speak volumes. When they found out that I was writing this article, they contacted me and wanted me to know the following: "We have also observed that our deer now enter our food plots without their usual nervous tendencies. They are not worried anymore about being chased and attacked by coyotes and/or bobcats. Additionally, our wild turkey population has exploded due to our decreased predator populations." With proven results like these, it's hard to argue why predator control should not be a major component

These are 41 cottontail rabbits which were harvested in less than 4 hours. This was possible due to successful predator population management.

Herbivores, such as beaver, can have negative effects on timber and crops. If you allow beaver populations to go unmanaged, you may find that the financial cost for repairs may be enormous.

A diversified habitat along with Predator Control are the keys to successful wildlife management.

of every wildlife management plan.

Predator control in wildlife management is catching on like wildfire! One may wonder why it has taken so long for the majority of wildlife managers across the United States to understand and acknowledge the importance of protecting their investments… Would you leave your vehicle unattended in a populated area and leave it unlocked with the keys in the ignition? I would hope that most of us would not. This is because we want to protect the investment that we have in that vehicle and we want to feel that we have done all that we can to maintain its safety and security. It is exactly the same with the wildlife resources on our properties. If you have an investment in managing those wildlife resources, then why would you not want to take measures in protecting those investments? Fortunately, those wildlife managers who have already taken measures to protect their wildlife management investments by incorporating predator control into their wildlife management plans are now experiencing the rewards of their efforts.

Controlling predator populations should be a continuous effort. One should understand that even if you were to eliminate every single bobcat, coyote, beaver, etc., off of your property, it will just be a matter of time until transient predators (or beaver, etc.) will fill the voided habitat and establish it within their own home range. The key to making your predator control efforts successful and providing you with that wildlife management optimum benefit, is to consistently control your predator populations just as you consistently provide your wildlife resources with adequate habitat (i.e. food, cover, water and space).

When conducting white-tailed deer management consultation work with clients, Mr. Macy Ledbetter, owner and consulting Wildlife Biologist of www.SpringCreekOutdoors.com, says, "Without growing fawns this year, you can't harvest a trophy buck in five years" and "Deer don't eat grass, they live in it. If you have predators, and I don't know of anyone who does not, you better have good grass for your fawns to hide in!" Macy Ledbetter conducts the majority of his work in the state of Texas and if there has ever been a place where managing for trophy whitetail bucks is taken seriously, its Texas!

DuCote Haynes, M.D. (retired) of Little Rock, Arkansas manages three separate hunting clubs which are located in north central Arkansas. At age 70, Dr. Haynes is one of those individuals whose battery never runs down. He

Establishing harvest parameters is another key to successful trophy whitetail buck management.

is passionate about wildlife management and never passes on any opportunity to expand his knowledge pertaining to cutting edge methods and technologies which may enhance his wildlife resources. Dr. Haynes states, "While trying to learn all that we could about proper wildlife management techniques from those who have succeeded before us, we came to the conclusion that we needed to incorporate predator control into our wildlife management plan. Our goals are to decrease our wild turkey and bobwhite quail depredation rates and to increase our whitetail fawn survival rate. Our predator populations have previously not been held in check and we sincerely believe that predator population management is past due."

There are numerous other success stories which reflect how predator control has benefited wildlife management. Whether it is problems with excessive predator populations such as bobcat, coyote, raccoon or river otter and/or herbivores such as beaver or nutria, consistent predator control efforts are the key to enhancing your wildlife management endeavors. If you have not yet been one of the many wildlife managers who have already incorporated predator control into your wildlife management plan, I highly encourage you to consider the proven benefits. Just remember, if you do nothing to keep your current predator populations in check, all of your wildlife management investments just may be eaten up right in front of you!

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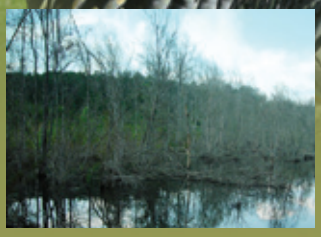

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Red-cockaded Woodpecker Management in Today's South: a lost cause, no cause or just because?

By G. Ryan Shurette

Adult RCW perched outside its cavity. USFWS (Eric Spadgenske)

G. Ryan Shurette is an Ecologist/ Botanist with the USDA Forest Service.

The very words "red-cockaded woodpecker" have the ability to stir instant emotion in people. For many, you might as well have slapped them in the side of the head as made them hear those awful words. For others, life-long work and worry is focused around the biology, well-being, and recovery of this species. Liaison by nature, I can see the underlying rationale that drives both of these viewpoints. Today in the southeastern United States however, more and more landowners are mending their relationship with the red-cockaded woodpecker (RCW) and changing their veiws regarding this species and the "big pine timber" ecosystems they inhabit. The truth is that the RCW is simply a species that became dependant on a particular type of habitat, much like the bobwhite quail. A habitat system that was once very common, stretching almost continuously from southern Virginia to east Texas. That system was, of course, the mature longleaf pine woodlands that occupied more than 90

million acres of the coastal plains, uplands, and even mountains across the South. When the longleaf ecosystem was common, the RCW was common. My grandfather saw some of the last big virgin longleaf stands in Alabama during his years in the log woods with a crosscut saw. He said "heck boy, in those days there was one on every ridge", referring to the groups of cavity trees or "clusters", described later. While RCWs also lived (and still do) in mature slash, shortleaf, and loblolly stands, longleaf was (and still is) by far the most important tree to the RCW.

Now, with less than three percent of that original longleaf habitat remaining (due to agricultural clearing, logging, free-range grazing, fire suppression, and other factors), the rarity of the ecosystem and its associated habitats has led to drastic declines of several plant and animal species, including the RCW. These declines led to federal protection and laws, with the passage of the Endangered Species Act in 1973, aimed at keeping species from becoming extinct. While the vast majority of the remaining mature longleaf occurs on federal or state lands, some private and industry landowners were affected by the laws. And when people were informed that they may be found liable for "take" if they planned to clear-cut their big longleaf sawtimber and had RCWs, they understandingly developed a sense of dislike for the bird. But these mindsets, as well as the management implications set by the federal government, have changed a bit in the past three to four decades, for government agencies, industries, and private landowners. As we have learned more about the RCW, the longleaf ecosystem, timber management, and people, it appears that there's some common ground after all. In fact, many of the timber sale projects (i.e. timber volume) that presently occur on USDA Forest Service lands in the southeast are driven by RCW habitat management. That's right, the RCW generates timber

Adult male RCWs have a small red spot called a "cockade" on each side of the head. USFWS (Eric Spadgenske)

projects. If that's not enough, now some private landowners (timber managers), and even timber companies, will proudly tell you they own habitat occupied by RCWs or that they are working hard to try to get them. So what's the deal? Why the change of heart? We will discuss those changes but first let's learn a bit about our subject.

RCW Biology and Life History

The federally endangered red cockaded woodpecker (*Picoides borealis*) is a relatively small bird, about the size of a cardinal, with black and white markings. It looks similar to

our downy (*P. pubescens*) or hairy (*P. villosus*) woodpeckers, but can be distinguished by its barred back, a large white cheek patch, and its short nasal call. Adult male RCWs have a tiny "spot" of red feathers at the top of each cheek patch, known as a "cockade", while females do not. However the sexes are generally indistinguishable from one another in the field. Juvenile males have a larger, more noticeable red spot on the top of the crown. RCWs are atypical birds in that they are cooperative breeders. This means breeding pair of adults often gets support from one or more male helpers, usually offspring from the previous season(s). Young females and the males that don't stick around to be helpers typically leave the cluster by their second spring. Usually they don't go far, although some have been documented to have traveled long distances. Nesting and roosting, for the most part, takes place in cavities that the birds excavate in old live pines, usually longleaf. Cavity excavation takes a long time to complete, often several years. A RCW cavity entrance appears perfectly round, about two inches in diameter. Elongated pits in live pines are usually foraging holes made by the much larger, and more common, pileated woodpecker (*Dryocopus pileatus*). Once the RCW cavity is completed, the owner will generally return to the same cavity each night to roost. The RCW causes the living pine to exude sap or resin around the cavity by keeping several small wounds, called resin wells, open and flowing. This sticky resin flow has been shown to be an effective barrier against climbing snakes. The family groups are highly cohesive and typically live together in a group of cavity trees referred to as a "cluster". Nesting season generally occurs around April and a typical clutch size is two to four. These eggs are most likely laid in the breeding male's roost cavity, and will hatch in only about eleven days. Young are fed by all members of the family group. The RCW's diet consists mainly of insects, spiders and other arthropods found on the trunks and in tops of trees; these trees generally are larger pines. Food availability is dependent on habitat quality, therefore habitat management is likely a good way to improve their abundance.

RCW Habitat

RCW's require mature live pines for roosting and nesting habitat (the cluster site), preferably >80 years, with little or no hardwood midstory encroachment in the area. Quality foraging habitat would contain a similar component of pine timber, although younger stand age and a limited amount of midstory is usually tolerable. The "open" park-like conditions of the stands are generally maintained, of course, with the use of frequent prescribed fire. This open spacing of large pines coupled with frequent burning builds a diverse herbaceous understory of

grasses, legumes, and forbs that is also an important component in quality RCW habitat; as a result, insect abundance remains high. "Good Quality Foraging Habitat" is technically defined in a few pages of the US Fish and Wildlife Service's RCW Recovery Plan (2003 revision), but in a nutshell, good RCW habitat essentially looks like good bobwhite quail habitat with an open stocking of large pines. However, unlike bobwhite requirements, the pine timber component is mandatory for the RCW. In fact, many of the same management tools that create good quail habitat are used for RCW habitat management. And yes, that management includes timber thinning over time. As stands get too dense, say >80 ft^2/acre in basal area, the herbaceous understory becomes sparse, lower-level canopy structure becomes less open, and they begin to look less appealing to RCW's. Timber thinning to benefit RCWs is sometimes conducted with group or "patch" cuts, where small patches of timber are harvested through the stand, or more commonly with "bottom up" thins, where mainly intermediate pines and hardwoods are harvested, leaving the oldest

longleaf. The ability to keep an active timber program, while managing for longer rotations of poles and sawtimber, is one reason folks are taking an interest in RCW's.

Notably, proper habitat management of (old-growth) longleaf forests for RCWs and bobwhites benefits numerous other flora and fauna. Several declining wildlife and plant species are tightly associated with the same open, fire-maintained conditions. Species like Bachman's sparrow (*Aimophila aestivalis*), prairie warbler (*Dendroica discolor*), and brown-headed nuthatch (*Sitta pusilla*) and several reptiles including the glass lizard, (*Ophisaurus* sp.) and gopher tortoise (*Gopherus polyphemus*) are often common in RCW habitat. However the most notable diversity is observed in the plant communities of the understory. A typical understory in RCW country would consist of several native grass species, dependent on soils and location, including wiregrasses (*Aristida* spp.), bluestems (*Andropogon* spp, *Schizachirum* spp.), and Indiangrass (*Sorghastrum* spp.). Native legumes including partridge pea (Cassia fasciculata), creeping lespedeza (*Lespedeza repens*), and beggarweeds (*Desmodium* spp.), to name a few, would also be common. There would be an almost countless variety of forbs including asters (*Aster* spp.), bonesets, (*Eupatorium* spp.), and goldenrods (*Solidago* spp.). Again, all of this might sound familiar to you from a quail management standpoint. This abundant, diverse understory generates the abundance of food (the food that will find its way up into the trees) rendering high quality RCW foraging habitat. And, as you have learned from previous articles in Wildlife Trends, early succession under pine stands is also a great habitat for white-tailed deer and wild turkeys. The associated wild-

life benefit (for both game and non-game species), along with the release of rare plant communities, resulting from RCW management is another reason for the increased interest in RCW management by private individuals.

Modern RCW Management

According to the revised RCW Recovery Plan (available online at the website link provided), in 2003 there was an estimated 14,068 RCW's living in 5,627 clusters across eleven states. Most of these birds live on National Forest lands, with the Apalachicola National Forest population being the largest (at approximately 665 active clusters). National Forests are considered to have the most important role in the recovery of the RCW because that is where the vast majority of the longleaf is. Military installations are considered to be second in line followed by National Wildlife Refuges and other federal and state-managed lands. The remaining 23 percent of RCW groups are found on private lands, although old longleaf timber is generally rare on private property. There is increasing interest from individuals and timber companies to manage their properties to a higher standard than is required, to aid in the recovery efforts.

For the most part, RCW managers practice similar management techniques across the South. These commonly are prescribed burning, hardwood midstory control, timber management, artificial cavity installation, population monitoring/banding, and translocation of birds. There are specific guidelines spelled out in the Recovery Plan for each of these tools. Controlled burning is the key to successful maintenance of a longleaf stand for red-cockaded woodpecker habitat. Growing season burning is somtimes used by RCW managers to effectively control the woody species encroachment in the stands. Frequency of burning varies but is typically conducted every 1 to 3 years on most intensively managed tracts. Longleaf are

Mountain longleaf RCW habitat on the Shoal Creek Ranger District, Talladega National Forest. USFS (Ryan Shurette)

Dormant season controlled burn in a RCW stand. USFS (Blake Morris)

exceptionally adapted to surviving fire. However, they can still be killed by fire. Caution must be taken when planning and conducting prescribed burns, as retention of an adequate number of old longleaf is essential in RCW management. A common practice used to protect the cavity tree resources from fire weakening or killing them is to rake the litter back away from the base of the cavity trees in the cluster prior to the burn. Ignition methods can also be adjusted to help ensure the cavities and older trees in the stands don't get too hot during the burn. Research has shown that unwanted mortality in old longleaf stands is sometimes caused by burning when the duff layer was too dry or there was an extended period of no rain after the burn, leaving the duff to

USFWS Artificial cavities, or inserts, are often used in RCW management.

smolder and cook the fine roots and/or cambium at the base of old longleaf trees. A long period of fire suppression adds to the risk of mortality while prescribed burning as well.

In pine stands that contain significant hardwood or undesirable midstory encroachment, it is usually necessary to physically reduce this structure to create or restore suitable RCW habitat. These "midstory" treatments can be achieved via timber sales, chainsaw contracts, or using herbicides. RCWs can tolerate limited structure in the stand's midstory but will abandon the cluster if it becomes too dense. The same goes for the overstory; it can't become too dense or the habitat quality declines. An ideal canopy closure for RCW management is one that allows enough sunlight reaching the ground to produce a total coverage of herbaceous plants, while also having enough tree substrate to most efficiently forage on. This usually equates to longleaf basal areas ranging from around 40 to 70 ft^2/acre.

An adequate amount of this open, good quality foraging habitat should be available within ¼ to ¼ mile of the cluster site. How much is "an adequate amount" of quality forage habitat? The Fish and Wildlife Service recommends that federal agencies, state lands, and private individuals who desire to increase their RCW population, should maintain at least 120 acres of quality habitat per breeding group of birds. However, if the landowner is merely concerned with maintaining enough foraging habitat to prevent the requirement of obtaining a permit for "incidental take" they are typically bound to a significantly smaller size, usually around 75 acres. Individual situations are often analyzed by the Fish and Wildlife Service on a case by case basis so that a workable plan can be developed.

Availability of old longleaf trees (greater than 80 years) used for nesting is typically a limiting factor on the lands that support RCWs. The older trees are used by the birds for building cavities because they often are infected with red-heart fungus that softens the heart of the pine, making the task of excavation much easier. To supplement this resource, mangers commonly install artificial nest boxes (inserts) in younger live pines, essentially buying time until more trees in the stand can reach the age required for excavation. Inserts must be used in trees that are large enough (typically greater than 15 inches in diameter at the point of installation) to safely accommodate the box. Typical preparation for the installation is done with a small chainsaw and the insert is glued flush into the tree with wood putty. If installed correctly, they are often difficult to distinguish from natural cavities at a distance. RCW's in the immediate vicinity usually take to these inserts fairly well. Drilled cavities sometimes are also used in recovery efforts.

Most RCW managers also conduct some amount of monitoring and banding. These techniques require permitting from the appropriate agencies. Information gathered from the efforts is recorded and used when it comes time to capture and move "extra" birds from one location to the other (translocation). Essentially it gives you the knowledge to tell "who's who", so that breeding adults are not accidentally taken from a productive cluster. Extra birds used in translocation are generally young females and helper males that come from large (over 100 active clusters) populations. These areas often have more population growth than habitat growth so they donate birds to smaller populations with suitable habitat. Moves within a population are sometimes conducted also.

Safe Harbor Agreement

As you may have figured out by now, these guys are specialists that are finicky about where they live. They are actually quite intolerant of poor habitat and on more than one occasion I have watched them abandon what appeared to me as great RCW habitat. However, if you hold property that is somewhat near an existing population, and you do have open pine sawtimber, there is a possibility that red-cockaded woodpeckers might use your habitat. The Fish and Wildlife Service realized that people's fear of "getting" RCWs was causing a lot of old longleaf habitat to be clear-cut. This trend was not only detrimental to RCWs, but to other associated plants and animals relying on longleaf ecosystems. A great remedy to this dilemma was the Safe Harbor Program that came into effect in 1999.

Under the Safe Harbor Agreement, a landowner who manages their pine forests in a manner beneficial to the RCW is provided certain guarantees. Prior to enrollment, the government will conduct a survey to determine the baseline number of clusters on the property. If woodpeckers happen to increase on an enrolled property, owners are only held liable for the baseline number. The landowner retains all property rights but agrees to provide a net conservation benefit through the use of some of the management practices that we have previously discussed, including increased timber rotation and prescribed burning. The government will also help enrolled parties to obtain financial assistance in the form of grants and cost-share pro-

Prairie warblers are generally a common inhabitant of stands managed for RCWs. USFS (Ryan Shurette)

grams to help cover the costs of these activities. Upon termination of enrollment, any birds that have occupied the property during enrollment can be relocated. For more about the red-cockaded woodpecker Safe Harbor Program in Alabama visit the FWS Safe Harbor website at http://www.fws.gov/daphne/rcw/rcw-safeharbor.html.

Summary

The majority of RCW management occurs on public lands. However, private landowners, bird enthusiasts, and general conservationists are now concerned with their management, not only for the single-species of RCW, but for the entire longleaf ecosystem, whereby numerous species (flora and fauna) benefit from the successful management of this habitat type. In some respects, RCWs are indicator species where their 'picky-ness' indicates when the habitat is poor. And, despite hostility and/or enmity that exists toward RCWs, the management for these guys is oftentimes synonymous with bobwhite quail management and a whole host of others. Further, recent programs have been developed to aid landowners financially and physically to manage these ecosystems properly to restore sustainable longleaf habitats yielding healthy forestlands as a whole, and also to protect private landowners or, minimally, free them of concern from increasing RCW abundance on their properties via the Safe Harbor Program.

After years of effort, research, and communicating with folks, modern RCW management in today's South seems to be working, both for the birds and for the people involved. If you are interested in learning more about the management of red cockaded woodpeckers, to find out if you are near existing RCW populations, or if you need assistance with the verification of their presence on your property, contact your nearest US Fish and Wildlife Service Field Office or link from the Safe Harbor website above. Please understand the information provided in this article is based on personal observation and the regulating agency (USFWS) should be consulted before any action is taken regarding RCWs.

Management Calendar

By Dave Edwards
Westervelt Wildlife Services

June/July 2008

Late May & early June is a great time to conduct quail call counts.

Conduct summer quail call counts.

Call counts conducted in June provide an estimate of the number of males available for breeding and an evaluation of winter survival. This information allows you to monitor the quail population's response to habitat management efforts and quail production. To obtain an index of male birds, set up several "listening points" on your property that can be used each year. Listen for whistling males for 1-2 hours after sunrise. In June, nesting by females is at its peak in many regions, so males will be actively calling. To standardize the call count, arrive at the first station at sunrise, wait one minute to allow vehicle disturbance to settle, then listen for five minutes and record the number of male quail heard. Count the number of different individuals you hear. Continue until all stations have been monitored. You will need to conduct the call counts at least 5 different days for the most accurate esti-

mates. The more counts you conduct, the more accurate your estimates will be (statistically speaking). We often conduct 10 call counts (10 different mornings) each June. After completing the call counts, calculate the average number of calling males heard per station. This is your "index" and the number in which you will compare against future call count data to assess increases or decreases. The key to accurate year-to-year counts is to be consistent about everything you can control: same people listening, same locations, same kind of weather (clear, windless days) same week of the year, and the same time of day.

Start preparing and planting dove fields.

Dove field preparations should begin by July. Planting dates will depend on the soil moisture, crops you are planting, and the time required to produce seed. Common dove field crops include dove proso millet, browntop millet, Japanese millet, sunflowers, grain sorghum, corn, and wheat. For best results obtain soil samples and apply required lime and fertilizer before planting. Be sure to allow enough time for your crop to produce seed before dove season arrives. If you are in a pinch or running behind on your planting, browntop millet is a good choice for dove or ducks because it only takes about 50 days to produce seed. One trick that we often implement on dove fields to create hunting blinds is to plant strips of Egyptian wheat or sorghum Sudan. These plants can grow 8-10 feet tall and will provide adequate cover for hunters. Another option is to simply hand sew the seed where you want hunting blinds to be. This will create small "islands" for hunters to use. These tall crops also provide shade for hunters during the early part of dove season when temperatures can be hot.

Monitor and control competing weeds around fruit trees or other plantings.

Herbicide is a great tool to combat weeds and grasses that compete with young fruit trees. Using herbicide to reduce this competition is often overlooked, but is a critical step for success, particularly during drought conditions. Young fruit trees have a hard enough time obtaining adequate nutrients and water without other plants fighting for the same resources. Reducing competition will significantly increase tree growth and survival. Glyophosate, or Round Up, is the herbicide of choice. Be sure to avoid getting the herbicide on the leaves of the tree you are spraying around. I highly recommend using tree tubes when planting seedling fruit trees. Not only will the tube enhance tree growth by creating a "green house" effect, but will allow you to easily spray herbicide around the trees without the

Using tree tubes not only enhances growth of young trees, but it makes applying herbicide to control weeds much easier.

risk of getting it on the tree itself. Another helpful tip is to place 3-4" of mulch around the base of the trees. Mulching will reduce weed problems due to the unfavorable germination conditions under the mulch (no sunlight) and will also conserve soil moisture which will help your trees during the hot summer months.

Evaluate and repair existing roads & build new ones.

June and July are often the driest months in the Southeast (other than those of you lucky enough to get sea breezes and regular afternoon thunderstorms). Thus, this is a good time to work on or build new roads. Although you probably have a good idea of areas that need repair, the best time to identify road problems is during the wet season which is usually during late hunting season. Make notes during the winter then repair them when the property dries up in the summer. As you know, having all weather access to your property is important from a management perspective so that you can get tractors and equipment into areas of your property, but will also make life easier and more comfortable for you during hunting season. While working on roads, consider increasing the roadsides where possible to enhance wildlife habitat (see calendar item below). These areas can be planted or simply maintained as native grass/weedy areas that wildlife will use for food and cover. Wide roads also dry out quicker due to additional sunlight and wind.

Widen roadsides to create roadside management areas

Summer is a great time to create roadside management areas throughout your property. Creating roadside management areas can add wildlife and aesthetic value to

One of the best times to widen a roadside is just after the area has been clear cut

your property. Regardless of how intensely you manage these areas, they will create more "edge" habitat which is preferred and used by most game animals. To create a roadside management area simply clear the understory and undesirable trees along a roadside, lime/fertilize as needed, and periodically mow to maintain control of encroaching trees species and maintain a relatively low understory (avoid keeping a "manicured" look by mowing roadways often – this does not offer as much wildlife value). How wide you make the area is site specific, but is generally 10-20 yards wide. Be sure to leave a few desirable mature trees within the managed area. These trees will provide shade to conserve moisture in the summer and will add aesthetics along the road. If you desire to intensely manage your roadsides you can seasonally disk or burn them to promote desirable weeds, and/or install wildlife plantings such as clovers, sorghum, or wildflowers. Wildflowers provide both esthetics as well as bugging areas for turkeys. Managing roadsides not only increases the aesthetics of the property and add wildlife value, but will increase wildlife viewing opportunities. For more detailed information see the Roadside article in the April – May 2007 issue of Wildlife Trends.

Duck pond plantings take time to mature. Be sure to plan ahead. Teal generally start arriving in early September.

Complete draining duck ponds and prepare for planting.

If you are managing a moist soil area/duck pond (native vegetation vs. planting agricultural crops), you should have started your spring drawdown around 45 days after the last frost. Slow drawdowns, those that take 2-3 weeks, are desired because they result in a more diverse wetland plant community than rapid drawdowns. A diverse community of wetland plants will result in many different types of food sources (seeds and insects). By May or early June, your drawdown should be complete and native moist soil plants are starting to establish. Herbicides can be a useful tool to remove undesirable vegetation if it becomes a problem and is dominating the pond. Button bush and sesbania (wetland shrubs) can be beneficial, but should be kept in check and not allowed to comprise more than 25% of the pond.

If you plan to plant an agricultural crop rather than manage the native vegetation, leave the pond flooded until closer to planting time. That is, drain ponds you plan to "plow and plant" a few weeks before you start plowing and preparing the soil for planting. Leaving the pond flooded until this time will provide weed control and will reduce tractor time later. Drying time will vary depending on your soils. It is better to drain early than to wait and not be able to work the ground because it is too wet and chance running out of growing season. My personal favorite crop for duck ponds is rice. Rice, however, requires more time and effort to manage and takes about 120 days to produce seed (depends on variety used) so you need to plant early. For best results obtain soil samples and apply required lime and fertilizer before planting. Japanese millet is also a favorite of ducks and is easily grown by duck pond managers. In fact, Japanese millet can be top dressed or broadcast onto mud flats of a wetland or beaver pond. Japanese millet is a strong re-seeder, meaning that it will produce seed that will germinate the following year.

Conduct warm season or summer prescribed burns.

Warm season burns are an exceptional tool for managing quail habitat. Warm season burns are generally conducted from June through August. However, extreme caution should be used when conducting summer burns. Due to higher ambient air temperatures and low relative humidity, summer fires can get very hot and difficult to control. If the area you plan to burn has a heavy fuel load (understory shrubs, grasses, and thatch) or has not been burned in

over 3 years, I recommend initially conducting a cool season burn (December – March) to reduce fuel loads before attempting a summer burn. Fire rotations (interval of time between burning the same area again) for summer burns vary depending on your goals and habitat types but are generally every 1-2 years to promote quality wildlife habitat. Regular warm season burns will often promote native warm season grasses that are desirable for quality quail habitat. It is also a good idea to strategically plan your burns so that you always leave some areas unburned. This will help to maintain diverse habitat types which will enhance the wildlife value of the area. Always check local burning laws and consult with an experienced burn manager before lighting a woodland fire. The U.S. Forest Service or your state forestry commission are great sources for obtaining more information regarding burning in your area.

Plant chufa for turkeys.

Chufa can be planted in May or June in the Southeast, but most plantings occur in June when summer rains start. Monitor chufa plots for competing grasses and weeds and apply herbicide accordingly to control. Adding chufa to your planting program can be quite rewarding if you like to see or hunt turkeys. Turkeys primarily utilize chufa in the fall, winter and spring once the tubers have developed. If your turkeys have never been exposed to chufas, you may need to lightly disk a strip through the patch in late fall to expose tubers. Once turkeys find them, you will not be able to keep them out. A word of caution – raccoons and hogs like chufas as well and can pose problems in some areas. Chufa patches can often be regenerated the following spring by lightly disking the areas. There has to be adequate chufa seed remaining to regenerate an adequate stand (there's often more left than you may think). To regenerate the stand, lightly disk the plots once in April, again in May, and once more in June. The key is to continue disking each month regardless of how nice your plot is growing with chufas – it's going to kill you, but do it. Herbicide applications can be used to enhance chufa plots by controlling competing weeds and grasses. Be sure to rotate your chufa patches every 2-3 years to avoid nematode problems.

Identify and control invasive exotic plant species.

Exotic species are very competitive with native plants and can take over your property and compromise habitat quality. The best time to control or eradicate exotic plants is during the growing season. Strategies to control these plants vary depending on the species at hand. However, herbicide will likely be the tool of choice. It is much easier to control exotic species if you catch them in the early stages of colonization. Once the have a foothold, eradicating can sometimes be impossible. Some of the common invasive exotics in the Southeast include Cogongrass, Chinese tallow tree, Kudzu, Chinese Privet, Chinese Lespedeza, and many others. If the common name has a foreign country in it, I would get rid of it. A great field guide to keep on hand is "Nonnative Invasive Plants of the Southern Forest" by James H. Miller. You can get this publication from the USDA Forest Service – Southern Research Station at Auburn University or visit http://www.bugwood.org/weeds/forestexotics.html. This guide has information regarding identifying invasive exotics as well as methods of controlling them. Another resource is the Florida Pest Plant Council - www.fleppc.org.

It is also wise to consult with a professional herbicide applicator before deciding which herbicide and method to use. Besides the complex world of herbicides themselves, mixing and applying them can be complicated as well.

Although chufa is planted in the summer, their fruit (small tubers attached to the roots) matures in the fall. Chufa provides a food source for turkeys winter through late spring.




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