

ABSTRACT

DALEY, SALINDA SIOBHAN. Examining landowner attitudes and behavior towards wildlife management on private land in North Carolina. (Under the direction of Peter T. Bromley and David T. Cobb).

In the United States, where private land predominates, most conservation and management efforts have focused on publicly owned land, likely due to conflicting traditions of private property rights, public ownership of wildlife, and state regulation of wildlife. At present, property rights are increasingly juxtaposed with stewardship responsibilities and there is increasing pressure to blend public and private land management. In the southeastern United States, early successional habitats have declined considerably in recent years, amidst rising growth and development rates. In accordance with the recognition of declining wildlife populations associated with early successional habitat and the need for influence over habitat on private land, the North Carolina Wildlife Resources Commission established the Cooperative Upland Habitat and Enhancement (CURE) Program in August 2000. The program targets private landowners in three select regions of the state (Upper Coastal Plain I, Upper Coastal Plain II, Western Piedmont). Human dimensions survey research was conducted in the three CURE Programming areas in order to: 1) validate either a regional or statewide approach to promoting and implementing the CURE Program; and 2) recommend pertinent programming changes relative to the suggested approach. Survey results confirmed previous research conducted on private landowner attitudes and behavior regarding wildlife, which suggested differences in population subsets warrant tailored approaches to wildlife programming. Regional differences were found among the majority of variables examined in the survey. Regional differences were most pronounced across

area (rural vs. urban), occupational (production vs. non production land), income, and land-use variables. Though Coastal Plain landowners did not express as much support for wildlife values or responsibility towards wildlife as Western Piedmont landowners did, they appeared more likely to participate in CURE Programming, due to familiarity with incentives-based agency programs. Notwithstanding regional variability, the typical landowner who is actively managing for wildlife is a male who is involved in land production, and who lives on or very near to his property. Programming efforts must be geared toward the varied land-use and occupational characteristics of the CURE Program regions. While a 'top-down' approach (offering specific enhancement practices coupled with economic incentives) will be most cost effective in the Coastal Plain, wildlife programming in the Western Piedmont region will likely require a 'bottom-up' approach of soliciting individual or small groups of landowners to work with the NCWRC in a highly cooperative and personalized manner.

**EXAMINING LANDOWNER ATTITUDES AND BEHAVIOR TOWARDS
WILDLIFE MANAGEMENT ON PRIVATE LAND
IN NORTH CAROLINA**

By
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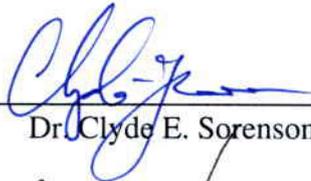
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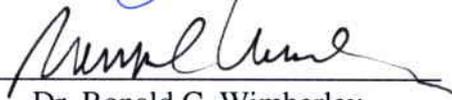
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BIOGRAPHY

The oldest of four children born to Mary and Paul Daley, Salinda grew up on a small farm in West Kingston, RI. She graduated from South Kingstown High in 1994 and attended Connecticut College her freshman year of college. Her interest in field biology and wildlife led her to transfer the following year to the University of Rhode Island, where she spent the next three years studying the ecology of the familiar southern New England flora and fauna. She earned her BS degree with Highest Distinction in Wildlife Ecology and Management in 1998. For a year and half following graduation, Salinda worked in field jobs around the country. During the summer of 1998, she dodged Army tanks and ordinance while studying the Henslow's sparrow on Ft. Drum, in upstate NY. That fall, she headed west to assist on a project about elk foraging in Bandelier National Monument, NM. At the start of 1999, Salinda moved to rural eastern NC, to begin a 6 month position working for the North Carolina Wildlife Resources Commission on a quail nest predator project with researchers at NC State University. That summer, Salinda began to apply for graduate programs starting the following winter. She contacted Dr. Pete Bromley, a Principal Investigator on the quail project, and he encouraged her to consider NC State. Salinda moved to Raleigh on January 2, 2000 to begin her Masters degree in the Fisheries and Wildlife Program of the Zoology Department. This thesis details much of her time since then!

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CHAPTER 1
INTRODUCTION

PRIVATE LAND AND WILDLIFE MANAGEMENT

Since the early part of the twentieth century, wildlife managers have recognized the promise of, and the need for, better wildlife management on private land (e.g., Leopold 1934, 1949). Yet here in the United States, where private land predominates, most conservation and management efforts have focused on publicly owned land (Knight 1999). This oversight of private land management likely evolved out of conflicting traditions of private property rights, public ownership of wildlife, and state regulation of wildlife (Matthews 1986, Benson et al. 1999). Aldo Leopold (1934) clearly understood and expressed this conflict:

“The crux of the problem is that every landowner is the custodian of 2 interests, not always identical, the public interest and his own. What we need is a positive inducement or reward for the landowner who respects both interests in his actual land practice. All conservation problems - erosion, forestry, game, wild flowers, landscapes - ultimately boil down to this.”

Today, economics drives the majority of landowner decisions. Without sufficient incentives, landowners often perceive wildlife as having minimal economic value; indeed it can often become a cost or liability (Higbe 1981, Noonan and Zagata 1982). At present, property rights are increasingly juxtaposed with stewardship responsibilities and never before has the need to blend public and private land management been so great (Knight 1998, Knight and Landres 1998).

In recent years, however, significant efforts have been made by private non-government organizations, and state and federal agencies to address and improve private land management. On a national level, organizations like The Nature Conservancy work to preserve habitat through land acquisitions and conservation easements with private

landowners. Land trusts do similar work on a state or regional level. Federal agencies, too, have improved their outreach material, available resources and programming for private landowners across the country (NRCS 1996). In a survey of state agencies regarding habitat, hunting, and nongame management, Benson (2001) found that 96% of all respondents thought that access to private land was important for achieving their missions, and had therefore implemented programs to assist with hunting, wildlife, and habitat management on private land.

Although managers widely accept that the successful management of private land for wildlife relies on cooperation with those who control that land, it is in this arena that management policy has fallen short in many regards. The dilemma is how best to effectively educate private landowners and influence their decision-making regarding wildlife habitat management. The answers to this question are complex and variable, and the issues surrounding it are not purely biological. Instead, sociological considerations - often contingent upon landowner concerns about tradition, property rights, government involvement, and market-based economics - are primary factors in developing a management approach (Vaske et al. 2001). Benson (1998) identified three issues that comprise landowner concerns regarding wildlife on their land: 1) how to make wildlife an asset; 2) how to have control over one's land and activities; and 3) how to manage to reduce uncertainty. Benson (1998) proposed that developing solutions to these concerns will promote a land ethic for sustaining wildlife. The critical matter, therefore, becomes how to better understand private landowners. The field of human dimensions research in wildlife management has emerged out of this realized need.

HUMAN DIMENSIONS RESEARCH

In the early 1970's, the phrase *human dimensions* was coined to describe the aspects of wildlife management that dealt with humans and their attitudes and behaviors toward wildlife (Decker et al. 2001). As defined by Decker et al. (2001), human dimensions is what people think and do about wildlife and wildlife management, as well as why they think and do these things. Consider the following quotations:

“By and large, our present problem is one of attitudes...To rebuild the wildlife resource, you must...rebuild the people who use it.” (Leopold 1949)

“Most wildlife management problems start out as biological problems but eventually become people problems.” (Teague 1979)

“Wildlife management is 10% managing wildlife and 90% managing people.” (adapted from Fazio and Gilbert 1981)

These statements all speak to the need for wildlife managers to have a solid understanding about what people think and do regarding wildlife. Indeed, since its inception over 30 years ago, interest in the field of human dimensions of wildlife management has steadily increased (Manfredo et al. 1996, Decker et al. 1996). One of the most fundamental applications of human dimensions research has been to guide managers toward incorporating the views and interests of the public they serve into their management activities (Manfredo et al. 1996). Tarrant et al. (1997) identified four primary reasons that incorporating public attitudes into wildlife management is critical:

- 1) wildlife agencies are legally mandated to involve the public in decision-making processes;
- 2) attitudes influence behavior;
- 3) changing constituencies make it difficult to predict human responses to management actions; and
- 4) ecosystem management requires that human dimensions are considered with biophysical information.

As such, many state

agencies have incorporated human dimensions research into their management, policy and stakeholder initiatives with great success (Decker and Enck 1996). Traditional wildlife management approaches, which have relied solely on biological information, are therefore being replaced by models that also incorporate human dimensions information (Decker et al. 1992).

At the heart of human dimensions research are basic social-science theories that describe human behavior, perceptions and decision-making processes. Two of the most commonly used approaches in human dimensions research, taken from the field of social psychology, are the cognitive and the motivational approaches (Pierce et al. 2001).

The cognitive approach is used to better understand how people's attitudes, values and norms can predict their behavior. Fulton et al. (1996) developed the cognitive hierarchy to show how people's attitudes are mediated by their values and can therefore be used to predict their behavior. In this modeled process values determine value orientations that forecast attitudes and norms which lead to behavioral intentions and which ultimately shape behavior. Examples of a cognitive approach to human dimensions research include a study of people's attitudes toward prairie dog management in Fort Collins, CO (Zinn and Andelt 1999); a study of visitor attitudes toward bobcat reintroductions on Cumberland Island National Seashore, GA, (Brooks et al. 1999); and an investigation of land stewardship values on farms in Alberta (Fisher 1998).

The motivational approach is used to explain why people exhibit certain behaviors. Much of the theoretical background for such an approach is attributed to Maslow's (1970) "hierarchy of needs" theory, proposed to explain basic human motivations, beginning with physiological needs, safety, belongingness and love, esteem,

and finally self-actualization needs. The motivational approach has been used to study birdwatchers in Alberta (McFarlane 1994), hunters on Cooperative Wildlife Management Units in Utah (Messmer et al.1998), and deer harvest management strategies in New York (Decker and Connelly 1989).

Although some still bemoan the lack of human dimensions university course work and formal training opportunities (Jacobson and McDuff 1998), interest in and application of human dimensions research continues to increase. Without question, the results of human dimensions research have led to improved relations and cooperation between public land managers and private landowners (Decker et al. 1992, 1996, Decker and Chase 1997). Human dimensions research as it relates to private landowners is applied in numerous ways.

LANDOWNER STUDIES

Human dimensions studies all share one common goal: to improve our understanding of how humans perceive wildlife. Yet beyond this basic tenet, human dimensions research consists of a wide variety of interrelated topics (e.g., hunting access, wildlife recreation, private land management, stakeholder involvement, species restoration, pest control).

Kellert's (1980) study of American attitudes toward wildlife has provided a sound basis for much of the subsequent work in this field concerning landowner-wildlife relations. Through a large-scale survey effort, he developed a typology of ten basic orientations that Americans exhibit toward wildlife:

1. **naturalistic** – primary interest in and affection for wildlife and the outdoors
2. **ecologicistic** – primary concern for environment as a system, interrelationships between wildlife species and natural habitats
3. **humanistic** – primary interest and strong affection for individual animals, principally pets; focus on wildlife is on large, attractive animals with strong anthropomorphic associations
4. **moralistic** – primary concern for the right and wrong treatment of animals, with strong opposition to exploitation or cruelty toward animals
5. **scientific** – primary interest in the physical attributes and biological functioning of animals
6. **aesthetic** – primary interest in the artistic and symbolic characteristics of animals
7. **utilitarian** – primary concern for the practical and material value of animals or the animals' habitat
8. **dominionistic** – primary interest in the mastery and control of animals, typically in sporting situations
9. **negativistic** – primary orientation is an active avoidance of animals due to dislike or fear
10. **neutralistic** – primary concern is a passive avoidance of animals due to indifference or lack of interest

In the context of private land wildlife management, Kellert (1981) stressed the tendency of livestock producers, farmers, and rural landowners to have utilitarian, dominionistic, and naturalistic views of wildlife. In addition, he found important differences among these three landowner groups reflected in varying economic and educational backgrounds. Kellert's work demonstrated the need for different outreach and targeting approaches for different landowner groups.

Kirby et al. (1981) conducted a study of farm operators in Missouri to address some basic questions regarding their values and attitudes toward wildlife and their incentives preferences. This study showed that while only 17% of respondents said that wildlife was not important, most (53%) respondents were not willing to accept assistance for land improvements regarding wildlife. When asked "why?" the three most common responses were "don't want to attract hunters" (30%), "don't have enough land" (29%),

and “already do enough for wildlife” (18%). The results of this survey were directly applied to a private land program developed by the Missouri Department of Conservation, and important issues that were identified through the survey effort (e.g., hunter mistrust) became programming priorities.

Kelley (1981) reported on landowner values in Vermont. In response to questions concerning wildlife management on their land, most landowners reported that they did not manage specifically for wildlife, mainly due to limitations of time and money. In response to questions that asked if they would participate in wildlife management programs where cash assistance was available, still more than 50% of responses were “no.” Yet using Kellert’s typology, Kelley classified most landowners as naturalistic. Similar to other study findings, Kelly concluded that landowners do not dislike wildlife intrinsically, but view it as an obstruction to their livelihoods. He recommended that assistance programs be modified to improve farming practices coincidentally with habitat management to benefit wildlife most.

Data from a survey of Minnesota landowners (Svoboda 1980) support the concept that most landowner decisions regarding wildlife habitat management are based on economics. Cost-sharing and tax credits were the two most popular assistance types indicated. The survey results also suggested that landowners would be in favor of technical guidance and personal contact from resource professionals who they consider to be a reliable source of information. Return rates of this mail-return questionnaire were highest among individuals participating in conservation programs.

Miller and Bromley (1989, 1990) surveyed Conservation Reserve Program (CRP) participants in Virginia to measure their interest in improving wildlife habitat on their

land and to determine their acceptance of available management options. Most CRP participants (72%) were interested in improving habitat, but were largely uninformed about information sources (62%). Through a logit analysis, they predicted that those most likely to desire wildlife improvement on their land were males between the ages of 45 and 54 who farmed >40.5 ha. Two variables were significant in determining those likely to implement a wildlife management plan: amount of acres retired in CRP (>16.2 ha) and education level (1-3 years beyond high school).

McIvor and Conover (1994) examined the perceptions of farmers and nonfarmers toward “problem” wildlife management in Utah and Wyoming, with particular interest in the sandhill crane (*Grus canadensis tabida*), a species that was reportedly the cause of much crop damage. McIvor and Conover’s study supported Kellert’s (1980) finding that farmers are particularly utilitarian in their views toward wildlife, because their livelihoods are directly affected by crop depredation. They reported that the two respondent groups credited different degrees of depredation to certain wildlife, and that control methods for managing wildlife conflicts differed among groups. Farmers generally rated levels of damage more severely than nonfarmers. As Kellert’s work would predict, nonfarmers preferred nonlethal control methods, whereas farmers tended to choose whichever method (lethal or nonlethal) would best eliminate the problem.

In two studies about general land stewardship and conservation practices on private land in Canada, Sutherland (1997, Nova Scotia) and Fisher (1998, Alberta) found that local contacts and resources were important sources of information and support for landowners. Sutherland (1997) reported a general lack of knowledge about nature conservation and conservation options among landowners, translating into attitudes based

on misunderstandings that likely worked against conservation efforts. Her study also revealed that the landowners most likely to be involved in conservation efforts were significantly different in many demographic and land characteristics. They were more educated, had higher income levels, a non-resource based occupation, an urban background, and often were absentee landowners. Fisher (1998) found a similar trend among landowners in Alberta. Though 90% of respondents felt that wildlife preservation was important, they did not feel that their own land activities were impacting wildlife.

The general trend among many studies examining private landowner's attitudes and behaviors toward wildlife relates back to the roots of the conflict. This refers to the perception that wildlife, although valued and appreciated by landowners, is a potential cost or detriment to landowners who rely directly on their land for income (e.g., agriculture and timber). Monetary compensation is the most commonly cited incentive necessary for landowners to initiate wildlife habitat work. Obvious delineations among landowner groups appear across demographic and landownership characteristics. These differences reflect a need for a variety of targeting methods and incentives options to appeal to the spectrum of landowner objectives and views.

LANDOWNER AND LAND-USE PATTERNS

Within the contiguous United States, nearly 70% of the land is privately owned (NRCS 1996). As such, the boundaries and borders between private and public lands become critical areas in terms of natural resources and ecosystem management initiatives (Knight and Clark 1998). At this interface, three trends warrant immediate and continued attention: 1) increasing human densities, 2) increasing economic activities that depend

on public land resources, and 3) alteration of biotic communities and ecological processes. While these trends were described by Knight and Clark (1998) in the context of the American West, where large public land tracts dominate, they are equally, if not more, important within the confines of the East (Decker and Enck 1996, Figure 1). In order to provide information pertinent to the survey effort described in the following chapters, I will limit my discussion of landowner and landuse patterns to the Southeast. Consider the following trends:

Growth rates. According to the U.S. Census Bureau (1999), southern states combined experienced a 13% increase in population size between 1990 and 1999.

Increased economic activities. Development rates have also increased with burgeoning human populations across the United States. Among the top 10 states for most acres of developed land in 1997 are three southeastern states: Florida, Georgia, and North Carolina. Five southeastern states, Georgia, Florida, North Carolina, Tennessee, and South Carolina, are among the top 10 for total acres of developed land between 1992 and 1997 (NRCS 1997).

Alteration of biotic community and ecological processes. Helinski (2000) summarized many of the habitat and ecosystem concerns across the country. In the Southeast region, pasture and range reportedly declined by more than 2% between 1982 and 1992 and many of the remaining areas were planted in non-native forage grasses (e.g., fescue and bermudagrass). Greater than 60% of this region's original wetlands have been converted to agriculture, and while farm size doubled between 1950 and 1990, farm numbers declined by 60%, resulting in the loss of many small habitat patches. As a result of habitat modifications, early successional habitats and small game populations in

the Southeast have been negatively affected over the past 40 years. Based on Breeding Bird Survey data, bobwhite quail (*Colinus virginianus*) have experienced greater than a 60% decline since the mid-1960s (Sauer et al. 2001, Figure 2). This decline is due largely to degradation and reduction of habitat, in part because of urbanization and changing landuse practices across the species range (Church et al. 1993).

THE NORTH CAROLINA SITUATION

Clearly private land management is recognized as a critical component of successful wildlife management. Literature regarding human attitudes and behaviors toward wildlife is growing, and many efforts have been directed toward private land management issues (most human dimensions research throughout the country has focused on hunters and landowners, Conover and Messmer 2001). Human growth, landuse, and landownership trends reveal a continued loss of habitat and place more pressure on private land wildlife management. One way that state agencies are addressing this issue is by supporting research efforts aimed at improving current private land programming and landowner education and contact. Such research was recently initiated in North Carolina.

The following statements reveal the current demographic and landuse trends in the state. NC is 84% privately owned (NRCS 1992), leaving a small proportion of land in state or federal ownership. The state experienced a 12% increase in population from 1990 to 1997, and population numbers have grown steadily since 1950 (U.S. Census Bureau 2000, Figure 3). North Carolina ranks sixth in the country for total acres developed between 1992 and 1997 (NRCS 1997).

As growth and development rates in the state rise on an annual basis, this translates to annual losses of wildlife habitat. Further consider that the mission of the state wildlife management agency, the North Carolina Wildlife Resources Commission (NCWRC), is to “manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State of North Carolina” (North Carolina General Statute § 143-239). Clearly management efforts must go beyond wildlife refuges, Game Lands, and state owned property to address the private landowners that control the majority of wildlife habitat in the state.

In accordance with the recognition of declining wildlife populations associated with early successional habitat and the need for greater influence over habitat management on private land, the Small Game Committee of the NCWRC established, on August 30, 2000, a number of objectives to meet this need. One objective was to “identify specific geographic areas in the state where the potential to improve quail habitats and populations on private land are greatest, and concentrate resources and target programs into these geographic areas” (Cobb 2000). In order to achieve this objective, the NCWRC launched the Cooperative Upland habitat Restoration and Enhancement (CURE) Program, an initiative to enhance early successional habitat and to target landowners that control this habitat across the state. Through a rigorous Geographic Information System analysis of statewide land-use/ land cover data, NCWRC staff established three Focal Areas (FAs) in the state where resources and habitat enhancement work will be concentrated (Figure 4).

Currently, however, a factual basis for effectively targeting private landowners for wildlife habitat initiatives is lacking. A solid understanding of landowner attitudes and

behaviors relative to wildlife habitat is necessary to ensure the success of the CURE Program and to improve current understanding of the decision making processes of landowners. Prior to the initiation of CURE, this information was unavailable. So as the CURE Program was implemented, human dimensions survey research was undertaken in the same FAs. The objective of this research was to conduct a survey of private landowners in CURE Program Focal Areas in order to:

1. Characterize and compare landowner attitudes and behavior regarding wildlife management on private land.
2. Validate either a regionally specific or a statewide approach to promoting and implementing the CURE Program.
3. Recommend programming to enhance the effectiveness of the CURE Program relative to the suggested approach.

The first two goals are addressed in Chapter 2. The third is addressed in Chapter 3. Ultimately, our survey research results will provide baseline information from which to conduct future NCWRC program evaluations and will aid in fostering better wildlife management on private land across the state.

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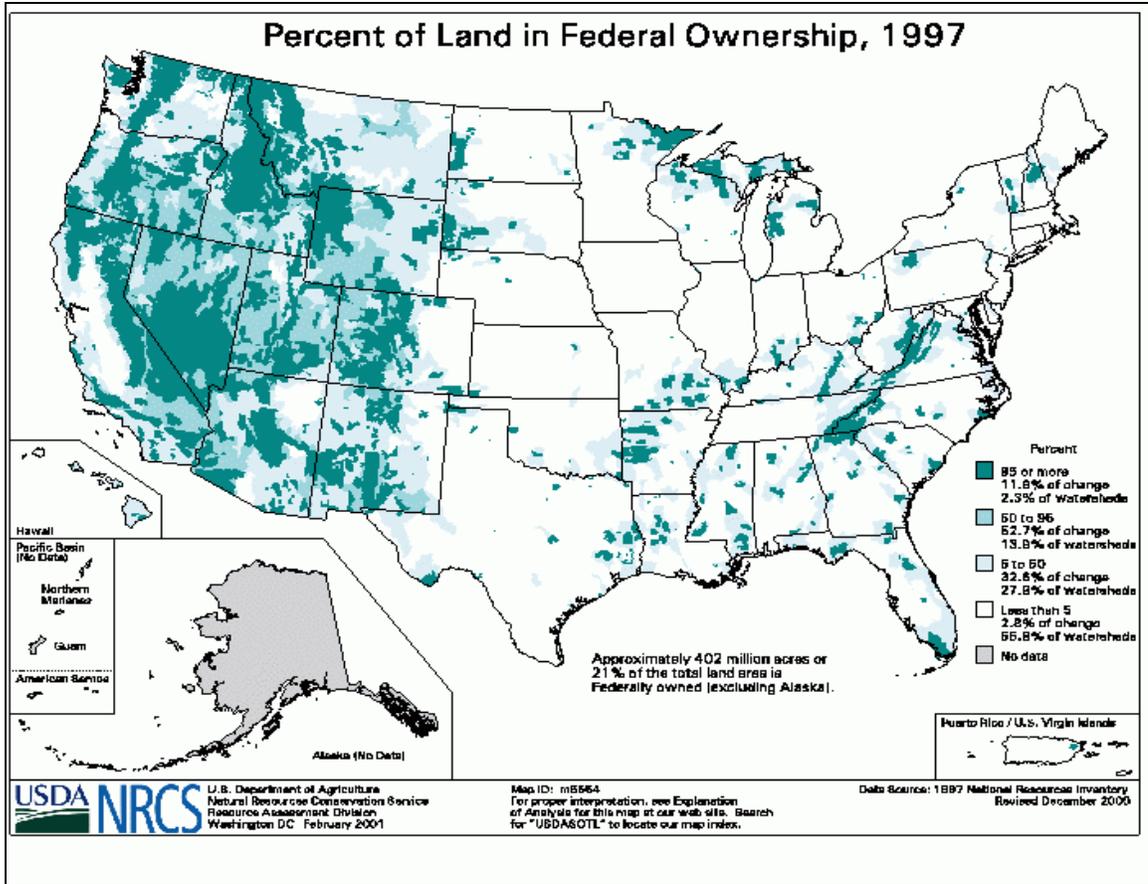


Figure 1. Percent of land in the United States in federal ownership, 1997 (source: *Natural Resource Conservation Service 1997, revised December 2000*).

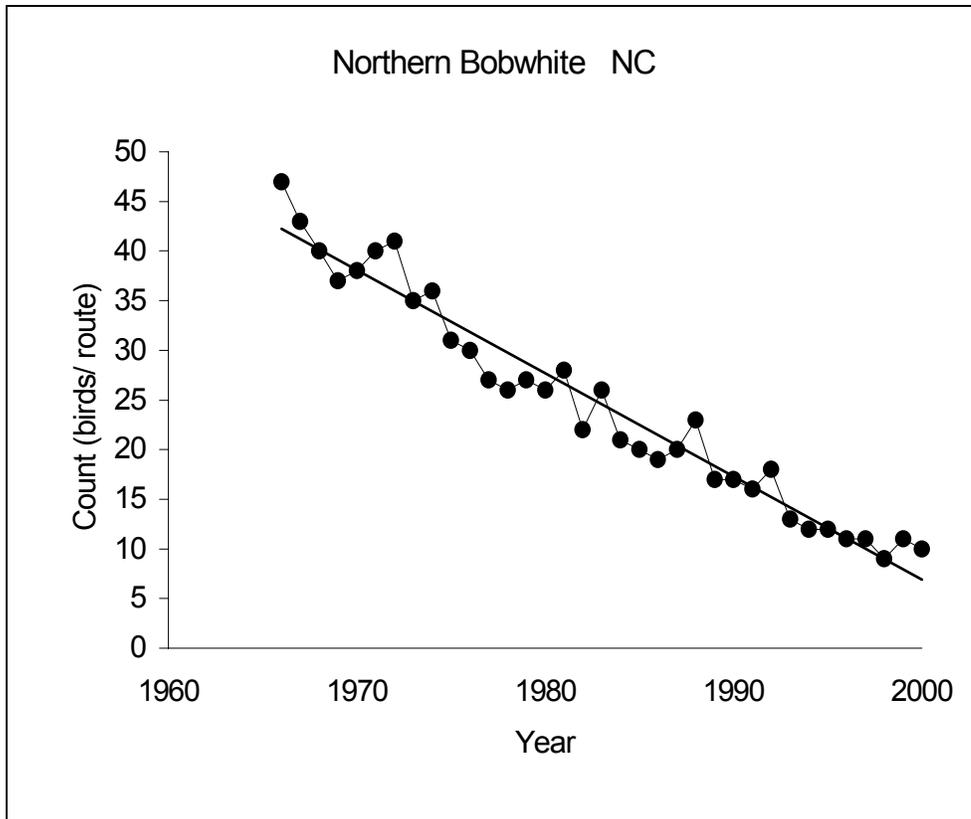


Figure 2. Northern Bobwhite decline in North Carolina, 1966-2000 (data from Sauer et al. 2001).

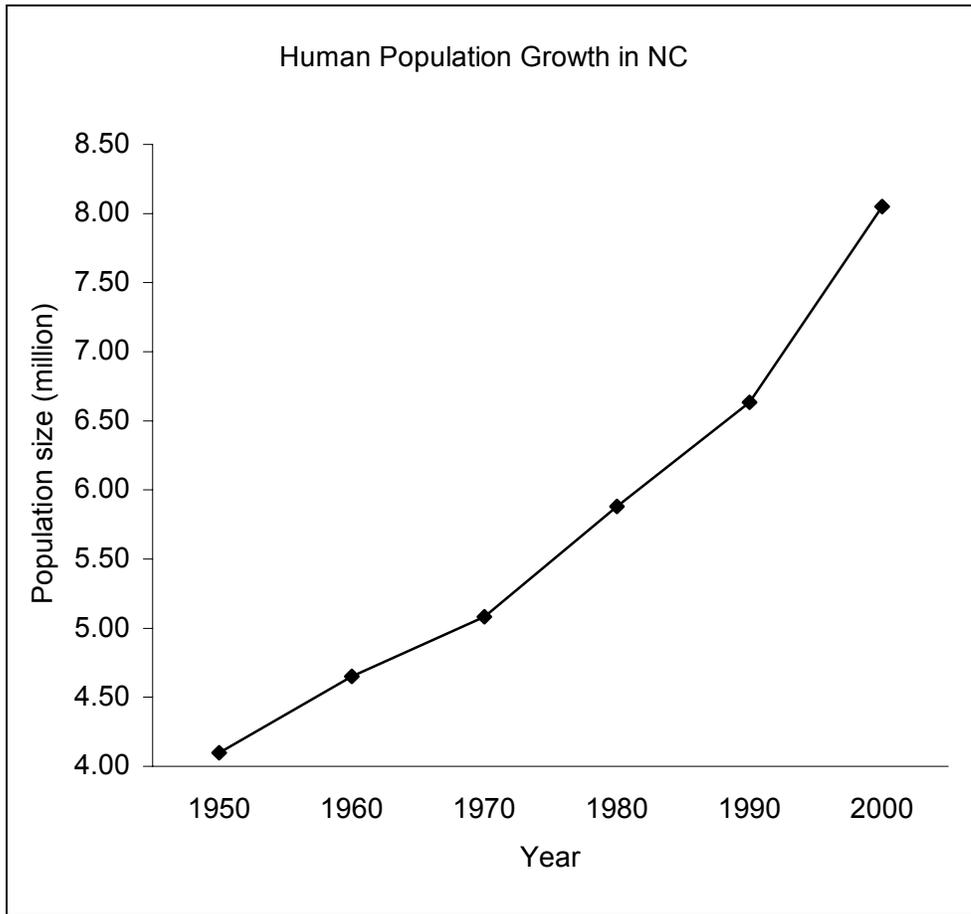


Figure 3. Human population growth in North Carolina, 1950-2000 (*data from U.S. Census Bureau*).

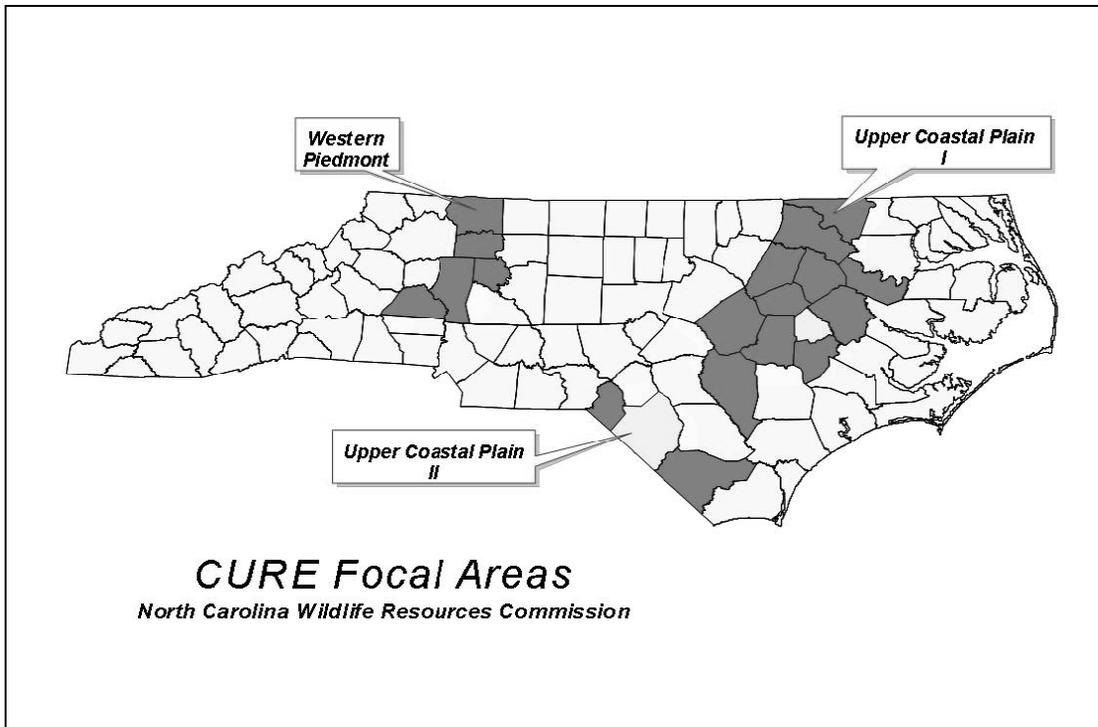


Figure 4. Locations of counties sampled during landowner survey, CURE Program Focal Areas, North Carolina, 2001 (*image provided by D. Howell, NCWRC*).

CHAPTER 2

A SURVEY OF PRIVATE LANDOWNERS IN CURE PROGRAM FOCAL AREAS IN NORTH CAROLINA

INTRODUCTION

Since the early part of the twentieth century, wildlife managers have recognized the promise of, and the need for, better wildlife management on private land (e.g., Leopold 1934, 1949). Yet here in the United States, where private land predominates, most conservation and management efforts have focused on publicly owned land (Knight 1999). This oversight of private land management opportunities likely evolved out of conflicting traditions of private property rights, public ownership of wildlife, and state regulation of wildlife (Matthews 1986). Leopold (1934) clearly understood and expressed this conflict:

“The crux of the problem is that every landowner is the custodian of 2 interests, not always identical, the public interest and his own. What we need is a positive inducement or reward for the landowner who respects both interests in his actual land practice. All conservation problems – erosion, forestry, game, wild flowers, landscapes – ultimately boil down to this.”

Today, economics drives the majority of landowner decisions. Without sufficient incentives, landowners often perceive wildlife as a cost or liability (Higbe 1981, Noonan and Zagata 1982). Currently, property rights are increasingly juxtaposed with stewardship responsibilities and never before has the need to blend public and private land management been so great (Knight 1998, Knight and Landres 1998).

In recent years, significant efforts have been made by private non-government organizations, state, and federal agencies to address and improve private land management. On a national level, organizations like The Nature Conservancy work to preserve habitat through land acquisitions and conservation easements with private landowners. Land trusts do similar work on a state or regional level. Federal agencies,

too, have improved the resources and opportunities available to private landowners across the country (NRCS 1996). One way state agencies are addressing private land management is by supporting research efforts aimed at improving current private land programming and landowner education and targeting. Such research was recently initiated in North Carolina.

The mission of the North Carolina Wildlife Resources Commission (NCWRC), is to “manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State of North Carolina” (North Carolina General Statute § 143-239). In light of recent growth trends, however, this goal will be increasingly difficult to meet without the cooperation of private landowners.

North Carolina is 84% privately owned (NRCS 1992), leaving a small proportion of land in state or federal ownership. The state experienced a 12% increase in population from 1990 to 1997, and population numbers have grown steadily since 1950 (U.S. Census Bureau 2000, Figure 1). North Carolina ranks sixth in the country for total acres of land developed between 1992 and 1997 (NRCS 1997). As land development and population growth rates have increased, wildlife habitat has been lost. Early successional habitat and small game populations in the Southeast have been especially impacted over the past 40 years. Based on Breeding Bird Survey data, bobwhite quail (*Colinus virginianus*) have experienced a greater than 60% decline since the mid-1960’s (Sauer et al. 2001). This decline is due largely to degradation and reduction of habitat, in part because of urbanization and changing landuse practices across the species range (Church et al. 1993). With this in mind, the need for management beyond wildlife refuges, game lands, and other state-owned property has never been greater.

In recognition of declining wildlife populations associated with early successional habitat and the need for influence over habitat on private land, the Small Game Committee of the NCWRC established, on August 30, 2000, a number of objectives to meet their goals of restoring small game habitats and populations. One objective was to “identify specific geographic areas in the state where the potential to improve quail habitats and populations on private land are greatest, and concentrate resources and target programs into these geographic areas” (Cobb 2000). In order to achieve this objective, the NCWRC launched the Cooperative Upland habitat Restoration and Enhancement (CURE) Program, an initiative to enhance early successional habitat and to target landowners that control this habitat across the state. Through a rigorous Geographic Information System analysis of statewide landuse/ land cover data, NCWRC staff established three Focal Areas (FAs) in the state where resources and habitat enhancement work will be concentrated.

Currently, however, a factual basis to effectively target private landowners for wildlife habitat initiatives is lacking. A solid understanding of landowner attitudes and behaviors relative to wildlife habitat is necessary to ensure the success of the CURE Program and to improve current understanding of the decision making processes of landowners. As of yet, this information is undocumented specific to wildlife habitat in the state. So as an initial component of the CURE program, human dimensions survey research was undertaken in the three FAs (Figure 2; Upper Coastal Plain I, Upper Coastal Plain II, and Western Piedmont are hereafter referred to as UCP1, UCP2, and WP, respectively) in order to characterize and compare landowners’ views about wildlife and early successional habitat on their property. Results will be used by the NCWRC to

develop programming appropriate to landowners in each CURE FA. Ultimately, this research will provide the NCWRC with baseline information from which to conduct future program evaluations and will aid in fostering better wildlife management on private land across the state.

OBJECTIVE

The objective of this research was to conduct a survey of private landowners in CURE Program Focal Areas of North Carolina in order to:

1. Characterize and compare landowner attitudes and behavior regarding wildlife management on private land.
2. Validate either a regionally specific or a statewide approach to promoting and implementing the CURE Program.

METHODS

A telephone survey approach was employed to meet the study objective. This approach was selected over other survey types (e.g., mail return, personal interview) to maximize sample size, streamline data collection, and improve the depth of the survey (Rea and Parker 1997). A 70 question, 12-15 minute interview schedule was designed to obtain information pertaining to both landowner demographics, and landowner attitudes and behavior regarding wildlife and land management issues. The final interview schedule was implemented through Responsive Management, Inc. (Harrisonburg, VA 22801).

Twenty counties fell within the FA boundaries set by the CURE Program. Due to difficulty in obtaining data from two counties (Robeson and Greene), 18 counties were included in the final sampling frame. Landowner records were obtained for these

counties through county tax, planning, and GIS offices. Records varied in format and content; ten counties had data available to query in digital form, while 8 counties sent hardcopy records. A sampling rule was set to survey only private landowners who owned ≥ 50 acres so that the results applied to those most likely to be targeted for conservation programming. Some offices were not able to query their databases for this information, so as records were obtained, they were cleaned of extraneous data, and sorted to include only the names and addresses of all landowners who fit the sampling rule. Duplicate landowner records (due to ownership of multiple tracts) were deleted in order to compile a complete census of all available landowners by county (as opposed to a census of owners of land tracts greater than 50 acres in size).

A stratified random sampling approach was used to select individuals for the survey. Total required sample size was set at 900 after consideration of desired parameter significance levels ($\alpha = 0.05$), maximum allowable sampling error, sub-group population variation, time constraints, and survey costs (Fowler 1984). Because data acquisition resulted in a complete census of the target population, sample sizes per FA were selected in proportion to the total population size, and individual county sample sizes were selected in proportion to the population of the FA (Table 1). Due to difficulty in finding landowners who met sampling requirements in Scotland County, sample size in that county was severely limited. In an effort to meet the requirement, every landowner in the county record was contacted.

Pilot study survey

A pilot study was conducted with landowners in Iredell County in March, 2001 to gather preliminary information and gauge the possible range of opinions among our target population (Fowler 1984, Rea and Parker 1997). All landowners included in the pilot study were involved in early successional habitat enhancement work on their land through a local Quail Unlimited chapter. A mail return questionnaire (Appendix A) was developed and distributed to landowners at a meeting on March 29, 2001. Twenty questionnaires were distributed and twelve (60%) were returned.

The questionnaire included open- and close-ended questions and was divided into two sections. Section A encompassed questions regarding land ownership, land management, and broad demographics. Section B dealt with issues of wildlife values, responsibility towards wildlife, and interest in incentives programs. In many cases, we were interested in finding out how a landowner might interpret a certain question and therefore left it open-ended in order to compare among respondents (e.g., income sources). We considered the responses gathered during this pilot study in designing the final survey for our target audience in each focal area. For example, in an open-ended fashion, we asked respondents to indicate their major sources of income (e.g., farming, dairy production, retirement). We used the responses to generate appropriate answer categories for a similar close-ended question in our final questionnaire (answer categories: agricultural production, forestry production, livestock production, hunting/recreation, income not earned from land holdings).

Focus group research

Prior to commencing our final landowner survey, we held a series of four small, informal landowner meetings as another form of pre-testing. In UCP1 meetings were held in Johnston County (three participants) and Edgecombe County (three participants) (two meetings were held in UCP1 to better represent its geographic size); in UCP2 a meeting was held in Robeson County (one participant); in the WP a meeting was held in Iredell County (five participants). The purpose of these meetings was to: 1) generate discussion about issues pertinent to the survey; 2) assess the knowledge level of landowners with regard to the survey topic; and 3) gain a better understanding of regional landowner perceptions, opinions, beliefs, and attitudes about wildlife on private land.

Landowner contacts were made through local Natural Resources Conservation Service officials, per the suggestion of researchers involved in similar work (Eisen-Hecht, personal communication). Participants were contacted by telephone and invited to attend the voluntary discussion meeting; 7-10 participants were invited to each of the four meetings. A university researcher skilled in landowner interactions moderated the discussions and a member of the survey team was present to take discussion notes.

Topics covered in focus group discussions included landownership changes, land values, state agency program involvement, actions to benefit wildlife, responsibility towards wildlife, willingness to pay, property appearance, incentives options, understanding of “early successional habitat,” attitudes towards hunting, and future intentions for land.

Through our focus group meetings we identified issues important to landowners in each sampling region prior to surveying. We also used landowner responses to

improve the clarity of our survey instrument with reference to specific phrases and answer categories. Last, we confirmed our belief that such survey research is necessary by uncovering some regionally variable attitudes towards wildlife, state agencies, and private land management (see Appendix B for a complete report on focus group findings).

Survey implementation

On June 18, 2001 the survey protocol and questionnaire were exempted from further review and approved for use by the NCSU Institutional Review Board for the Use of Human Subjects in Research, as outlined in the Code of Federal Regulations (Exemption 46.101.b.2). In order to inform potential participants of their selection, state the goals of the survey, and improve response rates, a preliminary letter (Appendix C) was sent to all selected individuals in mid-September. Before coding and implementation, the final survey instrument (Appendix D) was reviewed by NCSU faculty, NCWRC staff, and Responsive Management staff. The survey instrument was transferred to a Computer Assisted Telephone Interview (CATI) system, coded for responses, pretested with 40 individuals, and implemented on September 27, 2001. Calls were made Monday thru Friday (9am - 9pm), and Saturday (10am- 4pm). Individuals who were unavailable at the time of the call were called back a minimum of five times (often eight to ten times) to reduce nonresponse bias. Subsequent calls were placed at different times of the day, on different days of the week. Appointments were set up for those who specified a convenient interview time. Nonresponse bias was minimized by converting initial refusals into completed interviews. Data collection was completed on

November 19, 2001. All questions asked in the survey were directed at property owned by respondents in a single county. Results below reflect landowner responses in relation to individual tracts ≥ 50 acres in size, not necessarily in relation to their total land holdings in the state.

Data analysis

All interval and selected ordinal level variables were tested for normality using the Kolmogorov-Smirnov test. Due to nonnormal distributions, these variables were examined for regional differences using a Kruskal-Wallis test. Pairwise regional comparisons were made using Wilcoxon Z approximations. Though these variables were examined through nonparametric analyses, means or medians are reported in the results for qualitative comparison. Means and standard deviations are reported for all continuous variables mentioned in the text that do not differ regionally. Chi-square tests of independence were used to examine categorical variables for regional differences. Chi-square tests were also used to test for associations between ten attribute variables and two response variables, RESPONSBL (responsibility for providing wildlife habitat on land) and MANAGEWL (actively manage for wildlife on land). Adjusted residuals (AR) were examined for all Chi-square tests in order to identify which cells deviate from independence. An adjusted residual > 2 in absolute value is evidence against independence; values exceeding 3 provide strong evidence against independence (Agresti and Finlay 1997). In order to maintain a minimum of five responses per cell, categories were merged or excluded when necessary and acceptable. For example, “Don’t know”, “Not applicable”, and/or “Refused to respond” categories were often excluded from

analyses. Ten attribute variables were tested for associations using Spearman's rho (the nonparametric version of Pearson correlation). Seven of these variables were ordinal level data; three were recoded from interval level data into ordinal categories in order to meet the assumptions of Spearman correlation. All analyses were conducted using SPSS 11.0.0 (SPSS Inc. 2000). Sample size (N) is reported for analyses in which it differed from the total number of completed interviews.

To address item nonresponse, the frequency of responses in the "Don't know" and/or "Refused to answer" categories was examined for individual questions. Questions that received more than 10% of responses in either of these two categories were considered nonresponse. These questions were examined for clarity, sensitivity, and bias to deduce a possible explanation for the nonresponse.

RESULTS

Response rate

A total of 2,753 calls were attempted (Table 2). Of those attempts, 167 were disconnected/ non-working numbers and 21 were fax/ computer modems, leaving 2,565 calls made to viable people. Seventy-six calls were made to respondents who were deaf or had language barriers and 524 were made to ineligible respondents (e.g., deceased, own < 50 acres). This resulted in a total of 1,965 working eligible numbers; 397 people refused to participate, 671 were callbacks or soft refusals (e.g., not available, not interested), and 915 people completed interviews. Overall response rate, calculated as total completed calls (N = 915) divided by number of working eligible numbers (N = 1,965) was 46.6%. This rate reflects a relatively high response in comparison to other

telephone surveys conducted by Responsive Management (Duda, personal communication). It is also comparable to other rates reported in the literature. Tarrant et al. (1997) conducted a telephone survey of four wildlife constituent groups in the southeast and reported a 43.8% response rate. In a mail-return survey of Minnesota landowners, Svoboda (1980) had return rates of between 32.6% and 35.7% for various landowner subgroups. Raedeke et al. (2001) achieved a response rate of just under 50% in a mail-return questionnaire in Missouri. When we considered only flat refusals (excluding call backs and ‘soft refusals’), response rate increased to 70.7%. It was not possible to calculate a response rate by region because county identification was made for completed interviews only. Further examination of the data, for patterns in item nonresponse or poor representation of known landowner characteristics, does not suggest that there are any particular attributes or characteristics of landowners that would make response rate differ by region. As previously mentioned, overall nonresponse bias was addressed a priori by making all possible attempts to reach selected individuals. Those who initially declined to respond were encouraged to complete the interview at a more convenient time.

Variable descriptions

Variables were described and identified by scale (nominal, ordinal, or interval) (Table 3). Descriptive statistics were calculated for all variables, along with indication of regional significance if present (Appendix E). Non-normal distributions were identified for all variables included in Kolmogorov-Smirnov tests.

Demographic and landownership characteristics

Most respondents (70.0 %) were male. Respondents ranged in age from 18 to 99 ($\bar{x} = 63.48$, $SD = 13.20$). Over one-third of respondents (33.5%) had a high school diploma, 23.5% had a college degree, and 20.4% had some college or trade school education. The remaining respondents had some high school (11.1%) or a graduate or professional degree (11.1%). More than one-quarter (27.6%) of respondents earned their primary income through retirement, social security, or pensions. Less than one-fifth (19.1%) of respondents belonged to or gave money to environmental/ conservation organizations ($N = 879$). Few respondents (9.9%) were currently involved in state or federally subsidized land programs ($N = 872$). Nearly all respondents (89.3%) intended to pass their land on to the next generation as opposed to selling it in the coming years.

Regional differences in landowner characteristics

Four land ownership variables differed among landowners in UCP1 and the WP: average parcel size, number of parcels ≥ 50 acres, acreage owned, and average size of largest parcel (Table 4). Landowners in UCP1 owned more parcels ($\bar{x} = 3.89$) than those in the WP ($\bar{x} = 2.30$, $Z = -2.615$, $p = 0.009$, $N = 814$). They owned more parcels 50 acres or larger ($\bar{x} = 1.77$) than those in the WP ($\bar{x} = 1.37$, $Z = -3.051$, $p = 0.002$, $N = 809$), as well as more total land ($\bar{x} = 228.35$ acres) than those in the WP ($\bar{x} = 144.55$ acres, $Z = -4.679$, $p < 0.001$, $N = 788$) and the size of their largest parcel ($\bar{x} = 129.77$ acres) was significantly greater than landowners in the WP ($\bar{x} = 105.03$ acres, $Z = -3.700$, $p < 0.001$, $N = 786$).

To better classify their land holdings, respondents were asked to indicate what percentage of their land was made up of each of five landuses: 1) rowcrop, 2) pasture/hay production, 3) standing forest (> 5 years old), 4) clearcuts (< 5 years old), 5) other (e.g., home, lawn, wetlands, roads, open fields). Rowcrop, pasture, and clearcut proportions differed regionally (Table 4). Land holdings in the WP included a significantly lower proportion of rowcrops ($\bar{x} = 21.70\%$) that in either UCP1 ($\bar{x} = 42.07\%$, $Z = -8.543$, $p < 0.001$, $N = 773$) or UCP2 ($\bar{x} = 43.36\%$, $Z = -5.384$, $p < 0.001$, $N = 323$), but a higher proportion of pasture ($\bar{x} = 31.08\%$) than the other two regions (UCP1, $\bar{x} = 7.09\%$, $Z = -11.534$, $p < 0.001$, $N = 726$; UCP2, $\bar{x} = 5.79\%$, $Z = -6.772$, $p < 0.001$, $N = 309$). More land in UCP1 ($\bar{x} = 15.84\%$) was in clearcuts < 5 years old than in the WP ($\bar{x} = 10.10\%$, $Z = -2.606$, $p = 0.009$, $N = 357$).

Percent of income earned from farming and total annual income also differed regionally. Only 9.7% of respondents earned their entire annual income by farming; 23.7% receive no revenue from farming, and 59.3% made up to half of their income by farming. UCP1 landowners earned a higher percentage of their income from farming ($\bar{x} = 30.26\%$) than did landowners in the WP ($\bar{x} = 18.92\%$, $Z = -5.125$, $p < 0.001$, $N = 668$). Total household income was reported by just over two-thirds of all respondents ($N = 597$). Of those, 30% reported incomes of \$75,000 or more, 18% made between \$50,000 and \$74,999 per year, and 14% made between \$30,000 and \$39,999 per year. UCP1 landowner annual household incomes (median category = \$50,000 - \$74,999) were significantly higher than those in the WP (median category = \$40,000 - \$49,999, $Z = -2.442$, $p = 0.015$, $N = 831$). Primary household income sources differed regionally

when divided into two broad categories: (a) income earned from land holdings (agricultural production, livestock production, or forest production), (b) income not earned from land holdings (separate job). Most respondents (73.9%) earned their primary household income through separate earnings (category b), though in UCP1 more landowners than expected reported primary household income from production associated income (category a) (AR = 2.4) and in the WP more than expected reported separate job earnings (AR = 3.0).

Just under half (47.3%) of respondents lived on their property. Fewer than expected lived on their property in UCP1 (AR = -3.4) and more than expected did so in the WP (AR = 4.3). Of the remaining 53% who did not live on their property, 57.6% lived within 10 miles of the property, 20.9% lived 11-49 miles away, and 21.5% lived more than 50 miles away or out of state. Most respondents (73.0%) reported living in a rural area; however in UCP1 more than expected lived in a city > 10,000 people (AR = 4.3) and fewer people lived in a rural area (AR = -3.4); conversely, in the WP more people lived in a rural area (AR = 3.2) and fewer people lived in a city (AR = -4.4).

With regard to land management decisions, 73.9% of landowners make those decisions themselves, 16.4% left decision making to land leasees, 3.6% had a hired land manager and 6.0% reported that someone made those decisions (the most common answers were their husband, son, brother, or a combination of the owner and the leasee). In UCP1 fewer landowners than expected (AR = -2.3) and more leasees than expected (AR = 2.1) made land management decisions. Conversely, in the WP land management decisions were made by more landowners than expected (AR = 2.0) and fewer leasees than expected (AR = -2.7). The majority (60.3%) of respondents leased some of their

land to others for agricultural production. This type of leasing was more frequent than expected in UCP1 (AR = 5.1) and less frequent than expected in the WP (AR = -5.8). Most landowners leased out 50 acres (median and modal value), though responses ranged from 1 -1000 acres. Ninety-five percent of those who leased land to others for agricultural production leased less than 200 acres.

Land values

Respondents were asked to rank the importance of 13 land values. For eight values > 50% of the responses were in the “Very important” category: property appearance, knowing wildlife lives on their property, maximizing profits, being able to watch wildlife on their land, caring for and protecting fish and wildlife and their habitats, the long-term financial investment of their land, lifestyle or heritage value associated with the land, and owning or maintaining undeveloped land. Two values received greater than 50% of responses in the “Very unimportant” category: generating revenue from hunting opportunities on land, and having other personal outdoor recreation opportunities on land. The remaining 3 values, receiving payment to initiate habitat work or enhancement on their property, having personal hunting opportunities, and providing hunting opportunities for others, did not show strong response trends.

In UCP1 (Table 5), more people than expected responded that “receiving payment to initiate habitat or enhancement work” (AR = 3.3) and “maximizing profits” on their land were very important (AR = 5.2). More people responded that “being able to watch wildlife” was very unimportant (AR = 3.2). Responses for the value “generating revenue

from hunting opportunities on land” were higher than expected in the somewhat important (AR = 2.7) and the neutral (AR = 2.7) categories.

In UCP2 (Table 6), more respondents than expected felt that “being able to watch wildlife” on their land (AR = 2.1) and the “long-term financial investment” of their land (AR = 2.1) were very important.

In the WP (Table 7) landowners ranked “receiving payment to initiate habitat or enhancement work” very important far less than expected (AR = -3.6). They responded in higher frequencies than expected that this value was somewhat unimportant (AR = 2.2). “Maximizing profits” was ranked very important far less than expected (AR = -6.5); it was ranked somewhat unimportant (AR = 4.4) and very unimportant (AR = 3.5) more than expected. “Being able to watch wildlife” was ranked very important more than expected (AR 2.2). More landowners than expected ranked “generating revenue from hunting opportunities on land” very unimportant (AR = 3.4). Fewer than expected ranked the “long-term financial investment” of their land very important (AR = -2.3), and more responded that this value was somewhat unimportant (AR = 3.4).

Landowners were also asked to rank five land management goals in relation to each other: maximizing profits, hunting opportunities, managing wildlife habitat, recreation, owning or maintaining undeveloped land. Values were ranked in the following order of importance (1 is most important, 5 is least important): 1) maximizing profits ($\bar{x} = 1.93$), 2) managing wildlife habitat ($\bar{x} = 2.84$), 3) owning or maintaining undeveloped land ($\bar{x} = 3.04$), 4) hunting opportunities ($\bar{x} = 3.43$), and 5) recreation ($\bar{x} = 3.75$). Three goals, maximizing profits, managing wildlife habitat, and recreation, differed regionally (Table 4). Landowners in the WP ranked maximizing profits lower in

importance ($\bar{x} = 2.31$) than those in UCP1 ($\bar{x} = 1.77$, $Z = -6.289$, $p < 0.001$, $N = 782$) or UCP2 ($\bar{x} = 1.96$, $Z = -2.631$, $p = 0.009$, $N = 314$). They ranked managing wildlife habitat ($\bar{x} = 2.69$) higher than landowners in UCP1 ($\bar{x} = 2.87$, $Z = -2.048$, $p = 0.041$, $N = 782$) or UCP2 ($\bar{x} = 3.08$, $Z = -2.528$, $p = 0.011$, $N = 314$). WP landowners also ranked recreation ($\bar{x} = 3.53$) higher than those in UCP1 ($\bar{x} = 3.86$, $Z = -3.146$, $p = 0.002$, $N = 782$).

Wildlife management decisions

Just over three-quarters (75.7%) of respondents ($N = 847$) felt a responsibility for providing habitat for wildlife on their land. Fewer than expected felt responsible in UCP1 ($AR = -2.6$) while more than expected felt responsible in the WP ($AR = 2.6$). However, most (88.3%) would not pay a management agency for implementing a wildlife management plan on their land. Those who responded in this way were then asked if they would be willing to allow a management agency to implement a wildlife management plan on their land, if paid for the permission to do so; 43.1% said “no,” 36.0% said “yes,” and 20.9% responded they didn’t know ($N = 808$). Significant regional differences were detected. More than expected from UCP2 responded that they would do so if paid ($AR = 2.2$), while fewer than expected did in the WP ($AR = -2.9$); more than expected in the WP responded that they didn’t know ($AR = 2.6$). Under half of all respondents (46.8%) actively manage for wildlife on their land. Regional differences reveal that fewer than expected actively manage in UCP1 ($AR = -2.8$) and more than expected actively manage in the WP ($AR = 2.1$). Landowners who actively manage were then asked to report what they do to help wildlife (Figure 3). The most

commonly reported answers were “plant food plots” (60.6%), “keep borders of vegetation around fields” (30.3%), and “leave strips of un-harvested grain at field edges” (16.2%). Those who do not actively manage were asked why (Figure 4). Nearly one-third (30.8%) responded “I don’t see a need to manage for wildlife,” and 21.9% answered they didn’t know. Finally, when asked to note which type of wildlife they prefer MOST, nearly equal proportions of respondents answered small game and big game (31.7% and 30.0%, respectively); one-quarter (25.2%) of respondents don’t prefer any type of wildlife over another.

Enhancement practices

Most landowners appear willing to participate in timber thinning (66.0% somewhat or very likely, N = 802), planting wildlife food and cover plots (64.0% somewhat or very likely, N = 785), establishing field borders of natural vegetation (62.5% somewhat or very likely, N = 769), and using herbicides to control vegetation (54.4% somewhat or very likely, N = 787). Two enhancement practices met with overall aversion; prescribed burning (57.1% somewhat or very unlikely, N = 785) and use of fences to create habitat borders along streams while controlling cattle movement (54.8 % somewhat or very unlikely, N = 549). Regional differences are apparent in response to prescribed burning and timber thinning. More respondents than expected are very likely to participate in prescribed burning in UCP2 (AR = 4.2); more than expected are very unlikely to participate in the WP (AR = 5.3). More respondents in UCP1 (AR = 4.0) and UCP2 (AR = 2.1) are very likely to participate in timber thinning while response

frequencies in the WP were higher than expected for the “Somewhat unlikely” (AR = 4.6) and “Very unlikely” (AR = 3.8) categories.

Assistance options

Respondents were asked about their interest in five forms of assistance: 1) general information, 2) technical guidance, 3) monetary incentives, 4) tax incentives, and 5) wildlife agency initiated labor and/or maintenance. No single assistance option was favored more than others, and in fact the highest proportion of responses for every option was in the “Not at all interested” category. Tax incentives and general information were options that received the highest proportion of responses in the “Very Interested” category (34.7% and 31.6%, respectively). Strong disinterest was reported for technical guidance (53.3 %), wildlife agency initiated labor and/or maintenance (51.4 %), and monetary incentives (45.4 %). Regional differences were detected for the options monetary incentives and wildlife agency initiated labor. More respondents than expected in UCP2 responded that they were very interested in monetary incentives (AR = 2.9) and in wildlife agency initiated labor (AR = 3.2). In the WP fewer than expected responded that they were very interested in monetary incentives (AR = -2.6).

Attribute associations

Ten attribute variables were tested for linear associations using Spearman’s rho correlation coefficient (Table 8). Due to large sample size, many correlations were significant. Five associations were moderately strong (> 0.350 in absolute value): PRIJOB (primary household income source) and FARMING2 (percent income earned

from farming) (-0.704), HOWNEAR (distance from home to property) and AREA (characterization of area based on population) (0.437), INCOME (total annual household income) and AGE2 (age) (-0.430), LEVED (education level) and INCOME (0.389), LIVEON (live on property) and AREA (0.356). The strong relationship between PRIJOB and FARMING was expected due to the nature of the variables; those who do not earn much from farming would likely have a separate job for earned income. The other associations do suggest weak relationships between the variables, yet none of the correlations are strong enough to suggest that the variables could be surrogates for one another.

Characteristics of ‘pro-wildlife’ landowners

Chi-square tests were used to compare the ten independent variables used in the previous analysis with landowner responses for two response variables: 1) RESPONSBL (feeling responsible towards wildlife on their land), and 2) MANAGEWL (actively managing wildlife on their land) (Table 9). Five variables were significant with responsibility towards wildlife: AREA, PRIJOB, INCOME, AGE2 and GENDER (male/female). Male landowners (AR = 3.5) who live in rural areas (AR = 2.7), make their primary income source from land production (AR = 2.7), and make \$75,000 or more per year (AR = 3.4) are more likely to feel responsible for providing habitat for wildlife on their land. Landowners older than 70 (AR = -2.5) are less likely to feel responsible. Seven variables were significant with actively manage for wildlife: LIVEON, HOWNEAR (distance from home to property), AREA, PRIJOB, FARMING2, AGE2, and GENDER. Male landowners (AR = 6.5) who live on their property (AR = 2.8), or

less than 10 miles away from their property (AR = 3.2), who live in a rural area (AR = 3.3), and make their primary income source from land production (AR = 2.4) are more likely to actively manage for wildlife on their land. Those who make less than 25% of their income from farming (AR = -2.9), and are older than 70 (AR = -3.9) are less likely to actively manage.

Item nonresponse

Six survey questions met item nonresponse requirements (Table 10). Four questions dealt with issues of income level or monetary payment, which are considered a highly sensitive topic in survey research (Rea and Parker 1997). With this in mind, it was not unexpected that questions of this nature would be a source of nonresponse.

Nonresponse was also detected for a question regarding likelihood of participating in herbicide use to control vegetation, and in this instance the nonresponse is suspected to be due to unfamiliarity with the subject or the wording of the question. Finally, nonresponse was detected for the question “Why don’t you manage for wildlife on your land?” Due to the open-ended nature of the question, respondents may have felt put on the spot to provide an answer and simply responded that they didn’t know.

DISCUSSION

Regional Characterizations

The purpose of this survey effort was to characterize and compare landowners in three areas of North Carolina in relation to their views about wildlife and habitat

management on their property. Our results identify many landowner and landuse characteristics that are regionally unique.

Landuse characterizations made by survey respondents mirrored the regional patterns confirmed in the initial GIS analysis for CURE Program development. Most notably, Coastal Plain landowners reported a significantly higher proportion of land in rowcrops than did those in the Western Piedmont, but a significantly lower proportion of pastureland by comparison.

Landowners in UCP1 earned more money than those in other regions, and a higher proportion of their income came from farming. Profit maximization was a primary land management goal in the region and was thus valued highly. Most people in this region did not live on their property and many lived in urban settings. Leasing land for agricultural production was more common than in the other regions, and more landowners left their land management decisions to those who lease the land. Fewer people felt responsible for providing wildlife habitat and fewer managed for wildlife. Yet landowners appeared willing to participate in a variety of enhancement practices, such as establishing field borders, planting food and cover plots, and thinning timber.

Landowners in UCP2 were similar to those in UCP1 in most respects. It is important to note here, however, that due to sampling constraints the UCP2 region is overwhelmingly represented by a single county (81 out of 84 completed interviews in this region came from Columbus County). Future survey efforts should focus on attaining better representation of this region. Their responses to some questions, however, did set UCP2 landowners apart. Landowners in this

region were more willing to work with a management agency to implement a wildlife management plan if paid to do so. They were also more interested in monetary incentives and agency initiated labor than in the other two regions. Two land values, watching wildlife and the long-term investment of their land, were more important to UCP2 landowners than they were to landowners in other regions. Like UCP1 landowners, prescribed burning and timber thinning were both readily accepted in the region.

WP landowners were often distinguished in analyses. In addition to geographic location, land ownership characteristics and landuse types differentiated WP landowners from those in the Coastal Plain. In the WP, most respondents lived on their property, and many lived in rural areas. Most earned income from separate jobs, and they earned significantly less than landowners in UCP1. Landowners most often made their own land management decisions and more respondents than expected felt responsible for providing wildlife habitat, actively managed for wildlife habitat, and valued wildlife highly. However, landowners in the WP were not particularly interested in initiating a wildlife management plan with agency help, even if paid to do so. Profit and financial incentives were not highly valued by WP landowners, nor were enhancement practices such as timber thinning or prescribed burning.

Comparative Studies

Select demographic characteristics were compared to North Carolina Census of Agriculture data (USDA National Agricultural Statistics Service 1999), to provide a basis

for comparison of how well the population subset evaluated in our survey represented a pre-existing statewide landowner database. It is important to note that Census of Agriculture data differ from our landowner survey in three major ways, making it inappropriate to compare them statistically, but still valuable for broad comparison. First, the Census of Agriculture, as the name implies, is a count of all farms; our data set was chosen without predetermined knowledge of land use. Second, the demographic characteristics reported in the Census of Agriculture are accurate of those farm operators (be they full owners, tenants, or other); we surveyed only owners. Third, there are no minimal acreage requirements for Census of Agriculture data; our data are representative only of those who own 50 acres or more. And finally, Census of Agriculture data represent statewide trends; our data are representative of three relatively small regions of the state.

Four variables, age, gender ratio, average size of property, and principal occupation, were compared. We found that landowners in our study are on average over 8 years older ($\bar{x} = 63.5$) than those represented by Census of Agriculture data ($\bar{x} = 55.2$). The gender ratio (% male: % female) for our study was 70.0: 30.0, while the ratio was more skewed in the Census of Agriculture (91.8: 8.2). On average, landowners survey in our study owned more land ($\bar{x} = 199$ acres) than those in the Census of Agriculture ($\bar{x} = 185$ acres). Finally, a smaller proportion of landowners surveyed in our study farmed or were involved in land production as their principal occupation ($\bar{x} = 26.1\%$) as compared to data reported in the Census of Agriculture ($\bar{x} = 49.3\%$). Again, a major difference between these data sets is that the Census of Agriculture represents agricultural landowners, regardless of farm size, whereas landowners sampled in our survey were

selected with respect to the size of their land holdings, regardless of how that land is used. The differences found between the data sets would therefore be expected due the nature of the populations represented by each. Though a portion of respondents in our survey were involved in agriculture, our data set do not appear to represent the agricultural population as a whole.

Many of the demographic variables that appear influential in this study (income, age, area characterization, and gender) are also commonly cited in other landowner studies. The results of survey research conducted on Conservation Reserve Program (CRP) land in Virginia parallel our results most strongly. Miller and Bromley (1990) reported that desire to improve wildlife habitat was influenced by three attribute variables: age, years in operation, and gender. They characterized a CRP participant most likely to desire wildlife habitat improvement as being a 45-54 year old male farming > 40.5 ha (\approx 100 acres). Occupation, education, and whether respondents were raised in an urban or rural setting were influential in predicting wetland landowners' attitudes towards wetland values in a southern Ontario study (Kreutzwiser and Pietraszko 1986). In a gender study regarding attitudes and behavior towards wildlife Kellert and Berry (1987) found that men are more familiar with wildlife management issues than women. Consequently, it would be expected that they manage for wildlife more frequently. Our results support this claim.

The common conclusion among these studies is that select demographic variables appear to distinguish landowners who value particular natural resources, as measured through their attitudes or behavior. Studies focused on more general conservation on private land have emphasized a need for integrated and coordinated programming efforts

between regional and local agencies, because information sources (e.g., a local conservation group vs. a federal agency) can heavily influence a landowner's willingness to adopt conservation practices on their land (Messmer et al. 1996, Sutherland 1997, Fisher 1998). Researchers have been hesitant to generalize about how study results can be applied to private landowners as a whole, due to regional variation in landowner characteristics, landuse patterns, and management goals (McIvor and Conover 1994).

Wildlife and the Private Landowner in North Carolina

Though enhancement and assistance options met with mixed approval in the CURE FAs, wildlife and wildlife habitat still appear to be a priority among landowners. Wildlife-related land values consistently ranked high among respondents, second only to profit when compared to four other common land management goals. However, we did identify an inconsistency between landowner attitudes and their behavior by comparing two survey questions, and posit that it would be misleading to base the success of private land management on attitudes alone. Just over three-quarters of all respondents reportedly feel a responsibility to provide habitat for wildlife on their land, yet under half of respondents actively manage for wildlife. This finding is consistent with findings of Miller and Bromley (1990), who noted a great disparity between the number of people who expressed interest in improving wildlife habitat on their CRP land and the number of people who actually implemented work. Landowners may indeed feel that they provide habitat without doing anything (most landowners in our survey indicated that they do not actively manage because "(they) don't see a need to manage for wildlife"). But from a management perspective, the most useful measure of an active "pro-wildlife" landowner

is not what they say, but what they do. The typical landowner who is actively managing wildlife in these areas of North Carolina is a male who is involved in some sort of land production, most likely agriculture, and who lives on or very close to his property.

The NCWRC should adapt habitat incentives programs and assistance options to work with differing regional perspectives and needs. Based on the regional characterizations, landowners in each study area possess particular attributes that bode well for wildlife programming efforts. In the Coastal Plain, landowners appear familiar with common wildlife management practices and with state agency incentives. They need to be offered specific programming, such as the options already developed for the CURE Program, which will not impede their production oriented livelihoods. In the western Piedmont, landowners are in favor of conserving and protecting habitat for wildlife, but they are not as familiar with, or as interested in, management practices or state agency involvement as their Coastal Plain counterparts. Landowners in the western Piedmont must be convinced that active wildlife management can best be accomplished with the help and cooperation of NCWRC wildlife managers. Specific to the CURE Program, however, in which particular enhancement practices are necessary and financial assistance is available, wide-scale success seems most probable in the Coastal Plain region.

The Broad Picture

The survey results suggest that still today, as historically noted, landowners want to retain their own property rights and independence above all else. Less than 20% of the landowners surveyed belonged to conservation organizations, and only 10% are involved

in state or federal land programs. In terms of private land programming success, a lack of interest or information on the part of landowners must be met with improved outreach efforts by state and federal agencies to promote these programs.

Ultimately, the success of early successional habitat programming will rely on the availability of habitat on private land. In North Carolina, much of this land is farmed. Yet data reported by the USDA (USDA National Agricultural Statistics Service 1999) shows that the number of farms, and the number of operators whose principal occupation is farming, have been declining steadily since 1969. In recent years (1992-1997), amidst the loss of farms, the average size of farms increased 8%, land in farms increased 2%, and market values of land, buildings, and agricultural products sold also rose. So it appears that farm consolidation and growth is occurring at the expense of operators who can no longer afford to farm. Our data suggest that rural, successful male farmers are predisposed to manage for wildlife. So it is essential that those who remain in farming are targeted for wildlife programs and encouraged to continue wildlife management along with their land production activities. Wildlife managers must work to dispel the view that wildlife management comes at too great an economic cost to the private landowner.

CONCLUSION

Regional differences in private landowner attitudes and behavior towards wildlife in North Carolina warrant programming efforts that appeal to these differences. Early successional habitat programming appears most promising in the Coastal Plain region of the state. Though landowners in the region may always place their production goals ahead of wildlife programming, a “top-down” approach (offering specific enhancement

practices coupled with economic incentives) will be most cost effective for the NCWRC. CURE Programming need not be highly adapted from its current operational parameters; assistance options such as tax incentives and cost sharing should be emphasized due to their likely acceptance among landowners.

Wildlife programming in the western Piedmont will likely require a “bottom-up” approach of soliciting individuals or small groups of landowners to work cooperatively with the NCWRC in a more personalized manner (as demonstrated through the pilot study population and by their current involvement in the CURE Program). CURE Programming in this region would benefit from an increase in NCWRC personnel to facilitate increased contact and personal assistance to area landowners. At a minimum, CURE Programming success in the Western Piedmont will require a considerable effort by the current personnel to address individual landowner concerns and will likely reduce the amount of time they can dedicate to their other duties.

The most obvious delineations among landowner attitudes and behavior toward wildlife arise across occupational, income, area characterization, and gender variables. This finding, frequent in literature regarding landowners, supports a conclusion common to human dimensions research, that management and educational programming efforts must be tailored to specific user groups or population subsets (Decker and Brown 2001). Effective private land wildlife management will rely heavily on the success of those efforts.

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Table 1. Sample size determination by county for a landowner survey, CURE Program Focal Areas, North Carolina, 2001.

County	Number of Eligible Respondents	Proportion of Focal Area (FA) by county	Target N value	Attained N value
Upper Coastal Plain I				
Northampton	739	0.072	43	42
Halifax	857	0.084	50	51
Martin	734	0.072	43	45
Edgecombe	661	0.065	38	40
Nash	952	0.093	55	55
Wilson	693	0.068	40	40
Pitt	881	0.086	51	54
Wayne	945	0.092	55	54
Johnston	1435	0.140	83	83
Lenoir	636	0.062	37	37
Sampson	1700	0.166	99	101
			Subtotal = 594	Subtotal = 602
Upper Coastal Plain II				
Scotland	444	0.268	26	3
Columbus	1211	0.732	70	81
			Subtotal = 96	Subtotal = 84
Western Piedmont				
Surry	1148	0.318	67	68
Yadkin	626	0.174	36	39
Iredell	989	0.274	58	67
Davie	507	0.141	30	35
Catawba	337	0.093	20	20
			Subtotal = 201	Subtotal = 229
			Total = 900	Total = 915

Table 2. Telephone response categories for a landowner survey, CURE Program Focal Areas, North Carolina, 2001.

Telephone response category	Number of calls
Nonviable telephone number	
Disconnected/ non-working number	167
Fax/ computer modem	21
Viable telephone number but ineligible respondent	
Deaf/ language barriers	76
Ineligible respondent (e.g., deceased, own < 50 acres)	524
Viable telephone number and eligible respondent	
Refused to participate	379
Soft refusals/ call backs (e.g., not available, not interested)	671
Completed interviews	915
Total number of calls	2753

Table 3. Name, description, and scale of variables used in statistical analyses of landowner survey data, CURE Program Focal Areas, North Carolina, 2001.

Variable	Description	Scale
PARCELS	Total parcels of land owned in county	Interval
LANDSIZE	Number of parcels 50 acres or larger	Interval
ACRES	Number of total acres owned in county	Interval
LARGEST	Size of largest parcel (acres)	Interval
LIVEON	Live on property (Y/N)	Nominal
HOWNEAR	Distance from home to property	Ordinal
ROWCROP	Percent (%) of land in row or root crops	Interval
PASTURE	% of land in hay production or pasture	Interval
FOREST	% of land in standing forest greater than 5 years old	Interval
CLEARCUT	% of land in cutovers (clearcuts) less than 5 years old	Interval
OTHERUSE	% of land in other uses	Interval
OWNTIME	Number of years since land was acquired	Interval
LEASELND	Lease to others for agricultural production	Nominal
LEASENUM	Number of acres leased to others	Interval
HUNTCLUB	Lease to hunt club	Nominal
WHODEC	Who makes the majority of land management decisions	Nominal
LONGKEEP	Length of time intending to keep land	Ordinal
RESPONSBL	Personal responsibility for providing wildlife habitat for wildlife on land	Nominal
HOWLOOK	Appearance of property	Ordinal
WILDLIVE	Knowledge that wildlife lives on property	Ordinal
HABWORK	Receiving payment to initiate habitat work or enhancement on property	Ordinal
PROFIT	Maximizing profits on land	Ordinal
WILDMETHOD	Watch wildlife on land	Ordinal
YOUHUNT	Personal hunting opportunities on land	Ordinal
HUNTOTH	Providing hunting opportunities for others on land	Ordinal
HUNTFEES	Generating revenue from hunting opportunities on land	Ordinal
OUTREC	Other personal outdoor recreation opportunities	Ordinal
WILDHAB	Caring for and protecting fish and wildlife and their habitats on land	Ordinal
INVEST	Long-term financial investment of land	Ordinal
LIFESTYL	Lifestyle or heritage associated with land	Ordinal
UNDEVLDP	Owning or maintaining undeveloped land	Ordinal
RANKPRFT	Maximizing profits	Ordinal
RANKHUNT	Hunting opportunities	Ordinal
RANKHAB	Managing wildlife habitat	Ordinal
RANKREC	Recreation (all activities other than hunting)	Ordinal
RANKOWN	Owning or maintaining undeveloped land	Ordinal
PAYFEE	Willingness to pay a management agency for implementing a wildlife management plan on land	Nominal
GETPAID	Payment for a management agency to implement a wildlife management plan on land	Nominal
BORDERS	Establish field borders of natural vegetation	Ordinal
BURNING	Participate in prescribed burning	Ordinal
PLNTFOOD	Plant wildlife food and cover plots	Ordinal

Table 3. (continued)

Variable	Description	Scale
HERBCIDE	Participate in the use of herbicides to control vegetation	Ordinal
THINNING	Participate in timber thinning	Ordinal
FENCES	Use or construct fences to create habitat borders along streams while controlling cattle movement	Ordinal
INFOHELP	General information	Ordinal
TECHHELP	Technical guidance	Ordinal
MONEYHLP	Monetary incentives	Ordinal
TAXHELP	Tax incentives	Ordinal
AGNCYHLP	Wildlife agency initiated labor and/or maintenance	Ordinal
MANAGEWL	Actively manage for wildlife on land	Nominal
WHATDO	Actions done to help wildlife on land	Nominal
WHYNOT	Reasons for not managing for wildlife on land	Nominal
LIKEWILD	Type of wildlife <i>most</i> important to respondent	Nominal
BELONG	Belong or give money to environmental organizations	Nominal
NUMORGS	Number of different organizations belonged to	Interval
FEDPROG	Involved in state or federally subsidized land programs	Nominal
FEDNUM	Number of state or federal programs involved in	Interval
AREA	Characterization of area respondent lives in (in terms of population size)	Ordinal
LEVED	Highest grade level completed	Ordinal
PRIJOB	Primary household income source	Nominal
FARMING	Percent of total household income from farming	Interval
INCOME	Total household income before taxes last year	Ordinal
AGE	Age	Interval
GENDER	Gender	Nominal
ACRES2 ¹	Number of total acres owned in a county	Ordinal
FARMING2 ¹	Percent of total household income from farming	Ordinal
AGE2 ¹	Age	Ordinal

¹ Variable was recoded from interval to ordinal scale data in order to meet the assumptions of Spearman correlation during analyses.

Table 4. Test statistics for landowner survey variables examined for regional differences using nonparametric tests for independent samples¹, CURE Program Focal Areas, North Carolina, 2001.

	Variable	N	Kruskal-Wallis test			UCP1	UCP2	WP
			test statistic	df	significance			
Interval and numerically categorized ordinal data	PARCELS	895	7.276	2	0.026	a(>)		b
	LANDSIZE	893	9.522	2	0.009	a(>)		b
	ACRES	866	22.171	2	0.001	a(>)		b
	LARGEST	867	13.714	2	0.001	a(>)		b
	HOWNEAR	482	3.240	2	0.198			
	ROWCROP	853	76.604	2	<0.001	a	a	b(<)
	PASTURE	799	145.073	2	<0.001	a	a	b(>)
	FOREST	742	5.137	2	0.077			
	CLEARCUTS	390	7.022	2	0.030	a(>)		b
	OTHERUSE	268	1.517	2	0.468			
	OWNTIME	832	0.200	2	0.905			
	LEASENUM	505	5.660	2	0.059			
	LONGKEEP	915	0.058	2	0.972			
	LEVED	893	5.643	2	0.060			
	FARMING	668	26.576	2	<0.001	a(>)		b
INCOME	597	9.832	2	0.007	a(>)		b	
AGE	886	0.600	2	0.741				
Land management goals	RANKPRFT	860	39.443	2	<0.001	a	a	b(<)
	RANKHUNT	860	4.601	2	0.100			
	RANKHAB	860	7.959	2	0.019	a	a	b(>)
	RANKREC	860	9.930	2	0.007	a		b(>)
	RANKOWN	860	1.645	2	0.439			

¹ Significant regional differences ($p < 0.05$) are indicated by differing letters; (>) or (<) symbols indicate the direction of the difference.

Table 5. Proportional distribution of responses from a landowner survey regarding land values in Upper Coastal Plain I, CURE Program Focal Areas, North Carolina, 2001. **Bold** indicates the highest proportion of responses per value. Rows total 100%.

Value (Variable name)	Very important	Somewhat important	Neither important nor unimportant	Somewhat unimportant	Very unimportant
Appearance of property (HOWLOOK)	70.6	18.8	3.7	4.1	2.8
Knowing wildlife lives property (WILDLIVE)	63.0	25.2	4.8	5.4	1.6
Receiving payment to initiate any habitat work or enhancement property (HABWORK)	30.2 (>)¹	24.1	9.8	15.9	20.0
Maximizing profits (PROFIT)	72.6 (>)	17.2 (<) ²	2.0	5.4 (<)	2.9 (<)
Being able to watch wildlife on land (WILDVIEW)	46.5 (<)	24.9	6.4 (>)	11.9	10.3 (>)
Having personal hunting opportunities on land (YOUHUNT)	31.9	17.4	2.9	11.8	36.0
Providing hunting opportunities for others on land (HUNTOTH)	18.6	26.3	3.2	14.1	37.8
Generating revenue from hunting opportunities on and (HUNTFEES)	6.0	12.3 (>)	5.3 (>)	18.1	58.3 (<)
Having other personal recreation opportunities on land (OUTREC)	9.6	12.6	5.2	17.8	54.8
Caring for and protecting fish and wildlife and their habitats on land (WILDHAB)	52.9	26.3	5.9	6.2	8.7
Long-term financial investment of land (INVEST)	72.2	15.8	2.8	3.6 (<)	5.6
Lifestyle or heritage value associated with land (LIFESTYL)	76.5	15.5	1.6	3.5	2.9
Owning or maintaining undeveloped land (UNDEVLDPD)	48.4	24.7	4.3	12.1	10.5

¹ Significantly more than expected ($p < 0.05$); adjusted residuals > 2 .

² Significantly fewer than expected ($p < 0.05$); adjusted residuals > -2 .

Table 6. Proportional distribution of responses from a landowner survey regarding land values in Upper Coastal Plain II, CURE Program Focal Areas, North Carolina, 2001. **Bold** indicates the highest proportion of responses per value. Rows total 100%.

Value (Variable name)	Very important	Somewhat important	Neither important nor unimportant	Somewhat unimportant	Very unimportant
Appearance of property (HOWLOOK)	72.0	23.2	2.4	1.2	1.2
Knowing wildlife lives property (WILDLIVE)	68.8	20.8	3.9	6.5	0.0
Receiving payment to initiate any habitat work or enhancement property (HABWORK)	26.9	16.4	17.9 (>) ¹	16.4	22.4
Maximizing profits (PROFIT)	73.5	18.1	1.2	3.6	3.6
Being able to watch wildlife on land (WILDVIEW)	61.4 (>)	18.1	6.0	10.8	3.6
Having personal hunting opportunities on land (YOUHUNT)	39.0	12.2	6.1	18.3	24.4
Providing hunting opportunities for others on land (HUNTOTH)	18.2	28.6	2.6	14.3	36.4
Generating revenue from hunting opportunities on and (HUNTFEES)	7.6	7.6	3.8	25.3	55.7
Having other personal recreation opportunities on land (OUTREC)	17.7	12.7	5.1	19.0	45.6
Caring for and protecting fish and wildlife and their habitats on land (WILDHAB)	59.3	24.7	4.9	6.2	4.9
Long-term financial investment of land (INVEST)	81.5 (>)	11.1	1.2	2.5	3.7
Lifestyle or heritage value associated with land (LIFESTYL)	76.8	11.0	3.7	4.9	3.7
Owning or maintaining undeveloped land (UNDEVLPD)	57.7	17.9	6.4	9.0	9.0

¹ Significantly more than expected (p < 0.05); adjusted residual >2.

Table 7. Proportional distribution of responses from a landowner survey regarding land values in the Western Piedmont, CURE Program Focal Areas, North Carolina, 2001. **Bold** indicates the highest proportion of responses per value. Rows total 100%.

Value (Variable name)	Very important	Somewhat important	Neither important nor unimportant	Somewhat unimportant	Very unimportant
Appearance of property (HOWLOOK)	69.5	22.8	2.0	3.3	2.4
Knowing wildlife lives property (WILDLIVE)	64.8	25.9	4.0	3.2	2.0
Receiving payment to initiate any habitat work or enhancement property (HABWORK)	17.2 (<) ¹	24.9	9.0	22.6 (>) ²	26.2
Maximizing profits (PROFIT)	49.1 (<)	25.6 (>)	2.6	14.1 (>)	8.5 (>)
Being able to watch wildlife on land (WILDVIEW)	56.6 (>)	30.1	1.6 (<)	7.2 (<)	4.4 (<)
Having personal hunting opportunities on land (YOUHUNT)	32.6	21.9	2.5	9.9	33.1
Providing hunting opportunities for others on land (HUNTOTH)	16.7	21.2	2.9	17.1	42.0
Generating revenue from hunting opportunities on and (HUNTFEES)	5.8	6.2 (<)	0.8 (<)	16.5	70.7 (>)
Having other personal recreation opportunities on land (OUTREC)	7.0	18.4	4.1	15.6	54.9
Caring for and protecting fish and wildlife and their habitats on land (WILDHAB)	60.3	24.7	3.6	5.3	6.1
Long-term financial investment of land (INVEST)	65.2 (<)	20.3	0.9	9.3 (>)	4.4
Lifestyle or heritage value associated with land (LIFESTYL)	74.4	16.7	1.7	3.8	3.4
Owning or maintaining undeveloped land (UNDEVLDPD)	53.4	26.1	3.0	9.8	7.7

¹ Significantly fewer than expected ($p < 0.05$); adjusted residual > -2 .

² Significantly more than expected ($p < 0.05$); adjusted residual > 2 .

Table 8. Spearman correlation coefficients among attribute variables from a landowner survey, CURE Program Focal Areas, North Carolina, 2001. **Bold** values indicate correlation coefficients above 0.350 in absolute value.

Variable	N	Spearman's rho Correlation Coefficient	significance
Correlations with ACRES2			
LIVEON	867	0.053	0.120
HOWNEAR	451	-0.094	0.045
AREA	845	-0.012	0.732
LEVED	848	0.050	0.149
PRIJOB	666	-0.314	<0.001
FARMING2	709	0.337	<0.001
INCOME	577	0.136	0.001
AGE2	843	0.013	0.712
GENDER	867	-0.076	0.026
Correlations with LIVEON			
HOWNEAR ¹	483	--	--
AREA	891	0.356	<0.001
LEVED	894	0.201	<0.001
PRIJOB	699	0.081	0.032
FARMING2	736	-0.086	0.020
INCOME	597	0.197	<0.001
AGE2	887	-0.054	0.111
GENDER	915	-0.033	0.312
Correlations with HOWNEAR			
AREA	473	0.437	<0.001
LEVED	476	0.316	<0.001
PRIJOB	374	0.270	<0.001
FARMING2	397	-0.298	<0.001
INCOME	322	0.220	<0.001
AGE2	471	0.058	0.207
GENDER	483	0.136	0.003
Correlations with AREA			
LEVED	878	0.255	<0.001
PRIJOB	688	0.183	<0.001
FARMING2	721	-0.186	<0.001
INCOME	585	0.185	<0.001
AGE2	870	0.046	0.178
GENDER	891	0.043	0.197

¹ No correlation exists between LIVEON and HOWNEAR because they are mutually exclusive questions.

Table 8. (continued)

Variable	N	Spearman's rho Correlation Coefficient	significance
Correlations with LEVED			
PRIJOB	699	0.208	<0.001
FARMING2	731	-0.144	<0.001
INCOME	596	0.389	<0.001
AGE2	878	-0.178	<0.001
GENDER	894	0.112	0.001
Correlations with PRIJOB			
FARMING2	604	-0.704	<0.001
INCOME	523	0.009	0.838
AGE2	692	0.043	0.260
GENDER	669	0.120	0.002
Correlations with FARMING2			
INCOME	536	-0.045	0.300
AGE2	728	0.022	0.560
GENDER	736	-0.119	0.001
Correlations with INCOME			
AGE2	595	-0.430	<0.001
GENDER	597	-0.231	<0.001
Correlations with AGE2			
GENDER	887	0.170	<0.001

Table 9. Chi-square test statistics for comparison of two response variables, RESPONSBL and MANAGEWL, with ten attribute variables from a landowner survey, CURE Program Focal Areas, North Carolina, 2001.

Response Variable	Attribute Variable	Answer category	Chi-square		
			test statistic	df	significance ¹
RESPONSBL	ACRES2		7.835	5	0.166
	LIVEON		1.677	2	0.432
	HOWNEAR		2.388	6	0.881
	AREA	Rural	9.214	2	0.010 (>)
	LEVED		1.212	4	0.876
	PRIJOB	Land production	7.387	1	0.007 (>)
	FARMING2		1.333	4	0.856
	INCOME	≥ \$75,000	17.100	5	0.004 (>)
	AGE2	> 70	20.015	6	0.003 (<)
	GENDER	Male	12.073	1	0.001 (>)
MANAGEWL	ACRES2		7.995	5	0.157
	LIVEON	Reside on property	9.306	2	0.010 (>)
	HOWNEAR	< 10 mi. from property	20.349	6	0.002 (>)
	AREA	Rural	14.197	1	0.001 (>)
	LEVED		5.113	4	0.276
	PRIJOB	Land production	5.615	1	0.018 (>)
	FARMING2	< 25% income from farming	10.445	4	0.034 (<)
	INCOME		10.337	5	0.065
	AGE2	> 70	47.505	6	<0.001 (<)
	GENDER	Male	42.043	1	<0.001 (>)

¹ (>) symbol indicates that the variable predicts someone more likely to feel responsible/ manage for wildlife; (<) symbol indicates that the variable predicts someone less likely to feel responsible/ manage for wildlife.

Table 10. Item nonresponse (questions with > 10% of responses in the “Don’t know” or “Refused to answer” categories) from a landowner survey, CURE Program Focal Areas, North Carolina, 2001.

Question ¹	“Don’t know” frequency (percent)	“Refused to answer” frequency (percent)
40. What about receiving payment to initiate any habitat work or enhancement on your property? Is this important or unimportant to you? ²	138 (15.1)	0
69. Would you be willing to allow a management agency to implement a wildlife management plan on your land, if you were paid for the permission to do so? ³	168 (18.3)	0
74. Would you be likely or unlikely to participate in the use of herbicides to control vegetation to provide wildlife habitat? ⁴	104 (11.4)	0
87. Why don’t you manage for wildlife on your land? ⁵	108 (11.8)	0
102. What is your primary household income source? ⁶	60 (6.6)	155 (16.9)
105. Which of these categories best describes your total household income before taxes last year? ⁷	54 (5.9)	263 (28.7)

¹ See Appendix C for numerically referenced questions.

² Likert scale question ranged from 2 (Very important) to 6 (Very unimportant); 7 (Don’t know).

³ Yes/ No question: 2 (Yes), 3 (No), 4 (Don’t know).

⁴ Likert scale question ranged from 2 (Very likely) to 6 (Very unlikely); 7 (Don’t know).

⁵ Respondents were asked the open-ended question and responses were put into any of 12 pre-coded response choices by the surveyor, or one of the above categories.

⁶ Respondents were asked the open-ended question and responses were put into one of 5 pre-coded response choices, or one of the above categories.

⁷ Respondents were asked to indicate one of 7 income categories.

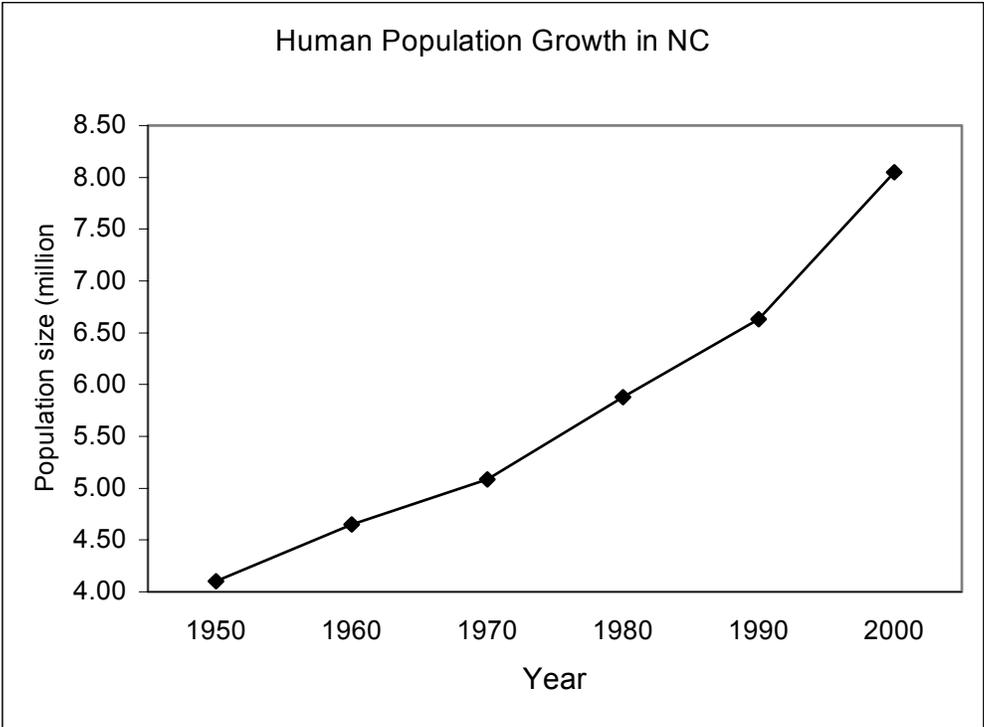


Figure 1. Human population growth in North Carolina, 1950-2000 (data from U.S. Census Bureau).

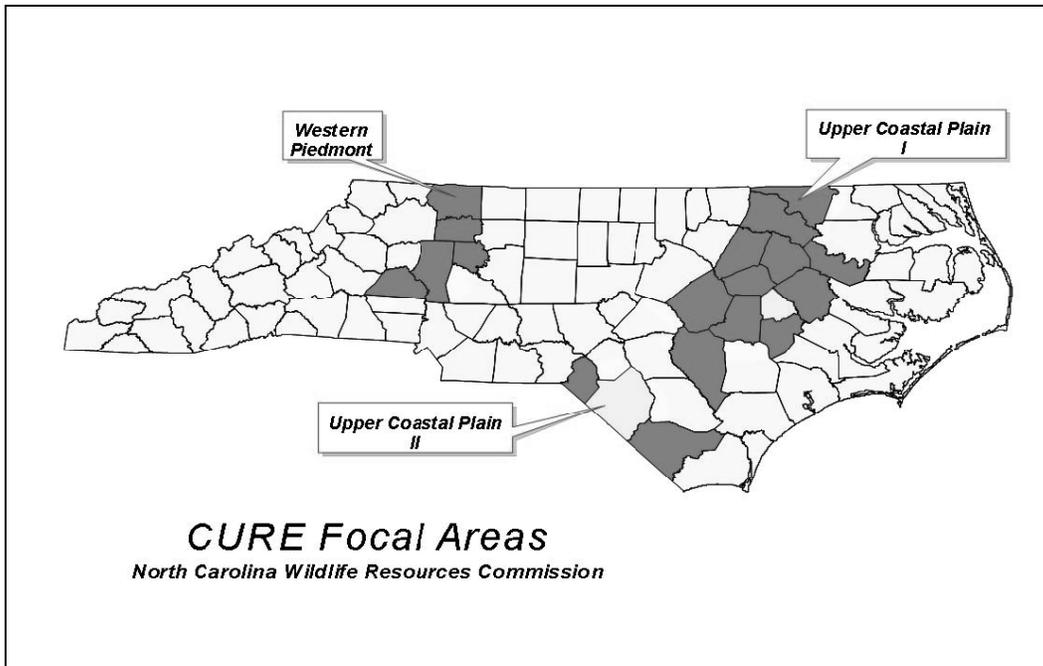


Figure 2. Locations of counties sampled during landowner survey, CURE Program Focal Areas, North Carolina, 2001 (*image provided by D. Howell, NCWRC*).

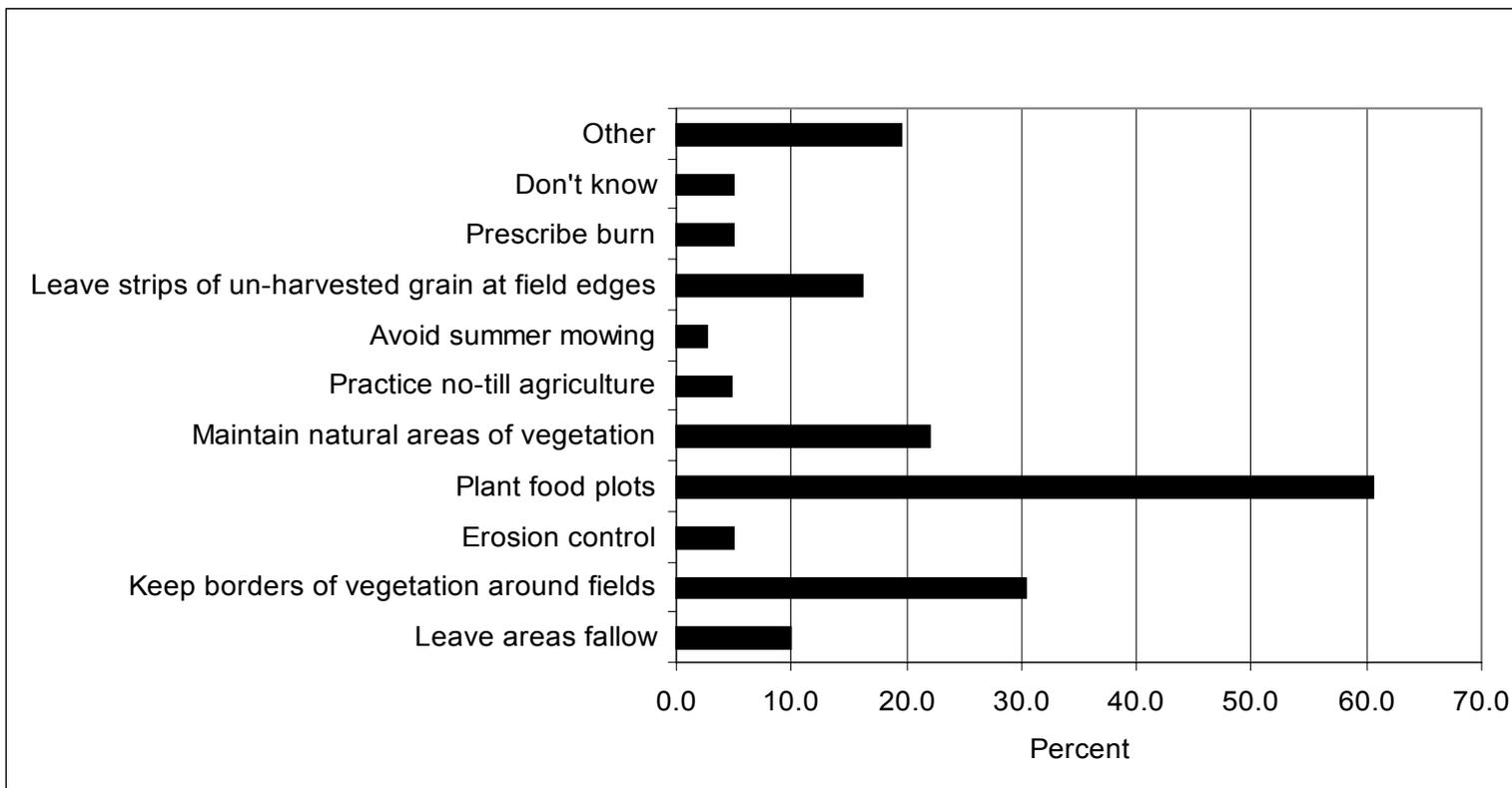


Figure 3. Management activities that landowners use to help wildlife on their land in CURE Program Focal Areas, North Carolina, 2001 (N = 419). Most common “other” responses: “don’t allow hunting (7.6%), “place food out for animals (3.1%), maintain woods/ timber management (2.3%).

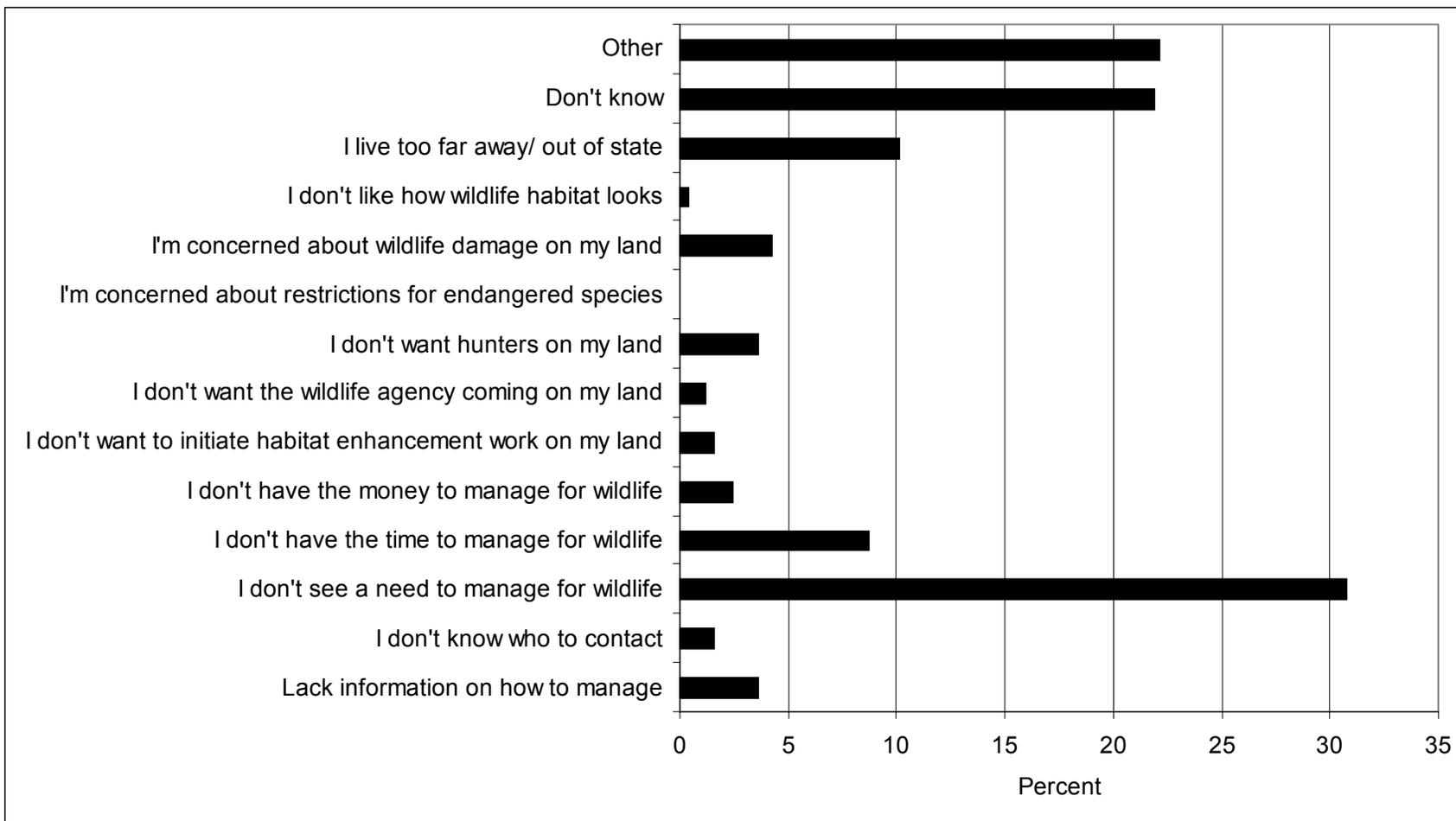


Figure 4. Reasons that landowners do not manage for wildlife on their land in CURE Program Focal Areas, North Carolina, 2001 (N = 497). Most common “other” responses: “lease it out to others” (3.6%), “too old/ poor health” (3.6%), “not interested in wildlife” (2.2%).

CHAPTER 3
WILDLIFE PROGRAMMING MANAGEMENT RECOMMENDATIONS
FOR NORTH CAROLINA

INTRODUCTION

Within the contiguous United States, nearly 70% of the land is privately owned (Natural Resources Conservation Service 1996). As such, the boundaries and borders between private and public lands become critical areas in terms of natural resources and ecosystem management initiatives (Knight and Clark 1998). At this interface, three trends warrant immediate and continued attention: 1) increasing human densities, 2) increasing economic activities that depend on public land resources, and 3) alteration of biotic communities and ecological processes. While these trends were described by Knight and Clark (1998) in the context of the American West, where large public land tracts dominate, they are equally, if not more, important within the confines of the East (Decker and Enck 1996). Early successional habitat in the southeast has been particularly affected by these trends over the past half century (Burger 2001).

According to the U.S. Census (1999), southern states combined experienced a 13% increase in population size between 1990 and 1999. Five southeastern states, Georgia, Florida, North Carolina, Tennessee, and South Carolina, are among the top 10 for total acres of land developed between 1992 and 1997 in the United States (Natural Resources Conservation Service 1997). Helinski (2000) reported that in the Southeast region, pasture and range reportedly declined by more than 2% between 1982 and 1992 and many of the remaining areas were planted in non-native forage grasses (e.g., fescue and bermudagrass). Greater than 60% of this region's original wetlands have been converted to agriculture, and while farm size doubled between 1950 and 1990, farm numbers declined by 60%, resulting in the loss of many small habitat patches. According to Breeding Bird Survey data, bobwhite quail (*Colinus virginianus*) have experienced

greater than a 60% decline since the mid-1960's (Sauer et al. 2001). This decline is due largely to degradation and reduction of habitat, in part because of urbanization and changing land-use practices across the species range (Church et al. 1993).

NORTH CAROLINA WILDLIFE PROGRAMMING

Recently, North Carolina commenced programming to promote the restoration of early successional habitats on private land in the state. Growth and development trends make this a timely and challenging goal. North Carolina is 84% privately owned (Natural Resources Conservation Service 1992), leaving a small proportion of land in state or federal ownership. The state experienced a 12% increase in population from 1990 to 1997, and population numbers have grown steadily since 1950 (U.S. Census Bureau 2000). As growth and development rates in the state rise on an annual basis, this translates to annual losses of wildlife habitat.

In response to the decline of wildlife populations associated with early successional habitat and the need for influence over habitat on private land, the Small Game Committee of the North Carolina Wildlife Resources Commission established, on August 30, 2000, a number of objectives to meet this need. One such objective was to “identify specific geographic areas in the state where the potential to improve quail habitats and populations on private land are greatest, and concentrate resources and target programs into these geographic areas” (Cobb 2000). In order to achieve this objective, the NCWRC launched the Cooperative Upland habitat Restoration and Enhancement (CURE) Program, an initiative to enhance early successional habitat and to target landowners that control this habitat across the state. Through a rigorous Geographic

Information System analysis of statewide land-use/ land cover data, they established three areas in the state, officially termed Focal Areas (FAs), which identified early successional habitat with the greatest enhancement potential (Figure 1).

In order for the CURE Program to succeed, however, the NCWRC needs to effectively target private landowners. As of yet, information about private landowners relative to wildlife habitat in the state is undocumented. So, as the CURE Program was developed, human dimensions survey research was undertaken in the same three areas of the state. The objective of this research was to conduct a survey of private landowners in CURE Program Focal Areas in order to:

1. Characterize and compare landowner attitudes and behavior regarding wildlife management on private land.
2. Validate either a regionally specific or a statewide approach to promoting and implementing the CURE Program.
3. Recommend programming to enhance the effectiveness of the CURE Program relative to the suggested approach.

The first two goals were addressed in Chapter 2. The third is addressed below. These recommendations apply to the needs of the CURE Program specifically, but they also address broader issues that will affect the future of wildlife programming and management in the state of North Carolina, and in the southeast region as a whole.

CURE PROGRAMMING NEEDS

An important question to answer in the context of the CURE Program is whether a regional approach to early successional private lands wildlife programming is necessary. The results suggest that such an approach is needed. The predominance of larger tracts of production-oriented land in the eastern portion of the state is a strong

contrast to the smaller tracts of non-production private land in the Western Piedmont. While Coastal Plain landowners appear to see goals of improved wildlife populations and habitats as a potential conflict with their land production activities, they are willing to initiate habitat enhancement practices like establishing field borders, using herbicides to control vegetation, and timber thinning. Those in the lower Coastal Plain are especially supportive of prescribed burning. Incentives programming in the Coastal Plain region should continue to focus on promoting the use of these practices in a way that can be integrated with production activities. As currently structured, the CURE Program is well suited to meet the needs of Coastal Plain landowners. Furthermore, the feasibility of integrating habitat enhancement with production agriculture has been confirmed by recent research efforts addressing the agronomic implications of enhancement work in the North Carolina Coastal Plain. Morris (1998) found that in areas of eastern North Carolina, field border adoption was economically viable because the cost of removing unprofitable land from production was less than the foregone production gain. Furthermore, Outward (2002) found that in such field border systems, the number of pest insects species detected in adjacent crops was not inflated by the presence of a field border; indeed it was often reduced. These results support the notion that wildlife management practices need not be too costly to production landowners; the challenge is to transfer this information to agricultural landowners through sources they consider both reliable and informed (e.g., extension agents, NRCS and USDA offices).

Assistance options, though generally looked upon with disinterest by landowners (the highest proportion of responses for each option was in the “Not at all interested” category), are most likely to be accepted in the form of tax incentives or cost-sharing.

These two options are commonly favored throughout much of the landowner literature (Svoboda 1980, Noonan and Zagata 1982, Sutherland 1997), and they reinforce the notion that wildlife management is viewed by private landowners as cost they should not be required to absorb alone. Assistance options that make wildlife management affordable to landowners would likely allay these feelings. In the lower Coastal Plain, where annual income levels are low, assistance options involving direct financial assistance are especially favorable. Though wildlife management in the Coastal Plain may always be a secondary goal to profit maximization, the CURE Program should continue to be promoted through a 'top-down' approach (offering specific enhancement practices coupled with economic incentives). This approach is referred to by Decker and Chase (2001) as an expert authority approach to stakeholder involvement. It works well in areas where manager and stakeholders alike view a problem as largely biological, and rely on expertise to provide a solution (Decker and Chase 2001). The success of this approach is probable in the Coastal Plain, due to the prominence of similarly structured agricultural land programs like CREP, WRP, and other Farm Bill programs, limited landowner time resources, and a general lack of interest in more personalized contact or involvement.

Landowners in the Western Piedmont are not as financially dependent on their land as are those in the Coastal Plain, and they exhibit stronger feelings of wildlife valuation. Leasing land is less common in the region, and landowners are the primary land management decision makers. Thus, they should be the focus of wildlife programming by the NCWRC. Though on an individual basis Western Piedmont landowners do not appear interested in state agency involvement on their land, or in

traditional enhancement practices, they do express interest in promoting wildlife populations and habitat. Wildlife programming in the Western Piedmont will require a 'bottom-up' approach of soliciting individuals or small groups of landowners to work cooperatively with the NCWRC in a personalized manner. The success of the CURE Program, or other wide-scale programming efforts, is therefore limited without substantial baseline support from area landowners. Yet the Iredell Co. pilot study population, surveyed in preparation for the large-scale survey effort, illustrates an example of how this approach can be successful. Individual landowners became involved in a cooperative land improvement project through the leadership of a local Quail Unlimited chapter. The NCWRC worked with other area agencies to provide guidance and resources to the group as needed, in a way that made all parties involved feel they were working towards a common goal. This method, referred to in human dimensions literature as the inquisitive approach (Decker and Chase 2001), incorporates stakeholder input during or before directed actions are taken, and as a form of evaluation afterwards, to improve the quality and acceptance of the management. Though this approach differs drastically from the method suggested for the Coastal Plain, our survey results suggest that it is an obvious choice for wildlife managers in the Western Piedmont because landowners in the region place little emphasis on quick, affordable, state-run programming but great emphasis on the quality of the experience and the commitment level of involved agencies. Modifications of this approach have worked with great success on a variety of issues around the country, from deer management in New York (Decker and Connelly 1989), to Cooperative Wildlife Management Units in Utah (Messmer et al. 1998), to ecosystem management in Missouri (Raedeke et al. 2001). In

all instances, the solutions to biological problems were possible only with considerable support from the involved stakeholder groups, not simply structured programming options. The current CURE Program structure is not a feasible solution to early successional habitat restoration in the Western Piedmont. Such management is possible in the region, but only through small-scale efforts in specific areas, not through wide-scale regional programming.

In general, North Carolina landowners are not willing to pay money to initiate wildlife management on their land, nor are they overwhelmingly interested in being paid to do so (though it is a possibility in the lower Coastal Plain). Still, wildlife-related land values consistently ranked very high among respondents, second only to profit when compared to four other common land management goals. Though future early successional programming efforts will need to focus on persuading landowners to initiate active management measures, wildlife managers will likely have an easier time explaining the necessity of those activities than they would overcoming, for example, a directed aversion to wildlife. The challenge to North Carolina wildlife managers, and to other states whose demographic trends are analogous, is to address landownership characteristics (noted in the following section) that complicate targeting efforts and preclude a single solution to successful private land management. These cases are not the majority, but their effects have strong implications for the future.

MANAGEMENT CHALLENGES AND SOLUTIONS

The greatest challenge to successful private land wildlife management lies in identifying and earning the cooperation of the individuals who are responsible for the

land management decisions on private land. Three ownership patterns complicate this task: 1) absentee landowners, 2) land leasing, and 3) an aging landowner population.

Just under half of all landowners surveyed live on their property. While nearly 60% of the remainder lived within 10 miles, it is difficult to pinpoint how far or how infrequently a landowner must visit their property in order to have little practical influence on wildlife management. Our results suggest strongly that those who live closer to their property are more likely to manage for wildlife on their property. So how can absentee or distant landowners be influenced to feel more responsibility towards the wildlife on their land? First the NCWRC must work to identify themselves as an available resource to area landowners, both in rural areas where the land is located, and in urban centers where landowners may live. They will increase their involvement in the region through improved cooperative efforts with other local offices of natural resource organizations, such as the Cooperative Extension Service, the NRCS, and Soil and Water Conservation Districts. Sutherland (1997) found, in a survey of landowners in Nova Scotia, that local community groups and organizations were among the most important sources of support and information for private land conservation efforts. As more landowners become involved in wildlife habitat management, they will likely influence others to do the same. Neighbor to neighbor contacts also have a strong influence on the adoption of conservation innovations (Fisher 1998).

Most landowners (74%) are the primary land management decision makers for their property. However, our results show that in areas where agricultural production and farming are more prevalent (as in the Coastal Plain), leasing land is more common, and decision making is sometimes left to those leasing the land. Data reported by the USDA

(USDA National Agricultural Statistics Service 1999) shows that leased acreage is increasing in the state, suggesting that land management decision making by land leasees may also be on the rise. In order to influence wildlife habitat management in such areas, wildlife managers must successfully identify the party(s) in control of land management activities. Again, as is the case with absentee landowners, the stronger presence the NCWRC has in agricultural areas, the more they will be recognized as a source of assistance to those landowners who manage for wildlife as well as production. Area hunting clubs, farm supply centers, and local USDA or NRCS officials are venues that the NCWRC should make their presence known at in order to promote their services and programs.

A third demographic trend uncovered in the survey which will affect future land management decisions is an aging landowner population. The average age of landowners surveyed was 63.5 years. More than one quarter (27.6%) of respondents earned their primary income through retirement, social security and pensions. Many also report health issues or old age as reasons they are not as active in the management of their land anymore. Though nearly all landowners plan to pass their land holdings on to family members, it is unknown how younger generations will manage the land bestowed on them. Successful wildlife management programming will depend on creating a positive relationship between the NCWRC and the new generation of landowners and managers. Much in the same way that absentee landowners may be targeted through cooperative efforts with other natural resource agencies, and through the contact of neighbors and local community leaders, young landowners who are successfully targeted and assisted in

their land management activities will generate a climate of positive relationships with the NCWRC.

CONCLUSION

Three issues are at the heart of understanding landowner attitudes and behavior towards wildlife on private land in North Carolina. If NCWRC programming can be successful in addressing these issues, they have the potential to greatly influence wildlife populations in the state. First, regional differences in landowner attributes, attitudes, and behavior warrant specific regional approaches to private lands wildlife programming. A “top-down” approach to CURE Programming by the NCWRC can be successful in the Coastal Plain, but a “bottom-up” approach is more desirable in the Western Piedmont. Second, a major delineation among landowner views regarding wildlife centers around the use of their property and their dependency upon economic returns. Wildlife management must be made economically viable to large production-oriented landowners, who control the majority of habitat in the eastern portion of the state. Third, a great challenge to successful private land wildlife management will be identifying and gaining the trust of the person(s) who preside over decision making and are most likely to initiate habitat management.

Our survey results document important information about North Carolina landowners. It is clear that landowners, though bound by a common thread of private property ownership, vary widely in their personal land management objectives and views towards wildlife. Ironically, the CURE Program may work best in areas where wildlife is not necessarily valued highly, but where it is feasible to promote land management to

those who simply want economic compensation for their efforts. But beyond the specific goals of the CURE Program, the NCWRC is challenged in the future to improve their presence in both rural areas and urban centers through other regionally active natural resource agencies, local community groups, and active landowners. In doing so, they will strengthen participation in their programming activities, lay the foundation for improved community based initiatives, and will fulfill their mission to manage, conserve, and protect the wildlife resources of the state far into the future.

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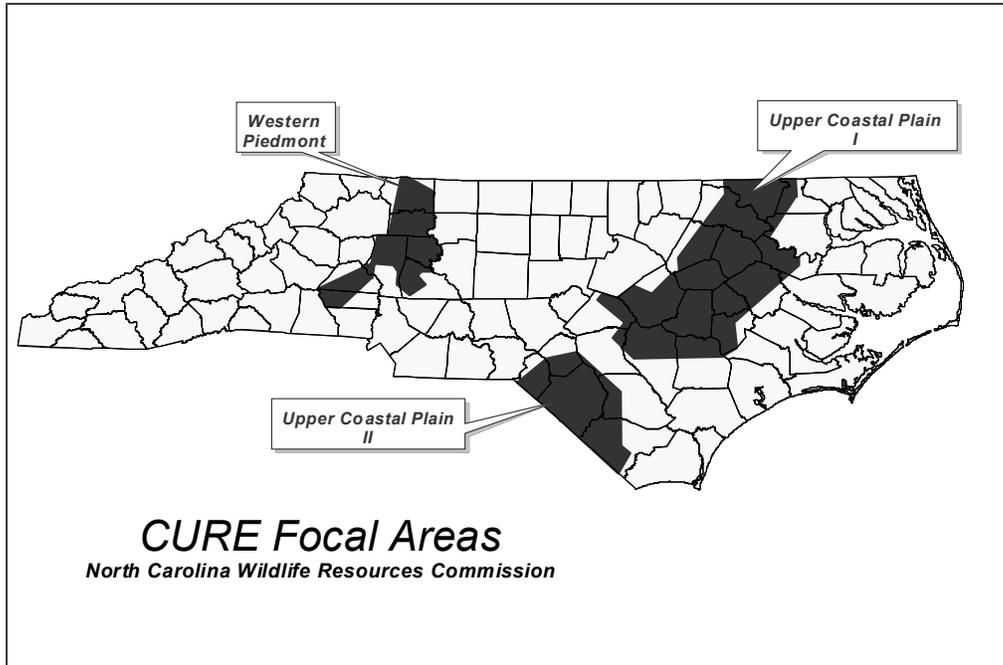


Figure 1. CURE Program Focal Areas, North Carolina, 2001. (image provided by D. Howell, NCWRC).

APPENDIX A
PILOT STUDY QUESTIONNAIRE

Section A. In this section, we are interested in learning more about your land and how you manage it. Please feel free to skip over questions that you do not feel comfortable answering and continue on with the survey.

1. Please estimate the percentage of land that you **own** in the following categories (should total 100%):

- _____ % Row crop
- _____ % Pasture/ hayland
- _____ % Forested land
- _____ % Other (living area, lawn, right-of-ways, ponds, etc...)

2. Please estimate the percentage of land that you **lease** (for agriculture) in the following categories (should total 100%; if you do NOT lease, leave this question blank):

- _____ % Row crop
- _____ % Pasture/ hayland
- _____ % Forested land
- _____ % Other (living area, lawn, right-of-ways, ponds, etc...)

3a. Please estimate the amount of land you own:

- () 0-100 acres
- () 101-200 acres
- () 201-300 acres
- () 301-400 acres
- () 401-500 acres
- () 500+ acres

3b. In what year did you begin to acquire this land? _____

3c. What percentage of your property did you:

- _____ Buy
- _____ Inherit (together these should total 100%)

4a. Please estimate the amount of land that you lease (for agriculture):

- () I do not lease any land
- () 0-50 acres
- () 51-100 acres
- () 101-150 acres
- () 151-200 acres
- () 200+ acres

4b. In what year did you begin to lease this land? _____

5. Do you reside on land that is located in the “Turnersburg Project” area?
 YES
 NO (if you answer NO, approximately how far away do you live?)
_____miles away
6. Do you receive incentive or cost-share payments from any state or federally subsidized land programs? (in other words, do you work with organizations like the Natural Resources Conservation Service or the Farm Services Agency on your land?)
 YES
 NO
7. Do you belong to any wildlife or nature conservation organizations (for example, Quail Unlimited, The Nature Conservancy, The Wildlife Federation)?
 YES
 NO
- 8a. What are your reasons for owning land?
- 8b. What are your reasons for leasing land? (if you do NOT lease, leave this question blank)
9. Given your current situation, how long do you intend to keep your land?
 For no more than 5 years
 For no more than 10 years
 For no more than 20 years
 For *more* than 20 years
 Pass on to next generation as family inheritance
10. If you do **not** intend to keep your land for more than 20 years from now, please indicate why (skip this question if you **DO** plan to hold on to your land for more than 20 years):
 Taxes are too expensive
 I cannot derive enough income on my land to afford it in the future
 I do not wish to live here anymore
 I can profit from selling my land
 Other (please specify): _____

11. With respect to your land holdings, what are your major sources of income? (please list)
12. Is farming your primary income, or a part-time income?
 Primary income
 Part-time income
13. Please rank the following land management activities (1= highest, 6= lowest) in terms of your own personal goals for your land:
_____ Agricultural production
_____ Timber production
_____ Hunting opportunities
_____ Wildlife habitat
_____ Recreation
_____ Owning or maintaining undeveloped land

Section B. By law, wildlife in NC belongs to the people of the state. However, most of the wildlife in the state occurs on private land. The following questions address how you as a private landowner feel about wildlife. They are designed to give us some information about the reasons that you have shown interest in improving the quality of wildlife habitat on your land. Again, if there are any questions that you do not wish to answer, please just skip over them and continue on through the survey.

14. In your opinion, who should be responsible for managing wildlife on private land?
15. Would you support a program providing financial and technical assistance from the Wildlife Resources Commission to help you manage wildlife on your land?
 YES
 NO
16. Do you feel responsible for providing wildlife habitat on your land?
 YES
 NO

17. Please choose the statement that BEST describes your views:

Private landowners...

- should be responsible for wildlife on their land and do what they can to manage for wildlife habitat
- don't have a responsibility towards wildlife on their land; the state does
- should be helped by the state because the state must manage (owns) the wildlife but the landowner controls (owns) the habitat

18. Why are you interested in wildlife enhancement on your land? (check all that apply)

- I could make money from recreational hunter fees
- I would like to see the return of desired wildlife species (for example, quail and songbirds)
- I would like the opportunity to view wildlife on my property
- I look forward to personal hunting opportunities
- I want to provide something beneficial for wildlife
- My neighbors have shown an interest
- Other (please specify): _____

19. Why are you **not** interested in wildlife enhancement on your land? (check all that apply)

- I don't have the time and/or money to manage for wildlife
- I don't want to initiate habitat enhancement work (field borders, prescribed burning, timber thinning) on my land
- I don't want the state coming on to my land to do work
- I don't want hunters on my land
- I'm concerned about restrictions by the state for endangered species
- I'm concerned about wildlife damage on my land
- I manage my land for maximum economic benefits and do not have room for wildlife management
- Other (please specify): _____

20. If you desire to manage for wildlife on your land but haven't, why not? (check all that apply)

- I do **not** desire to manage for wildlife on my land
- Lack of time
- Lack of money
- Lack of information on how to manage for wildlife
- Lack of agency technical support
- Lack of agency financial support
- I don't know who to contact
- I don't like how the appearance of wildlife habitat looks
- Other (please specify): _____

21. If the following options for incentives were available from the Wildlife Resources Commission, which would you be **MOST** interested in (check *only* one):
- State-provided assistance by way of monetary incentives, labor, and maintenance (state does all the work).
 - State-provided monetary incentives and information for landowner (landowner initiates work based on advice and information from state).
 - State-provided incentives and labor, landowner maintenance (state does work, landowner maintains).
22. Please indicate your interest in the following habitat enhancement practices on your land by checking practices that you would consider, with guidance from Wildlife Resources Commission personnel:
- Establishing borders of natural vegetation along fields, ditches or pastures
 - Prescribed burning
 - Herbaceous plantings and chemical maintenance
 - Timber thinning
 - I would not consider habitat enhancement practices on my land
23. Which wildlife species would you like to see increase in abundance on your land?
24. Please rank which types of wildlife are most important to you (1= highest, 6= lowest):
- _____ **IF** all are equally important to you, please indicate that here (otherwise, leave blank)
- _____ Big game (deer and turkeys)
- _____ Small game (quail, rabbits, squirrels, doves)
- _____ Waterfowl
- _____ Songbirds
- _____ Other non-game wildlife (flying squirrels, reptiles, amphibians, butterflies, etc.)
- _____ Furbearers (opposum, raccoons, bobcat, mink, otter, etc.)
25. Which statement(s) describe your view of small game on private land in North Carolina? (check all that apply)
- Small game populations are as prevalent as ever
 - I've seen a decline in small game over the past ___ years
 - Small game and farming don't mix
 - Small game populations are an added benefit to my land
 - Small game populations will rebound on their own
 - Small game populations need management to ensure their success
 - I haven't really thought about it

26. How high do other people's perceptions (neighbors, other farmers) of the appearance of your property rank in terms of your land management decisions?
- () The appearance of my property is important to me and therefore other people's perceptions weigh heavily on my decisions.
 - () The appearance of my property is important to me but I do not base my land management decisions on other people's perceptions.
 - () Characteristics other than the appearance of my property are most important to me, and therefore I am not influenced by other people's perceptions.

**THANK YOU VERY MUCH
FOR COMPLETING THIS SURVEY**

APPENDIX B
FOCUS GROUP FINDINGS

FOCUS GROUP FINDINGS

Consultation with focus groups is a common form of qualitative research, used to gather information about people's perceptions, opinions, beliefs and attitudes in preparation for quantitative survey research. They are semi-structured, informal discussions about a specific topic led by a moderator. In survey research, focus groups are used to refine the objectives of the survey, assess the knowledge of the population of interest, uncover differences within the study population, and test specific survey material.

We conducted a series of four focus groups in order to learn more about the population we aimed to target during the survey effort. One meeting was conducted in a central county of the Western Piedmont Focal Area and the Upper Coastal Plain II Focal Area, and two were conducted in the Upper Coastal Plain I Focal Area to better represent its geographic size.

Table 1. Focus Group meeting locations.

Focal Area	County Focus group took place in	Date of Focus Group	Location of Focus Group
Upper Coastal Plain I (southern)	Johnston	June 26, 2001	Johnston County Public Library
Upper Coastal Plain I (northern)	Edgecombe	June 27, 2001	Edgecombe County Public Library
Upper Coastal Plain II	Robeson	June 28, 2001	Robeson County Public Library
Western Piedmont	Iredell	July 11, 2001	Iredell County Public Library

County selection was to a large degree determined by contact with local NRCS offices. We used these offices to collect names and phone numbers of area landowners (upon suggestion by other researchers who have conducted focus groups with similar study populations). We conducted focus groups in counties whose NRCS offices were willing to provide us this information.

Focus groups were conducted between June 26th and July 11th, 2001, at county public libraries.

FOCUS GROUP #1- SMITHFIELD, JOHNSTON COUNTY
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Participants:

1. Active farmer, in late 40's, growing mainly tobacco, sweet potatoes, small grains, 4th generation farmer, enjoys hunting, hopes to leave farm to son.
2. Retired farmer, in early 70's, used to farm, teach, work with USDA; most of land in trees now, enjoys nature, birdwatching.

3. Retired physician, in mid 70's, large land owner, bought first piece of land in 1952, still owns it; forestry is a particularly avid interest.

Twelve questions were posed to generate discussion; individuals responded in succession. Topics that generated the most discussion and that appeared most important to the participants are below.

- Development pressures, changing face of the neighborhoods, high cost of land

Land in Johnston County, especially close to the I-40 corridor, is under heavy development pressure. One participant estimated that since the first subdivision in his area went in around 1975, he's seen the loss of 10-12 good farms, and the ones that are left behind are not nearly as productive. That hurts his livelihood each year. In 1973, he paid \$1000/ acre for land, now it sells for \$10,000/ acre in the same area. Newcomers in the area complain about farm equipment on the roads, and farm towers looking unsightly.

- Frustration with the status of forestry products industry and the lack of competition

One participant was deeply concerned about the changes occurring in the forestry products industry; citing that the individual landowner cannot compete with the larger corporations, and that consolidation of larger industries is reducing competition and hurting the US. He worries that international trade agreements like NAFTA and the WTO make it impossible for southeastern farmers to compete with South American, Asian, and European peasant farmers. He contends that the price of a bushel of corn on the Chicago market today (\$1.85) is the same as it was sixty years ago. Furthermore, he said, within the past two years, International Paper has bought Union Camp, Federal Paper Company, and Champion International- 4 companies down to 1, and so IP is controlling the price of all timber in the Carolinas. He worries that state government is not complaining about this competition reduction.

FOCUS GROUP #2- TARBORO, EDGEcombe COUNTY

Participants:

1. Retired farmer, in early 60's, still managing a considerable amount of land in the area.
2. Active farmer, in mid 30's, owns and leases land, in both agricultural and forested land.
3. Business man/ farmer, runs a hosiery/ knitting business, in early 70's; sons help to manage the farmland.

Twelve questions were posed to generate discussion; individuals responded in succession. Topics that generated the most discussion and that appeared most important to the participants are below.

- Frustration with agricultural market, the economic status of farming and the specialization of commodities

All participants felt that the agricultural economy is in serious trouble, that if the government doesn't work to help American farmers, or encourage people to "buy American," the current situation will only worsen. One participant mentioned that some farmers in the area are turning to specialized commodities instead of a wide variety of crops, and that those doing so are controlling bigger acreages on average.

- Frustration with government decisions regarding agricultural imports/exports

Other countries involved in NAFTA now grow commodities for much less than the American price; they export everything and automatically America loses. All participants felt a lack of support from the US government and a lack of understanding from the American public.

FOCUS GROUP #3- LUMBERTON, ROBESON COUNTY

Participant:

1. In early 60's, owns 100% of the land he farms near Roland, NC; in a partnership with his two brothers to keep assets in agriculture together.

Twelve questions were posed to generate discussion. Topics that generated the most discussion and that appeared most important to the participant are below.

- Agricultural economy in a poor state, changing attitudes towards agriculture

The economic condition of agriculture is forcing area farmers to get by on a small operating budget, therefore production costs have had to be cut as much as possible. He felt like fewer and fewer people are involved in agriculture, so there is less understanding about agricultural practices (for example, burning wheat fields). Many things farmers always did are now being criticized, he said, especially in areas that are experiencing more urban expansion. However, Robeson County does not have that sort of pressure; the land is primarily used for farming, and will continue to be farmed for some time to come, he felt.

FOCUS GROUP #4- STATESVILLE, IREDELL COUNTY

Participants:

1. Physician and small farmer, in mid 70's
2. Dairy farmer, grow soybeans, wheat, corn, in late 60's
3. Dairy farmer (son of previous), partner in business, 40 years old

4. Farmer, used to dairy farm, now raises dairy replacement heifers, developing a hobby quail preserve, in late 50's, actively involved in QU, sowing habitat for quail
5. Farmer, nursery owner, involved in poultry, quail, beef cows, and hay production, in late 50's

Twelve questions were posed to generate discussion; individuals responded in succession. Topics that generated the most discussion and that appeared most important to the participants are below.

- Frustration with laws and regulations being enforced by people that do not have an understanding about farming- "red-tape"

All participants agreed that being told what they have to do by lawmakers who do not have experience farming is frustrating. One participant commented that wetland regulations limit how they can use their land. Another mentioned recent regulation changes, especially regarding animal waste, which have caused state-wide laws to become more stringent and have affected the Iredell County area, when the problems were originating elsewhere. Another mentioned stream protection laws, and commented that the people who make the laws know very little about farming or cattle and about how you manage those operations. One of the participants posed the question "What can you do to protect me from the stream?" He was concerned with erosion and water pollution that might destroy his crops.

- Land values increasing

The price of land in Iredell County was of major concern to participants. Land is selling at a high rate, for lots of money, and development pressures from Charlotte are steadily moving north. One participant mentioned land in his neighborhood going for \$10,000/acre. Another commented that land values between 1975 and 1990 changing very little, but that since 1993, land values have exploded. Land is so expensive that it is difficult to buy for agricultural purposes anymore.

- Frustration with current programs and incentives options.

Most participants have participated in government programs, but many felt frustrated with their experiences. They spoke of needing incentives that make it economically feasible for them to participate (at or above the going land rental rate), staff that are available when they call, and technical assistance on their land. One participant felt that he would not participate in a program in which he had to pay for services, but that if those services were provided for free, he might become more interested and participate more fully in the future. A few participants expressed that they have been happy with their participation in WHIP.

Table 2. A comparison of land values and worth across Focus Group counties.

	Johnston Co.	Edgecombe Co.	Robeson Co.	Iredell Co.
Estimated current price per acre?	\$10,000	--	\$500-\$1500	\$10,000
To take 1 acre out of production, how much money would you require?	\$50-100	Terms more important than price; estimated \$150	\$30-50, similar to CRP	More than land rental rates (\$25-50), estimated \$100

SELECTED QUOTES

Johnston County

Re: Land-use/ livelihood changes in Johnston Co.

“We’ve lost a lot of good farms to subdivisions...It takes my livelihood away. Every time I lose a highly productive farm, it seems like those that are not as productive are left behind.”

“The price of corn today on the Chicago market was quoted at \$1.85 a bushel and sold for that sixty years ago!”

Re: Values associated with land

“Farmland is going, and woodland for wildlife is going”

“Owning timberland and farmland has been the biggest asset that I’ve ever known...Took a lot to pay for it; you don’t buy farmland anymore for \$600 or \$1000 per acre. The area we live in, it’s \$10,000(plus) an acre farmland.”

“My heritage (is most important) and I say that because I’m a 4th generation farmer. My great grandfather farmed, my grandfather, my dad, I’m a farmer, my son’s a farmer at this time.”

“My banker tells me I’m a fool not to put in a golfcourse.”

“...one morning I got up and at the feeder there were six Evening Grosbeaks...those things I enjoy.”

Re: Incentive programs

“I think also that some landowners don’t have the finances to do it. Whereas at this point in my life I do have the equipment to do it and of course I take it on myself...I think a lot of people look to me (people he rents land from) and I look after trying to help them. I think they look to the farmer for advice.”

“Something has to be done to help the individual farmer. We’re the ones who were here in the first place.”

Edgecombe County

Re: farming/ land ownership pattern changes

“No question about it, farming’s changed a great deal in this area. Folks that used to grow tobacco, corn, soybeans, peanuts, a lot of them have gone and specialized on cucumbers and potatoes...I mean they’ve gone into specialty areas because commodities are so depressed.”

“If I can’t make 20% about my cost, then that’s what drove me to rent my land out to go into the vegetable operation. I found a guy who was doing vegetables and I could make a lot more with vegetables than I could with corn, wheat, and soybeans which is what I was used to growing.”

Re: property appearance

“Yes, I’m real concerned with the appearance of my farm. I want it to be like all my machinery, I want it to look good, I want it to work good, I want it to look maintained...”

Re: assistance/ incentives program preferences

“You know, you talk about opening up your land to the public. Well, they’re going to have to be stewards also. If they want to have some birds, I think they should help Chicken Little. I think every one else should help.”

“I don’t want a lot of third party traffic on my land.”

Re: intentions of land for the future

“If we were going to build skyscrapers we’d already have done it!”

Robeson County

Re: land-use changes in Robeson Co.

“One big change is the economic conditions of agriculture. We’re operating on such a very small margin that we’ve had to cut every corner that we could as far as production cost.”

“A lot of things we have always done...we’re being criticized for because the attitude toward agriculture has changed...The population isn’t quite as tolerant and as patient as they used to be.”

Re: responsibility for providing/ managing habitat on private land

“I think it’s a decision he’s (the landowner) got to make, depending on how interested he is in wildlife. And to be honest with you, a larger percentage of this land is owned by absentee landowners, so that causes a problem.”

Re: payment for wildlife habitat

“I’m not going to spend any large amount of money to establish it for the good of the public. I guess the way I should state it is that I try to protect what I’ve got. But I haven’t spent a whole lot of money to make it better.”

Re: property appearance

“As one old timer said, ‘when the disc pass got wider than the tractors, that’s when the quail numbers declined’.”

Iredell County

Re: changes in Iredell Co., pressures participants experiencing

“We caught a lot of slack over hog spills that happened down east. It was still a bad thing, but all of a sudden you had a lot of government people making a lot of rules that they knew nothing about! And I think farmers were pretty resentful of the fact that they came up here and basically forced a lot of red-tape on us...when you’ve got a man, sitting down in Raleigh, that’s never been on a farm telling you how to handle your animal waste, it’s kind of hard to accept the fact that ‘well, where’s he getting all his knowledge on it when we’ve been hauling it and spreading it for thirty years’.”

Re: stream protection

“What can you do to protect ME from the stream?”

Re: development pressure

“In our neighborhood, there’s some land that’s been bought for \$10,000 an acre, you’re talking about just a little 10 acre field being \$100,000. How do you ever consider farming that property? It can’t be done...”

“If there’s ever going to be wildlife land and habitat available, other than what the farm owned land is going to be, then the wildlife department is going to have to be able to come up with some kind of funds that will help offset set-asides, or even land purchases that would be guaranteed to not be developed. It all comes down to money sooner or later...”

Re: values associated with land

“...the values we think of, it’s not unlike you said, it’s not just the dollars and cents, but it’s the – we raised our family...on the farm and our sons, two of them at least, are there and I think they think of it as a kind of life they’d like to have.”

“My land is...guess the only way I can put it is my land’s my heart.”

“Everybody’s got a computer, but not many people have got land.”

Re: private landowners’ responsibility toward wildlife management

“We don’t have a responsibility to the state, we have a responsibility to the wildlife.”

Re: property appearance

“To me that’s the most important thing, above and beyond making a profit, ... what the appearance looks like and what the fellow people, citizens, neighbors, see I’m doing.”

“I realize that’s the critical border edge that the quail need, so that is one thing that impacts our wildlife. But the field looks a lot better! It kind of looks sloppy when you don’t do it.”

“We try to leave all the old fence rows (that) have some briars, sassafrass, and wild cherry. Anything the quail will eat, we won’t knock down. Our farm, it’s not pretty, it’s got briars on it and bushes, that’s the plan.”

Re: hunting on land, third party traffic

“The more programs we become involved in (and we’re putting government money in there) then are we opening ourselves up to where we’ve got to put our land up (for hunters)?”

Re: intentions for land in the future

“It’s very important to me to keep it rural...I’d like to think that they (his sons) would pass it on from generation to generation. But yet, do you want to put your land in a program that limits what they can do with the land down the road? ...I’ve got mixed emotions about real long term programs.”

“I intend to give every acre I own to my children, but with no strings- I’m not saying ‘you’ve got to keep this land’ and put (on) long term stipulations.”

“If you don’t ever intend to sell it, it’s not really wealth anyways. I don’t feel like I’m wealthy in any way because of my own land, because I’m not ever going to sell it, so probably it’s been a burden!”

APPENDIX C
PRELIMINARY LETTER

NC STATE UNIVERSITY

Campus Box 7646
Raleigh, NC 27695-7646

919.515.7586
919.515.5110 (fax no.)

September 21, 2001

Dear resident,

North Carolina State University (NCSU) is requesting your help with a study of North Carolina landowners. In an effort to conduct an assessment of land management practices and state program needs, NCSU has randomly selected landowners across the state to take part in a series of confidential interviews. This assessment will assist the Wildlife Resources Commission, the state wildlife agency, in tailoring its wildlife management programs to be more effective in managing the state's natural resources and to be more appealing to private landowners.

The Wildlife Resources Commission is dedicated to the conservation and management of the state's fish and wildlife resources. However, the vast majority of land in the state is privately owned and so public input, and specifically private landowner input, is essential to the success of their policies and programs. The information collected in this study will be used by the Wildlife Resources Commission to tailor its landowner programs to meet the needs of its stakeholders, the residents of North Carolina, and to fulfill its mission of conserving the state's natural resources. Your personal input is vital!

Within the next few weeks, a research associate from Responsive Management, an independent research firm, will call you to interview you by phone. The interview will take approximately 15 minutes, and we would very much appreciate it if you could take the time to complete it. Responsive Management will be conducting interviews through Wednesday, October 24, 2001.

The information you provide during the interview is confidential and your answers will never be associated with your name. Your participation in this study is entirely voluntary but your input is essential to the completion of the study and the success of our efforts to conserve and manage the state's natural resources. If you wish further information regarding this study, you may contact Bill Testerman toll-free at 888-810-4460 or myself at (919) 515-1174. Thank you very much, in advance, for your help.

Sincerely,



Salinda Daley, North Carolina State University
North Carolina Wildlife Resources Commission

APPENDIX D
SURVEY INSTRUMENT

2001 NCSU Landowner Study
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1. PRESS RETURN WHEN INTERVIEW BEGINS

START

TIMER STARTS AFTER THIS SCREEN

2. Time when interview began

TIME1 1:1-5

|_|_|_|_|_|_|_|_|_|

3. Hello, may I speak with _____ ? My name is _____ and I'm calling on behalf of North Carolina State University and we are conducting a survey with landowners in North Carolina. This survey will help The North Carolina Wildlife Resources Commission better manage the state's natural resources. Furthermore, your responses will remain strictly confidential and will never be associated with your name. Would you be

able to

answer some questions for us?

CONPER 1:6-7

(CHECK ONLY ONE ANSWER)

QUESTION 5) |_| 1. Correct person, good time to do survey (GO TO

QUESTION 4) |_| 2. Bad time/schedule recall (CB - do not save) (GO TO

|_| 3. AM, NA, BZ (do not save)

|_| 4. TM

|_| 5. RF

|_| 6. NE

|_| 7. DS

|_| 8. BG

|_| 9. DL

|_| 10. Bad Number (missing digit, begins with zero, etc.)

SKIP TO QUESTION 112

=====

4. When would be a more convenient time to call you back?
Thank you for your time.

WHENCALL

ENTER DAY AND TIME ON CALLSHEET (CB)

SKIP TO QUESTION 112

=====

5. ENTER COUNTY FROM CALLSHEET.

COUNTY 1:8-9

(CHECK ONLY ONE ANSWER)

- 1. Catawba
- 2. Columbus
- 3. Davie
- 4. Edgecombe
- 5. Halifax
- 6. Iredell
- 7. Johnston
- 8. Lenoir
- 9. Martin
- 10. Nash
- 11. Northampton
- 12. Pitt
- 13. Robeson
- 14. Sampson
- 15. Scotland
- 16. Surry
- 17. Wayne
- 18. Wilson
- 19. Yadkin

6. First, I'd like to ask you some general questions about the land that you own in #5 county.

How many total parcels of land do you own in #5 county?

(ENTER 999 FOR DON'T KNOW)

PARCELS 1:10-12

|_|_| parcels of land

LOWEST VALUE = 1

7. Of these parcels of land you own in #5, how many are 50 acres or larger?

(ENTER 999 FOR DON'T KNOW)

LANDSIZE 1:13-15

|_|_| parcels of land

IF (#7 = 0) GO TO #8
 IF (#7 = 999) GO TO #9
 IF (#7 > #6) GO TO #7

SKIP TO QUESTION 9

=====

8. I'm sorry, but right now we are only interviewing landowners in North Carolina that possess at least one parcel of land that is 50 acres or larger. However, we thank you for your time and cooperation.

SORRY

RECORD AS NE; PRESS ENTER TO CONTINUE

SKIP TO QUESTION 112

=====

9. How many total acres do you own in #5 county?
(ENTER 999999 FOR DON'T KNOW)

ACRES 1:16-21

|_|_|_|_|,|_|_|_|_| acres

LOWEST VALUE = 50

10. And how large is the largest parcel of land you own in #5?

(ENTER 999999 FOR DON'T KNOW)

LARGEST 1:22-27

|_|_|_|_|,|_|_|_|_| acres

LOWEST VALUE = 50

IF (#10 = 999999) GO TO #11

IF (#10 > #9) GO TO #10

11. The next questions are designed to help us learn more about your land and how you manage it. For each of these questions, please refer to your LARGEST parcel of land over 50 acres that you own in #5 county.

First, do you live on this property in #5 county?

LIVEON 1:28

(CHECK ONLY ONE ANSWER)

|_| 1. Invalid answer. Select another. (GO TO QUESTION 11)

|_| 2. Yes (GO TO QUESTION 13)

|_| 3. No

|_| 4. Don't know

12. How near to this property do you live?
(READ LIST; CHECK ONLY ONE ANSWER)

HOWNEAR 1:29

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 12)
 2. Less than 10 miles away
 3. 11 - 20 miles away
 4. 21 - 30 miles away
 5. 31 - 40 miles away
 6. 41 - 50 miles away
 7. More than 50 miles away
 8. Out of state
 9. Don't know

13. Now I'm going to ask you about five different possible uses for your land, and I'd like you to tell me what percentage of the largest parcel of land you own in #5 is used for each purpose. The total of these FIVE items should add to 100%.

First, what percentage of your land is used for ROW OR ROOT CROP?
(ENTER 999 FOR DON'T KNOW)

ROWCROP 1:30-32

|_|_|_|%

HIGHEST VALUE = 100

14. COMPUTING REMAINING PERCENT

COMP1 1:33-35

|_|_|_|%

COMPUTE (100 - #13)

15. What percentage of your land is used for PRODUCTION OF HAY OR AS PASTURE?

(Subtotal is now #13; You have #14 remaining)
(ENTER 999 FOR DON'T KNOW)

PASTURE 1:36-38

|_|_|_|%

HIGHEST VALUE = 100

16. COMPUTING SUBTOTAL1

COMP2 1:39-41

|_|_|_|%

COMPUTE (#13 + #15)

17. COMPUTING REMAINING PERCENT
COMP2R 1:42-44
|_|_|_|_|%
COMPUTE (100 - #16)
18. What percentage of your land is STANDING FOREST GREATER THAN
5 YEARS OLD?
(Subtotal is now #16; You have #17 remaining)
(ENTER 999 FOR DON'T KNOW)
FOREST 1:45-47
|_|_|_|_|%
HIGHEST VALUE = 100
19. COMPUTING SUBTOTAL2
COMP3 1:48-50
|_|_|_|_|%
COMPUTE (#16 + #18)
20. COMPUTING REMAINING PERCENT
COMP3R 1:51-53
|_|_|_|_|%
COMPUTE (100 - #19)
21. What percentage of your land is in CUTOVERS (CLEARCUTS) LESS
THAN 5 YEARS OLD?
(Subtotal is now #19; You have #20 remaining)
(ENTER 999 FOR DON'T KNOW)
CLEARCUT 1:54-56
|_|_|_|_|%
HIGHEST VALUE = 100
22. COMPUTING SUBTOTAL4
COMP4 1:57-59
|_|_|_|_|%
COMPUTE (#19 + #21)
23. COMPUTING REMAINING PERCENT
COMP4R 1:60-62
|_|_|_|_|%
COMPUTE (100 - #22)

24. What percentage of your land is in OTHER USES?
(Subtotal is now #22; You have #23 remaining)
(ENTER 999 FOR DON'T KNOW)

OTHERUSE 1:63-65

|_|_|_|_|%

HIGHEST VALUE = 100

IF (#13 + #15 + #18 + #24 + #21 < 100) GO TO #25

IF (#13 + #15 + #18 + #24 + #21 > 100) GO TO #25

IF (#24 = 0) GO TO #30

SKIP TO QUESTION 28

=====

25. COMPUTING INCORRECT TOTAL

COMP5 1:66-68

|_|_|_|_|%

COMPUTE (#22 + #24)

26. I'm sorry, but that totaled #25.
Let's review those numbers.

NOADD

PRESS ENTER TO TRY AGAIN

SKIP TO QUESTION 13

=====

27. YOU DID NOT USE SPACE BAR

NOSPAC1

PRESS ENTER TO TRY AGAIN

28. What are these other uses of your land?
(DNR LIST; CHECK ALL THAT APPLY)

WHTOTH 1:69-75

(CHECK ALL THAT APPLY)

- 1. Right-of-ways
- 2. Pond/Lake
- 3. River/Stream/Creek
- 4. Lawns
- 5. Recreational use
- 6. Don't know
- 7. Other

IF (#28 = 0) GO TO #27

IF (#28 @ 7) GO TO #29

SKIP TO QUESTION 30

=====

29. ENTER OTHER USES FOR LAND.
(IN 1ST PERSON; 120 CHAR.)

WHTOTHST 2:1-120

30. In what year did you begin to acquire this parcel
of land in #5 county?

YEARBUY 3:1-4

|_|_|_|_|

LOWEST VALUE = 1

31. Do you lease any of this parcel of land in #5
county to other people for agricultural production?

LEASELND 3:5

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 31)
- 2. Yes (GO TO QUESTION 32)
- 3. No
- 4. Don't know

SKIP TO QUESTION 33

=====

32. Of the #10 in this parcel of land, approximately how much land do you lease to others for agricultural production?

LEASENUM 3:6-11

|_|_|_|_|,|_|_|_|_| acres

LOWEST VALUE = 1

IF (#32 = 999999) GO TO #33

IF (#32 = 888888) GO TO #33

IF (#32 > #10) GO TO #32

33. Do you lease any of this parcel of land in #5 county to hunting clubs?

HUNTCLUB 3:12

(CHECK ONLY ONE ANSWER)

|_| 1. Invalid answer. Select another. (GO TO QUESTION 33)

|_| 2. Yes

|_| 3. No

|_| 4. Don't know

34. Who makes the majority of land management decisions on the land you own?

(DNR LIST; CHECK ONLY ONE ANSWER)

WHODEC 3:13

(CHECK ONLY ONE ANSWER)

|_| 1. Invalid answer. Select another. (GO TO QUESTION 34)

|_| 2. I do (the owner)

|_| 3. A hired land manager

|_| 4. Those who lease the land

|_| 5. Don't know

|_| 6. Other (GO TO QUESTION 35)

SKIP TO QUESTION 36

=====

35. ENTER OTHER PERSON(S) THAT MAKE MANAGEMENT DECISIONS. (IN 1ST PERSON; 120 CHAR.)

WHODECST 4:1-120

36. Given your current situation, how long do you intend to keep your land? (READ LIST; CHECK ONLY ONE ANSWER)

LONGKEEP 5:1

(CHECK ONLY ONE ANSWER)

- inheritance
- 1. Invalid answer. Select another. (GO TO QUESTION 36)
 - 2. Less than 5 years
 - 3. 6-10 years
 - 4. 11-20 years
 - 5. Over 20 years
 - 6. Plan to pass on land to next generation as family
 - 7. Don't know

37. Do you feel personally responsible for providing habitat for the wildlife on your land (not to any management agency, but to the wildlife itself)?

RESPNSBL 5:2

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 37)
- 2. Yes
- 3. No
- 4. Don't know

38. Now, I'd like to ask you about various items associated with your land in #5 county and I'd like for you to tell me how important each is, to you, on your property.

First, what about the appearance of your property and the perceptions of your neighbors and fellow citizens? Is this important or unimportant to you?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

HOWLOOK 5:3

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 38)
- 2. Very important
- 3. Somewhat important
- 4. Neither important nor unimportant
- 5. Somewhat unimportant
- 6. Very unimportant
- 7. Don't know

39. What about knowing that wildlife lives on your property?
Is this important or unimportant to you?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WILDLIVE 5:4

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 39)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

40. What about receiving payment to initiate any
habitat work or enhancement on your property?
Is this important or unimportant to you?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

HABWORK 5:5

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 40)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

41. And how important is maximizing profits on your land,
for example, through agriculture or timber production?
Would you say it is important or unimportant?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

PROFIT 5:6

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 41)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

42. What about being able to watch wildlife on your land?
Would you say it is important or unimportant?
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WILDVIEW 5:7

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 42)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

43. What about having personal hunting opportunities on your
land? Would you say it is important or unimportant?
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

YOUHUNT 5:8

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 43)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

44. What about providing hunting opportunities for others on
your land? Would you say it is important or unimportant?
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

HUNTOTH 5:9

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 44)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

45. What about generating revenue from hunting opportunities on your land? Would you say it is important or unimportant? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

HUNTFEES 5:10

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 45)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

46. What about having other personal outdoor recreation opportunities on your land, for example, camping, boating or ATV use? Would you say they are important or unimportant? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

OUTREC 5:11

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 46)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

47. What about caring for and protecting fish and wildlife and their habitats on your land? Would you say it is important or unimportant?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WILDHAB 5:12

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 47)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

48. What about the long-term financial investment of your land?
Would you say it is important or unimportant?
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

INVEST 5:13

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 48)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

49. What about the lifestyle or heritage that is associated with
your land? Would you say it is important or unimportant?
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

LIFESTYL 5:14

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 49)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

50. And what about owning or maintaining undeveloped land?
Would you say it is important or unimportant?
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

UNDEVLPD 5:15

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 50)
 2. Very important
 3. Somewhat important
 4. Neither important nor unimportant
 5. Somewhat unimportant
 6. Very unimportant
 7. Don't know

51. Now I'd like you to rank each of the following land management activities on a scale of 1 to 5, where 1 is the MOST IMPORTANT activity and 5 is the LEAST IMPORTANT activity, using each number ONLY ONCE. First, I'll read all five items then I'll read each item one at a time, so you can tell me which number to assign to each.

Ok, the items are: maximizing profits (for example, agriculture or timber production), hunting opportunities, managing wildlife habitat, recreation (all activities other than hunting, e.g., bird watching or hiking) and owning or maintaining undeveloped land.

RANKACT

PRESS ENTER TO CONTINUE

52. The first item is maximizing profits on your land, for example, agriculture or timber production. How would you rank this land management activity on a scale of 1 to 5, where 1 is the most important activity and 5 is the least important activity.

RANKPRFT 5:16

|__|

LOWEST VALUE = 1
HIGHEST VALUE = 5

53. The second item is hunting opportunities. How would you rank this land management activity on a scale of 1 to 5, where 1 is the most important activity and 5 is the least important activity.

Previous responses:
maximizing profits - #52

RANKHUNT 5:17

|__|

LOWEST VALUE = 1
HIGHEST VALUE = 5

IF (#53 = #52) GO TO #54

SKIP TO QUESTION 55

=====

54. Sorry, you've already used that answer choice for maximizing profits.

SORRY1

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 53

=====

55. The third item is managing wildlife habitat. How would you rank this land management activity on a scale of 1 to 5, where 1 is the most important activity and 5 is the least important activity.

Previous responses:
Maximizing profits - #52
Hunting opportunities - #53

RANKHAB 5:18

|__|

LOWEST VALUE = 1
HIGHEST VALUE = 5

IF (#55 = #52) GO TO #56
IF (#55 = #53) GO TO #57

SKIP TO QUESTION 58

=====

56. Sorry, you've already used that answer choice for maximizing profits.

SORRY2A

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 55

=====

57. Sorry, you've already used that answer choice for hunting opportunities.

SORRY2B

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 55

=====

58. The fourth item is recreation (all activities other than hunting, e.g., bird watching or hiking). How would you rank this land management activity on a scale of 1 to 5, where 1 is the most important activity and 5 is the least important activity.

Previous responses:
Maximizing profits - #52
Hunting opportunities - #53
Managing wildlife habitat - #55

RANKREC 5:19

|__|

LOWEST VALUE = 1
HIGHEST VALUE = 5

IF (#58 = #52) GO TO #59
IF (#58 = #53) GO TO #60
IF (#58 = #55) GO TO #61

SKIP TO QUESTION 62

=====

59. Sorry, you've already used that answer choice for maximizing profits.

SORRY3A

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 58

=====

60. Sorry, you've already used that answer choice for hunting opportunities.

SORRY3B

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 58

=====

61. Sorry, you've already used that answer choice for managing wildlife habitat.

SORRY3C

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 58

=====

62. The fifth item is owning or maintaining undeveloped land. How would you rank this land management activity on a scale of 1 to 5, where 1 is the most important activity and 5 is the least important activity.

Previous responses:
Maximizing profits - #52
Hunting opportunities - #53
Managing wildlife habitat - #55
Recreation - #58

RANKOWN 5:20

|__|

LOWEST VALUE = 1
HIGHEST VALUE = 5

IF (#62 = #52) GO TO #63
IF (#62 = #53) GO TO #64
IF (#62 = #55) GO TO #65
IF (#62 = #58) GO TO #66

SKIP TO QUESTION 67

=====

63. Sorry, you've already used that answer choice for maximizing profits.

SORRY4A

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 62

=====

64. Sorry, you've already used that answer choice for hunting opportunities.

SORRY4B

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 62

=====

65. Sorry, you've already used that answer choice for managing wildlife habitat.

SORRY4C

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 62

=====

66. Sorry, you've already used that answer choice for recreation.

SORRY4D

PRESS ENTER TO CONTINUE

SKIP TO QUESTION 62

=====

67. Would you be willing to pay a management agency for implementing a wildlife management plan on your land, that is, work done specifically to promote wildlife?

PAYFEE 5:21

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 67)
- 2. Yes (GO TO QUESTION 68)
- 3. No (GO TO QUESTION 69)
- 4. Don't know

SKIP TO QUESTION 71

=====

68. What do you think would be a reasonable one-time fee for a management agency to implement a wildlife management plan on your land.

(ENTER 999,999 FOR DON'T KNOW)

FEEPRICE 5:22-27

\$|_|_|_|_|,|_|_|_|_|

LOWEST VALUE = 1

SKIP TO QUESTION 71

=====

69. Would you be willing to allow a management agency to implement a wildlife management plan on your land, if you were paid for the permission to do so?

GETPAID 5:28

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 69)
- 2. Yes (GO TO QUESTION 70)
- 3. No
- 4. Don't know

SKIP TO QUESTION 71

=====

70. What do you think would be a reasonable one-time payment, to you, for a management agency to implement a wildlife management plan on your land. (ENTER 999,999 FOR DON'T KNOW)
PAYPRICE 5:29-34

\$|_|_|_|_|,|_|_|_|_|

LOWEST VALUE = 1

71. Now I'm going to read you a list of habitat enhancement practices that are possible on private land and could be paid for by the NCWRC (the state wildlife agency). Please rate your likelihood of participating in each enhancement practice if financial and technical assistance were available to you. If a practice doesn't apply please indicate Not Applicable.

First, would you be likely or unlikely to establish field borders of natural vegetation along field edges, ditches or pasture edges? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)
BORDERS 5:35

(CHECK ONLY ONE ANSWER)

- |_| 1. Invalid answer. Select another. (GO TO QUESTION 71)
 |_| 2. Very likely
 |_| 3. Somewhat likely
 |_| 4. Neither likely nor unlikely
 |_| 5. Somewhat unlikely
 |_| 6. Very unlikely
 |_| 7. Don't know
 |_| 8. NA

72. Would you be likely or unlikely to participate in prescribed burning? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)
BURNING 5:36

(CHECK ONLY ONE ANSWER)

- |_| 1. Invalid answer. Select another. (GO TO QUESTION 72)
 |_| 2. Very likely
 |_| 3. Somewhat likely
 |_| 4. Neither likely nor unlikely
 |_| 5. Somewhat unlikely
 |_| 6. Very unlikely
 |_| 7. Don't know
 |_| 8. NA

73. Would you be likely or unlikely to plant wildlife food and cover plots? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)
PLNTFOOD 5:37

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 73)
- 2. Very likely
- 3. Somewhat likely
- 4. Neither likely nor unlikely
- 5. Somewhat unlikely
- 6. Very unlikely
- 7. Don't know
- 8. NA

74. Would you be likely or unlikely to participate in the use of herbicides to control vegetation to provide wildlife habitat? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

HERBCIDE 5:38

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 74)
- 2. Very likely
- 3. Somewhat likely
- 4. Neither likely nor unlikely
- 5. Somewhat unlikely
- 6. Very unlikely
- 7. Don't know
- 8. NA

75. Would you be likely or unlikely to participate in timber thinning? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

THINNING 5:39

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 75)
- 2. Very likely
- 3. Somewhat likely
- 4. Neither likely nor unlikely
- 5. Somewhat unlikely
- 6. Very unlikely
- 7. Don't know
- 8. NA

76. And would you be likely or unlikely to use or construct fences to create habitat borders along streams while controlling cattle movement? (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

FENCES 5:40

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 76)
 2. Very likely
 3. Somewhat likely
 4. Neither likely nor unlikely
 5. Somewhat unlikely
 6. Very unlikely
 7. Don't know
 8. NA

77. Next I'm going to read you some forms of assistance that are available to landowners in North Carolina. These programs are available to help landowners manage wildlife habitat on their land. Please tell me if you are very interested, somewhat interested or not at all interested in each of these items for your land in #5 county.

Would you be interested in GENERAL INFORMATION, such as pamphlets, guides and handbooks, to help you manage wildlife habitat on your land?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

INFOHELP 5:41

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 77)
 2. Very interested
 3. Somewhat interested
 4. Not at all interested
 5. Don't know

78. Would you be interested in TECHNICAL GUIDANCE, such as site visits and recommendations by District Biologists, to help you manage wildlife habitat on your land?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

TECHHELP 5:42

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 78)
 2. Very interested
 3. Somewhat interested
 4. Not at all interested
 5. Don't know

79. Would you be interested in MONETARY INCENTIVES, such as cost-sharing, payments and grants, to help you manage wildlife habitat on your land?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

MONEYHLP 5:43

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 79)
- 2. Very interested
- 3. Somewhat interested
- 4. Not at all interested
- 5. Don't know

80. Would you be interested in TAX INCENTIVES on land that is devoted to wildlife habitat, to help you manage wildlife habitat on your land?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

TAXHELP 5:44

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 80)
- 2. Very interested
- 3. Somewhat interested
- 4. Not at all interested
- 5. Don't know

81. And would you be interested in WILDLIFE AGENCY INITIATED LABOR AND/OR MAINTENANCE of wildlife habitat to help you manage wildlife habitat on your land?

(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

AGNCYHLP 5:45

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 81)
- 2. Very interested
- 3. Somewhat interested
- 4. Not at all interested
- 5. Don't know

82. Do you actively manage for wildlife on your land?

MANAGEWL 5:46

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 82)
- 2. Yes (GO TO QUESTION 84)
- 3. No
- 4. Don't know

SKIP TO QUESTION 87

=====

83. YOU DID NOT USE
YOUR SPACE BAR

NOSPAC2

PRESS ENTER TO TRY AGAIN

84. What do you do to help wildlife on your land?

(DNR LIST; CHECK ALL THAT APPLY)

WHATDO 5:47-57

(CHECK ALL THAT APPLY)

- 1. Leave areas fallow
- 2. Keep borders of vegetation around fields
- 3. Erosion control
- 4. Plant food plots
- 5. Maintain natural areas of vegetation
- 6. Practice no-till agriculture
- 7. Avoid summer mowing
- 8. Leave strips of un-harvested grain at field edges
- 9. Prescribe burn
- 10. Don't know
- 11. Other

IF (#84 = 0) GO TO #83

IF (#84 @ 11) GO TO #85

SKIP TO QUESTION 89

=====

85. ENTER OTHER WAY TO HELP WILDLIFE ON LAND.
(IN FIRST PERSON; 120 CHAR.)

WHATDOST 6:1-120

SKIP TO QUESTION 89

=====

86. YOU DID NOT USE
YOUR SPACE BAR

NOSPAC3

PRESS ENTER TO TRY AGAIN

87. Why don't you manage for wildlife on your land?
(DNR LIST; CHECK ALL THAT APPLY)

WHYNOT 7:1-13

(CHECK ALL THAT APPLY)

land

- 1. Lack of info on how to manage for wildlife
- 2. I don't know who to contact for help
- 3. I don't see a need to manage for wildlife
- 4. I don't have the time to manage for wildlife
- 5. I don't have the money to manage for wildlife
- 6. I don't want to initiate habitat enhancement work on my
- 7. I don't want the wildlife agency coming on my land
- 8. I don't want hunters coming on my land
- 9. I'm concerned about restrictions for endangered species
- 10. I'm concerned about wildlife damage on my land
- 11. I don't like how wildlife habitat looks
- 12. I live too far away/ out of state
- 13. Don't know
- 14. Other

IF (#87 = 0) GO TO #86
IF (#87 @ 13) GO TO #88

SKIP TO QUESTION 89

=====

88. ENTER OTHER REASON FOR NOT MANAGING FOR WILDLIFE.
(IN FIRST PERSON; 120 CHAR.)

WHYNOTST 8:1-120

89. Now please indicate which of the following types of wildlife is MOST important to you?
(READ LIST; CHECK ONLY ONE ANSWER)

LIKEWILD 9:1

(CHECK ONLY ONE ANSWER)

- 89) 1. (DNR: Invalid answer. Select another.) (GO TO QUESTION
 2. Big game, such as deer, bear and turkeys
 3. Small game, such as quail, rabbits, squirrels and doves
 4. Waterfowl, such as ducks and geese
 5. Songbirds
 6. Other nongame wildlife, such as
reptiles/amphibians/butterflies
 7. Furbearers, such as opossum, racoons, bobcat, mink or
otter
 8. DNR: No preference
 9. Don't know

90. Now I just have a few final questions for background information. Again, all of your responses will remain completely confidential.

DEMO

PRESS ENTER TO CONTINUE.

SKIP TO QUESTION 92

=====

91. YOU DID NOT USE SPACE BAR

NOSPAC4

PRESS ENTER TO TRY AGAIN

92. I'm going to read a list of outdoor activities and I would like to know if you've participated in each activity more than once in the past 2 years in North Carolina?

(READ LIST; CHECK IF YES; PROMPT FOR TYPE OF CAMPING)

ACTIV 9:2-10

(CHECK ALL THAT APPLY)

1. Hiking
 2. Backpacking
 3. Bird watching/Wildlife viewing
 4. Camping in a campground
 5. Camping in a wilderness area
 6. Fishing
 7. Hunting
 8. DNR: None of these
 9. DNR: REFUSED

IF (#92 = 0) GO TO #91

93. Do you belong or give money to any environmental or conservation organizations?

BELONG 9:11

(CHECK ONLY ONE ANSWER)

- |__| 1. Yes (GO TO QUESTION 94)
- |__| 2. No
- |__| 3. Don't know

SKIP TO QUESTION 98

=====

94. To how many different environmental or conservation organizations do you belong or give money? (ENTER 999 FOR DON'T KNOW; 888 FOR REFUSED)

NUMORGS 9:12-14

|__|__|__|

LOWEST VALUE = 1

SKIP TO QUESTION 96

=====

95. YOU DID NOT USE SPACE BAR

NOSPAC5

PRESS ENTER TO TRY AGAIN

96. To which organizations do you belong or give money?
(DNR LIST; CHECK ALL THAT APPLY)

WHCORG 9:15-30

(CHECK ALL THAT APPLY)

- 1. Ducks Unlimited
- 2. Quail Unlimited
- 3. Trout Unlimited
- 4. B.A.S.S.
- 5. Pheasants Forever
- 6. National Wild Turkey Federation
- 7. The National Wildlife Federation
- 8. The Nature Conservancy
- 9. The National Audubon Society
- 10. Sierra Club
- 11. Safari Club International
- 12. Greenpeace
- 13. National Rifle Association
- 14. Don't know
- 15. REFUSED
- 16. Other

IF (#96 = 0) GO TO #95
IF (#96 @ 16) GO TO #97

SKIP TO QUESTION 98

=====

97. ENTER OTHER ENVIRONMENTAL OR CONSERVATION ORGANIZATION(S).
(IN FIRST PERSON; 120 CHAR.)

WHCORGST 10:1-120

98. Are you involved in any state or federally subsidized land programs such as The Conservation Reserve Program or the U.S. Fish & Wildlife Partners Program?

FEDPROG 11:1

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 98)
- 2. Yes (GO TO QUESTION 99)
- 3. No
- 4. Don't know
- 5. (DNR: REFUSED)

SKIP TO QUESTION 101

=====

99. In how many state or federally subsidized land programs are you involved? (ENTER 99 FOR DON'T KNOW; 88 FOR REFUSED)

FEDNUM 11:2-3

100. How would you characterize the area in which you live? Would you say you live in a rural area, a small town (less than 10,000 people), a city (10-50,000 people), or a large city (50,000+ people)?

(READ SCALE AS NECESSARY)

AREA 11:4

(CHECK ONLY ONE ANSWER)

100)

- 1. (DNR: Invalid answer. Select another.) (GO TO QUESTION
- 2. Rural area
- 3. Small town
- 4. City
- 5. Large city
- 6. (DNR: REFUSED)

101. What is the highest grade level you have completed in school? (READ SCALE AS NECESSARY)

LEVED 11:5

(CHECK ONLY ONE ANSWER)

101)

- 1. (DNR: Invalid answer. Select another.) (GO TO QUESTION
- 2. Grades 1 - 12, but no HS Diploma
- 3. High school graduate
- 4. Some college or trade school
- 5. College graduate
- 6. Graduate or professional degree
- 7. (DNR: REFUSED)

102. What is your primary income source?
(DNR LIST; CHECK ONLY ONE ANSWER)

PRIJOB 11:6

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 102)
- 2. Agricultural production
- 3. Livestock production
- 4. Forest production
- 5. Hunting/Recreation
- 6. Income NOT earned from land holdings (separate job) (GO TO QUESTION 103)
- 7. Don't know
- 8. REFUSED

SKIP TO QUESTION 104

=====

103. ENTER OTHER PRIMARY SOURCE OF INCOME.
(IN FIRST PERSON; 120 CHAR.)

PRIJOBST 12:1-120

104. Approximately what percent of your total household income is from farming?
(ENTER 999 FOR DON'T KNOW; 888 FOR REFUSED)

FARMING 13:1-3

|__|__|__|%

- IF (#104 = 999) GO TO #105
- IF (#104 = 888) GO TO #105
- IF (#104 > 100) GO TO #104

105. Which of these categories best describes your total household income before taxes last year? (READ SCALE)

INCOME 13:4-5

(CHECK ONLY ONE ANSWER)

105)

- 1. (DNR: Invalid answer. Select another.) (GO TO QUESTION
- 2. Less than \$9,999
- 3. \$10,000 to \$19,999
- 4. \$20,000 to \$29,999
- 5. \$30,000 to \$39,999
- 6. \$40,000 to \$49,999
- 7. \$50,000 to \$74,999
- 8. \$75,000 or more
- 9. (DNR: DON'T KNOW)
- 10. (DNR: REFUSED)

106. And, finally, may I ask your age? (ENTER 999 FOR DON'T KNOW; 888 FOR REFUSED)

AGE 13:6-8

|_|_|_|_|

LOWEST VALUE = 1

IF (#106 = 888) GO TO #107
 IF (#106 = 999) GO TO #107
 IF (#106 > 125) GO TO #106

107. That's the end of the questionnaire, thank you very much for your time and cooperation! (ENTER ANY ADDITIONAL COMMENTS; IN FIRST PERSON; 120 CHARACTERS)

END 14:1-120

108. OBSERVE AND RECORD RESPONDENT'S GENDER

GENDER 15:1

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 108)
- 2. Don't know
- 3. Male
- 4. Female

109. TIME INTERVIEW WAS COMPLETED

ENDTIME 15:2-6

|_|_|_|_|_|_|_|_|

110. Please enter your initials in LOWERCASE ONLY!

INTVPRINT 15:7-9

|_|_|_|_|

111. Enter the area code and telephone number of number dialed.

TELEPHON 15:10-19

|_|_|_|_|_|-|_|_|_|_|_|-|_|_|_|_|_|_|_|_|

LOWEST VALUE = 1000000000

112. SAVE OR ERASE INTERVIEW.

DO NOT ERASE A COMPLETED INTERVIEW!

FINISH 15:20

(CHECK ONLY ONE ANSWER)

|_|_| 1. Save answers (GO TO QUESTION 114)

|_|_| 2. Erase answers

|_|_| 3. Review answers (GO TO QUESTION 3)

113. ARE YOU SURE YOU WANT TO ERASE THIS INTERVIEW?

ONLY ERASE IF: Terminated (record on back),
RF, BZ, NA, DS, BG, DL, AM

MAKESURE 15:21

(CHECK ONLY ONE ANSWER)

|_|_| 1. No, do not erase the answers (GO TO QUESTION 112)

|_|_| 2. Yes, erase this interview

114. Date call was made

INTVDATE 15:22-29

|_|_|_|_|_|_|_|_|-|_|_|_|_|_|-|_|_|_|_|_|
Year Month Day

SAVE IF (#112 = 1)

APPENDIX E

VARIABLE DESCRIPTIVE STATISTICS

Appendix E. Name and descriptive statistics for all variables collected in private landowner survey, CURE Program Focal Areas, North Carolina, 2001. If regional differences were found during statistical analyses, they are indicated with an (X).

Variable	N	Measure of Central Tendency		Standard Deviation	Range	Regional Differences
		Mean ¹	Median			
PARCELS	896	3.32	2.00	8.282	1-140	X
LANDSIZE	894	1.63	1.00	1.689	1-25	X
ACRES	867	199.36	120.00	265.724	50-3000	X
LARGEST	868	122.12	90.00	103.893	50-900	X
LIVEON	916	2.53	3.00	0.500	2-3	X
HOWNEAR	483	3.50	2.00	2.126	2-8	
ROWCROP	854	36.39	33.00	32.379	0-100	X
PASTURE	800	14.06	0.00	25.384	0-100	X
FOREST	743	43.22	40.00	29.381	0-100	
CLEARCUT	390	14.02	0.00	21.205	0-96	
OTHERUSE	268	20.76	11.50	21.155	0-100	
OWNTIME	833	25.38	23.00	18.052	0-97	
LEASELND	912	2.40	2.00	0.490	2-3	X
LEASENUM	506	67.77	50.00	72.885	1-1000	
HUNTCLUB	915	2.94	3.00	0.273	2-4	
WHODEC	915	2.62	2.00	1.147	2-6	X
LONGKEEP	915	5.91	6.00	0.703	2-7	
RESPONSBL	915	2.37	2.00	0.619	2-4	X
HOWLOOK	915	2.59	2.00	1.148	2-7	
WIDLIVE	915	2.71	2.00	1.209	2-7	
HABWORK	915	4.33	4.00	1.800	2-7	X
PROFIT	915	2.83	2.00	1.407	2-7	X
WIDLVIEW	915	3.08	3.00	1.417	2-7	
YOUHUNT	915	4.08	4.00	1.787	2-7	
HUNTOTH	915	4.43	5.00	1.661	2-7	
HUNTFEES	915	5.27	6.00	1.284	2-7	X
OUTREC	915	4.99	6.00	1.445	2-7	
WILDHAB	915	2.95	2.00	1.382	2-7	
INVEST	915	2.92	2.00	1.603	2-7	X
LIFESTYL	915	2.68	2.00	1.389	2-7	
UNDEVLDPD	915	3.36	3.00	1.686	2-7	
RANKPRFT	861	1.93	1.00	1.350	1-5	X
RANKHUNT	861	3.43	3.00	1.276	1-5	
RANKHAB	861	2.84	3.00	1.052	1-5	X
RANKREC	861	3.75	4.00	1.163	1-5	X
RANKOWN	861	3.04	3.00	1.475	1-5	X
PAYFEE	915	3.02	3.00	0.341	2-4	X
GETPAID	809	2.85	3.00	0.740	2-4	X

¹ Mean values reported here incorporate all responses; they may differ slightly from means reported in the text due to the elimination of “Don’t know” or “Not applicable” responses during analyses.

Appendix E. (continued)

Variable	N	Measure of Central Tendency		Standard Deviation	Range	Regional Differences
		Mean	Median			
BORDERS	915	4.23	3.00	2.071	2-8	
BURNING	915	4.81	6.00	1.900	2-8	X
PLNTFOOD	915	3.90	3.00	1.947	2-8	
HERBCIDE	915	4.39	5.00	1.913	2-8	
THINNING	915	4.02	3.00	2.074	2-8	X
FENCES	915	5.75	6.00	2.226	2-8	
INFOHELP	915	3.10	3.00	0.868	2-5	
TECHHELP	915	3.39	4.00	0.836	2-5	
MONEYHLP	915	3.31	3.00	0.888	2-5	X
TAXHELP	915	3.15	3.00	0.952	2-5	
AGNCYHLP	915	3.43	4.00	0.838	2-5	X
MANAGEWL	915	2.56	3.00	0.536	2-5	X
LIKEWILD	915	4.33	3.00	2.510	2-9	
BELONG	915	1.86	2.00	0.451	1-3	
NUMORGS	150	1.85	1.00	1.432	1-12	
FEDPROG	915	2.96	3.00	0.421	2-5	
FEDNUM	83	1.24	1.00	1.043	1-10	
AREA	908	2.49	2.00	0.922	2-6	X
LEVED	915	3.98	4.00	1.285	2-7	
PRIJOB	915	5.64	6.00	1.900	2-8	X
FARMING	736	26.63	10.00	33.339	0-100	X
INCOME	915	7.29	8.00	2.405	2-10	X
AGE	887	63.68	64.00	13.202	18-99	
GENDER	915	3.30	3.00	0.459	3-4	