

What motivates private forest landowners to manage their forest land, and how are their management objectives formed?

Chapter 9: Motivation for Private Forest Landowners

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Key Findings

■ Private timberlands in the South are held in more than 4.9 million tracts. The number of private ownerships is increasing, and tract sizes are decreasing.

■ In 1994, two-thirds of all private timberland tracts were <10 acres, but they accounted for only 4 percent of the total private timberland acreage. Tracts >500 acres represented nearly one-half the total private acreage.

■ Southern nonindustrial private forest (NIPF) owners have widely diverse ownership use and management objectives, beliefs, values, and interests.

■ Primary reasons for NIPF ownership in the South include rural area residence, land investment growth, farm or domestic use, enjoyment of natural resources, estate purposes, and outdoor recreation.

■ Although representing a small percentage of all private timberland owners, owners interested primarily in timber production make management decisions for more than one-third of all private timberland.

■ Available research information is insufficient to define an average private southern forest landowner.

■ Factors that can influence the ways in which private owners manage their land include income, personal values, tract size, residence, long-term plans, knowledge of alternative management options and benefits, taxation policies, and government assistance programs.

■ Research information about objectives or behaviors of subgroups of the general southern NIPF population is limited and inconclusive, except for those who have participated in government cost-share programs.

■ Little research information is available about owner corporations, partnerships, clubs, and other entities, including timber investment and management organizations (TIMOs). Nonindustrial corporate owners control 11 percent of the South's total private timberland acreage. Forest industries control 21 percent of the total private acreage.

■ In 1994, 1.4 million private owners had intentions to harvest timber on more than 112 million acres within the following decade. The <1 percent of owners holding tracts >500 acres controlled 65 percent of the timberland intended for harvest.

■ In 1994, private owners who indicated they would never harvest timber from their land controlled only 12 percent of the total private timberland acreage.

■ Government cost-share programs have assisted a small percentage of the total NIPF owner population. The programs seem to be most popular with owners interested in timber and wildlife production. Related motivational factors include management costs, available capital, taxes, and resource commodity values.

■ Many southerners, including forest landowners, feel that private property rights are important but secondary to environmental protection needs.

Introduction

The South's 215 million acres of forest land are among the most productive in the Nation. About 201 million acres of this land are classed as timberland, capable of producing at least 20 cubic feet of industrial wood each year and not withdrawn from timber utilization. Private holdings account for about 89 percent of the total timberland acreage. The major private owner groups are NIPF owners and forest industry owners. NIPF owners alone control 79 percent of the total private timberland acreage. How the South's private forests are used and managed will have important impacts on future supplies of forest-resource-related goods, services, and benefits. Identifying and understanding the characteristics of private owners and the major factors that may influence land use and management will be important to the development of effective owner assistance programs, as well as for predicting future resource conditions.

Methods

Information presented here is based solely on a review of existing data, papers, and published literature.

Data Sources

A primary source of data is the nationwide Forest Inventory and Analysis (FIA) project of the USDA Forest Service, undertaken in cooperation with the National Association of State Foresters and the USDA Natural Resources

Conservation Service. A description of inventory procedures used to collect survey data in the South is presented in chapter 16. Other sources of information reviewed for this chapter included papers and articles published primarily during the last 10 years that describe acreage, demographics, attitudes, and management behavior of private forest owners in various Southern States. Selected FIA data on regional timberland acreage, as well as selected State and Private Forestry Cooperative Program accomplishments data for Southern States, were obtained from unpublished USDA Forest Service sources. The term “forest land” as used in this chapter refers to tracts at least 1 acre, that are at least 10-percent stocked with trees of any size and are not currently developed for nonforest use.

Results

Ownership

The 13 Southern States contain an estimated 215 million acres of forest land. About 201 million acres are classified as timberland (chapter 16). In 1999, an estimated 179 million acres of the South's timberland (89 percent) were in private ownership (chapter 16). Birch (1996) found southern private timberlands to be in 4.9 million tracts owned or controlled by private individuals and legal entities, including corporations, clubs, trusts, partnerships, American Indian tribes, and Native American corporations. More than three-quarters of all private owners owned only one tract. More than two-thirds of these tracts were located <1 mile from owners' residences.

In 1999, about 21 percent (37 million acres) of the South's private timberlands were owned by forest industries (chapter 16). In 1994, forest industries represented <1 percent of all private ownership units (Birch 1996). Although forest industry timberland acreage slowly increased from 1953 until 1989, it declined by about 1 million acres (3 percent) between 1989 and 1999 (chapter 16).

In 1994, an estimated 4.7 million individual owners held the largest share of private southern timberland. Individual owners compose the core of the group commonly referred to as

NIPF owners (Moulton and Birch 1995). Almost 95 percent of all private timberland owners in the South are in this group (Birch 1996). In 1999, they controlled 63 percent of the total private timberland acreage (chapter 16).

Since African-Americans constitute the largest group of minority rural landowners in the South, they are probably also the largest group of minority NIPF owners. No statistics are available, however, regarding overall minority ownership characteristics (Shelhas 2000). Gan and others (1999) have reported data about a limited number of minority NIPF owners in two southeastern Alabama counties. Selected owner information from this study is included in various sections of this chapter.

In 1994, nonindustrial corporations, partnerships, clubs, associations, and other entities held nearly 5 percent of the 4.9 million private timberland tracts in the South (Birch 1996). Acreage in nonindustrial corporate ownerships increased by about 25 percent from 1982 to 1999. By 1999, corporate owners accounted for 11 percent of private timberland acreage (chapter 16). Nonindustrial corporate owners include various timber and investment management organizations (TIMOs), such as banks, insurance companies, agribusiness, and investment and development firms (chapter 16). In 1999, TIMOs held about 4 million acres of timberland throughout the South (chapter 14).

Information about timberland ownership by ecological province is presented in chapter 16. As illustrated in figure 16.35 and table 16.32 of that chapter, private timberland is represented in all 11 provinces. Public, private corporate, and private forest industry ownerships are concentrated in the Outer Coast Mixed and Southeast Mixed Provinces (chapter 16).

Nearly 2 million new, predominately NIPF owners acquired their land sometime between 1980 and 1994. Of these new owners, more than one-fifth acquired land between 1990 and 1994 alone (Birch 1996). Many undoubtedly inherited land. Amacher and others (1998), for example, found that almost one-fourth of Virginia's NIPF owners had obtained their land through inheritance. Jacobson (1998) reported the same situation for three-tenths of Florida NIPF owners.

The acreage and number of all private timberland tracts in the South increased at a moderate rate between 1978 and 1994, while average tract size decreased. During that period, all private timberland ownerships increased by nearly one-third, or 1.1 million units. Acreage held in tracts of <10 acres increased by 51 percent. Other acreage changes included: 10- to 99-acre tracts (+25 percent); 100- to 499-acre tracts (-15 percent); 500- to 999-acre tracts (-9 percent); 1,000+-acre tracts (+9 percent) (Moulton and Birch 1995). For a comprehensive review of changes and trends in forest land and timberland over the past 50 years, see chapter 16.

By 1994, about two-thirds of all private timberland tracts were <10 acres. Together, however, these small tracts accounted for only 4 percent of the South's total private timberland acreage. The majority of all timberland (70 percent) was held in tracts of at least 100 acres, by <6 percent of all owners. Tracts >500 acres alone represented nearly one-half the total private timberland acreage (Birch 1996).

Private Owner Occupation, Income, and Education

Information about NIPF owner demographics in the South is sketchy. Kluender and Walkingstick (2000), for example, found that >40 percent of Arkansas NIPF owners were retirees. Birch (1996) reported that 29 percent of all southern private timberland owners were white-collar workers. Retirees and blue-collar workers were two other dominant classes. Together, these three classes accounted for 72 percent of all private owners. Retirees and white-collar workers each owned around 20 percent of all private timberlands.

Farmers accounted for only 6 percent of all southern owners and held only about 9 percent of all private timberland. As noted in chapter 16, farmer-owned timberland has been declining for many decades. Fifty years ago, farmers owned about two-thirds of the South's timberland (chapter 16).

Limited State-level research findings suggest that annual income and educational levels of NIPF owners probably vary considerably, just as they do for people in general. Amacher and

others (1998) found that the average annual income of NIPF owners in rural southwestern Virginia was about \$48,000. Landowners in the more urbanized, central Virginia region, however, had an average yearly income of >\$91,000. The modal subjects of a Florida NIPF study had at least a bachelor's degree and a household income of >\$50,000 annually. Kluender and Walkingstick (2000) found about 18 percent of NIPF owners in Arkansas had not graduated from high school, about 30 percent had graduated from high school, and the remainder either had some college education (25 percent) or were college graduates (26 percent). Almost half of these landowners reported household incomes of at least \$35,000 per year, while 28 percent averaged <\$20,000 annually (Kluender and Walkingstick 2000). The median annual household income of NIPF minority landowners in two Alabama counties was between \$30,000 and \$39,999, with two-fifths having incomes of at least \$40,000. Four-fifths had at least a high school education (Gan and others 1999).

The large numbers of retiree NIPF owners in the South, as well as other research findings, suggest that many timberland owners are probably between 50 and 60 years old. Hodge (1996) reported that about 50 percent of Virginia NIPF owners were older than 60. Another third were 46 to 60 years old. Virginia landowners studied by Amacher and others (2000) had an average age of 60 years. About 60 percent of new NIPF forest owners in Georgia were older than 55 (Newman and others 1996). Nearly three-quarters of Louisiana NIPF owners enrolled in the Forest Stewardship Program (FSP) ranged from 40 to 69 years old (Lorenzo and Beard 1996). Jacobson (1997) reported the modal subjects of a Florida NIPF study to be between 56 and 75 years old. More than three-quarters of Mississippi NIPF owners who had harvested timber in recent years were found to be at least 50 years of age (Gunter and others 2001). More than two-thirds of minority NIPF landowners in two southeastern Alabama counties were found to be at least 50 years old (Gan and Kollison 1999).

Ownership Reasons and Objectives

Various regional and State surveys of southern NIPF owners have been conducted to determine reasons for ownership and related management objectives. Different surveys, however, have offered different arrays of choices from which single or multiple selections could be made by NIPF owners. Birch (1996), for example, found that the four most popular primary reasons for ownership in the South, accounting for more than two-thirds of all owners and one-third of all private timberland acreage, included residential use, estate use, land investment, and aesthetic enjoyment. Aesthetic enjoyment was the most popular benefit expected in the future decade. The second most popular benefit expected was farm and domestic use (Birch 1996). More than a third of North Carolina NIPF owners indicated that their desire to pass on an estate to heirs was one major reason for owning forest land. Owning forest land as part of a residence and for the enjoyment of owning green space were tied for the second most popular reason (Megalos 2000). The most significant multiple ownership reasons of Virginia NIPF owners included preserving nature (63 percent), maintaining scenic beauty (59 percent), and viewing wildlife (47 percent) (Hodge 1996). Arkansas NIPF landowners included living in a rural environment (58 percent), enjoying green space (54 percent), providing a place for wildlife (54 percent), and creating an estate for heirs (44 percent) as their most popular objectives, selected from a list of 11 choices (Kluender and Walkingstick 2000).

Only 5 to 6 percent of southern private timberland owners were found by Birch (1996) to have an interest in recreation as a primary or secondary reason for ownership. Recreation was also chosen by only 7 percent of all owners as a future expected benefit. Megalos (2000) found that 21 percent of North Carolina landowners favored recreation, such as hunting, camping, fishing, and birdwatching, as one reason for owning forest land. About 40 percent of NIPF owners in Arkansas chose "personal recreation opportunity" as an ownership objective (Kluender and Walkingstick 2000).

Financial returns from timber production and growth in real estate values are important objectives for many forest landowners. Birch (1996) found about 4 percent of southern timberland owners, holding 35 percent of the total private acreage, owned forests primarily for timber production. About 7 percent of all private owners expected to receive income from timber within the following decade. Another 27 percent of all private timberland owners expected land value increase to be a future ownership benefit (Birch 1996).

Timber production was an important ownership objective of almost one-fourth of North Carolina NIPF owners (Megalos 2000). In Virginia, timber production was an important ownership reason for 27 percent of all forest landowners (Hodge 1996). Growing trees for timber to sell was selected as at least one of multiple ownership objectives by a third of Arkansas NIPF owners (Kluender and Walkingstick 2000). Timber production was found by Newman and others (1996) to be the most popular ownership reason chosen by new forest land purchasers in Georgia. This finding could have been influenced by the fact that only owners of tracts of at least 75 acres were surveyed.

Results of a nationwide recreation study, as reported in chapter 11, showed that about 7 percent of southern landowners selected making money as a primary or secondary objective of forest landownership. In Virginia, real estate investment was chosen by 40 percent of forest owners as one important reason for ownership (Hodge 1996). More than half of Arkansas NIPF owners indicated they would "emphasize using land to make money, but will also consider natural aspects" as a future management objective. About 13 percent of these owners included "making money by charging others for hunting, fishing, and other recreation" among their ownership objectives. Only 5 percent of all owners intended to "mostly use land to just make money" (Kluender and Walkingstick 2000).

Ownership reasons and objectives are no doubt greatly influenced by personal beliefs and values. These values, in turn, may be influenced by external factors such as local and regional economies, land management

traditions, and basic land characteristics. As one moves the focus of a landowner study from regional to substate levels, these factors become more narrowly defined and unique. Several southern researchers have addressed possible differences in various landowner characteristics from this basic perspective. Williams and others (1996), for example, found significant differences between Delta and Southwest Arkansas NIPF owners regarding forest land use preferences. Megalos (2000) found “unequivocal regional differences” in forest landownership objectives among North Carolina landowners. These differences were thought to be related to factors such as historical land use, local timber markets, and site productivity. Mountain region landowners, for example, were more likely to enjoy owning their forests for green space and as a place of residence than landowners in the Piedmont and Coastal Plain regions. Landowners in the Coastal Plains, where farming and forest industry are predominant employers, were found to be focused more on farm and timber-related objectives. Kluender and others (1999) determined that Arkansas NIPF owner groups of different physiographic regions had different management objectives and tendencies. Strong variations were also found among NIPF owners within individual physiographic regions.

Owner Attitudes, Values, and Knowledge

Rural landowners and nonlandowners seem to share similar beliefs and attitudes about forest values and the environment. As reported in chapter 7, Tarrant and others found, with one important exception, no significant differences between these two groups. The exception was that forest landowners were likely to rate wood products as a more important management objective for private forests. The ecological region that people lived in was also found to have had little bearing on beliefs and attitudes.

Some southern forest owners seem to dislike government regulation of private forest use and management, while others think regulation for the public good may become necessary in the future. Related research information, however, is limited. A

majority of Arkansas NIPF owners were reported to believe they had the right to use their land in any fashion without regulations, but also believed in environmental protection and land stewardship (Williams and others 1996). More than half of new forest landowners in Georgia, surveyed by Newman and others (1996), indicated land management regulations might be necessary in the future. Another 40 percent felt that private landowners have an obligation to maintain areas for the protection of endangered species. In a study of Mississippi NIPF owners who had harvested timber sometime between 1994 and 1998, Gunter and others (2001) found that the vast majority thought that reforestation should not be regulated by the State government but should remain a landowner decision.

A 1992 survey of residents of the seven States (Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia) revealed that the great majority of survey participants favored a balance between private property rights and environmental regulations, as long as protection of the environment was ensured. Forest owners and nonowners shared similar opinions about this issue (Bliss and others 1994). Differences of opinion among several subgroups were later examined by Bliss and others (1997). Strong majorities of urban and rural residents and forest owners and nonowners agreed that private property rights were important but secondary to environmental protection. Few people of any category agreed that private owners have the right to do as they please with their forests, regardless of environmental consequences. Most private forest owners (63 percent) approved of limiting owner rights if necessary to protect the environment. A majority of private owners also agreed that it would be appropriate for the government to regulate tree cutting on private land to protect streams, wetlands, threatened and endangered species, and scenic beauty.

The attitudes of NIPF owners in the Tennessee Valley who had sold timber in the past differed markedly from other owners who had not. Only 4 out of 10 owners who had sold timber supported limiting private owner rights to protect the environment. Yet only a third of the total believed private owners have the

right to do as they please with their forests. These seemingly conflicting findings may suggest that some landowners believe that environmental protection is a personal rather than governmental responsibility. From another perspective, some landowners may feel they should be allowed to tend to their own private business on their land and let others tend to theirs. In a study of South Carolina NIPF owners, for example, Jacobson and others (1996) found that more than half did not agree that the impact of personal land use decisions on neighboring landowners was an appropriate private owner concern. Only 3 out of 10 favored joint planning for land use with neighbors. A study of NIPF owners in nine Southeastern States (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia) revealed a slight majority agreeing that society should regulate landowners' activities, but only if they caused harm to adjacent properties (Brunson and others 1997).

What NIPF owners think is appropriate for private land management may differ from what is thought appropriate for public land. Tennessee Valley landowners were found to share public concerns about clearcutting and prescribed burning on private land, being evenly divided on the acceptability of such practices. Relatively few, however, approved clearcutting and herbicide use on public land (Bliss and others 1994). In a later report, Bliss and others (1997) reported no significant differences between urban and rural residents, or between forest owners and nonowners, in the approval of such practices. Again, it seems that private landowners reflect the general characteristics of the public at large, at least in terms of attitudes toward forest land use and management.

Limited research findings suggest that many landowners may be unaware of the social, political, and environmental policies and issues that influence natural resource conditions and management opportunities in forests. Newman and others (1996), for example, found that most new forest owners in Georgia were unaware of forest management opportunities and laws affecting land management. Most were also unaware of, or uncertain

about, the potential use of State Agricultural Preference or Conservation Use classifications to reduce their annual property taxes. In a study of Arkansas NIPF owners, a majority were found unaware of the Endangered Species Act or the Clean Water Act (Williams and others 1996). Jacobson and others (1996) concluded that South Carolina NIPF owners' knowledge of ecosystem management varied widely. Only one-fourth were familiar with the concept. About one-third had no apparent knowledge of it.

Tract size may influence landowner attitudes toward timber production. As reported in chapter 16, various researchers have concluded that the practicality of timber management decreases as tract size decreases. Landowners with the fewest acres are thought to also have the fewest management options to pursue (chapter 15). In a study of Virginia NIPF owners, Hodge (1996) found a significant relationship between ownership of <250 acres and the likelihood that an owner would believe: (1) harvesting has adverse effects on the forest's natural growth process and hunting; (2) cutting firewood is not harvesting trees; and (3) more land was needed, with more trees of higher quality, to harvest timber. Williams and others (1996) found that Arkansas NIPF owners were more likely to practice some type of active forest management when their tracts were >100 acres. This finding is supported by Gunter and others (2001), who found that about two-thirds of Mississippi NIPF owners who reforested their land after a timber harvest owned holdings of at least 100 acres.

Reforestation after timber harvest helps ensure the growth of new stands of desired tree species. Megalos (2000) found that an individual's choice to reforest land was positively associated with variables such as costs, knowledge of cost-share assistance, knowledge of tax incentives, income, and timber prices. Newman and others (1996) reported timber prices to be the most important primary factor justifying reforestation investments by new Georgia owners. Cost sharing and other government payments were strong secondary factors. In a study of Mississippi NIPF owners who had harvested timber between 1994

and 1998, Gunter and others (2001) found that the two leading reasons for reforestation were: (1) the desire to keep land in timber production, and (2) the desire to be good stewards. The two most important owner reasons for not reforesting harvested lands were: (1) the belief that a site would reforest itself naturally, and (2) high reforestation costs.

Private owner attitudes are generally unfavorable toward allowing the public access to their land for recreation. The most important problems and concerns of southern landowners in this respect have included littering and garbage dumping, illegal hunting and fishing, and damage to property fences and gates. About 41 percent have posted their land to control public use and prevent damage (chapter 11). Williams and others (1996) found that major concerns of Arkansas NIPF owners included timber theft, trash dumping, and trespassing.

The percent of individuals who allow public access to their land has been declining over the past 15 years. This change has been due partly to increases in land development pressures, people seeking recreation, and forest fragmentation (chapter 11). Kluender and Walkingstick (2000) found that only 4 percent of Arkansas NIPF owners included providing recreation for others as an important management objective. A study of southern landowners found that most permitted recreation access only to family and friends (chapter 11).

Private Forest Management Planning and Practices

Much research and resource inventory work was focused in past decades on determining the characteristics of southern timber stands and the types of management activities private owners were, or were not, actively practicing. Such information allowed calculations of how many landowners needed timber management information and how much acreage was in need of treatment such as stand improvement or harvest. In more recent years, research information has been gathered about a greater variety of landowner management practices, perhaps reflecting awareness in the forestry

community of a greater variety of important ownership objectives.

As noted in chapter 11, the most common management practices employed by southern private landowners included: using fire to control undesirable vegetation (14 percent), wildlife habitat improvement (11 percent), tree planting (10 percent), and mature timber harvest (8 percent). More than 30 percent of landowners had practiced some form of wetlands conservation. Less than a third of large (100+ acre) NIPF landowners in Florida were found to have implemented practices designed to enhance timber growth, improve wildlife habitat, protect water quality, and/or enhance scenic values (English and others 1997). Only 43 percent of FSP participants in the South indicated that water-quality management practices were included in their management plans (Esseks and others 2000). Protection of wetlands proved to be the least frequently used conservation practice of Florida NIPF owners (English and others 1997). Kluender and Walkingstick (2000) reported that past management activities of Arkansas NIPF owners had included wildlife habitat improvement (36 percent), tree thinning (22 percent), tree planting (21 percent), road development (14 percent), and trail development (11 percent).

These findings suggest that numerous private forest landowners in the South are not actively managing their resources. This conclusion is supported by findings of a study of Florida NIPF owners, which determined that 47 percent of them did not actively manage their land. Possible reasons for not managing are acquisition objectives involving land investment, second home sites, and other nonmarket uses (Jacobson 1998). Of course, doing nothing with a tract of forest land can be viewed as an intentional form of passive management. Given the numbers of forest owners throughout the South interested in owning land for nonconsumptive reasons such as green space, aesthetic values, wildlife viewing, etc., doing nothing may be thought to be both practical and cost-effective by many.

Some forest owners may not forgo timber production due to a lack of understanding of management practices and land potentials. Megalos (2000) found, for example, that more than half

of NIPF owners in North Carolina not interested in timber production either believed their tracts were too small or in too many locations, or they simply did not know where to start. About one-fourth indicated that timber management was just not a personal priority. Nearly one-sixth selected not liking the looks of a harvested area as a reason. Less than one-tenth felt high initial investment costs, government regulations, or other reasons discouraged management. Gan and others (1999) found similar reasons why southeastern Alabama minority NIPF owners were not managing their forest land to improve personal income. These reasons included: lack of capital (44 percent), no time to manage (40 percent), do not know how to manage (38 percent), and have limited knowledge of marketing (29 percent). These owners, however, were very interested in becoming more knowledgeable about various management practices and in timber marketing and selling information (see "Landowner education and technical assistance").

Even if the millions of private forest owners in the South were all convinced of the need for professional forestry assistance, it would be difficult to estimate how many government and private natural resource professionals would be needed to provide such assistance. The great majority of private owners, however, do not seek professional assistance. Of those people who do seek assistance, many receive it from State agency personnel. Southern State forestry agencies reported providing technical assistance to almost 78,000 landowners in the year 2000. From 1990 to 2000, an average of 76,200 landowners were assisted each year throughout the South (U.S. Department of Agriculture Forest Service 2001). It is not known how many of these owners were new versus repeat customers. Although impressive, such large numbers represent only a small percentage of potential customers. No current information was found about numbers of southern landowners assisted by forest industry and private consulting foresters.

Kluender and Walkingstick (2000) found about three-quarters of Arkansas NIPF owners managed their forests themselves, without any assistance. Among Virginia NIPF owners who

had harvested timber, about 46 percent indicated they had not sought any type of professional forestry assistance. The most common reasons included "never thought about it," "did not know assistance was available," and "did not know whom to contact" (Hodge 1996).

Tract size seems to be related to whether a landowner seeks management assistance. Hodge (1996) found that the smaller the tract size owned, the less likely an owner would be to seek professional assistance. Among owners who had harvested timber from their land, larger landowners (owning 100 acres or more) were found more likely to seek assistance. Landowner awareness of the potential benefits of good forest management may also be a factor. Hodge (1996) found a significant positive relationship between knowledge and the propensity to seek professional forestry assistance. A similar relationship was found by English and others (1997) between information-seeking activity and participation in the FSP by Tennessee NIPF owners.

In spite of the vast majority of southern forest landowners indicating timber production is neither a primary nor secondary objective, significant percentages of private owners do sell their trees for harvest. The extent to which harvests are conducted for financial gain, lot clearing, interest in sustaining forest ecosystem health, and/or other reasons is unknown. Kluender and others (2000) discovered that about half of Arkansas NIPF owners had sold timber from their land at some time. Birch (1996) found that about 45 percent of all private timberland owners in the South, controlling 78 percent of all private acreage, had harvested timber in the past.

Birch (1996) reported that 1.4 million private owners had intentions to harvest timber on more than 112 million acres of southern timberland within the following decade (1994–2003). Of these owners, <1 percent held tracts >500 acres, but they controlled about 65 percent of the private timberland intended for harvest. Another 18 percent of tracts intended for future harvest ranged in size from 100 to 499 acres (Birch 1996). These findings are supported by the results of a survey of new Georgia forest owners having forest tracts of at least

75 acres. About 60 percent of these owners said they were likely to harvest timber some time in the long-term future (Newman and others 1996).

Amacher and others (1998) reported that owners of large forest tracts were more likely to harvest timber than small tract owners, due to greater concerns about investment risks and returns. Surprisingly, however, more than half of all private owners in the South in 1994 having future harvest intentions held tracts <10 acres. They also accounted for only 1 percent of the total land intended for harvest (Birch 1996). Whether any of the numerous small landowners mentioned actually have had timber harvested from their land by this time, as intended, is not known.

Kluender and others (1999) found that ownership objectives, education, and income levels were strong factors influencing management propensity, inclination to harvest timber, and use of cost-share assistance. In a study of Virginia NIPF owners, however, Conway and others (2000) found significant regional differences in the usefulness of factors such as income and nontimber activity preferences for predicting the probability of timber harvesting.

A professionally prepared forest management plan reflects owner objectives, natural site capabilities, and practices that can be used to achieve desired resource characteristics. In 1994, only 5 percent of all southern private timberland owners had written management plans of some type for their forests. These forests, however, collectively comprised about 40 percent of the South's total private timberland acreage. Most owners (78 percent) of tracts of at least 5,000 acres did have plans. Plans were found especially uncommon among owners of small and mid-sized tracts (Moulton and Birch 1995). Only 9 percent of corporate NIPF owners had management plans in 1994, representing only 7 percent of the total regional timberland acreage. About 5 percent of individual NIPF owners had management plans. They controlled 14 percent of the South's private timberland acreage in 1994 (U.S. Department of Agriculture Forest Service 2001). In North Carolina, about 16 percent of NIPF owners had management plans for their forest lands (Megalos 2000).

Melfi and others (1995) found that more than half of the participants in the FSP in South Carolina had management plans prepared by government forestry agency employees. Private consultants had prepared a third of all the Forest Stewardship Program (FSP) plans. Forest industry employees were responsible for the remainder. Individual owners of relatively large tracts were generally found to have had plans prepared by forest industry employees. Owners of smaller tracts generally had their FSP plans prepared by State government personnel.

Land Management Incentives and Disincentives

Taxes—Sampson and DeCoster (1997) reported that influential national and regional forestry leaders believe tax policy rewards to be the most effective motivators for private landowners. McColly (1996) suggested that tax reforms, particularly for inheritance, capital gains, property taxes, and passive loss rules, were the number one concern of NIPF owners throughout the United States.

Since many NIPF owners receive land-based income through infrequent activities such as timber harvesting and land sales, they are viewed as passive investors. Such investors are subject to rules making it difficult to recapture expenses incurred for services such as expert advice or conservation and maintenance measures (DeCoster 1996). Federal tax law provides for the recovery of a percent of invested monies, excluding government cost-share monies, in the form of a tax credit. Provisions also allow early amortization of reforestation and afforestation expenses (Kluender and others 1999). Peters and others (1996) found numerous studies of forest estate cases suggesting that Federal and State estate tax burdens may cause heirs to harvest timber prematurely or abandon timber production activities. Cabbage and others (1993) surmised that high property taxes might lead some landowners to prematurely harvest timber or convert forest lands to more profitable uses, to generate cash needed for tax bills. Peters and others (1996) suggested that expert information and estate planning assistance could save forest land heirs a substantial amount of Federal and State taxes and could

help avoid disruptions in management efficiency and continuity. Schelhas (2000) reported that inadequate estate planning was one of the principal obstacles to forest management on minority-owned land. For a detailed discussion of State and Federal tax laws and their influence on forest management activity, see chapter 8.

Private owners have varying opinions about the importance of taxes to forest ownership and management. Newman and others (1996) found that more than half of new Georgia private owners did not consider property taxes to be an important issue. Jacobson (1998) found that only one-fourth of Florida NIPF owners had taken advantage of reforestation tax credits. Megalos (2000) reported <5 percent of North Carolina NIPF owners selected tax-related issues as a management deterrent. More than half of them, however, indicated likely participation in future programs that would reduce property taxes and provide income tax relief. A third also favored the idea of a tax-deferred green investment reforestation account (GIRA) as an incentive. A GIRA, as described by DeCoster (1996), would provide for a tax-free savings account to fund reforestation activities.

Government regulations—For a comprehensive review of State and Federal land and water laws and policies influencing private forest management practices in the South, see the section on Protective Regulatory Policies in chapter 8. The authors conclude that regulatory policies may limit acreage that can be used for certain purposes and otherwise alter landowner management strategies, increase costs, and possibly reduce income. Impacts may vary with tract size, tract resource attributes, location, and owner management objectives. Landowners seeking to maximize income through timber sales, for example, could be more adversely affected than those managing for natural amenity values. Megalos (2000) found, however, that only 7 percent of North Carolina NIPF owners believed government regulations would discourage management.

Government forest management assistance programs—Government technical, educational, and financial forestry assistance programs have been designed over the years to promote

certain forest management practices by NIPF owners. Timber production historically has been a primary emphasis of such programs. Perhaps this is one reason why Jacobson and others (1996) concluded that past studies of NIPF owners have usually focused on timber-related issues. Megalos (2000) noted that the strongest justification for government timber-oriented programs might be the nontimber benefits enjoyed by the public, including soil and water-quality protection, scenic beauty, wildlife habitat, carbon sequestration, and recreation. Gaddis (1996) stated that government cost-share incentives program costs are offset by reductions in prices of forest-related goods, such as wood products, as well as public amenities.

The history of Federal-State forestry assistance programs began with the creation of the U.S. Department of Agriculture Division of Forestry in 1898, to assist and educate private landowners (Megalos 2000). Congress passed the first Federal-State cooperative forestry legislation in the Clarke-McNary Act in 1924. This act attempted to slow the rate of timber price increases and forestall a foreseen national timber supply shortage. It provided matching funds to States to supply tree seedlings used for windbreak, shelterbelt, and farm woodlot plantings (Cabbage and Wear 1993).

Gaddis (1996) thoroughly described the history of Federal-State cooperative programs since the 1930s. A summary of this information is presented here. The Agricultural Conservation Program, authorized in 1936, used cost-share monies as incentives for farmers to implement certain soil conservation measures, such as pasture improvement, tree planting, timber stand improvement, and wildlife habitat improvement. In 1956, the first Conservation Reserve Program (CRP) (the Soil Bank) paid farmers to retire farmland from crop production and shared the costs for practices that improved watershed conditions, wildlife habitat, recreation, and aesthetics; controlled soil erosion; and increased wood supplies. The Forestry Incentives Program (FIP) was initiated in 1973 to share the costs of tree planting for timber production. A new CRP was authorized in 1985 to convert

highly erodible cropland to pasture or forest. Its primary goals were soil and water conservation and wildlife habitat improvement. These activities were supported by cost-share funds and annual payments to landowners (Gaddis 1996).

In 1990, several new programs were authorized that emphasized forestry practices on private land. In that year, CRP, along with the Wetlands Reserve Program (WRP), was made a part of the Environmental Conservation Acreage Reserve Program (ECARP). Under ECARP, CRP was modified to encourage hardwood tree planting and conversion of grassland to forest. The WRP provided cost-share monies for wetland reforestation (Gaddis 1996).

The FSP and the Stewardship Incentives Program (SIP) were authorized by the Forest Stewardship Act of 1990 to promote management of NIPF tracts of at least 10 acres for multiple objectives, including timber, recreation, wildlife, aesthetics, water-quality and soil conservation. SIP cost-share incentives were designed to replace the timber-oriented FIP incentives. The FSP required a written management plan to be prepared for landowners by State forestry agency personnel or other qualified professionals. SIP cost-share funds were used to help landowners implement approved practices (Gaddis 1996).

Since 1991, a reported 36,786 FSP management plans, covering 8,586,730 acres of NIPF land, have been prepared for southern landowners. In the year 2000 alone, 3,031 plans were prepared, involving 459,864 acres of private forest land (U.S. Department of Agriculture Forest Service 2001).

Esseks and Moulton (2000) reported a profile of the average FSP participant. Participants from the South were predominantly male (85 percent) and white (95 percent), held at least a bachelor's degree (61 percent), and owned from 50 to 199 acres of forest land (36 percent). The median acreage owned was 102 acres. Most did not live on their land (58 percent), had owned it for >10 years (58 percent), and were interested primarily in growing trees and providing wildlife habitat (79 percent). Most had never before received advice about forest land management from a specialist (58 percent), had had someone from a public agency prepare their FSP plan

(70 percent), and had received follow-up assistance (72 percent), primarily from a State agency (80 percent). Participants' annual incomes ranged from <\$25,000 (10 percent) to >\$75,000 (30 percent). Their median income was between \$50,000 and \$75,000 per year.

Eight Southern States currently have their own forestry incentives programs. In 1970, Virginia led the way with the creation of its Reforestation of Forest Lands program. This program provides cost-share funds to private landowners to support reforestation, site preparation, timber stand improvement, firebreak construction, prescribed burning, and fencing. Other Southern States with forestry incentives programs include Alabama, Florida, Kentucky, Louisiana, Mississippi, North Carolina, and Texas (Megalos 2000).

Landowner use of cost sharing— Cost-share programs are very popular with landowners because they reduce initial investment costs for various forestry practices and increase rates of financial return (Kluender and others 1999). Studies designed to determine whether cost-share monies take the place of other available capital have had mixed results. In a review of related research, Gaddis (1996) found that some researchers did find evidence of cost-share fund substitution for available capital, while others did not. Kluender and others (1999) found that Arkansas cost-share users with timber management interests would probably have pursued tree growing and commercial forestry activities regardless of assistance payments. Esseks and others (2000), however, found that 60 percent of southern FSP participants would not have accomplished as much management plan implementation if they had not received cost-share payments. Only one-fourth would have implemented their plans without cost-share funds.

As mentioned earlier, Newman and others (1996) reported that cost sharing and other government payments were strong secondary factors influencing reforestation activities. Williams and others (1996) noted that Arkansas NIPF owners have historically reforested a large portion of their harvested land only during periods of government incentives programs. Megalos (2000), however, found that only one-third of North Carolina forest owners favored

future cost-share funding assistance for tree planting and timber management. Reasons for this were not requested from, or provided by, the landowners. Gunter and others (2001) found that a large number (44 percent) of NIPF owners in Mississippi had used government cost-share funds to help cover their reforestation expenses.

Kluender and others (1999) reported that NIPF owners in Arkansas who owned land primarily for wildlife, water, and natural beauty were not likely to be users of government cost-share incentives. Incentives users were found to most likely own land primarily for growing trees and to use or lease their land for hunting. Somewhat similar results in part were reported by Melfi (1998), who found that 60 percent of FSP participants in South Carolina had timber management as a primary objective, while 28 percent had wildlife management as a primary objective.

Predicting cost-share use is difficult. Kluender and others (1999) found that cost-share users, on average, were better educated and had higher income levels than nonusers. Megalos (2000), however, found annual income and education levels were not significant predictors of forest owner participation in North Carolina's forestry cost-share program. In addition, a study of Louisiana NIPF owners found that, although 89 percent of SIP cost-share users had either completed college or had some college education, no significant positive relationships existed between educational levels and cost-share use (Lorenzo and others 1996).

Tract size seems to be a predictor of cost-share program participation. Both Megalos (2000) and Lorenzo and others (1996) found significant positive relationships between the likelihood of cost-share fund use and relatively large forest acreage ownership and tract size. Jacobson (1998) found that 43 percent of Florida NIPF owners of tracts >20 acres in size had participated in cost-share programs.

Megalos (2000) found that gender was not significantly related to North Carolina NIPF owner cost-share use. Resident landowners were less likely to participate than nonresidents. Not surprisingly, landowner awareness of program assistance was found to be the most important predictor of participation. Other than for

individuals in the finance, real estate, and insurance professions, owner occupation was not a significant predictor of cost-share use. Lorenzo and others (1996) also found that NIPF owner occupation was not significantly associated with cost-share use in Arkansas.

Significant regional (substate) differences were found among private landowners in North Carolina concerning likelihood of participation in forestry incentives programs (Megalos 2000). These programs involved income tax relief, property tax relief, cost sharing, low-interest loans, and educational and technical assistance activities.

Landowner education and technical assistance—Educational programs help landowners understand forestry opportunities and provide incentives for undertaking various management practices. McColly (1996) suggested that education was the second most important issue for NIPF owners, following tax reform. Numerous Federal and State agencies, universities, private forest industries, and other groups are involved in educational efforts of various kinds. Their messages and objectives differ. A report on nationwide non-Federal forest management opportunities noted the importance of Federal–non-Federal partnerships in educational outreach and program delivery (National Research Council 1998).

When asked to rank their interest in various educational and technical assistance program topics, Florida NIPF owners indicated that information about property rights and regulations was very important. Timber prices and taxes were the next most important topics. Megalos (2000) found that educational programs which provided better timber price information would be popular with nearly half of North Carolina private forest owners.

Within a specific forest owner group, subgroups may have differing educational preferences. Jacobson (1998), for example, found that Florida absentee NIPF owners owning <100 acres were most interested in recreation and wildlife habitat. They also preferred to attend educational meetings on weekends. The larger landowners (500+ acres) were more interested in receiving information through workshops. Absentee landowners

as a whole indicated they would rather receive information through publications than attend meetings. Meetings held in the city in the evening were preferred over meetings held during the day in the woods.

Gunter and others (2001) reported that a majority of Mississippi NIPF owners who had harvested timber in recent years had not participated in landowner educational programs. Of those who had participated, the likelihood that they reforested land was significantly related to a higher rate of educational program participation.

Most minority NIPF owners in a two-county area of southeastern Alabama were found willing to participate in continuing education programs to improve their knowledge and skills in forest management (Gan and Kollison 1999). Megalos (2000) found that less than a third of North Carolina NIPF owners would be interested in participating in future programs involving educational demonstrations and tours. Gunter and others (2001) reported that a majority of NIPF owners in Mississippi believed the most important sources of basic forestry information were books, bulletins, and newsletters. Only one-fourth indicated that meetings and short courses and were highly important sources of information. The same finding held true for the importance of receiving information from any individual agency or professional organization.

Although technical advice and assistance provided by professional natural resource managers can be assumed to be important influences on landowner management activity, related research information is scarce. One study found that technical assistance was thought by most (71 percent) southern FSP participants to be a very important factor positively influencing FSP plan implementation (Esseks and others 2000). A large percentage (68 percent) of Florida NIPF owners were found by Jacobson (1998) to have received technical assistance, primarily from State forestry agency personnel. More than half of Mississippi NIPF owners who had reforested their land after harvest felt that the advice of a professional forester was highly important. Of those who had not undertaken reforestation, only one-fourth had sought advice about

reforestation from a professional forester (Gunter and others 2001). About two-thirds of minority NIPF owners in a two-county area in Alabama were found to have received past forest management or marketing assistance from forest industries, the extension service, consulting foresters, or State forestry professionals (Gan and Kollison 1999). Of NIPF owners in Mississippi who had received professional assistance, most were found to believe that the services of consulting foresters and State forestry agency foresters were most useful (Gunter and others 2001).

Bliss and others (1997) suggest that future southern foresters will need to be competent in assessing and prescribing management practices appropriate for a diversity of forest resource values. Future professionals will need a more explicitly environmental orientation in all aspects of the profession, from undergraduate education to continuing education (Bliss and others 1997). A key conclusion of Megalos (2000) was that alternatives to traditional timber-oriented management plans were needed to cater to the diverse ownership objectives of North Carolina NIPF owners.

Discussion and Conclusions

About 89 percent of the South's timberlands are privately owned. A majority is owned by individuals and family units. These owners form a core ownership group commonly referred to NIPF owners. Collectively, individual NIPF owners represent about 95 percent of all private timberland owners and control about 63 percent of the South's total private timberland acreage. Most own just one tract of timberland and live either on or within a mile of that tract.

The number of private timberland owners in the South is growing, and the average tract size is shrinking. This parcelization of timberland will influence how private forests can and will be managed for various purposes. Most private timberland owners have tracts <10 acres. These owners, however, account for only 4 percent of the total acreage. Private owners holding tracts >500 acres, representing <1 percent of all private owners,

control almost 47 percent of the South's private timberlands.

The size of a tract, as well as the sizes and characteristics of adjacent tracts, can limit an owner's options for certain uses and management benefits. Small tracts of forest land, for example, may not produce the volumes of wood fiber needed to interest timber buyers. They may also not provide the acreage required for habitat and range by some wildlife game species or needed for certain outdoor recreation activities. But small tracts obviously have values and produce benefits that land purchasers desire.

Available research information does not allow the description of the average private southern forest landowner. Factors that influence the ways in which owners manage their land include income, personal values, tract size, residence, long-term plans, knowledge of alternative management options and benefits, taxation policies, and government assistance programs. Other likely factors may include historic land use, soil productivity, local markets for resource goods and values, and current land and resource health.

Perhaps because of popular concerns about timber management activity and future supplies of wood fiber, much research during the past decade has focused on timber growing by NIPF owners. In attempts to define owner characteristics and predict management behavior, different researchers have also collected somewhat varying types of owner-related data. This variation makes it difficult to derive information useful for the South as a whole. The often conflicting results of both individual State and Southwide studies simply suggests that, as for the public in general, landowners with similar backgrounds facing similar choices often have different objectives and make different management decisions.

Research findings lead to some very broad conclusions about southern NIPF owners. More than half of them are white-collar workers and retirees, probably 50 to 60 years old, with varying income and education characteristics. Most own forest land because they want to reside in a rural area, see their land investment grow in value, use the land for farm or domestic reasons, enjoy the natural resources, and/or have an estate to pass along to heirs. Most probably manage their land

themselves. Many seem to be somewhat interested in making money from land investments, but they are also interested in wildlife, water, aesthetics, and other natural values and benefits. Many, especially those who are relatively new owners or small tract owners, have limited knowledge about forest management practices, current environmental laws, and the concept of management for renewable, sustainable resource benefits. Nearly half, holding more than three-quarters of the total timberland acreage in the South, have harvested timber in the past, while many intend to do so in the future. It is unclear what other kinds of management activities they will undertake. There are indications that some may plant and periodically thin trees, implement wildlife habitat improvement measures, or actively attempt to conserve natural resources in some manner.

The reasons why certain forest owners are motivated to implement certain practices and others are not probably reflect basic resource characteristics, personal values and attitudes, and available income. A change in any of these factors—whether due to personal fortune or misfortune, the results of past management practices, new information, expert technical assistance, tax relief, or government cost sharing—would likely influence a change in an owner's objectives.

Rural landowners and nonlandowners seem to have similar beliefs and attitudes about forest values. Private forest owners, as well as nonowners, from both rural and urban backgrounds, share strong concerns about the need for environmental protection. Many feel they have a personal obligation to protect the quality of resources under their care without interference from the government or neighboring landowners.

Most southern landowners are not interested in allowing the public to use their property for outdoor recreation. Many have concerns about trespassing, garbage dumping, and timber theft. Very few, especially those with small to mid-sized tracts, have written management plans to guide them in achieving their objectives. They also generally do not take advantage of free government forestry assistance and financial incentives programs.

In fact, an average of <2 percent of all southern forest owners receive technical assistance each year from State forestry agencies. It is not known how many seek and receive assistance from other public and private agencies and individual consultants, who are important sources of assistance. It seems that many owners may not be aware of available assistance, think that management activities are too costly or complicated, or view forestry program assistance as being focused mostly on timber production and harvest-related objectives.

Research findings commonly describe wide variations in certain NIPF owner characteristics, intentions, and behaviors between substate regions and even within such regions. This variation suggests the difficulty in describing, as well as understanding or predicting, different management objectives and behaviors for NIPF owner groups in the South. Many NIPF owners who have timber production and income as primary ownership objectives probably have wildlife-oriented recreation use as a secondary objective. Although they represent a relatively small percentage of all landowners, these timber-oriented owners make management decisions for more than one-third of all private timberland in the South. Many of them own at least 100 acres of land, which is thought by some to be the minimum size needed for profitable timber production. They are the most likely to be aware of government forestry programs, participate in government cost-share incentives activities, seek professional assistance, have management plans, and be somewhat knowledgeable about forestry operations.

Considerable research information is available about the motivations and behavior of participants in government cost-share incentives programs and the FSP. Disagreements exist about the relative merits of these programs. It is certain, however, that cost-share incentives are popular with owners who must invest monies to realize long-term financial returns. Management activity costs, knowledge of available assistance, State and Federal tax policies, personal income, available capital, and resource commodity sale values are other important motivational factors. When nonmonetary returns are more

important, it seems that the primary force influencing forest resource management may be a desire to protect and maintain natural resources to ensure continued benefits not only for personal reasons, but also for intrinsic environmental health-related purposes.

Little is known about the management objectives and motivations of NIPF corporations, partnerships, clubs, and other entities, which own a significant 11 percent of all private timberland in the South. TIMOs, which control about 4 million acres of timberland throughout the South, are assumed to be oriented toward management activities that generate investment profits.

The decisions of all private forest owners in the South, with all their diverse interests and objectives, collectively affect the health and use of vast natural resources of significant public interest. Government and private programs that focus on the objectives of a single owner group will miss opportunities to encourage and support the production of diverse benefits valued by a public having diverse interests and needs. More landowners might be receptive to such encouragement if they understood forestry and forest management to be means of securing a variety of forest resource benefits, rather than just those associated with the production of valuable commercial timber supplies. On the other hand, the numbers of landowners that government and private forestry professionals are able to assist on a one-to-one basis will no doubt continue to represent a relatively small percentage of a huge owner population. Understanding the specific needs and interests of different targeted owner subgroups will remain critical to developing programs that successfully deliver useful assistance. In this respect, primary reasons for ownership and ownership objectives will remain the most important types of research information needed. State-level research, especially for owner subgroups within individual States and substate regions, will likely provide much more accurate program planning information than that generated by regional studies.

Needs for Additional Research

- Identify the technical information and professional assistance needs of NIPF owners having nontimber-related interests and management objectives, for individual States.
- Identify the interests, management activities, and objectives of private owner subgroups such as Native Americans, African-Americans, White Americans, Asian-Pacific Americans, Hispanic Americans, women, and men.
- Identify the skills and educational curricula needed to produce a future generation of professional natural resource managers and leaders able to provide the special types of information and technical assistance needed by diverse landowners.
- Identify the potential social and economic benefits of providing targeted information and technical assistance to meet the needs and objectives of nonindustrial private corporation owners.
- Identify the nature, extent, and effectiveness of forestry-related educational and technical assistance activities of public and private agencies.

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Literature Cited

- Amacher, Greg; Conway, Christine; Sullivan, Jay; Hensyl, Curt. 1998. Effects of shifting populations and preferences on the behavior of nonindustrial landowners and forest industry: empirical evidence from Virginia. SOFAC Rep. 12. The Southern Forest Resource Assessment Consortium. 106 p.
- Birch, Thomas W. 1996. Private forest land owners of the Southern United States, 1994. Resour. Bull. NE-138. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 195 p.
- Bliss, J.C.; Nepal, S.K.; Brooks, R.T., Jr.; Larsen, M.D. 1994. Forestry community or grandfalloon? *Journal of Forestry*. 92(9): 6–10.
- Bliss, John C.; Nepal, Sunil K.; Brooks, Robert T., Jr.; Larsen, Max D. 1997. In the mainstream: environmental attitudes of Midsouth forest owners. *Journal of Forestry*. 21(1): 37–43.
- Brunson, Mark W.; Yarrow, Deborah T.; Roberts, Scott D. [and others]. 1997. Nonindustrial private forest owners and ecosystem management: can they work together? *Journal of Forestry*. 94(6): 14–21.
- Cleaves, D.A.; Bennett, M. 1994. Holding size and behavior of nonindustrial private landowners: a cautious second look. In: Newman, D.H.; Aronow, M.E., eds. *Forest economics on the edge: Proceedings of the 24th annual southern forest economics workshop*. Athens, GA: The University of Georgia, Daniel B. Warnell School of Forest Resources: 196–209.
- Cubbage, F.W.; Wear, D.N. 1993. Can nonindustrial private forest land owners make up the shortfall in timber production from national forests? In: *Proceedings of the 1993 Society of American Foresters national convention*. Bethesda, MD: Society of American Foresters: 421–426.
- Cubbage, Frederick W.; New, Barry D.; Moulton, Robert J. 1996. Evaluations of technical assistance programs for nonindustrial private forest land owners. In: Baughman, M.J., ed. *Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future*. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 367–376.
- Cubbage, Frederick W.; O’Laughlin, Jay; Bullock, Charles S., III. 1993. *Forest resource policy*. New York: John Wiley. 562 p.
- Day, Jennifer C.; Cury, Andrea E. 1998. Current population reports, P20–513, educational attainment in the United States. Update. Washington, DC: U.S. Bureau of the Census; U.S. Government Printing Office. 1 p.

- DeCoster, Lester A. 1996. Green IRAs to improve forest care. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 300-307.
- de Steiguer, J.E. 1984. Impact of cost-share programs on private reforestation investment. *Forest Science*. 30(3): 697-704.
- Doolittle, L.; Straka, T.J. 1987. Regeneration following harvest on nonindustrial private pine sites in the South: a diffusion of innovations perspective. *Southern Journal of Applied Forestry*. 11(1): 37-41.
- English, Burton C.; Bell, Caroline D.; Wells, Garland R.; Roberts, Roland K. 1997. Stewardship incentives in forestry: participation factors in Florida. *Southern Journal of Applied Forestry*. 21(1): 5-10.
- Esseks, J. Dixon; Moulton, Robert J. 2000. Evaluating the forest stewardship program through a national survey of participating forest land owners. DeKalb, IL: Northern Illinois University, The Center for Governmental Studies, Social Science Research Institute. 113 p.
- Franklin, E.C. 1990. N.C. forest land owners survey results. Res. Sum. Raleigh, NC: North Carolina State University, Small Woodlot Program. [Number of pages unknown].
- Gaddis, Deborah A. 1996. Accomplishments and program evaluations of forestry financial assistance programs. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 357-366.
- Gan, Jianbang; Kollison, Stephen H., Jr. 1999. Minority forest land owners in southeastern Alabama. *Southern Journal of Applied Forestry*. 23(3): 175-178.
- Greene, John L. 1996. The effect of income tax incentives on cash flows from nonindustrial private forests. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 308-317.
- Gunter, J.E.; Bullard, S.H.; Doolittle, M.L.; Aranao, K.G. 2001. Reforestation of harvested timberlands in Mississippi: behavior and attitudes of nonindustrial, private forest landowners. Bull. FO172. Mississippi State, MS: Mississippi State University, Forest and Wildlife Research Center. 25 p.
- Hodge, Sandra S. 1996. Challenges for ecosystem management with Virginia NIPF owners. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 426-433.
- Jacobson, Michael G. 1998. Developing extension programs for private forest land owners in the Southeast: are we putting the cart before the horse? In: Extension forestry: bridging the gap between research and application; third IUFRO extension working party symposium. <http://iufro.boku.ac.at/iufro/iufronet/d6/wu60603/proc1998/jacobson.htm>. [Date accessed unknown].
- Jacobson, Michael; Jones, Edwin; Cubbage, Fred. 1996. Landowner attitudes toward landscape-level management. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 417-425.
- Kluender, R.A.; Walkingstick, T.L. 2000. Rethinking how nonindustrial landowners view their lands. *Southern Journal of Applied Forestry*. 24(3): 150-158.
- Kluender, R.A.; Walkingstick, T.L.; Pickett, J.C. 1999. The use of forestry incentives by nonindustrial forest landowner groups: is it time for a reassessment of where we spend our tax dollars? *Natural Resources Journal*. 39: 799-818.
- Kurtz, W.B.; Noweg, T.A.; Moulton, R.J.; Allig, R.J. 1996. Retention, condition, and land-use aspects of tree plantings under Federal forest programs. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 348-356.
- Lorenzo, Alfredo B.; Beard, Pat. 1996. Factors affecting the decisions of NIPF owners to use assistance programs. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 264-275.
- McColly, Robert. 1996. Consulting foresters perspective. In: Baughman, M.J., ed. Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 34-36.
- Megalos, Mark A. 2000. North Carolina landowner responsiveness to forestry incentives. Raleigh, NC: North Carolina State University. 119 p. Ph.D. dissertation.
- Melfi, Frances M.; Straka, Thomas J.; Baumann, Jeffrey L.; Marsinko, Allan P. 1995. An analysis of nonindustrial private forest land owners' attitudes towards the forest stewardship program. In: Caulfield, Jon P.; Bullard, Steven H., eds. A World of forestry: Proceedings of the 25th annual southern forest economics workshop. Mississippi State, MS: Mississippi State University, Department of Forestry: 90-105.

- Moulton, Robert J.; Birch, Thomas W. 1995. Southern private forest land owners—a profile. *Forest Farmer Magazine*. September/October: 44–46.
- Munn, Ian. 1996. Public, private, expert, layman: who's selling makes a difference. In: Baughman, M.J., ed. *Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future*. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 386–393.
- Nagubadi, V.; McNamara, K.T.; Hoover, W.L.; Mills, W.L., Jr. 1996. Program participation behavior of nonindustrial forest land owners: a probit analysis. *Journal of Agriculture & Applied Economics*. 28(2): 323–336.
- National Research Council. 1998. *Forested landscapes in perspective: prospects and opportunities for sustainable management of America's non-Federal forests*. Washington, DC: National Academy Press. 249 p.
- New, Barry D. 1995. *The stewardship incentives program, 1992–1994: a review of accomplishments*. Raleigh, NC: North Carolina State University. 37 p. M.S. thesis.
- Newman, David H.; Aronow, Mary Ellen; Harris, Thomas G., Jr.; Macheski, Ginger. 1996. Changes in forest land ownership characteristics in Georgia. In: Baughman, M.J., ed. *Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future*. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 214–221.
- Peters, Daniel M.; Haney, Harry L., Jr.; Greene, John L. 1996. Effects of Federal-State death and gift taxes on the management of private nonindustrial forest lands for selected States. In: Baughman, M.J., ed. *Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future*. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 285–299.
- Royer, J.P. 1987. Determinants of reforestation behavior among southern landowners. *Forest Science*. 33(3): 654–667.
- Royer, Jack P.; Moulton, Robert J. 1987. Reforestation incentives: tax incentives and cost-sharing in the South. *Journal of Forestry*. 85(8): 45–47.
- Sampson, R. Neil; DeCoster, Lester A. 1997. *Public programs for private forestry*. Washington, DC: American Forests. 100 p.
- Schelhas, John. 2000. Sustainability and forest fragmentation in the U.S. South: minority and limited resource landowners. In: DeCoster, Lester A., ed. *Fragmentation 2000: a conference on sustaining private forests*. Alexandria, VA: Sampson Group, Inc.: 154–159.
- Sinclair, K.D.; Knuth, B.A. 2000. Nonindustrial private forest landowner use of geographic data: a precondition for ecosystem-based management. *Society and Natural Resources*. 13: 521–526.
- Teasley, R. Jeff; Bergstrom, John C.; Cordell, H. Ken [and others]. 1999. Private lands and outdoor recreation in the United States. In: *Outdoor recreation in American life: a national assessment of demand and supply trends*. Champaign, IL: Sagamore Publishing: 183–218.
- Tyson, C. Benjamin; Broderick, Stephen H.; Snyder, Leslie B. 1998. A social marketing approach to landowner education. *Journal of Forestry*. February: 34–40.
- U.S. Department of Agriculture, Forest Service. 2001a. *Selected annual State forestry agency program accomplishment report data*. Atlanta: U.S. Department of Agriculture, Forest Service, Southern Region, State and Private Forestry. [Number of pages unknown].
- U.S. Department of Agriculture, Forest Service. 2001b. *Selected forest inventory analysis data*. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Area, State and Private Forestry. [Number of pages unknown].
- Williams, Richard A.; Voth, Donald E.; Hitt, Carl. 1996. Arkansas' NIPF landowners' opinions and attitudes regarding management and use of forested property. In: Baughman, M.J., ed. *Proceedings: symposium on nonindustrial private forests: learning from the past, prospects for the future*. St. Paul, MN: University of Minnesota, Minnesota Extension Service, Extension Special Programs: 230–237.

In: Wear, David N.; Greis, John G., eds. 2002. Southern forest resource assessment. Gen. Tech. Rep. SRS-53. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 635 p.

The southern forest resource assessment provides a comprehensive analysis of the history, status, and likely future of forests in the Southern United States. Twenty-three chapters address questions regarding social/economic systems, terrestrial ecosystems, water and aquatic ecosystems, forest health, and timber management; 2 additional chapters provide a background on history and fire. Each chapter surveys pertinent literature and data, assesses conditions, identifies research needs, and examines the implications for southern forests and the benefits that they provide.

Keywords: Conservation, forest sustainability, integrated assessment.

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