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Management Practices and Reforestation Decisions for Harvested Southern Pinelands

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ABSTRACT

A southwide study was conducted in 1981 which examines the harvesting and reforestation decisions of the South's nonindustrial, private forest landowners. Some 28 percent of the Nation's commercial timberland is managed by these owners and recent studies have indicated a less than desirable amount of reforestation to pine following harvest of these lands. The information in this report is primarily intended to help Federal, State, and forest industry analysts understand the policies and programs that might encourage these landowners to invest in pine reforestation.

Keywords: Area frame, harvested forest land, reforestation, nonindustrial, private land owners.

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SUMMARY

This survey is the first to address the harvesting and reforestation decisions of nonindustrial, private harvested forest landowners throughout the South. The need for this data became evident because some 28 percent of the Nation's commercial timberland is managed by these owners and recent studies have indicated a less than desirable amount of reforestation to pine following harvest of these lands. The sample design of the study utilized screening and interviews based on the area frame sample used by the Statistical Reporting Service for its 1981 June Enumerative Survey. Some of the most general findings of the report are: the key motive for owning forest lands is the building of an estate; there is a perception that pine will regenerate naturally without specific actions following harvest; professional foresters have only limited influence on the forest management decisions on the lands studied in this report; and various tax reductions and cost-sharing offer the most potential as pine reforestation incentives.

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R.S. Fecso, H.F. Kaiser, J.P. Royer, and M. Weidenhamer [1/]

INTRODUCTION

Much of the future supply of softwood timber in the United States will depend on the forest management decisions of the Nation's nonindustrial, private forest landowners in the South. Over 134 million acres of commercial timberland in the South, some 28 percent of the Nation's total, are managed by these owners. In addition, over two thirds of the southern pine acreage is found on nonindustrial private holdings and more than half of the Nation's reforestation investment opportunities which have the potential for a 4-percent or greater return after inflation are found on these ownerships (21). 2/ Nonindustrial private owners in the South thus hold a large share of the investment opportunities which could lead to increased softwood timber production. Since the early 1960's, however, less than one third of the pineland cut in the South by nonindustrial, private owners has been reforested with pine in a manner which would attain the return on investments as indicated in the study.

The deficiency of pine regeneration was cited in a Georgia study following a 1972 remeasurement of Forest Survey plots measured 10 years earlier (4). The study found that more than half of the 2.9 million acres of southern pine harvested on nonindustrial private forest lands during the 10 years between the two surveys changed to another forest type. Furthermore, less than 10 percent of the total acreage harvested that remained in commercial forest during the survey period showed any evidence of being replanted to pine (13). The lack of planting pine seedings or land preparation for pine regeneration has also been identified in follow-up surveys in North Carolina, 1974; Virginia, 1977; South Carolina, 1978; and Florida, 1980.

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2/ Underscored numbers in parentheses refer to literature cited in the References at the end of this report.

The lack of pine regeneration has not been fully appreciated by resource analysts because of the continuing increases in the volume of softwood inventories in the South (5). In the past, regeneration of pine often occurred naturally or through planting pine trees on land retired from agriculture. The situation is different today because only small areas of farmland are being retired. Active pine regeneration, such as reseeding, leaving mature pine seed trees, or planting pine seedlings, is not compensating for the reduced rate of cropland retirement. The current practice of cutting without special pine regeneration measures often leads to an understocked stand of pine or to a hardwood stand. Future supplies of pine in the South depend on the selection of forest management strategies which ensure the perpetuation of pine.

These concerns resulted in this survey, which examines the harvesting and reforestation decisions of the South's nonindustrial, private forest landowners. The central aim of the study is to reveal the rationale underlying the landowners' decisions to harvest and, subsequently, to reforest or not to reforest their lands with pine trees. The information is primarily intended to help Federal, State, and forest industry analysts shape policies and programs that encourage nonindustrial forest landowners to invest in pine reforestation following harvest of pine in the South.

STUDY METHODS

The sample used in this study was derived from the area frame sample 3/ used by the Statistical Reporting Service for its 1981 June Enumerative Survey. This survey is conducted annually during the last weeks of May and the first week of June. During the 1981 survey, respondents in 12 southern States were asked to identify tracts of land within sample units (called segments) from which timber had been harvested in the preceding decade. 4/ Enumerators recorded the names and addresses of the owners of the tracts meeting the following definition:

> Nonindustrial, private forest ownerships were considered to be all non-public holdings of 10 acres or more, including single proprietorships, partnerships, and corporations, but excluding forestry-related corporations and corporations publicly trading stock.

3/ A more detailed explanation of the sampling can be found in appendix I.

4/ The actual dates were January 1, 1971, through the survey date (approximately late May 1981). The screening form is in appendix II.

Personal interviews with these landowners were then conducted by the enumerators in August (North Carolina pilot) and October (remaining States), 1981. Overall, 759 interviews were conducted in the 12 southern States comprising the pine region: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and the eastern parts of Oklahoma and Texas.

The questionnaire used for the reforestation survey was developed to complement several earlier ownership studies by the Northeastern Forest Experiment Station and Duke University (12) (18). A copy of the questionnaire is included in appendix II.

Sample Estimates

Due to the survey design, the socioeconomic characteristics and attitudes of the owners of these acres could be estimated only on an acreage basis rather than as the number of owners. Estimates are thus of the form: "Number of acres owned by individuals who had a certain attitude or characteristic." 5/

The coefficient of variation 6/ for total acres harvested in the 12 States surveyed was 7 percent, whereas the coefficient of variation for total acres harvested in the individual States varied from 14 percent for Mississippi to 71 percent for Oklahoma. The southwide estimate has an acceptable sampling error, but the sampling errors for the individual States were generally too large to permit analysis on an individual State level.

Estimates of the acreage harvested were desired by response to the various questions. 7/ For example, in the table for question 3, 637 thousand of the estimated 9.267 million harvested acres were owned by respondents who indicated that their total forest land holdings were from 10 to under 50 acres. The coefficients of variation for some of these estimates are high, but for the overall analysis the precision is acceptable.

5/ Statistically this is referred to as domain estimation (6).

6/ Coefficient of variation or relative standard deviation is a measure of relative rather than absolute variation; it is the ratio of the standard deviation to the mean expressed as a percent. This measure is used to assess the precision with which areas or treatment effects can be estimated.

7/ Tables of estimates for each question along with the respective coefficients of variation are presented in appendix III.

Comparison with Other Surveys

A comparison of the results of the reforestation survey with the timber harvesting estimates made by the Southeastern Forest Experiment Station reveals some differences over the 10-year period addressed in this study. For example, the estimated acreage harvested during the beginning of the 10-year period tends to be lower for the reforestation survey (question 2). For more recent years, the two estimates show little difference. Factors contributing to this difference may include:

(1) different definitions--only the most recent harvest was reported in this survey; and

(2) telescoping--difficulty in identifying forest acres that were harvested early in the decade.

The potential impact of the difference on the analysis was explored by comparing landowner responses from the three harvest-year groupings estimated in question 2. This analysis revealed that between each harvest-year group, the proportions of landowners in the group with a given response to the various survey questions did not differ substantially. Therefore, no adjustments were deemed necessary for the summarization of the survey data by response to the individual questions. Yet it should be noted that, for analysis, the relative differences (percentages) between responses to questions should be used rather than the absolute acreage estimates.

OWNERSHIP CHARACTERISTICS

About 89 percent of forest land harvested in the South was held as a family operation, i.e., a sole proprietorship (including husband and wife) or as a partnership or corporation among family members (question 7). Harvested forest ownerships were held for a variety of reasons, including timber production, estate purposes, land investments, and as part of farm operations (question 9). Four out of five harvested acres were held by owners who said that plans to pass their holdings on to their heirs were of high or moderate importance. Four out of five harvested acres were also held by owners who maintained that timber production was of moderate or high importance.

Only about 5 percent of the acres were being considered for sale to nonfamily members within the next 5 years, while 86 percent of the harvested land was held by owners with no intentions to sell (question 16). This absence of plans to sell harvested forest land to nonfamily members is consistent with the desire to pass the land on to heirs.

The survey also provided the following general description of the harvested timberland ownerships:

* Almost half of the forest land harvested was also owned by persons whose major source of income was reported to be wages, salaries, or retirement benefits (question 42). In addition, 11 percent of the acres were owned or co-owned by persons reporting their primary source of income as timber harvesting, while 15 percent reported farming as the primary source of income. Only 7 percent of the land harvested was owned by persons who received professional fees as their primary source of income.

* Over half of the land harvested was owned or co-owned by persons who had at least some college education, while only eight percent was owned by those with 8 years or less formal education (question 38).

* About half (48 percent) of the harvested forest land in the South had been acquired by inheritance or gift (question 14). As common a method of acquiring land was purchase; some 51 percent of the harvested forest land had been acquired in this way.

* Most harvested forest land, 83 percent, was held by persons over 46 years old, including 33 percent by persons over 65 (question 37).

* One-third of the harvested forest acreage was acquired in the most recent time period, 1970-81 (question 15). One-third of the harvested forest acres had been owned by the current owner since before 1950; the remaining one-third was acquired between 1950 and 1969.

* About 70 percent of the forest land harvested was owned by operations having agricultural land (question 6). Likewise, 42 percent was held by respondents living on a farm (question 40), although the owners of only 15 percent of these acres indicated that farming or ranching was their primary source of income (question 42).

* Almost two-thirds of the acres were owned by persons living within 10 miles of the harvested tracts (question 11).

* About a third of the land was owned by individuals with before-tax incomes in 1980 of at least $45,000 (question 41). About one sixth of the land was owned by persons making from $25,000 to $44,999. About a quarter of the land was owned by persons making less than $15,000.

FOREST LAND HARVESTED

The forest land harvested on nonindustrial private holdings in the South varied widely in its physical attributes and ownership features. Most of the acres harvested, 84 percent, were from large ownerships (100 or more acres of forest land, question 3). Moreover, most of the acres harvested, 71 percent, were part of harvests larger than 100 acres (questions 12 and 13).

Respondents who had owned the land at the time of the most recent harvest were considered in the following analysis. 8/ Owners of 95 percent of the acres harvested reported that at least some pine trees were removed, while one-third of the area harvested involved only pine (question 18). More hardwood than pine was harvested at sites accounting for 17 percent of the area. Harvests of hardwood exclusively accounted for only 5 percent of the acreage. Foresters selected the trees to be cut for 37 percent of the harvested area, while timber buyers or loggers selected the trees for 35 percent of the area. Landowners chose the trees to be cut for 26 percent of the area harvested (question 20).

The landowners indicated that about nine out of ten acres harvested were left in an overall satisfactory condition, a surprisingly high proportion given the nature of timber harvesting operations (question 22). Owners of only 21 percent of the acreage indicated that the condition of the tract differed after harvest from what they anticipated, with debris and damage to trees the more commonly mentioned problems (question 21).

Reasons for Harvesting Timber

The important reasons for harvesting timber reported by the owners of most of the harvested southern forest lands were: (1) recognition of the maturity of the timber, (2) the offering of a suitable price, and (3) the desire to improve the growth of trees left on the site (question 23). On about three-fourths of the acres harvested, the maturity of timber was considered moderately or highly important, and on a similar proportion of the harvested land, the offering of a good price was deemed moderately or highly important.

In contrast, the need for income, other than for estate or inheritance tax purposes, was highly or moderately important to harvesting decisions on less than half (42 percent) of the acreage harvested. Income to cover estate and inheritance

8/ At the time of harvest, 97 percent of the harvested land was owned by the respondent. Only these respondents answered or were summarized in the questions used in the remainder of this section on Forest Land Harvested (question 17).

taxes was given as a reason for harvesting less than 10 percent of the acres.

These findings imply that most of the harvesting in the South was elected by landowners and occurred without external economic pressures playing a major role in the decision. That is, the landowner recognized the mature condition of the stand and was offered an acceptable price for that stand. Taxes, damage, and financial pressures were not the foremost considerations in promoting the harvest of timber.

Harvesting Methods

Three methods of harvesting were used by landowners: clearcutting, including seed tree cuts; partial cutting; and thinning (question 24). The clearcut or seed tree cut was used on 32 percent of the area harvested. In the clearcut method, all marketable trees are harvested although occasional trees may be left that are below market size or are culls. In the seed tree method, 9 to 15 mature trees per acre are left standing singly or in groups for the purpose of furnishing seed to restock the harvested areas.

Partial cutting was used on 46 percent of the area harvested. With partial cutting, only some of the mature trees are harvested. Many large or mature trees, regardless of type, remain on the site. There is, however, no harvesting system with a definition subject to such a wide range of interpretation. Partial cutting includes the shelterwood method in which a mature stand is removed in two or more cuts and the new stand is regenerated under the shelter of a partial overstory. Partial cutting also includes the selection method of harvesting where all mature trees are removed either singly or in small groups, permitting continuous establishment of regeneration. Partial cutting may also include the high grading of a stand where a substantial number of trees are left because they are not marketable or they are inferior species.

As one might expect, partial cutting in a pine stand is a controversial subject among foresters (1). On the positive side, the partial cut method leaves a stand which could produce another harvest of marketable timber in a shorter period of time than a clearcut and may also be aesthetically pleasing. The principal disadvantages of partial cutting are its general incompatability with current logging techniques and the high levels of skill required to properly select trees to be cut.

Thinning accounted for 21 percent of the area harvested. Thinning involves cutting only some of the immature or defective trees in order to make room for growth of the

remaining trees. Thinning is necessary because pure stands of overstocked pine frequently become established on upland sites as well as on those seeded artificially by broadcast methods. Hardwood trees also may be removed to improve the growth of the remaining pine trees. Removing these trees concentrates the wood production of the stand on a limited number of selected trees. Reforestation methods are not typically needed on thinned stands because stocking levels remain high following thinning.

REFORESTATION ACTIVITIES

Following harvests, landowners are faced with decisions on reforestation that depend on the method of harvesting employed. For this study, the owners of lands that were clearcut or partially cut were assumed to face reforestation investment decisions. It was assumed that owners of lands that were thinned did not face those decisions. Regardless of the method of harvest, however, some sort of site preparation and reforestation activity is generally necessary to assure that a fully stocked pine stand is established. The practice of cutting without special pine regeneration measures often results in an understocked stand of pine or a hardwood stand.

Preparation of Seedbeds

This survey of harvested, nonindustrial, private ownerships showed that about 80 percent of the clear or partial cut forest lands were not prepared for reforestation (question 25). When asked if any cultural practices were carried out to prepare land for reforestation, landowners who either clearcut or partially cut their forest holdings said action was taken on only 21 percent of the area. These answers support the view that owners of a great majority of the nonindustrial forest land in the South are not investing in pine regeneration following harvest.

Analysis of only the clearcut or seed tree cut acres indicated a higher incidence of acreage treated (38 percent). Seedbeds were prepared using heavy machinery on 26 percent of this land; 14 percent was controlled burned; and 7 percent had a herbicide application. Evidently, once the land had been clearcut, more landowners recognized that cultural treatments were needed and were willing to make the needed investments.

When the responses for partially cut lands were examined, only 9 percent of the acres were found to have been prepared for reforestation. Roughly half of those prepared acres had a controlled burn.

Reforestation Methods

The predominant methods of reforestation used on land which was clear or partial cut were: planting pine seedlings (18 percent), leaving mature seed trees standing on the site (13

percent), and leaving the site to reforest itself (64 percent) (question 26). Little area was reported as having pine seeds dispersed on the site by hand or mechanically.

In the analysis of clearcut or seed tree cut areas, it was found that pine seedlings were reportedly planted on 35 percent of the land area. This procedure is one of the simplest of all methods of regeneration. The site and pattern of cutting are not limited by the necessity of reserving a source of seed and there is no need to modify procedures to ensure that a seedbed appropriate for seed germination is created.

Mature seed trees were left on 8 percent of the land clearcut or seed tree cut. On many ownerships, this type of regeneration may be desirable because it is less expensive initially than planting pine seedlings (23). With the clearcut method, the area is cut clear except for certain trees which are left standing singly or in groups for the purpose of furnishing seed to restock the cleared area naturally. Only a small proportion of the original stand is left. After a new tree stand is established, these seed trees may be removed in a second cutting or left for future harvesting. It is generally mandatory that some sort of site preparation, such as burning to eliminate duff, be carried out where seed trees are left to ensure that the ratio of established seedlings to seeds is as high as possible. Success of natural regeneration also depends on a sufficient seed supply, a receptive seedbed, freedom from competing plant cover, and ample rainfall well distributed through spring and summer (1).

Of the clearcut areas, 51 percent were left to reforest themselves. Although pine seedlings can be established from the seed of neighboring pine stands, it is more likely that hardwood species were already established before harvesting. Pine reproduction is assured only when there is a negligible undergrowth of hardwood before the pine is removed (22). When the pine canopy is broken by harvesting timber, hardwoods respond vigorously to added light and space. Failure to reestablish pines when most mature ones are harvested is one of the most important factors that is transforming nonindustrial forest lands from pine to hardwood forest types (5).

For partially cut areas, 73 percent were left to reforest themselves. On an additional 17 percent of the partially cut acres, mature pine trees were reportedly left to ensure reforestation. Partial cutting is usually associated with natural reproduction, but under certain conditions seedlings

can be planted effectively (19). In fact, landowners reported that 6 percent of the area harvested by partial cutting was planted with pine seedlings. However, as with clearcut areas where no action was taken, it is likely that the future stands would be composed of mostly hardwood species. Many pine stands in the South have an understory of hardwoods, and the situation is intensified in areas where some form of partial cutting of softwood trees has been practiced. Each time a partial cut is made, hardwoods usually gain in stature and extent (22).

Reasons for Actively Reforesting

A variety of reasons motivated landowners either to reforest by planting pine seedlings or to leave mature pine trees standing as a seed source. Questions 29a through 29f addressed these motivations. The reason for reforestation associated with most of the land was that landowners felt that their land should be kept in timber production (question 29f). Landowners who reforested their lands listed continuous timber productivity as having high or moderate importance on over nine out of ten acres reforested. The two next most important reasons, on about three quarters of the acres reforested, were anticipation of future profits from forest production (question 29c) and the advice of professional foresters (question 29d). These findings were consistent with those in Georgia where Holemo and Brown (9) found that income production was the primary reason given by nonindustrial landowners for owning forest land. Mullaney and Robinson (15) found that the number one reason for investing in forest production was to keep the area productive.

Other reasons were also given by landowners as important in their decision to reforest their lands to pine. Landowners who controlled about two out of five acres of actively reforested land felt that having revenues from harvesting to finance reforestation (question 29a) or the availability of cost-sharing from public agencies (question 29b) were important.

Public cost-sharing was used on two out of five acres that were reforested by planting pine seedlings, by dispersing pine seeds, or where mature pine seed trees were left standing as a seed source (question 27). On most of the land reforested without public cost-sharing, owners were aware of public cost-sharing, but reforested without that assistance (question 27a). In a separate analysis of the clearcut acres where pine seedlings were planted, 69 percent of the acreage was cost-shared. Where there was a large per acre investment, fewer landowners appeared willing or able to undertake the forest investment without capital assistance.

The principal program used by the landowners to cost-share with the government was the Federal program (question 28). The Forest Incentive Program (FIP) was authorized by Congress in 1973 to share with private landowners the cost of tree planting and timber stand improvement. The federal share of these costs ranges from 65 to 75 percent, depending upon the cost-share rate set by the particular State and county Agricultural Stabilization and Conservation committee. Similar State cost-share programs are offered by Mississippi, North Carolina, and Virginia.

REASONS FOR NOT ACTIVELY REFORESTING

The importance of selected reasons in making the decision not to actively reforest to pine was explored in question 30. The lack of reforestation efforts on the southern timberland considered in this question can be attributed largely to the owners' abiding faith that harvested sites will reforest to pine naturally. This belief was also held in a separate analysis of the clearcut lands and those lands cut using selective harvesting methods. In fact, little difference was found between the clearcut acres and the partially cut acres for any of the reasons rated in question 30. Therefore, the data presented are not cross tabulated by harvest type. On about three out of four of the South's acres that were not actively reforested, the owners' feelings that their site would reforest itself were of high or moderate importance in their decision not to actively reforest to pine.

The widespread perception that natural pine reforestation occurs on harvested lands raises important issues with respect to landowner decisions. The forest inventory data of the U.S. Forest Service show that the acres of southern forest land growing pine began to decline in the past decade, following the extensive rotation of retired cropland to pine between 1915 and 1965 (5, 21). As a rule, harvested lands do not adequately reseed to pine naturally, but require treatments such as burning, applications of herbicides, chopping, and planting to insure an adequate stocking of pine. This implies the need for a conscious effort by landowners to seek help to identify the specific needs of their site, and subsequently to make the investments of time and money to carry out the treatments necessary to insure pine reforestation. Without a recognition of the need to invest in pine regeneration following harvest, little can be expected in terms of pine establishment except in highly fortuitous situations. Foremost to the question of pine reforestation, then, is reshaping the perceptions of the owners of some three quarters of the clear and partial cut lands in the South that were not actively reforested. Owners' present perception, that harvested lands will reforest themselves, can only be accurate

in a few cases. Without recognition by the landowners of the need to invest in pine regeneration, the South will likely face a further reduction in pineland area.

Other highly or moderately important reasons for the decision not to actively reforest to pine were: high costs (50 percent of the acres), returns from reforestation investment occurring too far in the future (42 percent of the acres), other uses for harvest revenues (39 percent of the acres), and returns on reforestation investment being too low (34 percent of the acres). While offered far less frequently than relying on natural reforestation, these reasons were important because they highlighted the extent to which several basic problems in nonindustrial private forestry play a role in landowner decisions. That is, the alternative uses of timber harvesting revenues compound the problem of high costs. In 1979, average reforestation costs on harvested pinelands ranged from $75 to $150 (14) and ran as high as $200 per acre on clearcut lands. Landowners may view these costs as prohibitive. This suggests that forestry investments, while profitable on many sites, may not be perceived by these landowners as the most attractive use of their harvesting revenues.

These economic and financial constraints on forestry management represent another major challenge. Assuming the need to actively reforest was established in the minds of these landowners, would they elect to spend money on forestry? The data from this study indicate that a significant obstacle to the investment in reforestation of pine is a combination of high costs and perception of low or delayed returns.

Other factors in the decision to actively reforest to pine were rated of high or moderate importance for fewer acres. Low site productivity, poor condition of the site following harvest, and high risks from natural hazards were each important to the owners of about one-tenth of the lands harvested. A larger, although modest, proportion of the acreage, two-tenths, was held by owners who replied that indecision about the future use of their land was important. A still larger proportion, one quarter of the acres, was owned by individuals who considered "too much red tape" associated with getting technical or cost-sharing assistance to be important. Finally, only 9 percent of the acres were held by individuals who replied that the inability to obtain cost-sharing funds was important. It should be noted, however, that about one in five of these acres was owned by someone who was unaware that cost-sharing was available.

This combination of factors points to the complexity of reasons that underline the decisions not to actively reforest

cutover forest land in the South. Singly, they represent relatively small proportions of the acres harvested; but taken together, they suggest some need to inform landowners of the opportunities available through forest management and investment.

TECHNICAL ASSISTANCE

When asked if they obtained advice or assistance from a professional forester about reforesting their harvested parcels, landowners of only two out of five acres who either clear or partial cut their land said they had received assistance (question 31). For most of the land with owners who received assistance, awareness of the technical assistance came through personal contact with a forester (question 31a). Private consultants provided technical assistance to landowners controlling about half the acres assisted (question 31b). This finding was not surprising because many large landowners retain private forestry consultants on a continuing basis and public agencies often refer landowners to private forestry consultants. Technical assistance was also provided by State forestry agencies, forest industry, the Extension Service, and the Soil Conservation Service. Landowners controlling 93 percent of the acreage receiving technical advice rated the technical ability of the person who gave the advice as good (question 31c).

Written management plans had been developed prior to harvest for only one out of five of all the harvested acres (question 32). A written management plan is important because it sets the stage for a sound program of action and provides an important record for future reference. In forest management, decisions and actions taken today often require follow-up actions several years in the future. A written plan gives continuity to recommendations and provides a framework for effective protection, development, and use of timber and related resources.

Landowners of one fifth of the acres had a written plan that considered the present condition of the parcel (question 33). For these acres, private consultants developed the plans on about one half of the area covered; industry foresters prepared the plans on a quarter of the area; the remaining area was planned by public agency foresters from State forestry agencies, the Extension Service, or the Soil Conservation Service (question 33a).

POTENTIAL EFFECTS OF PUBLIC PROGRAMS

The appropriate role of government in fostering forestry investments on nonindustrial forest lands has been debated for several decades, and the tenor of the debate seems to have

grown in recent years (21). Public technical and financial assistance programs are now an integral part of forest policy as are numerous tax law provisions intended to improve outputs from nonindustrial forests. However, evaluations of current policies and programs have been limited largely to accomplishment reports, such as how many owners take advantage of a public program. The question remains: To what extent do alternative public programs act as incentives to owners who otherwise would not invest in pine reforestation? Quizzing landowners on their perception of the effects of alternative public policies and programs offers a point of departure for evaluating the relative importance of differing incentives. As part of this study, landowners were asked about the potential impacts of additional tax incentives, cost-sharing, price information, additional technical assistance, special loans, forestry insurance, and education programs on forestry practices.

The incentives deemed by owners of most of the harvested forest land in the South as likely to influence reforestation decisions were tax adjustments and increased cost-sharing (questions 34 and 35). About four-fifths of harvested timberland in the South was owned by individuals who said lower property taxes would have a high or moderate effect on their decision to reforest their land to pine (question 34). Most southern counties now make tax assessments based on "use value", but the owners of much of the harvested forest land desire even lower taxes.

Other tax adjustments reportedly would have importance to landowner decisions for nearly as much of the harvested land. According to the landowners surveyed, reduced inheritance and estate taxes would affect decisions on three-fourths of the acres harvested. In the past, estate and inheritance taxes have been especially burdensome to many forest land owners. Prior to the Economic Recovery Tax Act of 1981 (effective June 9, 1981), the sum of a landowner's cumulative lifetime gifts and bequests at death could equal only $175,625 before being subject to the unified gift and estate tax. This tax policy was accomplished by providing each taxpayer a unified credit of $47,000 which could be applied to any gift tax or estate tax owed. Under the 1981 tax revisions the unified credit will be raised progressively over the period 1982 to 1987 to a total of $192,800 or an exemption equivalent of $600,000.

Another key provision of the Economic Recovery Tax Act was the change in valuation procedures for forested estates. Prior to 1981, the value of forest land for estate tax purposes was considered its fair market value, which may have frequently been for uses other than forestry. This valuation meant

higher estate taxes for forested land and a corresponding burden on the heirs to raise revenues to pay those taxes, perhaps by harvesting the timber prematurely. The 1981 act allows for current-use valuation for estate tax purposes and specifically modifies the way forest lands may qualify for use value.

Tax credits and additional deductions for reforestation were also identified as likely to have an affect on about seven-tenths of the harvested acres in the South. Again, recent legislation has addressed the need for tax reform; however, tax credits and deductions for forestry investments had been in effect less than a year at the time of this study. Public Law 96-451, signed into law in October 1980, allows a 10-percent investment tax credit on the first $10,000 spent on reforestation each year and an accelerated writing-off of the remaining costs up to the $10,000 limit over a 7-year period. The previous policy of allowing the capitalization of reforestation expenses only at the time of harvesting, which almost always occurred 25 years or more after the investment, offered little incentive to invest in forestry. Many of the landowners in this study were likely reacting to this lack of tax incentives in the past.

The final tax policy adjustment that the survey respondents rated as having a high or moderate possible effect was improving capital gains tax treatment for timber income (nearly seven-tenths of the acres). Nonindustrial forest owners may now exclude from their gross income 60 percent of their net capital gains from the sale of timber, with the remaining 40 percent being taxed as ordinary income. Prior to the Economic Recovery Tax Act of 1981, the maximum tax rate for nonindustrial taxpayers was 70 percent. The 1981 law reduced that rate to 50 percent, thus reducing the maximum tax burden on timber income to 20 percent (40% of 50% = 20%). Moreover, the 1981 tax act reduces tax rates on ordinary income by 5 percent in 1981, by 10 percent in 1982, and by 10 percent in 1983.

The only nontax-related program rivaling the importance of tax policies was cost-sharing. According to the landowners polled, reforestation decisions on six-tenths of the area harvested would be highly or moderately affected by the increased availability of cost-sharing. In the 12 States studied, cost-sharing is currently available through the Forestry Incentive Program (FIP). In addition, the states of Mississippi, North Carolina, and Virginia supplement FIP monies with their own State programs of cost-sharing. As previously noted, 69 percent of the land which had pine

seedlings planted following harvest was subsidized by a cost-share payment from either the Federal or a State source.

Other than taxes and cost-sharing, none of the programs were rated as highly or moderately effective by the owners of more than half of the acres. Nonetheless, providing better, more accessible information on prices for standing timber and making more free technical forestry advice available from professional foresters were rated as having at least a moderate effect on decisions for about half of the harvested lands. Special loans, forestry insurance, and education on forestry practices were the programs which seemed least likely to be influential.

IMPLICATIONS

This survey is the first to address the harvesting and reforestation decisions of nonindustrial, private harvested forest landowners throughout the South. As such, it offers an initial look at the rationale underlying landowner choices to harvest and subsequently to reforest or not to reforest their timberlands. It also presents insights on alternative public programs that may stimulate investment in pine reforestation. The results of the survey give rise to several general conclusions regarding the forest management and investment decisions of these landowners.

The key motive for owning and managing harvested forest lands in the South is oriented more toward the building of an estate (that is, a long-term, family-oriented investment) than toward deriving short-term profits. Evidence to support this contention can be found in the large proportions of harvested lands owned by individuals who (1) have inherited their land, (2) plan to pass that land on to their heirs, (3) feel timber management is very important, (4) have no intentions to sell to nonfamily members, and (5) hold land as part of a family-oriented ownership. Further supporting this conclusion is evidence showing most timber was sold because it was perceived as being mature and a suitable price was offered. Most active reforestation efforts following harvesting were prompted by the feeling that the land should be kept in timber production and in anticipation of returns from timber production.

The lack of investment in pine regeneration efforts on much of the clearcut lands in the South can be largely attributed to a perception among landowners that there is no need to undertake specific actions following harvesting to insure the perpetuation of pine because they feel that pine will regenerate naturally on their sites. Also of importance, albeit secondary, was a concern for the high costs and delayed returns of forestry.

Professional foresters have only limited influence on the forest management decisions on lands harvested in the South. Support for this contention is evident in the small proportion of harvested acres for which a forest management plan had been prepared; the small proportion of land area owned by individuals who had received reforestation advice or assistance from a professional forester, either public or private; and the high proportion of harvested land on which loggers, timber buyers, or landowners chose the trees that would be harvested.

Public policies that would offer potentially effective pine reforestation incentives to the owners of a large majority of harvested timberlands were identified as follows:

* Reduced property taxes (to ease the annual financial burden of owning and managing pine).

* Reduced estate and inheritance taxes (to minimize the financial penalties and the need for hasty decisions regarding pinelands following the death of the landowner).

* More favorable tax credits and tax deductions (to encourage investment in pine reforestation at the time of harvest).

* More favorable capital gains treatment for timber revenues (to increase the availability of pine reforestation investment dollars).

* Increased public cost-sharing (to defray partially the high costs of pine reforestation to the private landowner).

Instituting these public policies should alleviate some of the pressures perceived and expressed by landowners who face reforestation decisions. Over the past three years, several tax policy adjustments affecting forest land operations have been adopted. The full impact of the enacted incentives should be monitored closely over the next decade.

Management of and investment in pinelands in the South present a unique challenge to the forestry community. This study identifies key parameters associated with the decisions to manage land for pine and to invest in pine reforestation following harvesting. As an inaugural effort on pine reforestation decisions, the study should serve as a benchmark and point of departure for further analysis.

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APPENDIX I: SURVEY DESIGN

This appendix outlines the important constraints and decisions made in the development of the survey design and the questionnaire.

Population of Interest

Information was desired from nonindustrial, private forest landowners in the South who had harvested timber for industrial or commercial wood products on their forest land during the period January 1, 1971, through approximately May 15, 1981. 1/

With the reporting unit defined, the sampling frame must be decided upon. A sampling frame is a list of sampling units (units subject to random selection) that contains all the reporting units in the population from which information is desired. The sampling frame is used to design the probability sample which enables one to estimate the desired population statistics and measure the variability of the estimates.

For the collection of attitude and socioeconomic information, a list frame in which each sample unit corresponds to one reporting unit is desirable. Unfortunately, an adequate list frame could not be developed from available list sources because the resultant list frame would be seriously incomplete. Therefore, area frame sampling was necessary.

The Area Frame

The area frame concept is simple: (1) associate the reporting unit with a specific land area, (2) determine a larger land area which contains the land areas associated with all the reporting units, and (3) divide this larger area into small blocks of land (frame units). At this point, a probability sample from these frame units (the area frame) can be selected and information can be collected from all reporting units associated with land in the selected frame units (segments).

The development of an area frame is expensive because of the amount of mapping material and labor required to identify distinct boundaries (roads, rivers, etc.) between segments. Fortunately, the Statistical Reporting Service (SRS) has constructed and maintains an area frame for each of the 48 contiguous states. Surveys utilizing these frames are a major source of indications for U.S. agricultural estimates. Each frame has an operational sample drawn from a stratified 2/ design based on land use that has been tailored to the

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1/ For a more precise definition of eligible respondents see the questionnaires in appendix II.

2/ Groupings of segments in a manner which reduces the variability of segment land use, thus providing increased precision for many estimates.

agricultural practices in the state. 3/ After inspection of the stratified designs used in the southern states, it was decided that the existing Statistical Reporting Service survey structure would provide the lowest cost area frame possible, adequate precision for the reforestation information desired, and a low-cost, trained data collection organization.

Segments in an area frame are clusters which contain tracts of land each having a unique ownership (management) and/or land use. Thus, cluster sampling methodology applies in the computation of survey estimates and variances (10). Generally, there are three types of estimates which can be developed using an area frame: open, closed, and weighted estimates. The open estimator is used when the reporting unit can be identified with a single small area of land which would be entirely contained in one frame unit. An example would be farm operators and their place of residence. The weighted estimate requires that total land area owned, both inside and outside the segment, be reported as well as the total for the item being estimated. An example would be total land owned inside and outside the tract and total timber harvests. The total timber harvest is then weighted to the segment by multiplying it by the ratio of land owned inside the segment to total land owned.

The open and weighted estimates were not considered appropriate for this survey. The open estimator could not be considered because many forest landowners live in the city; enumeration of many city areas would add considerably to the survey cost, and a suitable unique association with noncity segments could not be developed. The weighted estimator was ruled out because a bias problem could be expected in the reporting of total land area, and another value suitable to creating the weight could not be determined.

The remaining estimator, the closed estimator, is best suited for estimation of land areas. Land areas with a certain characteristic found in the sample segments can be expanded to estimate the total area in the frame having that characteristic. Thus, the area frame is ideally suited for the estimation of total private forest land harvested during the period of interest. All the enumerator needs to do is locate the tracts inside the segments having this characteristic and identify the acreage of these tracts.

3/ See (8) and (10) for more detail on the design and sampling of SRS area frames.

Sample Design

More was desired from the survey than an estimate of total harvested forest land. Information about the socioeconomic characteristics and attitudes of the owners was also desired. To accommodate this need, owners' characteristics are estimated on an acreage basis rather than as a number of owners. Thus, estimates are of the form "Number of acres owned or co-owned by respondents who have a certain opinion or characteristic." This is referred to as domain estimation (6).

To collect the desired data, the SRS area frame and the annual June Enumerative Survey (JES) conducted with this frame were used. During the 1981 JES, segments in the twelve southern states were screened to identify tracts within each segment that had timber harvested in the preceding 10-year period. 4/

During the screening, enumerators recorded the names and addresses of the owners of the tracts with the desired forest harvesting characteristics. These owners were later contacted and interviewed (in August 1981 for North Carolina and October 1981 for the remaining eleven States). When a screening questionnaire could not be completed (refusal, inaccessible, etc.), the enumerator determined if the tract met the forest harvesting definition. The decision followed specific criteria based on existing land cover. These acres, as well as unanswered individual questions, are summarized as "unanswered" in the tables.

North Carolina Pilot Study

North Carolina was selected for a pilot survey. The questionnaire was administered to respondents identified during the screening and the responses were analyzed to determine the adequacy of the questionnaire and survey design. As expected, it was determined that twelve-state estimates would have acceptable sampling errors but that subregional breakdowns would generally not have acceptable sampling errors.

4/ See appendix II for the screening questionnaire.

APPENDIX II:
QUESTIONNAIRES

State	District	Segment
__ __	__ __ __ __ 00000	__ __ __ __

Form Approved
O.M.B. Number 535-0089

County _____

Part _____ of _____

1981
Reforestation Survey
Screening Form

Introduction

In addition to the June Acreage and Livestock Survey, we are screening the area of land outlined in red on this photo for landowners who harvested timber for commercial purposes during the past 10 years. This information will be used to develop a list of timber producers to be sampled for a follow-up reforestation survey later this year. Response is voluntary and not required by law.

Enumerator Note:

Point out tract boundaries on photo
and turn to page 2.

PAGE 2

(1)	(2)	(3)	(4)	(5)
Tract Letter	Tract operator's Name	Is this tract publicly owned land or owned by a commercial paper or wood products Company?	Has any timber been harvested for industrial timber products from land inside these blue tract boundaries during the past 10 years?	How many acres of timber were harvested inside these blue tract boundaries?
		☐ YES - STOP ☐ NO-Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•
		☐ YES-STOP ☐ NO- Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•
		☐ YES-STOP ☐ NO-Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•
		☐ YES-STOP ☐ NO-Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•
		☐ YES-STOP ☐ NO- Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•
		☐ YES-STOP ☐ NO-Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•
		☐ YES-STOP ☐ NO- Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•
		☐ YES-STOP ☐ NO-Continue	☐ YES - Continue ☐ DK-Go to Column 6 ☐ NO-Go to Column 9	•

(6)	(7)	(8)	(9)
Record land owner's name and address if different than operator.	**Does tract owner live inside or outside segment?**	Tract Acres	**Can you identify any other land inside these red lines from which timber was harvested for industrial timber products during past 10 years?**
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP
	☐ Inside ☐ Outside	.	☐ YES - Complete new line ☐ NO - STOP

Enumerator Check List

1. Total tract letters listed in Column 1, page 2 . . . . . [ ]

2. Count entered in Item 1, page 4, of Part ID . . . . . [ ]
   Items 1 and 2 must agree

Comments:

Enumerator: _____

Crop Reporting Board

Statistical Reporting Service

U.S. Department of Agriculture

REFORESTATION SURVEY
1981

Form Approved
O.M.B. Number 0596-0060
Approval Expires 8/30/82

Survey Code	Year Month	State	District	Segment	Tract	Sub-Tract	CRD	CO
984	110							

Enumerator Aide:

Tract Letter _____

Owner lives ☐ *Inside* ☐ *Outside* *Segment boundaries*

INTRODUCTION

Hello, my name is _____ and I am with the *(your state)* Crop and Livestock Reporting Service, USDA. We are conducting a survey for the Forest Service to obtain information about land which has had timber harvested during the last 10 years. We are interested in determining why landowners did or did not reforest after harvesting their timber.

You have been selected at random to respond to this survey and your response is voluntary and not required by law. However, cooperation is very important in order to develop future forestry programs. Information you provide will be kept confidential and used only in combination with other reports to arrive at survey totals.

1. Are you the owner or co-owner who makes reforestation decisions about the land located within these blue tract boundaries?
Review photo and tract boundaries with respondent. DO NOT *change Blue Tract boundaries.*

☐ YES. Continue with question 2.

Name of owner _____

Address _____

_____

Phone No. _____

☐ NO.

Who is the owner or co-owner responsible for making the reforestation decisions?

Name _____

Address _____

_____

Phone No. _____

Conclude Interview. *If owner listed above is located within your assignment area, contact owner and interview. If owner located outside your area, contact your State Supervisor.*

2. What was the most recent year timber was harvested for industrial or commercial wood products from land located within these blue tract boundaries?..... YEAR 103 19 __

ENUMERATOR: If prior to 1971, conclude interview.

REFORESTATION SURVEY DEFINITIONS

Reforestation (pine tree) – Regeneration of trees (pine), either artificially or naturally.

Forest Land – Land at least 1 acre in size and at least 10 percent stocked by forest trees of any size. Include land from which trees were harvested and current usage would allow reforestation. Also include roadside and streamside strips of timber with a crown width at least 120 feet and total area of at least 1 acre.

Nonforest Uses – Christmas trees, orchards, cropland, improved pasture, native range or pasture stocked with less than 10 percent trees as well as commercial and residential real estate, golf courses, lakes, highways and highway easements, powerlines and powerline easements.

Agricultural Land – Land in crop production, idle cropland, summer fallow, cropland pasture, improved pasture, land planted to soil improvement crops and native range or pasture stocked with less than 10 percent trees. Exclude cropland that has been idle for more than 2 years.

Industrial or Commerical Wood Products – All commercial wood products excluding fence posts, firewood, and Christmas trees.

First, we would like to ask questions about your total land ownership. Include land rented to others, but exclude land rented from others. Your response to these questions will help us understand how your land ownership is like or unlike others who own forest land.

3. How many total acres of forest land do you own or co-own?
(Include forest land both inside and outside the tract) ..... ACRES [104 .]

If Item 3 is less than 10 acres, **Conclude Interview.**

4. Pine land is an area where at least 50% of the trees are pine. Of your *(item 3)* acres of forest land, how many acres are pine land? ..... ACRES [107 .]

5. Of the Item 3 forest land acres, how many have been harvested for industrial or commercial timber products since 1971?
(Exclude land no longer in timber production)..... ACRES [106 .]

6. How many acres of agricultural land do you own or co-own?
(include agricultural land both inside and outside the tract)..... ACRES [105 .]

7. Refer to Flash Card #7

Please indicate which ownership category best describes the major portion of your forest landholdings?
(Enumerator: Check only one)

a. Sole proprietor *(include husband and wife)*..... ☐ = 1
b. Partnership or corporation with family members..... ☐ = 3
c. Partnership with other than family members..... ☐ = 4
d. Other corporation..... ☐ = 6
e. Other, specify _____ ☐ = 7

Enter Code [108]

(Enumerator: Was other corporation (Code 6) checked in Item 7?)

☐ NO, continue with question 8.

☐ YES

7a. Does this corporation trade stock publicly?

☐ NO = 2. Enter code and continue.

☐ YES = 1. Enter code and Conclude Interview [109]

8. Refer to Flash Card #8

In which of these periods did you acquire the majority of the forest land you now own? *(Enumerator: check only one.)*

a. 1970 until now	☐	= 2
b. 1960 through 1969	☐	= 3
c. 1950 through 1959	☐	= 4
d. 1940 through 1949	☐	= 5
e. Prior to 1940	☐	= 6

Enter Code [110]

9. Refer to Flash Card #9

Following is a list of reasons for owning forest land. Please indicate degree of importance each reason has for owning your forest land.
(Enter appropriate code for each reason)

Reason for Ownership	IMPORTANCE High (4)	Moderate (3)	Low (2)	None (1)	
a. Inherited land	☐	☐	☐	☐	[111]
b. Residence	☐	☐	☐	☐	[112]
c. Plan to pass it on to my heirs	☐	☐	☐	☐	[113]
d. Future or secondary home	☐	☐	☐	☐	[114]
e. Part of the farm	☐	☐	☐	☐	[115]
f. Growing timber or other wood products for sale	☐	☐	☐	☐	[116]
g. Land investments (from revenue other than farming or timber)	☐	☐	☐	☐	[117]
h. Recreation such as hunting	☐	☐	☐	☐	[118]
i. Want woodland or green space around my home	☐	☐	☐	☐	[119]

10. Considering the forest land you own, how important is timber management? *(Enumerator: Read scale to respondent. Check only one.)*

a. Very important ..... ☐ 1
b. Some importance ..... ☐ 2
c. Little importance ..... ☐ 3
d. No importance ..... ☐ 4

Enter Code 120

Enumerator: Questions 11 through 33a apply only to the land located within the blue tract boundaries. When there was more than one harvest during the last 10 years, questions 14 - 33a pertain to the most recent harvest (see question 2.)

Next, we would like to ask about wood harvesting and reforestation of only the land located within these blue boundaries. *Review tract boundaries with respondent.* DO NOT *change blue tract boundaries.*

(Enumerator Note: If it is obvious that the owner's residence is less than one road mile from the tract enter 1 in code box 121 and go to Item 12.)

11. Traveling by road, approximately how many miles is your residence from this tract? ..... MILES *(Round to nearest mile)* 121

12. How many acres inside this tract were harvested since 1971, for industrial or commercial wood products? *(Exclude land no longer in timber production)* ..... ACRES 122 .

Draw off *Item 12* acres in green.

13. In addition to the *Item 12* acres, was any timber harvested since 1971, from continuous land you own outside these blue tract boundaries?

☐ NO – 2. Enter code and continue.

☐ YES – 1. Enter code and continue. 123

13a. How many acres of timber were harvested from the continuous land located outside the tract? *(Exclude land no longer in timber production.)*..... ACRES 124 .

Draw off *Item 13* acres in green.

Enumerator: If the sum of items 12 & 13a is less than 10 acres, Conclude Interview.

14. How did you acquire the majority of this forest land outlined in green?
(Enumerator note: Check only one.)

a. Purchased ..... ☐ = 1
b. Inherited or gift ..... ☐ = 2
c. Other, specify _____ ☐ = 4

Enter Code [125]

15. In what year did you acquire most of this parcel?..... YEAR [126]

16. Do you intend to sell this parcel to anyone outside of your immediate family within:

a. Next 5 years ..... ☐ = 2
b. 6 - 20 years ..... ☐ = 3
c. No intentions to sell..... ☐ = 4
d. Undecided ..... ☐ = 5

Enter Code [127]

17. Who owned this parcel at the time of the most recent harvest?

- ☐ Current owner. Include joint ownerships that involved current owner – 1 → Enter code and GO TO QUESTION 18.
- ☐ Someone other than current owner – 2
- ☐ Don't know – 3

→ Enter code and continue with Item 17a.

128

17a. Since the most recent harvest, has this parcel been actively reforested to pine or allowed to reforest itself with pine naturally?

- ☐ NO – 2 Enter code and GO TO QUESTION 30.
- ☐ YES – 1 Enter code and continue.

129

17b. Did you make the decision to reforest the land with pine?

- ☐ YES – 1 Enter code and GO TO QUESTION 26.
- ☐ NO – 2 Enter code and GO TO QUESTION 32.

130

Enumerator: If land was reforested while under respondents ownership, check YES in Item 17b.

18. Refer to Flash Card #18

What type of trees were harvested from this parcel?
(Enumerator: Check only one.)

- a. Pine only ..... ☐ = 1
- b. Mostly pine *(more than half, but some hardwood)* .... ☐ = 2
- c. Mostly hardwood *(more than half, but some pine)* .... ☐ = 4
- d. Hardwood only ..... ☐ = 5
- e. Other, specify _____ ..... ☐ = 6

Enter Code 131

19. Refer to Flash Card #19

What type of trees remained on the site after harvest?

- a. Pine only ..... ☐ = 1
- b. Mostly pine *(more than half, but some hardwood)* ... ☐ = 2
- c. Mostly hardwood *(more than half, but some pine)* ... ☐ = 4
- d. Hardwood only ..... ☐ = 5
- e. All trees were removed *(clear cut)* ..... ☐ = 7
- f. Other, specify _____ ..... ☐ = 6

Enter Code 240

20. Who determined which trees would be harvested?
(Enumerator Check only one.)

- a. A forester ..... ☐ = 1
- b. A timber buyer or logger ..... ☐ = 3
- c. I selected them myself ..... ☐ = 4
- d. Other, specify _____ ☐ = 5

Enter Code 132

21. After harvest, how did the condition of this parcel differ from what you had anticipated prior to harvest?

(Enumerator: Allow respondent to reply without reading responses. Enter code 1 for all that apply.)

- a. Not at all 139
- b. Didn't cut trees specified 140
- c. Altered drainage pattern, plugged up ditches or caused excessive erosion 141
- d. Logging destroyed or damaged other trees or property 142
- e. Left too much debris 239
- f. Other specify _____ 144

22. Overall, were you satisfied with the condition of this parcel after harvest?

☐ YES = 1
☐ NO = 2

..... Enter Code 145

23. Refer to Flash Card #23

Please indicate the degree of importance each of the following reasons had on why you harvested this parcel of forest land when you did.
(Enter appropriate code for each reason)

Reason for Harvesting	IMPORTANCE High (4)	Moderate (3)	Low (2)	None (1)	Enter Codes
a. Timber was mature	☐	☐	☐	☐	147
b. Was offered a good price	☐	☐	☐	☐	148
c. Wanted to clear the land for a change to agriculture or other uses	☐	☐	☐	☐	149
d. Needed income to pay or reduce estate or inheritance tax	☐	☐	☐	☐	150
e. Needed income for other purposes	☐	☐	☐	☐	152
f. To salvage timber damaged by storms, insects, disease, fire	☐	☐	☐	☐	154
g. To improve growth of other trees left on the site	☐	☐	☐	☐	155

24. Refer to Flash Card #24

Which one of the following statements best describes how trees were harvested from this parcel?
(Enter code 1 for appropriate method of harvest and continue with Item specified)

a. Clear Cut or Seed Tree Cut: Most or all trees were harvested; only small trees or scattered large trees serving as a seed source remained on the parcel 241
(Go to Item 25)

b. Partial Cut: Only some mature trees were harvested; many large or mature trees, regardless of type, remained on the parcel 242
(Go to Item 25)

c. Thinning: Only some immature or defective trees were cut to make room for remaining trees to grow 243
(Go to Item 32)

Enumerator Note: Only one box should be coded for Item 24

25. Refer to Flash Card #25

After harvest, were any of the following practices carried out to prepare land for reforestation?
(Enumerator: Enter Code 1 for all that apply.)

a. Prepared seedbed (ground) using heavy machinery	160
b. Controlled burn	161
c. Herbicide application	162
d. Other, please specify _____	163
e. No action taken	164

26. Refer to Flash Card #26

What method of reforestation was used on this parcel?
(Enumerator: Check only one.)

a. Planted pine seedlings ☐ = 6	
b. Dispersed pine seed on the site by hand or mechanically ☐ = 7	
c. Left mature pine seed trees standing on the site ☐ = 5	
d. Left site to reforest itself ☐ = 1	
e. Other specify _____ ☐ = 3	

Enter Code 166

Enumerator Note: If code box 166 was
- *= 5, 6 or 7,* **Continue with question 27.**
- *= 1 or 3,* **Go to question 30.**

27. Did you receive public cost-sharing funds for reforestation of this parcel? *(Examples: Forestry ncentive Program-FIP; Agricultural Conservation rogram-ACP; State Programs, etc.)*

☐ YES = 1. Enter code and continue with question 28.

☐ NO = 2
☐ DON'T KNOW = 3

Enter code and continue [169]

27a. Were you aware that government cost-sharing for reforestation existed?

☐ YES = 1
☐ NO = 2

Enter code and GO TO QUESTION 29. [170]

28. From what source did the cost-sharing funds come? *(Enumerator: Check only one.)*

a. Federal program ..... ☐ = 1
b. State program *(Miss., N. C. and Va. only)* .... ☐ = 2
c. Federal and State *(Miss., N. C. and Va. only)* . ☐ = 3
d. Don't know ..... ☐ = 4
e. Other, specify _____ ☐ = 5

..... Enter code [171]

Next, we would like to gain a better understanding of your reasons for reforesting this parcel with pine

29. Refer to Flash Card #29

Please indicate the degree of importance each of the following reasons had on your decision to reforest this parcel to pine? *(Enter appropriate code for each reason)*

Reasons for Reforesting	IMPORTANCE			
	High (4)	Moderate (3)	Low Or None (2)	
a. Had revenues from harvesting to finance reforestation	☐	☐	☐	[174]
b. Availability of cost-sharing from public agencies	☐	☐	☐	[175]
c. Economic decision in anticipation of future profits from forest production	☐	☐	☐	[176]
d. Advice of professional Forester	☐	☐	☐	[177]
e. Availability of tax credits and tax deductions	☐	☐	☐	[178]
f. Felt the land should be kept in timber production	☐	☐	☐	[179]

Enumerator: **GO TO QUESTION 31.**

30. Refer to Flash Card #30

You have indicated that this parcel was not actively reforested in pine. How important were each of the following reasons in making this decision?

(Enter appropriate code for each reason)

Reasons for Not Reforesting	IMPORTANCE					
	High (4)	Moderate (3)	Low (2)	None (1)	Was not aware of program (5)	
a. Couldn't get cost-sharing	☐	☐	☐	☐	☐	181
b. Land is not sufficiently productive for pine	☐	☐	☐	☐		182
c. Return on reforestation investment occurs too far in the future	☐	☐	☐	☐		183
d. Return on reforestation investment is too low	☐	☐	☐	☐		184
e. Have not yet decided the future use of the land	☐	☐	☐	☐		188
f. Investment in reforestation is too risky because of fire, insects and disease	☐	☐	☐	☐		189
g. Had other uses for harvest revenues	☐	☐	☐	☐		190
h. Reforestation costs too much	☐	☐	☐	☐		191
i. Too much red-tape in obtaining technical or cost-sharing assistance	☐	☐	☐	☐	☐	193
j. Felt the site would reforest itself to pine naturally	☐	☐	☐	☐		194
k. Logging treatment when timber was harvested left site in such poor condition that it made reforestation with pine difficult	☐	☐	☐	☐		195

31. Did you obtain advice or assistance (free or paid for) from a professional Forester about reforesting your harvested parcel?

☐ **NO = 2.** Enter code and **GO TO QUESTION 32.**

☐ **YES = 1.** Enter code and continue → 197

31a. How did you become aware of this technical assistance?

(Enter code 1 for all that apply.)

a. A friend	198
b. The media *(newspaper, radio, etc.)*	199
c. Personal contact with State Forester	203
d. Personal contact with Extension Service	204
e. Personal contact with City or Urban Forester	205
f. Personal contact with Private Consultant or Industry Forester	206

31b. Refer to Flash Card #31

From whom did you obtain this advice or assistance? *(Enumerator: Enter code 1 for all that apply.)*

a. Private Consulting Forester	207
b. Industry Forester	208
c. State Forester (County Forest Ranger, etc.)	209
d. Extension Service Forester	210
e. Soil Conservation Service Forester	211
f. Other, specify _____	212

31c. How would you rate the technical ability of the person who gave the advice?

☐ GOOD = 1
☐ FAIR = 2
☐ POOR = 3

.... Enter Code 214

32. Was a forestry management plan written for this parcel prior to harvest?

☐ YES = 1
☐ NO = 2
☐ DON'T KNOW = 3

..... Enter Code 215

33. Is there a written forestry plan which considers the present condition of this parcel?

☐ NO = 2
☐ DON'T KNOW = 3

Enter code and GO TO QUESTION 34.

☐ YES = 1. Enter code and continue. 216

33a. Who prepared the most recent management plan for this harvested parcel?

(Check only one.)

a. Private Counsulting Forester ..... ☐ = 2
b. Industry Forester ..... ☐ = 3
c. State Forester (County Forest Ranger, etc.) ..... ☐ = 4
d. Extension Service Forester ... ☐ = 5
e. Soil Conservation Service Forester ..... ☐ = 6
f. Other, specify _____ ☐ = 7

Enter Code 217

34. Refer to Flash Card #34

What effect, if any, would each of the following programs have on your decision to reforest your land with pine after harvest?

(Enter appropriate code for each program)

Programs	High effect (4)	Moderate effect (3)	Low effect (2)	No effect (1)	Don't know (5)	
a. Increasing education on or demonstration of forestry practices	☐	☐	☐	☐	☐	219
b. Making more free technical forestry advice available from professional foresters	☐	☐	☐	☐	☐	220
c. Increasing the availability of cost-sharing money to help you cover part of the costs of reforesting your land	☐	☐	☐	☐	☐	221
d. Modifying tax laws which allow you to recover reforestation costs through additional tax credits or tax deductions	☐	☐	☐	☐	☐	222
e. Offering loans at market rates which would provide you with yearly or periodic income, and which you would repay at time of harvest	☐	☐	☐	☐	☐	223
f. Providing better, more accessible information on prices for standing timber	☐	☐	☐	☐	☐	224
g. Making forestry insurance available to insure against losses due to fire, insect, or disease damage to trees	☐	☐	☐	☐	☐	225
h. Improving capital gains tax treatment for timber income	☐	☐	☐	☐	☐	226
i. Reducing the tax burden on heirs by lowering inheritance and estate taxes	☐	☐	☐	☐	☐	227
j. Permitting lower property tax assessment because land is in forestry use	☐	☐	☐	☐	☐	228

ENUMERATOR: When only one program was rated high (Code 4) in Item 34, check and enter appropriate code for that program in Item 35 then continue with Item 36.

35. Please indicate the one program which you believe would have the GREATEST FAVORABLE IMPACT on encouraging you to reforest your land with pine.

a.	New education or demonstration programs	☐	= 1
b.	Assistance from professional Foresters	☐	= 2
c.	Cost-sharing programs	☐	= 3
d.	Tax credits and tax deductions	☐	= 4
e.	Government-guaranteed loans to provide regular income from forestry	☐	= 5
f.	Timber price reporting	☐	= 6
g.	Forestry insurance program	☐	= 7
h.	More favorable capital gains	☐	= 8
i.	More favorable inheritance tax or estate tax laws	☐	= 9
j.	Lower property tax appraisal	☐	= 10

Enter Code
230

(Review answer for consistency with Item 34)

ENUMERATOR: If other corporation (Code 6) was checked in Item 7, Go to Item 40.

Your answers to the following questions will help us build a composite picture of landowners. Please be assured that the answers to these questions and to all questions on the questionnaire will remain strictly confidential. Your name will not be associated with the information you provide.

36. How many dependents do you have including yourself? ..... NUMBER [231]

37. In what year were you born? ..... YEAR [232]

38. How many years of formal education have you completed?

(Enumerator: Check only one.)

a. 0-8 years ..... ☐ = 1
b. Some high school ..... ☐ = 2
c. High school graduate ..... ☐ = 3
d. Some college ..... ☐ = 4
e. College graduate or above ..... ☐ = 5

Enter Code [233]

39. What is your race? *(Observe, if possible.)*

a. White, not of Hispanic origin ..... ☐ = 1
b. Black, not of Hispanic origin ..... ☐ = 2
c. Hispanic ..... ☐ = 3
d. American Indian or Alaskan Native. ☐ = 4
e. Asian or Pacific Islander ..... ☐ = 5
f. Other, specify _____ ☐ = 6

Enter Code [234]

40. Which category best describes where you now live?
(Enumerator: Check only one.)

a. In a city with a population of 100,000 or more .... ☐ = 1
b. In a city with a population of 10,000 to 99,999 ... ☐ = 2
c. In a city or town with a population less than 10,000 ..... ☐ = 3
d. On a farm ..... ☐ = 4
e. In a rural area, but not on a farm ..... ☐ = 5

Enter Code [235]

41. Refer to Flash Card #41

In which category would you place your total 1980 income (before taxes)?
(Enumerator: Check only one.)

a. Under $5,000 ..... ☐ = 1
b. $5,000–$9,999 ..... ☐ = 2
c. $10,000–$14,999 ..... ☐ = 3
d. $15,000–$24,999 ..... ☐ = 4
e. $25,000–$34,999 ..... ☐ = 5
f. $35,000–$44,999 ..... ☐ = 6
g. $45,000+ ..... ☐ = 7

..... Enter Code [236]

42. What was the primary source of that income?
(Enumerator: Check only one.)

a. Pension or retirement benefit .. ☐ = 2
b. Wage or salary ..... ☐ = 3
c. Professional fees ..... ☐ = 4
d. Farming or ranching ..... ☐ = 5
e. Timber harvesting ..... ☐ = 6
f. Other, specify _____ ☐ = 7

..... Enter Code [237]

This completes the interview. We would like to thank you for helping us with this survey. Would you like to receive a copy of the results of this survey?

☐ YES = 1
☐ NO = 2 } ..... Enter Code

238

Enumerator: Check and enter respondent code.

☐ = 1. Owner

☐ = 2. Spouse

☐ = 3. Other (Specify) _____

101

☐ = 4. Inaccessible

☐ = 5. Refusal

Enumerator: Was interview concluded due to any of the following reasons:

- *question 2, page 1 — timber harvested prior to 1971.*
- *question 3, page 2 — less than 10 acres of forest land.*
- *question 7a, page 4—land owned by corporation that trades stock publicly.*
- *enumerator box on bottom of page 5—less than 10 acres harvested.*

☐ YES

☐ NO. *If question 12, page 5 was not answered for any reason (refusal, inaccessible, don't know, etc.) observe tract, if located within your area, and estimate the acreage of timber harvested for commercial purposes within the tract boundaries during the past 10 years.*
Exclude land no longer in timber production . . . ACREAGE

102 .

Enumerator _____ Date _____

APPENDIX III: TABLES

These tables are presented in the order of questioning. The wording used in the actual questions, probes excluded, is generally the table heading. The tables are identified by the number of the question on which they are based.

The tabulations represent estimates of the total acres owned or co-owned by respondents who gave the indicated answer. Multiple answers were permitted on some questions. Question 1 was a screening question which required no table.

Percentages are based on the indicated row or column total. The individual percentages indicated may not add to 100 because of rounding.

Coefficients of variation (CV) are expressed in percentages. The large CV's are a result of few (or only one when CV=99) respondents for the estimate.

Question 2--What was the most recent year timber was harvested for industrial or commercial wood products from land located within these tract boundaries?

Year harvested	Thousand acres	Percent of acres	Coefficient of variation
1971-1976	2,688	29	14
1977-1979	3,219	35	10
1980 to the day interviewed	3,360	36	11
Total	9,267	100	7

Question 3--How many total acres of forest land do you own or co-own? (Include forest land both inside and outside the tract)

Acres owned	Thousand acres	Percent of acres	Coefficient of variation
10 to 49 1/	637	7	9
50 to 99	811	9	11
100 to 399	2,872	31	9
400 or more	4,947	53	11
Total	9,267	100	7

1/ If response was less than 10 acres, interview was concluded and the response was not included in the summary.

Question 4--Pine land is an area where at least 50% of the trees are pine. Of your (Question 3) acres of forest land, how many acres are pine land?

Acres	Thousand acres	Percent of acres	Coefficient of variation
None	1,117	12	21
1 to under 50	776	8	10
50 or more	7,372	80	8
Unanswered	2	*	99
Total	9,267	100	

* = Less than one percent.

Question 5--Of the Item 3 forest land acres, how many have been harvested for industrial or commercial timber products since 1971? (Exclude land no longer in timber production)

Acres	Thousand acres	Percent of acres	Coefficient of variation
1 to under 50	1,076	12	7
50 or more	8,149	88	9
Unanswered	42	*	99
Total	9,267	100	7

* = Less than one percent.

Question 6--How many acres of agricultural land do you own or co-own? (Include agricultural land both inside and outside the tract)

Acres	Thousand acres	Percent of acres	Coefficient of variation
None	2,721	29	13
1 to under 50	1,330	14	12
50 or more	5,189	56	10
Unanswered	27	*	99
Total	9,267	100	7

* = Less than one percent.

Question 7--Please indicate which ownership category best describes the major portion of your forest landholding.

Ownership category	Thousand acres	Percent of acres	Coefficient of variation
Sole proprietor (includes husband and wife)	5,461	59	8
Partnership or corporation with family members	2,746	30	14
Partnership with other than family members	385	4	30
Other corporation	144	2	61
Other 1/	513	5	43
Unanswered	18	*	99
Total	9,267	100	7

* = Less than one percent.
1/ Includes hunting clubs and estates in probate.

Question 8--In which of these periods did you acquire the majority of the forest land you now own?

Year acquired	Thousand acres	Percent of acres	Coefficient of variation
1970 to now	2,933	32	13
1960 to 1969	1,356	15	14
1950 to 1959	1,765	19	15
1940 to 1949	1,113	12	15
Prior to 1940	2,026	22	16
Unanswered	74	*	99
Total	9,267	100	7

* = Less than one percent.

Question 9--Following is a list of reasons for owning forest land. Please indicate degree of importance each reason has for owning forest land.

Reason for ownership	IMPORTANCE					
	High	Moderate	Low	None	Unanswered	Total
	1,000 acres					
Inherited land	4,722 cv=11	612 cv=22	605 cv=20	3,189 cv=9	138 cv=43	9,267 cv=7
Residence	2,419 cv=13	739 cv=14	1,233 cv=19	4,728 cv=10	147 cv=42	9,267 cv=7
Plan to pass it on to heirs	4,901 cv=10	2,460 cv=13	926 cv=17	840 cv=22	141 cv=43	9,267 cv=7
Future or secondary home	240 cv=24	834 cv=30	1,779 cv=17	6,267 cv=7	147 cv=42	9,267 cv=7
Part of the farm	3,231 cv=11	1,903 cv=13	1,576 cv=20	2,411 cv=13	147 cv=42	9,267 cv=7
Growing timber or other wood products for sale	4,871 cv=11	2,403 cv=11	1,105 cv=18	741 cv=24	147 cv=42	9,267 cv=7
Land investments (from revenue other than farming or timber)	1,643 cv=15	1,379 cv=15	2,341 cv=16	3,754 cv=11	150 cv=41	9,267 cv=7
Recreation such as hunting	897 cv=18	1,912 cv=18	2,625 cv=14	3,685 cv=10	147 cv=42	9,267 cv=7
Want woodland or green space around my home	983 cv=19	817 cv=25	1,342 cv=14	5,978 cv=9	147 cv=42	9,267 cv=7

cv = coefficient of variation.

Question 10--Considering the forest land you own, how important is timber management?

Importance	Thousand acres	Percent of acres	Coefficient of variation
Very important	5,742	62	9
Some importance	1,850	20	13
Little importance	1,161	13	19
No importance	478	5	17
Unanswered	36	*	83
Total	9,267	100	7

* = Less than one percent.

Question 11--Traveling by road, approximately how many miles is your residence from this tract?

Miles from residence	Thousand acres	Percent of acres	Coefficient of variation
1 or less	3,158	34	10
2 to 10	2,632	28	14
more than 10	3,475	38	12
Unanswered	2	*	99
Total	9,267	100	7

* = Less than one percent.

Questions 12 and 13--Size of harvested area. 1/

Harvested acres (Questions 12 and 13)	Thousand acres	Percent of acres	Coefficient of variation
10 to 19 2/	251	3	11
20 to 49	1,041	11	8
50 to 99	1,355	15	10
100 to 199	1,899	20	10
200 to 399	1,872	20	14
400 or more	2,849	31	17
Total	9,267	100	7

1/ Question 12 - How many acres inside this tract were harvested since 1971, for industrial or commercial production? (Exclude land no longer in timber production.) Question 13 - In addition to the (Question 12) acres, was any timber harvested since 1971, from continuous land you own outside these blue tract boundaries?

2/ If Question 12 plus Question 13 summed to less than 10 acres, the interview was concluded and no data were summarized.

Question 14--How did you acquire the majority of this forest land?

Method of acquision	Thousand acres	Percent of acres	Coefficient of variation
Purchased	4,717	51	8
Inherited or gift	4,440	48	11
Other	11	*	99
Unanswered	99	1	76
Total	9,267	100	7

* = Less than 1 percent.

Question 15--In what year did you acquire most of this parcel?

Year acquired	Thousand acres	Percent of acres	Coefficient of variation
1970 to 1981	3,116	34	13
1960 to 1969	1,594	17	15
1950 to 1959	1,550	17	13
1940 to 1949	1,540	17	18
Prior to 1940	1,467	15	16
Total	9,267	100	7

Question 16--Do you intend to sell this parcel to anyone outside of your immediate family within:

Intentions to sell	Thousand acres	Percent of acres	Coefficient of variation
Next 5 years	459	5	26
6-20 years	32	*	44
No intention to sell	8,014	86	8
Undecided	667	7	24
No answer	95	1	79
Total	9,267	100	7

* = Less than one percent.

Question 17--Who owned parcel at the time of most recent harvest?

Owner	Thousand acres	Percent of acres	Coefficient of variation
Current owner(s)	8,949	97	7
Someone else	318	3	19
Total	9,267	100	7

Questions 17a and 17b--Reforestation actions on land which changed ownership since the most recent harvest.

Did the current owner make the decision to reforest the land with pine?	Since the most recent harvest, has this parcel been actively reforested to pine or allowed to reforest itself with pine naturally?	
	YES	NO
	1,000 acres	
Yes	32 (cv=43)	N/A
No	102 (cv=36)	N/A
Total 1/	134 (cv=24)	184 (cv=24)

1/ 134 + 184 = 318 from question 17 - Ownership change from time of most recent harvest.
N/A = not asked due to question skip pattern.

Question 18--What type of trees were harvested from this parcel? 1/

Type of trees	Thousand acres	Percent of acres	Coefficient of variation
Pine only	2,942	33	11
Mostly pine 2/	4,447	50	11
Mostly hardwood 3/	1,061	12	20
Hardwood only	403	5	23
Other	37	*	53
No answer	59	*	95
Total	8,949	100	8

* = Less than one percent.
1/ Asked only of respondents to Question 17 who owned the land at the time of the most recent harvest.
2/ More than half, but some hardwood.
3/ More than half hardwood, but some pine.

Question 19--What type of trees remained on the site after harvest? 1/

Type of trees	Thousand acres	Percent of acres	Coefficient of variation
Pine only	969	11	22
Mostly pine 2/	4,619	52	10
Mostly hardwood 3/	1,555	17	16
Hardwood only	450	5	22
All trees removed	1,268	14	19
Other	14	*	63
No answer	74	*	99
Total	8,949	100	8

* = Less than one percent
1/ Asked only of respondents to Question 17 who owned the land at the time of the most recent harvest.
2/ More than half, but some hardwood.
3/ More than half hardwood, but some pine.

Question 20--Who determined which trees would be harvested? 1/

Selected trees	Thousand acres	Percent of acres	Coefficient of variation
Forester	3,279	37	13
Timber buyer or logger	3,145	35	11
Landowner	2,335	26	13
Other	147	2	40
No answer	43	*	94
Total	8,949	100	8

* Less than one percent.
1/ Asked only of respondents to Question 17 who owned the land at the time of the most recent harvest.

Question 21--After harvest, how did the condition of this parcel differ from what you had anticipated prior to harvest? 1/ (Multiple response allowed.)

Condition difference	Thousand acres	Percent of acres 2/	Coefficient of variation
Not at all	7,040	79	8
Didn't cut trees specified	290	3	25
Altered drainage pattern and caused extensive erosion	321	4	34
Logging damaged other trees	893	10	17
Left too much debris	816	9	37
Other	254	3	99
Total	8,949	100	8

1/ Asked only of respondents to Question 17 who owned the land at the time of the most recent harvest.
2/ Percent of 8,949 acres.

Question 22--Overall were you satisfied with the condition of this parcel after harvest? 1/

Satisfied	Thousand acres	Percent of acres	Coefficient of variation
Yes	7,711	86	8
No	1,063	12	16
Unanswered	175	2	99
Total	8,949	100	8

1/ Asked only of respondents to Question 17 who owned the land at the time of the most recent harvest.

Question 23--Please indicate the degree of importance each of the following reasons had on why you harvested this parcel of forest land when you did. 1/

Reason for harvesting	IMPORTANCE					
	High	Moderate	Low	None	Unanswered	Total
	1,000 acres					
Timber was mature	4,544 cv=10	1,980 cv=14	1,262 cv=20	964 cv=20	199 cv=99	8,949 cv=8
Was offered a good price	2,742 cv=13	3,614 cv=10	1,421 cv=19	976 cv=20	196 cv=99	8,949 cv=8
Wanted to clear the land for a change to agriculture or other uses	267 cv=23	114 cv=30	582 cv=19	7,776 cv=3	210 cv=99	8,949 cv=8
Needed income to pay/reduce estate or inheritance tax	377 cv=59	385 cv=26	1,113 cv=18	6,852 cv=3	212 cv=99	8,949 cv=8
Needed income for other purposes	1,741 cv=14	2,055 cv=14	1,729 cv=17	3,213 cv=12	211 cv=99	8,949 cv=8
Salvage timber damaged by storms, insects, disease, and fire	1,132 cv=16	777 cv=25	1,252 cv=18	5,569 cv=10	219 cv=99	8,949 cv=8
Improve growth of other trees left on site	2,976 cv=12	1,848 cv=14	1,306 cv=22	2,621 cv=13	198 cv=99	8,949 cv=8

cv = coefficient of variation.
1/ Asked only of respondents to Question 17 who owned the land at the time of the most recent harvest.

Question 24--Which one of the following statements best describes how trees were harvested from this parcel?

Method	Thousand acres	Percent of acres	Coefficient of variation
Clearcut or seed tree cut 1/	2,884	32	11
Partial cut 2/	4,120	46	12
Thinning 3/	1,902	21	16
Unanswered	43	*	99
Total	8,949	100	8

* = Less than 1 percent.

1/ Clear Cut or Seed Tree Cut: Most or all trees were harvested; only small trees or scattered large trees serving as a seed source remained on the parcel.

2/ Partical Cut: Only some mature trees were harvested; many large or mature trees, regardless of type, remained on the parcel.

3/ Thinning: Only some immature or defective trees were cut to make room for remaining trees to grow.

Question 25--After harvest, were any of the following practices carried out to prepare land for reforestation?

Practices	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/ seed tree cut		Partial cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
Prepared ground using heavy machinery	741	23	105	74	846	22
Controlled burn	416	33	206	41	622	26
Herbicide application	198	54	90	81	288	45
Other	16	63	59	44	75	36
No action taken	1,775	12	3,737	12	5,512	9
Total 1/	2,884	11	4,120	12	7,004	8

1/ Addition of columns exceed the indicated total because multiple responses were allowed.

Question 26--What method of reforestation was used on this parcel?

Method of reforestation	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/seed tree cut		Parital cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
Planted pine seedlings	995	23	245	44	1,240	20
Dispersed pine seed	31	100	8	100	39	81
Left mature pine trees standing	243	36	701	26	944	21
Left site to reforest itself	1,460	13	3,027	14	4,487	11
Other	87	52	95	38	182	30
Unanswered	68	99	44	99	112	80
Total	2,884	11	4,120	12	7,004	8

Question 27--Cost-sharing. 1/

Did you receive public cost-sharing funds for reforestation of this parcel(Question 27)?	Were you aware that government cost-sharing for reforestation existed (Question 27A)?		
	Yes	No	Row totals
Yes	909 cv=24	0 cv=0	909 cv=24
No or don't know	1,158 cv=20	156 cv=28	1,314 cv=18
Column totals	2,067	156	2,233

1/ Includes only those respondents summarized in Question 26 who indicated that they actively reforested the parcel surveyed.

Question 28--From what source did the cost-sharing funds come? 1/

Source	Thousand acres	Percent of acres	Coefficient of variation
Federal program	787	87	28
State program	18	2	63
Federal and State	85	9	52
Don't know	19	2	80
Total	909	100	25

1/ Asked only of respondents who actively reforested and received cost-sharing funds (Questions 26 and 27).

Question 29--Please indicate the degree of importance the following reason had on your decision to reforest this parcel to pine.

QUESTION 29a Had revenues from harvesting to finance reforestation.	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/seed tree cut		Partial cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
High	164	38	179	58	343	36
Moderate	407	32	124	38	531	26
Low or none	653	30	625	28	1,278	21
Unanswered	45	99	26	99	71	99
Total	1,269	20	954	21	2,223	16

Question 29--Please indicate the degree of importance the following reason had on your decision to reforest this parcel to pine.

QUESTION 29b Availability of cost-sharing from public agencies.	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/seed tree cut		Partial cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
High	406	41	49	66	455	37
Moderate	267	37	123	66	390	33
Low or none	557	27	757	26	1,314	18
Unanswered	39	99	25	99	64	99
Total	1,269	20	954	21	2,223	16

Question 29--Please indicate the degree of importance the following reason had on your decision to reforest this parcel to pine.

QUESTION 29c Economic decision in anticipation of future profits from forest production.	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/seed tree cut		Partial cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
High	441	37	429	36	870	26
Moderate	631	27	275	36	906	21
Low or none	193	35	224	46	417	29
Unanswered	4	99	26	99	30	99
Total	1,269	20	954	21	2,223	16

Question 29--Please indicate the degree of importance the following reason had on your decision to reforest this parcel to pine.

QUESTION 29d Advice of professional forester.	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/seed tree cut		Partial cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
High	733	29	262	35	995	23
Moderate	263	41	359	45	622	31
Low or none	228	28	306	32	534	22
Unanswered	45	99	27	99	72	99
Total	1,269	20	954	21	2,223	16

Question 29--Please indicate the degree of importance the following reason had on your decision to reforest this parcel to pine.

QUESTION 29e Availability of tax credits and tax deductions.	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/seed tree cut		Partial cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
High	281	45	22	84	303	42
Moderate	168	42	69	51	237	33
Low or none	780	25	836	25	1,616	18
Unanswered	40	99	27	99	67	99
Total	1,269	20	954	21	2,223	16

Question 29--Please indicate the degree of importance the following reason had on your decision to reforest this parcel to pine.

QUESTION 29f Felt the land should be kept in timber production.	Question 24--Which one of the following statements best describes how trees were harvested from from this parcel?					
	Clear/seed tree cut		Partial cut		Row total	
	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation	Thousand acres	Coefficient of variation
High	1,048	22	724	26	1,772	16
Moderate	173	54	121	62	294	41
Low or none	44	52	83	84	127	58
Unanswered	4	99	26	99	30	99
Total	1,269	20	954	21	2,223	16

)uestion 30--You have indicated that this parcel was not actively reforested to pine. How important were each of the following reasons in making this decision? 1/

Reasons for not reforesting	Importance						
	High	Moderate	Low	None	Was not aware of program	Unanswered	Total
	1,000 acres						
;ouldn't get cost-sharing	190 cv=25	268 cv=34	812 cv=24	2,562 cv=13	1,089 cv=20	68 cv=99	4,989 cv=7
and is not sufficiently productive for pine	229 cv=26	348 cv=26	911 cv=24	3,433 cv=12	--2/	68 cv=99	4,989 cv=7
:eturn on reforestation imvestment occurs too far in the future	720 cv=16	1,393 cv=19	1,178 cv=22	1,620 cv=13	--	78 cv=99	4,989 cv=7
eturn on reforestation investment is too low	463 cv=23	1,240 cv=16	1,472 cv=21	1,736 cv=13	--	78 cv=99	4,989 cv=7
ave not yet decided the future use of land	490 cv=20	573 cv=21	649 cv=18	3,267 cv=12	--	88 cv=99	4,989 cv=7
nvestment in reforest-action is too risky because of fire, insects, and disease	270 cv=32	324 cv=26	1,188 cv=22	3,129 cv=12	--	78 cv=99	4,989 cv=7
ad other uses for harvest revenues	1,072 cv=24	886 cv=20	631 cv=16	2,319 cv=13	--	81 cv=99	4,989 cv=7
eforestation costs too much	1,451 cv=19	1,028 cv=18	778 cv=20	1,606 cv=14	--	125 cv=99	4,989 cv=7
oo much red-tape in obtaining technical or cost-sharing assistance	556 cv=20	769 cv=32	785 cv=25	2,054 cv=13	740 cv=25	85 cv=99	4,989 cv=7
elt the site would reforest itself to pine naturally	2,943 cv=14	913 cv=20	237 cv=25	805 cv=15	--	91 cv=99	4,989 cv=7
ogging treatment when timber was harvested left site in such poor condition that it made reforestation with pine difficult	115 cv=28	405 cv=28	1,308 cv=23	3,082 cv=10	--	80 cv=99	4,989 cv=7

1/ Asked only of respondents who did not actively reforest the site after clearcutting r partial cutting (Question 26) and those who acquired the site after harvest who did ot actively reforest or allow the site to reforest itself to pine (Question 17a).
2/ -- indicates not applicable.
cv = coefficient of variation.

Question 31--Did you obtain advice or assistance (free or paid for) from a professional forester about reforesting your harvested parcel?

Obtained advice	Thousand acres	Percent of acres	Coefficient of variation
Yes	2,774	38	13
No	4,447	62	9
Total	7,221 1/	100	8

1/ Not asked of respondents who acquired the land after reforestation (Question 17c) whose harvest was a thinning (Question 24), or who did not answer Question 24.

Question 31a--How did you become aware of this technical assistance? 1/

Source 2/	Thousand acres	Percent of acres	Coefficient of variation
Friend	415	15	37
The media (newspaper, radio, etc.)	250	9	44
Personal contact with state forester	1,174	42	17
Personal contact with Extension Service	657	24	29
Personal contact with city or urban forester	121	4	61
Personal contact with private consultant or industry forester	1,438	52	19
Total 1/	2,774	100	13

1/ Asked only of respondents who obtained technical assistance (Question 31).
2/ Could become aware of assistance from more than one source.

Question 31b--From whom did you obtain this advice or assistance?

Source of assistance	Thousand acres	Percent of acres	Coefficient of variation
Private consulting forester	1,396	50	18
Industry forester	869	31	31
State forester (county forest ranger, etc.)	1,098	40	18
Extension Service Forester	361	13	40
Soil Conservation Service Forester	212	8	41
Other	36	1	54
Total	2,774[1/2]	100	13

1/ Asked only of respondents who obtained technical assistance (Question 31).
2/ Could obtain assistance from more than one source.

Question 31c--How would you rate the technical ability of the person who gave the advice?

Rating	Thousand acres	Percent of acres	Coefficient of variation
Good	2,584	93	14
Fair	187	7	50
Poor	3	*	99
Total	2,774	100	13

* = Less than one percent.
1/ Asked only of respondents who obtained technical assistance.

Question 32--Was a forestry management plan written for this parcel prior to harvest?

Management plan	Thousand acres	Percent of acres	Coefficient of variation
Yes	2,013	22	14
No or don't know	7,254	78	8
Total	9,267	100	7

Question 33--Is there a written forestry plan which considers the present condition of this parcel?

Management plan	Thousand acres	Percent of acres	Coefficient of variation
Yes	1,899	20	16
No	7,368	80	8
Total	9,267	100	7

Question 33a--Who prepared the most recent management plan for this harvested parcel? 1/

Prepared management plan	Thousand acres	Percent of acres	Coefficient of variation
Private consulting forester	869	46	23
Industry forester	495	26	43
State forester (county forest ranger, etc.)	279	15	24
Extension Service Forester	105	6	70
Soil Conservation Service Forester	145	7	40
Other	6	*	99
Total	1,899	100	16

* = Less than one percent.
1/ Asked only of respondents who had a current written management plan (Question 33).

Question 34--What effect, if any, would each of the following programs have on your decision to reforest your land with pine after harvest?

Programs	High	Moderate	Low	None	Don't Know	Unanswered	Total
			1,000 acres				
Increasing education on/ or demonstration of forestry practices	686 cv=18	2,205 cv=15	2,310 cv=14	3,239 cv=11	771 cv=28	56 cv=99	9,267 cv=7
Making more free technical forestry advice available from professional foresters	1,749 cv=19	2,660 cv=13	1,462 cv=16	2,973 cv=11	367 cv=28	56 cv=99	9,267 cv=7
Increasing availability of cost-sharing money to help cover part of the cost of reforesting land	4,331 cv= 11	1,459 cv=14	1,219 cv=20	1,898 cv=14	304 cv=32	56 cv=99	9,267 cv=7
Modifying tax laws which allow to recover reforestation costs through additional tax credits or tax deductions	4,240 cv=11	2,222 cv=14	861 cv=16	1,514 cv=15	368 cv=28	68 cv=99	9,267 cv=7
Offering loans at market rates which provide yearly/periodic income, and which you repay at time of harvest	880 cv=27	1,546 cv=21	1,493 cv=16	4,532 cv=9	754 cv=21	62 cv=99	9,267 cv=7
Providing better, more accessible information on prices for standing timber	2,439 cv=16	2,208 cv=13	1,320 cv=16	2,735 cv=12	474 cv=25	91 cv=99	9,267 cv=7
Making forestry insurance available to insure against losses due to fire, insect, or disease damage to trees	1,008 cv=19	1,394 cv=17	2,463 cv=14	3,619 cv=11	707 cv=20	76 cv=99	9,267 cv=7
Improving capital gains tax treatment for timber income	4,270 cv=11	2,010 cv=15	1,008 cv=25	1,322 cv=16	534 cv=22	123 cv=99	9,267 cv=7
Reducing the tax burden on heirs by lowering inheritance and estate taxes	5,265 cv=10	1,725 cv=17	700 cv=21	1,212 cv=16	289 cv=33	76 cv=99	9,267 cv=7
Permitting lower property tax assessment because land is in forestry use	5,631 cv=9	1,885 cv=16	594 cv=22	814 cv=19	267 cv=34	76 cv=99	9,267 cv=7

cv = coefficient of variation.

Question 35--Please indicate the one program which you believe would have the GREATEST FAVORABLE IMPACT on encouraging you to reforest your land with pine.

Program with the greatest favorable impact	Thousand acres	Percent of acres	Coefficient of variation
Increasing education on/or demonstration of forestry practices	108	1	33
Making more free technical forestry advice available from professional foresters	150	2	37
Increasing availability of cost-sharing money to help cover part of the cost of reforesting land	2,325	25	16
Modifying tax laws which allow to recover reforestation costs through additional tax credits or tax deductions	1,062	11	26
Offering loans at market rates which provide yearly/periodic income, and which you repay at time of harvest	75	*	33
Providing better, more accessible information on prices for standing timber	167	2	25
Making forestry insurance available to insure against losses due to fire, insect, or disease damage to trees	70	*	37
Improving capital gains tax treatment for timber income	780	8	24
Reducing the tax burden on heirs by lowering inheritance and estate tax	1,713	18	15
Permitting lower property tax assessment because land is in forestry use	2,140	23	13
Unanswered	677	7	29
Total	9,267	100	7

* = Less than 1 percent.

Question 36--How many dependents do you have including yourself?

Number of dependents	Thousand acres	Percent of acres	Coefficient of variation
One	1,827	20	15
Two	3,910	42	10
Three	1,010	11	18
Four	1,134	12	18
Five or more	910	10	25
Unanswered	476	5	33
Total	9,267	100	7

Question 37--In what year were you born?

Year	Thousand acres	Percent of acres	Coefficient of variation
Before 1917	3,056	33	11
1917 to 1935	4,310	47	11
1936 or later	1,390	15	16
Unanswered	511	6	30
Total	9,267	100	7

Question 38--How many years of formal education have you completed?

Years completed	Thousand acres	Percent of acres	Coefficient of variation
0 to 8	742	8	17
Some high school	907	10	13
High school graduate	2,180	24	13
Some college	1,317	14	17
College graduate or above	3,594	39	13
Unanswered	527	6	30
Total	9,267	100	7

Question 39--Race of landowner.

Race	Thousand acres	Percent of acres	Coefficient of variation
White, not of Hispanic origin	8,489	92	7
Black, not of Hispanic origin	434	5	25
Other	13	*	99
Unanswered	331	4	42
Total	9,267	100	7

* = Less than one percent.

Question 40--Which category best describes where you now live?

Residence	Thousand acres	Percent of acres	Coefficient of variation
City with a population of 100,000 or more	762	8	22
City with a population of 10,000 to 99,999	1,677	18	21
City or town with a population of less than 10,000	1,638	18	17
On a farm	3,920	42	10
In a rural area, but not on a farm	1,118	12	20
Unanswered	152	2	53
Total	9,267	100	7

Question 41--In which category would you place your total 1980 income (before taxes)?

Income before taxes	Thousand acres	Percent of acres	Coefficient of variation
Under $5,000	468	5	18
$5,000 to 9,999	982	11	14
$10,000 to 14,999	773	8	22
$15,000 to 24,999	1,194	13	13
$25,000 to 34,999	635	7	17
$35,000 to 44,999	888	10	26
$45,000 or more	2,996	32	13
Unanswered	1,331	14	22
Total	9,267	100	7

Question 42--What was the primary source of that income?

Source of income	Thousand acres	Percent of acres	Coefficient of variation
Pension or retirement benefit	2,014	22	12
Wage or salary	2,346	25	12
Professional fees	666	7	34
Farming or ranching	1,396	15	13
Timber harvesting	1,010	11	20
Other	1,026	11	18
Unanswered	809	9	34
Total	9,267	100	7

Respondent Code

Respondent	Thousand acres	Percent of acres	Coefficient of variation
Owner	7,183	78	8
Spouse	386	4	28
Other	1,698	18	16
Inaccessible	0	0	0
Refusal	0	0	0
Total	9,267	100	7

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