



the Upland GAZETTE

North Carolina Small Game Notes

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A Quiet Comeback—

The Return of the Fox Squirrel to Northwestern North Carolina

By Chris Kreh,
District 7 Wildlife Biologist, NCWRC

Generally, the restoration of a game animal is accompanied by a great deal of fanfare and attention. Consider the publicity surrounding turkey restoration efforts or the release of elk in the Great Smoky Mountains National Park.

But squirrels and many other small game species rarely garner this type of attention. And most North Carolina sportsmen only think of fox squirrels as the squirrels of our southeastern longleaf pine forests. However, hunters in several northwestern counties are aware that fox squirrels are making an astounding, though quiet, comeback all on their own.

Fox squirrels (*Sciurus niger*) range throughout much of eastern North America. Several subspecies can be found, and coloration tends to vary considerably among these subspecies and locales. Black and brown hues are most common, but some areas have blond or even bright red individuals.

Those fox squirrels making a comeback in our northwestern counties are likely a subspecies native to the Midwestern United States and are also found in other parts of the Appalachian Mountains. This subspecies is different from the subspecies found in the Coastal Plain of eastern North Carolina.

Mountain fox squirrels often have a reddish hue and generally have a blond colored nose, although coloration can vary from



JEFFREY S. PIPPEN

black to blond. Like all fox squirrels they are large, roughly 1½–2 pounds, which is noticeably bigger than a gray squirrel.

How fox squirrels differ from gray squirrels

Fox squirrels are not simply a super-sized version of gray squirrels. It is true that both gray and fox squirrels climb trees, feed on nuts and acorns, and den in leaf nests or tree cavities, but fox squirrels have some distinct differences. In comparison to gray squirrels, their home range tends to be larger and their reproductive output tends to be lower. Their behavior sets them apart as well. They often run from tree to tree on the ground, rather than jump from limb to limb. As such, their preference is not for large tracts of unbroken forest. They do much better in open forests, brushy fencerows, pastures with scattered trees, and in

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Fox squirrels have largely made this recovery without any special assistance ...

BONITA JONES AND DORIS BREWER



Hunters who report fox squirrel observations help biologists document range expansion and species abundance.

other areas where gray squirrels would not likely be found. That is why, in many areas of the Midwest, fox squirrels are more common than gray squirrels.

Fifteen to 20 years ago you would have been hard pressed to find a fox squirrel anywhere in northwestern North Carolina, but today they are common throughout Ashe and Alleghany counties and are showing up in many of the surrounding counties as well (Figure 1).

It is not entirely clear whether fox squirrels were present here, historically. A few older folks tell of areas that had fox squirrels when they were kids, but how widespread or common they were is debatable. If they were here, it is not clear why they were extirpated. But it's worth noting that the habitat, the wildlife species present, and day-to-day lives of people in the area were all different in the early- to mid-1900s. Our forests had been extensively logged, big-game populations were at all-time lows, small farms were a way of life, and small game hunting for grouse, quail, and squirrels was very popular. We'll likely never fully understand how all these forces interacted. The only thing we know for sure is that fox squirrels seem to be making an astounding comeback.

Expanding ranges

Presumably, these squirrels have moved in from Virginia where they are quite abundant in neighboring counties like Carroll and Grayson. It is not clear why they are so abundant in some areas in Virginia bordering North Carolina or why they are just beginning to become common in our state.

Also, some fox squirrel populations may have expanded from isolated pockets within North Carolina that have been in place for years. In the mid-1990s, we started getting a few reports of sightings close to the North Carolina-Virginia state line near Grassy Creek and Mouth of Wilson. In following years, we received more reports around Sparta and Laurel Springs, indicating that the population was expanding. We had a few reports from Surry County during those years as well. Initially, seeing a fox squirrel was worthy of mentioning to a friend but, now, seeing one is nearly an everyday occurrence in much of Ashe or Alleghany counties.

The North Carolina Wildlife Resources Commission (NCWRC) opened the hunting season for fox squirrels in Ashe and Alleghany counties in 2006. The season's

framework is the same as for fox squirrels in eastern North Carolina, opening in early October, closing on Dec. 31, and limiting hunters to one fox squirrel each day and no more than 10 fox squirrels each season. The shorter season and more restrictive bag limit (in comparison to that for gray squirrels) is the result of lower reproductive output and generally more restricted range, habitat, and abundance.

As expected, fox squirrel harvest during this season has not been significant; few hunters pursue squirrels more than a few times each season. It is difficult to put an exact figure on hunting pressure and harvest because it is so light. In fact, fox squirrels seem to be more common than squirrel hunters.

Most of what the NCWRC knows about fox squirrels in this area is from observations by sportsmen and others that care about wildlife. The map (Figure 1) is a good example as it summarizes data from a survey of 140 deer hunters in Ashe, Alleghany, Watauga, Wilkes and Surry counties. We have been able to document the fox squirrel's range expansion, map out areas where they are found, get basic

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Figure 1. Recent locations of fox squirrels in northwestern North Carolina. This information is from a survey of 140 deer hunters hunting in the area during the fall of 2008. Each star represents an area where one or more fox squirrels was observed.



An Upland Gazette Feature

Thanks to positive feedback, *Ask the Wildlife Biologist* returns with our popular staff Q&A. As in past issues, the NCWRC staff answers questions about anything related to wildlife habitats and the species that use them. Please send questions to:

Attention: Ask the Wildlife Biologist
The Upland Gazette
1722 Mail Service Center
Raleigh, NC 27699-1722

Be sure to include your name, city, and state, which will be printed along with our response. Thanks for reading the *Upland Gazette*, and don't forget to send us those questions

*Mark D. Jones,
NCWRC Supervising Wildlife Biologist*

What assistance is available to North Carolina landowners who want to implement wildlife habitat management activities on their lands?

Jonathan Smith, Raleigh, N.C.

This is a great question, Mr. Smith! Here is a short summary of options available to the landowner. There are two main opportunities in terms of services provided by North Carolina's natural resource agencies: technical advice and financial assistance.

NCWRC biologists provide technical assistance and advice free of charge to any landowner in the state. Call our Raleigh office at (919) 707-0050 to get the phone number of the nearest biologist. Currently, NCWRC offers no direct financial assistance to landowners; however, our biologists can provide free expert advice and direct you to available cost-share programs, while explaining how to make them work best for the goals and objectives you have for your property. Often these biologists can direct you to other state agencies (ex., N.C. Department of Forest Resources) and federal agencies (ex., U.S. Fish and Wildlife Service) that may have programs suitable for your management goals.

The best sources of funds for landowners are the federal Farm Bill programs administered by either the Natural Resources Conservation Service (NRCS) or the Farm Services Agency (FSA). These agencies are located within service centers managed by

the U.S. Department of Agriculture (USDA). USDA Service Centers are single locations where customers can access services provided by FSA, NRCS, Rural Development, and other agencies. USDA has a Web site where you can find contact information for your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app>). NRCS program information specific to North Carolina can be found at the following Web site: <http://www.nc.nrcs.usda.gov/programs/>.

Finally, be sure to read Brad Howard's article on the Wildlife Conservation Lands Program in this issue. This new program provides tax relief for landowners managing private lands if those lands meet certain program requirements.

*Mark D. Jones,
NCWRC Supervising Wildlife Biologist*

How does a wet or dry spring affect the success rates of nesting quail?

Jim Smith, Halifax, N.C.

Mr. Smith,

As a general rule, wild animals are best adapted to an average year and any conditions well out of the ordinary can cause problems. Quail nest from May-September, so the impact of spring weather on nesting success is indirect. Extremely unusual spring weather—too wet, too hot, too dry, or too cold—will affect quail nesting in three primary ways:

- One is related to the survival of adult birds. If spring weather is so harsh that it increases adult quail mortality, fewer birds will enter the breeding season and fewer nests will hatch. Such conditions can occur during a really wet spring when high water concentrates quail on patches of high ground. Anytime quail concentrate, predators benefit.
- Second is through the impact of the weather on insect populations. Quail hens eat insects for egg production and quail chicks eat insects for proper body growth. Insects are essential foods for nesting success and brood survival. Spring weather that is either too wet or too dry, can reduce insect production and hurt quail reproduction.
- Third is through the impact of the weather on summer plant growth. Quail hide under and in the midst of plants, and a spring drought that leads to poor summer plant growth can make quail more vulnerable to predators. Spring weather can also influence fall seed production. Quail live off seeds during the fall and winter, and low food supplies, as a result of unusual spring weather, can reduce survival of chicks and adults.

I apologize for the lengthy answer but nature can get complicated with one thing connected to another. Someone told me that it's easy to be a biologist because all we ever say is, "It depends."

*John Wooding,
NCWRC Small Game Biologist* ♣

Possam on the Half Shell

A Unique Visitor May be Coming to North Carolina



JAY BUTFLOSKI/SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

By Colleen Olfenbittel, Black Bear and Furbearer Biologist, NCWRC

“P ossam on the half shell” and “Little Armored One” are just a few nicknames that North Carolinians will be hearing more often as nine-banded armadillos (*Dasypus novemcinctus*) become more common in the state. Wait a second! Armadillos in North Carolina?

While most North Carolinians have never seen an armadillo, North Carolina Wildlife Resources Commission biologists have documented their occurrence in the state over the last few years (see map). These armadillos likely dispersed naturally from Tennessee, Georgia, and South Carolina, although one reported road-kill found in Bladen County purportedly hitched a ride on a palm tree truck from Florida. While a few armadillos may be helped in their travels by unsuspecting motorists, we can expect that most armadillos that show up in the Tarheel State will do so through natural dispersal.

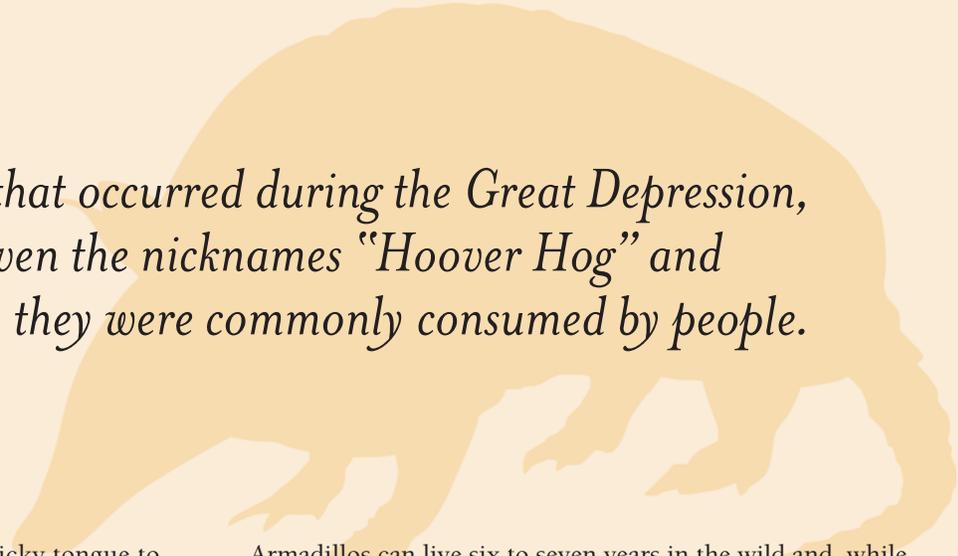
Native to Central and South America, armadillos were first recorded in Texas in 1849 but have since expanded their range north and east, crossing the Mississippi River sometime in the early 1940s, appearing in western Tennessee in 1980, and reaching North

Carolina in the late 2000s. Waterways, such as streams and rivers, are not always barriers to armadillo movements. These animals can cross water by inflating their stomach and intestine with air for buoyancy and can hold their breath for several minutes.

Whether armadillos will continue spreading beyond their current range (see map) will be determined by precipitation levels and severity of winter weather. Invertebrates, the armadillo’s main food source, depend on moisture in the soil, while freezing temperatures make it difficult for the armadillos to dig into the ground. Researchers in Missouri found eight dead armadillos after a week of snow. They also found other armadillos that survived likely due to better body fat reserves that helped them through a period when they could not dig into the ground for food.

While the armadillo’s vision is poor, it does have a good sense of smell and can detect invertebrates such as beetles, wasps, larvae, and ants underground. Nicknamed “armored pigs” due to their foraging behavior, armadillos move slowly with their nose to the ground, turning over leaf debris in their search for food. Once it senses prey, the armadillo will dig by pushing

During food shortages that occurred during the Great Depression, armadillos were given the nicknames “Hoover Hog” and “Texas Turkey” because they were commonly consumed by people.



its nose into the loosened soil and using its sticky tongue to capture food.

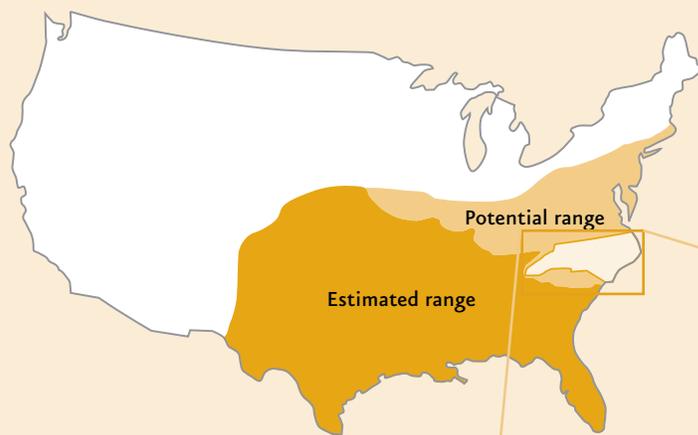
While studies have shown that invertebrates make up to 99 percent of their diet, armadillos will also eat fruits, small snakes, toads, and various eggs found on the ground including those of snakes, lizards, turtles, and, in one study, quail eggs. While the armadillo’s habit of digging for food can cause property damage, one benefit provided by armadillos is their voracious appetite for fire ants and the larvae contained within their mounds.

Armadillos can live six to seven years in the wild and, while they can be killed by various predators such as feral hogs, coyotes, black bears, bobcats, fox, and raccoons, they can protect themselves by fleeing rapidly through thick brush or through the protection afforded to them by their hard carapace. The carapace, or “shell,” covers everything but their ears and underbelly.

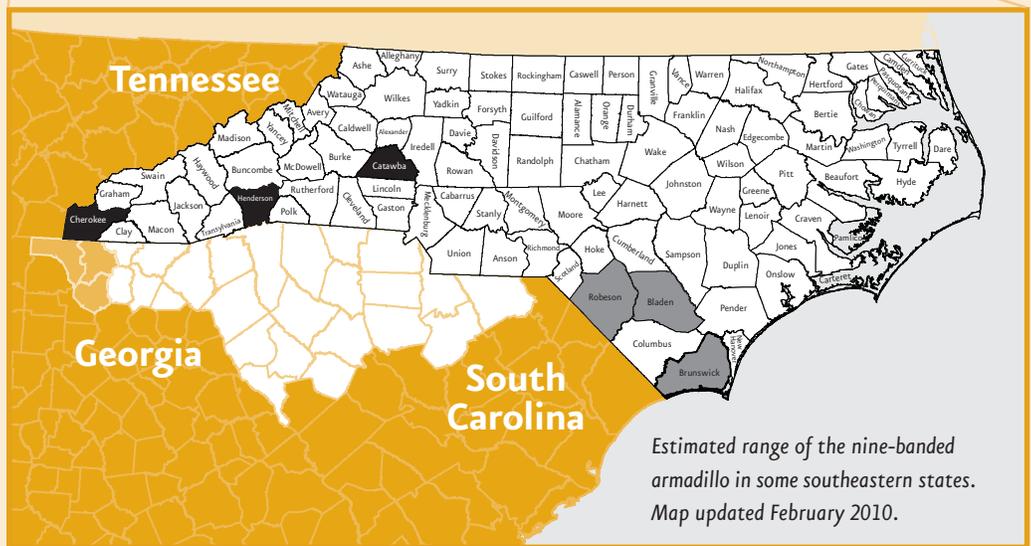
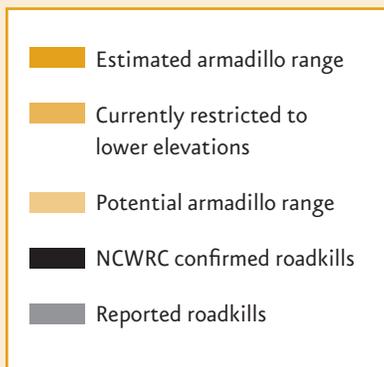
Armadillos also have been prey for another type of predator, people. During food shortages that occurred during the Great Depression, armadillos were given the nicknames “Hoover Hog” and “Texas Turkey” because they were commonly consumed by people. Even today, people consume armadillo meat, likening it to pork in taste and texture.

Armadillos are the only mammals that have a shell. Another distinctive aspect of the armadillo is that the female produces one fertilized egg that then divides into four embryos, producing four identical young.

As this strange and unique animal becomes more common, North Carolinians will be reminded of the prehistoric past as it adds another dimension to our ecological landscape. ♣



Estimated distribution of the nine-banded armadillos in the United States.



Estimated range of the nine-banded armadillo in some southeastern states. Map updated February 2010.

Holly Shelter Game Land

Managing Wildlife on Public Lands in Southeastern North Carolina

By C. Victor French, Southern Coastal Management Biologist, NCWRC

The North Carolina Wildlife Resources Commission (NCWRC) public land managers deal with a variety of user groups that vary from big game and small game hunters to hikers and birdwatchers. Our public land managers are faced with the challenge of managing both for the benefit of the ecosystem and the public.

As a game land manager in the southern coastal region for 32 years, I have dealt with the concerns of endangered species enthusiasts, naturalists, big game hunters, and small game hunters. We work to manage the total ecosystem first while considering public desires whenever possible. Our most beneficial and economical tool in Coastal environments is prescribed fire. Coastal ecosystems are fire-dependent, and without fire, many coastal plant and animal species disappear from the landscape.

Holly Shelter Game Land is located in the southern coastal plain. It contains habitat once common throughout this region. Longleaf pines, with wiregrass sand ridges dispersed with Carolina bays (depressions that are often wet and contain dense understory layers of shrubs and vines) and larger dense pocosins (“swamps on a hill”), are found across this 64,743-acre game land. Approximately 100 acres of maintained wildlife openings exist on the game land.

Management on Holly Shelter involves prescribe burning approximately 2,000 acres annually during summer and winter. Incorporating pocosin transition edges and Carolina bay pockets into our prescribed burns provides an abundance of greenbrier, gallberry, red bay, and other native vegetation and seed for many wildlife species. Historically, fire occurred in these ecosystems during the spring, summer, and early fall periods. We attempt to mimic the natural process by including “growing season” (spring or summer) burns.

The 2,000 acres of annual burns represent one-third of our burning plan, thus

we prescribe burn on a three-year rotation. By alternating winter and summer burns, we always provide adequate cover and habitat for various species.

These management strategies have been in place for many decades making Holly Shelter a desirable combination of habitats for endangered species and game animals, like white-tailed deer, wild turkey, black bear, and bobwhite quail. Reduced fuel loads and beneficial impact from a prescribed burning program prevent any catastrophic ecosystem damage from wildfire.

The intensively managed timberlands in our new 14,000-acre addition have been included in our burning program. Longleaf pine is being planted in previously logged areas, and loblolly pine stands are being thinned to open the canopy and produce a beneficial herbaceous understory layer.

Although representing a small percentage of the total area (0.15 %), openings on

Holly Shelter are being managed to optimize additional benefits for a variety of species. Thirty-foot wide field borders on the larger fields offer early-succession habitat and cover for bobwhite quail, rabbits, turkey, deer and non-hunted species. Perennial and annual plantings use no-till planting methods to grow milo, small grains, crimson clover, and ladino clover. These plantings provide brood habitat for turkey and quail and winter foods for deer and turkey.

Wildlife species need nesting or rearing cover, brood habitat, escape cover, and winter forage. The management techniques of prescribed burning, timber management, field borders, perennial plantings, and no-till planting methods combine to provide the components of good wildlife management. This ensures that NCWRC public land managers fully address the needs of the entire ecosystem. ♣



SCOTT MCLEAN

The N.C. Wildlife Resources Commission manages 87 game lands that total more than 2 million acres throughout the state.

State and Federal Agencies Work to Improve Wildlife Habitat and Plant Diversity on Christmas Tree Farms

By Brian Davis, North Carolina Cooperative Extension Office and
Patrick Farrell, Technical Assistance Biologist, NCWRC



BRYAN DAVIS/NC COOPERATIVE EXTENSION OFFICE

In properly managed Christmas tree farms, the potential for wildlife habitat and plant diversity is promising with mixed groundcover.

Christmas tree farms have historically been criticized for management practices that reduce and degrade wildlife habitat. In areas where Christmas trees grow, the major habitat change has been the conversion of lands to tree monocultures and tall fescue from native grasses and woodlands. When added to nearby development pressures, changing agricultural practices, and invasive species, this conversion combines to increase the struggle for species such as bobwhite quail, eastern bluebirds, common yellowthroat, ruffed grouse, field sparrows, eastern towhee, and indigo bunting.

However, thanks to new efforts from natural resource agencies and partnerships with growers, Christmas tree farms now represent a unique opportunity to improve wildlife habitat in the mountains of northwestern North Carolina. Natural Resources Conservation Service (NRCS), Soil and Water Conservation Districts (SWCD), North Carolina Cooperative Extension Offices (NCCEO), and North Carolina

Wildlife Resources Commission (NCWRC) personnel have been working to improve wildlife habitat and plant diversity on Christmas tree farms. Efforts are concentrated in Alleghany, Ashe, and Watauga counties where a majority of tree farms are located.

Many Christmas tree farmers now work to promote a mixed groundcover of Dutch white clover, dandelion, red sorrel, Queen Anne's lace, yarrow, wild strawberry, nimblewill grass, false dandelion, ox-eye daisy, chickweed, purple deadnettle and various other annual and perennial weeds and grasses. They do this by avoiding the once standard use of high herbicide rates and killing of vegetation down to mineral soil.

Years of research and on-farm demonstrations have helped create a system of weed suppression or "chemical mowing" that is more wildlife-beneficial. This system is properly timed by the application of low rates (4-8 oz/acre) of glyphosate to control annual weeds such as pigweed, ragweed, foxtail, and lambs quarter, while

having little or no effect on many beneficial perennial weeds. These lower growing non-competitive weeds form a living weed barrier that prevents germination of annual weeds. Some annual weeds remain in and around the fields and provide valuable food sources, nesting habitats, and cover for many species of birds.

Fescue, a plant reviled by most wildlife enthusiasts, is also detrimental to the growth of Christmas trees. Many growers are working on wildlife-friendly techniques to eliminate fescue while allowing clover to naturally establish in most fields, once competitive fescue grasses are removed. This system provides a gradual conversion to fields with a dominant groundcover mainly consisting of Dutch white clover. It also exemplifies the Integrated Pest Management (IPM) approach to producing Christmas trees in a manner which is environmentally and economically beneficial.

The clover groundcover greatly reduces weed competition to trees and provides a natural source of nitrogen through the process of nitrogen fixation. This can reduce fertilizer input in fields that have sufficient levels of other nutrients and only require nitrogen. Additionally, many Christmas tree farmers are making a voluntary effort by maintaining groundcover within the trees, seeding cover crops and food plots for wildlife, and managing field borders to offer wildlife benefit.

Two Federal Farm Bill Programs, the Wildlife Habitat Incentives Program and the Environmental Quality Incentives Program, can be used to cost-share practices to improve habitats in tree farms. Contact your local U.S. Department of Agriculture office for information on how to learn more about these programs or check out "Ask the Wildlife Biologist" in this issue to learn about additional options for advice and guidance. ♣

Game Lands Management

The Transition from Loblolly Pine to Longleaf Pine

*Brent Wilson, Northern Coastal Forester, NCWRC and
Dale Davis, Northern Coastal Management Biologist, NCWRC*

The North Carolina Wildlife Resources Commission purchased large tracts of land in Bertie, Gates, and Hertford counties from International Paper Company in 2007 and 2008. Almost 25,000 acres of property were acquired for the Game Lands Program after all sales had closed, including many different types of habitat ranging from upland sand ridges to bottomland flooded hardwoods.

Much of the upland had been converted to loblolly pine by International Paper Company and other previous landowners. These plantations were in many different age classes when acquired, while much of the upland areas contained well-drained

sandy soils, ideal for longleaf pine establishment. Our long-term goal is to restore these areas to longleaf pine-dominated timber stands through harvesting, reforestation, and a prescribed burning program.

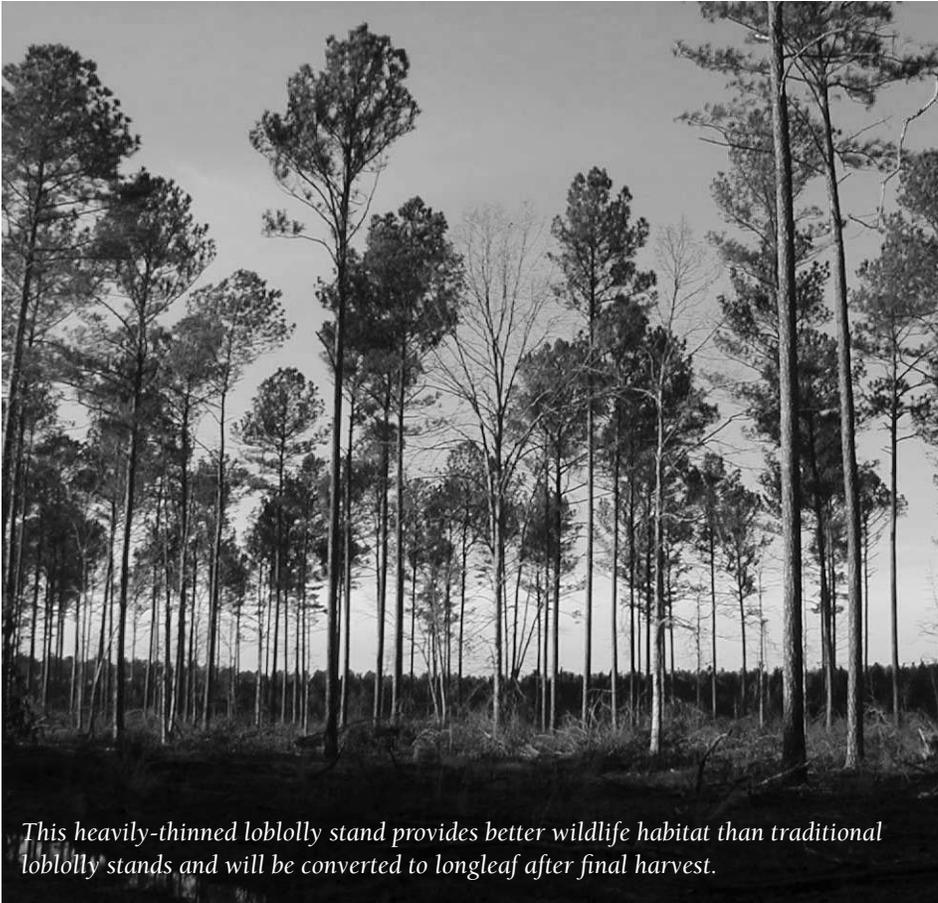
Though typically thought of as a sand-hill species, longleaf pine once covered about two-thirds of the forests in the eastern part of North Carolina. A longleaf pine stand maintained by fire is among the most biologically diverse ecotypes in North America. Well-managed longleaf pine forests provide quality habitat for a variety of desirable plant and animal species. Longleaf typically supports high-legume populations, which benefit wild

turkeys, deer, squirrels, bobwhite quail and many varieties of songbirds.

Our short-term objective is to manage the current loblolly stands to their highest potential for sustaining early-successional habitat-related species. Our ultimate goal includes replanting with longleaf at the end of the loblolly pine rotation in all areas where soil conditions are favorable to longleaf. This entails thinning as early as the stands become merchantable (16-18 years on these sites) and removing as many as three-quarters of the stems from stands with 600+ trees per acre. Second thinnings are being employed in older stands to carry 75-100 trees per acre to final harvest. Some mature loblolly stands have been clearcut and replanted with longleaf. Where longleaf pine presently exists, seed tree treatments have been applied to promote natural regeneration of longleaf.

Our foremost management goal is to provide wildlife habitat with timber production as a secondary benefit. A key component of management is using practices to open the tree canopy to allow sunlight to reach the forest floor, followed by a prescribed fire regimen. This will allow grasses, legumes, and other herbaceous plants to flourish. Thus, we manage timber stands with a lower stocking than is typically done for wood production, in order to provide better habitat for wildlife.

Over the past three years, NCWRC management crews have prescribe-burned 990 acres on these tracts. In addition, 300 acres have been reforested in longleaf pine, and 930 acres of loblolly stands have been thinned since the acquisition of the properties. Under an active management regimen, these areas in the Chowan and Roanoke River watersheds will progress toward longleaf pine ecosystems that will thrive for years to come and provide important and quality wildlife habitats. ♣



This heavily-thinned loblolly stand provides better wildlife habitat than traditional loblolly stands and will be converted to longleaf after final harvest.

BRENT WILSON/NCWRC

Down by the Ditch Bank

*Benjy Strope, Corporate CURE
Technical Assistance Biologist, NCWRC*



BENJY STROPE/NCWRC

Field borders make ideal habitat for wildlife between a ditch bank and a field.

Ditches and their associated banks are commonplace in eastern North Carolina agricultural fields and roadsides. Agricultural crop fields in North Carolina use ditches to drain away excessive amounts of water that can cause pooling or even flooding of the entire field. If water control structures are appropriately placed, ditches can be used to hold water for dry spells in the summer (reducing the need for irrigation), or they can hold water to allow nutrients to be used before the water is allowed to drain. Agricultural ditches and ditch banks can meet the needs of water control and provide excellent plant and animal habitat, if properly managed.

Ditches in a sea of corn or soybeans can act as wildlife corridors if the vegetation is allowed to grow. Ditches and their banks are often home to fish, insects, turtles, and mammals (mice, beavers, otters, etc.), and many bird species rely on them for food, cover, nesting, and brooding areas.

Ditches in and around crop fields are a great place to install field borders. In addition to slowing runoff, reducing nutrients in adjacent waters, and blocking herbicide drift, field borders can provide a great place for bobwhite quail to nest and brood young. Contact your local Farm Service Agency office to find out about CP33 (Buffers for Bobwhites) or visit www.ncwildlife.org/CURE for more information.

Culverts used to cross ditches should be appropriately sized and should have fabric and riprap on the inlet and outlet of the culvert to reduce erosion. More information on proper sizing of culverts can be found by searching “culvert sizing” on the Internet. Pipes that are too small can lead to water backing up during rain events or soil “scouring out” around them, letting the water pass through on the outside of the pipe.

Vegetation management of most agricultural crop field ditch banks is done by using a side mower. If ditches are mowed,

this should be done in the early spring or late winter. A late winter/early spring mowing will provide much more year-round habitat and give birds an opportunity to nest in the vegetation. Mowing should not scalp the ditch banks or the soil as this could lead to erosion and increased maintenance costs. A six-to-eight inch mowing height will still provide some cover for birds and should be sufficient to keep any trees and shrubs under control. Also, mowing can leave a lot of decaying vegetation in the water, potentially clogging culverts and making mini-dams in the watercourse.

Spot-spraying herbicides can reduce the need to mow ditch banks and provides much better cover on a year-round basis. Check the herbicide label to make sure it is legal to use on ditch banks and/or around water. Broadleaf herbicides can allow grasses to grow and provide tree control. Again, check the label, as certain herbicides will not control certain species. Spot-spraying herbicides can control or kill the undesired vegetation and leave plenty of cover on the ditch banks. The best time to spray for tree control is in the early spring just after leaf-out and before the leaves get their tough summer waxy-coating on them. Spraying in the fall, before the leaves turn, can also be productive for tree control but usually requires a higher rate of herbicide.

Fire is another tool that can be used to maintain small ditch banks or banks that are not heavily sloped. The use of fire requires some fire behavior knowledge and experience. Fire should only be used in the early growing season so that the vegetation can promptly resprout to reduce erosion. Fires later in the spring or summer may destroy nests and are more difficult to implement without damaging nearby crops. Fire can act as a mower and herbicide—killing any trees (if enough fuel is available)—and removing the layers of duff that might otherwise clog the ditches.

Wick bars or weed wipers are another option to control unwanted vegetation in ditches. Wick bars range in size from small hand-held applicators to tractor-mounted booms. These devices normally use full strength or lightly diluted herbicides to contact the plants, leaving a coating of herbicide on the plant tissue.

Management of ditches and their vegetation is best done in a rotation to maximize the habitat provided for wildlife. Most farms can easily be divided into management sections. Mow one year, spot spray or burn the following year, and leave idle for a year. Silt removal should be done on a similar but longer rotation to preserve insect and fish populations. Silt cleaned out of ditches should be incorporated back into the field. Silt piled right alongside the ditch will act as a dam potentially impacting crops and can create a hoe drain where the water finds its way out.

Ditches provide a host of benefits for agricultural producers and wildlife. Proper management of ditches is necessary for them to work as designed. Poorly maintained ditches may cause flooding of crops or destroy bird nests or other wildlife that use the ditches. The guidelines above will help you better manage land where water needs to be drained, while also providing beneficial habitats for wildlife. ♣

Predation on Bobwhite Quail

The Habitat Influence

By John Wooding,
Small Game Biologist, NCWRC

North Carolina quail research tells us that Northern bobwhites divide the year into two six-month periods based on behavior: the months of April-September are focused on nesting and raising young; and October-March are focused on surviving to the next nesting season. Such is a quail's life.

Bobwhites have tremendous reproductive potential (1-3 nests/year, average of 12 eggs/nest), but the potential is not being realized due to heavy predation. Predation occurs during all months. During the nesting season, predators eat eggs, chicks, and adults. In winter season, when quail live in coveys, predators catch the quail individually. In one North Carolina study, only six percent of quail survived the year.

Habitat characteristics greatly influence the risk of predation. Preferred habitat occurs in patches or strips. The patch may be a quarter-acre weedy corner in a 20-acre bean field or a weedy ditch bank along a drainage canal. When you look at the field, you know exactly where to look for quail, and so do predators. These small habitat patches concentrate birds, nests, and broods making them easier for predators to find.

Preferred habitats are widely scattered requiring greater movement and increasing predation risk. Movements of over one mile have occurred between nesting habitat and wintering habitat. Bobwhite home range sizes in North Carolina frequently exceed 100 acres, and home ranges of 300-400 acres have been documented. In areas with widely scattered food sources and cover, quail have to range widely, and by doing so, they are exposed to more danger.

Preferred habitats come and go with the seasons and changing land management activities. Changes can be gradual when



Extensive areas of quail habitat provide much better protection from predators than small isolated areas.

a clearcut matures into a forest, or rapid as occurs with crop harvests, mowing, and prescribed fire. A soybean field that provides extensive cover one week will provide none after the harvest. A weedy ditch bank mowed in May becomes instantly useless to a bobwhite hen looking to nest. A longleaf stand burned in January provides insufficient hiding cover for quail until spring regrowth. The birds live in a world with frequent change that requires frequent movement and increased risk of predation.

All population monitoring data indicate that quail numbers have declined in North Carolina and the entire southeastern United States over the past 60 years. Survival rates must increase to boost quail populations.

There are two obvious approaches. One is to increase year-round habitat quality and quantity and provide the birds with the food and cover they need to maximize egg production and elude predators. This is the NCWRC's current quail management strategy.

The second strategy is to control predation. Predator control can temporarily increase quail populations at the local level in suitable quail habitat. For maximum effectiveness, predator control must include the entire range of predatory species such as fire ants, raccoons, opossums, rat snakes and Cooper's hawks. The gains will depend on the effort put into predator control and the total area controlled. The benefits will only apply to the control area

MARK D. JONES/NCWRC

The Diggs Tract

A New Game Land Opportunity in the Piedmont



RUPERT MEDFORD

By Eli Beverly, Crew Leader,
Troy Wildlife Depot, NCWRC

and will not change the quail's future at the regional or statewide level.

Year-round control of all predators, conducted year after year in quality habitat will likely produce the most benefits. If predator control is only conducted sporadically, predators from surrounding habitats will move in to fill the void left by control measures. Costs will be prohibitive for most landowners. And given that hawks are fully protected, laws would need to be changed to make hawk control legal.

Predator control is not viewed as a practical option for increasing quail populations at the regional level. This is why NCWRC focuses on habitat establishment and improvement as the most practical strategy to restore quail numbers.

If you are a landowner with an interest in quail management, please contact NCWRC, and we can advise you on beneficial habitat management practices. Please consider these strategies:

- Provide weedy ditch banks for nesting quail. Don't mow in spring or summer; it's detrimental to nesting and brood-rearing quail.
- Provide hardwood drainage areas, which are essential to wintering habitat.
- Use thinning techniques and prescribed fire to modify heavily-stocked loblolly pine plantation. These practices eliminate trees that shade out groundcover.
- Protect the red bay, a small tree that provides berries for quail to gorge upon.

Quail need our help. The best way to help is to provide the right quantity and quality of habitat. Our biologists stand by ready to assist you in managing your lands to develop this critical habitat. ♣

The Diggs Tract, part of the Pee Dee River Game Land (PDRGL), lies in southwestern Richmond County. It has been in the Game Lands program, through Carolina Power and Light (now Progress Energy), since 1992. In 2009, final grant monies were secured and the tract was purchased by the State of North Carolina.

The property consists of approximately 1,650 acres in a mosaic of habitat types. About 700 acres are in intensive pine plantations, predominantly loblolly, and less than 15 years old. More than 500 acres were left as streamside-management zones (SMZs), and 100 acres are in permanently or semi-permanently flooded wetland in the floodplain of the Pee Dee River. The remaining acreage is in mixed timber types of varying ages, with one wildlife opening of about 30 acres, which is managed primarily for dove hunting.

A number of animal and plant species of significance occur on the property. These include barking treefrog, timber rattlesnake, southeastern myotis bat, Huger's carrion-flower, Piedmont aster, Cumberland spurge, and cypress knee sedge. The adjacent Pee Dee River waters support robust redhorse and Neotropical migratory songbirds.

Currently, management activities are rather limited due to the "newness" of the acquisition. The Diggs Tract, along with the rest of the PDRGL, is managed by the North Carolina Wildlife Resources Commission's Troy Wildlife Crew. The Troy crew began a limited burning program in the pine plantations in 2009, but plans are to incrementally increase the acreage targets over time as personnel, equipment availability, and weather allow. The Diggs Tract will offer some new challenges for Wildlife Resources Commission burn crews. Active management of the wildlife opening in the northeastern portion of the tract is a priority, particularly considering its high level of public use during the first few days of dove season.

In addition to habitat management, there are infrastructure needs on the property. A half-dozen or so new gates were installed on side roads in anticipation of funding for construction of a Commission-maintained boating access area and for improvements to the access road leading to it. Several small trash dumps have been cleaned up and hunter parking areas have been improved and delineated. Maintenance of the existing metal Progress Energy gates has also begun.

The management plan for Diggs is expected to call for occasional fire in the hardwood SMZs to reduce the fuel load and enhance browse opportunities for upland species, such as deer and rabbits, while maintaining vegetation for squirrels and turkeys. When pine plantations need thinning, regular fires should improve overall productivity of the sites for wildlife. We will have annual plantings, as well as native vegetation, including native warm-season grasses, in the wildlife opening. Though the challenges are many, so are the opportunities. ♣

Small-Scale Disturbance Can Yield Success for Landowners on Small Properties

By Mark Johns, Stevens Nature Center, Cary, N.C.

Landowners with small pieces of property can find interesting and inexpensive small-scale management options that are valuable for forest and early-successional wildlife. Some are subtle, others are easily seen. For smaller size property, timber management and prescribed fire may not be feasible. But, there are many other practices that can benefit a variety of birds, small mammals and more.

Single tree selection can create canopy gaps. By removing one large tree, you create horizontal and vertical structural diversity that exposes the ground to sun, enabling early-successional wildlife to forage and nest. I have seen early-successional songbirds, grouse, woodcock, turkey and quail use these small shrubby gaps that may measure only a quarter- or half-acre.

Another option for creating a gap is selecting a less valuable timber species for snag (dead tree) creation to benefit a variety of wildlife, including cavity-using birds like woodpeckers, chickadees, nuthatches, and even bluebirds. Larger snags are most useful for several animal species over time and tend to stay up a bit longer.

Don't neglect the importance of logs (downed woody debris) on your property. Wildlife uses logs for feeding, cover, or display platforms. Don't remove all the woody debris on your property as it will break down over time on its own and serve as vital habitat for many reptiles, amphibians, small mammals, and birds.

Even when large prescribed burns can't be conducted, a small one- to two-acre burn can provide important habitat structural diversity.

Landowners can also use small-scale herbicide treatments or mechanical thinning to create small zones of habitat disturbance in a forest landscape, similar to patches created by a wind event.

Most wildlife species, especially birds, need small-scale disturbance of some type to create optimal foraging, cover, or nesting opportunities. The more "different" you can make your landscape via several small disturbances over time, the better. What you want to do is create layers throughout your property at all levels. This will help you provide quality habitat when you may not be able to provide quantity habitat. ♣

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measures of abundance, and develop a unique hunting opportunity because hunters care about wildlife and report anything unusual. Fox squirrels have largely made this recovery without any special assistance and, as a consequence, no one can take credit for the comeback. The role of the Commission has chiefly been to monitor the population and maintain appropriate limits on hunting.

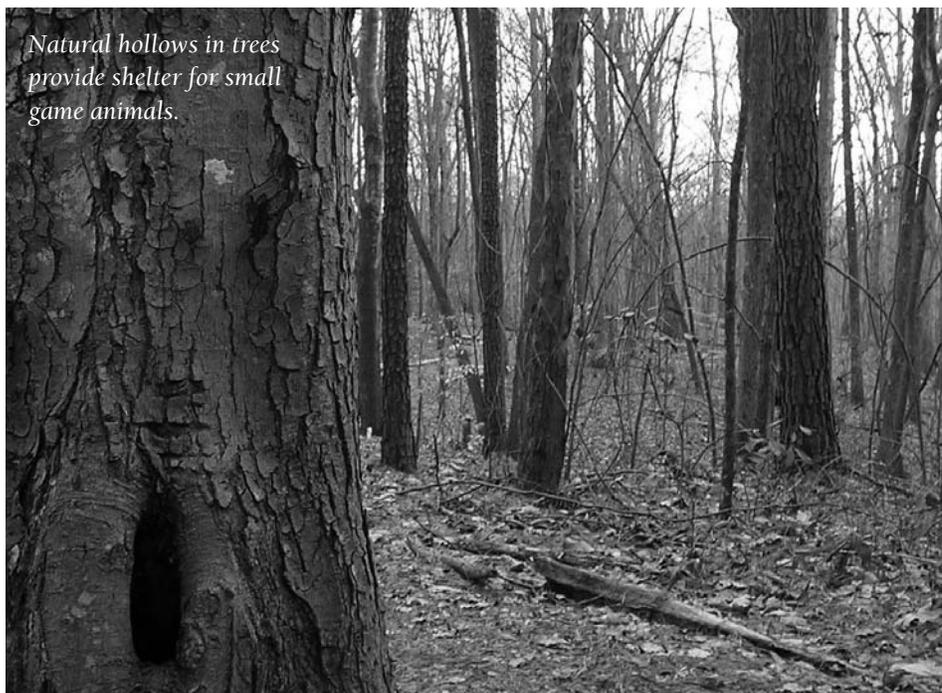
How hunters can help

But that doesn't mean there is nothing sportsmen can do to help fox squirrels. Reporting an observation is still extremely helpful and can document what, hopefully, will be a continuation of their range expansion and increasing abundance. Reports in the counties surrounding Ashe and Alleghany would be especially helpful.

Reports can come from observing a live squirrel, finding a roadkill, or even from photos taken at backyard bird feeders. If you are an avid squirrel hunter and would be willing to share the results of your hunting efforts—even better. That would provide a good opportunity for our biologists to get a better handle on harvest rates and hunting pressure.

If you are managing property in Ashe, Alleghany, or the surrounding counties, please give some consideration to fox squirrels. If you are harvesting timber, you should leave plenty of potential den trees and, of course, providing a diverse forest with plenty of mast-producing species is important as well. Planting walnut trees along your fence rows is a great idea, and you might try looking at those scattered trees in your pasture as a good thing rather than something to be removed. Fox squirrels can make good use of those open areas. And if you have never done so, consider taking a trip to hunt fox squirrels in the northwestern counties. Better yet, take a young hunter with you. You won't be likely to encounter a lot of fanfare, but you will almost certainly develop a worthwhile appreciation for a game animal that is quietly making an astounding comeback and do a little mentoring at the same time. ♣

Natural hollows in trees provide shelter for small game animals.





Land Managers' **TOOLBOX**

Wildlife Conservation Land Program

Managers of Wildlife Habitat Finally Get Some Tax Relief

By Brad Howard, Private Lands Coordinator, NCWRC

With the passage of a bill in the 2008 General Assembly Session, the Wildlife Conservation Land Program (WCLP) was established. The program allows landowners who practice certain wildlife habitat management on their property to apply for a reduced tax assessment on their lands. Once qualified, the land is assessed as if it were agricultural land enrolled in the Present Use Valuation (PUV) program.

Many landowners are familiar with the agriculture, horticulture, or forestry tax classifications (PUV) for their property. While not specifically tied to those classifications, this program essentially does the same thing for landowners on their yearly tax bill. However, this benefit does not come without specific criteria and requirements.

Early-successional, stream and riparian, small wetland communities, longleaf pine forest, bat caves, and rock outcrop habitats were designated as special classes of property for the purpose of taxation. Landowners who own 20 contiguous acres of one or a combination of the above may apply for a Wildlife Habitat Conservation Agreement with the North Carolina Wildlife Resources

Commission. Once that agreement is signed, landowners can make application with the county to have their habitat classified as Wildlife Conservation Land and assessed as if it were agricultural land in the current PUV program.

The bill also provides a tax break to landowners who manage their land to protect a species of wildlife that is on the North Carolina protected animal list. These species are commonly referred to as endangered, threatened or of special concern. To receive a reduced tax assessment, at least 20 contiguous acres of property must be managed for one or more of these species.

What does this mean for wildlife species across the state? For the first time ever, wildlife habitat is recognized as a special “use” of land. This is important because it allows landowners to manage their land for the production of wildlife habitat while receiving a tax break. Prior to this program, only lands used for agriculture, horticulture production, or forestry could receive a reduced tax assessment.

While not extremely complicated, the program does have its limitations and some specific requirements. See details below. ♣

Important Details of the Wildlife Conservation Land Program:

1. You must have at least 20 connected acres of qualifying habitat.
2. You must have at least one of the listed habitat types, or you must use the land to conserve a protected animal species.
3. You must sign an agreement with the North Carolina Wildlife Resources Commission and then make application with the county where the property is located during the open enrollment period for the program.
4. No individual landowner may have more than 100 acres enrolled in the Wildlife Conservation Land Program in any one county.
5. Final decisions on all tax assessments rest with the county tax office—not the North Carolina Wildlife Resources Commission.

Landowners who are interested in this program are encouraged to contact the North Carolina Wildlife Resources Commission (919-707-0050) for more information. Your request will be routed to the most appropriate wildlife biologist for a more detailed discussion of the program and how it would apply to your property.



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Thanks for reading the *Upland Gazette*!
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