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Wildlife Trends JOURNAL

NOVEMBER/DECEMBER 2008 VOLUME 8, ISSUE 6

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101 MARKET PLACE, SUITE 500
MONTGOMERY, ALABAMA 36117

www.wildlifetrends.com

800-441-6826

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

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

Quail Management on a Small Property: A Case Study

Green Ash advanced hardwood encroachment.

By Wes Burger, Ph.D. and Leslie Burger

Wes Burger is a Professor of Wildlife Ecology in the Department of Wildlife and Fisheries at Mississippi State University. His research interests include bobwhite population ecology, impacts of federal farm programs on wildlife populations, and response of early successional birds to forest and agricultural management regimes.

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Despite notable successes with species such as white-tailed deer and eastern wild turkey, not all species have thrived in modern landscapes. Throughout the Southeast over the past 30 years, some species of wildlife have declined to historic lows, specifically songbirds and small game species associated with early successional habitats and grasslands. Although it's perhaps more appealing to blame these losses on single issues, like fire ants or predators, the most important reason for these observed declines is the alteration of an entire ecosystem. Granted, by the early 1900's the Southeastern landscape was already highly altered by the land use practices of Europeans' settlement and agricultural development. But these land use practices created a diverse mosaic of row crops, native grasslands, fallow fields, and forest to which bobwhite and other early successional species were ideally suited. The high bobwhite populations of past decades were an accidental by-product of

those agricultural times and the early successional habitats created through timber harvest, primitive agriculture, land fallowing, and broadly applied fire. Today, by necessity, modern land use practices strive to maximize food, fiber, and forest products and have the net effect of simplifying the landscape. These land use practices, coupled with interruption of natural disturbance regimes (e.g. fire exclusion), have contributed to a reduction in landscape complexity, or heterogeneity, and reduced the number of places where bobwhite can prosper and the population size which a given location is able to support. Declining habitat quantity and quality has produced fragmented and isolated bobwhite populations that may be more vulnerable to harvest and predation.

Although it is not feasible to return to those days when farming was done by mule or 1-cylinder tractors and natural fire regimes will never be restored on historic scales, it is possible to provide wildlife habitat in the context of today's agricultural and forested systems. In the July/August 2007 issue of *Wildlife Trends*, we described how one landowner in northeast Mississippi has been able to improve wildlife habitat and enhance wildlife populations while still maintaining a productive working farm of 5,200 acres. However, recreational properties are typically much smaller than that and most landowners have limited resources to allocate to wildlife habitat management. In this article, we would like to show you how the owners of a newly acquired smaller property (338 acres) could manage their lands primarily for wildlife recreational opportunities in an agricultural landscape.

Property Description

The property that is the focus of this article is located in Monroe County in northeast Mississippi. The native vegetation of this region was warm-season native grasses and scattered hardwoods. This is in the Blackland Prairie region and fire was an important historical factor that shaped plant communities. However, today most of this region has been cultivated or converted to exotic-forage grass pasture. For the past two decades, this property has been used for recreational hunting and for generating income through the Conservation Reserve Program (CRP). Eighty-seven percent of the property (294 ac) was enrolled in CRP and the remaining 13% is wooded. Although CRP grasslands can provide excellent quail habitat, most do not. On this property, the CRP currently provides little bobwhite habitat. One hundred seventy-one acres (51% of the property) is CRP grassland dominated by a mixture of fescue and Johnson grass with scattered native grasses (broomsedge) and forbs. Seventy-eight acres (23%) is CRP with encroachment by sapling hardwoods (primarily green ash); 42 acres (12%) is CRP with advanced (diameter >1") hardwood invasion. Thirteen percent (45 acres) of the property is in forest, characterized by cedar, Osage orange, green ash and other low-quality hard-

Current conditions and features on 320 ac tract in Monroe County, MS.

Current land use/landcover on 320 ac tract in Monroe County, MS.

Suggested plantings on 320 ac tract in Monroe County, MS.

woods located in hedgerows, drainages, and an old pond site.

Like many properties in the Southeast, active land management on the area has been limited to maintenance mowing and establishment of a few, small, rye-grass deer food plots (totaling 3 acres). These practices have had little or no positive impact on carrying capacity or habitat quality for focal wildlife species. Most southeastern landowners would like to produce large bucks on their property. Many are willing to implement the principals of quality deer management to achieve this objective. However, effectively controlling harvest on a scale sufficient to manage sex/age structure of the population requires control of several thousand acres. This property, like many in the southeast, is too small to *independently* manage harvest and production in a way that produces quality bucks. However, through cooperation of like-minded adjacent landowners, a management cooperative could be developed to achieve harvest/age structure objectives on a larger scale. Furthermore, a property of this size can be managed so as to produce an abundance of high-quality white-tailed deer forages that are distributed in a manner so that viewing and harvest opportunities are maximized.

Many landowners would also like to support bobwhite populations reminiscent of past decades. Like quality deer management, successful bobwhite management is scale-dependent. The same intensity of management, conducted over a larger scale, will normally produce a greater response. Population modeling studies have suggested that, depending on the frequency and nature of catastrophic weather events, harvest rate, and bird density, as much as several thousand acres may be required to support viable bobwhite populations independent of surrounding habitat over the long run. Furthermore, achievable sustained densities may be a function of total area under management. But most landscapes, even today, support low density bobwhite populations (1 bird/10 – 20 ac). When appropriate habitat is created and maintained local populations will respond and increase. On this Mississippi property, advanced natural succession, exotic forage grasses, historic land use practices, and lack of appropriate periodic disturbance limits habitat for bobwhite and other early successional or grassland species. However, nearly all of the property is conducive to bobwhite management and could provide habitat that would support sustainable bobwhite populations. Additionally, the property lies in a portion of the state that has been identified as having high potential for bobwhite habitat development. Although the surrounding properties are in row crop and pastures, habitat improvements within 5 miles of this property have already been made through establishment of several thousand acres of native warm-season grass pastures and CRP buffer practices. The new landowners would like to implement a plan that would provide sustainable bobwhite populations that would allow for quality dog training opportunities and some recreational hunting. This article will outline a suggested course of action that could achieve their ownership objectives.

Habitat Issues

The various seasonal habitat needs of bobwhite are provided by different stages of *early successional habitats*, those plant communities that develop after some form of land disturbance. Bobwhite thrive in areas that have high interspersion of several different plant communities including perennial native grasses, annual weeds, grain crops, mast-producing shrubs or trees, and shrubby cover. The subtle changes associated with just a few years' growth can dramatically alter the value of habitat to meet the bird's seasonal needs. Because bobwhite are relatively sedentary, it is essential to provide all of their seasonal habitat needs in a relatively small (40 ac) area. Consequently, the distribution of habitat components is as important as the amount.

Successful bobwhite management entails identifying those components that are lacking in either quantity, quality, or distribution, and then managing the landscape to increase the proportion that is usable to bobwhite. An evaluation of the Monroe County property revealed that four essential resources – nesting habitat, brood-rearing habitat, shrubby cover, and winter food – are limiting.

Nesting cover is characterized by 2-3-year-old idle native grasslands with moderate litter accumulation. Perennial grasslands dominated by native bunch

grasses such as broomsedge, little bluestem, or Indian grass provide excellent nesting cover. Bobwhite often nest in proximity to low shrubby cover. The time since disturbance (i.e. prescribed fire) will influence the degree of litter accumulation, and hence suitability for nesting. During the first growing season following a dormant season burn, little or no residual grass cover remains and the grass stand does not provide nesting habitat until late in the nesting season. In the Southeast, native grasslands provide just the right amount of residual litter during the second growing season following a dormant season burn. By the 3rd growing season, litter accumulation may have become too dense to provide optimal nesting cover. Periodic disturbance, on about a 2-yr rotation, is therefore required to maintain appropriate nesting cover.

Brood-rearing habitat is typified by 1-2 year-old fallow annual weed (forb) communities with abundant (25 – 50%) bare ground and high insect density. Broods also use clumps of woody shrubs for shade and loafing. In contrast, the property in question is dominated by exotic grasses which have formed a dense, thick mat of vegetation unsuitable for nesting or brood-rearing. Prior cropping created a poor seed bank, further reducing plant species diversity. Management of the CRP fields by mowing has created a dense duff layer, reduced bare ground, inhibited germination of desirable native forbs and legumes, and shifted the plant community to a relatively monotypic stand of perennial grass. Mowing also did not provide long-term control of encroaching hardwoods, because it simply top-killed them, allowing them to sprout again from the roots.

The open nature of the property and interspersion of wooded hedgerows and drains are an asset and will provide some escape and winter cover. Roosting cover, however, is poorly distributed and is not adequately provided in the property's CRP fields, many of which are covered with exotic grasses on the ground and green ash in the overstory. Roosting cover is best provided by a mixture of annual or perennial weeds, bare ground, and shrubby, woody cover. The absence of grain crops, annual weeds, and mast means fall and winter food resources are also absent on the property.

In summary, the 338 acre tract provides opportunity for bobwhite habitat management. However, existing grasslands are poor in plant species richness and dominated by fescue, Johnson grass, and in some places advanced natural succession. Little nesting cover or brood- rearing cover is available, and year-round food resources are limited. Management activities will need to be focused on creating and maintaining habitat that meets all the seasonal needs of quail, particularly nesting and brood-rearing habitat. The goal will be to maximize usable space on the property in an attempt to approach 100% usable.

Fescue dominated CRP fields.

Managment Recommendations

Bobwhite management in the lower coastal plain of the Southeast is primarily vegetation management to maintain a diversity of early- to mid-successional plant communities. Annual disturbance is essential to maintain the plant community in a suitable stage. The primary management tools used to achieve this are rotational rowcropping, disking, prescribed fire, judicious use of herbicides, and timber thinning where appropriate. Where exotic plants dominate, the first step is eradication of these invasive species so that native plants to which bobwhite are adapted can be reestablished. The objective of a management program should be: (1) make every square foot of a managed landscape usable to bobwhite; (2) ensure an interspersion of plant communities that are readily accessible for these short distance fliers; (3) address factors such as energetics and predation which may inhibit population growth.

CRP grasslands can provide essential nesting, brood rearing, foraging, and roosting habitats for quail. However, the CRP grasslands on the Monroe County property are dominated by fescue and Johnson grass and, over much of the area, are quickly becoming a hardwood forest. Therefore, the first step for quail management on this property will be to eradicate exotic grass species and invading hardwoods, then plant appropriate native warm-season grasses (NWSG), legumes, and forbs.

CRP fields in this condition are not only poor bobwhite habitat, they are also out of compliance with the CRP contract which states that the fields will be maintained in grass cover. Re-enrollment of these fields in the newly-developed Continuous CRP practice CP38 will provide annual income and offset the costs of more-intensive management. The CP38 is a state-specific practice under the continuous CRP program designed to restore and maintain high-priority habitats. Each state identifies the wildlife species and habitats that are highest priority in their region and develops a practice that pro-

vides the desired habitat. In Mississippi, restoration of native grasslands within the Blackland Prairie physiographic region is an approved CP38 practice. However, to be eligible for re-enrollment, the fields must be "physically capable of being cropped", which, in their current state, they are not. Consequently, the woody encroachment will need to be eliminated.

Native Grass Restoration for Nesting Brood-rearing Habitat

Native warm-season grasses (NWSG) are annual and perennial grasses that were present prior to the introduction of non-native grasses such as Bermudagrass and Tall Fescue. Native grasses are regionally adapted to climate and rainfall and local wildlife species are adapted to these native communities. "Warm season" means these grasses primarily grow during summer months (and also during portions of spring and fall). When we replant native grass, we also establish some of the native forbs (e.g. wildflowers and legumes) that historically occurred with these grasses. Some of the most common NWSG species include Broomsedge, Big Bluestem, Little Bluestem, Broomsedge, Indiangrass, Switchgrass, and Eastern Gamagrass. Common forbs include partridge pea, ragweed, native wild sunflowers, coneflowers, butterfly weed, black-eyed Susans, and many other species.

In some situations, a native warm-season grass and forb community is already present but is suppressed by competition with non-native grasses. Use of either a selective herbicide to which NWSG are tolerant (i.e. imazapic) or application of a non-selective herbicide (i.e. glyphosate) during a time when the cool season vegetation is actively growing and NWSG are dormant (i.e. fall or spring) may release the native plants and satisfactorily restore that community.

For some sites native plants are scarce and the seed bank is impoverished. This is the case on the Monroe County property, and undesirable vegetation will need to be eliminated so desirable plants can be established. To eliminate the fescue in the property's CRP fields, an herbicide-burn regime will need to be applied. In the fall, fifteen-foot firebreaks will need to be disked around the perimeter of each field and around areas of hardwood encroachment to prepare for fall and winter prescribed fires. These disked lanes will also later serve as brood plots and food plots. Both imazapic and glyphosate are herbicides that are effective in eradicating fescue. Research by Dr. Tom Barnes in Kentucky and Dr. Craig Harper in Tennessee has shown that either a spring or fall application can effectively eradicate the fescue, but in many cases a fall applications works better. These herbicides can be used individually or in combination, as is marketed under the product named Journey®. For this property, I recommend that the landowners apply 64 oz. (2 qts) glyphosate (Roundup-Pro®, Roundup-Ultra®, or generic glyphosate) + 0.5% non-ionic surfactant in 20 gallons of water per acre while the fescue is actively growing in October or November. Roundup® is a foliar active, non-selective herbicide, meaning that plants absorb it through the foliage and it will kill or injure most plants (read labels prior to use). During February or early March, fields that were sprayed with herbicide during the previous fall will be burned to remove residual dead grass prior to planting. Approximately 2-3 weeks after the fire and 2-3 weeks before planting to NWSG, an additional application of 11 oz of Journey® + 32 oz of glyphosate and 1 pint methylated seed oil in 20 gal H20 per acre will be needed to help control competing weeds. Journey® is a foliar- and soil-active herbicide with residual activity that will kill any remaining fescue and control Johnson

grass seedlings released by the fescue eradication and prescribed fire.

In April - early June, the locally-adapted NWSG and forb seeds will be planted at appropriate rates. The recommended mix for the Monroe County property is a 3-species mixture of Little Bluestem (2 lbs PLS/ac), Indian Grass (1 lb PLS/ac), and Big Bluestem (1 lb PLS) with addition of 2 lbs/ac total forbs that include partridge pea (1 lb/ac), Black-eyed Susan, Maximilian Sunflower, Purple Coneflower and Coreopsis to add diversity, visual appeal, and abundant insects. The fluffy seeds of Big Bluestem, Little Bluestem, and Indiangrass are best planted with a no-till NWSG seed drill specially designed to handle these seeds. No-till establishment is generally preferred, but if the site must be plowed before planting, a firm seedbed will need to be prepared prior to planting to prevent seeds from being buried too deeply. Cultipacking following plowing or discing can prepare this firm seedbed.

Prescribed fire is an essential tool for management of grasslands for bobwhite. Regular application (2-year interval) controls native grass density and stand composition without accumulating litter as mowing does. Burning only half of the area each year in late February to early March provides annually available nesting habitat. Prescribed fire is permitted, and even cost-shared, under the CRP program, however, it must be incorporated as part of a management plan in the CRP contract and be conducted within guidelines established by NRCS. In Mississippi, landowners must: (1) have a written, notarized burn plan, including a description of smoke management; (2) have a burning permit from MS Forestry Commission issued the morning of the burn; (3) conduct the burn with a Certified Prescribed Fire Manager; (4) establish a fire break between areas to be burned and surrounding areas; and, (5) execute the fire within the parameters specified in the plan.

Hardwood Control

Prescribed fire on a 2-year rotation will inhibit invasion of green ash; however, in many places on the Monroe County property, these stands have succeeded beyond the point of control with fire alone. Dormant season fire would simply top-kill these trees, but would not kill the rootstock, allowing prolific re-sprouting. For areas with seedling and small saplings (<1" diameter), a combination of herbicide (one that will eradicate both the saplings and the fescue), followed by prescribed fire, disking, and site preparation for planting to NWSG will be needed. In the fall, after the fescue has greened up but before leaf-fall, landowners will disk 15-ft. fire lanes around the units needing control, then apply 2-5 quarts of glyphosate + 0.5% non-ionic surfactant in 20 gallons of water per acre. Alternatively, 32

oz of Chopper® (active ingredient imazapyr) could be used. Between January and February, but after the fescue and trees have completely browned down, prescribed fire will be applied to the unit. Disking, harrowing, and cultipacking may be necessary to prepare for NWSG establishment, depending on amount of residual woody stems. As an alternative to herbicide application, recent research by Dr. Craig Harper has shown that prescribed fire applied in September can also be effective in eliminating green ash saplings.

Those fields with advanced tree invasion (saplings 2-3"diameter) will require even more pre-planting treatment. Mechanical removal alone would leave well established root-stock that would re-sprout. Herbicidal application could kill the trees and the rootstock, but would leave the stems standing. For complete conversion back to open land, these areas need a combination of herbicide, followed by mechanical removal, disking, and site prep for planting to NWSG. After nesting season (approximately August 15) and before September 15th, the Monroe County property owners will need to apply with a skidder- or tractor-mounted sprayer 4 quarts of Garlon 4 ® + 0.5% non-ionic surfactant in 20 gallons of water per acre. Alternatively, 32 oz of Chopper® would also work. Larger trees, or trees in stands too dense to penetrate with equipment, will need to be treated manually by using "hack and squirt"-- hacking a cut into the tree trunk with a small hatchet and spraying 1 ml of 25% Arsenal AC ® solution into the cut. After complete leaf fall, these areas will need to be cleared with either a mechanical mulching machine or a bulldozer. A mulching machine will not leave dirt piles, although there will be considerable woody mulch on the surface that will have to be incorporated or removed. Clearing with a dozer/shear blade may leave less surface debris and require less disking, but debris will have to be piled and burned. After the sites are cleared, and when soil moisture conditions are appropriate, the sites will have to be deep disked, harrowed, smoothed, and cultipacked in preparation for planting.

Shrub Plantings for Cover

Another essential bobwhite resource missing on the Monroe County property was shrubby cover. Bobwhite use low bushes for loafing and thermal cover, escape from predators, and as a "covey headquarters". Shrub thickets should be a minimum of 20 - 30' across and ideally be available every 100 yards, so that birds are never more than a short flight from cover. Although the property of interest has an over-abundance of wooded habitat, very little is in appropriate low-growing shrubby cover. Furthermore, the understory of fescue restricted access to the extant woody cover. Strategic plantings of clumps of shrubs such as Chickasaw plum will be established by planting 36 seedlings in a 6 x 6 grid on 6' spacings. Shrub planting locations can be disked in the fall and new shrubs planted during the winter and early spring using a dibble bar. Either before or after planting, but prior to bud-break (February – March), 2 oz. of Oust XP® (or equivalent) in 10 gal H2O with no surfactant will need to be applied to reduce herbaceous competition.

Growth of low, shrubby cover can be stimulated along wooded corridors adjacent to grasslands through a practice called edge-feathering. This process requires removal of low-quality hardwoods, such as sweetgum, hackberry, cottonwood, sycamore, and green ash, from 30 - 50 feet from the edge, allowing sunlight to penetrate to the forest floor. Desirable hard and soft-mast producing trees (oaks, walnut, persimmon) should be left to provide fall and winter foods for both quail and deer. Periodically (3-5 yr rotation) allowing prescribed fires to burn through these edges will maintain the early successional structure, but allow development of shrubs.

Winter Food

Cultivated grain crops (corn, beans, sorghum, etc.), annual native weeds (pigweed, ragweed, foxtail, etc.), and legumes (partridge pea, *Lespedeza* spp., *Desmodium* spp.) provide important fall and winter foods to bobwhite. Although the value of foodplots has recently been the subject of considerable debate, in general, the number of coveys that a place can hold can be increased with strategic provision of additional fall, winter, and early breeding season food. The goal of a comprehensive food management program is to provide a super-abundant, continuous food supply on a year-round basis. Natural vegetative response to management practices is frequently sufficient to provide ample food, however, factors such as poor seed bank or drought can sometimes reduce production of native seed plants. Also, different food types become available at various times of the year and will persist for varying lengths of time. Therefore, if a food plot program is implemented, it should be planned so that each potential covey is provided with 2 - 4 different food resources (in addition to native seeds) to ensure a continuous and reliable food supply throughout the annual cycle and in all years.

Research on radio-tagged bobwhite during winter has shown that these birds generally forage within 50 meters of woody cover, so food plots will be well-distributed and in close proximity to some type of woody escape cover. Each year approximately half of the permanent firebreaks on the Monroe county property will be planted to ragweed (5 -10 lbs/ac)/partridge pea (1 - 3 lbs/ac) or Kobe or Korean Lespedeza (10 -15 lbs/ac)/partridge pea, and the remainder planted in an annual grain food (10 - 20 lbs/ac).

Recommendations could include broadcasting and lightly harrowing plantings (15' x 100-200 yards) of grain crops (browntop millet, soy beans,

milo) alternated with equal- length segments of native seed plants.

Maintaining approximately 5% (28 acres) of the property in a mixture of year-round perennial plantings (Duranna white clover) and cool-season forages (oats and crimson clover) will provide nutritional benefits to white-tailed deer as well as enhance harvest opportunities. These plots should be placed to utilize existing cover and travel corridors and to maximize viewing and harvest. Food plot locations will need to be prepared with herbicide (glyphosate), deep-disking, and cultipacking to produce a firm seedbed., followed by broadcasting seed.

Supplemental Management Practices

On smaller properties like the one in Monroe County, supplemental feeding superimposed onto a comprehensive habitat management program may be beneficial. A successful supplemental feeding program involves year-round feeding of an energy rich food (milo). Supplemental feeding of milo can conducted by broadcasting grain into cover (plum thickets, bicolor *Lespedeza* patches, black berry patches, etc.) or through use of feeders. However, individual landowners should check the wildlife regulations on supplemental feeding in their state. In some states, hunting in areas with supplemental feeding will constitute baiting. Research has indicated that supplemental feeding in some years, particularly drought years, may increase total production, and hence fall population size. However, research has also clearly shown that good bobwhite populations can be produced with habitat management only.

The issue of predation and bobwhite populations is emotionally and politically charged. Predation management, as opposed to predator control, is based on understanding how to minimize predation on bobwhite nests, broods, and adults through indirect and direct management of habitats, predators, and prey. The key to indirect predation management is to provide sufficient herbaceous cover with scattered low brushy woody cover over extensive areas to provide protection from predators. Simultaneously, cover that supports or harbors predators (avian and mammalian) should be reduced or eliminated. Properties with an abundance of drains, creeks, bottoms, and hardwoods are likely to support a higher predator population. In these circumstances, reducing the abundance of common nest predators, such as raccoon, opossum, skunk, armadillo, fox, and feral cat, may be necessary to achieve the desired level of bobwhite population response. However, removal of a few individuals during a short period is unlikely to be of any benefit. To be effective, predator management must be intensive, conducted on a large scale (across the entire property), of sufficient duration to offset immigration, repeated annually, and conducted during the nesting season. As such, predator management is expensive and should not be undertaken in a haphazard fashion. Mesomammal nest predators can be most effectively managed with an intensive trapping program, however, specific wildlife regulations for resident states should be consulted prior to initiating any predator removal. Should a landowner elect to implement a predator management program, all predator removal must be conducted in a legal and ethical manner. Any use of toxicants (poisons) is non-selective, dangerous, expressly forbidden by numerous statutes and would constitute a violation of Federal and State wildlife code and off-label use of a registered pesticide. As such, these activities should never be employed. Birds of prey (hawks, owls and eagle) are federally and state-protected and can only be managed indirectly by habitat manipulation.

Future Options

Bobwhite management is a function of scale of application. The same intensity of management will accrue a greater per acre response when implemented on a larger acreage. As more acreage is drawn into management, you should expect a greater level of response. Therefore, when faced with quail management on smaller acreages, acquiring additional adjacent properties or forming cooperatives with adjacent landowners who implement similar practices should be considered, whenever feasible, to achieve greater sustained population levels. Similarly, an expanded wildlife program that includes quality deer management objectives could be achieved if a cooperative of like-minded surrounding landowners could be formed such that common harvest objectives were applied over a larger (> 2000 ac) tract.

Managing smaller properties for sustainable bobwhite populations is a feasible option for many landowners. But before initiating any management, factors such as: (1) location of the property relative to historic quail range and existing quail populations; (2) types of habitat and land use practices on adjacent properties (3) land use history; and (4) the status of current habitat on the property should be considered. A 300-acre tract like the one in Monroe County is suitable for quail, albeit with considerable amount of management to reestablish conditions. However, a 300-acre tract covered primarily in closed canopy hardwood forest will not be conductive to quail management, even if the openings are planted with food plots. A 300-acre tract covered with large pines could be managed for quail if the timber was thinned to substantially reduce basal area and the forest floor managed for grasses and forbs. In any case, consultation with wildlife biologists and experienced private land managers can help a landowner decide whether quail management is possible on his property and what financial incentives might be available to offset management costs.

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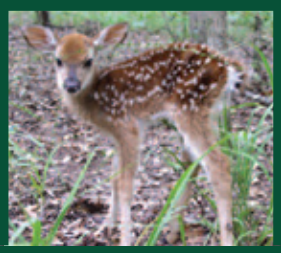



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Riparian Corridors

Riparian corridors, or lands bordering streams, are not only important to prevent soil erosion and save the streams, they provide some of the best habitat for a wide diversity of wildlife.

By Monte Burch

Monte and his wife Joan, live on a 350 acre farm in the Missouri Ozarks. The farm is a working cow-calf operation and is managed extensively for wildlife. Monte is the author of numerous books, including: Wildlife & Woodlot Management, a comprehensive, 320 page handbook for food plot and habitat development. For more information: www.monteburch.com.

When we purchased the first part of our property about 35 years ago it had a year-round, spring-fed creek running through it, one of the reasons we loved the property. Luckily the property was so run down, fences gone, that it had not been grazed, nor had other intensive agricultural practices on it. The old well on the farm was no good, so we spent the first summer bathing in the creek, until we got in a new well. The creek water was deep and cold. Some time later, we purchased an adjoining piece of property, just up stream. That property had been heavily grazed and row-cropped. The creek had filled in with gravel, even washing a great deal of it downstream into our original creek section. As we increased our own farming practices, it became evident we needed to protect the creek. We also intensively manage our farm for wildlife and the creek is a major factor in our wildlife populations.

Some of the most important water sources for both wildlife and mankind are

streams. In the drier, western portions of North America, riparian zones (areas along the banks of natural waterways or lakes) are extremely critical to wildlife survival. These wooded corridors help control erosion and filter sediments. Protection and/or creation of riparian corridors is a major factor in providing good water sources for wildlife and quality water for human use as well. Riparian corridors may consist of grasslands alone, however, in most instances, even in dry country these corridors consist of woodlands of some sort in addition to grasslands. A good number of wildlife use these areas for all or a part of their habitat, and some animals and birds spend their entire lives in these zones. Riparian corridors provide a steady supply of food, cover, nesting places, dens and wildlife travel lanes. Our creek provides lots of enjoyment, from skipping rocks with kids to exploring for wildlife tracks and observing wildlife, not to mention fishing and hunting.

High-tensil electric fencing is an effective, economical and easy-to-erect fence.

Fence Off the Area

The first step is to fence off the area. We've done quite a lot to preserve our creek or the riparian zones on our property. Missouri is the second largest cattle-producing state and our county is the largest cattle producing county. Cattle are a way of life in our part of the country and have always been important in our family. But cattle can be extremely destructive to woodlands and especially to riparian corridors. In fact, soil erosion may increase as much as 110 times on heavily grazed woodlands. This is due to the compaction of the soil and the removal of leaf litter and understory vegetation. Fencing off the corridor protects it, including wooded areas, from livestock damage such as vegetation destruction and erosion caused by the denuding and destruction of the banks. We have spent the last few years establishing an intensive grazing system utilizing high-tensil electric fencing and a charger capable of handling 100 miles of fence. Over a mile of creek is fenced off on both sides using

The first step is to fence off the corridor from livestock.

Trees that fall into the stream should be left to slow flood waters and create wildlife and fish habitat.

Most woodland corridors require some maintenance or improvement. This includes timber stand improvement (TSI), or in some cases planting of trees.

the system. This type of fencing is economical and very easy to install, in comparison to standard barbed or hog wire fencing. High tensil fencing also can more easily follow a meandering corridor, using wood or steel posts at turns. The fence is set about hip high. We've discovered the fencing does not stop wildlife such as turkeys or deer from crossing it. In fact, deer can be a problem during the rut when they are chasing as they often run right through the fence. We've learned to check our fences daily during the rut. The rest of the season deer simply jump over. Two crossings, using polywire and wire tape have been left so the cattle can rotate from one side of the creek paddocks to the opposite. There is both technical and monetary assistance for this type of fencing.

With the stream fenced off, the second step is to develop alternative watering sources for livestock. Adding alternative sources may be as simple as creating an area of limited access to the stream for livestock. More sophisticated systems may use solar pumps to pump water to a stock tank. Wells can also be economically developed. We built a pond, with a frost-free tank below for water and fencing off the pond. This not only provides an alternative water source, but another wildlife habitat. Our ponds provide great fishing and wildlife such as waterfowl, furbearers, deer and turkeys regularly use them. Unfortunately the folks heading up erosion control don't see ponds as a viable solution, so funding is no longer available for them, although they will provide technical assistance. Instead, funding programs are available for spring development, even for digging wells for livestock water sources.

Vegetation Management

One major step is to practice timber-stand improvement (TSI) on the area. At least a one- to two-hundred foot wide corridor of trees should be protected or planted to protect the

Edge should be created along the woodlands between fields and agricultural areas. Planting shrubs and native warm-season grasses in strips alongside the woodlands is a good idea.

zone. The trees and brush slow down the water in a flood, reducing erosion of the banks and adjoining bottomlands. The slowed-down water drops much of its sediment within the stream corridor, rather than on the bottomland fields. Woody debris that would also end up in the bottomlands is trapped in the stream corridor. The tree canopy, as well as the leaf layer also protects the soil from the force of falling rain and acts as a sponge to trap rainwater. The root system of trees growing on the stream banks further protects them from erosion. Trees that do fall in the stream slow floods and create fish habitat.

Because these bottomlands usually have excellent soil, they can often produce valuable hardwoods that can be managed for both monetary gain and wildlife habitat. We have walnuts and pecans planted in our corridor. Timberland improvement using standard woodland management practices such as TSI can be used to manage the woodland corridor. It's important not to overcut or clear cut any areas of a riparian corridor, and timber cuts should minimize the loss of important snag and den trees. When you make a timber cut, don't remove only tall trees such as walnuts, cottonwoods and sycamores. Cutting out all of the tall trees encourages understory trees such as mulberry and redbud to grow more thickly, preventing the growth of the new tall-tree seedlings. Some soft mast, such as mulberry, redbud, persimmon and others, however, is desirable. Even if the timbered zone is not as wide as one- to two-hundred feet, fencing it off and allowing natural succession will result first in woody shrubs and vines, followed by sapling growth and finally

In some cases the banks must be protected using a variety of means. Pushing willow sprouts into the banks is one method.

Rip-rap or rocks can also be used to protect severely eroding areas.

timber growth. The faster-growing trees in the South and Southeast include walnuts, cottonwoods, green ashes, willows, silver maples, sycamores, elms, sweet gums and yellow poplars.

Basically, you should treat the riparian corridor as any other woodland edge. The ideal situation is to feather or partially cut edge trees, allowing them to fall over, but stay attached to the stump. You can also plant shrubs, followed by a strip of native warm season grasses. A strip of native warm season grasses can add even more value to the corridor as they add more diversity and further prevent erosion and remove sediment and chemicals before they reach surface water. Turkeys, quail and other ground-nesting birds will use the areas for nesting and deer, especially big bucks like to bed in them. Warm season grasses and forbs have very deep roots, some species with roots extending four to eight feet into the soil. Non-native grasses such as Kentucky blue grass extend only a few inches into the soil. Native plants can withstand long periods of dry weather, even a serious drought.

Protect the Stream Banks

It's important not only to protect or plant vegetation along the stream but to protect the stream banks themselves. Some past practices are not only ineffective, but can create even more problems. The first is channelizing or straightening a stream. A common practice several years ago, channelizing involves straightening a stream to create a channel to move water faster. Faster water eliminates major fish and wildlife habitat. Since the water flows faster it also causes faster erosion of banks and stream bottoms, deepening the stream. This pushes the eroding gravel against the banks. Removing gravel and placing old car bodies or other junks on the streams banks are also ineffective. The latter is not only ugly, but can cause pollution. Don't remove trees that have fallen over into the stream or those that appear ready to fall. The fallen trees help slow the current, hold the bank in place, and also create important wildlife habitat. Don't create or enlarge stream crossings except where necessary, and then choose areas where you'll do the least damage, such as natural low-water crossing areas. Areas with high banks that must be cut will wash out each time there is high water. One crossing on our property was made on such a bank by the previous owner and the cut has washed almost 15 feet into the field. Make sure the crossings are at right angles to the stream banks.

In some instances you may need to stabilize the stream bank to prevent further erosion problems. One way to do this is to simply cut switches from willows and stick them into the bank. A good number will sprout and create a natural bank cover. Sometimes a revetment may be needed and this may consist of several practices. One practice is using rocks to create riprap to prevent erosion. Special revetment bars are also available for this type of stream protection. These are driven into the stream bank at an angle to help hold the banks. Cedars are often placed in these revetment bars for further help in controlling the water flow.

Again, a number of riparian corridor practices are available. Check with your local county extension office, Soil and Water Conservation office as well as local fish and game departments.

A riparian corridor along your stream can not only protect your property, but add invaluable wildlife habitat, and a lifetime of quality fishing, hunting and wildlife watching.

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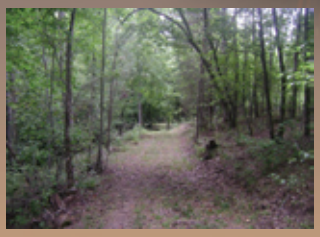

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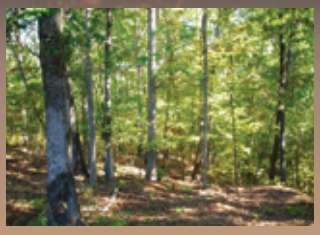

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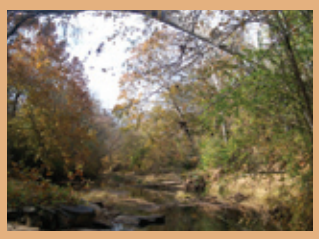

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Wintertime Rainbows: Trout in Southern Ponds

By Jeff Slipke

Jeff Slipke is chief biologist and manager of Southeastern Pond Management's Jackson, TN, office. Jeff received a B.S. degree from Iowa State University, M.S. from South Dakota State and a Ph.D. from Auburn University where he conducted research on reservoir fisheries and population dynamics for eight years before joining SPM.

Trophy trout like this are extremely rare in the wild, but they have become a common occurrence for some pond owners.

With summer well behind us and the leaves beginning to drop from the trees, most of us forget about fishing and turn our thoughts toward the pursuit of game with feathers or fur. After all, bass and bluegill fishing can get awfully darn slow once the water gets cold enough to necessitate wearing waders. And let's face it; fishing is great fun, but catching is a whole lot better.

But you don't have to wait until next spring to enjoy some red-hot fishing action. You just have to fish for a species that loves cold water: rainbow trout. That's right, rainbow trout. The fish traditionally associated with pristine mountain streams of the Rockies and Appalachians is equally at home in bass ponds throughout the southeast from November through April. In fact, southern ponds in the winter offer everything rainbow trout need to not only survive, but thrive!

Rainbow trout require cool, oxygen rich water. That's exactly what southern

ponds offer from November through April. Contrary to popular belief, trout do not require flowing water and cobble substrate to survive. Trout do need current and cobble to successfully spawn, but they will survive and grow just fine in a pond environment.

Speaking of growth, trout stocked into southern ponds are capable of impressive weight gains throughout the fall, winter and early spring. It is certainly not unheard of for trout to gain two or three pounds over the course of a few months in a pond. Of course, to realize weight gains like that the trout need to have access to an ample food supply (more on that later). I will use the remainder of this article to discuss some common questions I get asked by pond owners who are considering wintertime trout.

How long will trout survive in a southern pond?

Rainbow trout prefer water temperatures in the 50° to 65°F range. However, they can tolerate temperatures up to about 75°F. This translates into trout survival up to about late April or early May in ponds along the latitude of central Alabama and Mississippi. For ponds in Tennessee and northern Georgia, trout may not perish until the end of May or even mid-June in spring-fed ponds. Again, trout require cool water and high concentrations of dissolved oxygen. As the water warms, the amount of oxygen that can be dissolved in water becomes less; therefore, trout become stressed from both of these factors.

Why stock trout if they only survive for a few months?

There are a lot of answers to this question; and for good reason. There are a lot of benefits to stocking trout in southern ponds. First, rainbow trout are absolutely wonderful fish. They are pretty to look at, easy to catch, fight hard, and perform magnificent aerial displays when hooked. And the best part is they are most active and aggressive when the bass and bluegill are their most lethargic. It's easy to see why die-hard trout fishermen travel the world in pursuit of their quarry. But even for those of us that still prefer bass and bream, wintertime rainbows provide a unique diversion to what we fish for most of the year. A couple hours fishing for rainbows at the pond is a nice way to unwind after a morning in the tree stand or the duck blind.

Trout are readily available in a variety of sizes, from small fish in the 8 to 10 inch range all the way up to jumbo-sized fish exceeding five pounds. Imagine that, a trout over five pounds in your own pond! Most trout fisherman will go their entire lives without catching a rainbow that big. And I can tell you from personal experience, when one of these jumbo trout hits your lure, make sure your drag is properly adjusted because it will take off in a line-stripping run like you can't imagine.

Did my mention of smaller trout resonate with any of you trophy bass guys? Have you ever wondered why so many amazingly huge bass – bass approaching the 20 pound range – are caught each year from California reservoirs? The answer has a lot to do with the fact that they are heavily stocked with catchable-sized trout, and big bass absolutely love trout! For those who have ever handled a trout, their attractiveness to big bass should be quite evident: torpedo-shaped, soft, no spines,

Small trout are like a "power bar" for bass.

These fat bass are treated to an annual stocking of trout, and evidently they love it!

high in protein. Trout are like a "power bar" for bass. Whereas an 18 inch bass would have all it can handle with a 6 inch bluegill, it could easily consume a 12 inch trout. Now that's what I call pigging out.

What do I feed trout and how fast do they grow?

The natural diet of rainbow trout is varied and depends largely upon what is available. Trout in a pond will consume zooplankton, macro invertebrates such as larval and adult insects, and some fish. However, most pond owners who stock trout supplement their diet with an artificial ration. This is a proven way to maximize their growth.

Rainbow trout will readily consume a variety of prepared fish foods. However, it is best to offer them a formulation that is higher in protein than feeds marketed for bluegill and/or catfish. A balanced feed with at least 40% protein such as Purina Aquamax is recommended. Research has shown that rainbow trout convert high protein fish food rather efficiently; on the order of about 0.8 pounds of fish weight gain for every pound of fish feed consumed. With feed conversion ratios like that it's easy to see how trout can pack on the weight over the course of just a few months. In addition to keeping your rainbows plump and growing well, regular feeding concentrates the fish near the feeders at the designated feeding times so you'll know right were to go to get an easy hookup.

How many trout should I stock?

There is no hard and fast rule to determine how many trout to stock into a pond, but a good rule of thumb is about 100 pounds per acre. Stocking more will provide higher catch rates, but also a higher cost. Stocking fewer will reduce catch rates, particularly if you plan to harvest fish as you catch them. It is worth mentioning that a pond can support far more that 100 pounds of trout per acre, particularly with supplemental feeding.

The most common and least expensive size of trout to stock are fish in the 12 to16 inch range; fish that weigh about one to two pounds. These fish are commonly referred to as "stocker" size. A good stocking strategy for angling purposes is to stock about 60 to 70 pounds of stocker fish with about 30 to 40 pounds of jumbo fish per acre. This mix will equate to about 50 - 65 fish per acre; enough for reasonably high catch rates and the opportunity to catch a true trophy sized rainbow.

What about brown trout?

While brown trout are certainly an option, they are generally not recommended for a number of reasons. Accordingly, they are not widely available because there is not much of a market for them. Brown trout are much more piscivorous than rainbow trout, meaning their diet consists largely of fish. This means that browns do not train as well to artificial diets in a pond environment. Their piscivorous nature also means that they are very cannibalistic in the hatchery environment, and

therefore are more difficult and expensive to produce. You don't have to be a math wiz to figure out that it costs a lot more to produce fish that eat each other. Additionally, brown trout are more reclusive and territorial, traits which make them more difficult to catch.

What's the best way to catch trout?

Rainbow trout are readily caught on a variety of natural and artificial lures. So I guess the answer to the question is, "you can catch them on whatever they're biting." Seriously though, small spinners, spoons and grubs are always good artificial lures, as are small minnow baits like a rapala. For those who prefer the less aggressive method of cast; crack open a cold beer; then wait for the cork to go under, worms, corn and prepared baits like Berkley Power Baits are a great way to go. The more refined angler will enjoy using a fly rod with gaudy streamer patterns like a wolly bugger, muddler minnow or simi-

Southern ponds are well suited to support great trout fishing from fall to early spring.

Even in the dead of winter, when bass won't sniff a lure, trout fishing can still be hot.

lar variations.

The point is that rainbows stocked into southern ponds are pretty darned aggressive and fairly easy to catch. However, like all fishing, there are days when it seems you can't even get them to bite dynamite. This can be especially true the first couple days after they are stocked, when the trout are acclimating themselves to their new environment. Also, after a few weeks on a steady diet of high protein fish food, trout can become pretty selective. If and when that happens, it becomes necessary to match-the-hatch so to speak. A bread ball on a small hook looks a lot like a food pellet. So too does a brown yarn-ball presented with a fly rod.

What's the best way to prepare trout for the dinner table?

Good question, but as you probably guessed, the answer is going to be different for everyone based on individual taste. There is no shortage of trout recipes floating around in cyberspace or the myriad cookbooks in print. I wish I had the time and metabolism to try them all. As you think about ways to prepare your fresh rainbow trout, keep in mind that trout are higher in omega-3 fatty acids than nearly all other freshwater fish. So in addition to all the other benefits of stocking trout this winter, the health benefits from eating them may be the best one yet.

Stocker-size trout like this can grow substantially over the winter when fed a high-protein diet.

There you have it; all you ever wanted to know about trout in southern ponds. The best way to beat the wintertime blues is with a pond full of wintertime rainbows!

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We no longer are content to rely on blind luck for success in hunting and fishing. More and more landowners are applying the same principle to planting trees for habitat.

Tree tubes make spot weed control with RoundUp or other herbicides fast, safe and easy. Wildlife trees are often planted in long rows where the linear feet of fencing required to protect a small area would be cost prohibitive.

By Chris Siems

Chris Siems is head of Research & Development for Plantra, Inc., a Minnesota-based manufacturer of tree tubes and other plant establishment products. He has a B.S. in Forestry from the University of Minnesota.

Think about how we used to go hunting and fishing. Army surplus camouflage. A rifle we last sighted in during the Roosevelt administration (Teddy, not FDR). Sporting a fragrance best described as "Old Spice meets Swisher Sweets meets old socks." Fishing line the diameter of telephone cable. The term "electronics" applied to the flashlight we used to illuminate the crumpled topo map we kept crumpled up in our tackle box.

Bagging that trophy buck, tom or bucketmouth was based primarily on dumb, blind luck (more accurately, it was "luck" when your buddy got his, and "skill" when you got yours).

Think about how far we have come. Camo that would fool a tree. Microscopic fishing line. There's more electronic technology on the average bass boat than was on Apollo 11. Video surveys of deer. Food plots… you get the idea. Everything we

do is specifically designed to do one thing: take the "blind luck" factor out of hunting and fishing – or at least minimize the luck factor through a combination of better equipment, better knowledge and better technique.

As part of this evolution, more and more land owners are actively managing their land to improve habitat. Food plots are part of this. So is planting trees to produce hard and soft mast, safe zones of cover and travel corridors.

Quietly and behind the scenes, tree establishment has undergone exactly the same evolution as hunting and fishing. Better knowledge, better technology and better techniques have combined to virtually eliminate "blind luck" as a factor in tree planting success. Landowners and managers are achieving levels of success that would amaze tree planters of decades ago.

The transformation of tree planting has been a quiet one. Unlike hunting and fishing, there are no TV shows touting the latest advancements in tree establishment. I guess watching trees growing is not considered compelling "must see" TV… although with modern growth rates maybe TV executives should rethink this. Watching crabapple trees growing 2 inches a day beats most of what's on TV these days!

The Obstacles

One reason landowners are increasingly unwilling to follow a "plant and pray" approach to tree establishment is that it's just plain more difficult to successfully establish trees these days.

Next time you see a 100 year old oak tree, think about this. That oak got started in a world with perhaps 500,000 deer in the entire eastern United States, a world with very few exotic and invasive weed competitors, and in a world with periodic fires to kill back competing vegetation.

Fast forward to 2008. There are states in which 500,000 deer are harvested each year without reducing the size of the herd. Counts of 20, 30, 40 more deer per square mile are common (heck, counts of 40 deer per cornfield are common).

Wildlife trees are often planted in places where you want deer to move freely, making fencing impractical. The sawtooth oak seedling growing up through this tree tube will soon supplement or replace the feeding station as a source of hard mast.

Dozens of invasive grasses and weeds are now vying for the same precious moisture, nutrients and light that tree seedlings need to survive. In addition to this, most trees planted for wildlife are planted in degraded farm fields or eroded hillsides (that's how we can afford to buy them as hunting properties) that are lacking in nutrients.

If the odds against tree survival are bigger than ever before, so are our expectations for success. Foresters and tree planters years ago were content to throw a lot of seedlings at the ground in hopes that an acceptable percentage would survive. If they didn't survive, well… foresters were very much like Cubs fans: There's always next year. Today's landowner is not willing to waste growing seasons. After all, none of us is getting any younger (we're all holding steady at 39 years of age, of course, but not getting any younger).

It Starts with Planting Stock

In the 1980's my dad was advertising manager for Federal Cartridge. Federal's "call out" line at the time was "Choose your shot carefully." I always liked the double meaning of that message. Someday I should tell my dad that he was really, really good at his work.

Imitation (or flat out plagiarism) being the sincerest form of flattery, I have changed my dad's catch phrase to apply to planting habitat trees: Choose your stock carefully. The first step in choosing your stock carefully is deciding what to plant. This is too big a topic to cover here other than to make two quick but important points:

- Always seek the advice of forestry professionals when deciding what to plant.
- If your site is not well suited to your favorite tree due to soil texture, pH, fertility, etc., don't plant it. You'll only be disappointed. Plant something else.

The next step is to decide how big a tree to stick in the ground. In recent years there has been a trend toward planting bigger planting stock for wildlife habitat. The reasons for this are understandable. Taller planting stock already has a growing tip that's above the deer browse line. The landowner hopes that by planting larger stock he or she will shorten the time window until the tree begins producing food for wildlife. However, the idea or trend of planting bigger planting stock has four major drawbacks:

As a rule, the larger the tree you plant the longer it will take for it to recover from transplanting and resume growing.

The larger the tree you plant, the greater the likelihood of root deformations, especially spiraling (girdling) roots, that will create health and vigor problems down the road.

The obvious one is expense; you are a lot of money out of pocket and you still haven't invested in tree protection and weed control.

Larger trees still require additional protection from deer, especially from

A sawtooth oak growing up through a tree tube, benefitting from browse protection and reduced moisture stress.

buck rub – so generally some sort of protective device is necessary at additional cost.

Back when the alternative was puny bare root seedlings available only once a year from the state nursery, the desire for larger planting stock made sense. But today's hardwood seedlings are not your father's seedlings. Nursery practices have improved dramatically. Today's nurseries – and this is true for state nurseries, and is especially true for private nurseries specializing in wildlife habitat trees – produce seedling trees that are packed with serious growth potential. Planting seedlings has several advantages over planting larger stock:

- **Better root development** – The root system develops *"in situ"* with less disturbance and less root deformation
- **Rapid establishment** – Smaller trees undergo a much shorter period of "transplant shock" and resume growing almost immediately.
- **More bang for your buck** – You can take the money you save on planting stock and invest in tree protection, weed control and fertilization

In short, the development and promotion of large planting stock is a flawed solution to something that is no longer a problem. You're better off planting small but high quality stock, and then investing your time and effort in giving those trees everything they need.

Browse Protection

Wouldn't it be great if we could just put a sign out by our newly planted trees:

ATTENTION DEER: THESE TREES ARE PLANTED FOR YOUR BENEFIT. IF YOU WILL KINDLY LEAVE THEM ALONE FOR A FEW YEARS, THEY WILL PRODUCE MORE PERSIMMONS, ACORNS, CHESTNUTS, PEARS AND APPLES THAN YOU CAN POSSIBLY EAT. THANK YOU. THE MANAGEMENT.

Deer don't understand that you are planting to feed them in the long term, and there are WAY more deer around today than when our fathers and grandfathers planted trees. There is simply no point in going through the cost and effort of planting trees for wildlife habitat without taking steps to prevent deer browse.

Fencing is one method. But while fences certainly have their advantages (especially when it comes to Robert Frost's famous line about fences and neighbors), they have severe limitations when it comes to establishing wildlife trees.

- Fences restrict movement and access of people and wildlife. The whole point of planting wildlife trees is to plant them where you want animals to concentrate – near blinds, deer stands, feeding stations, etc.
- Wildlife trees are often planted in oblong strips, rows or corridors – the most inefficient and expensive configuration for fencing in terms of linear feet of fence per acre protected
- Fences can be effective at preventing deer browse, but do little or nothing to prevent damage by rabbits, voles and other rodents

- Fences don't facilitate weed control
- Fences do nothing to reduce seedling moisture stress, increase survivability, and accelerate seedling growth (keep reading below…)

Another popular browse protection option is enclosing individual trees with mesh – either plastic mesh tubes or do-it-yourself wire mesh cages. These solve the problems of restricting wildlife movement around the trees and the high cost of oblong or irregularly shaped fence lines. However mesh enclosures

- Can be expensive and time-consuming to purchase and install
- Do not facilitate weed control
- Do not reduce plant stress to improve survival and growth
- Allow terminal shoots and branches to poke through, exposing them to browse or creating a potential girdling problem

So what's the answer? How do you protect a 12 inch tall seedling until it grows past the deer browse line of 4 or 5 feet (and continue to protect it until it is safe from buck rub)?

In 1979 a Scottish forester named Graham Tuley placed 4ft tall translucent plastic tubes over tiny oak seedlings – secure in the knowledge that he would probably fry the trees to death. Contrary to all expectations, the trees not only survived, they thrived – with dramatically improved survival rates and growth rates of up to 400% faster than unprotected seedlings. "Tuley Tubes" – later called treeshelters and more recently (and commonly) called tree tubes – were born. Tree tubes provide 3 primary benefits:

1) **Physical protection from deer browse to a given height.** Tree tubes typically range in height from 2 feet to 5 feet. All tree tubes are meant for use with small seedling trees (or even direct seeded acorns). You can put a 5 foot tall tree tube over a 6 inch tall seedling. The tree tube provides a "safe channel" for growth until the tree emerges from the tube.
2) **Reduced moisture & light stress, resulting in increased survival and growth rates.** Tree tubes protect seedlings from the desiccating effects of the wind, and maintain a humid environment around the leaves. Far from increasing stress, trees in treeshelters are under much less moisture stress. They grow more actively more of the time.
3) **Facilitates weed control.** So much of what we do in the outdoors is about NOT being seen. But even the best pattern from the mind and drawing board of Toxey Haas has nothing on seedling trees; they are the masters at not being seen, especially in mid-summer when surrounding grasses and weeds are 3 or 4 feet tall and our seedlings are 12 or 20 inches tall.

Tree tubes are primarily for deciduous trees; as a rule conifers do not thrive in them. One notable exception to this is bald cypress, which grows extremely well in tree tubes.

You can't safely spray or mow around trees you can't see. First, tree tubes make it easy to see your seedlings. Second, tree tubes shield seedling trees from contact systemic herbicides like RoundUp® that provide great weed control, but which you couldn't use without protecting deciduous tree seedlings.

All of these benefits combine into one primary benefit: Tree tubes reduce the real time and expense needed to successfully establish wildlife trees.

Luckily for today's landowner and wildlife manager, twenty years of trial and error in the USA has resulted in major advancements in tree tube design, and have resulted in a tube that performs extremely well under the wide range of climatic conditions we have in North America.

The UK is the same approximate cold hardiness zone as the panhandle of Florida, but only gets as hot as Duluth, Minnesota. Tree tubes that work there are not well suited to the US. Far from the small diameter, solid

wall tubes that first arrived in the US 20 years ago, today's best tree tubes are…

At least 3.5 inches in diameter, for increased biomass, thicker stems and a balanced root/shoot ratio

Designed to optimize red light which limits useless and unwanted parts of the light spectrum

Twin-walled (corrugated) to diffuse the light

Ventilated, to provide dappled sunlight and CO2 exchange (up here in the frozen north of Minnesota ventilating tree tubes also helps trees harden off for winter)

So now we have a small but high quality seedling, and a state-of-the-art tree tube. We're done, right? Wrong.

Weed Control

Grasses and weeds utilize growing resources more efficiently – or at least more quickly – than trees do. Weeds, especially the hundreds of invasive and exotic grasses and weeds we have today, out-compete trees for light, moisture and soil nutrients. Every square foot of soil is capable of producing a certain, finite volume of biomass. The goal is to channel that growth potential into your trees.

"Triangle of Success" in action. The granular fertilizer feeds the tree. The herbicide treatment ensures that the tree gets the nutrients, not weeds. The tree tube protects the seedling from herbicide. The tree is off to the races!

Naturally regenerated trees (and in this age of deer browse there are fewer and fewer of these) have two defenses against competing vegetation, fire to kill competition long enough for the tree to get started, or shade in which many tree species can patiently wait for years for a hole to open in the canopy.

Since we're typically planting wildlife trees in open fields, the job of the tree planter is to mimic the beneficial effects of fire. In other words, to aggressively kill competing vegetation in the area immediately around each tree. (Fire is of course still a great management tool. However, be warned that fire and plastic tree tubes don't mix. We have a term for tree tubes in areas that have been burned: Frisbees.)

The two most effective means of weed control are herbicides and weed mats (a.k.a. mulch mats). When properly used, herbicides are extremely effective at killing competing vegetation and making more site resources available to your tree. Many of the most effective non-selective herbicides will also injure or kill your trees, requiring that seedlings be protected during treatment. Tree tubes effectively shield seedlings from herbicide, saving

you a lot of time and work.

Weed mats are made from poly film or woven plastic strands. Weed mats cost more than herbicide treatment, but provide the additional benefit of retaining soil moisture. Another plus is time; you apply weed mats once at planting time and your weed control is done for the next 3-5 years. By that time your trees will be well established.

Whether by herbicides or weed mats the most important thing about weed control is to take Nike's advice: Just do it!

Fertilization

Even when you plant seedlings that are adapted to your soils you still face two issues that can limit the success of your planting. Wildlife trees are typically planted in old farm fields that have been degraded by years of crop production. And even when a site as a whole has the fertility your trees need, there are microsite variations in which nutrients might be in limited supply in specific planting spots.

So it's a good idea to fertilize newly planted trees, either with a tablet or packet in the planting hole or with granular fertilizer around the seedling. A nutrient mix of 15-10-10 or 18-9-9 works well, along with other micronutrients.

However, keep in mind that when you fertilize your seedlings you are also doing 2 other things:

- Making trees tastier (although this isn't true in the case of some newly developed fertilizer blends)
- Feeding the weeds. Fertilization goes hand in hand with browse protection and aggressive weed control.

Triangle of Success

The best way to visualize all of this information is what I call the "Triangle of Planting Success." In the middle of the triangle is high quality seedling planting stock. The three sides of the triangle are browse protection, weed control, and fertilization.

When you do all three things you will be absolutely amazed at what your trees are capable of. You will invest a little more time and effort in the first two years, but you will find that the total expense of tree planting will be greatly reduced, and the total establishment period during which you have to do the work is dramatically shortened.

And you will have taken the element of luck out of tree planting… you'll be as good a tree planter as you are an angler and hunter!

Go where the wild things are.

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Management Calendar

By Dave Edwards
Westervelt Wildlife Services

December 2008/January 2009

Collect hunter observation and deer harvest data.

This information is the "backbone" of your deer program and allows you monitor/assess its success and make sound management decisions/ adjustments if needed to reach your deer management goals. Collecting this information each year is important because it will allow you to assess trends in the harvest and observation data which will help you determine if your program is working. Without this information, you are simply guessing and are less likely to achieve your goals.

Apply a boost of nitrogen to your food plots in December (not on perennial legume/clover plots).

Top-dressing your fall annual food plots of small grains (wheat, oats, etc) with a boost of nitrogen will enhance the nutritional value as well as promote additional growth in the plants. A common application rate is 100 lbs/acre of 34-0-0 or ammonium nitrate. Many land managers do not fertilize fall food plots again once they are planted because it is an added cost. However, the added boost of nitrogen will not only increase forage production, but deer and turkeys are attracted to plants that are nutritious and actively growing which will result in better hunts on your property. Although fertilizer has significantly increased in cost this year, nitrogen is the cheapest of the primary elements to apply (Nitrogen, Potassium, Phosphorus)

If you intend to plant trees this year, now is the time to start planning, ordering supplies, and planting.

Besides actually planting the trees, site preparation is important to reduce competing weeds to enhance tree seedling survival during the first growing season. There are a number of fruit trees you can plant that will benefit wildlife on your property. A few I have had good success with include sawtooth oaks, Chinese chestnuts, pears, apples, persimmon, crabapples, autumn olive, and plums. Fruit tree plantings not only provide additional food resources for wildlife on your property but can provide exceptional enhancements to the aesthetics. Areas commonly planted in fruit trees include road intersections, roadside management areas, and in or along the edge of fields or food plots. The key is to plant them in areas they will receive sunlight. Some trees

require cross-pollination to produce fruit so, if needed, be sure to plant them in small groups. Ordering trees/shrubs and supplies well ahead of time will ensure they will be ready when you are.

Host a cookout with adjacent landowners and/or game wardens.

This is a great way to meet your neighbors and local game wardens. The cookout provides opportunities to exchange ideas on deer and habitat management as well as harvest strategies. If you are trying to convince an adjacent landowner or hunting club to practice quality deer management, this is a great time to show them some of the success you have had. Pictures of harvested bucks and/or scouting camera pictures is usually all it takes to convince others to join your efforts. These cookouts often result in long-term relationships between landowners or hunting clubs that is mutually beneficial.

Strip disk areas to promote natural, desirable weeds for wildlife.

Lightly disking the ground will provide enough disturbance to stimulate the natural seed bank which will often result in a diversity of wildlife friendly weeds the following spring and summer. Although this is a common practice used to produce quality quail habitat, many of the resulting forbs will be used by deer and turkeys. Strip disking at different times of the year will result in different plant communities. While disking can be conducted anytime of year, it is normally done in spring or fall. Fall/winter disking normally results in a broadleaf plant response, while spring/summer disking will result in more native grasses. Altering the season in which you strip disk will add diversity to your property. Strip disking can be done in thinned pine plantations, relatively open mature pine stands, along the edges of food plots, or in open fields. Basically anywhere sunlight can reach the ground will work. To optimize the benefit of strip disking, avoid disking straight lines. A serpentine pattern that winds through the habitat will provide the most edge and diversity. Also, to stimulate desirable wildlife friendly weeds, you do not need to disk like you were preparing a clean seedbed for planting a food plot. One pass is generally enough to stir the ground up and expose bare soils that will promote germination of desirable weeds.

Assess and flag or mark wildlife clearcut areas, new food plots or plot expansions, new roads, and roadsides that will be widened.

Because temperatures are cool (or cold) and the leaves are off trees where you can generally see better in the

woods, winter is a great time to assess and mark areas where trees will be harvested or dozier work will be needed. Having the leaves off is certainly a big help because you can see what you are doing and visualize areas that you are flagging. Projects that may need to be marked or flagged include small bedding areas that will be created with chainsaws, new food plot areas or expansions on existing plots, areas along roadsides that need attention next spring, etc. Besides flagging areas that will require heavy equipment and drier conditions, winter is also a good time to flag areas that will be planted in wildlife friendly orchards, supplemental hardwoods, areas to plant hedgerows for quail through fields, etc. Marking these areas in winter will not only be more pleasant for you and allow you see what you are doing, but will ensure you are ready to tackle these projects when conditions are right. Also, flagging in winter gives you time to think more about the areas you have flagged out before the project is implemented. The last thing you want is to be flagging just ahead of a logging crew and having to make hasty decisions on where you want a new food plot to be created.

Prepare dormant season prescribed burn plans and initiate burns as weather permits.

As many of you know, prescribed fire is an exceptional tool for managing wildlife habitat. However, burn plans need to be well thought out and completed well ahead of time. With the exception of longleaf pine/coastal plain areas, most understory burning in the Southeast is conducted during the winter dormant season. Acceptable relative humidity, temperature, fuel moisture, and steady, persistent winds often occur during this period. Cool season burns are generally conducted between December and spring green up. In the deep south, try to conduct burns before March 15 to avoid destroying turkey nests. Cool season or winter burning is not only a good way to reduce fuel loads and control undesirable hardwoods in a pine stand (which reduces the chances of a wildfire that can be detrimental), but is also a great way to stimulate new understory plant growth which will result in quality food sources for wildlife. Fire rotations (interval of time between burning the same area again) vary depending on your goals and habitat types but are generally every 2-5 years to promote quality wildlife habitat. It is also a good idea to strategically plan your burns so that you always leave some areas unburned. How much area to burn will depend on your specific property and habitats. However, do not feel that you have to burn large areas (50-100 acres or more) to make a difference and create quality wildlife habitat. Relatively small burn areas in the 5-10 acre range are easily done in a couple hours and will make a difference. 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. Check with the US Forest Service for information regarding prescribed burning as well as examples of a burn plan. It is also a good idea to coordinate your burns with a professional land manager who has experience burning.

Mow or manicure quail hunting areas to enhance access and create additional quail habitat.

Mowing lanes within quail habitat makes for a more enjoyable experience for hunters. This allows hunters to work through the field or woods while hunting without staying tangled in vegetation. This also promotes safer hunting by reducing the possibility of tripping while carrying a gun. If possible, avoid mowing straight lanes. Serpentine cuts through the habitat will create more edge and a more natural look for wildlife. Not only does this technique increase the quality of the quail habitat and enhance hunting access, but it can also reduce predator success.

Create and/or recharge mineral licks for deer.

If minerals are lacking in the native habitat (or in the soils), deer will readily use mineral licks you create throughout the growing season (spring/summer). If deer on your property do not use the licks, don't worry. This probably means that they are acquiring adequate minerals from native plants and do not need supplemental minerals. There are many commercial products available to use in mineral licks that are pre-mixed or you can create your own. A recipe I often use is 50# Dicalcium Phosphate, 50# Calcium Carbonate, and 50# Trace Mineral Salt. This mix will be enough to create about 3-4 mineral licks if you are mixing the minerals into bare ground. A good rule of thumb is to establish 1 lick per 200 acres.

If possible, collect fetal data from harvested whitetail does.

If your breeding season or rut occurs before or around Thanksgiving, and your hunting season extends into late

December of January, you should be able to find and measure fetuses. The age of the fetuses is determined by their length. A fetus scale is very helpful in determining the age of the fetuses. Once you know the age of the fetus and the date of the harvest, you can determine the day of conception. This information can provide much insight to your deer herd's reproductive performance as well as the length and peak of the rut in your deer herd. This not only helps you determine when to put in for vacation next year, but the length of the breeding season will shed light on the adult sex ratio of the herd. A tighter sex ratio will result in a shorter more intense rut due to increased competition for mates, while an unbalanced sex ratio will likely be represented by a long, weak rut due to less competition and the length of time it takes bucks to "service" the abundant doe population. This information, along with hunter observation data, is a great way to assess the status and success of your deer management program.

Identify roads on your property that need attention.

Winter is often very wet in the mid-south which makes this a great time to identify and assess problem areas along roads where work will be needed next summer. Make notes or identify areas on maps that you can refer back to when you start to repair roads next spring or summer. You will be glad you did. Once your property dries out, it can be difficult to remember and/or find the areas that were bad during the hunting season. Although many landowners/hunters access properties during hunting season on 4-wheelers, electric carts, or other gas powered ATV's that will certainly get through wet and slippery roads, roads are an important part of managing a property. If you are actively managing your property, you will need to be able to drive or transport large equipment such as spreader trucks, tractors, and agriculture buggies throughout the property. Thus, having good roads is essential.




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