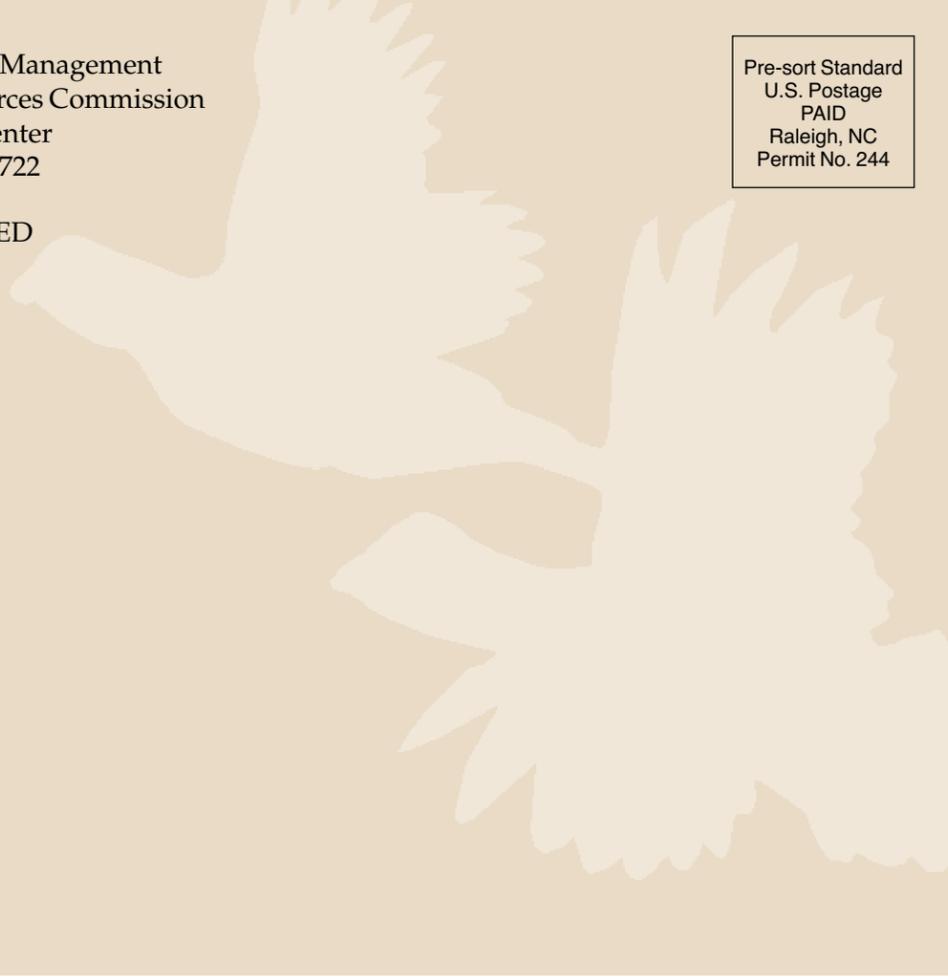




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# the Upland GAZETTE



North Carolina Small Game Notes

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## Murphy-Brown and CURE: A Unique Partnership

**A**t first, it is a concept that seems at odds: A large-scale hog farm that benefits the environment. But a North Carolina Wildlife Resources Commission partnership with the Murphy-Brown Farm in Bladen County is doing just that.

corn, soybeans and wheat, and in pastureland. As part of the cooperative effort, Murphy-Brown and the Commission established buffers along ditches to filter out nutrients and herbicides from waterways, prevent erosion and

## Grant Provides for Water Quality and Wildlife Habitat

**A** recent \$308,000 grant to the N.C. Wildlife Resources Commission will help continue the efforts on the Murphy-Brown Farm and expand habitat improvements to nine additional farms.

The N.C. Department of Justice grant was announced by state Attorney General Roy Cooper on Oct. 22. The money is part of an agreement reached in 2000 with Smithfield Foods, the world's largest pork producer, to enhance North Carolina's environment, particularly its river basins.

The grant funds the installation of field borders and buffers, which will help improve water quality and enhance wildlife habitat in the region. The grant will also assist educational and scientific programs for farmers on the compatibility of water quality and wildlife habitat with successful agri-business practices.

The Commission has already established habitat on more than 4,000 acres of farmland under a prior grant. The additional funds will allow continued work on those acres and expansion to approximately 3,000 more acres.

"This has been a great cooperative effort, resulting in good program relations, good habitat and benefits to water quality," said Don Hayes,

*"Both Murphy-Brown and the Commission can be proud of their contributions to this project. Enhancing the buffer system and adding block habitat has yielded increased water quality and improved habitat for quail, songbirds and other small game. Murphy-Brown is pleased to support the Commission and promote these cooperative projects with landowners."*

—DAWN WILLIAMSON, MURPHY-BROWN

Utilizing the Commission's Cooperative Upland habitat Restoration and Enhancement program (CURE), Murphy-Brown Farms provides wildlife habitat, meets water quality standards and continues to be a successful agri-business.

The 80,000-hog, 4,000-acre facility near Ammon, N.C., uses lagoon effluent as fertilizer in row crops, which include

—as naturally vegetated areas—provide needed habitat for quail, rabbits and other wildlife. Not far from Suggs Mill Pond Game Land, the farm is a valued conservation area in North Carolina's southeastern region.

The project is funded by a grant from the N.C. Department of Justice, but, unlike other CURE cooperatives across the state, Murphy-Brown is not

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## Commission Presents the Larry Diedrick Small Game Awards



(L-R) Dr. David Cobb of the Commission, winners Ruffin Powers II, Dawn Williamson of Murphy-Brown and Commission Chairman Wes Seegars.

Each year the Commission presents the Larry Diedrick Small Game Awards. These awards honor former wildlife commissioner Larry Diedrick and his commitment to enhancing small-game populations in N.C.

Ruffin Powers II of Swansboro, N.C., received the 2006 Landowner Award for developing and managing quail habitat on his family farm near St. Pauls (Robeson County) over the past 15 years. A long-time member and supporter of Quail Unlimited, Powers has used textbook quail management including timber thinning, prescribed burning, food plot establishment, planting of native warm season grasses and establishment of field borders.

Murphy-Brown, Inc. of Warsaw, N.C. received the Corporate Award for supporting the Commission's CURE program. This award recognizes companies that own and manage land to benefit small-game wildlife species.

Congratulations to the 2006 winners. We appreciate your commitment to quail habitat. ♣

*continued from page 1*

private lands coordinator with the Wildlife Management Division of the N.C. Wildlife Resources Commission. "This grant will help keep the program running for a few more years at the same level, with expansion to some additional farms."

Among the project goals:

- Install field borders and buffers on 10 hog farms to form a 7,000-acre cooperative for water quality improvements and wildlife habitat enhancement
- Demonstrate that water quality, wildlife and farming operations can coexist
- Document the effects of field borders and buffers on water quality and biodiversity
- Continue to maintain the Murphy-Brown Complex in Bladen County as a showcase farm.

For more information, go online to [www.ncwildlife.org](http://www.ncwildlife.org) or call (919) 707-0058. ♣

*continued from page 1*

paid for its participation. The grant requirements call for removing 150 acres from production, which was completed in January 2007. The majority of that acreage is in 20-foot buffers, a width chosen to accommodate farm equipment. These buffers, along with block habitats, protect a whopping 18.4 miles of waterways. Most of the buffers are maintained by disking on a two- or three-year rotation and allowed to grow in natural vegetation. Some buffers will be maintained by prescribed burning or use of herbicides, and several of the block habitats have been planted in native warm-season grasses and forbs.

Water quality, a major component of the project's goals, is monitored by testing samples in the field and by sending samples to the N.C. Department of Agriculture laboratory in Raleigh. Testing is performed monthly and after significant rainfall or severe storms. Nutrients, pH, dissolved oxygen, dissolved solids and temperatures are monitored to ensure the buffers help unpolluted water flow downstream.

Ongoing bird and quail counts are essential to ensure that management practices are improving and maintaining habitat. Initial results are encouraging, with three calling males on average per point count for the summer quail routes.

Some timber stands have been improved as wildlife habitat through roller chopping and prescribed burns. Lanes were created to open up part of a nearby bay habitat. Future plans for timber stand improvements include additional prescribed burns, thinning, and replacing a stand of mixed pines with longleaf pines.

Four other habitat areas have been heavily planted in wildflowers and native grasses by Dr. David Orr of N.C. State University, who will study predacious insects and beneficial pollinators on the land.

Murphy-Brown Farms and CURE form a unique and important partnership that is dedicated to providing wildlife habitat and improving water quality. By its total commitment to this effort, Murphy-Brown sets an example for other landowners to follow and serves as a showcase for management practices that improve the land for wildlife and protect water quality.

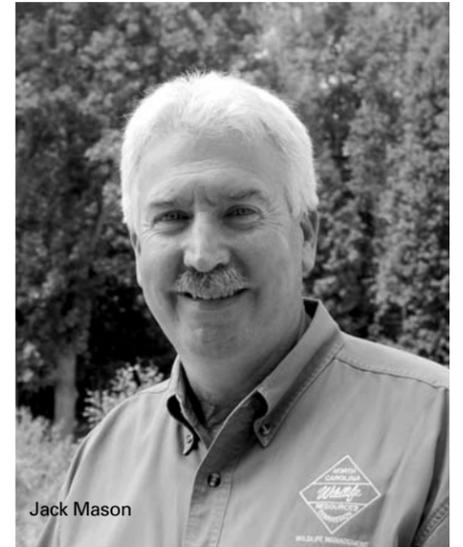
The partnership is working so well, in fact, the site hosts Wildlife and Water Quality Workshops several times a year, to show how a large-scale hog farm can be productive and improve the environment at the same time. Quail Unlimited, Roundstone Seed, N.C. State University and N.C. Cooperative Extension Services have co-sponsored workshops, with topics ranging from use of fire as a management tool, maintenance of early succession vegetation, native grass establishment, and quail ecology, to examining farm bill programs. Anyone interested in attending future sessions should e-mail [cure\\_tour@yahoo.com](mailto:cure_tour@yahoo.com). Use the word "tour" in the subject line. ♣

*Benjy M. Strope,  
CURE Technical Assistance Biologist*

## Jack Mason, Agriculture Liaison Biologist, Retires

Jack Mason, agriculture liaison biologist, retired in August from the N.C. Wildlife Resources Commission. Jack earned his B.S. in Wildlife Conservation from N.C. State University in 1974. He began working for the Wildlife Resources Commission in 1975 serving as a wildlife management technician in the Mountain Region. In 1976 he became a wildlife biologist providing technical guidance and supervising the Crossnore Wildlife Management crew, a position he held for five years. In 1981 he became the wildlife biologist for District 8 and held this position until December 2006, when he succeeded Terry Sharpe as agriculture liaison biologist.

Jack's career has been devoted to conservation of wildlife with an emphasis on habitat development and improvement. As biologist for the *Upland Gazette*, Jack was an important resource and authority on small game animals, particularly upland game birds. The Commission congratulates him on his career and wishes him well. ♣



Jack Mason



Former black bear biologist, Mark Jones, replaced Jack Mason as agriculture liaison biologist.

**Upland Gazette: Tell us about your background and your previous positions working at the Wildlife Resources Commission.**

Mark Jones: I have degrees from Virginia Tech (B.S.) and the University of Tennessee (M.S.) in wildlife biology and management. Many people know I worked as the black bear project leader for over nine years, but prior to that, I worked as a small game biologist on many of the issues that are now part of the CURE program. These include Farm Bill issues, habitat management issues, research into quail habitat needs and predation, and management of early successional wildlife.

**UG: It sounds like this new job is quite a change from the Black Bear program.**

MJ: Yes, it is. I supervise five biologists

## Meet Mark Jones

### Q and A with new Agriculture Liaison Biologist

*The Upland Gazette editor, Jill Braden, recently sat down with Commission biologist Mark Jones and discussed his role as the new agriculture liaison biologist.*

who work on early successional wildlife around the state. Three of these biologists are based out of the USDA Natural Resources Conservation Service regional offices, an agency that has primary federal oversight for farmers. The other two biologists work on improving habitats on corporate hog-farming operations and in longleaf pine ecosystems.

**UG: How will the Agriculture Liaison Program benefit from your previous experience?**

MJ: Black bears are a real wildlife success story, but they are very different from the species impacted by the Agriculture Liaison Program. Bears are highly adaptable to human activities and respond to regulatory management actions such as those that control and influence harvest levels. Quail and early successional birds are habitat specialists to some extent. They require very specific habitats and are not as adaptable as bears. In many ways, managing these species is a much greater challenge because landscape patterns, cultural influences and development are not working to our advantage

in North Carolina in terms of putting habitat for these species on the ground. As most of our readers know, many of these species are declining throughout most of the southeastern United States.

**UG: What are your goals for this position?**

MJ: Obviously, we would like to see bobwhite quail (and species with similar habitat needs) increase in numbers. To do this we need to create large areas of improved early successional habitats.

**UG: Tell us about the research and work you have planned.**

MJ: We concentrate on actually creating habitat for quail and songbirds—not doing applied research; although we do monitor species response (both birds and plants) to our habitat treatments. It's interesting that many non-target species, such as abundant animals like deer and turkey, also benefit from these habitats. This new opportunity allows me to work on many of these matters again under the umbrella of a well-designed program like CURE. ♣

# What Makes Some Field Border Habitats Better Than Others?

By Jason Riddle (Ph.D. candidate) and Christopher Moorman (Associate Professor),  
Department of Forestry and Environmental Resources, N.C. State University

Creation of farm field borders is widely encouraged to increase bobwhite quail nesting and brood-rearing cover on farms. But does it make a difference if field border habitat is long and thin, or wide and block-shaped? And how does the landscape surrounding a farm with field borders influence the bobwhite response?

We set up an experiment designed to answer both the landscape and the field border shape questions relevant to the N.C. Wildlife Resources Commission's Cooperative Upland-habitat Restoration and Enhancement program (CURE). Landscape and border shape are also applicable to the Conservation Reserve Program's bird conservation practice known as the Upland Bird Habitat Buffer (CP33) program. CURE and CP33 provide financial and technical assistance to establish field borders on private lands in North Carolina.

Specifically, we wanted to determine:

- If the focal area approach of the CURE program works (see below for a quick review) and
- If it is important for the U.S. Department of Agriculture to consider targeting its financial incentives (e.g., CP33) for upland bird habitat conservation in landscapes that have high potential for quail management.

We also wanted to know if bobwhites respond better to certain field border shapes. We thought this information would help biologists select locations and layout patterns of field borders for the CURE and CP33 programs.

Initiated in 2004, our research was sponsored by the Wildlife Resources Commission, USDA-NRCS/MSU Bobwhite Restoration Project, NC State University, and Murphy-Brown, LLC, the nation's largest pork producer.

## A quick review of the focal area approach...why does it matter?

When Commission biologists considered approaches to restoring bobwhite habitat, they decided not to create a little bit of habitat here and a little bit of habitat there. Instead, they wanted to join together as much habitat as possible in areas that had "high potential" for quail. An area has high potential if quail already are present in reasonable numbers or the area is suitable for dispersing quail to find new habitat (see "Bobwhite Spring Dispersal" from the spring 2007 *Upland Gazette*).

Commission biologists searched the state for areas dominated by plant communities that could be easily managed for quail (such as crop fields interspersed with pine woodlands). They avoided areas dominated by plant communities such as tall fescue pasture and developed areas, which are unsuitable for quail. Aggregations of suitable areas have been designated "focal areas" by the Commission (see map below). For the sake of convenience, all other areas are designated as non-focal areas.

## Why might field border shape matter?

Wildlife biologists have recommended linear field borders for quail habitat for almost 100 years. One logistical advantage of relatively narrow, linear field borders is that they typically use less productive land found along field edges. Recently, wildlife managers have observed that linear habitats, such as narrow field borders, may concentrate quail in such small areas that their nests become vulnerable to predators. For example, imagine a pair of quail nesting in a field border 15-foot wide and 1452-foot long (a total

area of .5 acres). Nest predators such as raccoons or black rat snakes, which are known to travel along field edges, have a good chance of finding the nest and the incubating adults, even if they are not actively searching for them (i.e., random encounter). However, if .5 acres of habitat was clumped into a nonlinear field border in the corner of a field, a nesting pair of bobwhites might stand a better chance of evading detection because of the denser area (see Figure 2b, page 10).

## How did we find out if focal areas work or if shape matters?

We selected 24 sites in the Coastal Plain of North Carolina for our research. All sites were commercial hog farms owned by Murphy-Brown, LLC. Working with Murphy-Brown allowed us to choose sites from a large pool of company farms and to control for variables such as crop rotations and timber harvests, which could influence quail populations. It also was convenient to collaborate with Murphy-Brown because we were able to work with one landowner with 24 farms instead of 24 separate landowners.

We chose 12 farms in focal areas and 12 farms in nonfocal areas. Farms in focal areas were surrounded primarily by agriculture (49 percent row crops and 18 percent forest). Farms in non-focal areas were surrounded primarily by forest (20 percent row crops and 44 percent forests). In 2004, we began to delineate areas for field borders on each farm. On half the farms in each landscape, field borders were linear and 10 feet wide.

Wherever possible, we oriented linear field borders so they were parallel to crop rows to allow room for farm machinery to operate within the fields. On the other half of the farms in each

landscape, field borders were nonlinear blocks located at the ends or corners of fields. To minimize loss of crop production, we identified the most unproductive field ends, corners, and "odd areas" for nonlinear borders. Nonlinear borders ranged from .12 to 6.13 acres, but most were about .5 to .6 acres. Field borders were established over the next two years by simply allowing them to go fallow. Nothing special was planted to create field borders; instead, we simply took advantage of the existing seed bank. Our farms varied by size, but the amount of row crop that came out of production on each farm was between two and three percent.

Before establishing field borders in 2004, we counted the number of calling bobwhite males during the summer to get a baseline estimate of breeding season abundance. We continued to monitor summer quail populations in 2005 and 2006 after field borders were established. In 2005 and 2006, we also conducted an experiment where we placed artificial quail nests in field borders. This allowed us to estimate nest depredation in linear and nonlinear field borders and in focal areas and nonfocal areas (see illustration, page 10).

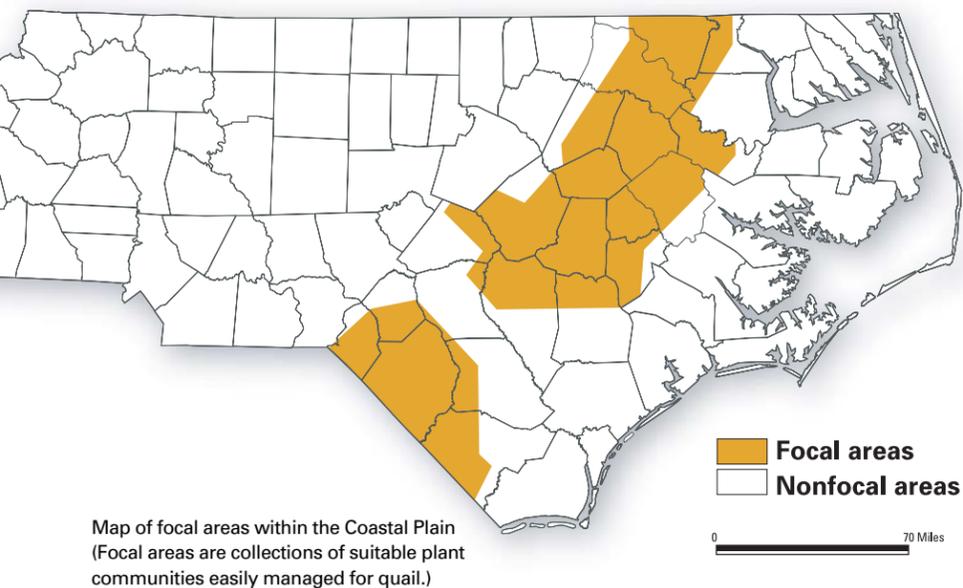
## Great news if you live in a focal area!

Quail increased on farms in focal areas, regardless of field border shape. Overall, breeding season quail increased



This nesting hen and her chicks are examples of wildlife that benefit from better field borders.

Figure 1



## Standing Cotton Stalks Provide Habitat for Wildlife

### They're also cost-effective

As a biologist new to the CURE program and to cotton farming, I have much to learn. Before becoming involved with CURE, I thought cotton stalks provided no benefit to wildlife from late fall to spring because shredded stalks leave little ground cover. Charles Grantham and Gene Bennett, members of the Benthall CURE cooperative, explained how they are trying to change that thinking. Instead of shredding the cotton stalks after the late-fall harvest—the way the majority of farmers in eastern North Carolina do—they leave the stalks standing for wildlife. Cotton stalks historically have been shredded to stop boll weevil infestations. However, weevils have been eradicated from the Southeast and are not an issue in North Carolina unless a local outbreak occurs.

There are several advantages to leaving the stalks. At \$4-6 per acre in fuel and labor costs, another trip across the field is costly. And farm machines further compact the soil. Both of these land managers noted that avian predators cannot get down into the standing cotton stalks to hunt. Grantham says that many times while hunting rabbits in adjunct cutovers, he noticed that the rabbits run out into the cotton stalk fields. He believes they view it just as a briar thicket, a safe piece of escape cover. He also has seen quail in the cotton stalks many times. Imagine a field with the stalks removed and devoid of cover. No small game would venture out into it in daylight. Leaving the stalks standing makes sense!

Cotton stalks left until the next spring have been successfully over-planted with corn (using no-till). According to Grantham, "The stalks are dry and brittle and fall down



No-till planting in standing cotton stalks.

when touched by the tractor," and "the planter functions the same when farmers plant fields with stalks removed." Planting is faster because no row markers are needed, assuming the planting is on the old row and root system. Row cleaners can be used to improve performance instead of conventional coulters (soil cutters).

Bennett, who is experimenting with over-planting, thinks that the best option is to broadcast the cover crop—in his case wheat—when the cotton is defoliated. If a grain drill is used behind the cotton picker, then many of the stalks will be lost. Placing a cover crop like wheat provides a food source for game such as rabbits and, at the same time, slows soil erosion. Farms enrolled in the Conservation Security Program (CSP), which was available in the Roanoke River drainage in 2005, receive compensation for leaving cotton stalks standing to benefit wildlife.

There are disadvantages to leaving cotton stalks. Lime truck drivers do not like to drive through standing stalks in late fall due to possible radiator punctures. However, liming could be done in the spring when the stalks are further decayed and more easily broken. Combine rakes and apparatus may become clogged when the wheat crop is harvested. Over-planting in the same row with cotton may be difficult; however, the process is new and the disadvantages remain unclear according to Bennett.

In the end, shredded cotton stalks may be another piece of the puzzle that explains why small game populations are declining in the Southeast. I am told that in the distant past, farmers left cotton stalks in the fields perhaps to protect small game from predators. I find no mention of the effects of leaving cotton stalks standing in current literature, so I am unsure as to the scientific merits of this practice. However, now that weevils are no longer an issue, leaving these stalks standing certainly warrants further investigation.

We have observed that small game populations derive more benefit from fields with standing overhead cover than from those with no cover at all. In addition, no extra fuel, tractor or mower wear/tear, or labor is needed to leave the cotton stalks and plant a cover crop over-top. I encourage farmers and landowners to consider leaving cotton stalks for wildlife. ♣

Greg Batts

CURE Technical Assistance Biologist  
NCWRC Division of Wildlife Management



## CURE has Long-Term Answer to Drought: Warm Season Grasses

*Editor's Note: For an in-depth look at establishing, grazing and haying of warm season grasses, check out the Land Managers' Toolbox—"Benefits of Warm Season Grasses," in the spring 2007 issue of the Upland Gazette. For article reprints, please call 707-0353.*

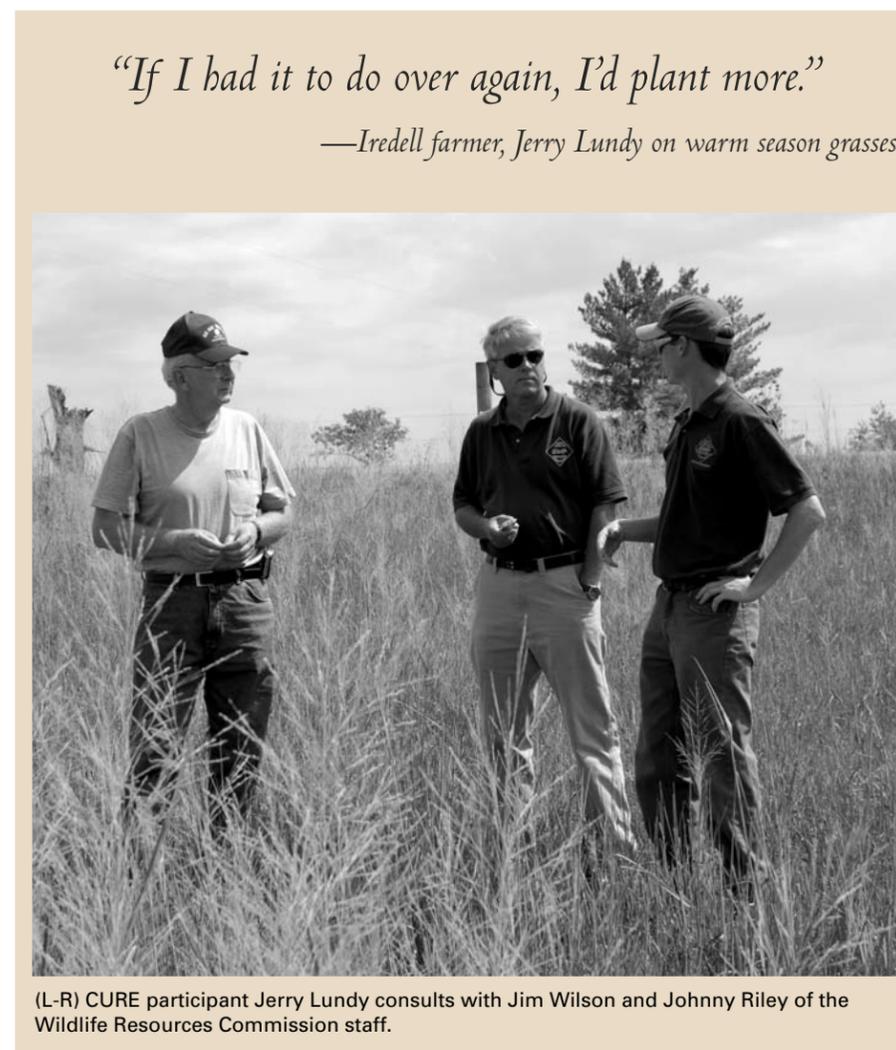
This summer's record-breaking drought has been tough on cool season grasses and the farmers who grow them, but other options exist when it comes to livestock forage.

The N.C. Wildlife Resources Commission is promoting its CURE program as win-win for private farmers. CURE promotes the creation of small game habitat in three focal areas across the state, using native plants such as drought-resistant, warm season grasses in areas like the western Piedmont.

"This is not a short-term method, this is a long-term approach," said CURE Technical Assistance Biologist Johnny Riley of warm season grasses, which can take two years to begin producing mature yields. "But if farmers will buy into the warm season grasses, the results could be tremendous and really help areas like the western Piedmont in future droughts. They are also a great way to diversify forage and get away from having 100 percent cool season grasses."

Unlike cool season forage species such as fescue and orchard grass, warm season varieties thrive during the hottest months of the year. Even better, they do not require substantial summer rainfall to produce significant tonnage. Although, with good precipitation, species like big bluestem, switchgrass and eastern gammagrass can produce impressive results with higher quality than most cool season grasses.

Iredell County farmer Jerry Lundy got more than three tons of forage per acre on the first cutting in 2006. A participant of CURE since 2002, Lundy said he has but one regret about



(L-R) CURE participant Jerry Lundy consults with Jim Wilson and Johnny Riley of the Wildlife Resources Commission staff.

*"If I had it to do over again, I'd plant more."*

—Iredell farmer, Jerry Lundy on warm season grasses

the 20 acres of warm season grasses scattered across his property.

"If I had it to do over again, I'd plant more," he explained.

While farmers can use warm season grasses to feed livestock, wildlife will also benefit from the cover. Rabbits, grouse, quail, deer, turkey and songbirds use warm season grasses to different extents. Commission biologists encourage CURE participants to leave these grasses uncut during the late summer, providing valuable early successional habitat—or young, burgeoning wild areas—for wildlife during the winter months. Helping farmers under-

stand how to incorporate small game habitat into their normal farming activities is a major focus of the program.

Technical assistance is not restricted to CURE areas. Commission biologists are also available to give advice throughout the state, and in many cases, federal Farm Bill programs can supplement costs of establishing grasses and other wildlife habitat.

In addition to the Piedmont focal area, CURE cooperatives are located in the northern and southern Coastal Plains. To learn more about CURE, or the N.C. Wildlife Resources Commission, visit [www.ncwildlife.org](http://www.ncwildlife.org). ♣

## Managing Forests for Songbirds

John Ann Shearer, Fish & Wildlife Biologist, U.S. Fish & Wildlife Service

Everyone loves songbirds. Their melodious and sometimes persistent warbling marks the coming of spring. For many of us, bird songs—like that of the wood thrush—trigger fond childhood memories of playing in the woods. But rarely are songbirds the focus of forest management. Have you ever considered which songbirds might be living in a nearby forest? Have you ever asked yourself how you might make that forest better for songbirds?

The Forest Landbird Legacy Program (FLLP) can help you answer those questions.

A voluntary wildlife conservation program, FLLP targets private non-industrial forest landowners in North Carolina who want to manage their mature forests to benefit forest-dwelling songbirds. Most of FLLP's focus is on migratory birds thought to be in decline (according to the best data available). In addition to providing planning and financial assistance for forest management, FLLP also recognizes landowners who conserve forest songbird habitat.

The Hosley Family was an early participant in FLLP. The Hosleys thought so much of songbirds that they purchased 350 acres in the mountains just for the birds and worked with a forester to do selective harvests. The family also asked the FLLP team from the N.C. Wildlife Resources Commission, the US Fish and Wildlife Service, and the USDA Natural Resources Conservation Service for ideas to improve forest management. Through FLLP, the Hosleys developed a plan to arrest encroaching exotic invasive plants that would

eventually reduce native plant cover and food for the wood thrushes, hooded warblers and scarlet tanagers that used their forest as a breeding home. In addition to advice, FLLP provided cost-share funds for the exotic plant treatments and recognized the Hosleys with a sign and certificate.



FLLP partners from the Commission and the U.S. Fish & Wildlife Service present a certification sign to Jessica Blake (center) of the NC Coastal Land Trust for longleaf pine restoration work in Bladen County.

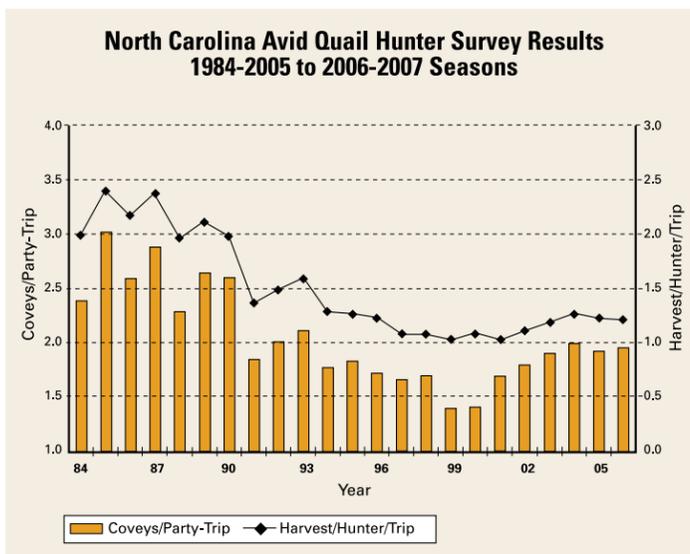
Promoting forest management strategies that sustain bird populations can mean different things in different forests. Fortunately, wildlife officials can accomplish songbird management while managing for forest health and economic returns. Treatments may include snag creation, prescribed burning, control of exotic invasive plants, forest stand habitat improvement plantings—and in some cases—simply maintaining the status quo.

To learn more, or to locate an FLLP biologist near you, visit: <http://www.fws.gov/nc-es/es/partners/factsheet/bl.pdf> or email Mark Johns at: [johnsme@mindspring.com](mailto:johnsme@mindspring.com)

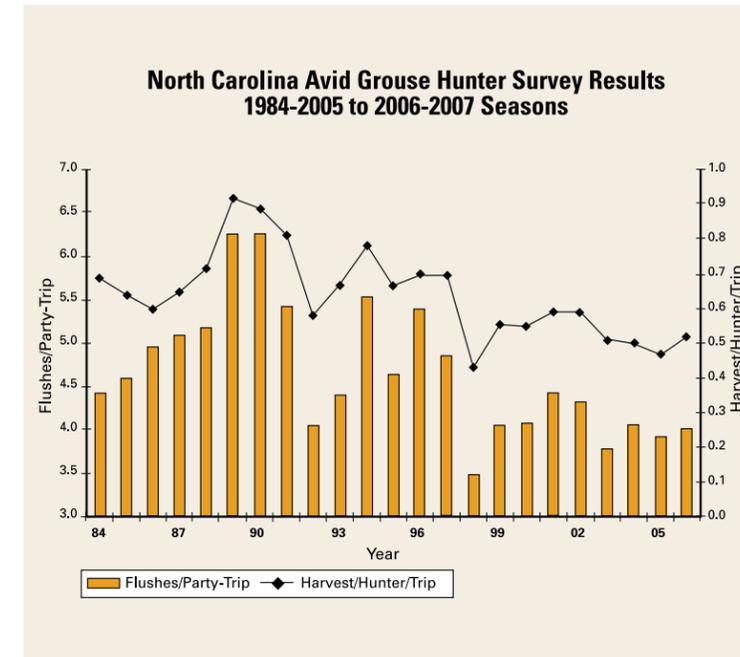
## 2006-2007 Avid Quail Hunter Survey Summary

A total of 78 avid quail hunters reported on 1,192 hunts during the 2006-2007 season. The statewide quail flush rate increased two percent to 1.96 coveys/party trip, while the harvest rate declined two percent to 1.21 quail bagged/hunter trip. Regionally, the flush rate in the Coastal Plain was unchanged with 2.34 coveys/party trip. The flush rate in the Piedmont increased to 1.20 coveys/party trip (+19 percent), and the flush rate in the Mountains declined to only 0.14 coveys/party trip (-89 percent but a very small sample size). The central Coastal Plain, where the flush rate had increased 39 percent in 2005-06, maintained a high flush rate of 3.61 coveys/party trip this year (+1 percent). The flush rate in the central Piedmont increased 67 percent over the 2005-2006 season to 1.52 coveys/party trip. Other climatological regions maintained flush rates similar to the 2005-2006 season.

David T. Sawyer,  
Upland Game Bird Biologist



## 2006-2007 Avid Grouse Hunter Survey Summary



A total of 53 avid grouse hunters reported on 721 hunts during the 2006-07 season. After slightly declining during the 2005-06 season, both the grouse flush rate and the harvest rate increased during the 2006-07 season. The grouse flush rate increased slightly from 3.94 to 4.03 flushes/party trip (+2 percent) and the harvest rate increased from 0.47 to 0.52 grouse bagged/party trip (+11 percent). The grouse flush rate in the Southern Mountains (4.50 flushes/party trip; down 5 percent) remains considerably higher than the flush rate in the Northern Mountains (2.68 flushes/party trip; up 25 percent). Flush rates were lowest in October (2.54 flushes/party trip) when the leaves were still on the trees and progressively increased through November (3.74 flushes/party trip), December (3.93 flushes/party trip), January (4.20 flushes/party trip), and February (4.39 flushes/party trip). Flush rates continue to be somewhat higher on private lands (4.56 flushes/party trip) than on game lands (3.57 flushes/party trip).

David T. Sawyer,  
Upland Game Bird Biologist

## Bobwhite Quail Call Count Trends Downward

In 2007, 25 quail routes were surveyed: 10 routes in the Coastal Region, 11 routes in the Piedmont Region, and four routes in the Mountain Region. In the Coastal Region, the average number of quail calls heard per route (25.2) was up one percent from the previous year. In the Piedmont Region, the average number of quail calls heard per route (4.6) was down nine percent from the previous year. In the Mountain Region, the average number of quail calls heard per route (1.0) remained the same compared to the previous year; however, the number of routes in the mountains was reduced from six in 2006, to four in 2007. The number of quail calls heard per route in the Coastal Region has been relatively stable since 2000; the Piedmont has varied up and down at a low level and appears to be declining; and the Mountain Region has declined to an average of only one bird heard per route.

There is a long-term downward trend in quail numbers in North Carolina. Although there have been minor annual fluctuations, survey results over the short term (six to eight years) seem to indicate that quail numbers in the Coastal Region may be stabilizing at a relatively low level consistent with the ever-more limited amount of available habitat. Survey numbers obtained in the Piedmont and Mountain regions are so low that a change in the number of bird calls heard (or not heard) dramatically alters the percent change between years, and real increases or decreases in actual numbers are hard to detect. Although it is difficult to assess the last six to eight years in the Piedmont, the downward trend in quail abundance in the Mountain Region appears to continue. Data indicate that certain birds apparently travel back and forth between more suitable habitats, and contribute the majority of the total calls heard within the Piedmont and Mountain regions.



Adult male quail

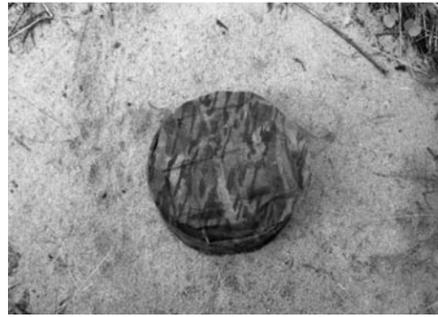
percent of cropland taken out of production should exceed three percent, especially on small farms or on farms with limited early-succession vegetative cover.

### What about the artificial nests?

Most predators of artificial nests were raccoons. Interestingly, our artificial nests were no more vulnerable in linear field borders than nonlinear field borders. We also lost the same number of nests to predators in focal areas and nonfocal areas alike. We believe artificial nest depredation was similar on our farms because the vegetation within the field borders was similar among farms in terms of plant species composition and physical structure. It is also possible that our nonlinear field borders were not large enough to negate the "edge effect," where predators may be more abundant.

### Conclusions

- In agriculture-dominated focal areas, landowners have flexibility because both linear and nonlinear field borders increase quail populations. But landowners in forest-dominated nonfocal areas shouldn't despair. They may be able to increase quail on their farms, but it will require larger blocks of nonlinear field borders or wide, linear borders to do so. On our study sites, two to three percent of cropland was converted to fallow habitat.



These examples show an undisturbed artificial nest (L) and a nest that's been disturbed.

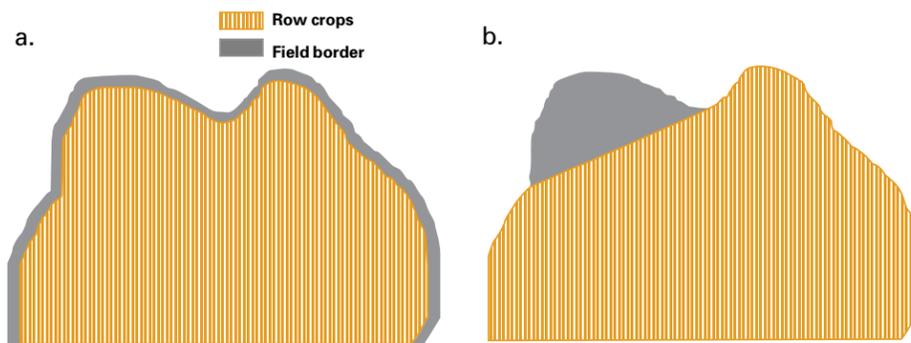
Ideally, field borders should comprise a larger percentage of row crops on farms (five to 10 percent). While many farmers cannot afford to take so much land out of production, several state and federal programs are available to help offset the cost of lost crop production. Some farmers also take advantage of enhanced hunting lease opportunities to supplement farm income.

- Quail counts increased quickly on our test farms, but the increase did not continue during the second year of field border establishment. Additional increases probably would have occurred only after establishing more acreage in field borders or other habitats favored by quail.
- After establishing field borders, landowners may create additional early succession habitat by thinning and burning adjacent woods. Thinning to reduce tree canopy closure to

approximately 30 percent and burning to remove leaf litter and other debris from the forest floor will promote increased groundcover and food resources for quail and other wildlife. Quail enthusiasts who plant food plots may not see an increase in the quail population. Food is not the only consideration in attracting quail. Quality cover for nesting, brood rearing, and the ability to escape predators are also limiting factors for bobwhite in North Carolina. Breeding-season quail counts on our focal area farms almost doubled without food plots or special seed mixes.

- On a practical note, landowners should clearly communicate their management goals with contract growers, contract pesticide applicators, and any others working in the field(s). Their cooperation is crucial. Biologists can enlist their support by posting signs showing where field borders are set aside for wildlife. We used PVC poles and couplings as a flexible way to identify field borders. We cut eight-foot lengths of 1/2-inch PVC pipe in half and used them to identify field borders beside wheat and soybeans. When crops were rotated to cotton or corn, we placed a coupling on top of the existing pole and extended it to eight feet with another four-foot length. Bright orange flagging tape was tied to the top of each pole to increase visibility. After harvest, the poles could easily be broken down to four-foot lengths. This reduced wind drag and helped keep poles from blowing down in winter. ♣

Figure 2



Overhead representation of two identical row crop fields with field borders of different shapes. One field has a half-acre linear field border along the backside (a), and the other field has a half-acre nonlinear field border in an "odd" corner (b).

## Prescribed Fire: A Cost-Effective Tool



### Land Managers' TOOLBOX

**P**rescribed fire is a cost-efficient and effective tool that is used to restore and maintain groundcover in open forest stands, openings and grasslands. Prescribed fire promotes a lush growth of grasses and herbaceous vegetation that provides food and cover for many species of wildlife. Prescribed fire benefits many important game species and rare plants and animals, reduces wildfire impacts, controls undesirable vegetation, and prepares sites for forest regeneration.

### Objectives

Sunlight must be available to produce lush groundcover vegetation. Prescribed fire, either alone or in combination with mechanical or herbicide treatments, can be used to open forest stands and remove litter to stimulate native groundcover or prepare sites to reestablish groundcover. A series of carefully conducted prescribed fires over several years may be necessary to rehabilitate sites with a long history of fire exclusion. Once a grass or herbaceous groundcover is established, fire applied on a one-, two-, or three-year rotation will maintain a healthy and diverse groundcover. Burn block size, season of burning, and fire intensity can be modified to meet wildlife objectives.

### Timing of Burns

Restoration burns may be prescribed during the winter to reduce the litter layer in small increments and prevent damage to over-story trees. In summer, where fuel levels allow, prescribed fire can be used to top kill mid-story hardwoods. Maintenance burns are typically applied in late winter or early spring to minimize the time until green up.

Rotating the use of growing season and dormant season burns often maximizes the diversity of wildlife habitat.

### Fire Lines

Prescribed fires are controlled by a break in fuels. Existing landscape features such as streams, fields and roads can often serve as fire lines. Fire lines should be cleared of all flammable materials. This may be accomplished using heavy equipment or farm tractors. Short lines can be constructed with rakes, leaf blowers, or ATVs with drags. Fire lines should be planned and constructed in advance to facilitate maintenance and safety.

### Safety and Logistics

A burn plan which describes goals, techniques, smoke sensitive areas, weather parameters, block size and location, and safety issues must be prepared for each burn block. Work in conjunction with your local N.C. Forest Service office to address these issues. Contractors are available to conduct prescribed burns in many areas of the state. Always contact your neighbors, local Volunteer Fire Departments, 911 centers, and the N.C. Forest Service on the day of your burn. ♣



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