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Management of Non-Industrial Private Forest Lands: Survey Results from Western Oregon and Washington Owners

By

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OREGON STATE UNIVERSITY
COLLEGE OF FORESTRY

Forest Research Laboratory

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Abstract

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Oregon State University researchers conducted a survey in 1994 of non-industrial private forest (NIPF) landowners in western Oregon and western Washington. Private forests provide valuable ecological services, such as fish and wildlife habitat, and are also partially filling the gap created by recent reductions in federal timber harvest in the region. The purpose of the study was to assess demographic characteristics, timber management practices, harvest decisions, attitudes toward government regulation, and the use of government assistance by NIPF landowners in western Oregon and western Washington. NIPF owners are a very heterogenous class with diverse objectives, ranging from timber production to the enjoyment of owning "green space". Most of the owners surveyed had harvested timber from their land and had used a variety of methods, including clearcuts (28%) and thinnings and other partial cuts (60%). A majority (68%) said they would alter the amount and timing of their harvest if it were necessary to maintain a healthy ecosystem. However, most owners would not be willing to give up their right to harvest timber altogether, even if offered a tax incentive. Many of the results differed between owners of large acreages and owners of small acreages.

Contents

Introduction

Non-industrial private forests (NIPF)[1] are important resources in the United States because they contain approximately three-fifths of the timberland area (Powell et al. 1993). NIPF owners' approach to land management has also been widely discussed in forestry literature, including in other countries (e.g., Kuulavainen and Salo 1981, Lonnstedt 1989). Many see such lands as providing opportunities for expanded timber production and non-timber outputs and services.

In the Pacific Northwest, the role of private forestlands in contributing to overall ecosystem health has become an important part of recent policy analyses [e.g., Forest Ecosystem Management Assessment Team report (FEMAT 1993); Governor's coastal salmon restoration initiative (Nicholas 1997)]. Virtually all wildlife species of concern that use late-successional forests have large proportions of their range on private forestland. Private forestland in the Pacific Northwest is also important from a landscape perspective because it is generally located at lower elevations, and hence contains ecological zones that differ from those on federal forestland.

At the same time, NIPF owners in the Pacific Northwest are playing a larger role in the region's timber supply picture. As harvests decline from federal sources due to regulations concerning threatened and endangered species and other environmental issues, the region's wood-processing industries have increasingly turned to NIPF lands as a source of raw materials. The role of NIPF lands in the Pacific Northwest, then, is rapidly changing, as both commodities and amenities produced from forests increase in socioeconomic value.

This paper presents the results of a study of NIPF landowners west of the Cascade Range (Westside) in Oregon and Washington. The study was designed to investigate management and harvest behaviors, as well as landowner characteristics, motivations, and attitudes. The specific objectives of the study were to

- describe Westside NIPF land and landowner characteristics
- describe landowner motivations for owning forestland, attitudes toward selected forest practice regulations, and reasons for harvesting behavior
- describe management and harvest practices
- determine landowner participation in government assistance programs and attitudes toward potential new government programs.

[1] In this study, NIPF owners are private owners with at least 1 ac who do not own wood-processing facilities, not including corporations actively involved in forest-related business.

Previous Studies

NIPF Ownership Patterns

In a recent national survey that included both non-industrial and industrial forest landowners, Birch (1997) found that forest lands were concentrated in the hands of relatively few. Birch estimates that there are currently 9.9 million private forest landowners in the United States. Of these, slightly over 1 million are in the 17 western states (Great Plains, Rocky Mountain, and Pacific states, including Hawaii and Alaska). There are 166,200 NIPF owners in Oregon and 91,400 in Washington. The general pattern, as exhibited in the United States, the West, and Oregon, is that most (58%–69%) private forest landowners have less than 10 ac. Washington is an exception, where only 38% of private owners have ownerships of 10 ac or less. The most common (46%) ownership size in Washington is 10–49 ac, compared with 22% in that size range in Oregon and 28% for both the West and the United States. Comparatively few owners hold most of the forest acreage in all areas of the United States. Nationwide, almost 70% of the private forest land is held by 7% of owners; in the West, 66%–71% of all forest land is held by less than 1% of private owners. The majority of NIPF land, at the national level, is controlled by about 10% of NIPF owners. About 80% of the harvesting that occurs on NIPF land occurs on these larger ownerships (Powell et al. 1993).

Total private timberland ownership in western Oregon consists of 5.9 million acres (MacLean 1990); NIPF owners have approximately 1.8 million acres, or 30%. NIPF owners also control 26% of the private growing stock inventory in western Oregon (Sessions 1990).

Total timberland area in western Washington consists of 9.6 million acres, of which private landowners control approximately 5.7 million acres (59%) (Adams et al. 1992, MacLean et al. 1992). Of this, NIPF owners control approximately 2.0 million acres, or approximately 21% of the total timberland area, and approximately 35% of the total private timberland area. Additionally, NIPF owners control approximately one-quarter of the total growing stock volume in western Washington.

Given their portion of all timberland in the Pacific Northwest, NIPF owners have a larger than proportional share in lower slope classes (Bettinger and Alig 1996). Slopes of <30% are prime candidates for ground-based harvesting operations, but also often form important parts of valley and riparian ecosystems. Early Euro-American settlement patterns in the 1800s favored gently sloping lands and led to today's ownership landscape. These ownership patterns also mean that NIPF owners, by way of property location, may be heavily subject to riparian-zone regulations and related forest-practice regulations.

Studies of NIPF Forest Management Behavior

Previous studies of NIPF landowners can be classified into three types: descriptive, economic, and behavioral. Here we will focus on the type similar to ours, descriptive studies, which rely on surveys, conducted via mail or phone,

to obtain basic information about non-industrial landowners. These studies provide fundamental knowledge that can be used in further analyses, and often provide insights into the attitudes of landowners toward some management practices.

Most descriptive analyses have focused on the characteristics of landowners and/or the characteristics of their forestlands. Demographic information about landowners, such as age, occupation, income level, gender, race, and residence, have been collected in these studies. Other variables that focus on the ownership, such as size of land holding, forest type, and management history, describe the forests of non-industrial owners.

Surveys of non-industrial landowners have been conducted at several levels of aggregation, including the national, regional, state, and sub-state levels. Surveys conducted at the national and regional levels have focused on providing basic data on landowners and their forests, with little or no use of the data for exploring relationships or building models (Birch et al. 1982, Rosson and Dolittle 1987).

Surveys conducted at the state or sub-state level, however, are often concerned not only with providing basic demographic data, but also with correlating demographic or forest conditions with a particular forest management practice. Cleaves and Bennett (1995) related past participation in harvesting, harvest type, and future harvest intentions with various landowner and land characteristics in western Oregon. In an Idaho survey, Force and Lee (1991) evaluated the harvest intentions, use of forest management practices, and use of forestry assistance programs in that state.

The accuracy of some NIPF surveys has been questioned; some surveys may have provided inaccurate information due to poor design, a poor understanding of questions on the part of respondents, or other reasons. Egan and Jones (1995) showed inconsistencies between survey and re-survey responses from non-industrial land owners about forest ownership and harvesting activities on their lands.

In addition, surveys of NIPF timber resource conditions and historical timber practice levels sometimes fail to distinguish clearly between actual on-the-ground management and responses to survey questions. This may lead to survey responses that, in aggregate, seem to conflict with results from ground surveys. However, careful survey design can address many of these limitations. Surveys offer insights that would be too expensive and labor-intensive to achieve through other approaches.

Results of previous studies have shown that NIPF landowners own and manage land for a wide variety of benefits. Blatner et al. (1991) found that 56% of landowners surveyed considered income from timber harvesting as an important factor in their ownership of forestland. However, other factors were also found to be important, including aesthetics, sentimentality, wildlife habitat, and privacy. Some studies (Rutledge 1989, Bennett 1993) also suggest that factors other than (or in addition to) income from timber are important in the decision to own forestland. In a recent national survey of private forestland owners (both NIPF and forest industry), Birch (1996) found that the most common primary reason for ownership was simply that the forest was part of their residence or farm (39%, nationally; 43% of Oregon owners). Timber production was listed as the primary reason for owning forestland by only 3% of owners nationwide, and 4% of the Washington and Oregon owners. However, when the survey results were recast in terms of acres owned, timber pro-

duction emerged as the most important reason for owning forestland in all areas (29% of U.S. acres), and was especially important in Washington (57%) and Oregon (60%).

An article by Bliss and Martin (1989) suggests that qualitative methods can be used to gain further insights into the motivations for nonindustrial landowners' forest management behavior. Some researchers have used survey methods and social or behavioral models developed in the fields of psychology, sociology, or anthropology to examine the land-management behavior of NIPF owners. The underlying principle of most of these analyses is to examine the beliefs and attitudes of landowners with respect to various forest management activities, then relate those to observed behaviors. The influence of landowner beliefs on forest management behavior was examined by Gramann et al. (1985), who found that beliefs about the relative advantage of an activity affected the probability of planning to carry out the activity in the future. Similar results were observed by Young and Reichenbach (1987), who found that landowner attitudes and beliefs about harvesting could be used to accurately predict harvesting activity. Bliss and Martin (1988) found that a landowner's personal, social, and ethnic identity influenced, and was influenced by, forest management activities.

Few studies of NIPF landowner behavior have sought to determine whether concerns about future forest practice regulations may affect current management behavior (Johnson et al. 1997). Bennett (1993) found that 11% of NIPF landowners in western Oregon felt that avoiding future restrictions on harvesting was an important reason for harvesting. However, no attempt was made to determine how management practices were likely to be affected (e.g., shorter harvest rotations or increased partial cutting) or which landowners may be most likely to alter management behavior (e.g., owners of more acres, owners with longer tenure of ownership, owners with older timber age classes).

Previous research has demonstrated that NIPF owners are a diverse group who own and manage—or don't manage—forestland for a variety of reasons. The literature suggests that a recurring theme for predicting forest management and investment behavior is size of ownership. Although this appears to be true of all western Oregon and Washington owners, the aggregation of industrial and NIPF data in previous studies makes it difficult to draw conclusions about NIPF owners. Reasons for ownership, residency status, and other owner and ownership characteristics may also play a role. Consequently, generalizing about why NIPF owners choose to manage their land as they do is difficult. Effective policymaking aimed at NIPF lands will have to be sensitive to different motivations and should consider incentives compatible with them.

In western Oregon and Washington, NIPF owners are increasingly being asked to manage their lands for ecosystem health, but relatively few studies have examined likely owner responses to potential associated incentives, regulations, or restrictions. Royer and Moulton (1987) investigated reforestation practices in the South and landowners' use of incentives such as tax credits to promote reforestation. We examined management activities, owner characteristics, and responses to proposed regulations and incentives in a survey of western Oregon and Washington NIPF owners.

Methods

Non-industrial private forest land owners on the Westside were surveyed in July and August of 1994. Trained telephone interviewers at the Oregon State University Survey Research Center conducted the survey. Names of NIPF owners with one or more acres of forest land were obtained from county assessors' offices in Oregon and Washington. A random sample was drawn from the population of owners in each county. The sample size for each county was in proportion to the number of NIPF acres in each county. From the original list of NIPF landowners in the 19 Washington and 19 Oregon counties, the response rate was 58%, providing a total of 1,004 samples.

The survey instrument was developed with input from representatives of state and federal forestry agencies. A small sample of Oregon NIPF owners completed a telephone pre-test of the questionnaire. Survey questions were designed to determine past management and harvest behavior and expected future harvest behavior. Survey questions covered the following topics:

- ownership information and sociodemographics
- reasons for NIPF ownership
- status of stands and management practices
- harvest decisions and practices
- characteristics of the most recent harvest decisions
- reasons for partial harvests
- future timber management decisions
- effect of tax reduction incentives
- awareness and use of government assistance programs
- forest practice beliefs
- willingness to make long-term investments.

A combination of open- and closed-ended questions was used throughout the survey. To get more information about recent harvest decisions, owners were asked detailed questions about the first, second, and third most recent harvests made in the past 5 years. They were also asked about their management practices on a "representative stand", which was defined as a stand that would be representative of the multiple stands they might own.

Royer and Moulton (1987) found that NIPF owners in the South made significant use of tax credits, in many cases complementing them with other government cost-share assistance. We included several closed-ended questions to assess compensation levels that might be required to alter landowners' intentions. We asked whether landowners would a) use only selective-harvest methods on their representative stand in order to improve wildlife habitat, b) forego harvesting timber from their forestland, c) harvest and reforest an underproductive stand, and d) forego harvesting within 200 feet of a riparian area if given an annual federal income tax reduction for 10 years. Each respondent received a hypothetical offer of a single tax reduction (i.e., tax credit). The amounts of the reduction were varied across respondents, ranging from $25 to $2,000 per acre per year. Owners were also queried regarding their knowledge of forestry regulations requiring reforestation after final harvests. Owners were asked whether they intended to reforest after harvest, and whether

they were aware of government assistance programs that could provide cost sharing or technical assistance during reforestation.

Results

Relatively few owners account for much of the NIPF land, while many owners have very small parcels (Table 1). Complete results are presented in tabular form in the Appendix. Because there were often significant differences between owners of small and large acreages, the tables present results for both "percent of owners" and "percent of acres" (Appendix). They also show a breakdown of responses for owners with >100 ac versus <100 ac.

Table 1. Size Class Distribution

	% Response	Responses	% Acres*
Size Class (ac)	**96.8**	**972**	**100.0**
1–9	13.7	133	1.0
10–49	50.6	492	15.2
50–99	15.9	155	12.8
100–499	16.7	162	37.7
500–999	2.2	21	15.8
1,000+	0.9	9	17.5
Size of Ownership	**96.8**	**972**	**100.0**
<100 ac	80.2	780	
>100 ac	19.8	192	

*% of acres for those responding to question on size class

Ownership Information (Appendix, Tables 1–3)

Of the 1,004 NIPF owners surveyed, 440 (44%) owned land in Oregon only, and 556 (55%) owned land in Washington only; <1% held land in both states. The largest ownership type was individuals (92%), followed by partnerships (7%). Most of the land had been owned for 30 years or less (68%), and the mean tenure of ownership was 27.3 years.

Sociodemographic Profile of Survey Sample (Appendix, Tables 4–8)

Three-quarters of NIPF owners were not employed in an occupation related to the forest industry, and only 8% reported timber revenue as their primary source of income. More than 35% of the NIPF owners were retired,

26% were employed full-time with a company, and 21% were self-employed. Forty-three percent of owners had household incomes between $25,000 and $49,999. More than 95% of the sample group had received a high school degree or more, while 37.9% had received a university degree or more.

Reasons for NIPF Ownership (Appendix, Tables 9–16)

Respondents were asked to rate several reasons for forest ownership on a 5-point scale of importance (1 = very important; 5 = not at all important). Investment was identified by 64%, while the enjoyment of owning "green space", part of residence, and an estate for children were also identified as important or very important reasons for NIPF ownership by >60% of respondents. Mean responses were highest (indicating less importance) for the following reasons: part of farm, recreation, and timber production. When asked for their *primary* reason for owning forestland, the largest percentage (20%) of owners chose the enjoyment of owning green space, followed by land investment (16%). Timber production was cited by 9% of the owners as their primary reason for owning forestland.

Because many acres of forestland are held by relatively few owners, we calculated the percent of *acres* as well as the percent of *owners* for each reason for ownership. Although timber production was listed as very important by 23% of the owners, those owners represented 43% of the acres in the sample. Similarly, when asked for their *primary* motivation for owning forestland, 25% of the owners said either timber production or land investment, but this represented 44% of the acres.

Status of Stands (Appendix, Tables 17–24)

The mean tract size of NIPF ownerships in the survey was 59 ac. Just over two-thirds of the representative stands identified by the NIPF owners were <40 ac (69%) in size and the size of holdings ranged from 1 to 2,400 ac.

Most of the youngest trees in the representative stand were <20 years old (85%). The age of the youngest trees ranged from 1 to 120 years and the mean age of the youngest trees on the representative stand was 10 years; the mean age of the oldest trees in the representative stand was 73 years. Roughly 42% of NIPF owners reported that their stands were well stocked, 45% reported that their stands were adequately stocked, and only 9% reported that their stands were poorly stocked.[2] The mean size of poorly stocked stands was 3 ac. Of those NIPF owners reporting poorly stocked stands, 65% reported that they planned to restock the stand. Additionally, 13% of the NIPF owners reported problems with disease or insects. The mean size of stands with disease or insect problems was 1 ac.

Management Practices (Appendix, Tables 25–34)

The results of questions regarding management practices revealed that most NIPF owners practiced minimal management of their stands during their

[2] Respondents were presented with the choices "well stocked", "adequately stocked", and "poorly stocked", and the interpretation of these terms was left up to the respondent.

ownership. The great majority of NIPF owners (84%) had not converted their forest types (harvested, then replanted with a different species), although 61% had planted trees for reforestation. Only 15% of NIPF owners had fertilized and only 9% had conducted a prescribed burn, although 39% had pruned.

Harvest Decisions and Practices (Appendix, Tables 35–42)

Approximately 51% of NIPF landowners surveyed had harvested timber from their land, although these owners represented 62% of the acres in the sample. In response to an open-ended question regarding the biggest influence on their most recent harvesting decision, 33% of the NIPF owners identified the need for income as the biggest influence on their decision to harvest. Other reasons included thinning and the fact that trees had reached a mature age as the biggest influences in the decision to harvest.

When asked specifically about the impact of possible future regulations on their most recent harvest decision, 44% responded that the possibility of revised riparian-area harvest restrictions was not at all important. Similarly, the possibility of a log export ban for private timber was not at all important to 48% of those who had harvested, and 46% responded that harvest restrictions arising from the Endangered Species Act (ESA) were not at all important in their most recent decision to harvest. When these questions are analyzed on the basis of the percentage of acres, instead of percentage of owners, the results are somewhat different. Those responding that riparian restrictions, possible export ban, and ESA restrictions were not at all important represented 29%, 25%, and 26% of the acres, respectively.

Most Recent Harvest of Past Five Years (Appendix, Tables 43–54)

Three hundred forty-one owners had harvested timber from their lands at least once in the last 5 years. In the most recent harvest, the mean number of acres was 18, although most of those who had harvested at least once in the last 5 years had harvested <10 ac (55%). Although 55% of the owners had harvests of <10 ac, they represented only 30% of the acres in the sample, meaning that owners with larger acreages were more likely to be harvesting units >10 ac. Most of those harvests were for sale (90%), rather than for personal use (10%). Clearcutting was the harvesting method of choice for 28% of all harvests, while thinning or other partial cutting methods were used for 68%. Most of the timber harvested was classified as primarily conifers (62%). Primarily hardwood stands made up 13% of the harvest, and an even mix of hardwoods and conifers made up 26%.

The mean age of the youngest timber harvested was 33 years, and the mean age of the oldest timber harvested was 68 years. Harvested timber quality was rated as high by 36%, lesser by 16%, and both by 48%. The diameter of the harvested timber was reported as large by 31% and small by 17%. One-third of respondents did not plan to reforest, while 26% planned to reforest, and 43% had already reforested the harvested area. The mean acreage reforested was 20 ac, with a mean of 377 replanted trees per acre.

Second Most Recent Harvest in Past Five Years (Appendix, Tables 55–65)

Seventy-three owners harvested at least twice in the last 5 years. Nearly two-thirds harvested less than 10 ac, although they represented only 24% of the acres in the sample. The mean harvest acreage was 17 ac. Most of those harvests also were for sale (84%), rather than for personal use. Clearcutting comprised 28% of the second harvests, and thinnings and other partial cuts were 49%. Most of the timber harvested was classified as primarily conifers (64%). Primarily hardwood stands made up 16% of the harvest, and 20% was an even mix of hardwoods and conifers. The quality of the timber harvested was reported as high by 49% of the respondents, lesser by 13%, and mixed by 38%. The youngest harvested timber had a mean age of 37 years, while the oldest harvested timber had a mean age of 70 years. The diameter of the harvested timber was reported as large by 41% of landowners and small by 10% of landowners. Thirty-eight percent of respondents did not plan to reforest, 16% planned to reforest, and 47% had already reforested the harvested area.

Reasons for Partial Harvest (Appendix, Tables 66–75)

As noted above, many landowners either partially cut, thinned, or salvage-logged their forestland. Of those who used these types of harvests, 66% said they did so to increase the yields of remaining trees. The elimination of dead, dying, or damaged timber was identified by 59% of respondents as a reason for partial harvesting. Harvesting to provide income, yet retain some trees for non-timber benefits was identified by 62% of those who cut part of their trees, while 12% harvested for income without the motivation of retaining some trees for non-timber benefits. Few owners stated that the recommendation of either loggers or timber buyers (12%) or foresters or consultants (24%) was the reason for partial cutting. Nearly two-thirds of landowners selected the trees for harvest. Two-fifths depended on loggers or timber buyers to make the selection, and 15% used a forestry consultant. Lastly, only 16% of the trees selected for partial harvest were high-value trees.

Expected Future Harvests (Appendix, Tables 76–80)

The majority of NIPF owners surveyed planned to harvest in the next 10 years (58%), and these owners represented 74% of the acres in the sample. The possibility of harvest restrictions on private lands due to additional government regulation and court rulings has led to the speculation that many NIPF owners would harvest sooner if such restrictions were imposed. However, we found that the majority of respondents were not likely to harvest sooner under increased riparian harvest restrictions (54%), a log export ban on private timber (61%), increased restrictions under the ESA (52%), or more restrictive reforestation requirements (66%). However, when analyzed on the basis of acres owned, the first three categories have lower percentages: 37% for riparian restrictions, 48% for a log export ban, and 36% for ESA restrictions.

Effect of Tax-reduction Incentives (Figure 1)

Income tax reductions of $400 per acre annually for 10 years appeared to be an adequate incentive for the majority of NIPF owners to alter their harvest and management decisions. For example, 72% of respondents would use only selective-harvest methods on their representative stands in order to improve wildlife habitat under this tax incentive. Most respondents (59%) who received a $400 per acre "offer" on their survey said they would also willingly forego harvesting under this tax incentive. Similarly, 71% would willingly forego harvesting within 200 ft of a riparian area, and 93% would harvest and reforest an underproductive stand under the same tax-reduction program.

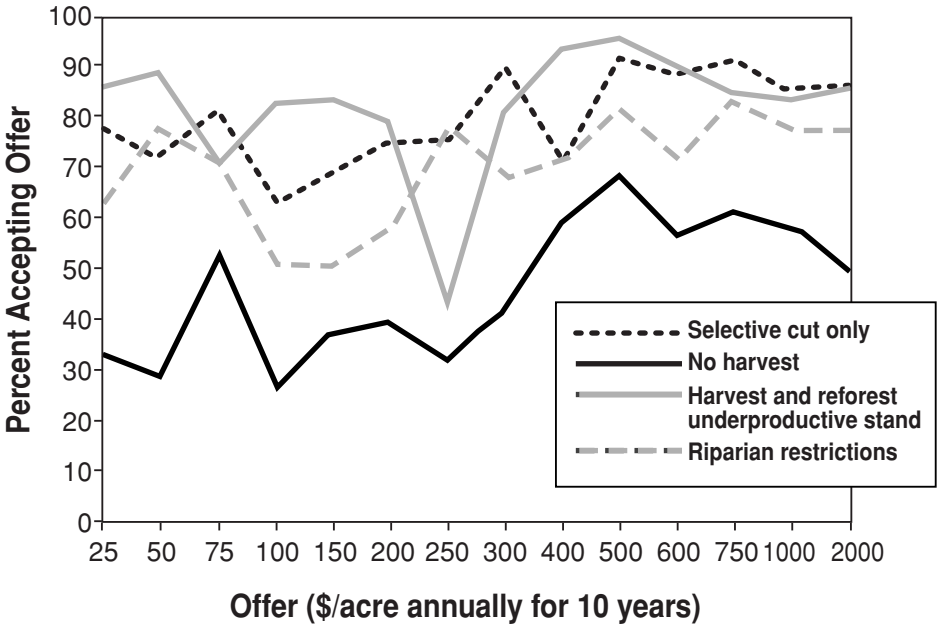

Figure 1. Effect of tax-reduction incentives on future harvest intentions.

Awareness and Use of Government Assistance Programs (Appendix, Tables 81–90)

Less than half of the survey sample answered these questions, which is probably a reflection of their unfamiliarity with the programs. Most landowners (63%) were generally unaware of various technical assistance and cost-share programs available to them. Of those who were aware of programs, few took advantage of them. Even from an acreage perspective, only 57% of the acres were owned by the 27% who were familiar with these programs. This indicates that owners of larger parcels are more aware of these programs than are owners of smaller parcels.

Of those generally aware of assistance programs, nearly two-thirds were aware of conservation planning through the Natural Resource Conservation Service (NRCS, previously Soil Conservation Service) (62%) and federal cost-

share monies (65%). Considered in terms of acres, large landowners (>100 ac) were most aware of these programs (75% and 85%, respectively). Tax incentives were not as well known. Forty-four percent (51% of acres owned) were aware of the federal income tax credit for reforestation, and 29% (37% of acres owned) were aware of similar state-sponsored programs. Use of such programs among those aware of them was mixed; those who used such programs made up a minority of all landowners surveyed. As with general awareness, owners of larger acreages appeared more aware of tax incentive programs than were those with smaller acreages.

Forest Practice Beliefs (Appendix, Tables 91–94)

Most respondents (76%) agreed or strongly agreed with the statement that private forest landowners should be required to maintain or establish at least a minimum level of stocking after harvest, while 16% disagreed or strongly disagreed. More than 44% agreed or strongly agreed that there should be additional riparian harvest restrictions on private forests to protect riparian ecosystems, although this represented only 35% of the acres. However, over half (57%) of the landowners strongly disagreed or disagreed with the statement that harvest should be restricted on private forestland to protect endangered species; this encompassed 69% of the acres. Most respondents (68%) said that they would agree or strongly agree to alter the amount and timing of their harvest if it was necessary to maintain a healthy ecosystem.

Willingness to Make Long-term Investment (Appendix, Tables 95–99)

The surveyed NIPF owners were asked if they would be willing to make a long-term investment (15 yr or more) to improve an existing stand or to plant and manage additional trees on the land, if there was reasonable assurance of a 4% rate of return after inflation. Of the 803 respondents, 75% responded positively. Of those who responded negatively, 25% claimed lack of funds, 18% were opposed to timber management and harvesting, 28% felt they could obtain a higher return elsewhere, and 32% were concerned about further government restrictions.

Discussion and Conclusions

Technical Assistance and Incentives

Our results suggest that few landowners (37%) are generally aware of various technical assistance and cost-share programs, and even fewer participate. This information should be considered when interpreting the results of the tax-incentive scenarios presented to respondents. Specifically, the low awareness and adoption of existing programs lowers the likelihood that landowners

will know about proposed incentive programs, or that if aware, they will enroll. As noted previously, a person's stated intent is not always consistent with his or her action. Conversely, past action tends to correlate with positive future actions (Ajzen and Peterson 1988). Further research should investigate both the awareness and adoption aspects of existing and future incentive programs to determine the factors that intervene between an individual's stated intent and his or her action.

A second concern is that fostering widespread adoption of the proposed incentives could be quite expensive. For example, if landowners were paid $400/ac/yr, the cost of protecting riparian areas for 100 mi of stream with 300-ft buffers would be $2.96 million. The large number of forested streams makes widespread use of this policy impractical. Such a program would have to target specific streams or other desirable features on the landscape to be feasible. For broader application, reduced incentives or other options (e.g., easements, increased education) may represent viable alternatives.

Self-assessment of Stand

As has been noted, what respondents say on a survey is not always consistent with what they say on another survey or with what actually happens on their land. This tendency may be particularly evident in the owners' self-assessments of their land in this study. For example, only 9% of respondents reported that their representative stands were "poorly stocked". It is highly unlikely that only 9% of NIPF lands are poorly stocked because previous studies of Oregon's NIPF lands showed much higher levels (Granger et al. 1993). It is possible that the surveyed landowners actually have better-stocked stands than nonsurveyed landowners. But given the random survey design and other results that show a wide range of NIPF owners, this seems unlikely. A more compelling reason for the discrepancy may be the extent to which landowners' and foresters' definitions of these terms are consistent. This does not mean that the landowners' responses are incorrect or inaccurate. It only means that they may define stocking differently than professional foresters do.

A similar example might be evident from Table 28 (Appendix), where pruning is evaluated as a relatively common practice. Pruning in traditional silviculture is an extremely labor-intense, time-consuming exercise. Whether through the actions of the owner or his/her agent, it is expensive to accomplish. It is possible that respondents were reporting the pruning of a single tree or a few trees for other purposes. Both these examples suggest that future work with similar goals should attempt to determine the meanings that private forest landowners attach to forestry concepts and terms to ensure consistent interpretation of responses.

Comparison with Other Studies

The recent publication of the periodic USDA Forest Service assessment of private forest owners offers a useful context for comparing the results of this Westside study with state and national statistics. In Table 2, we provide several comparisons of our results with those of Birch (1996). These variables suggest that Westside respondents differ in some regards from those in other regional and national studies of forest landowners. This is not surprising, given the different study objectives and methodologies. Most notable is the rather

Table 2. Comparison of Westside survey results with Oregon, Washington, and national data on four key variables.

Variable	Westside	Oregon*	Washington*	National*
Mean ownership size (ac)	59	23	30	23
Primary reason for ownership (% of owners)				
Aesthetic enjoyment/enjoyment of owning green space	20	17	6	14
Land investment	16	18	16	9
Part of farm	6	6	43	12
Part of residence	14	37	6	27
Timber production	9	4	4	3
Other	35	18	25	20
Harvest during ownership (% of ac owned)	51 (62)	43 (74)	70 (80)	47 (70)

*From Birch (1996, 1997).

large mean ownership on the Westside. This may at least partially be a result of sampling from designated forest lands on the tax rolls; other small parcels containing forests might not be designated as forestland.

Suggested Future Research

Along with that already noted above, other research questions regarding the ownership and management of private forestland are worth considering. This study and a previous one (Johnson et al. 1997) explored only a portion of the data collected. Further analysis could yield additional useful insights. Specific areas that might be included in extended analyses of the data are

- Comparison of NIPF owners in western Oregon with NIPF owners in western Washington with respect to forest management practices; harvest decisions and harvest practices; effects of regulations; awareness of government assistance programs; willingness to make long-term investments in forestry; and effects of tax incentives. A similar comparison would be warranted for different ownership size classes.
- Compare land-tenure classes of NIPF owners and their employment situations, education levels, and income levels with respect to forest management practices; harvest decisions and harvest practices; effects of regulations; awareness of government assistance programs; willingness to make long-term investments in forestry; and effects of tax incentives.
- Investigate relationships between reasons for NIPF ownership and land-management tendencies (e.g., intermediate forest management practices and harvest practices).

Our study has implications for future studies of private woodland owners. Some potential studies include

- Improved integrated analysis of NIPF owner characteristics, behavior, and condition of their forest properties, including effects of risk, uncertainty, and dynamic processes. This should include components

to address likely responses to incentives to practice "ecosystem management" in a mixed-ownership setting.

- Generalized forest investment analysis designed to capture implications of land management including owner characteristics and motivations for land ownership and management, land-use change, timber markets, and competing investments.
- Development of a repeated sample frame and improvements in data collection.
- Analysis of market imperfections and the efficiency of policies in addressing any imperfections.
- Thorough analyses of both positive and negative effects of major government programs in the Pacific Northwest affecting NIPF lands, addressing questions of inducement, substitution, redistribution, long-term supply effects, and benefit-cost comparisons.

As the economic, ecological, technological, and social landscapes change in the Pacific Northwest, the role of private forest landowners in providing benefits society expects of forests is likely to increase. This trend is already evident in recent changing public land policies, concern over salmon stocks, and clean water issues. However, for a policy to be effective it must be designed with the end-user in mind. The collection of accurate and timely information on owner expectations and motivations and their interaction with ownership status and management will aid in effective policy enhancement.

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Appendix—Tables of Survey Results

				<100 ac		>100 ac	
	% Response	Responses	% Acres	% Response	Responses	% Response	Responses
Ownership Information							
Table 1. Type of ownership	98.9	993	96.1	99.2	774	97.4	187
Individual	92.3	917	80.3	94.3	730	83.4	156
Partnership	6.8	68	16.0	5.3	41	13.9	26
Corporate	0.7	7	3.6	0.3	2	2.7	5
Club/association	0.1	1	0.1	0.1	1	n/a	n/a
Forest industry	n/a	n/a	0.0	n/a	n/a	n/a	n/a
Other	n/a	n/a	0.0	n/a	n/a	n/a	n/a
$\chi^2 = 30.24$, $P < 0.001$							
Table 2. State of ownership	100.0	1,004	100.0	100.0	780	100.0	192
Oregon	43.8	440	46.3	43.7	341	44.8	86
Washington	55.4	556	50.8	55.9	436	53.1	102
Both	0.8	8	2.9	0.4	3	2.1	4
$\chi^2 = 6.43$, $P < 0.040$							
Table 3. Number of years of ownership	94.9	953	89.1	96.2	750	90.6	174
0–10	24.0	229	13.8	27.6	207	10.9	19
11–20	24.8	236	15.2	26.8	201	16.1	28
21–30	18.8	179	16.7	19.2	144	17.8	31
31–40	10.8	103	14.4	8.9	67	17.8	31
41–50	10.7	102	16.4	9.3	70	15.5	27
>50	10.9	104	23.6	8.1	61	21.8	38
Mean response (yr)	27.3			24.4		38.7	
$T = 7.59$, $P>\|T\| = 0.0001$							
Sociodemographic Profile of Survey Sample							
Table 4. Occupation related to forestry industry	99.5	999	99.9	99.4	775	100.0	192
Yes	24.5	245	45.3	20.9	162	40.6	78
No	75.5	754	54.7	79.1	613	59.4	114
$\chi^2 = 32.08$, $P < 0.001$							
Table 5. Timber revenue primary income	98.9	993	98.7	99.0	772	99.0	190
Yes	8.2	81	22.9	5.2	40	20.5	39
No	91.8	912	77.1	94.8	732	79.5	151
$\chi^2 = 47.63$, $P < 0.001$							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 6. Current employment situation	98.8	992	99.7	98.7	770	100.0	192
Farmer/rancher	4.4	44	10.7	3.1	24	8.9	17
Self-employed	20.5	203	29.2	18.8	145	28.6	55
Student	1.2	12	0.4	1.4	11	0.5	1
Disabled	0.7	7	0.4	0.8	6	0.5	1
Retired	35.1	348	30.9	34.5	266	36.5	70
Employed full-time w/company	25.5	253	18.2	27.8	214	16.1	31
Employed part-time w/company	4.0	40	2.8	4.3	33	3.1	6
Other	8.6	85	7.3	9.2	71	5.7	11
$\chi^2 = 31.20$, $P < 0.001$							
Table 7. Education	98.1	985	97.8	98.1	765	99.5	191
Non high school graduate	4.6	45	4.7	4.4	34	5.2	10
High school graduate	27.7	273	32.4	25.9	198	35.1	67
Some college	23.9	235	18.3	25.0	191	18.3	35
Associates degree	6.0	59	6.8	6.0	46	5.2	10
College degree	23.8	234	25.5	23.9	183	23.0	44
Advanced degree	14.1	139	12.3	14.8	113	13.1	25
$\chi^2 = 8.23$, $P < 0.144$							
Table 8. Income ($)	68.3	686	70.3	70.0	546	66.1	127
<10,000	2.3	16	1.3	2.0	11	3.1	4
10–14,999	3.8	26	1.7	4.4	24	0.8	1
15–24,999	10.6	73	7.8	11.0	60	9.4	12
25–34,999	20.0	137	21.1	20.5	112	18.1	23
35–49,999	23.3	160	15.2	24.0	131	20.5	26
50–64,999	14.6	100	14.9	14.8	81	14.2	18
65–74,999	7.4	51	10.8	7.1	39	9.4	12
75–89,999	6.0	41	5.1	6.0	33	5.5	7
90–99,999	2.3	16	2.7	2.2	12	3.1	4
≥100,000	9.6	66	19.4	7.9	43	15.7	20
$\chi^2 = 13.30$, $P < 0.150$							

Reasons for NIPF Ownership

Table 9. Investment	100.0	1,004	100.0	100.0	780	100.0	192
Very important	27.1	272	36.4	24.5	191	37.0	71
Important	36.5	366	39.7	37.1	289	35.4	68
Neither	10.2	102	7.0	10.6	83	8.9	17
Unimportant	14.2	143	8.3	15.1	118	10.4	20
Not at all important	12.1	121	8.7	12.7	99	8.3	16
Mean response	2.4771			2.54		2.18	
$T = 3.56$, $P>\|T\| = 0.0004$							

				<100 ac		>100 ac	
	% Response	Responses	% Acres	% Response	Responses	% Response	Responses
Table 10. Recreation	100.0	1,004	100.0	100.0	780	100.0	192
Very important	14.8	149	11.2	16.0	125	8.9	17
Important	28.8	289	36.1	27.4	214	35.4	68
Neither	10.4	104	9.4	10.5	82	9.9	19
Unimportant	26.4	265	26.4	26.2	204	27.6	53
Not at all important	19.6	197	16.9	19.9	155	18.2	35
Mean response	3.0717			3.06		3.11	
T = 0.42, P>|T| = 0.6723							
Table 11. Timber production	100.0	1,004	100.0	100.0	780	100.0	192
Very important	22.7	228	43.4	17.6	137	44.3	85
Important	32.1	322	33.5	30.5	238	38.0	73
Neither	9.6	96	7.3	10.0	78	7.8	15
Unimportant	19.1	192	9.2	22.4	175	6.3	12
Not at all important	16.5	166	6.6	19.5	152	3.6	7
Mean response	2.7470			2.96		1.87	
T = 11.98, P>|T| = 0.0001							
Table 12. Enjoy owning ‘green space’	100.0	1,004	100.0	100.0	780	100.0	192
Very important	40.5	407	30.1	42.7	333	30.7	59
Important	32.7	328	38.0	31.8	248	36.5	70
Neither	9.4	94	10.6	8.8	69	11.5	22
Unimportant	9.5	95	13.1	8.3	65	13.5	26
Not at all important	8.0	80	8.2	8.3	65	7.8	15
Mean response	2.1165			2.08		2.31	
T = 2.31, P>|T| = 0.0214							
Table 13. Part of the farm	100.0	1,004	100.0	100.0	780	100.0	192
Very important	14.6	147	16.8	13.6	106	17.7	34
Important	27.6	277	35.0	25.6	200	35.4	68
Neither	11.2	112	11.8	11.0	86	12.5	24
Unimportant	17.2	173	14.1	17.7	138	15.1	29
Not at all important	29.4	295	22.2	32.1	250	19.3	37
Mean response	3.1912			3.29		2.83	
T = 4.04, P>|T| = 0.0001							
Table 14. Part of residence	100.0	1,004	100.0	100.0	780	100.0	192
Very important	31.0	311	23.8	32.8	256	23.4	45
Important	30.3	304	28.0	30.0	234	32.8	63
Neither	7.0	70	5.9	7.3	57	5.7	11
Unimportant	14.0	141	22.1	12.7	99	17.7	34
Not at all important	17.7	178	20.2	17.2	134	20.3	39
Mean response	2.5727			2.51		2.79	
T = 2.27, P>|T| = 0.0239							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 15. An estate for children	100.0	1,004	100.0	100.0	780	100.0	192
Very important	32.1	322	23.8	29.2	228	42.7	82
Important	34.4	345	28.0	33.6	262	36.5	70
Neither	10.4	104	5.9	10.9	85	7.3	14
Unimportant	11.3	113	22.1	12.6	98	6.8	13
Not at all important	12.0	120	20.2	13.7	107	6.8	13
Mean response	2.3665			2.48		1.98	
T = 5.03, P>|T| = 0.0001							
Table 16. Primary reason for owning forestland	100	1,004	100.0	100.0	780	100.0	192
Enjoyment from owning 'green space'	20.0	210	12.7	22.1	172	12.5	24
Land investment	16.1	162	23.3	15.1	118	20.3	39
Woodland is part of my residence	14.3	144	6.4	16.7	130	6.3	12
An estate to pass on	12.3	123	13.9	11.4	89	15.6	30
Timber production	8.7	87	21.1	6.0	47	20.3	39
Recreation	6.8	68	5.8	7.1	55	5.2	10
Part of the farm	5.5	55	5.0	4.9	38	6.8	13
Other	16.3	164	11.7	16.8	131	13.0	25
χ^2 = 61.97, P < 0.001							

Status of Stands

Table 17. Number of acres of representative stand	96.9	973	95.7	99.7	778	96.9	186
0–40	69.2	673	29.1	82.3	640	15.6	29
41–100	19.4	189	23.7	17.7	138	26.3	49
101–250	7.8	76	21.2	n/a	n/a	40.3	75
251–500	2.5	24	11.1	n/a	n/a	12.4	23
>500	1.1	11	15.0	n/a	n/a	5.4	10
Mean response (ac)	59.04			27.0		186.9	
T = 8.23, P>|T| = 0.0001							
Table 18. Age of youngest timber (yr)	83.0	833	86.0	82.4	643	90.1	173
<20	84.4	703	81.8	84.6	544	82.1	142
21–50	13.4	112	12.0	13.5	87	14.5	25
51–80	1.9	16	5.9	1.7	11	2.9	5
81–120	0.2	2	0.3	0.2	1	0.6	1
Mean response (yr)	10.48			10.2		12.1	
T = 1.30, P>|T| = 0.1956							

				<100 ac		>100 ac	
	% Response	Responses	% Acres	% Response	Responses	% Response	Responses
Table 19. Age of oldest timber (yr)	71.8	721	79.0	71.7	559	81.8	157
<20	9.0	65	6.9	10.0	56	5.7	9
21–50	32.7	236	23.7	35.2	197	23.6	37
51–80	30.8	222	34.9	28.1	157	40.8	64
81–120	19.7	142	19.4	19.1	107	21.0	33
>120	7.8	56	15.1	7.5	42	8.9	14
Mean response (yr)	73.26			71.5		80.0	
T = 1.43, P>|T| = 0.1539							
Table 20. Stocking of timber stand	98.2	986	99.2	98.1	765	99.5	191
Well stocked	41.7	411	52.6	39.2	300	54.5	104
Adequately stocked	45.4	448	39.3	47.5	363	35.6	68
Not sure	3.4	34	2.3	3.3	25	3.1	6
Poorly stocked	9.4	93	5.8	10.1	77	6.8	13
χ^2 = 14.89, P < 0.002							
Table 21. Number of poorly stocked acres	99.1	995	99.5	99.1	773	100.0	192
None	91.6	911	94.7	90.9	703	93.2	179
0–10	3.2	32	0.7	4.0	31	0.5	1
11–20	2.0	20	0.8	2.5	19	0.5	1
21–50	2.0	20	1.9	2.3	18	1.0	2
>50	1.2	12	2.0	0.3	2	4.7	9
Mean response (ac)	2.79			1.7		6.2	
T = 2.30, P>|T| = 0.0227							
Table 22. Do you plan to restock	9.1	91	5.7	9.6	75	6.8	13
Yes	65.9	60	56.4	66.7	50	61.5	8
No	34.1	31	43.6	33.3	25	38.5	5
χ^2 = 0.13, P < 0.719							
Table 23. Stand problem with disease/insects	97.6	980	97.8	97.9	764	97.4	187
Yes	13.2	129	14.0	12.8	98	14.4	27
No	86.8	851	86.0	87.2	666	85.6	160
χ^2 = 0.342, P < 0.559							
Table 24. Number of acres affected by disease/insects	95.4	958	96.1	95.2	743	96.4	185
None	91.3	875	89.8	91.8	682	89.2	165
<10	6.5	62	7.4	6.1	45	8.1	15
11–20	0.9	9	0.4	1.1	8	0.5	1
21–50	0.5	5	0.3	0.7	5	n/a	n/a
>50	0.7	7	2.1	0.4	3	2.2	4
Mean response (ac)	1.37			0.8		3.5	
T = 1.68, P>|T| = 0.0938							

Management Practices

	% Response	Responses	% Acres	<100 ac % Response	<100 ac Responses	>100 ac % Response	>100 ac Responses
Table 25. Owner has converted forest types	97.8	982	95.8	98.1	765	97.4	187
Yes	15.8	155	29.4	13.9	106	24.6	46
No	84.2	827	70.6	86.1	659	75.4	141
$\chi^2 = 12.92$, $P < 0.001$							
Table 26. Planted trees for reforestation	99.6	1000	99.9	99.5	776	100.0	192
Yes	60.9	609	71.3	57.6	447	71.9	138
No	39.1	391	28.7	42.4	329	28.1	54
$\chi^2 = 13.11$, $P < 0.001$							
Table 27. Fertilized trees	98.1	985	96.2	98.6	769	96.4	185
Yes	14.8	146	16.7	15.1	116	14.1	26
No	85.2	839	83.3	84.9	653	85.9	159
$\chi^2 = 0.12$, $P < 0.724$							
Table 28. Pruned trees	99.0	994	97.2	99.1	773	99.0	190
Yes	38.7	385	39.3	38.4	297	41.6	79
No	61.3	609	60.7	61.6	476	58.4	190
$\chi^2 = 0.64$, $P < 0.424$							
Table 29. Controlled grass/brush/ undesirable trees	99.1	995	97.3	99.1	773	99.5	191
Yes	63.2	629	68.1	62.2	481	69.1	132
No	36.8	366	31.9	37.8	292	30.9	59
$\chi^2 = 3.14$, $P < 0.077$							
Table 30. Conducted a prescribed burn	98.7	991	97.1	98.6	769	99.0	190
Yes	9.0	89	17.0	7.4	57	15.3	29
No	91.0	902	83.0	92.6	712	84.7	161
$\chi^2 = 11.50$, $P < 0.001$							
Table 31. Left snags for wildlife habitat	97.4	978	96.1	97.7	762	97.4	187
Yes	78.0	763	70.4	79.0	602	73.8	138
No	22.0	215	29.6	21.0	160	26.2	49
$\chi^2 = 2.37$, $P < 0.124$							
Table 32. Rehabilitated the stand	96.6	970	95.8	96.8	755	97.4	187
Yes	46.2	448	57.2	43.3	327	58.3	109
No	53.8	522	42.8	56.7	428	41.7	78
$\chi^2 = 13.52$, $P < 0.001$							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 33. Planted vegetation for wildlife	98.3	987	97.0	98.1	765	99.0	190
Yes	18.8	186	22.9	19.6	150	15.3	29
No	81.2	801	77.1	80.4	615	84.7	161
$\chi^2 = 1.89$, $P < 0.170$							
Table 34. Fed wildlife	98.5	989	96.8	98.3	767	99.0	190
Yes	43.9	434	37.6	45.6	350	36.8	70
No	56.1	555	62.4	54.4	417	63.2	120
$\chi^2 = 4.78$, $P < 0.029$							

Harvest Decisions and Practices

Table 35. Harvest during ownership	99.2	996	99.4	99.5	776	99.0	190
Yes	50.8	506	62.3	47.7	370	61.6	117
No	49.2	490	37.7	52.3	406	38.4	73
$\chi^2 = 11.79$, $P < 0.001$							
Table 36. Biggest influence in most recent harvest	81.6	413	61.9	47.4	370	60.9	117
Convert forest type	3.9	16	1.9	4.1	15	0.9	1
Logger/buyer recommendation	2.9	12	2.7	2.4	9	2.6	3
Forester recommended	4.8	20	5.8	3.8	14	2.6	3
Good price	10.2	42	10.3	7.6	28	11.1	13
Needed income	32.9	136	34.2	24.3	90	35.0	41
Mature timber	11.1	46	9.0	7.8	29	11.1	13
Clear land for sale	1.7	7	0.0	n/a	n/a	n/a	n/a
Scheduled harvest in management plan	n/a	0	1.3	1.6	6	0.9	1
To avoid possible restrictions in future	2.7	11	7.4	1.6	6	4.3	5
Improve condition of stand	4.4	18	1.9	4.1	15	2.6	3
Thinning	14.3	59	11.1	11.4	42	12.8	15
Salvage	9.2	38	4.2	8.1	30	6.0	7
Concern about revised riparian restrictions	0.7	3	1.0	0.3	1	1.7	2
Concern about export log ban	1.2	5	2.5	n/a	n/a	4.3	5
Other	n/a	0	6.9	23.0	85	4.3	5
$\chi^2 = 49.36$, $P < 0.001$							
Table 37. Second biggest influence in most recent harvest	69.6	352	61.9	47.4	370	60.9	117
Convert forest type	2.8	10	3.0	1.4	5	4.3	5
Logger/buyer recommendation	1.7	6	5.6	1.1	4	1.7	2
Forester recommended	6.5	23	7.0	4.1	15	6.8	8
Good price	6.8	24	5.5	4.6	17	6.0	7

				<100 ac		>100 ac	
	% Response	Responses	% Acres	% Response	Responses	% Response	Responses
Needed income	13.4	47	8.0	8.6	32	10.3	12
Mature timber	19.0	67	15.1	12.7	47	13.7	16
Clear land for sale	1.7	6	1.1	0.8	3	1.7	2
Scheduled harvest in management plan	5.1	18	3.2	3.0	11	6.0	7
To avoid possible restrictions in future	2.8	10	1.5	2.2	8	1.7	2
Improve condition of stand	8.5	30	3.3	6.2	23	5.1	6
Thinning	17.6	62	12.4	12.2	45	12.8	15
Salvage	11.4	40	7.4	8.9	33	6.0	7
Concern about revised riparian restrictions	1.7	6	1.5	0.5	2	3.4	4
Concern about export log ban	0.9	3	3.1	0.5	2	0.9	1
Other	n/a	0	22.3	33.2	123	19.7	23
$\chi^2 = 21.81$, $P < 0.083$							
Table 38. Third biggest influence in most recent harvest	48.6	246	61.9	47.4	370	60.9	117
Convert forest type	1.2	3	2.6	0.3	1	1.7	2
Logger/buyer recommendation	4.1	10	2.2	1.9	7	2.6	3
Forester recommended	3.3	8	1.1	1.9	7	0.9	1
Good price	7.3	18	4.1	2.4	9	6.8	8
Needed income	12.6	31	5.4	6.2	23	6.8	8
Mature timber	13.0	32	12.6	5.9	22	8.5	10
Clear land for sale	1.6	4	0.7	0.8	3	0.9	1
Scheduled harvest in management plan	8.5	21	9.0	3.2	12	6.8	8
To avoid possible restrictions in future	4.5	11	2.7	1.9	7	3.4	4
Improve condition of stand	17.1	42	7.0	8.1	30	8.5	10
Thinning	12.6	31	7.2	5.9	22	6.0	7
Salvage	11.4	28	6.5	4.9	18	7.7	9
Concern about revised riparian restrictions	2.0	5	1.6	0.3	1	3.4	4
Concern about export log ban	0.8	2	0.3	0.3	1	0.9	1
Other	n/a	0	37.1	55.9	207	35.0	41
$\chi^2 = 31.64$, $P < 0.004$							
Table 39. Importance of possible revised riparian harvest restrictions in most recent harvest	100.0	506	61.9	47.4	370	60.9	117
Very important	14.2	72	35.3	10.3	38	28.2	33
Important	11.3	57	11.5	10.3	38	15.4	18
Neither	10.3	52	8.7	8.9	33	11.1	13
Unimportant	20.6	104	16.0	22.7	84	15.4	18

				<100 ac		>100 ac	
	% Response	Responses	% Acres	% Response	Responses	% Response	Responses
Not at all important	43.7	221	28.5	47.8	177	29.9	35
Mean response	3.6818			3.88		3.03	
T = 5.05, P>|T| = 0.0001							
Table 40. Importance of possible log export ban for private timber in most recent harvest	100.0	506	61.9	47.4	370	60.9	117
Very important	8.7	44	10.0	7.0	26	15.4	18
Important	9.3	47	16.9	4.9	18	23.1	27
Neither	9.9	50	11.5	10.5	39	6.8	8
Unimportant	24.3	123	36.9	23.5	87	25.6	30
Not at all important	47.8	242	24.6	54.1	200	29.1	34
Mean response	3.9328			4.13		3.30	
T = 5.49, P>|T| = 0.0001							
Table 41. Importance of harvest restrictions from the ESA in most recent harvest	96.2	487	61.9	47.4	370	60.9	117
Very important	14.0	68	19.2	11.1	41	21.4	25
Important	11.1	54	9.7	9.2	34	15.4	18
Neither	10.5	51	11.6	9.5	35	12.0	14
Unimportant	22.4	109	34.0	20.5	76	25.6	30
Not at all important	46.0	224	25.5	49.7	184	25.6	30
Mean response	3.7253			3.89		3.19	
T = 4.44, P>|T| = 0.0001							
Table 42. Number of harvests in the past 5 yr	99.7	1001	99.9	99.6	777	100.0	192
0	65.9	660	56.3	68.0	528	56.8	109
1	26.8	268	27.8	26.6	207	28.6	55
2	4.4	44	5.0	3.6	28	7.3	14
3	1.1	11	4.9	0.5	4	3.1	6
4	0.4	4	0.2	0.5	4	n/a	n/a
5	1.3	13	5.9	0.6	5	4.2	8
>5	0.0	1	0.0	0.1	1	n/a	n/a
Mean response (harvests)	0.4945			0.44		0.73	
T = 3.15, P>|T| = 0.0018							

Most Recent Harvest of Past Five Years

Table 43. Year of most recent harvest	97.1	331	43.1	31.2	243	42.2	81
1988	2.1	7	0.9	2.9	7	n/a	n/a
1989	8.8	29	4.0	10.3	25	4.9	4
1990	12.7	42	6.4	14.0	34	8.6	7

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
1991	10.3	34	8.9	9.9	24	12.3	10
1992	13.9	46	14.1	14.0	34	11.1	9
1993	26.6	88	23.7	25.5	62	28.4	23
1994	25.7	85	42.1	23.5	57	34.6	28
$\chi^2 = 9.43$, $P < 0.151$							
Table 44. Number of acres in most recent harvest	81.8	279	35.5	26.0	203	38.0	73
<10	54.8	153	30.4	61.6	125	37.0	27
11–50	38.4	107	51.1	35.5	72	45.2	33
51–100	5.0	14	10.3	2.5	5	12.3	9
>100	1.8	5	8.1	0.5	1	5.5	4
Mean response (ac)	17.73			13.4		29.6	
$T = 3.89$, $P>\|T\| = 0.0002$							
Table 45. Harvested timber sold or used	34.3	344	43.7	32.3	252	43.2	83
Own use	10.5	36	2.6	13.5	34	2.4	2
Sale	89.5	308	97.4	86.5	218	97.6	81
$\chi^2 = 8.00$, $P < 0.005$							
Table 46. Type of cut	99.7	340	43.7	31.9	249	43.2	83
Clearcut	27.9	95	31.8	24.9	62	38.6	32
Partial	21.8	74	25.7	22.1	55	19.3	16
Thin	38.5	131	34.2	40.2	100	32.5	27
Salvage	6.8	23	3.7	7.6	19	4.8	4
Other	5.0	17	4.6	5.2	13	4.8	4
$\chi^2 = 6.01$, $P < 0.199$							
Table 47. Youngest age of harvested timber (yr)	99.7	340	32.2	21.9	171	31.8	61
<20	21.5	73	14.1	36.3	62	18.0	11
21–50	37.9	129	69.3	51.5	88	65.6	40
51–80	8.5	29	13.8	11.7	20	14.8	9
81–120	0.6	2	2.8	0.6	1	1.6	1
>120	n/a	n/a	0.0	n/a	n/a	n/a	n/a
Mean response (yr)	33.27			31.9		37.0	
$T = 1.83$, $P>\|T\| = 0.0700$							
Table 48. Oldest age of harvested timber (yr)	65.4	223	31.4	21.0	164	30.2	58
<20	5.8	13	2.1	6.1	10	5.2	3
21–50	33.6	75	30.6	33.5	55	32.8	19
51–80	36.8	82	33.0	36.6	60	37.9	22
81–120	18.8	42	16.1	19.5	32	17.2	10
>120	4.9	11	18.3	4.3	7	6.9	4

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Mean response (yr) T = 0.96, P>|T| = 0.3379	67.64			66.1		72.2	
Table 49. Type of timber harvested	98.8	337	43.6	31.7	247	43.2	83
Conifers	62.0	209	69.2	60.7	150	65.1	54
Hardwoods	12.5	42	9.8	12.6	31	13.3	11
Even mix χ^2 = 0.83, P < 0.660	25.5	86	20.9	26.7	66	21.7	18
Table 50. Diameter of timber harvested	97.7	333	43.2	31.3	244	42.7	82
Large	30.9	103	31.5	31.1	76	32.9	27
Small	17.4	58	14.6	18.4	45	13.4	11
Both χ^2 = 1.09, P < 0.579	51.7	172	53.9	50.4	123	53.7	44
Table 51. Quality of timber harvested	94.1	321	42.9	29.7	232	42.2	81
High	36.4	117	40.2	34.9	81	40.7	33
Lesser	15.6	50	15.2	15.1	35	18.5	15
Both χ^2 = 2.08, P < 0.353	48.0	154	44.6	50.0	116	40.7	33
Table 52. Plans for reforestation	95.6	326	42.7	30.4	237	42.2	81
Will not reforest	31.3	102	22.6	34.2	81	23.5	19
Will reforest	26.1	85	34.7	24.9	59	29.6	24
Have reforested χ^2 = 3.23, P < 0.198	42.6	139	42.7	40.9	97	46.9	38
Table 53. How many acres were or will be replanted	52.2	178	24.7	16.0	125	26.6	51
0–10	49.4	88	48.2	52.8	66	43.1	22
11–50	43.8	78	32.0	45.6	57	37.3	19
51–100	4.5	8	10.4	1.6	2	11.8	6
101–150	1.7	3	1.9	n/a	n/a	5.9	3
>150	0.6	1	7.5	n/a	n/a	2.0	1
Mean response (ac) T = 3.08, P>|T| = 0.0033	19.76			14.8		31.6	
Table 54. How many trees/acre were or will be replanted	29.3	100	16.6	9.5	74	13.5	26
0–100	37.0	37	8.9	48.6	36	3.8	1
101–250	15.0	15	18.1	16.2	12	11.5	3
251–500	37.0	37	64.2	24.3	18	73.1	19
>500	11.0	11	8.8	10.8	8	11.5	3
Mean response (trees/ac) T = 1.18, P>|T| = 0.2470	376.6			316.4		548.1	

Second Most Recent Harvest in Past Five Years

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 55. Year of second most recent harvest	87.7	64	15.3	4.5	35	14.1	27
1989	7.8	5	6.7	5.7	2	11.1	3
1990	21.9	14	23.0	22.9	8	18.5	5
1991	18.8	12	6.9	14.3	5	22.2	6
1992	18.8	12	19.3	22.9	8	14.8	4
1993	32.8	21	44.1	34.3	12	33.3	9
$\chi^2 = 1.74$, $P < 0.783$							
Table 56. Number of acres in second most recent harvest	79.5	58	14.2	4.4	34	12.5	24
<10	63.8	37	24.2	88.2	30	29.2	7
11–50	25.9	15	53.7	8.8	3	50.0	12
51–100	10.3	6	22.1	2.9	1	20.8	5
>100	n/a	n/a	0.0	n/a	n/a	n/a	n/a
Mean response (ac)	16.67			6.2		31.4	
$T = 4.03$, $P>\|T\| = 0.0004$							
Table 57. Harvested timber sold or used	104.1	76	16.0	5.8	45	14.6	28
Own use	15.8	12	9.1	24.4	11	3.6	1
Sale	84.2	64	90.9	75.6	34	96.4	27
$\chi^2 = 5.48$, $P < 0.019$							
Table 58. Type of cut	93.2	68	15.4	5.0	39	14.1	27
Clearcut	27.9	19	54.1	23.1	9	33.3	9
Partial	16.2	11	19.7	12.8	5	22.2	6
Thin	42.6	29	21.5	51.3	20	33.3	9
Salvage	8.8	6	4.2	7.7	3	11.1	3
Other	4.4	3	0.5	5.1	2	n/a	n/a
$\chi^2 = 4.22$, $P < 0.377$							
Table 59. Youngest age of harvested timber (yr)	64.4	47	13.9	3.1	24	12.0	23
<20	23.4	11	9.5	29.2	7	17.4	4
21–50	59.6	28	79.2	54.2	13	65.2	15
51–80	14.9	7	11.0	12.5	3	17.4	4
81–120	2.1	1	0.3	4.2	1	n/a	n/a
>120	n/a	n/a	0.0	n/a	n/a	n/a	n/a
Mean response (yr)	36.60			36.8		36.4	
$T = 0.06$, $P>\|T\| = 0.9514$							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 60. Oldest age of harvested timber (yr)	61.6	45	13.7	2.9	23	11.4	22
<20	2.2	1	0.0	4.3	1	n/a	n/a
21–50	33.3	15	24.6	34.8	8	31.8	7
51–80	40.0	18	28.5	39.1	9	40.9	9
81–120	17.8	8	23.0	13.0	3	22.7	5
>120	6.7	3	23.9	8.7	2	4.5	1
Mean response (yr)	70.4			69.0		71.9	
T = 0.24, P>|T| = 0.8103							
Table 61. Type of timber harvested	94.5	69	15.5	5.1	40	14.1	27
Conifers	63.8	44	87.9	52.5	21	81.5	22
Hardwoods	15.9	11	3.3	25.0	10	3.7	1
Even mix	20.3	14	8.8	22.5	9	14.8	4
χ^2 = 7.05, P < 0.029							
Table 62. Diameter of timber harvested	94.5	69	15.5	5.1	40	14.1	27
Large	40.6	28	54.1	37.5	15	48.1	13
Small	10.1	7	2.5	17.5	7	n/a	n/a
Both	49.3	34	43.3	45.0	18	51.9	14
χ^2 = 5.32, P < 0.070							
Table 63. Quality of timber harvested	94.5	69	15.4	5.1	40	14.1	27
High	49.3	34	53.5	50.0	20	48.1	13
Lesser	13.0	9	12.9	12.5	5	14.8	4
Both	37.7	26	33.6	37.5	15	37.0	10
χ^2 = 0.08, P < 0.962							
Table 64. Plans for reforestation	87.7	64	15.0	4.6	36	13.5	26
Will not reforest	37.5	24	27.0	38.9	14	38.5	10
Will reforest	15.6	10	22.5	11.1	4	19.2	5
Have reforested	46.9	30	50.5	50.0	18	42.3	11
χ^2 = 0.88, P < 0.645							
Table 65. How many trees/acre were or will be replanted	24.7	18	8.0	1.2	9	4.7	9
0–100	44.4	8	3.9	77.8	7	11.1	1
101–250	11.1	2	23.5	11.1	1	11.1	1
251–500	44.4	8	72.5	11.1	1	77.8	7
>500	n/a	n/a	0.0	n/a	n/a	n/a	n/a
Mean response (trees/ac)	204.06			111.1		297.0	
T = 2.52, P>|T| = 0.0231							

Reasons for Partial Harvest

Did you partial cut, thin, or salvage log:

	% Response	Responses	% Acres	<100 ac % Response	<100 ac Responses	>100 ac % Response	>100 ac Responses
Table 66. to increase yields of remaining trees	42.7	216	21.6	21.9	171	20.8	40
Yes	65.7	142	80.4	61.4	105	82.5	33
No	34.3	74	19.6	38.6	66	17.5	7
$\chi^2 = 6.38$, $P < 0.012$							
Table 67. to eliminate damaged/ dead/dying timber	43.9	222	22.4	22.3	174	21.9	42
Yes	58.6	130	72.6	56.3	98	69.0	29
No	41.4	92	27.4	43.7	76	31.0	13
$\chi^2 = 2.26$, $P < 0.133$							
Table 68. for firewood	43.7	221	22.3	22.3	174	21.4	41
Yes	48.4	107	44.9	49.4	86	48.8	20
No	51.6	114	55.1	50.6	88	51.2	21
$\chi^2 = 0.01$, $P < 0.941$							
Table 69. to earn income and retain some trees for non-timber benefits	41.1	208	20.7	20.9	163	20.3	39
Yes	62.0	129	72.6	60.1	98	69.2	27
No	38.0	79	27.4	39.9	65	30.8	12
$\chi^2 = 1.11$ $P < 0.293$							
Table 70. to earn income with no regard for retaining some trees for non-timber benefits	39.5	200	20.3	20.1	157	19.8	38
Yes	12.0	24	9.5	10.8	17	15.8	6
No	88.0	176	90.5	89.2	140	84.2	32
$\chi^2 = 0.72$, $P < 0.395$							
Table 71. so as to not reforest	39.9	202	20.4	20.2	158	19.8	38
Yes	11.4	23	8.9	10.8	17	15.8	6
No	88.6	179	91.1	89.2	141	84.2	32
$\chi^2 = 0.75$, $P < 0.387$							
Table 72. Recommended by logger or timber buyer	43.1	218	22.1	21.9	171	21.4	41
Yes	12.4	27	8.4	12.9	22	9.8	4
No	87.6	191	91.6	87.1	149	90.2	37
$\chi^2 = 0.30$, $P < 0.586$							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 73. Recommended by a forester or consultant	43.1	218	22.1	21.9	171	21.4	41
Yes	23.9	52	20.4	24.6	42	24.4	10
No	76.1	166	79.6	75.4	129	75.6	31
$\chi^2 = 0.01$, $P < 0.982$							
Table 74. Trees were selected by whom	43.3	219	22.1	22.0	172	21.4	41
Landowner	63.5	139	61.1	66.9	115	51.2	21
Logger/buyer	21.9	48	24.7	19.8	34	29.3	12
Forestry consultant	14.6	32	14.2	13.4	23	19.5	8
$\chi^2 = 3.51$, $P < 0.173$							
Table 75. Were high value trees chosen only	42.1	213	21.8	21.3	166	21.4	41
Yes	15.5	33	11.5	16.3	27	14.6	6
No	84.5	180	88.5	83.7	139	85.4	35
$\chi^2 = 0.06$, $P < 0.798$							

Expected Future Harvests

Table 76. Plan to harvest in next 10 yr	92.5	929	94.6	92.6	722	94.3	181
Yes	57.9	538	73.5	54.8	396	71.3	129
No	42.1	391	26.5	45.2	326	28.7	52
$\chi^2 = 16.04$, $P < 0.001$							
Table 77. Would harvest sooner if riparian harvest restrictions enacted	97.7	981	97.7	97.7	762	97.9	188
Very likely	18.6	182	34.2	15.2	116	33.0	62
Moderately likely	16.0	157	17.2	15.9	121	17.0	32
Neither	11.9	117	11.5	11.3	86	14.4	27
Unlikely	19.2	188	17.0	19.6	149	16.5	31
Not at all	34.4	337	20.0	38.1	290	19.1	36
Mean response	3.3476			3.49		2.72	
$T = 6.24$, $P>\|T\| = 0.0001$							
Table 78. Would harvest sooner if log export ban on private timber enacted	90.4	908	90.4	90.2	704	92.2	177
Very likely	15.1	137	29.5	11.8	83	28.8	51
Moderately likely	12.0	109	11.8	10.8	76	16.9	30
Neither	11.8	107	10.6	11.9	84	11.9	21
Unlikely	25.2	229	25.3	26.3	185	21.5	38
Not at all	35.9	326	22.8	39.2	276	20.9	37
Mean response	3.5485			3.70		2.89	
$T = 6.42$, $P>\|T\| = 0.0001$							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 79. Would harvest sooner if harvest restrictions under ESA enacted	88.4	888	89.5	87.8	685	91.7	176
Very likely	22.6	201	35.7	19.1	131	36.9	65
Moderately likely	15.9	141	18.2	15.6	107	18.8	33
Neither	9.9	88	9.7	10.4	71	8.5	15
Unlikely	22.5	200	19.9	23.2	159	18.8	33
Not at all	29.1	258	16.4	31.7	217	17.0	30
Mean response	3.1948			3.33		2.60	
T = 5.56, P>|T| = 0.0001							
Table 80. Would harvest sooner if more restrictive reforestation enacted	86.4	867	84.9	86.5	675	86.4	166
Very likely	9.5	82	10.9	8.7	59	12.7	21
Moderately likely	12.7	110	8.9	13.6	92	9.0	15
Neither	11.6	101	14.1	11.0	74	15.7	26
Unlikely	29.0	251	35.0	28.1	190	30.7	51
Not at all	37.3	323	31.1	38.5	260	31.9	53
Mean response	3.7186			3.74		3.60	
T = 1.18, P>|T| = 0.2372							

Awareness and Use of Government Assistance Programs

Table 81. Aware of any state or federal assistance programs	97.2	976	98.3	97.2	758	97.9	188
Yes	37.3	364	56.9	31.9	242	60.6	114
No	62.7	612	43.1	68.1	516	39.4	74
$\chi^2 = 52.91$, $P < 0.001$							
Table 82. Aware of federal income tax credit for reforestation	36.0	361	55.1	30.9	241	59.4	114
Yes	44.0	159	50.8	41.5	100	47.4	54
No	56.0	202	49.2	58.5	141	52.6	60
$\chi^2 = 1.09$, $P < 0.297$							
Table 83. Used the federal income tax credit	91.8	146	27.0	11.7	91	26.6	51
Yes	39.0	57	38.9	37.4	34	45.1	23
No	61.0	89	61.1	62.6	57	54.9	28
$\chi^2 = 0.81$, $P < 0.367$							
Table 84. Aware of state income tax credit for reforestation of under-productive forest land	29.2	293	45.8	24.9	194	47.9	92
Yes	29.0	85	36.5	26.8	52	33.7	31
No	20.7	208	63.5	73.2	142	66.3	61
$\chi^2 = 1.44$, $P < 0.230$							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 85. Use the state income tax credit	97.6	83	16.6	6.5	51	16.1	31
Yes	74.7	62	44.5	23.5	12	29.0	9
No	25.3	21	55.5	76.5	39	71.0	22
$\chi^2 = 0.31$, $P < 0.580$							
Table 86. Aware of free SCS assistance in developing conservation plan	36.1	362	55.5	30.8	240	59.4	114
Yes	61.9	224	74.8	56.3	135	75.4	86
No	38.1	138	25.2	43.8	105	24.6	28
$\chi^2 = 12.13$, $P < 0.001$							
Table 87. Use the free SCS assistance	98.2	220	41.2	16.9	132	44.3	85
Yes	39.5	87	36.5	38.6	51	40.0	34
No	60.5	133	63.5	61.4	81	60.0	51
$\chi^2 = 0.04$, $P < 0.841$							
Table 88. Aware of federal cost share monies	35.9	360	53.7	30.9	241	57.8	111
Yes	64.7	233	85.2	55.2	133	84.7	94
No	35.3	127	14.8	44.8	108	15.3	17
$\chi^2 = 28.88$, $P < 0.001$							
Table 89. Use federal cost share monies	99.6	232	45.8	17.0	133	49.0	94
Yes	47.8	111	56.8	41.4	55	56.4	53
No	52.2	121	43.2	58.6	78	43.6	41
$\chi^2 = 4.99$, $P < 0.026$							
Table 90. Are you using any federal/state assistance program	37.0	371	56.3	31.7	247	60.4	116
Yes	8.1	30	6.0	7.3	18	10.3	12
No	91.9	341	94.0	92.7	229	89.7	104
$\chi^2 = 0.97$, $P < 0.324$							

Forest Practice Beliefs

Table 91. Minimum stocking regulation	95.6	960	94.0	96.2	750	95.3	183
Strongly agree	36.3	348	32.8	36.1	271	37.2	68
Agree	40.0	384	44.6	39.6	297	41.0	75
Neither	7.6	73	5.6	8.0	60	5.5	10
Disagree	11.5	110	13.2	11.1	83	13.1	24
Strongly disagree	4.7	45	3.8	5.2	39	3.3	6
Mean response	2.0833			2.10		2.04	
$T = 0.56$, $P>\|T\| = 0.5740$							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 92. More restrictive riparian harvest restrictions	92.0	924	95.5	91.3	712	94.8	182
Strongly agree	16.0	148	8.0	18.7	133	4.9	9
Agree	28.4	262	26.9	30.5	217	21.4	39
Neither	14.0	129	13.7	13.5	96	15.4	28
Disagree	25.6	237	25.5	23.5	167	33.5	61
Strongly disagree	16.0	148	25.8	13.9	99	24.7	45
Mean response	2.9729			2.83		3.52	
T = 6.60, P>|T| = 0.0001							
Table 93. Restricted to protect endangered species	94.0	944	95.2	93.7	731	95.3	183
Strongly agree	10.3	97	7.2	11.4	83	6.0	11
Agree	21.0	198	17.4	23.1	169	14.2	26
Neither	12.2	115	6.8	13.3	97	7.1	13
Disagree	32.6	308	38.7	29.7	217	44.3	81
Strongly disagree	23.9	226	29.8	22.6	165	28.4	52
Mean response	3.3898			3.29		3.75	
T = 4.55, P>|T| = 0.0001							
Table 94. I would alter amount and timing of harvest for the ecosystem	89.9	903	90.8	89.6	699	92.7	178
Strongly agree	21.9	198	18.8	23.3	163	17.4	31
Agree	45.8	414	40.2	47.8	334	38.8	69
Neither	12.4	112	10.1	11.7	82	13.5	24
Disagree	15.0	135	16.5	13.0	91	23.0	41
Strongly disagree	4.9	44	14.4	4.1	29	7.3	13
Mean response	2.3499			2.27		2.64	
T = 3.71, P>|T| = 0.0003							

Willingness to Make Long-term Investment

Table 95. Willing to make long-term investment for guaranteed 4% annual return	80.0	803	82.6	79.9	623	83.8	161
Yes	75.2	604	78.6	75.0	467	75.2	121
No	24.8	199	21.4	25.0	156	24.8	40
χ^2 = 0.00, P < 0.959							
Table 96. If no, because lack of funds	91.5	182	16.2	18.5	144	18.8	36
Yes	27.5	50	22.9	27.8	40	27.8	10
No	72.5	132	77.1	72.2	104	72.2	26
χ^2 = 0.00, P < 1.000							

	% Response	Responses	% Acres	<100 ac		>100 ac	
				% Response	Responses	% Response	Responses
Table 97. If no, because opposed to timber management/harvesting	89.4	178	16.1	17.8	139	19.3	37
Yes	19.7	35	31.2	16.5	23	29.7	11
No	80.3	143	68.8	83.5	116	70.3	26
$\chi^2 = 3.26$, $P < 0.071$							
Table 98. If no, because higher return elsewhere	88.4	176	15.7	17.8	139	18.2	35
Yes	31.8	56	37.6	29.5	41	42.9	15
No	68.2	120	62.4	70.5	98	57.1	20
$\chi^2 = 2.29$, $P < 0.130$							
Table 99. If no, because concerned about further government restrictions	88.4	176	15.9	17.7	138	18.8	36
Yes	36.4	64	45.1	34.8	48	44.4	16
No	63.6	112	54.9	65.2	90	55.6	20
$\chi^2 = 1.15$, $P < 0.284$							

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