



the Upland GAZETTE

North Carolina Small Game Notes

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Controlling Predation Without Killing Predators

Habitat Management is Key

By John Wooding, NCWRC Small Game Biologist

In my old job, I helped landowners with varmint problems. Sometimes it involved just a phone call with advice, sometimes a trip to the property to size things up, set the traps, and the landowner did the rest, and sometimes I did it all—from setting the traps, to running them daily, to fixing the fence to keep the varmints out—you name it. My kids got a lot of their school clothes from trapping money. We jokingly called it possum money.

I learned many lessons from that job. One is not to let your wife take the 2 a.m. call from the divorcee who wants the trapper to come over right now to get her possum—too much explaining for the middle of the night. A second is that knowing the critters and what makes them tick greatly increases your odds of success. A third is that there's more than one way to skin the cat when it comes to varmint control.

Some people think the best way to solve every wildlife problem is to start blasting. If you're lucky, you might get the offending varmint with one shot. Congratulations. But if you're like most people, you never even see the varmint to get a shot, or when you do, you miss and now you're after an educated varmint. Or you kill the wrong one. Why kill the raccoon when the bobcat is the problem? You might learn that for every one you shoot, there's two to take its place, and it's a never-ending deal. And if you ever shoot a hawk, and find out the hard way—the wildlife officer way—that what you did was extra illegal, you may give up yard chicken farming all together. We're talking fines, maybe jail time, confiscation of firearms and vehicles—just a mess.

Most people eventually realize that the best way to protect property is to use fencing or barriers of some type, and to adopt a live and let live philosophy with nature. When that doesn't

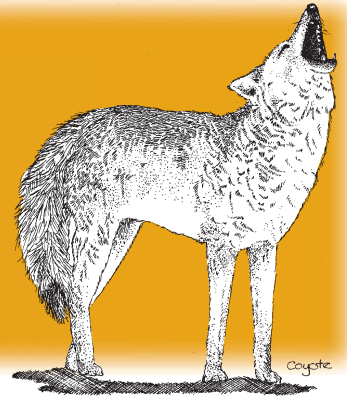
work, just remove the varmint causing the problem and leave the rest alone. You'll be crazier than a sprayed roach if you try to get them all.

This same way of thinking applies to predator control and small game management. You can't get them all. To do so would be to kill all snakes, fire ants, furbearers, hawks, and owls. Just for a minute, let's imagine you're successful, and you get them all, discreetly. No fines or jail time and you didn't get your vehicle confiscated (you do about wet your britches whenever a wildlife officer drives by, but you're not sitting in jail—yet). There will be more quail and rabbits at first, but only until the rats and locusts catch up and eat up the world you created. When I think about someone wanting to kill all the predators, I often think of the teachings, when our creator looked at the creation and said it was good—every bit of it. I like coyotes and hawks, and seeing a mink track on a river bank makes my day. I appreciate predators as much as I do small game, but the reality is that controlling predation is necessary for small game management. The question is how to go about it.

If you can't get them all, and even if you could it might have unintended consequences, should you just go after some of them? Maybe just Cooper's hawks if you're a quail person, but Cooper's hawks and all birds of prey are protected by law with serious penalties for violators. For that reason, let's forget the birds of prey. How about just snakes? Snakes are hard on quail eggs, so that's a possibility—just go after snakes. How do you go after snakes? You could mow all the weeds and destroy their habitat, but that's where quail nest—that wouldn't be a smart plan. Raccoons are known egg suckers. They're easy to trap, and North Carolina has a season. Maybe you could trap, or get a professional trapper to

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"You can create small game miracles with a little imagination and creativity, coupled with a good understanding of the critters."



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help. That's a possibility. The pelts can be sold, as can the meat. How effective it will be depends on how many are killed and how quickly new ones move in to fill the void. It could be helpful for nesting quail, but chances are it won't make any difference because you won't be able to trap hard enough and over a large enough area. You're spinning your wheels if you set a trap or two on your 200-acre farm.

If you're managing for rabbits, you could trap the coyotes. They eat their share. Since coyotes are smart, unless you're a good trapper or willing to learn, it's best to let a professional trapper handle it. Otherwise, all you'll do is give the coyotes a trapping lesson. If you are running a rabbit enclosure, you can effectively manage coyote predation with fencing and trap only those that beat the fence. Fencing is out of the question for wild rabbits that live in the wild, and no one is going to finance coyote trapping at a meaningful scale such as at the county level.

So what can we do? Trapping/shooting has questionable results unless done in a major way, fencing is out of the question because of price and practicality, and hawk/owl control is illegal. Poisoning is also illegal—ask the quail guys in south Georgia if it's worth it. They used a poisoned egg to kill the possum that killed the bald eagle that ate the poisoned possum—this brought in all the wildlife officers, state and federal—big penalties, news coverage, all over a possum. Reality leaves us few options to control predation on small game, except one really good one, which is all we need.

Think about this: we really don't have to kill the predators; all we have to do is control the predation. Sort of like a farmer protects his flock from predation by using a fence—it's not necessary to kill the predator to stop the predation. It's not practical to fence out predators in nature, but if we're skilled land managers, we can provide small game with enough hiding places that they can stay away from the predator. Cover is sort of like natural fencing. The predator may circle the hiding places, or fly over, or slither through, but if the cover is dense enough, tall enough, and extensive enough, we have effectively controlled the predation. Without firing a shot, or setting a trap. Very cool. The best way to control predation on small game is through habitat management.

A fundamental of cover management is that more is generally better. Too little, and we've created a predator food plot—a 15-foot wide, weedy ditch bank may lure a female quail in to nest. It will also attract the snakes and raccoons, and a long narrow cover

strip is easy for a predator to search. In the winter, a narrow cover strip may lure in a rabbit. A coyote pair can walk the strip at night, run the rabbit into the field, and share the meal. A wider strip—maybe 50 feet wide, or if you have the land, 100 yards wide—gives small game the area they need to effectively use their natural defenses: camouflage, quietly tiptoeing away, and if need be, a burst of speed—all in the cover. (Or if they run into the field, they can jump right back into the cover.) Quail that take flight to escape predators only fly a short distance before dropping back into cover.

Cover is the key for predator control. If you have the land, give the quail and rabbits an entire field, managed for their benefit with waist/chest-high weeds and blackberry patches, with plum thickets scattered about. We've all walked fields like this, and with every step, we expect to jump a rabbit or a covey.

Rabbits perceive brush piles as hutches. You can string out brush piles around your property, with connecting fairways of blackberry and wildflowers—maybe a brush pile or two per acre. Rabbits will hide in the brush piles by day and forage by night in the thickets. A big brush pile is 100 feet long by 30 feet wide (you can cut and pile whole trees to make the pile). Alternatively, you can ring an entire field with brush piles by felling trees away from the field, and let the rabbits forage on the field edge at night.

You can create small game miracles with a little imagination and creativity, coupled with a good understanding of the critters. Big results take work, land, and equipment. Controlling predation with habitat management is not free, but for the price, it's the best deal out there.

Predators and prey have been going at this for eons. Small game are prey species, and they are naturally equipped to escape predators, under the right conditions. The right conditions include cover and sufficient nutrition. Food is the second half of the small game management equation. Both are essential. With proper nutrition, small game are naturally prolific at reproducing, which is another way they counter predation: produce lots of little ones. They would be extinct if they weren't prolific and physically able to elude predators. Cover provides safety, food provides strength. Small game management—well done small game management—provides the safe world small game need to feed, to rest, and to raise their young. Predators will certainly get a few—even under the best habitat conditions—but at acceptable levels, leaving plenty for us as well. Habitat management is the professional's method to control predation on small game. ♣

Ducking the Issue

Conservation Reserve Program Favors Habitat Management Over Predator Control

By Chris Madson, Editor, Wyoming Wildlife

As readers will quickly learn, the theme of this issue of the Upland Gazette is that having healthy wildlife populations is all about three things: habitat, habitat, habitat. This holds true whether you are interested in bobwhite quail and deer in coastal pine woods or songbirds and bears in the Appalachians. I thought a perspective from across the country from 15 years ago would be interesting.

The following editorial was first published in the June 1996 issue of Wyoming Wildlife by Editor, Chris Madson. The editorial came at a time when I was working on a N.C. Wildlife Resources Commission-sponsored quail study looking at predation and habitat enhancement. This work was a cooperative effort between the N.C. Wildlife Resources Commission, N.C. State University, and the Virginia Department of Game and Inland Fisheries. Though ducks and quail are obviously very different, the points Mr. Madson made in 1996 about ducks were borne out in the results of our quail study a few years later—habitat was critical to any effort to increase bobwhite numbers. I thought a look back to the 1990s would interest our readers and complement articles in this issue.

The Conservation Reserve Program (CRP) in the South has never provided the wildlife benefits seen in the Midwest and West—primarily due to the types of cover and management allowed here. This is an issue I encourage our readers to learn more about and one we will attempt to address in future issues. With proper changes to land management regimes, CRP in the South could someday provide excellent habitat for bobwhite quail and other declining grassland birds.

I hope you enjoy the article as much as I did – then and now.

Mark D. Jones, Supervising Wildlife Biologist

In the last 20 years, duck biologists may have spent more time than any other wildlife managers talking about predator control. Much of this discussion has arisen from frustration. For most of the last century, the prairie potholes of the northern prairies have been drained of their life blood. The loss of water was obvious; more subtle was the loss of upland cover near the marsh basins, the true nurseries for prairie ducks. The best habitat management waterfowl biologists and enthusiasts could muster hardly seemed to stop the bleeding.

Research on nesting hen mallards showed beyond doubt that predators were taking a heavy toll. In some parts of the pothole country, only six percent of the clutches hatched. Losses among hens were huge.

The research left an important question unanswered: Are these losses of eggs and nesting ultimately caused by predators or a lack of habitat? It was an interesting question, but since there wasn't nearly enough state, federal, or private conservation money around to replace lost marshes and upland nesting cover, the managers focused on the predators. When you can't do what you need to do, you do what you can.

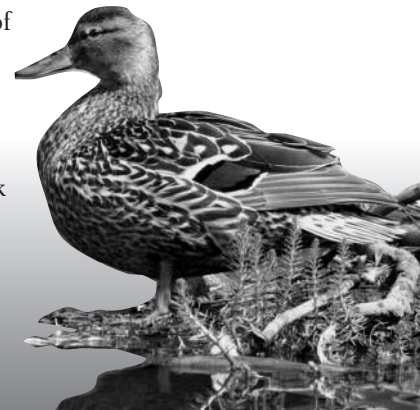
So more and more discussions of waterfowl management focused on predators, and answers emerged. We identified the most dangerous duck predators—red foxes, badgers, and ground squirrels were high on the list. We got a better grasp of the way different predator species influence each other. We experimented

with nesting islands and electric fences to keep predators away from ducks, and we found out that it was possible to trap enough red foxes to afford hens some measure of added nesting success. We found out that predator control was expensive, almost as expensive as habitat work.

And, while we were working on all this, the \$18 billion Conservation Reserve Program came along, followed by a few wet winters. More hens survived in the Dakotas; more eggs hatched, and North American duck populations in the Dakota prairie took a hefty jump upward. Across the border in Canada where there was no government subsidy for retiring land, duck populations hardly moved in spite of the added moisture.

All of which answered the first question: Are duck populations controlled by predators or habitat? Habitat seems to be the key. Of course, the habitat fix wasn't cheap—CRP expenditures in the Dakotas, Minnesota, and Montana amounted to more than \$1 billion. However, that money bought us much more than 20 million ducks. It was a salvation for dozens of other wildlife species, protected vulnerable topsoil, and may have tweaked grain prices a little, thanks to the reduction in surpluses.

When the issue of widespread predator control emerges in discussions of wildlife management, the example of prairie ducks keeps coming back to me. When we can't do what we need to do for wildlife, it seems to me that we ought to back up and try again. ♣



An Earthworm Feast in Crop Fields

American Woodcock Select Furrows for Foraging

By Emily B. Blackman, graduate student advised by Christopher S. DePerno, Christopher E. Moorman, and M. Nils Peterson in the Fisheries, Wildlife, and Conservation Biology Program at North Carolina State University

If you go to a forest opening in early spring near twilight in central or eastern North Carolina, you might witness one of the most unique courtship rituals in the animal kingdom: the mating dance of the male American Woodcock. The dance begins on the ground with the male woodcock making a loud “PEEEENT” call and then taking to the air in a vertical spiral flight. On the way up, his wings make a distinctive twittering sound as air passes through his first three thin primary feathers. The male woodcock circles and rises high into the air, up to several hundred feet. When he reaches the apex of his flight, he returns to the ground in a diving, zig-zag motion, while making a chirping call. The ritual is repeated again and again as the male attempts to attract females.

Woodcock are a species of conservation concern because of rangewide population declines of 1.1% per year since 1968, largely due to the loss of early-successional forest habitat and a lack of forest disturbance events such as timber harvest and fire. As a result of the decline, woodcock are listed as a Species of High Concern by the U.S. Shorebird Conservation Plan and a Game Bird Below Desired Condition by the U.S. Fish and Wildlife Service.

Woodcock are technically considered shorebirds, but you will not find them on the beach. They are adapted to life in forests and use their long bills to probe the soil for earthworms. Woodcock are migratory and move between breeding areas in the northeast and northcentral states to wintering areas in the South. Woodcock wintering grounds are found in Louisiana, Arkansas, Mississippi, Alabama, Georgia, North Carolina, South Carolina and Virginia. Some woodcock remain in southern



MARK D. JONES

Woodcock (right) are challenging game birds often taken while North Carolina hunters are pursuing bobwhite quail (left). However, the amazing “timberdoodle” is often found in slightly different habitats and is more than worthy of individual attention.

states year-round, including North Carolina, but most are migratory. Woodcock use different nocturnal habitat types for roosting and feeding across their winter range, including pastures in Louisiana, bottomland hardwoods, young pine plantations, seed-tree harvests and fallow-old fields in Georgia, forest openings in Alabama, and fallow soybean and abandoned grass fields in Virginia.

During the 1970s and early 1980s, researchers from North Carolina State University (NCSU) studied woodcock in Hyde County near Lake Mattamuskeet in eastern North Carolina. They observed woodcock feeding on earthworms in conventionally-tilled soybean fields at night rather than

in nearby disked corn or winter wheat fields. The tillage in the soybean fields created deep furrows that protected woodcock from winter weather and predators. However, since the original research project, most farmers have switched to no-till agricultural practices for soybeans. No-till plantings have narrower rows than conventional tillage and seeds are drilled into fields without disturbing the soil or creating the deep furrows that were important to woodcock 30 years ago.

During December–March 2008–2009 and 2009–2010, NCSU’s Fisheries, Wildlife, and Conservation Biology Program conducted a research project in the same study area that was used 30 years ago to

determine whether the large-scale adoption of no-till technology altered woodcock use of crop fields. We investigated whether crop type, earthworm abundance, and field structure affected woodcock use of different fields.

We worked in 72 fields. Main crops included no-till soybean planted after corn, no-till soybean planted after wheat, winter wheat, disked corn, and undisked corn with mowed standing stalks. Farmers in the area rotated their crops every year, switching between soybeans and corn or among soybeans, corn, and winter wheat. No-till soybean fields planted after corn have furrows left from the previous corn crop, whereas no-till soybean fields planted after wheat are flat due to disking before wheat is planted. Similarly, undisked corn fields have furrows, while disked corn fields do not.

To evaluate nocturnal woodcock field use, we looked for woodcock in fields from dusk until around midnight, when they were likely to be out searching for earthworms. Because we wanted to compare earthworm abundance in our fields to determine which crop types offered the best feeding opportunities, we also dug for earthworms in fields at the same time of night when woodcock were likely to be out foraging. Working with wildlife at night is always a challenge, especially when the study species is well camouflaged. Woodcock plumage blends in perfectly with debris and soil in crop fields. Luckily, woodcock have very large eyes that shine brightly when illuminated by a headlamp. We spotted woodcock in our crop fields by using headlamps and carefully searching for orange or red eye shine in the distance. Another research challenge for our team was that woodcock are picky about when they use crop fields. They typically stay in nearby forests when there is a full moon or when nights are too dry, cold or windy.

So, what were the results?

We observed more woodcock in no-till soybean fields planted after corn and

undisked corn fields with mowed standing stalks than in other crop types. Remember, no-till soybean fields planted after corn and undisked corn fields were the two crop types in our study area that had furrows. So, although conventional-tilled soybean's deep furrows have been replaced by no-till agriculture, woodcock

predators, and no-till soybean fields planted after corn offer high food abundance and concealment to wintering woodcock. However, woodcock require forest habitat close to the crop fields to provide daytime shelter and a safe place on nights when field conditions are unfavorable. Woodcock likely spend most of

"WOODCOCK ARE A SPECIES OF CONSERVATION CONCERN BECAUSE OF RANGEWIDE POPULATION DECLINES OF 1.1% PER YEAR SINCE 1968 ..."

still found shelter from weather and predators in no-till soybean fields that retained furrows from the previous corn crop and in corn fields that remain undisked over the winter.

Also, no-till soybean fields provided an abundance of earthworms. On average, we collected more earthworms in no-till soybean fields than in other crop types, probably because of the lack of soil disturbance in no-till fields. Tillage negatively impacts earthworm communities by exposing individuals to predation, and altering soil moisture and organic matter content. No-till technology benefits earthworms and is considered to be environmentally friendly because of reductions in soil and wind erosion and surface water runoff. Additionally, other researchers have reported significant benefits to wildlife from no-till agriculture, especially increased crop residue on the soil surface that provides quality cover, nesting, and food resources.

Today, in eastern North Carolina, undisked corn fields offer woodcock thermal protection and concealment from

their time in forests and only move to crop fields occasionally to feed at night. Therefore, to provide habitat for wintering woodcock, it is important to conserve forests in agricultural landscapes.

How can farmers help?

To create nocturnal habitat for woodcock in tilled corn fields, farmers can leave furrows intact over the winter; if field disking is necessary, it should be delayed until spring. By not disking, farmers can save time and fuel and labor costs. In the next planting season, soybeans can be drilled into the existing corn and the crop furrows retained into the next winter. In fields not in corn production, farmers can till in the spring to create ridges and furrows to improve crop drainage and soil warming. The beds can be used for multiple seasons and crops can be rotated with no tillage required until the beds need to be re-created. Improving woodcock winter feeding areas may increase woodcock winter survival, allowing them to return to their breeding grounds in good condition for their spring courtship dances. 🌿

Understanding the Benefits of Prescribed Fire

What Do We Have to Lose?

By John Ann Shearer,

President of the N.C. Prescribed Fire Council and Wildlife Biologist, U.S. Fish & Wildlife Service

What is at risk if burnable land is not maintained? We need a sizable amount of information to answer that question. Information such as: the location and size of all current burnable land, and the type of land included (farmland, forest land, private and so forth). We need to discern what characteristics make this land burnable, if any of the burnable land has actually been burned and if so, how much and when, and how frequently. What would the land be like if left unburned? What is the value of the land burned and unburned; and does the size of a burnable piece of land affect value? Whew! It's overwhelming and thought provoking.

Assembling a Database

To begin to answer these questions, I would assemble a database and generate four maps for North Carolina. The first map on my list would show the lands historically burned in the state and the frequency at which they were burned. This is the one map of my quartet that we actually have. Using various factors

such as topography, historical records, climate, plant communities and soils, Cecil Frost (Ecology Faculty, UNC-Chapel Hill) mapped out the presettlement fire regimes for the southeastern United States. His maps indicate that the majority of North Carolina burned every four to six years. The Sandhills and southeastern part of the state burned every one to three years. There are pockets in the northeast and in the mountains that were more likely to burn every seven to 12 years or greater than 12 years. While the frequencies are fascinating, the fact that most of our state's ecosystems evolved with fire and burned with some regularity up until the early and mid-1900s is no surprise.

The second map would be trickier to generate and would show the "valuable burnable land" across the state. Now that our state is heavily developed with roads, highways, industry, agriculture, and homes, we need to look at a current map indicating lands that are or can be burned and that provide value. Where are the places that are large enough and within a suitable landscape that make burning meaningful? Of course, consistently applying labels such as value, suitability, and meaningful can be difficult.

The third map would be a more restrictive version of the second. It would show "practical and valuable burnable land." When we take into consideration all the limitations to prescribed burning such as air quality concerns, effect of smoke near highways and neighborhoods and other high risk areas, it may not be practical or realistic to expect to burn certain valuable burnable lands. However, I'll bet this map would still include a fairly large portion of our state.

The last map to consider would depict what is actually being burned. Unfortunately, our burn database is not complete enough to adequately address this question. According to the N.C. Division of Forest Resources 2010 Forest Assessment, the annual average acreage prescribed burned for hazard reduction, wildlife, or silviculture is 118,779 acres. Most parties involved would agree that the number is actually higher, and hopefully in the next few years the information will be more certain. The large landholders who frequently burn (Department of Defense, N.C. Wildlife Resources Commission, U.S. Forest Service, and U.S. Fish and Wildlife Service) know and record what they burn annually. But, most of the records of day-to-day burning by family forestland owners are in a local office of the N.C. Division of Forest Resources. Collecting and compiling that data is a tall order. However, the Division of Forest Resources is working to develop an online database for reporting fires. While this is a step in the right direction, there are still some issues to be addressed. For example, once the request to burn is called into the local Forest Service office or entered into the forthcoming online data base, there is currently no way to know if the burn actually happened or whether it was smaller or larger than planned.



MARK D. JONES

Using prescribed fire in the Wildland Urban Interface is sometimes challenging, but has potential applications ranging from landscaping to protection from wildfire.

The mission of the North Carolina Prescribed Fire Council is to foster cooperation among all parties in North Carolina with an interest or stake in prescribed fire.
www.ncprescribedfirecouncil.org



Data Analysis and User Groups

The data in my four-map example would provide us with a comprehensive view of the geographic distributions of past, current, and future fire activities. This data could be used to prioritize burn areas, inform the public of trends and potential benefits, and lobby for more burns. There is still work to do in order to answer questions regarding what is at stake if we are faced with burning fewer and fewer acres. What if we go from several hundred thousand acres burned a year to just 100,000 acres or less? What difference will it make? When will the difference become apparent? Who will care?

One category of people likely to be concerned with these questions would be those citizens who love the land for its natural heritage value, aesthetics, wildlife, and recreational opportunities. They will be some of the first to be affected by the loss. After all, we know that the plant and animal species of our state's ecosystems evolved with fire and will fade away or at least change without it. Walks in the woods will not be the same, and productive hunting for many species will likely decrease. How many citizens would be affected by this loss? How much do they care? How powerful are they? How many actually realize the importance of fire?

People who care about healthy forests will notice a radical change. Forests grown for timber products often benefit from prescribed fire effects. This is especially true for our longleaf pine forests. Few forest owners are only interested in the forest as a timber resource. Most owners also care about the values of wildlife and recreation described earlier. Forests cover more than 60 percent of our state. Certainly many people care about forests, but to what lengths are they willing to go to protect and manage healthy forests?

The last group who will care is the largest group of all, but unfortunately by the time they care, it may be too late. These are residents negatively impacted by wild fires. The fuels that accumulate without prescribed fire make wildfires more likely to occur. Unlike prescribed fires, wildfires are not planned and occur without consideration for smoke management or air quality. Only after structures are threatened or destroyed is the larger population aware of the value of prescribed fire, and that awareness typically fades as time increases since a wildfire occurred.

Considering these user groups, we could conclude that what we lose by burning less is some native wildlife and recreation dependent upon native wildlife, healthy forests and the products from them, and the opportunity for wildfire prevention. We feel this impact already. Just as one begins to numb from cold gradually and becomes unaware of the onset of fatal hypothermia, we are gradually losing the benefits that come from fire-maintained ecosystems. We may or may not be aware of the change, but

nonetheless our reaction is slow. Land management without fire is a hard enough job. When proper land management calls for prescribed burning as part of the plan, the job gets tougher.

Challenges of Prescribed Fire

We know many of the challenges involved in maintaining our burnable lands. The U.S. Census Bureau projects that North Carolina will grow in population from more than nine million in 2010 to more than 12 million in 2030. Given our current population and projected growth, many land management activities become more difficult to implement. This is especially true of the ability to conduct prescribed burns. With our expanded population comes air quality and smoke management issues and risks to structures. Already, North Carolina has the most acres of any state (5.5 million) considered as Wildland Urban Interface. Wildland Urban Interface, or WUI as it is known, is the area where houses and wildland vegetation interface. With greater road density and traffic counts come greater risks to traffic from smoke. Obtaining insurance to conduct prescribed burns can be a nightmare. Few private consultants are willing or able to undergo the rigor and pay the premiums. The N.C. Division of Forest Resources conducts prescribed burns on private lands and is also limited, not by insurance but rather by time, money and inspiration.

I realize that I have painted a rather gloomy picture. But one thing is for sure, wildlife lovers are eternal optimists. I expect the deep connections that we developed since we were children shooting doves or rabbits on the back 40 have inspired us to be hopeful people. Thank goodness for that! So, how do we optimistically, but realistically address this extremely challenging problem?

Local Support

The N.C. Prescribed Fire Council was formed in 2006 to promote and advocate for prescribed fire as well as to improve our expertise. The Council has identified education as the area of greatest need and most opportunity for improvement. We cling to the hope that with the public's greater understanding of the benefits of prescribed fire, come solutions to maintaining it. The Council has no regulatory authority, but as a group with conceptual and practical expertise, we can serve as liaisons and educators promoting prescribed fire.

Feb. 7-13, 2011 marked the second annual Prescribed Fire Awareness Week proclaimed by Governor Bev Perdue. The week included public service radio and TV spots with a message about good fires and good forests. The North Carolina Wildlife Resources Commission conducted a prescribed burn in Burke County that was featured on Charlotte's WBTV and written up in the *Morganton News Herald*. An educational brochure was provided

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A Work in Progress

Collaboration Effort Helps Restore Longleaf Pine Ecosystem

By Susan Miller, Wildlife Biologist, U.S. Fish & Wildlife Service

The recently formed North Carolina Longleaf Coalition is promoting collaborative efforts to restore the longleaf pine ecosystem across its statewide range. Toward that end, the coalition's steering committee includes multiple state and federal natural resource and forestry agencies, as well as military interests, conservation groups, foresters and landowner representatives. This effort builds on decades of interest in longleaf by these stakeholders and was, in part, inspired by a regional campaign known as America's Longleaf Restoration Initiative. The regional initiative is guided by the first ever Rangewide Conservation Plan for Longleaf Pine released in 2009 by a consortium of agencies, conservation groups and longleaf professionals from Virginia to Texas.

The Rangewide Plan established an ambitious goal of restoring 8 million acres of longleaf, up from some 3.4 million acres today, over the next 15 years. That plan also identifies 16 "Significant Geographic Areas" for longleaf across nine states while proposing a number of strategies and key actions. Significantly, the Conservation Plan anticipates that on-the-ground implementation will be led by "local teams" of interested "longleafers" working at various scales. The North Carolina Longleaf Coalition is one of several such "local teams" emerging across the historical range of longleaf to lead restoration efforts.

The North Carolina Longleaf Coalition is a work in progress. Its mission is "promoting the maintenance and restoration of North Carolina's longleaf pine ecosystem, including its cultural and economic values, by forming a collaborative network of diverse stakeholders to provide strategic leadership across the historical range while also supporting local restoration activities." Following an organizational meeting in March 2010, the steering committee was formed along with various teams focusing on such topics as restoring longleaf



SUSAN MILLER

Pictured above is a longleaf pine stand in the Sandhills region of North Carolina.

on public and private lands, communications and education, prescribed fire, economics of longleaf, and GIS mapping/data management to support the overall effort. Based on the recommendations of these teams, the coalition will establish more specific goals and priorities later this spring. Meanwhile, coalition members are working together on such threshold tasks as updating and mapping the current inventory of longleaf.

Much of the longleaf restoration urged by the coalition will occur on private lands. Fortunately, willing landowners can concurrently manage for forest products, wildlife, and conservation. Coalition partners also have made significant support and assistance available to private forestland owners. For example, the Natural Resources Conservation Service (NRCS) set aside \$281,000 for landowner assistance in 2010 and that commitment has jumped to \$800,000 in 2011. "Because of the multiple resource values of longleaf, we want to make sure that landowners interested

in longleaf get the assistance they need, whether to improve the quality of existing longleaf stands through application of fire or by establishing new longleaf," said Matt Flint, a coalition steering committee member and assistant state conservationist with NRCS.

The longleaf resource in North Carolina has dwindled to around 300,000 acres. Increasing its extent and improving ecosystem values, including the native understory where much of the biodiversity exists, is necessarily a long-term proposition. Fortunately, the new coalition is drawing the interest and support of key stakeholders. The coalition is continuing outreach to concerned individuals and to local partnerships, including the Sandhills Conservation Partnership and the Onslow Bight Conservation Forum, to extend its reach and effectiveness. An upgrade of its website (www.nclongleaf.org) is also underway so that "longleafers" can learn more about the coalition and get involved in its activities. ♣

North Carolina Forest Service Begins Native Understory Plant Production

Kim Shumate, NCDFR ARRA Longleaf Program Coordinator
James West, NCDFR Nursery and Tree Improvement Program Head

The North Carolina Division of Forest Resources' Claridge Nursery is helping to regenerate the longleaf pine, a tree of historic importance and ecological necessity in the Tar Heel State. The longleaf pine, once a vital part of the state's economy and home to unique wildlife, has been decimated over the years starting with the growth of settlers in the new world and continuing to today's suburban sprawl.

Throughout North Carolina's history, longleaf pine has played an important role. Indeed, our state toast proclaims North Carolina as the "land of the longleaf pine." In pre-settlement times, longleaf pine dominated most of the coastal plain forest. Early explorers described the forest as a vast, open park-like savanna of long-needled pine over a diverse understory of grasses and forbs. Across the southeast, the longleaf forest once covered more than 90 million acres, but today it is one of the most threatened ecosystems in North America with less than three percent of the original forests remaining.

With settlement came 200 years of exploitation. Settlers harvested expansive forests for the superior wood, collected resin for turpentine, and used pitch and tar on ships. Much of the forestland was converted to farmland and used for free-range cattle. These free-ranging cattle ate the slow-growing seedlings. In more recent times, longleaf forests have been consumed by urban sprawl or replaced with faster-growing loblolly pine. Fire, which is crucial for the continuation of these lush forests, was excluded with an efficient fire control program. Without fire, other more competitive pines and hardwoods begin to replace longleaf pine. The culmination of all these factors, along with the fact that little was done to regenerate and manage longleaf pine, resulted in only about 300,000 acres remaining in the Tar Heel State.

The mismanagement of longleaf pine throughout history led to a decline in one of the most diverse ecosystems in the world. The longleaf forest provides excellent habitat for many wildlife species and is home to several threatened and endangered species. The early-successional understory layer of legumes and herbs, maintained by periodic fire, produces lots of hard seed that supports a diverse wildlife population. Quail, turkey, deer, and numerous songbirds such as the Bachman's sparrow, pine warbler, and bluebirds prefer the open, early-successional habitat. Quail and southeastern fox squirrels are particularly adapted to the open and grassy habitat of the longleaf pine ecosystem.

Many wildlife species need the longleaf pine ecosystem to thrive. Among them are the gopher tortoise in the Gulf Coast region, the red-cockaded woodpecker (the only woodpecker in the world to excavate its cavity in living trees), and the northern pine snake. The wet savannas and flat woods associated

with longleaf forests contain up to 40 different plant species per square meter including many rare plants. Some of these rare plants include the rough-leaf loosestrife and the unique insectivorous plants such as Venus fly-trap and pitcher plants. Of the estimated 1,630 plants found in the southeast, more than half of them are found only in the longleaf ecosystem. This astonishing biodiversity is second only to a tropical rainforest. Across the south and here in North Carolina, efforts are underway to restore this important tree and the plant communities associated with it.

The importance of longleaf pine ecosystems led to a longleaf pine initiative throughout the southeast. Building on decades of interest in longleaf pine, the North Carolina Longleaf Coalition was formed in early 2010 as a local implementation effort inspired by the launch of America's Longleaf Initiative. The coalition is made up of a group of longleaf pine enthusiasts from state and federal organizations, nonprofits, consulting foresters and landowners, and academics. This group's main mission is to work collaboratively toward the maintenance and restoration of North Carolina's longleaf pine ecosystems.

The launch of this coalition was sparked by a grant for \$1.7 million awarded to North Carolina through the American Recovery and Reinvestment Act of 2009 (ARRA stimulus) to restore longleaf pine ecosystems. This funding has supported a host of longleaf pine restoration efforts, including the expansion of the North Carolina Division of Forest Resources Claridge Nursery's longleaf pine seedling and understory species growing capacity. In 2010, four million longleaf pine seedlings were grown and sold, and the understory species seed production areas were established. Due to the growing demand for longleaf pine, the nursery plans to increase production to eight million seedlings this year. In addition to the tree seedlings, the understory plants are well on their way. Last season 80,000 seedlings were sold. Demand is on the rise, and next season's crop will be significantly larger. Sales will begin again on July 1, 2011 for understory plants from both Coastal and Piedmont seed sources. Species currently being cultivated include:

- Eastern reedgrass, *Calamagrostis cinnoides*
- Maryland goldenaster, *Chrysopsis mariana*
- Narrowleaf silkgrass, *Pityopsis graminifolia*
- Little bluestem, *Schizachyrium scoparium*
- Texas tickseed, *Coreopsis linifolia*
- Savannah meadowbeauty, *Rhexia alifanus*
- Cutover muhly, *Muhlenbergia expansa*
- Shortbeard plumegrass, *Saccharum brevibarbe*
- Toothache grass, *Ctenium aromaticum*
- Savannah blazingstar, *Liatris spicata*

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NCWRC Game Land Program Reaches 2 Million Acres

By Isaac Harrold, NCWRC State and Private Lands Section Manager

Thanks primarily to North Carolina's Clean Water Management and Natural Heritage Trust Funds, along with the support of numerous other conservation partners, the North Carolina Wildlife Resource Commission (NCWRC) continues to acquire land to protect critical wildlife habitats. At the same time, we provide our state's sportsmen and sportswomen with public opportunities for hunting, fishing, trapping, and other wildlife-related activities.

Since January of 2008, the NCWRC has acquired nearly 34,000 acres of new Game Land properties. This brings the total acreage allocated to NCWRC to approximately 500,000 acres. Combined with 1.5 million acres managed under cooperative agreements with federal, state, corporate, and private landowners, the agency's Game Land Program now totals more than 2 million acres, with 89 individual Game Lands located in portions of 79 counties.

Below is a table showing additions to the Game Land Program over the last three years. We will highlight specific hunting and fishing opportunities available on some of these Game Lands in future issues of the *Upland Gazette*. 🦋

North Carolina Wildlife Resources Commission Game Land Additions 2008–2010

Tract Name	Acres	County	Game Land	Acquired
Woodville	383	Bertie	Roanoke River Wetlands	2008
Jessup Millpond	1,173	Bladen	Suggs Mill Pond	2008
Elam	72	Caldwell	Pisgah	2008
Whitehurst	430	Craven	Neuse River	2008
IP–Chowan River	8,682	Hertford	Chowan Swamp	2008
Coweeta Creek	48	Macon	Needmore	2008
Corbett	971	New Hanover	Cape Fear River Wetlands	2008
Kassab	55	Onslow	Stones Creek	2008
McCotter	440	Onslow	Rocky Run	2008
Quattlebaum	105	Polk	Green River	2008
Odom/McPherson	260	Scotland	Sandhills	2008
GMS	8,476	Tyrrell	Alligator River	2008
Myers Lot	0.5	Ashe	Three Top Mountain	2009
Whitehall Plantation	1,430	Bladen	Whitehall Plantation	2009
Lutz	650	Caldwell	Pisgah	2009
Bigelow	5	Caswell	R. Wayne Bailey-Caswell	2009
Turkey Quarter Island	1,465	Craven	Neuse River	2009
Little Rose Creek	500	Mitchell	Pisgah	2009
Odom Prison	1,063	Northampton	Roanoke River Wetlands	2009
Quaternary	1,443	Onslow	Croatan	2009
Diggs	1,600	Richmond	Pee Dee River	2009
Carpenter	688	Scotland	Sandhills	2009
Wilkes	115	Scotland	Sandhills	2009
Diaz	1	Ashe	Three Top Mountain	2010
Miller-Hufnagel	100	Ashe	Three Top Mountain	2010
Johnson	218	Ashe	Pond Mountain	2010
Peterson	1	Ashe	Three Top Mountain	2010
Pond Mountain	1,850	Ashe	Pond Mountain	2010
Maple Prison	615	Currituck	North River	2010
Morton	204	Onslow	White Oak River	2010
King Mountain	190	Randolph	Uwharrie	2010
City of Hamlet	19	Richmond	Sandhills	2010
Harmon	238	Richmond/Scotland	Sandhills	2010
Terry	245	Rutherford	South Mountains	2010
TOTAL ACREAGE	33,735.5			

Evergreen Shrubs Threaten Fall Color in Mountains

By John Wooding, NCWRC Small Game Biologist

I didn't know until last November that mountain laurel and rhododendron are killing our mountain forests. My enlightenment came while on a walk in the Linville Gorge area (I was looking at the acorn crop). From ridge top to creek basin, laurel and rhododendron dominated the forest, from ground level to 15 feet high or so. Laurel was mostly on the sunny side, and rhododendron on the shady side, but they were intermixed in places. Their branches intertwined, and the evergreen leaves formed a solid canopy. Mature oaks and other hardwoods stuck through the canopy, but hardwood seedlings and saplings were absent. The forest was old hardwoods, many with trunk decay, and laurel and rhododendron. That was it. There was no ground cover, and hardwood regeneration was being hampered by the evergreen shrubs. That was the first time I really noticed the impact on our forests. The trees were dying and not being replaced. Over time, we should start noticing a decrease in fall color, not to mention a decrease in wildlife and fish. The mountain ecosystem depends on tree leaves as the nutritional base and when the trees go, the whole system is in trouble. After seeing the situation near Linville, I've been on the lookout, and I see the same situation all over the mountains—it's not an isolated event.

Mountain laurel and rhododendron have always been a component of the southern Appalachian forests. As a kid, my favorite flower was mountain laurel – something about the white flower cup with red stripes. Just pretty. And everyone likes rhododendron blooms; they light up the mountains in summer. The shrubs also have value for wildlife, mainly by the thick cover they provide.

The plants are toxic to most herbivores, but ruffed grouse and deer feed on laurel during hard times and somehow process the toxins and reap the little nourishment the leaves provide. The leaves kill goats and cows. Bees that feed heavily on the flowers produce a honey that some call “mad honey” because of the toxins that can make you crazy. A house cat or yard dog that feeds on discarded grouse remains from a dressed bird that ate laurel leaves can be killed by the toxins.

Until 100 years ago, frequent fires kept the laurel and rhododendron at bay. The mountain ecosystem depended on fire. Fire brought life. Then came Smokey the Bear—the most misguided bear that ever lived—and we put the fires out and kept them out. Now, we're seeing the consequences.

Better observers than I have known for years that rhododendron is especially bad for forest regeneration. In Britain, an introduced rhododendron is taking over large wild areas, and there is a major effort to control the plant. In Turkey, a native rhododendron is killing beech forests by hampering tree reproduction.

This is just now becoming common knowledge among biologists in the southern Appalachians. I was on the slow side of learning it—better late than never. As you travel the mountains, and walk the trails, look for yourself. Over the next few years, there will be a greater push to bring fire back to the mountains, in part to control laurel and rhododendron. Again, better late than never. The end result will be a more healthy forest that will be better for wildlife and tourists alike. No one wants to see us lose our fall color—not even Smokey the Misguided Bear. 🐾

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to legislators, and a prescribed burning workshop for landowners was held at the Montgomery Community College fire training center.

What can you do? For starters, join and support the N.C. Prescribed Fire Council (www.ncprescribedfirecouncil.org). You need not be a natural resource professional nor have ever conducted a prescribed burn. Work to hold onto large tracts of meaningful land, if appropriate, and see that

they are burned. Educate your neighbors and friends about the benefits of prescribed burning. Tell politicians that you think maintaining the ability to conduct burns is important. Take your children or someone else's children into the woods and let them learn and experience for themselves the value of our wildlife habitat. The need for and beneficial effects of prescribed fire will become more evident with each trip. 🐾

Prescribed fire benefits many high priority and declining species such as these loggerhead shrikes photographed in Craven County on a regularly burned landscape.



BECKY JONES



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Executive Director	Gordon Myers
Wildlife Management Chief	David Cobb, Ph.D.
Communications Director	Penny Miller
Editor	Jill S. Braden
Assistant Editor	Cay Cross
Graphic Designer	Carla Osborne
Supervising Wildlife Biologist, Private Lands Program	Mark D. Jones

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- Wiregrass, *Aristida stricta*
- Roundheaded lespedeza, *Lespedeza spicata*
- Joe-Pye weed, *Eupatorium purpureum*
- Big bluestem, *Andropogon gerardii*
- Rattlesnake master, *Eryngium yuccifolium*

The understory species are an important consideration when establishing, restoring, or managing longleaf pine forests. Understory plants enhance aesthetics, biodiversity, and wildlife value. Whether you are a novice bird watcher or an avid hunter, these species can bring new levels of enjoyment to your forest while promoting the expansion of a declining habitat. Technical and financial assistance for increasing wildlife value may be available to you through the North Carolina Natural Resources Conservation Service (NRCS), North Carolina Wildlife Resources Commission (NCWRC), and the U.S. Fish and Wildlife Service (USFWS). See your local NRCS district conservationist, NCWRC biologist, NCDNR county forest ranger, or USFWS biologist for information on these programs.

Superior longleaf pine understory plants are available for purchase as seeds or as seedlings. Claridge Nursery is more than happy to grow understory plants for your specific projects, or you can purchase from existing stock. For more information, contact James West, Nursery and Tree Improvement Program Head or Maxie Maynor, Claridge Nursery Manager with NCDNR at (919) 731-7988. ♻️

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