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.

Camp Canvasback

Encouraging and Supporting Tomorrow's Hunters

Written & photographed by Chase Luker, Hunter Education coordinator, North Carolina Wildlife Resources Commission

Waterfowl hunters, by and large, share a disdain for the summer months. Knowing more than a handful of waterfowlers, none have found a suitable way to pass the time from February to September, aside from traveling to the Southern Hemisphere to whet their appetite for whistling wings. Sure, there's plenty to do to get ready for the upcoming migration—whether it's hanging nest boxes in the late winter, trapping predators in the spring or building and repairing blinds, it is all work. However, the humid months also bring an opportunity to hone skills, invite and encourage new hunters, as well as learn a few new skills. Personally, I prefer to whittle away at the summer months by carving decoys and shooting clays. "If it's not fun, it's not worth doing," is the mantra!

Enter Camp Canvasback, a summertime youth residential camp at the Eastern 4-H Center in Columbia, where the Scuppernong River meets the Albemarle Sound. The Eastern 4-H Center, too, is a kid's playground: canoes, climbing walls, swimming pools and a top-shelf shooting range. It's a formula that has worked for the award-winning and nationally-recognized Camp Canvasback for over 10 years.

Camp Canvasback, in a nutshell, is designed for 10- to 17-year-old youth who have an interest or attraction to all things waterfowl hunting. Created in 2007 by the North Carolina Waterfowl Association, North Carolina 4-H and the North Carolina Wildlife Resources Commission (NCWRC), the program has brought hunter education and summer fun together. Youth participate in traditional summer camp activities such as swimming, crafts, archery and rock climbing, but it's the "duck stuff" that gets everyone fired up in the summer heat.

The program offers curriculum that's tiered from year to year so that returning campers learn new things at different levels. First-year campers depart with a North Carolina Hunter Education Certification, while Year Two participants graduate with a Boater Education Certification. Third-year campers spend a lot of time on the firearm range, as well as intensive time in outdoor classrooms learning refined skills needed for successful waterfowling. There are four "cornerstones" to the Camp Canvasback: safe firearm skills, water safety, hunting skills and conservation.

North Carolina 4-H has a long tradition of strong youth development. Those principles are applied with a conservation-minded curriculum so that when campers depart they have a good working knowledge of duck hunting and its many nuances. An emphasis on safe firearm handling is practiced throughout camp too. Campers practice a variety of wingshooting techniques on the shotgun ranges, all under the instruction and supervision of NCWRC enforcement officers, education staff and volunteer hunter education instructors.

It's common for participants to shoot hundreds of rounds as they practice stance, swing and follow-through. As any duck hunter knows, there are also a variety of

Camp Canvasback offers unique learning opportunities including how to hunt from layout blinds, survive in the water and make decoys.

situations where different skill sets are needed to be a safe and successful shooter, so youth practice shotgunning from traditional duck blinds and layout blinds. A graduated system of skill-set development is used to help bring novice shooters up to par with more seasoned campers as well.

Firearm safety is far from the only action served up at Camp Canvasback. Safety in and on the water is a primary concern for duck hunters throughout waterfowl season, so practicing these skills in warm water conditions is important. Boating safety courses are instructed, but the hands-on wader safety course, led by wildlife law-enforcement officers, demonstrates the many challenges and dangers a duck hunter could encounter. Campers learn to stay afloat with the many items found in a duck hunter's arsenal: decoy bags, floating coolers and even waders. Campers also learn the complications caused by cold water with the "penny drill" where campers have to attempt to recover pennies in the bottom of an ice-water filled pitcher.

Hunting skills are ever-present at Camp Canvasback too. Aside from firearms and boats, duck hunters use a variety of methods and tactics to bag birds. Camp Canvasback helps to promote and practice these skills. Duck calling is always fun, and campers love to learn—although it does get a little raucous. The "gear" class is always interesting. Southern Coastal Hunter Education Coordinator Kevin Crabtree leads this portion—and with good reason. Campers enjoy seeing the different types of decoys, whether they be floating, spinning or vibrating, Crabtree has it all. Still, it's the real-world experience, know-how and shortcuts from an experienced hunter like him that makes the class so valuable.

Rig'em Right Waterfowl, a North Carolina-based waterfowl gear company, has been a leading supporter of Camp Canvasback. Rig'em Right's Matthew Cagle always shows up with great stories and great gear and donates valuable items to campers. Another North Carolina-based waterfowl company, Allen Bliven Calls, leads Duck Calling 101. Bliven's extensive experience in the blind and with competition calling are a valuable part of Camp Canvasback.

Another great addition at Camp Canvasback is decoy carving with the Core Sound Decoy Carvers Guild. Each year, legendary carvers Jerry Talton and Joe Fulcher show up and help campers make a decoy, but what they make is always different. They have carved wooden and cork decoys, constructed decoys from crabpot floats, crafted silhouette brant and confidence decoys, and even painted antique-style shorebird decoys. The Guild also offers an essay competition and awards scholarships to interested and deserving campers.

Wetland conservation principles complete the fourth cornerstone of the program, and few could argue against Ducks Unlimited's success in this arena. Each year, Ducks Unlimited offers a wetland conservation course, with Justin Aycock presenting on topics that range from migration habits to nesting and wetland mitigation. Each attendee receives a Greenwing membership, but Aycock has also been known to bring duck calls, posters, hats and blind bags.

Camp Canvasback has received several accolades over the years. It has even been awarded the American Camping Association's Edie Klein Award of Program Excellence. The greatest rewards, though, are seeing the successful hunts of past participants. Camp Canvasback not only prepares youth for duck hunting, it also helps to encourage parents' participation. Many graduates even return to volunteer at Camp Canvasback, helping to lead classes on their favorite skills. After all, giving back is a great way for a waterfowler to pass the time.

Camp Canvasback is held in mid-July each year. Registration for camp is completed through staff at the Eastern 4-H Center in Columbia throughout the spring, so if you know a young hunter who would love to participate, get them signed up (eastern-4hcenter.org/). And if you're a duck hunter looking for a great way to give back, consider becoming a volunteer hunter education instructor.

Moist Soil Management of Swamp Land in North Carolina

Written by Luke Lolies, technical assistance biologist, North Carolina Wildlife Resources Commission and Kendall Smith, private lands biologist, U.S. Fish and Wildlife Service

For any experienced duck hunter, there is something special about walking out into the darkness of a swamp on a cool winter morning, shoulders loaded down with gear, guided only by a headlamp. After arriving at the "hole," the process of tossing decoys and searching for a little brushy cover for hiding begins. Following a brief period, the sun begins to break through the trees, shining just enough light to highlight wood ducks effortlessly weaving through the tall timber, while their distinctive whistle can be heard echoing in all directions.

While enjoying moments like these, it is important to understand why waterfowl utilize these swamps in the first place. North Carolina is home to wetlands that are resting and feeding areas for many species of waterfowl as they move to wintering grounds. These wetlands provide the primary food sources that are found naturally on the landscape. Seasonally flooded swamp land provides high quality moist soil vegetation such as smartweeds, panicums and wild millet. Soft and hard mast, mollusks and insects are an extremely important group of foods that are often overlooked. While it is common to associate agriculture grains as a waterfowl food source, natural vegetation, mollusks and insects provide a more suitable balance of nutrition. Specifically, the mollusks and insects provide extra protein which is needed later in the year for energy storage to fuel long flights for migration.

This article presents practical techniques and explains the basic principles for landowners and land managers to use to manage swamps for moist soil vegetation. It illustrates how managing the natural seed bank is an effective tool while planting grains is not always necessary. Active management of swamps for moist soil vegetation not only meets the diverse dietary needs of waterfowl, but it can provide some exciting hunts and wildlife viewing opportunities as well.

Methods

As a landowner who wants to improve the food resources in a beaver swamp using moist soil management, your main goal will be to gain the ability to manage water levels. In an active beaver swamp, this is a job that has already been claimed, and any attempt to unseat "Mr. and Mrs. Beaver" will be taken as a declaration of war! As such, the first step in the management of swamps is to evaluate beaver activity and beaver populations. If beavers are active, trapping should begin in order to reduce the beaver population to a more manageable size.

Managing the beaver population is critical to gain the ability to regulate water depth via the installation of water control structures. A water control structure allows the ability to hold or drain water from an impounded area (in this case, the swamp). There are several different types of water control structures for swamps including pond levelers and flash board risers. The more simplistic of the two structures is the pond leveler. This can be as basic as a large diameter PVC pipe buried in the channel section of the beaver dam or existing road. The channel is commonly referred to as the "run," which is the deepest section of the swamp. It is the stream channel where water flowed before the beavers dammed it. It is advisable to place metal fence panels around the ends of the pipe to help minimize loose litter and reduce the chance of beavers clogging the flow of water. A 90-degree elbow can be placed on one end to regulate water levels. The elbow can be rotated straight up to collect water or turned down to drain water. A web search for "Clemson beaver dam water leveler" will give multiple links to detailed designs and variations of this technique used around the country. You can also contact the USDA Wildlife Services' Beaver Management Assistance Program (BMAP) for more information and assistance.

The second type of water control structure is a flash board riser. This structure has two components. The first is a corrugated metal pipe that lies under the road or dam. The other component is a riser structure that is attached to the pipe. The riser contains slots on the inside that allow wooden boards to be stacked in a vertical pattern to regulate water levels. Stacked boards can hold water in the swamp or be removed to let water flow out.

As a landowner who wants to improve the food resources in a beaver swamp using moist soil management, your main goal will be to gain the ability to manage water levels.

It is ideal to begin collecting water in the swamp as early as September or October (depending on waterfowl objectives) and start draining water off as late as June or July. This cycle of collecting and draining water provides the perfect food resources for migrating birds as well as local wood ducks that brood ducklings in the spring and summer months. By slowly reducing the water levels in the swamp during the summer months, diverse moist soil vegetation can quickly germinate and produce seeds. Keeping the soil moist throughout this growing period is key. Once the moist soil plant species have developed a seed head and begin to die off, water should be gradually flooded back into the swamp creating a waterfowl buffet. Not only will there be abundant seeds on the bottom of the wetland, but all the degrading vegetation will create a perfect environment for insects and other aquatic invertebrates.

As you continue to manage your wetland through the fall and winter months, keep

MELISSA McGAW/NCWRC

MELISSA McGAW/NCWRC

Top left: Pictured is one of many species of smartweed, a group of moist soil plants that provide a nutritious seed source for waterfowl during migration. Top right: The moist soil vegetation is pulled back to show bare ground where an abundance of seed will be available to waterfowl species once the area is flooded. Bottom: Landowner Mike Brantley and N.C. Wildlife Commission biologist Luke Lolies discuss the benefits of managing for moist soil vegetation in an area that will soon be flooded.

MELISSA McGAW/NCWRC

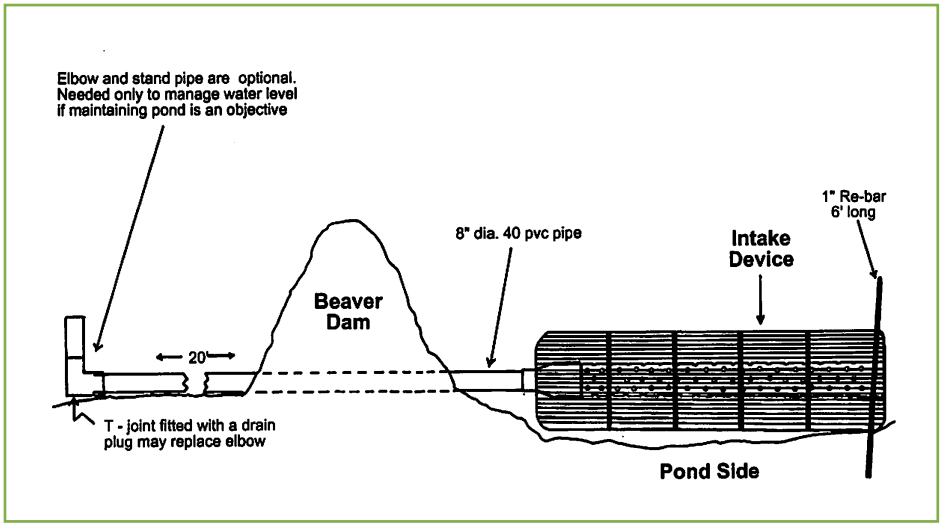
in mind a common mistake of many waterfowl enthusiasts is managing the wrong depths of water best suited for ducks. In a swamp, puddle ducks are the targeted group of species. These ducks need access to the bottom of the swamp where they can pull up plant material and ingest seeds, mollusks and insects. For this reason, the target water depth only needs to be an average of 6 to 8 inches as a rough rule of thumb. This shallow water depth also allows for variation in depths of the swamp where some areas will be deeper and others shallower. Therefore, aiming for about 6 to 8 inches of water where the food sources are readily available will provide the best outcome.

Management in Action

Mike Brantley and his father William Brantley are landowners, managers and conservationists. Their land in Nash County is a working farm that balances agriculture and loblolly pine production with wildlife management objectives. When we met with them for the first time, they recollected memories of bobwhites whistling, deer eating under the persimmon trees, beagles howling after rabbits and wood ducks whistling in the swamp. They both have the utmost respect for the resources on the landscape and pour in plenty of their own sweat equity into projects. The Brantleys were not seeing ducks in numbers like they once were and decided to act. They decided to implement management practices described in this article to improve habitat quality in hopes of restoring the waterfowl use on their property.

Beavers were constantly flooding the path that ran through the swamp and kept the water level too high for desirable moist soil plants to successfully germinate. So, they

Clemson Beaver Pond Leveler



KENDALL SMITH

KENDALL SMITH

Left: Recently installed Clemson Beaver Pond Leveler with moist soil vegetation in the background beginning to flourish on the mud flats of the drained swamp. Top right: Inline riser being installed by Matt Whitehead of AgLand Earthworks through a road to allow water control within the swamp.

contacted the United States Department of Agriculture Wildlife Services to come out and trap beavers. Once the beavers were reduced to a manageable population, the Brantleys cleaned out the pipe through the path and drained the water level, providing better conditions for moist soil vegetation to successfully germinate.

As the swamp became dry enough later in the summer, Mike began to disk areas that were matted up with less desirable perennial plants. Disturbing the root mat and exposing the soil encouraged more desirable annual species such as wild millets, smartweeds and fall panicum to proliferate. These species germinated successfully in the areas after completing this practice. As fall approached, these species developed seed heads and were ready for water.

Mike also broadcast Japanese millet in a small area of his swamp. This plant species serves as a great food source for waterfowl. It is not a moist soil vegetation species found in the seedbank in the area, however it can be used as an attractive food supplement. This species can be broadcast on exposed soil in wetter areas where equipment access might not be viable. It should be seeded at a rate of approximately 20 pounds per acre, followed by a drag to increase soil-to-seed contact.

By implementing active management techniques, the Brantleys will now be able to manage their swamp for moist soil vegetation and hope to see increased use by waterfowl. Projects like these using active management serve the dual purpose of allowing landowners to enjoy the sometimes ignored portions of their land and increasing conservation efforts on a landscape where many natural wetlands have been drained.

If you want to improve waterfowl habitat in your beaver swamp and are willing to challenge our flat-tailed friend (and sometimes foe), consider giving these techniques a try. Always consult with the U.S. Army Corps of Engineers when dealing with wetland management. Permits may be required to install water control structures. Commission experts listed on page 68 can be contacted for assistance.

NICOLE BEAULAC/FLICKR

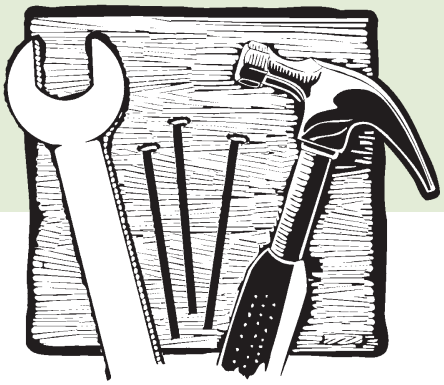
West Nile Virus in Ruffed Grouse

Written by Merril Cook, wildlife health biologist, North Carolina Wildlife Resources Commission

West Nile virus (WNV) is a mosquito-borne disease that has had a devastating effect on numerous North American bird species since it was introduced to North America in 1999. Recent impacts have been documented in upland game birds such as sage grouse in the western United States and ruffed grouse in the central Appalachians. Research conducted in Pennsylvania suggests that ruffed grouse are routinely exposed to WNV, and the disease appears to cause declines in the population in Pennsylvania. WNV can be particularly impactful on young grouse and grouse chicks. However, little is known about local effects of WNV in North Carolina's ruffed grouse population.

To better understand the effects WNV has on ruffed grouse populations, the North Carolina Wildlife Resource Commission is participating in multi-state, multi-year WNV surveillance. During the 2018–19 hunting season, grouse hunters provided feathers and blood samples from 68 harvested ruffed grouse (63 birds from North Carolina and five from Tennessee). All feathers and blood samples were submitted to the Southeastern Cooperative Wildlife Disease Study Unit in Athens, Ga. After five samples were removed as untestable, four of the 58 (6.9 percent) blood samples taken from North Carolina-harvested ruffed grouse showed evidence of exposure to the flavivirus, a family of viruses which includes WNV. This simply means that four grouse were infected at some point in their lives. It does not tell us if the birds had any health implications from the infection or how many other birds in the population might have been infected and died. A 6.9 percent infection rate is very low, and this could result from low infection rates in the population or a high proportion of infected birds not surviving. As you can see, there are many unanswered questions, so we will continue to monitor the disease to try to get a better handle on what WNV means for North Carolina's ruffed grouse populations.

We are continuing to seek assistance from grouse hunters with WNV sampling for this upcoming hunting season. Grouse hunters are asked to submit samples (feathers and blood) from their harvested birds to the North Carolina Wildlife Resource Commission. If you are interested in participating in this project or have any questions, please contact Merril Cook at merril.cook@ncwildlife.org or 919-707-0075.



Land Managers' TOOLBOX

Written by Benjy Strope, CURE management biologist, North Carolina Wildlife Resources Commission

Hitting the Spot

Often in our quest for quality wildlife habitat management, the use of chemicals is required to control or suppress certain vegetation in our habitat areas. Trees and exotic plants are usually the top targets for control. Control is often done by spot spraying or spot treating areas that have undesirable vegetation. Spot treating is just what the name implies: Only small areas or individual species are targeted.

Sprayers for spot treatments come in various sizes and are readily available at farm and garden centers. There are one to three-gallon pump style sprayers and backpack sprayers that hold three to five gallons. Twenty and 25-gallon tanks that have 12-volt pumps are available for ATVs or tractors. For those with UTVs, a 50-gallon tank and either an electric pump or gas engine pump are available.

Choose the right sprayer based on the size and accessibility of the job and the size of the target species. The 12-volt and engine-powered pumps are very effective because they can spray farther than hand pump sprayers and allow the user to stay farther from the target. Plus, they can do double duty for spraying water when conducting prescribed burns.

As with any herbicide or chemical use, the label is the law, and you are responsible for the required personal protective equipment. Spot spraying also requires keeping an eye on the weather. Windy conditions allow the herbicide to drift off the target or blow back to you. Rain may wash the chemical off the plant before it has time to work. Spraying with dew on the plants may dilute the herbicide to non-lethal levels. Treating plants while foggy is also a "no-no" because when the fog lifts it may take your herbicide with it to somewhere else and cause damage. Some chemicals do not function well when the temperatures are high (above 85 degrees). Again, check your label to make sure you do it safely and correctly to protect your health, time and money.

Actual spot treatments vary depending on the target. Treating trees involves starting at the crown and spraying down in a back-and-forth motion. Spray the leaves until wet but not to the point of having the herbicide running off the leaf. Using a surfactant that can cut through the waxy cuticle layer of the leaves will also help. This becomes more important the later in the growing season that you spray. Spraying trees with a mist type setting on your wand or spray gun is not recommended as this will allow the chemical to drift off target or evaporate before it has time to interact with the foliage. Broadleaved plants and grasses can be treated with more of a mist type spray (assuming it is not windy), and these plants should be treated in the spring or early summer while they are small and actively growing.

It is important to keep the spot spraying tool in your land management toolbox to maximize your wildlife habitat management objectives. If you have any questions on spot treatments, feel free to ask your NCWRC regional technical assistance biologist (listed on page 68) or check with most major chemical companies that have representatives that are available to help.

Food for Thought

In today's world, many landowners and managers often define wildlife management as planting a food plot. While a food plot may be of some value, most land managers are much better off to take a wholistic approach to property management and work to improve all of their lands, instead of just planting something. Think of it this way, would you design your house around the kitchen, or vice versa? Before deciding, there are many factors and questions you should ask yourself and consider.

Does your property have enough escape cover from any predators that might be drawn to a food plot in search of an easy meal? Would your time and money be better spent by working to improve the overall habitat quality instead of planting a food plot?

If you still intend to plant a food plot, do you know and have a basic understanding of your soil types? Have you had the soil tested? Are you liming and fertilizing based on the test results or just tossing some 10-10-10 fertilizer on the ground? As soil becomes more acidic or basic, the nutrients will be less available for uptake by plants, so make sure to apply lime appropriately to get the most out of your fertilizer.

What foods are currently available on your property and when? Do you have perennials or annuals? Having a smorgasbord throughout the year will be more beneficial than having all plants dropping fruit or seeds at once.

Always check to make sure that whatever you are going to plant can grow in your locale. Will you get enough rainfall that the plants require? Enough daylight? Will it be planted in the appropriate time frame? Are the planted species a potential nuisance, invasive or exotic?

Where are you going to place your plots and what size will they be? The answer to that is usually whatever will fit in front of the tree stand, but that may not be the best answer. Having plots near drinking water, travel paths and bedding or escape cover might be better.

Whatever you do, don't overlook the benefits of having fallow vegetation and using prescribed fire over large areas to provide succulent regrowth. Having a map and a management plan for your property will also be a benefit. There is nothing "wrong" with a food plot, but they are not the "end-all, be-all" to effective wildlife management. Sometimes carefully thinking about a more comprehensive approach to your land's management can provide a greater payoff in terms of wildlife benefit for the effort and money expended. The Private Lands Program staff listed on page 68 are ready and willing to assist you in your efforts if you give them a call. Consider reaching out to these experts to help you improve your management efforts for wildlife on your lands.

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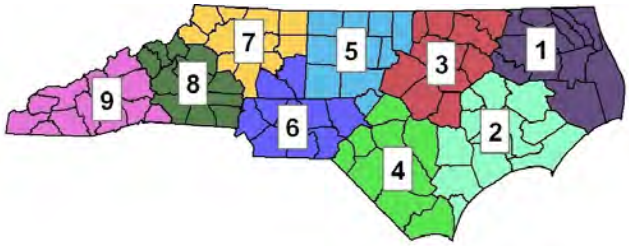
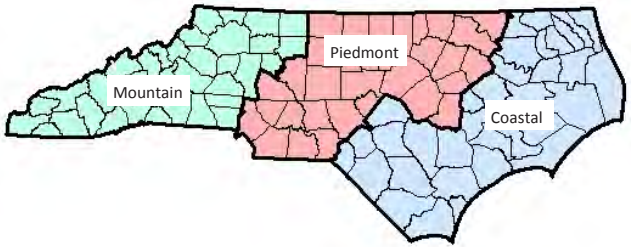
NORTH CAROLINA Wildlife RESOURCES COMMISSION

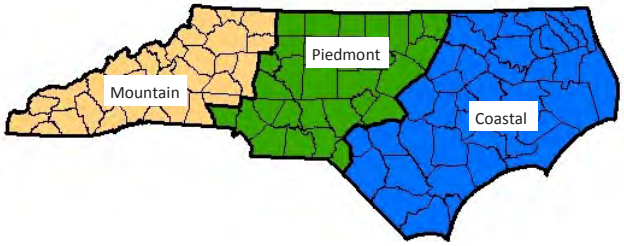
NC Wildlife Commission Districts



NC Wildlife Commission Private Lands Regions



NC Wildlife Commission Wildlife Habitat Program Areas



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