A Note from the Editor


REBECCA JONES

If you asked the average North Carolinian to name a Wildlife Commission employee, they would likely refer to the Wildlife Enforcement Officers who enforce fish and wildlife laws across the state. In many ways, they are the most visible and well-known employees in our agency through their regular interaction with sportsmen, boaters and other outdoor enthusiasts. The role these officers play in protecting our fish and wildlife is critical to the future of our precious resources.

Over the course of my career, it has become common knowledge that the public knows less about most of our other staff. We have a wide variety of employees who work on diverse issues covering all aspects of fish and wildlife management. There isn't enough space to highlight all of those employees in this issue, but I did want to take this opportunity to mention the biologists who make up our Private Lands Program. These biologists assist landowners, hunters and other constituents with everything from game management and disease monitoring to improving wildlife habitat on private lands.

Privately-owned lands make up over 85 percent of North Carolina's land base. Private Lands Program biologists offer technical advice and assistance to these private landowners each and every day. Many wildlife species, including State Species of Special Concern as well as high priority game species, are dependent on private lands, and the future of our fish and wildlife resources is dependent on effective wildlife management of these private lands.

A list of these biologists and maps of their coverage areas are included on page 68 of this issue. If you are a private landowner or land manager in North Carolina and wish to learn about ways to more effectively manage your lands, please consider giving one of these staff members a call. By continuing to work together, our biologists and North Carolina's private landowners can conserve our state's fish and wildlife resources for generations to come.

Mark D. Jones

Wildlife Research Program Supervisor
Private Lands Wildlife Habitat Group

THE Upland GAZETTE

WILDLIFE CONSERVATION AND HABITAT MANAGEMENT

Is planting required to establish high-quality early successional plant communities for various wildlife? No. Four years prior, this field in the Piedmont of NC had been row-cropped with soybeans and corn for years. Since, the seedbank has responded and provides food and cover for many wildlife species. Nothing was planted.

Establishing Early Successional Vegetation the Natural Way

Written & photographed by Craig A. Harper, professor and extension wildlife specialist, University of Tennessee; J. Wade GeFellers, graduate research assistant, University of Tennessee; Christopher E. Moorman, professor, North Carolina State University

Restoration and management of early successional vegetation is a high priority for state wildlife agencies across the South, as well as private landowners who wish to manage wildlife associated with these plant communities. And the list of early successional associates includes more than just quail and rabbits. Also associated are a host of songbirds, from grasshopper sparrow to yellow-breasted chat, other game birds, including American woodcock and wild turkey, white-tailed deer and a group of species that is getting lots of attention—insect pollinators.

However, there continues to be a misconception that planting native grasses and forbs is necessary to provide or enhance habitat for these species. As we see it, there are two prevailing beliefs that must be challenged: 1. Desirable native plants cannot be established from the seedbank after eradicating nonnative grasses, such as tall fescue or bermudagrass, because other nonnative species will outcompete desirable species. 2. Desirable native plant

communities cannot be established from the seedbank in retired crop fields (fallow fields) because desirable species have been eradicated over time by continued herbicide use in row crops. In general, these are misconceptions that have been perpetuated by misperceptions that you cannot control undesirable plants, and that many plants are undesirable when, in fact, they actually are quite desirable for various focal species.

Regardless of establishment method (whether by natural revegetation from the seedbank or by planting), when working with a field of nonnative sod grass, eradicating the nonnative grass is the necessary first step to improve habitat for most species that would use the field. Some species, such as Eastern meadowlark, will nest just as successfully in a field with a base of tall fescue or bermudagrass as in a field with broomsedge or little bluestem; however, we still advocate eradicating the nonnative grasses because of the associated problems for so many other wildlife species. Multiple studies have demonstrated tall fescue can be virtually eradicated (at least below 3 percent coverage after several years) with one application of glyphosate in the fall/early winter. Conversely, no single herbicide application will adequately control bermudagrass; multiple applications are necessary, usually including a single application of imazapyr in May/June (such as 24 oz Arsenal AC or 48 oz Arsenal per acre), followed by spot applications of a 5 percent solution of glyphosate in mid-to-late summer.

After the "carpet" of nonnative sod grass has been removed, the seedbank will respond. The response is almost always mixed, regardless of past field history. That is, some desirable species will respond, and some undesirable species will respond. However, most people do not recognize (cannot identify) many of the plants (good or bad) that respond, nor do they realize the wildlife value of many species that actually are beneficial. Regardless, and this is a critical point, problem plants are going to have to be dealt with when managing early successional plant communities, whether you are planting or using natural revegetation. Some fields have multiple layers of undesirable species. That is, some species do not germinate and respond until others have been removed, thereby requiring multiple herbicide applications before desirable native species respond. And many undesirable plant species, such as sericea lespedeza and bermudagrass, cannot be killed without killing grasses and forbs that were planted.

A recent study in Tennessee and Alabama compared the plant community response and resulting habitat quality for various wildlife species following natural revegetation and planting native grasses and forbs across 18 fields over three years. Fifteen fields initially were dominated by tall fescue or bermudagrass, and three fields had been in continuous row-crop production until the year before the study. Retired crop fields were split in two, with half of each field planted to native grasses and forbs and the other half left fallow to revegetate naturally from the seedbank. Each of the 15 fields dominated by tall fescue or bermudagrass was split into three sections, with one third of each field sprayed with glyphosate and then planted to native grasses and forbs, one third sprayed with glyphosate and left for the seedbank to respond and one third left as a "control" for comparison with no treatment other than annual winter mowing.

This field was planted with a mixture of native grasses and forbs. Two years later, little bluestem and black-eyed susan are prevalent throughout the field, but also prevalent are johnsongrass, horseweed and broomsedge, which were not planted. Regardless of whether you plant or not, you still will have species responding naturally from the seedbank, some good, some not good.

Personnel with the state wildlife agencies, the Natural Resources Conservation Service and the Tennessee Valley Authority planted the native grasses and forbs consistent with techniques and requirements for private landowners enrolled in conservation programs. For the natural revegetation treatment, personnel from the University of Tennessee visited each site, on average, once per year in summer and simply spot-sprayed undesirable plants to test the effect of "killing what you don't want, as opposed to planting what you do want."

Three years following control of tall fescue and bermudagrass and discontinuation of row cropping (fallow fields), coverage of native grass averaged 49 percent and coverage of native forbs averaged 53 percent following the natural revegetation treatment. Planted treatment areas averaged 61 percent coverage of native grass and 48 percent coverage of native forbs. Nonnative grass coverage averaged 12 percent and 17 percent, and nonnative forb coverage averaged 30 percent and 28 percent on natural revegetation and planted areas, respectively. Plant composition and structure in natural revegetation and planted treatments were compared with actual nest sites of several bird species. The natural revegetation and planted treatments provided compositional and structural characteristics similar to conditions measured at Northern bobwhite, grasshopper sparrow, Henslow's sparrow, field sparrow and dickcissel nest sites. Not surprisingly, control areas dominated by tall fescue were most similar to Eastern meadowlark nest sites. Openness at ground level was greatest in natural revegetation

This field was dominated by tall fescue, which was sprayed in fall for a complete kill, then the bare field was planted to native grasses and forbs the following spring. By mid-summer, the field was covered with sericea lespedeza. Now what? There is no herbicide that will control sericea lespedeza that will not kill planted native forbs. Conservation dollars are wasted every year with this practice.

Planted native grasses and forbs, such as coneflowers and black-eyed susan, are pleasing to the eye in mid-summer. However, most of the broadleaf plants in fields that were planted arose from the seedbank and were not planted, as represented here by goldenrod, field thistle, daisy fleabane, passionflower, ironweed, healall, blackberry and greenbriar. Problematic plants arising from the seedbank still have to be addressed, such as johnsongrass, orchardgrass, velvetgrass, crabgrass and sericea lespedeza.

This field was dominated by tall fescue, sprayed in the fall for a complete kill, then the following spring/summer, narrowleaf plantain responded from the seedbank and covered the field. The plantain was sprayed and killed with imazapic, and the following summer, johnsongrass responded and covered the field. The johnsongrass was sprayed and killed with imazapic, and the following summer, native forbs and grasses (milkweed, fleabane, and broomsedge) from the seedbank were finally released. Three herbicide applications were necessary before the native seedbank responded. However, no seed were planted, making this practice very efficient and effective.

Perception? This field was dominated by tall fescue. After killing the tall fescue with glyphosate, goldenrod, late flowering thoroughwort, old-field aster, ironweed, beggar's-lice, daisy fleabane, pokeweed, blackberry and broomsedge are prevalent. None of these are "pristine prairie plants," but the fact is these "Rodney Dangerfield plants" provide food and cover for the majority of wildlife species that use or require early successional communities in North Carolina, and they are free!

This field was in rowcrop production in 2015. Left: After three years of the natural revegetation treatment, native forbs and grasses have responded from the seedbank (NR). Right: The PL unit is dominated by little bluestem with fewer forbs.

treatments, which is critical to allow mobility and foraging for quail chicks and turkey poults.

Another interesting finding in the study was that the average number of native flowering plant species for pollinators did not differ between natural revegetation (13) and planted (14) treatments, but both contained more pollinator plants than control areas (8). Also, there was no difference in overall plant diversity between natural revegetation and planted treatments, but both had greater plant diversity than control areas. It is noteworthy that all of these relationships were the same when comparing natural revegetation with planted treatments in fields previously dominated by tall fescue and bermudagrass as well as retired row crop fields, debunking the notion that a desirable plant community cannot establish naturally from retired row crop fields.

Many people, including some biologists, find these results difficult to believe. One problem is our historic belief that in order to have a desirable plant community, we have to plant it. Another problem is perception, which originates from an agronomic past. How do you perceive cocklebur, smooth pigweed, pokeweed, common lambsquarters and horseweed? Probably negatively. Why? Did your daddy tell you they were bad? Our's did! They are all native forbs that occur across North Carolina. All of the wildlife species that require or benefit from early successional plant communities benefit from these and other plants that many people view as undesirable weeds. The structure of cocklebur, lambsquarters and horseweed are outstanding for bobwhite and Eastern box turtle. The seed of various pigweeds is relished by mourning doves and many species of songbirds. The structure, foliage and seed value of pokeweed is tremendous for deer and turkeys.

The fact is, these aren't your grandfather's agricultural weeds anymore; instead, they are your forbs to provide food and cover for wildlife on your property. Instead of hating them, appreciate and use them! How about broomsedge? How is it that we have come to believe little bluestem planted from seed grown in Missouri is better than naturally occurring broomsedge for bobwhite or any grassland songbird? Why do we think gray-headed coneflower or wild bergamot has to be planted from seed grown in Kentucky or Kansas in order to provide or enhance habitat for pollinators, and that old-field aster and ironweed arising from the seedbank on your property just won't do?

Finally, with thought toward conservation, consider the cost of planting. The above-mentioned study also documented associated costs of establishment. The average cost for planting was $190 per acre, whereas the average cost of natural revegetation from the seedbank was $43 per acre, highlighting how more-than four times the amount of land can be impacted through natural revegetation than planting with equal or better benefit, according to focal species and landowner objectives. We want to be clear that we are not saying that there is never a case or objective in which native grasses and forbs should be planted. However, we are saying that in most cases, and for most objectives, native grasses and forbs do not need to be planted to create or enhance habitat for wildlife associated with early successional plant communities. And it's cheaper and easier!

All of the wildlife species that require or benefit from early successional plant communities benefit from these and other plants that many people view as undesirable weeds.