

the Upland GAZETTE



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Managing Agricultural Lands for Bobwhite Quail

THE ABUNDANCE OF BOBWHITE QUAIL has declined across the southeastern United States since at least 1950, most noticeably on agricultural lands. Across the Southeast, biologists estimate the current annual decline to be 2.8 percent, and some have even raised the possibility that wild quail hunting may not persist in many areas. Fortunately, quail still exist in sufficient numbers on farms in parts of North Carolina and Virginia to allow testing of various ideas that could increase local populations. At N.C. State University, beginning in 1990, I led a series of experiments to understand how modern agriculture impacts bobwhites, and how agricultural systems can be adjusted to improve quail populations. This article highlights the results of those experiments.

Field Border Systems

A clue to the decline in quail came from observations in eastern North Carolina. Bobwhite populations soared shortly after large areas of the lower Coastal Plain were cleared of forests, ditched, drained and converted to row crops in the 1970s. Piles of stumps and other debris windrowed between the parallel drainage ditches soon supported briars and a variety of weeds. The sloped banks of the drainage ditches grew up and provided weedy, early-successional cover. Within a decade of the clearings, however, the rows of stumps with their tangles of cover were

burned off, leveled and converted to grain. At about the same time, sideboy mowers—rotary mowers or bushhogs attached to hydraulic arms—became available and were used to shear off the regenerating vegetation on the crowns and edges of drainage ditches. The fields no longer provided dense cover year-round.

In the 1990s, water quality in the rivers and sounds of North Carolina became a major concern. This created an opportunity to modify practices designed primarily for soil and water conservation to also improve quail habitat. In fact, in 1990, Alligator River National Wildlife Refuge managers established 15-foot-wide filter strips of vegetation, on both sides of each drainage ditch, on two large farm units. In the spring of 1993, cooperating farmers tilled up half of these filter strips or field borders on half of each farm unit, creating two large blocks of ditched and drained farmland with field borders and two blocks without borders. During the growing seasons of 1993 and 1994, biologists (principally Marc Puckett) monitored quail use of the farm units using radio telemetry and walked the edges of drainage ditches in

mid- and late-summer to count quail flushed. The results showed the farm units with field borders attracted more nesting bobwhites, and they held three to five times more quail throughout the growing season. In other words, row-cropped fields with weedy field borders attracted more quail than adjoining farms without borders. But it was not clear if these field borders actually increased quail populations.

A greatly expanded experiment between 1996 and 1999 tested the impact of field borders on quail numbers. Field borders of a 10-foot minimum width were established and maintained on six farm units in North Carolina. Six control farm units with no field borders were located nearby. The distance between test farms was at least a mile.

In the upper Coastal Plain of North Carolina—where soybeans, cotton and tobacco are domi-

nant crops—one set of four farms was established near Fountain in Wilson and Edgecombe counties. Two of the farms had field borders at least 10 feet wide, and two did not. In the lower Coastal Plain, in Hyde and Tyrrell counties, two sets of four farm units each were established, each of which had two units with field borders





Field tests with imprinted chicks indicated that no-till fields provided more insects for feeding chicks than conventionally-tilled fields.

and two without (clean-farmed units). Dr. Bill Palmer, now with Tall Timbers Research, designed this study.

To create the field borders, landowners allowed native vegetation to grow at the edges of all tilled fields within the experimental farm units after the prior year's harvest. Field borders occurred on ditchbanks, next to woods and along farm roads. The resulting vegetation included a variety of common weeds, vines, briars and shrubs: goldenrod, dog fennel, greenbrier, Japanese honeysuckle, blackberry, giant cane, broomsedge and fescue grass. The prevalence of sweetgum, cherry, willow, wax myrtle, winged sumac and loblolly pine saplings and shrubs increased over the three years.

To determine the abundance of quail, teams of listeners completed a census on each farm on two successive mornings between late-September and mid-October each fall. Observers were at least a half mile apart, which prevented counting the same covey twice. Shane Wellendorf led this exercise each year. On clear, nearly windless fall mornings, approximately 70 percent of the

coveys call, starting about 24 minutes before sunrise. On landscapes with relatively more coveys, the proportion of coveys that call is greater than on areas with fewer coveys.

The results clearly indicated that field border systems increased quail numbers on farm units—on average from 3.4 to 5.5 coveys heard per census station. In the upper Coastal Plain study area, the effect of field borders was more pronounced, where the average number of coveys heard on field border farms was 4.0, and the number heard on clean-farmed units was 1.9. This was probably due to less herbicide impact on the field borders in these farm units. In a related study, Jeff Marcus found that fields with field borders held three times more wintering sparrows than fields without borders. In the growing season, however, songbirds' nests were not successful in field borders.

Costs of Field Border Systems

The economic feasibility of establishing and maintaining field border systems is important to farm landowners because land dedicated to field borders is removed from production and the field borders need some maintenance. Additionally, if these borders harbor large populations of pest insects, then crop yields next to the borders would be threatened.

Recent research conducted over a three-year period (by N.C. State University researchers Randy Outward and Dr. Clyde Sorenson) indicated that field borders in the upper Coastal Plain did not pose yield risks to cotton or soybeans. It appeared that beneficial insects and spiders in borders actually suppressed cotton pests in some years. Earlier work, reported in 1998 by Ted Morris, indicated that field borders did not result in reduced yields from adjoining rows of corn or soybeans.

Management Tips for Field Borders

Field borders can be tied into other areas of early-successional habitat on most farms. They will provide protected corridors for productive nesting and brood-rearing throughout the property. Shrubs and low woody vegetation, along with briars, vines, native grasses and annual forbs, provide food and protection from predators, especially during the times when field crops are

not available. Annual maintenance of these areas to remove trees, especially hardwoods, will reduce the number of perches for hawks and make these habitats safer for quail. Disturbance of field borders by disking, prescribed fire, selective herbicide applications or mowing is recommended on a three-year rotation to maintain suitable quail nesting and brood-rearing cover.

Benefits of Conservation Tillage

Over the past two decades, many farmers have adopted conservation tillage for small grains; yet each year some producers till the ground before planting some crops. Fields planted with no-till or strip-till equipment retain plant residue in most of the field; these dead plants provide habitat for some insects, whereas the turned earth greatly reduces opportunities for insects. Bill Palmer and Walter Lane conducted experiments to determine the value of no-till versus conventional-tillage fields as foraging habitats for quail chicks.

Quail chicks were hatched in incubators and raised in captivity. In their first hours and frequently thereafter, the chicks were exposed to people and became imprinted on people. The imprinted chicks were taken to the crop fields when they were 10 to 13 days old for trials. The feeding rate of chicks was measured by determining the weight of the insects gathered by chicks over 30-minute periods. Growth rates were measured after chicks spent 6, 8 or 12 hours feeding in fields for tests that ran over two days.

The results of these tests were dramatic. Palmer found fallow fields and no-till soybean fields provided sufficient insects for chicks to meet their daily needs in approximately 5 hours of intense feeding, whereas chicks would have had to feed for more than 24 hours to meet their needs in conventionally planted crops of soybeans, corn or cotton. Later, Lane found that when chicks were allowed to feed 8 hours in no-till fields, they gained weight normally; chicks feeding in conventionally-tilled fields for the same length of time lost weight. The presence of plant residue, killed by herbicide prior to planting, was the key difference between no-till versus conventional-till planting systems. Crickets and other insects that the quail chicks feed upon inhabit plant residue.

Other Considerations

Pesticide Impacts

Some people considered pesticides a major threat to bobwhite quail when our research began in 1990. Past research indicates pesticides currently in use are more likely to affect quail indirectly by altering their cover or food supply, than by directly affecting them. Subsequent experiments revealed that the relatively potent carbamate insecticides Lannate® and Larvin®,

when applied at approved rates over soybeans in August, had little effect on the health of quail chicks held in pens below the soybean canopy. The advent of pyrethroid pesticides, which are not highly toxic to vertebrate animals, has further reduced the risk of directly killing quail in crop fields from sprays.

These experiments indicate that farmers who want to increase quail on their land can do so by establishing and maintaining

field borders and by employing conservation tillage. Integrating these practices with prescribed burning and timber management may yield even greater results. ♦

—Professor Peter T. Bromley, Ph.D., Fisheries and Wildlife Sciences Program Coordinator, N.C. State University

For additional information and references, please call the Wildlife Management office at (919) 733-7291

2001–2002 Avid Hunter Survey Summaries

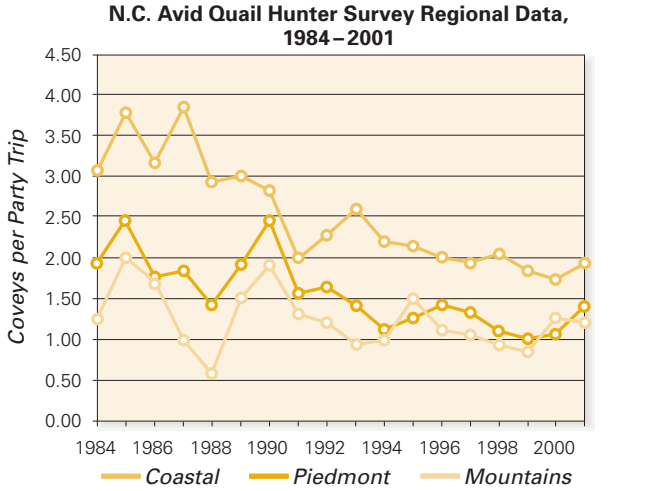
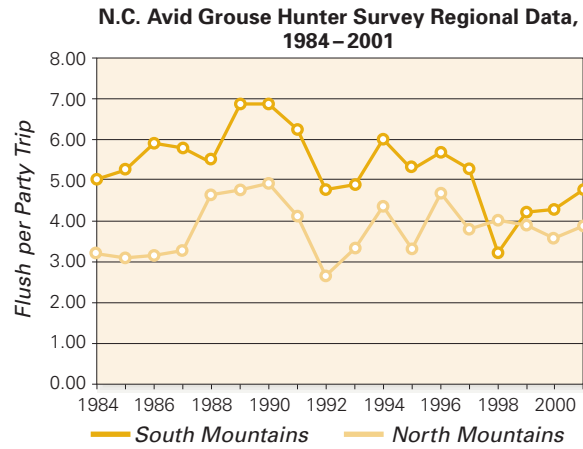
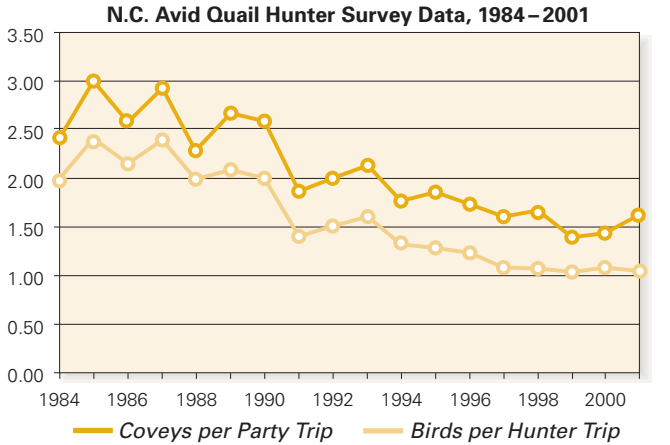
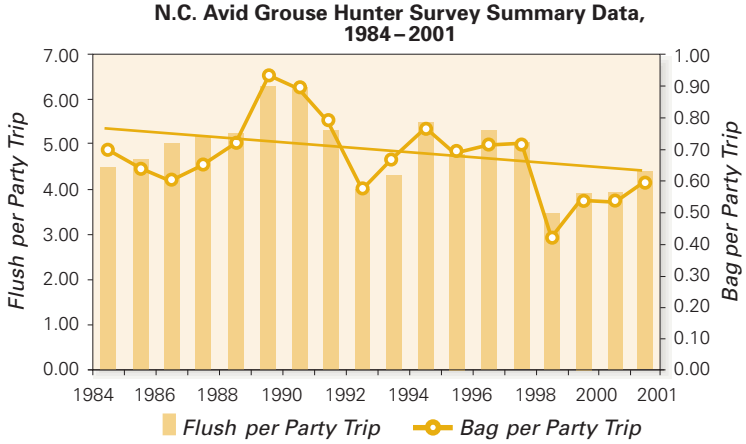
Grouse

A total of 74 grouse hunters reported on 1,181 hunts during the season. Although the long-term trend has been generally downward, during the 2001–2002 season both grouse flush and harvest rates were up slightly over the 2000–2001 season. The flush rate increased 8 percent to 4.43 flushes per party trip while the harvest rate increased 7 percent to 0.59 grouse bagged per party trip. The grouse flush rate in the southern Mountain region (4.67 flushes per party trip) was somewhat higher than the flush rate in the northern Mountain region (3.84 flushes per party trip). Flush rates were lowest in October (2.72 flushes per party trip) when the leaves were still on the trees, increased in November (3.89) and then seemed to level off during December (4.47), January (4.81) and February (4.73). Flush rates were considerably higher on private lands (5.1 flushes per party trip) than on game lands (3.5 flushes per party trip).

Quail

A total of 96 quail hunters reported on 1,478 hunts during the season. The long-term trend has been notably downward since 1984. During the 2001–2002 season, however, the average flush rate statewide increased by 19.9 percent over the previous season's—to 1.69 coveys per party trip. The average harvest rate declined by 4.6 percent to 1.03 quail bagged per-hunter trip. The average flush rate increased in all three regions. The average flush rate in the Coastal Plain was 1.90 coveys per party trip (up 12 percent over the previous year), the average flush rate in the Piedmont was 1.37 coveys per party trip (up 32 percent), and the average flush rate in the Mountain region was 1.17 coveys per party trip (up 4 percent). ♦

—Michael H. Seamster, Upland Game Bird Biologist



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Landowner Perspectives on Wildlife

I want to help wildlife, but I also need to make a living from my land.

Will wildlife affect my rights as a landowner?

How can wildlife be an economic asset to me?

I'm concerned about the appearance of my property.

This farm and the wildlife on it, it's an important part of my heritage.

I'm not sure I can afford to do more for wildlife.

Speak with North Carolina landowners about wildlife on their land, and you're sure to hear similar comments. These statements call attention to the issues that landowners consider when making plans about their property's management. Biologists, too, must understand landowners' choices and concerns if they are to effectively promote wildlife as an important part of these landowners' property management plans. With this understanding, the Wildlife Resources Commission recently took a vital step toward understanding North Carolina landowner perspectives on wildlife.

Landowner Survey Yields New Insights

The success of the Cooperative Upland-habitat Restoration and Enhancement (CURE) Program* depends upon landowners who are willing to initiate wildlife enhancement work on their property. Yet as our wildlife managers began the planning process for CURE, we realized that we did not have a concrete understanding of how the state's landowners value wildlife, or what they would or would not be willing to do for wildlife on their own property. So to jump-start the CURE Program, the commission launched a large-scale landowner survey that would look at perhaps the most important factor in determining the program's success—the human aspect.

Working with N.C. State University researchers (Drs. Peter Bromley, Clyde Sorenson and Ronald Wimberley) and Responsive Management, Inc., an environmental survey research firm, we designed a 70-question, 15-minute telephone interview. We interviewed landowners who lived within CURE Program focal areas so that our results could be applied directly to those areas. During the fall of 2000, we spoke to more than 900 landowners throughout 13 Coastal Plain counties and five western Piedmont counties (see graphic).

We asked about property characteristics (such as acreage, length of ownership, property land use), landowner demographics (occupation and age), incentive preferences (personal assistance, monetary compensation or information) and landowner attitudes and behavior (values associated with land and actions regarding wildlife). We compared landowner responses across different geographic areas, occupations and land uses to better understand how wildlife ranks in relation to other land-management priorities. We gathered information about what landowners do for wildlife, and about the reasons some landowners avoid managing for wildlife. We also asked questions to determine which incentives for habitat enhancement are most popular among landowners. Some findings are summarized below.

Landowners Differ Regionally

We found that the Coastal Plain has larger tracts of production-agriculture land, in strong contrast to the smaller tracts of nonagricultural private land in the western Piedmont. We also found that landowner responses about land values and wildlife activities were strongly related to property use. In other words, those who relied on their property for direct financial income (agriculture or forestry) had different opinions from those who were employed elsewhere. Understandably, those who relied on their land for direct income (the majority of Coastal Plain landowners) expressed concern about the economic impacts

of wildlife on their daily activities. Yet they were willing to initiate habitat enhancement practices such as establishing field borders, using herbicides to control vegetation and thinning timber. We also found that many agricultural landowners were interested in incentive options such as monetary compensation, cost-sharing and labor. This may be due to their familiarity with similarly structured agricultural land programs such as CREP, WRP and other Farm Bill programs.

Landowners in the western Piedmont were not as financially dependent on their land as were those in the Coastal Plain, and they exhibited stronger feelings of wildlife valuation. Leasing land for farm crops was less common in the western Piedmont than in the Coastal Plain, and western Piedmont landowners were more likely to personally make primary land-management decisions, instead of leaving those decisions to others (such as leasees or hired land managers). Though they did express great interest in promoting wildlife populations and habitat, individual western Piedmont landowners did not appear interested in state-agency involvement on their land or traditional enhancement practices. Perhaps this was due to perceptions of government agencies or concerns over individual property rights.

Nevertheless, one group of Iredell County landowners living near Turnersburg who were interviewed when we prepared for the large-scale survey effort provided an example of how CURE programming in the western Piedmont can work. Prior to our survey effort, individual landowners in the Turnersburg area

What types of incentives or assistance options are most appealing to landowners?

How can the Wildlife Commission best connect with landowners about wildlife?

Do landowner attitudes and behaviors regarding wildlife vary across the state? If so, how?

Pass It Along...

We are working to expand our mailing list to include other interested landowners and sportsmen. Please pass along your copy to friends who may be interested. Send names of others who may find the information useful to

The Upland Gazette
Division of Wildlife Management
N.C. Wildlife Resources Commission
1722 Mail Service Center
Raleigh, NC 27699-1722

(Note: Hunters who participated in last season's Avid Quail and Grouse Hunter Survey will automatically be included in further mailings and do not need to reply.)

Name _____
Address _____
City _____ State ____ Zip _____
Name _____
Address _____
City _____ State ____ Zip _____

became involved in a cooperative land-improvement project through the leadership of a local Quail Unlimited chapter. The Wildlife Commission worked with other area agencies to provide guidance and resources to the group as needed, and did so in a manner that actively involved all parties in work toward a common goal.

Landowners responded positively to these efforts. They indicated a strong interest in both habitat-enhancement practices and in state-agency assistance to implement those practices. As this example shows, forming strong working relationships with landowners can generate cooperation.

A Bright Future for Wildlife

Many of the North Carolina landowners that we interviewed consistently gave a very high ranking to wildlife-related land values, ranking those values second only to profit when compared to four other common land-management goals. The results of this survey effort will help guide the CURE Program across the state. Commission biologists will demonstrate how wildlife-friendly practices can be integrated into agricultural production without financial hardship to landowners. The biologists and technicians will also work closely with landowners to develop management plans and solidify good working relationships. The survey indicated that

More than 900 landowners were interviewed during fall 2000 within CURE Program focal areas.

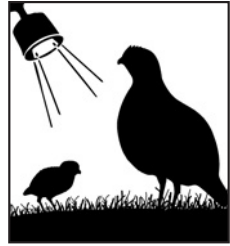
this combination will result in the greatest amount of landowner participation. We wholeheartedly thank those who took the time to respond to our telephone interview, those who filled out the Turnersburg surveys and others who participated in landowner meetings at the start of this project. The information we gathered will undoubtedly lead to better cooperation between North Carolina landowners and the Wildlife Resources Commission. Ultimately,

there will be better habitat available for the quail, songbirds and other wildlife that inhabit the farm borders and field edges of North Carolina. ♦

—Salinda Daley, N.C. State University

*If you don't know about the CURE Program, call the Wildlife Management office at (919) 733-7291 to request past issues of "The Upland Gazette."

A View from the Rowland Cooperative



Spotlight on C.U.R.E

T'S MID-JULY, THE PEAK OF THE QUAIL hatch. Bobwhites and grassland wildlife on the three cooperatives enrolled in the Wildlife Commission's Cooperative Upland-habitat Restoration and Enhancement Program (CURE) should be benefiting from the 1,500 acres of habitat improvements implemented during the program's first growing season. Weather has been very dry in the Piedmont, which will probably affect reproduction on the

Turnersburg CURE area. Thus far, however, the two Coastal Plains cooperatives have missed the brunt of the drought. On the Bent-hall Plantation and Rowland cooperatives, recently established field borders and burned woodlands, while too sparse for early-summer nesting cover, should now be dense enough to provide quality brood habitat during the important late-summer period. In this issue of "The Upland Gazette," we highlight one farm that provides an example of the management opportunities and limitations we face on farms and forestlands where habitat improvements must mesh with primary land uses. Rowland Farms Inc. has entered a 760-acre tract in the Rowland Cure cooperative—495 woodland acres and 265 acres of cropland. Primary crops are tobacco, cotton, soybeans and small grains. Rowland Farms is farmed by the landowner, Jimmy Pate, and forest management is accomplished with the help of a consultant.

The CURE Program is only possible with the dedication and enthusiasm of landowners like Mr. Pate. Tom Padgett, the District 4 technical guidance biologist who coordinates the CURE program on the Rowland cooperative, characterizes Mr. Pate as a "high-energy" individual. During the summer months, when farming activities are hectic, you better plan what you need to say before you meet with Jimmy. He is a very busy man.

Habitat improvements on Rowland Farms have focused on field edges, less-productive cropfields and open stands of loblolly pine. To create high-quality nesting and brood habitat, we have leased 31 acres of cropfield. About one-half of this land is in 30-foot-wide field borders, and the remainder is in blocks ranging from 8 to 10 acres each. We plan to disk about one-half of the rented cropfields each winter beginning in 2003. This will control tree encroachment while providing about 15 acres of brood habitat (young stands composed of a variety of volunteer plant species)

and 15 acres of nesting habitat (1-year-old plant communities with some dead material from the previous summer's growth).

For woodland habitat improvement, Wildlife Commission personnel burned one 37-acre tract of thinned loblolly pine plantation with an open canopy last February. We will burn another 22-acre block next winter. Subsequently, Mr. Pate will burn the two tracts of open woodlands annually.

What CURE can accomplish on working farms is limited by the current land uses. Portions of the Rowland Farms property are in loblolly pine plantations that are too young to thin and burn but too old to provide quality bobwhite habitat. One stand of older, naturally regenerated loblolly pines is too young and dense to benefit from controlled burning but too small to thin commercially. We have worked with the landowner and the N.C. Forest Service to explore the potential benefits of precommercially thinning the stand to a level compatible with forestry goals. But benefits to bobwhites will be short-lived because tree canopies will quickly recapture the site and suppress bobwhite food and cover plants.

About 15.5 acres of the property is in young longleaf pine—some planted on marginal cropland and enrolled in the Conservation Reserve Program and some on cutover woodland. The acreage enrolled in the Conservation Reserve Program should provide some excellent year-round habitat over the next five to 10 years.

Finally, we plan to use herbicide to selectively remove midstory hardwoods from pine stands along field edges soon after crops have been harvested. This will increase the habitat value of the field borders.

When fully implemented, the CURE Program will maintain about 12 percent of the Rowland Farms Property in high-quality early-succession habitat. The young longleaf pine plantations and agricultural fields will provide additional benefits, such as waste grain from soybean fields—a winter food source. Our efforts should be complemented by the work that is occurring on the 10 adjacent properties enrolled in the 5,000-acre Rowland cooperative. This will avoid a problem frequently encountered in past efforts to create habitat on individual properties where quail are constantly lost by dispersal into surrounding unsuitable habitat.

Future issues of "The Upland Gazette" will keep you up-to-date on the CURE Program management activities, progress and success. ♦

—Terry Sharpe, Agriculture Liaison Biologist, and Tom Padgett, District 4 Technical Guidance Biologist



Meshing habitat improvements with primary land uses presents both opportunities and limitations.

Prescribed Fire



Land Managers' TOOLBOX

E COLOGISTS TELL US THAT SOUTHEASTERN plant communities and the wildlife that these open-grass or shrub-dominated areas support evolved in a system that burned frequently. Lightning and Native Americans were responsible for the fires that maintained open-canopy pine forests, oak savannahs and Piedmont prairies. Today our landscape is fragmented with firebreaks in the form of roads and fields, and we actively suppress wildfires. Land managers can use prescribed fire, however, to maintain the grass-and-shrub plant communities that support early-succession wildlife.

Regular prescribed fire is perhaps the best tool we have for managing vegetation to benefit wildlife. It's inexpensive, and it can accomplish multiple objectives. Unfortunately, in many areas planning and executing a burn can be complicated. One must consider fuel loads on the site and in adjacent stands, weather factors and nearby smoke-sensitive areas such as roads and residential areas.

Fortunately, prescribed-fire expertise is available in many areas of the state. There are currently 380 "certified prescribed burners" in the state. These certified burners have completed training led by the N.C. Forest Service on planning and conducting burns safely. The Forest Service maintains a list of consulting foresters on their Web site: http://www.dfr.state.nc.us/managing/consulting_foresters.htm. The list indicates which individuals offer prescribed burning services. Many Forest Service district offices and county rangers also maintain a list of local contractors who offer prescribed burning services. Experienced burners can be especially valuable if you are conducting an initial burn on a site, have little personal experience in burning or have difficulty scheduling the time to conduct the burn.

Financial assistance may be available through the 2002 Farm Bill programs administered by the Natural Resources Conservation Service. The Wildlife Habitat Incentives Program, the Environmental Quality Incentives Program and the Forest Land Enhancement Program often reimburse landowners for part of the expenses incurred to implement regular prescribed burns.

To provide benefits to wildlife, fire needs to be applied frequently. The key to an effective burning program is to install firelines that can be easily maintained and effectively patrolled. Permanent firelines that can be maintained with a farm tractor are preferable to those that require a bulldozer to maintain.

Maybe you are worried that your land may not lend itself to prescribed fire and need some encouragement. You can see what fire accomplishes by visiting areas managed by the Division of Natural Resources of the Mecklenburg County Park and Recreation Department. The division uses regular fire as a management tool to restore remnants of Piedmont prairies on the outskirts of Charlotte. Managers employed by Mecklenburg County have burned 60 to 100 acres each year for about seven years on the

outskirts of our largest metropolitan area. According to Gary Marshall, Natural Resource Specialist, "the key to our success in conducting prescribed burns near a large metropolitan area has been planning prior to the burn and selecting the right weather conditions under which to conduct the burn." ♦

North Carolina Prescribed Burning Act

The 1999 General Assembly passed House Bill 316, the North Carolina Prescribed Burning Act, effective January 1, 2000. This act is designed to encourage additional burning of forestland in the state.

The law gives landowners limited liability protection from smoke resulting from a prescribed burn, provided that the proper procedures and requirements are followed. Prescribed burning is a planned reduction of forest fuels that follows a prescribed plan and uses a controlled forest burn in a designated area. It reduces the danger of uncontrolled wildfires that threaten forestland, woodland homes and wildlife habitat. It also reduces forest insect and disease populations. This type of burning also is a very efficient and effective way to prepare harvested forested areas for natural or artificial forest regeneration.

The law defines the requirements an individual must meet to become a certified burner through certification training approved by the Division of Forest Resources of the Department of Environment and Natural Resources. The program includes training in prescribed burning methods, burning permit requirements, methods for preparing a burning plan, air-quality regulations, voluntary smoke-management guidelines, local ordinances and local actions needed to conduct a prescribed burn.

Landowners are not required to conduct prescribed burning under the new law. It is legal for anyone to burn with a valid burning permit. Compliance with the new law, however, does reduce a landowner's liability from smoke when the burn is conducted by a certified burner or when the landowner is burning 50 acres or less of his or her own land and is following a written plan prepared by a certified burner.

Limited immunity from smoke does not relieve the certified burner from damage caused by burning activities. If damage occurs and negligence is found, the person who conducts the burn is liable.

For more information on training courses, or to register for the class, please call Rosie Vandenberg at (919) 733-2162, Ext. 252, or you may e-mail her at rosie.vandenberg@ncmail.net

Essentials to a Safe and Effective Prescribed Burn

- Planning Ahead
- Good Firelines
- Experienced Help
- Effective Communication
- Favorable Weather Conditions

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Upcoming Conference

Landowners and managers interested in bobwhites, grassland birds and the habitats that sustain them may find that the following conference provides valuable management information:

The Fourth Longleaf Alliance Regional Conference

Longleaf Pine: A Southern Legacy Rising From the Ashes
November 17–20, 2002

Pine Needles and Mid-Pines Resort, Southern Pines, N.C.
Hosted by The Longleaf Alliance and N.C. State University


The meeting is open to individuals and organizations interested in longleaf pine and associated plant and animal communities. Sessions and a tour will focus on needs, successes and opportunities in longleaf pine management for the private and public sector. Emphasis will be placed on addressing silvicultural, ecological, sociopolitical and economic issues challenging landowners and resource managers interested in managing and restoring longleaf pines.

For more information, call (919) 515-3184 or log onto www.longleafalliance.org.

2002–2003 Seasons and Bag Limits for Upland Game in North Carolina

<i>Species</i>	<i>Season Dates</i>	<i>Daily Bag</i>	<i>Possession Limit</i>	<i>Season Limit</i>
Dove	Sept. 2 to Oct. 5 Nov. 25 to Nov. 30 Dec. 17 to Jan. 15	12	24	None
Woodcock	Dec. 17 to Jan. 15	3	6	None
Quail	Nov. 23 to Feb. 28	6	12	None
Grouse	Oct. 14 to Feb. 28	3	6	30
Pheasant (males only)	Nov. 23 to Feb 1	3	6	30
Rabbit	Nov. 23 to Feb. 28	5	10	75
Gray and red squirrels	Oct. 14 to Jan. 31	8	16	75
Fox squirrel*	Oct. 14 to Dec. 31	1	2	10

*Fox squirrel hunting is permitted only in the following counties: Anson, Bladen, Brunswick, Cumberland, Duplin, Greene, Harnett, Hoke, Johnston, Jones, Lenoir, Moore, New Hanover, Onslow, Pender, Pitt, Richmond, Sampson, Scotland, Wayne

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