

Developing a Certification Framework for Minnesota's Family Forests

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Executive Summary

The purpose of this study was to evaluate the potential to increase the acreage of Minnesota's certified family forest land. To do so, the study sought to:

- Evaluate existing forest land certification systems available to Minnesota's family forest owners.
- Understand Minnesota family forest landowner attitudes toward and interest in forest land certification.
- Understand Minnesota logger attitudes toward and interest in logger certification.
- Evaluate the likelihood of enrolling a substantial amount of Minnesota family forest land in a certification program, given certification programs currently available to these owners.
- Develop a strategy for increasing the amount of Minnesota certified family forest land.

Available Forest Certification Systems

There are currently four forest land certification systems available to Minnesota's forest landowners: Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), American Tree Farm System (ATFS), and Green Tag Forestry (GTF). The only systems with third-party certified (meaning certification is undertaken by an organization that is independent of the owner seeking certification) forest land in the state are FSC and SFI. Nearly all of the owners of FSC and SFI certified forests are either corporate (primarily forest products industry) or public (exclusively county-administered forest lands). At present, less than 5,000 acres (less than 0.001 percent) of Minnesota's family forest lands are third-party certified, all of which are through FSC.

Other Family Forest Certification Programs

Forest land certification programs were examined in two countries with a large number of family forest landowners and facing many of the same forest management challenges as Minnesota: Finland's Finnish Forest Certification System (FFCS) and Norway's Living Forest Standards. Both countries' forest land certification programs were developed under the auspices of PEFC—an umbrella framework for forest land certification. Recognizing the political and cultural differences between Scandinavian countries and the United States, the case studies illustrate how many of the common challenges associated with certification of small acreage forest tracts have been successfully addressed. Important observations from the case studies include:

- Areas dominated by family forests can have significant acreage certified.
- Alternatives to individual parcel certification make sense, when family forest ownership is prevalent and composed mainly of small acreage parcels.
- Successful certification systems acknowledge the realities and limitations associated with owning and managing small acreage forests.
- Minnesota's institutional framework for forest management is similar to Finland and Norway in several important respects, notably the collaborative nature Minnesota has employed to engage a wide range of stakeholders in the development of its forest policies and programs.

- Minnesota's institutional framework for forest management is different than Finland and Norway in several important respects, notably the highly organized structure of regionally based forest management or owner associations found in the Nordic countries that readily facilitates group or regional certification processes.
- Minnesota is no less attentive to the environmental aspects of timber harvesting and forest management than Norway or Finland.

Minnesota Family Forest Attitudes and Perceptions About Forest Certification

As part of the effort in designing a family forest certification framework, a mail survey was conducted to gather information from family forest landowners in Aitkin, Cass, Itasca, and St. Louis counties. A total of 236 completed and useable questionnaires were returned, resulting in a 62 percent overall response rate. Major findings of the survey include:

Family forest landowner characteristics

- The majority of respondents were male (89 percent) and 50-69 years old (58 percent of the respondents).
- Nearly 40 percent had a bachelor's or higher degree, and all but 2 percent had a high school diploma.
- Most of the survey respondents were either working full-time (50 percent) or retired (35 percent).
- Thirty-seven percent lived in rural areas, 28 percent live in small to large rural communities, and 36 percent lived in a large metropolitan area or a nearby suburb.
- Most of the landowners who responded to the survey were absentee owners.
- Permanent/seasonal residents accounted for 24 percent of the respondents.

Family forest landownership characteristics

- The median acreage owned by survey respondents was 80 acres.
- About 60 percent of the respondents owned one or two parcels.
- Thirty-seven percent of the respondents had owned their forest land for at least 25 years.
- The top three reasons for owning forest land were noneconomic: wildlife watching, hunting, and hiking.
- Timber management ranked low as a stated reason for forest landownership.
- Seventy-seven percent of the owners surveyed did not have a forest management plan for their property.
- Less than half (42 percent) had sought advice from or had been contacted by a professional forester during the time they had owned the forest land.
- Forty-eight percent of the landowners had commercially harvested trees on their forest land.
- One of four landowners indicated they had no intention to have trees harvested in the next ten years.

Familiarity with forest certification

Familiarity with forest land certification among Minnesota family forest landowners was low. The majority of respondents (53 percent) had never heard of forest certification prior to receiving this survey. Another 27 percent described their understanding as “minimal.” Only 3 percent of the respondents indicated they had extensive understanding of forest certification.

Perceptions of certification benefits and costs

Respondents believed improved wildlife habitat, increased timber growth and productivity, and environmentally sound logging practices were the top three potential benefits of forest certification. A price premium, expanded markets, and public recognition of good forestry practices were rated considerably less important as possible certification benefits.

Loss of control over land use and management decisions was an often-cited drawback to forest certification. Specifically, this implied relinquishing control over selecting the logger (72 percent cited this as an important drawback) or the types of harvesting to be applied (67 percent felt this was an important drawback). Increased costs and paperwork that might result from having the forest land certified were also important concerns. More than half stated the need to follow a forest management plan was an important concern, and 40 percent stated the need for on-site inspections was a substantial drawback.

Most and least preferred certification program features

The most preferred family forest certification program was one that:

- Requires landowner involvement only at certain stages of the certification process.
- Is administered by a forest landowner association.
- Does not require landowners to pay the costs of certification.
- Does not require on-site inspections.
- Does not make any inspection results available to the public.
- Encourages but did not require a forest management plan.
- Does not require the use of a professional forester.
- Does not require the use of trained or certified loggers.
- Results in a price premium for certified timber.
- Results in a preference from the forest products mills for selling certified timber.

The least preferred program as expressed by survey respondents was one that:

- Does not involve the landowner in the certification process.
- Is administered by a government organization.
- Requires the landowner to pay all of the certification costs.
- Requires on-site inspections.
- Makes on-site inspection results fully available to the public.
- Does not require a forest management plan.
- Requires the use of a professional forester.
- Requires the use of trained or certified loggers.

- Does not result in a premium paid for certified timber.
- Does not result in a preference from the forest products mills.

Willingness to pay for forest certification

Family forest landowner's willingness to pay for forest certification was also quite limited. The majority of those owners surveyed indicated they would not be willing to pay \$1 per acre per year to have their forest certified.

Willingness to have their forest land certified

Only a very small portion (4 percent) of family forest landowners surveyed stated they were very likely to have their forest land certified. The vast majority (77 percent) of the landowners surveyed had formulated an opinion about whether they were interested in having their land certified (likely or not likely), but were persuadable. One in five family forest landowners indicated they would never want their forest land certified.

Analysis of family forest landowner subpopulations

Survey respondents were grouped according to several key characteristics to assess whether family forest landowner opinions and attitudes about forest land certification could be differentiated according to certain characteristics about them or their forest land. These characteristics were whether the landowner:

- Had a forest management plan.
- Owned a large amount of forest land.
- Was familiar with forest certification.
- Was likely to have their forest land certified.

The subgroup analysis showed that while larger acreage landowners and those with management plans were more likely to be familiar with forest certification, neither group was more interested in certifying their land relative to smaller acreage landowners or those without management plans, respectively. In the analysis based on the participant's likelihood or interest in forest certification, those not wanting to certify rated periodic inspections and the need to follow a management plan as more important drawbacks than both those more likely to certify and those who never want to certify.

Family forest landowner focus groups

Focus groups were convened to gather additional information about certification and family forest landowners. Thirty-seven family forest landowners participated in one of three focus groups. Focus group participants owned between 15-240 acres of forest land. Nearly all participants were unfamiliar with forest certification. They had many legitimate questions about forest certification, including: (1) the costs of participating; (2) the benefits (economic and noneconomic) of participating; and (3) how the forest certification program will allow them to maintain a sense of control over their land management and use decisions. When asked about factors that would encourage or discourage their participation in a forest certification program, the following themes emerged.

- The forest certification program would need to have an economic incentive.

- The forest certification program would need to allow landowners to retain a sense of control over land management and use decisions.
- The forest certification program would need to provide benefits (largely financial) to the forest landowner.

Those family forest landowners with a positive opinion of forest certification entering the focus groups became more positive after receiving more information about forest certification. In contrast, none of the participants with negative attitudes coming into the focus groups became more positive about forest certification—two-thirds even became less interested in certification. A majority (62 percent) of the landowners said they would participate in a hypothetical forest certification program that compensated them \$3-4 per acre per year, required a forest management plan and logging guidelines, and allowed for the possibility of periodic, randomly selected site inspections. Even among those with negative attitudes about forest certification, 33 percent of the participants said they would enroll and another 33 percent said they were not sure.

Minnesota Logger Attitudes and Perceptions About Logger Certification

Minnesota loggers were surveyed using a mail questionnaire to assess their opinions regarding logger certification. Of the 412 survey participants, 230 (56 percent) returned completed and useable questionnaires.

Minnesota logger characteristics

More than half of the responding loggers had been in the logging business for more than 25 years while another 30 percent between 15 and 25 years. The annual level of wood production ranged from approximately 100 cords to 140,000 cords.

Loggers' understanding of certification

Most loggers had at least some familiarity with forest certification. Fifty-eight percent of respondents indicated some familiarity with certification while another 28 percent indicated an extensive understanding.

Perceptions and importance of logger certification outcomes

Loggers indicated that higher prices paid for wood, access to new markets, and an easier access to wood on private lands were important outcomes of certifying their business. At the same time, loggers perceived these outcomes as unlikely. Their perception was that more record keeping, more restrictions on logging practices, and additional training courses to attend would be likely outcomes of certifying their logging business.

Most and least preferred logger certification program features

The most preferred logger certification program was one that:

- Is administered by a logger education association (e.g., MLEP).
- Uses auditing standards exclusive to Minnesota.
- Uses only Minnesota-based loggers and professional foresters to conduct field audits.
- Does not make the results of field audits available to the public.

- Terminates a logger's status in the program after repeated failure to pass logging audits.
- Is affiliated with a regional logger certification program.

The least desirable logger certification program was one that:

- Is administered by an independent organization.
- Uses national auditing standards.
- Uses field auditors that included loggers, professional foresters, other resource professionals and interest group representatives, and were not from Minnesota.
- Makes the results of inspections fully available to the public.
- Terminates a logger's status in the certification program after one failure of a field audit.
- Is not affiliated with other logger certification programs (i.e., national or regional).

Willingness to pay for a logger certification program

As the annual cost to a logging business increased in order to pay for a logger certification program, the percentage of loggers indicating the certified logger should pay the entire cost decreased. At \$100 per year, 46 percent of the responding loggers felt they should pay the entire annual cost to certify. The remaining 54 percent indicated the government and forest industry should assist the certified logger in paying for a Minnesota logger certification program. Only 8 percent of the loggers surveyed felt they should solely fund the program if it cost a logging business \$500 per year to be certified.

Need for and logger interest in logger certification

Less than one of four loggers did not perceive a need for developing a logger certification program in the state. Yet nearly three-fourths indicated they were somewhat to very likely to certify their business if a program was established.

Analysis of selected logger subgroups

To determine whether the opinions and attitudes of Minnesota's loggers about logger certification varied according to certain logger characteristics, survey respondents were grouped according to whether the logger:

- Was a large producer of timber.
- Was willing to pay the entire cost of certification.
- Purchased the majority of Minnesota wood from family forests.
- Thought a Minnesota logger certification program should be developed.
- Would likely have their logging business certified.

These subgroup analyses revealed loggers with an extensive understanding of logger certification were more likely to support the development of a certification program. Those in the logging business for a long period of time were less likely to support the development of a certification program, while those in the business for less time were more supportive and more willing to fund such a program. Loggers with higher annual productions were also more interested in a logger certification program and willing to underwrite its costs. Regardless of loggers' annual production levels or years in business,

the majority of all loggers indicated they were somewhat to very likely to certify their business.

Summary Observations

Based on the landowner and timber logger survey findings, as well as information gleaned from the focus groups with family forest landowners, a number of summary observations were made about factors contributing to and detracting from the state's ability to increase the presence of forest certification among its family forest landowners.

Positive factors

- Interest in and support within Minnesota for increasing the amount of family forest land is considerable and growing.
- Many of the state's large public and private forest land management organizations are certified.
- Minnesota's guidelines define sustainable forest management and timber logging standards.
- Minnesota has a process for systematically monitoring the application of guidelines across public and private forest lands.
- Minnesota's loggers express a strong interest in logger certification.
- Minnesota's SFIA provides a framework for group certifying family forest owners.

Negative factors

- Awareness of and interest in forest land certification among the state's family forest owners is extremely low.
- Minnesota family forest landowners are not interested in certifying their land unless the benefits of certification exceed the costs.
- Minnesota family forest landowners realize few, if any, tangible benefits of forest certification.
- Minnesota family forest landowners perceive few, if any, tangible benefits of forest certification.
- The most important benefits of certification to Minnesota's family forest landowners are not financial.
- Minnesota family forest landowners are not willing to pay the cost required to have their land certified.
- Minnesota family forest landowners object to several key requirements of existing forest certification programs available to them.
- Relatively few Minnesota family forests would qualify for enrollment under any certification programs currently available to them.
- The capacity to expand the acreage of Minnesota family forest land for which a forest management plan has been prepared is limited.
- Few organizational structures exist that would enable all multiple family forest landowners to certify their forest land under a single certificate.
- Family forest enrollment in the SFIA is very limited.

Family Forest Certification Goals and Principles

Goals

Any strategy with the objective of increasing the amount of certified Minnesota family forest land should lead toward the following outcomes in the state.

- Family forest land certified under a recognized and credible third-party certification system is substantial.
- Minnesota is recognized nationally as a leader in certification of family forest land.
- Family forests are owned and managed for a range of economic and ecological benefits.
- Family forest landowners have an enhanced commitment to sustainably managing their forests.
- Family forest landowners have an increased awareness of and support for forest certification.
- Timber harvesting and forest management practices applied to family forests improve the ability to sustain forest resources for a wide range of uses, values, and outputs.
- Wood-based industries are more competitive in a global market.
- Minnesotans have an enhanced awareness of and appreciation for forest certification and the role it plays in promoting sustainable forest management.
- Minnesotans have an enhanced awareness of and appreciation for the role and importance of family forests to the state's environment and economy.

Principles

Any strategy to increase the amount of certified family forest land in Minnesota should be guided principles that recognize:

- Family forest landowner participation in any certification program is completely voluntary.
- The legal, institutional, and economic setting within which timber harvesting and forest management is practiced.
- The procurement requirements of purchasers of Minnesota wood products as they relate to fiber sourced from sustainably managed forests.
- The importance of having broad support from a wide range of interests through credible standards and processes, independent verification of practices, and timely and public reporting of certification activities and outcomes.
- The need for cost-effective certification systems, regardless of the size or location of family forest holdings.
- The need for certification costs to be commensurate with certification benefits.
- The variety of reasons why individuals own and manage Minnesota forest land.
- The extent to which Minnesota's family forests have forest management plans, and the existing capacity to increase the family forest acreage covered by forest management plans.
- The existence of Minnesota's timber harvesting and forest management guidelines as the state's standard for defining sustainable forestry.

- The existence of initiatives in Minnesota that compliment forest land certification efforts (e.g., guideline implementation monitoring, logger education, training, and certification).
- The importance of continuously improving forestry and timber harvesting practices to protect and enhance ecological, economic, and social forest values.

Recommended Implementation Strategy

Large-scale expansion of family forest land certification in Minnesota is not likely at this time due to several factors:

- An incorrect assumption that landowner awareness of forest certification was a (possibly the) major barrier to increasing the amount of certified family forest land in the state. It was presumed that once these landowners were made aware of forest certification programs, a sizable portion would be receptive to having their forests certified.
- The vast majority of the state's family forest landowners are not managing the land with timber production as a primary objective, yet this is a major focal point for forest certification.
- Family forest landowners see little need to have their forest land certified, or the additional value not already provided by having a forest management plan for their property.
- Family forest landowners indicate there needs to be financial benefit from certification that more than covers the cost of certification.
- Family forest landowners presume certification will result in a loss of control over their land management and use decisions. Many also feel forest land certification could eventually lead to other organizations having a greater say over what can and cannot be done on their land.
- Prerequisites to forest land certification are not in place on the majority of the state's family forest lands. The most notable among these is a forest management plan. In addition to having forest management plans on only a relatively small portion of the state's family forest acreage, adding considerable forest acreage with management plans is severely constrained by the existing plan writing capacity in the state.

Despite the preponderance of factors limiting expansion of family forest certification in the state, the following actions are recommended to advance the level of certification activity among Minnesota's family forest lands.

Immediate actions

- Group certify family forest lands enrolled in the SFIA.
- Explore opportunities to expand significantly family forest landowner enrollment in the SFIA.
- Support efforts to establish a Minnesota logger certification program.
- Identify effective methods for informing Minnesota's family forest landowners about and encouraging their participation in forest land certification.
- Target forest certification outreach efforts toward the state's largest family forest tracts.

Long-term strategy

- Seek opportunities to make available to Minnesota's family forest landowners certification programs that do not require a forest management plan on the smallest parcels.
- Seek opportunities to promote the development of a certification program that jointly certifies participating public and private forest landowners in Minnesota.

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I. Introduction

The development of and participation in systems to certify forest management and timber harvesting practices has been arguably one of the most influential global forest management trends over the past decade. Initiated as a movement to establish market-based incentives to encourage sustainable forest management practices, forest land certification has become a tool for verifying the use of sustainable forestry practices. A landowner-initiated, voluntary process for independently assessing the quality of forest management practices in relation to a set of predetermined standards, forest certification has been applied to approximately 700 million acres of forest land worldwide (7.3 percent of the world's forests) (FAO 2003; Dovetail 2005). The number of different systems for certifying forests is extensive. Although individual forest certification programs vary (often considerably) with respect to their standards and procedures, they share the common goal of documenting the use of sound land management practices to conserve forests for their environmental, economic, and social benefits (Cashore et al. 2003; Wallinger 2003; Washburn and Miller 2003).

In the United States (US), approximately 65 million forested acres (13 percent of all timberland) have been certified using a process that includes independent, third-party review of land management practices. Although forest certification was initially designed for use on private forest lands, its use has expanded to include public forests (Vogt et al. 2000). Several states have certified forest land managed by their respective state forestry agency, either in part (e.g., Tennessee) or whole (e.g., Pennsylvania) (Vogt et al. 2000; Sample et al. 2003). Other public forests subjected to certification include those managed by universities and county governments (Cubbage et al. 2003a; Sample et al. 2003).

In Minnesota, nearly all major corporate owners of forest land have certified their forests (AF&PA 2004). The state's publicly managed forest lands are also subject to certification efforts. Several counties (e.g., Aitkin, Cass, St. Louis) have certified their county-administered forest lands, with several others currently undergoing initial certification assessments (AF&PA 2004; Smartwood 2004). The Minnesota Department of Natural Resources (MN DNR) is also pursuing forest certification on the 4.9 million acres of forest land under its management responsibility (MN DNR 2004a).

Most certification programs available to forest landowners in the US have been designed for owners with large forest land holdings (Vlosky and Granskog 2003). They include several requirements neither germane nor economically feasible to the typical owner of a small woodlot. Consequently, certification of private, noncorporate forest land (i.e., family forests), while comprising 58 percent of the nation's timberland land base, has been extremely limited (Haynes 2003; Newsom et al. 2003). Although initiatives to provide structures for certifying small acreage forests have been developing (e.g., recognition of the American Tree Farm System (ATFS) by American Forest and Paper Association's (AF&PA) Sustainable Forestry Initiative (SFI), Forest Stewardship Council's (FSC) Resource Manager certification, The Trust to Conserve Northeast Forestlands), most noncorporate forest landowners are unaware of or unwilling to participate in forest certification systems (Newsom et al. 2003; Wallinger 2003).

Additionally, the lack of a cost-effective framework for certifying small-acreage parcels has been a significant barrier to widespread certification of family forest lands (Newsom et al. 2003).

Increasingly, the customers of Minnesota's wood products industry are requiring a greater portion of the wood used in manufacturing processes come from certified forest land. Time Inc., for example, has set certification targets for its suppliers indicating that wood fiber used in products purchased by Time Inc. will come from sustainable managed lands certified by a third party using a credible recognized performance standard. These targets are differentiated by type of mill and size of forest holdings (Marshall 2005). Consequently, developing a strategy to increase substantially the acreage of Minnesota's family forests certified not only makes good sense from an environmental standpoint; it also makes good business sense.

Developing a strategy that enables a greater number of the state's family forest landowners to certify their forests voluntarily represents a substantial opportunity to influence positively the future economic viability of a major manufacturing sector, while concomitantly improving the ecological integrity by which forest management is practiced. It would also provide a mechanism to recognize those private forest landowners that, through the application of good stewardship practices, provide important economic, environmental, and ecological benefits. Without having a family forest certification strategy, Minnesota's primary wood products industry could lose a significant market share to competitors who can document that a greater portion of their wood fiber comes from certified forests. Thus, with family forests supplying half of the wood fiber harvested in the state, increasing certified family forest land is paramount to the future viability of the state's wood-based industry.

A. Study Objectives

The purpose of this study was to evaluate the potential to increase the amount of Minnesota's family forest land that is certified. To do so, the study sought to:

- Evaluate existing forest land certification systems available to Minnesota's family forest landowners.
- Understand Minnesota family forest landowner attitudes toward and interest in forest land certification.
- Understand Minnesota logger attitudes toward and interest in logger certification.
- Evaluate the likelihood of enrolling a substantial amount of Minnesota family forest land in a certification program, given certification programs currently available to these owners.
- Develop a framework (i.e., strategy) for increasing the amount of Minnesota family forest land that is certified.

B. Report Organization

The report is organized as follows.

- **Section II** provides background information on Minnesota's family forest landowners.

- **Section III** describes forest certification systems available to the state's family forest landowners or support family forest landowner certification.
- **Section IV** describes forest land certification programs available to family forest landowners in Norway and Finland, and contrasts those program requirements to Minnesota's framework for forest management and timber harvesting.
- **Section V** describes Minnesota family forest landowner attitudes and perceptions of forest certification, as well as their interest in certifying their forest land.
- **Section VI** describes Minnesota logger attitudes and perceptions of logger certification, as well as their interest in certifying their logging business.
- **Section VII** describes prospects for increasing the amount of Minnesota family forest land certified, given existing certification systems available to them and the attitudes and management objectives of the state's family forest landowners.
- **Section VII** identifies principles and goals to guide the development of a certification framework for Minnesota's family forest landowners.
- **Section IX** identifies a framework, or strategy, to increase the level of certification associated with the Minnesota's family forest land.

II. Minnesota's Forests and Their Owners

A. Extent and Ownership of Minnesota's Forests

Approximately one-third of Minnesota is forested, accounting for 16.8 million acres. The ownership of Minnesota's forests is approximately evenly split between public (56 percent) and private (44 percent) interests (Figure 1). Of the state's publicly owned land, 40 percent is owned by the state, 28 percent by counties and other municipal governments, and the remaining 32 percent by the federal government. Of the privately owned land, nonfamily forest landowners own 90 percent and incorporated entities own the remaining 10 percent (Smith et al. 2001).

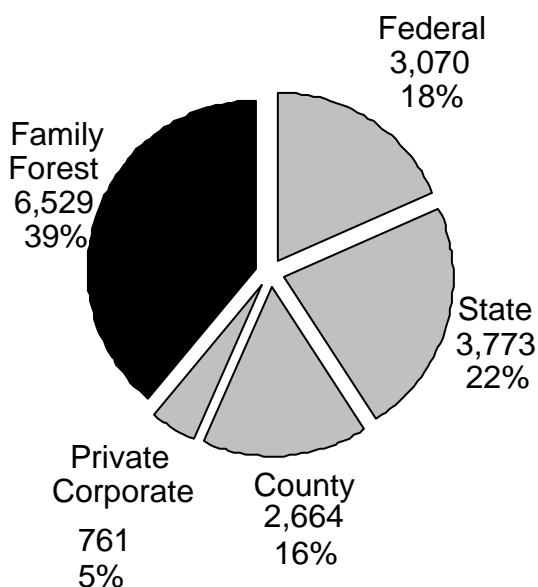


Figure 1. Ownership of Minnesota's forest land (thousands of acres). *Source:* Smith et al. 2001.

B. Family Forests and Their Owners

There are an estimated 170,000 owners of Minnesota's 6.5 million acres of family forest land (Butler and Leatherberry 2004). The number of family forest landowners has increased considerably over the last two decades. Carpenter et al. (1986) estimated Minnesota had 120,000 owners in 1986. One decade later, that number had increased by 10,000 owners (Birch 1996). With the total amount of family forest land remaining relatively stable over the last 20 years, the trend toward an increasing number of family forest landowners suggests this land base is being parcelized into smaller ownership blocks. Others (Fleury and Blinn 1996; Schmidt and Raile 1998; Kilgore and MacKay 2005) have documented a trend of decreasing tract size of Minnesota's private forest land since the late 1970s.

Several studies have profiled Minnesota's family forest landowners since the 1980s. While the specifics of each study (e.g., metrics used to evaluate family forest characteristics, scope of coverage) vary, a number of generalizations can be made about this ownership category. Such a characterization of these lands and their owners is that:

- The forested tracts are small, averaging between 60-80 acres per owner.

- More than half of the owners do not live on their forest land.
- Land tenure is considerable (the median ownership length is greater than 20 years).
- Individuals own forest land for many reasons, the most common being wildlife-related such as habitat or hunting.
- Timber management ranks low on the list of reasons why Minnesota's forest land is owned. It is estimated that only slightly more than 1 million acres of stewardship plans have been prepared for the state's family forests—less than 20 percent of the total family forest acreage.
- Despite the repeated confirmation that family forests are owned principally for reasons other than timber production, in 2003 more than half of the total timber volume harvested in the state came from private forests (Baughman 1988; Rathke 1993; Cervantes 2003; MN DNR 2003).

Table 1 highlights key findings of four studies conducted over the last 20 years of Minnesota's family forest landowners.

Table 1. Findings from selected studies of Minnesota's family forests.

Characteristics	MN family forest landowner study			
	Carpenter (1986)	Rathke (1993)	Baughman (1998)	Donnay (2005)
Forest land parcels included in study (acres)	≥ 10	≥ 40	≥ 20	≥ 10
Study coverage	State	Regional	State	Regional
Average parcel size (acres)	57	80	106	48
Ownership residence in relation to forest	71% within 25 miles	Median distance = 35 miles	47% absentee, average distance = 62 miles	58% > 100 miles
Average age of owner		56	55	48
Tenure (years)	62% ≤ 22	64% ≤ 20	Mean = 20	
Reasons (ranked order) for owning forestland	1. Residence 2. Aesthetics 3. Firewood 4. Recreation 5. Part of farm	1. Hunting 2. Wildlife habitat 3. Aesthetics 4. Land investment 5. Part of farm	1. Wildlife habitat 2. Recreation-hunting 3. Part of farm 4. Green space 5. Growing timber	1. Hunting 2. Investment 3. 2 nd residence 4. Primary residence 5. Expand ownership
Existing management plan (percent)		15	16	

C. Economic Importance

All but two million acres of Minnesota's forests are considered productive enough to be commercially managed for timber and not legally restricted from doing so (e.g., a state park or federal wilderness area) (Smith et al. 2001). The state's forests are a major driver of economic activity for the state. Primary wood products processing or manufacturing industries that rely, in part or whole, on Minnesota's forests for wood fiber include:

- Five pulp and paper mills.

- Three recycled pulp and paper mills.
- Three hardboard and specialty mills.
- Six oriented strand/structural board mills.
- 500+ sawmills.
- Additionally, there are 150 associated industries and more than 850 secondary manufacturers that use wood as a primary input into manufacturing (MN DNR 2004b).

The economic impact of Minnesota's forest products manufacturing was an estimated \$6.5 billion in 2002. It ranks fourth in terms of employment within the state's manufacturing sector. Fifty-five percent of this employment (29,000 jobs) was in primary processing (including logging) with the remaining 24,000 jobs in secondary manufacturing. Collectively this sector generated \$1.9 billion in wages in 2002—10 percent of all manufacturing wages paid in the state.

In 2001, 65 percent of Minnesota residents participated in some form of outdoor recreation including hunting, fishing, and hiking. It is estimated that outdoor recreationists in Minnesota spent \$2.7 billion in 2001 (Outdoor Industry Foundation 2003; USDI-FWS 2003; Ryan 2004). While one-third of the total economic activity is generated in the Twin Cities Metropolitan Area, outdoor recreation can be a very important economic driver to outstate regions. In northeastern Minnesota, outdoor recreation accounts for more than 10 percent of all economic activity (MN EQB 1993).

Over the past decade, the amount of timber annually harvested from Minnesota's forests has ranged from 3.5-4.1 million cords per year (Kilgore et al. 2005). The annual contribution of this wood fiber from different types of forest landowners has varied considerably (Figure 2). In 1991, the majority of Minnesota's timber harvesting occurred on public land (federal, state, county). However, over the past decade, family forests have contributed more than half of all wood harvested (MN DNR 2004b).

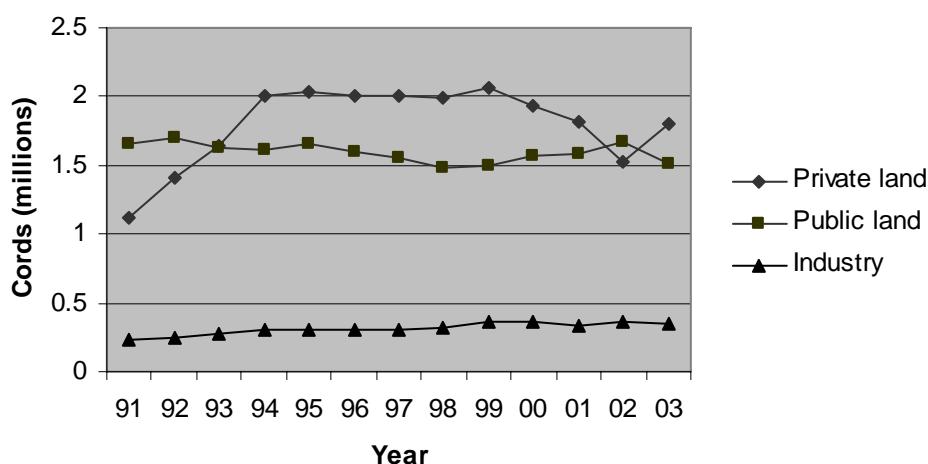


Figure 2. Extent of timber harvesting on public, private (family forest) and industry land.
Source: MN DNR 2004b.

D. Legal Context for Forest Management

A number of policies and programs guide forest management in Minnesota. Many of these are specific to an ownership group, particularly public forest lands. Federal, state, and county-administered forests are governed by largely distinct laws that address planning, management, and use activities on these lands. For private forest landowners, few legal restrictions constrain the types and extent of management and use activities on their forests. With the exception of state and federal laws governing the protection of rare or endangered species, most restrictions applicable to private forests are addressed through local zoning ordinances.

Since 1995, the Minnesota Sustainable Forest Resources Act has largely guided forest management and planning in Minnesota. This law established policies and programs intended to encourage sustainable use and management of forests in Minnesota. It included the establishment of the Minnesota Forest Resources Council (MFRC), the creation of voluntary site-level timber harvesting/forest management guidelines, landscape-level planning and coordination activities, as well as an integrated forest resources research program (Kilgore et al. 1996; Ellefson and Kilgore 2000; Minnesota Statutes 2004).

Minnesota's timber harvesting and forest management guidelines are the operating standard for forestry in Minnesota. Published by the MFRC in 1999, these voluntary guidelines include recommendations for the following timber harvesting and forest management activities.

- Designing and laying out timber sales to incorporate nontimber concerns.
- Managing slash and other woody debris.
- Establishing and managing riparian corridors.
- Defining best management practices (BMPs) for water quality.
- Retaining biomass in harvested sites.
- Defining postharvest reforestation practices.
- Constructing roads for timber harvesting and forest management.
- Managing for visual and aesthetic objectives.
- Protecting unique historic and cultural resources.
- Minimizing soil compaction.

Since their publication six years ago, substantial effort has been made to provide guideline education and training to the state's forest landowners, resource managers, and timber harvesters. The following describes several of these efforts but do not include internal industry and agency training sessions.

- In 1999 and 2000, loggers and resource managers attended 38 day-long guideline training workshops.
- In 2001, there were 907 attendees at the Minnesota Logger Education Program (MLEP) workshops—778 loggers, 129 resource managers. More than 850 resource professionals attended the University of Minnesota's College of Continuing Education (CCE) workshops in 2001.
- In 2002, the MLEP workshops focused on deficiencies in guideline application (i.e., use of water diversion and water and wetland crossing structures) identified

through the compliance monitoring program. Attendance at these workshops was 703 loggers and 249 resource managers.

- In 2003, attendance at specific guideline training workshops included 68 loggers and 7 resource managers.
- In 2004, 982 loggers and resource managers participated in guideline training workshops (Kilgore et al. 2005).

III. Review of Forest Land Certification Systems

A. History of Forest Certification

Forest land certification systems have existed in the US for more than 50 years. However, forest land certification has evolved within the past 15 years in response to several concerns (e.g., interest in protecting tropical forests; inaction by governments to do so at the international level). The reasons and motivations behind the development of various forest land certification systems are diverse and complex. Among them are the means by which:

- Sustainable timber harvesting practices can be established, improved, and monitored.
- Adverse consequences associated with timber harvesting practices can be addressed and their cost internalized by those responsible.
- Education and technology transfer efforts can be undertaken to elevate the quality of timber harvesting practices employed.
- Growing public concern about unsustainable timber harvesting practices can be more effectively addressed.
- Consumers can be better informed about forest management and timber harvesting practices.
- Greater influence over public policy affecting forest management and timber harvesting activities (Klingberg 2003; Cashore et al. 2005; Overdevest and Rickenbach 2005; Siry et al. 2005).

These systems, which are in various stages of development, employ different approaches to forest land certification, use different standards, and often use different labeling schemes to distinguish certified products. Worldwide, it is estimated that more than 50 different forest certification systems are in use (Dovetail 2005). Moreover, it is estimated that between 500 to 700 million acres of forest land is certified worldwide (Siry et al. 2005; Dovetail 2005). Siry et al. (2005) also notes that 93 percent of certified forest lands are in the northern hemisphere and certified wood products represent less than 1 percent of global forest product sales.

B. Major Approaches to Forest Certification

Although a wide variety of standards and administrative elements to the various certification systems exist, there are two basic approaches to forest certification: environmental management systems and forest land management. Despite the variation of these approaches, a number of commonalities exist between these various certification systems.

Environmental management systems, such as the International Organization for Standardization (ISO) 14001 standard, do not contain specific forestry performance measures. Alternatively, they require the implementation of various practices and procedures to ensure the existence of an environmental management system. The standard that is used provides a framework for developing this system along with an auditing component to evaluate progress. The ISO standard, for example, allows for first, second, or third-party auditing and does not have a labeling component within the

system. Conversely, the Canadian Standards Association (CSA) standard requires third-party auditing and has a labeling and chain-of-custody scheme.

Performance-based approaches are the other type of forest certification system. Examples include the Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), Programme for the Endorsement of Forest Certification Schemes (PEFC), American Tree Farm System (ATFS), and Green Tag Forestry. Unlike the environmental management systems approach, performance-based certification schemes certify actual parcels of land. Although these forest land certification systems vary, each has a set of performance standards that must be adhered to by the forest landowner. These standards vary from system to system, as well as the auditing procedures and, when offered, product labeling and tracking schemes.

Similar to the number of different certification systems, the cost to the landowner of certification varies immensely. Certification costs can range from no cost to more than \$500 an acre. This is not only dependent on the specific certification system, but also the size of the parcel to be certified, as well as other variables. Although the range of costs is tremendous, a review of the literature suggests average costs range from \$0.10/acre to about \$10.00/acre. Most systems also require annual or less frequent audits that generally cost much less than the certification process (Cubbage et al. 2002; Fletcher et al. 2002; Cubbage et al. 2003b).

C. Major Forest Land Certification Programs Available to Minnesota Family Forest Landowners

Forest Stewardship Council

Background

FSC was founded in 1993 by a diverse collection of environmental groups, timber industry, forestry professionals, community forestry groups, indigenous groups, and forest certification groups from 25 countries, and became operational as a membership organization the following year in 1994. FSC endorsed its first national standard in 1997 for Sweden. The US group was founded in 1995. Currently, FSC standards have been applied in more than 57 countries (FSC 2005).

Structure

FSC currently has more than 600 members and is governed by a general assembly and a nine-person board. The assembly, the highest decision-making authority, is divided into three chambers representing environmental, social, and economic interests, and each is assured equal voting rights. FSC developed 10 principles and 57 criteria to be used in the certification process. In turn, national groups are encouraged to adapt this set of principles and criteria to their specific conditions. In the US, these national standards have been further divided into nine approved regional FSC standards (FSC 2005).

FSC accredits the third-party organizations that conduct the actual certification process. There are currently three accredited certifiers within the US: Scientific Certification Systems, SGS Systems and Services Certification, Inc., and the Smartwood Program.

FSC also has a chain of custody and labeling system. The system has three labels that differentiate products according to the content of certified wood: 100 percent certified wood, partially from certified wood, and 100 percent from recycled material. Funding of the program comes from government, foundations, and accreditation and membership fees (FSC 2005).

Standards

FSC has developed a set of principles and criteria adopted or modified at a national and sometimes regional level. The state of Minnesota is covered by the Lake States Central Hardwoods Regional Standards of the FSC US Standards. The ten principles are:

1. Compliance with laws and FSC principles.
2. Tenure and use rights and responsibilities.
3. Indigenous people's rights.
4. Community relations and worker's rights.
5. Benefits from the forest.
6. Environmental impact.
7. Management plan.
8. Monitoring and assessment.
9. Maintenance of high conservation value forests.
10. Plantations.

Each principle is divided into criteria and often subcriteria. As a point of reference, the following is an example of the Lake States regional principles and criteria for Principle 1.

Principle #1: Compliance with Laws and FSC Principles

Criteria.

1.1 Forest management shall respect all national and local laws and administrative requirements.

Subcriteria.

1.1.a Forest management plans and operations comply with applicable federal, state, county, tribal, and municipal laws, rules, and regulations.

For example:

-All necessary permits are obtained.

-There is neither evidence nor substantial claims of continued or intentional noncompliance with laws and regulations that relate to forest management by the forest landowner or manager.

1.1.b Forest management plans and operation comply with State Best Management Practice (BMPs) and other forest management Guidelines applicable to the forest, both voluntary and regulatory.

For example:

-Compliance with state, county, watershed, and planning district regulations.

1.1.c Forest management plans and operations meet or exceed all applicable laws and administrative requirements with respect to sharing public information, opening records to the public, and following procedures for public participation.

The objectives, performance measures, and indicators associated with each principle and criteria (subcriteria) cover a number of general items, social considerations, management considerations, public involvement activities, and monitoring requirements. These include:

General Considerations

- Obtain resource inventory
- Obtain management plan
- Comply with all laws and regulations
- Demonstrate long-term commitment to sustainability
- Ensure long-term harvest levels
- Use of adaptive management
- Comply with international agreements
- Ensure procurement activities do not compromise sustainability
- Support forest research, science, and technology
- Pay all prescribed fees, royalties, and taxes
- Manage for sound economic performance

Social Considerations

- Provide for safe working conditions
- Recognize clearly demonstrated use rights
- Maintain indigenous control of land/rights/compensation
- Maintain local control/enhance local economy
- Confer with indigenous peoples
- Encourage sound practices through procurement activities
- Protect areas from illegal logging, settlement, conversion
- Employ mechanisms to resolve use rights disputes

Management considerations

- Meet water quality standards
- Identify and manage special sites
- Require proper training of personnel and contractors
- Maintain/enhance nontimber values
- Require reforestation/afforestation
- Minimize chemical use
- Protect and maintain soil/forest productivity
- Protect rare, threatened, and endangered species
- Protection from damaging agents
- Manage visual impacts of harvesting
- Conservation of biological/habitat/stand diversity

- Protection measures for riparian areas
- Use of prescribed fire
- Use of appropriate policy tools
- Minimize waste and promote efficient utilization
- Conduct environmental assessments
- Use of land planning
- Protection of representative samples of ecosystems
- Use of exotic species
- Utilization of biotechnology
- Proper disposal of wastes
- Emergency preparedness and response
- Use of genetically modified organisms
- Use of biological control methods
- Conversion to plantations
- Management of ‘high-value conservation’ forests
- Management of plantations

Public Involvement

- Publicize management plan
- Establish procedures to address public concerns
- Provide public access for recreation/education
- Support activities of public outreach, education, and involvement
- Implement public participation process
- Publicize monitoring data

Monitoring

- Establish monitoring program

Certification Process

FSC only accredits the certification bodies, which are monitored and re-accredited every five years. The actual certification process by the accredited authority is composed of the following elements:

- Pre-interview with auditor.
- Review of documentation.
- Field assessment.
- Subject to annual field audits.
- Full evaluation to renew certificate every five years.

Status

Currently, more than 16 million acres of FSC-certified forest land exists in the US. Within the state of Minnesota, there are six certified forest landowners with a total of 1,180,432 acres of FSC-certified forests. The first forest FSC-certified in Minnesota occurred in 1997. There are also 16 chain-of-custody certifications in Minnesota (Metafore 2005). Forest land administered by the MN DNR and Itasca and Lake counties are currently undergoing an initial assessment for certification under FSC.

Small Ownerships

In 2004, FSC established modified standards for smaller ownerships. Generally, these international standards apply to forest landownerships less than approximately 250 acres. However, the US program, the Family Forests Program, extends these modified standards to ownerships that are less than approximately 2,500 acres. These adaptations were meant to make it easier and more cost effective for smaller ownerships to certify their forest land. FSC also has provisions for group certification—a process whereby multiple owners are certified under a single group certificate. This type of certification is especially appealing to small landowners as the individual costs of certification are reduced and are spread among the group of landowners (FSC 2005). In 2004, there were approximately 40 group certificates in the US, comprising approximately 500,000 acres (Dovetail 2004). Two of these certificates cover forest land in Minnesota totaling less than 5,000 acres.

In addition providing a more cost-effective means for forest certification, small forest landowners and group certificates are subject to modified certification provisions. Requirements for a scoping document, stakeholder consultation, evaluation, certification reporting, peer review, public summation, and monitoring have been changed or modified to simplify and make the certification of small ownerships and groups of small ownerships much easier and more cost effective (FSC 2005).

Sustainable Forestry Initiative

Background

In October 1994, the AF&PA agreed to a set of sustainable forest management principles, which formed the basis for the SFI program. In 1998, the SFI program added a verification program component. In that same year, the program expanded and was made available to companies, landowners, and organizations whom were not members of AF&PA. Currently, SFI certification remains a requirement of AF&PA membership. To date, noncompliance with SFI has resulted in the expulsion of 17 AF&PA members. By the late 1990s, the program had evolved from a means of assuring the public that AF&PA members were practicing good forestry to a program that could certify other private and public lands. St. Louis County, Minnesota, was the first public forest land base certified under SFI, and received this status in 2004 (AF&PA 2005).

In 2000, a multistakeholder board was established to oversee the SFI program. The board was, in turn, granted status as a 501(c) nonprofit corporation. This board, the Sustainable Forestry Board (SFB), consists of 15 members: one-third are program participants, one-third represent conservation and environmental interests, and one-third represent the broader forestry community (SFI 2005). Currently, the SFI is seeking mutual recognition under PEFC, and has an interim agreement partnering with the ATFS (Dovetail 2005).

Structure

The 15-member multistakeholder board that governs the SFI program oversees the development and continuous improvement of the SFI standard. The governance of the organization is divided into four categories: enhancement, implementation, monitoring and reporting, and certification. In addition to this national governing board, there are 38

state and five provincial implementation committees in the US and Canada. These implementation committees work at the local level to promote and implement the SFI standard by assisting in education and training efforts directed at loggers, and following up on complaints of timber harvesting practices inconsistent with the SFI standard.

In addition to the governing board and the state or provincial implementation committees, the SFI standard is reviewed and assessed by an external review committee. This committee consists of 18 experts of various scientific fields which provide for an independent review of the SFI program. This committee has a number of charges including: ensuring the validity and accuracy of the annual report, providing continuous assessment of the program, and advising on appropriate changes to the program. SFI has four labeling programs for primary producers, secondary producers, participating publishers, and participating retailers (SFI 2005).

Standards

The SFI standard is used to evaluate forest land considered for certification. This standard is organized around a set of principles. These principles are translated into action by employing a set of objectives which serve as goals of sustainable forest management. These objectives are then further defined by performance measures, each of which is informed by a set of indicators. SFI has recently revised its standards that will be used from 2005-2009. For those entities certified under the old standard, they must also adhere to the revised SFI standards and be in compliance within a year of the date the revised standards become effective (SFI 2005).

The abbreviated core set of principles that provide the overarching framework for the SFI standard include:

- Sustainable forestry.
- Responsible practices.
- Reforestation and productive capacity.
- Forest health and productivity.
- Long-term forest and soil productivity.
- Protection of water resources.
- Protection of special sites and biodiversity.
- Legal compliance.
- Continual improvement.

The objectives, performance measures, and indicators derived from these principles provide greater specificity for land managers and certifying organizations. As an example, a portion of objective two is further defined in the following manner.

Objective 2. To ensure long-term forest productivity and conservation of forest resources through prompt reforestation, soil conservation, afforestation, and other measures.

Performance Measure 2.1. Program participants shall reforest after final harvest, unless delayed for site-specific environmental or forest health considerations, through artificial regeneration within two years or two planting seasons, or by planned natural regeneration methods within five years.

Indicators.

1. Designation of all management units for either natural or artificial regeneration.
2. Clear criteria to judge adequate regeneration and appropriate actions to correct understocked areas and achieve acceptable species composition and stocking rates for both artificial and natural regeneration.
3. Minimized plantings of exotic tree species and research documentation that exotic tree species, planted operationally, pose minimal risk.
4. Protection of desirable or planned advanced natural regeneration during harvest.
5. Artificial reforestation programs that consider potential ecological impacts of a different species or species mix from that which was harvested.

The objectives, performance measures, and indicators cover a number of general items, social considerations, management considerations, public involvement activities, and monitoring requirements. These considerations include:

General Considerations

- Obtain resource inventory
- Obtain management plan
- Comply with all laws and regulations
- Demonstrate long-term commitment to sustainability
- Ensure long-term harvest levels
- Use of adaptive management
- Comply with international agreements
- Ensure procurement activities do not compromise sustainability
- Support forest research, science, and technology
- Pay all prescribed fees, royalties, and taxes
- Manage for sound economic performance

Social Considerations

- Provide for safe working conditions
- Recognize clearly demonstrated use rights
- Maintain indigenous control of land/rights/compensation
- Maintain local control/enhance local economy
- Confer with indigenous peoples
- Encourage sound practices through procurement activities

Management considerations

- Meet water quality standards

- Identify and manage special sites
- Require proper training of personnel and contractors
- Maintain/enhance nontimber values
- Require reforestation/afforestation
- Minimize chemical use
- Protect and maintain soil/forest productivity
- Protect rare, threatened, and endangered species
- Protection from damaging agents
- Manage visual impacts of harvesting
- Conservation of biological/habitat/stand diversity
- Protection measures for riparian areas
- Use of prescribed fire
- Use of appropriate policy tools
- Minimize waste and promote efficient utilization
- Conduct environmental assessments
- Use of land planning
- Protection of representative samples of ecosystems
- Use of exotic species
- Utilization of biotechnology
- Proper disposal of wastes
- Emergency preparedness and response
- Use of genetically modified organisms

Public Involvement

- Publicize management plan
- Establish procedures to address public concerns
- Encourage landowners to use qualified professionals
- Provide public access for recreation/education
- Support activities of public outreach, education, and involvement
- Implement public participation process
- Encourage other landowners to implement sustainable practices
- Promote efforts by others to encourage sustainable forestry

Monitoring

- Establish monitoring program
- Monitor efforts to promote sustainable forestry

Certification Process

There are a number of methods employed to measure compliance with the SFI standard. These methods include: first-party verification (self-declaration), second-party verification (often with a specific customer), and third-party verification. Only auditing firms meeting the certification and training standards set by the American National Standards Institute and the Registrars Accreditation Board may conduct third-party

verification with the SFI standard. In order to obtain certification, a participant must satisfy the 103 indicators and provide for paper and field audits.

The general process for SFI certification is as follows:

- In-house review (first or second party audit).
- Notification of SFB.
- Contract established between participant and certification entity.
- Gap analysis conducted (done to see if to go forward with process).
- Selection of certification team.
- Identification of relevant indicators.
- Formulate a verification plan.
- Pre-verification meeting with certifiers and participant.
- Collection of evidence.
- Post-verification meeting.
- Verification report released.
- Issuance of certificate.
- Prepare audit summary for public consumption.

Status

Currently, 136 million acres are enrolled in SFI in North America. As of July 2005, 120 million of the enrolled acres have been independently (third party) certified, approximately 45.7 million acres of which are in the US. Funding for the program exceeded \$7 million for the last reported year (2000) and provided by the forest industry (82 percent), independent loggers and logging associations (7 percent), state and federal agencies (7 percent), and other sources (4 percent). In 2002, the state implementation committees received 304 complaints regarding practices not consistent with the SFI standard. Of these, 223 were found to be unrelated to SFI participants. Of the remaining 81, 76 were resolved (SFI 2005).

In Minnesota, four entities currently have completed third-party SFI certification of their forest land: Potlatch Corporation, Boise Cascade (now owned by Forest Capital Partners, LLC), St. Louis County Land Department, and UPM-Kymmene-North America. These entities combine for a total of 1,491,485 certified forest acres. Boise Cascade forest land (now owned by Forest Capital Partners, LLC) was certified in 2000, while the other two private entities were certified in 2002. St. Louis County lands were third-party certified in 2004 (Metafore 2005). Other SFI program participants include Carlton, Beltrami, Itasca, Koochiching, and Lake counties as well as the University of Minnesota's Cloquet Forestry Center. Forest land administered by the MN DNR is currently undergoing an initial assessment for certification under SFI.

American Tree Farm System

Background

The ATFS is the oldest forest certification system in the US, operating since 1941. Unlike some other certification systems available to landowners, the ATFS is focused primarily on family forest lands, specifically those who own between ten and ten thousand acres.

Structure

The American Forest Foundation, governed by a board of trustees, oversees the ATFS. The ATFS is governed by a tree farm operating committee and executive committee. State ATFS committees govern operations within each individual state. The program accredits inspectors to conduct certification. ATFS is privately funded by the forest industry, grants, member contributions, and publication sales.

Standards

In 2004, ATFS updated its certification standards, resulting in nine standards, 15 measures, and 21 indicators. The standards are as follows:

- Ensuring sustainable forests.
- Compliance with laws.
- Commitment to practicing sustainable forestry.
- Reforestation.
- Air, water, and soil protection.
- Fish, wildlife, and biodiversity.
- Forest aesthetics.
- Protect special values.
- Wood fiber harvest and other operations.

Performance measures and indicators are used to evaluate the application of the various standards on the land to be certified. The following is an example of one standard.

Standard 2. Compliance with laws – Forest management complies with all relevant federal, state, and local regulations and ordinances.

Performance measure 2.1 – Forest landowners must comply with all relevant federal, state, county, and municipal laws and regulations.

Indicator 2.1.1 – Landowner affirms that they comply with all relevant laws and regulations, and that they will correct conditions that led to adverse regulatory actions, if any.

Indicator 2.1.2 – Landowner obtains advice from forestry consultants, public agency natural resource managers, or contractors who are trained in, and familiar with, applicable laws, regulations, and published Best Management Practices for forestry.

These objectives, performance measures, and indicators cover a number of general items and management considerations. Social considerations, public involvement activities, and monitoring requirements are not accounted for in the ATFS certification process. The objectives, performance measures, and indicators include:

General Considerations

- Obtain resource inventory
- Obtain management plan
- Comply with all laws and regulations

- Demonstrate long-term commitment to sustainability
- Use of adaptive management

Social Considerations

- Provide for safe working conditions

Management considerations

- Meet water quality standards
- Identify and manage special sites
- Require proper training of personnel and contractors
- Maintain/enhance non-timber values
- Require reforestation/afforestation
- Minimize chemical use
- Protect and maintain soil/forest productivity
- Protect rare, threatened, and endangered species
- Protection from damaging agents
- Manage visual impacts of harvesting
- Conservation of biological/habitat/stand diversity
- Protection measures for riparian areas
- Use of prescribed fire
- Conduct environmental assessments
- Use of land planning

Public Involvement

- Encourage landowners to use qualified professionals

Monitoring

- Establish monitoring program

Certification Process

ATFS requires landowners to use an accredited Tree Farm Inspector to obtain certification. The property is audited for compliance with the standards by an auditor and re-inspected every five years. These inspections are done at no cost to the landowner. The ATFS has no product or tracking label program (ATFS 2005).

Status

There are 53,027 certified American Tree Farm family forests in the US, covering more than 29.6 million acres. Currently, in the state of Minnesota there are 2,048 tree farms totaling 240,874 acres (Chan 2005). If industrial lands are excluded, there are 1,678 ATFS-designated family forests, accounting for 204,318 acres (Sandler 2005). Minnesota does not have any forests that are third-party certified under ATFS.

Small Ownerships

ATFS has recently offered group certification, which evaluates and certifies groups of forest landowners under a single unit or certificate. This allows groups of forest

landowners to take advantage of economies of scale, thus increasing efficiencies in the certification process. Currently, there are eight certified group organizations, including those enrolled in the Wisconsin Managed Forest Law program.

ATFS is recognized by SFI as a credible family forest certification system. In order to achieve group certification under ATFS, it is required to be a legal entity, obtain a group manager, all owners must agree to manage according to ATFS standards, complete a third-party audit, follow standard operating procedures, and provide annual reporting (Simpson 2003).

Green Tag Forestry

Background and Structure

The Green Tag Forestry (GTF) certification system was established in 1998 by the National Forestry Association (NFA) in conjunction with the Association of Consulting Foresters and the National Woodland Owners Association. Similar to the ATFS, this certification system targets family forest landowners. GTF has a labeling program as well as a chain-of-custody certification program.

Standards

The GTF certification system consists of ten criteria and 46 indicators. The criteria are as follows:

- Forest planning and management.
- Forest health, inventory, and natural diversity.
- Logging, post-harvest education, and reforestation.
- Road construction, stream crossings, and protection of special sites.
- Product utilization and aesthetics.
- Chemical utilization.
- Community and social relations.
- Economic viability.
- Record keeping and tracking.
- Commitment to sustainability.

Performance criteria and indicators are used to evaluate the application of the various standards on the land to be certified. The following is an example of one standard.

Criteria #1 Forest planning and management

Indicator 1. Written, ten-year management plan is in place, documented and updated periodically.

Indicator 2. Landowner holds clear title and has considered easements.

Indicator 3. Property boundaries are known and clearly marked.

Indicator 4. Professional forestry advice (private and/or public) has been identified and obtained.

Indicator 5. Clear commitment to stewardship has been demonstrated.

Indicator 6. Contractors (logging, road, other) are informed of forestry plans and/or goals.

The criteria and indicators cover a number of general items, social considerations, management considerations, public involvement activities, and monitoring requirements. These include:

General Considerations

- Obtain resource inventory
- Obtain management plan
- Comply with all laws and regulations
- Demonstrate long-term commitment to sustainability
- Ensure long-term harvest levels

Social Considerations

- Recognize clearly demonstrated use rights
- Maintain indigenous control of land/rights/compensation

Management considerations

- Meet water quality standards
- Identify and manage special sites
- Require proper training of personnel and contractors
- Maintain/enhance nontimber values
- Require reforestation/afforestation
- Minimize chemical use
- Protect and maintain soil/forest productivity
- Protect rare, threatened, and endangered species
- Protection from damaging agents
- Manage visual impacts of harvesting
- Use of appropriate policy tools
- Minimize waste and promote efficient utilization

Public Involvement

- Publicize management plan

Monitoring

- Establish monitoring program

Certification Process

Third-party certified foresters approved by the NFA conduct GTF certification. The process begins with a preliminary phone interview, followed by a field review conducted by an auditor. Each parcel needs recertification every five years.

Status

There are currently 66,827 GTF certified acres in the US, with none in the state of Minnesota.

Small ownerships

GTF certification is aimed at certifying strictly private forest land holdings and focuses on small ownerships (Green Tag Forestry 2005).

Summary of Certification Programs

Although there is value in examining these standards in isolation, a comparative summation highlights important similarities and differences between the forest land certification systems available to Minnesota family forest landowners. Tables 2 and 3 provide a comparison of the various standards required by the aforementioned four certification systems (FSC, SFI, ATFS, GTF), as well as the number of acres certified nationally and in Minnesota.

Table 2. Comparison of certification standards.

Standards	SFI	FSC	ATFS	GTF
General Considerations				
Obtain resource inventory	X	X	X	X
Obtain management plan	X	X	X	X
Comply with all laws and regulations	X	X	X	X
Demonstrate long-term commitment to sustainability	X	X	X	X
Ensure long-term harvest levels	X	X		X
Use of adaptive management	X	X	X	
Comply with international agreements	X	X		
Ensure procurement activities do not compromise sustainability	X	X		
Support forest research, science, and technology	X	X		
Pay all prescribed fees, royalties, and taxes	X	X		
Manage for sound economic performance	X	X		
Social Considerations				
Provide for safe working conditions	X	X	X	
Recognize clearly demonstrated use rights	X	X		X
Maintain indigenous control of land/rights/compensation	X	X		X
Maintain local control/enhance local economy	X	X		
Confer with indigenous peoples	X	X		
Encourage sound practices through procurement activities	X	X		
Protect areas from illegal logging, settlement, conversion	X			
Employ mechanisms to resolve use rights disputes	X			
Management Considerations				
Meet water quality standards	X	X	X	X
Identify and manage special sites	X	X	X	X
Require proper training of personnel and contractors	X	X	X	X
Maintain/enhance nontimber values	X	X	X	X
Require reforestation/afforestation	X	X	X	X
Minimize chemical use	X	X	X	X
Protect and maintain soil/forest productivity	X	X	X	X
Protect rare, threatened, and endangered species	X	X	X	X
Protection from damaging agents	X	X	X	X
Manage visual impacts of harvesting	X	X	X	X
Conservation of biological/habitat/stand diversity	X	X	X	

Protection measures for riparian areas	X	X	X
Use of prescribed fire	X	X	X
Use of appropriate policy tools	X	X	
Minimize waste and promote efficient utilization	X	X	X
Conduct environmental assessments	X	X	X
Use of land planning	X	X	X
Protection of representative samples of ecosystems	X	X	
Use of exotic species	X	X	
Utilization of biotechnology	X	X	
Proper disposal of wastes	X	X	
Emergency preparedness and response	X	X	
Use of genetically modified organisms	X	X	
Use of biological control methods	X		
Conversion to plantations	X		
Management of "high-value conservation" forests	X		
Management of plantations	X		
Public Involvement			
Publicize management plan	X	X	X
Establish procedures to address public concerns	X	X	
Encourage landowners to use qualified professionals	X		X
Provide public access for recreation/education	X	X	
Support activities of public outreach, education, and involvement	X	X	
Implement public participation process	X	X	
Publicize monitoring data		X	
Encourage other landowners to implement sustainable practices	X		
Promote efforts by others to encourage sustainable forestry	X		
Monitoring			
Establish monitoring program	X	X	X
Monitor efforts to promote sustainable forestry	X		

Table 3. Acres of forest land third-party certified in Minnesota and the US.

Standard	Acres certified (thousands)	
	MN*	US*
Forest Stewardship Council	1,180**	16,000
Sustainable Forestry Initiative	1,491	45,700
American Tree Farm System	0	3,200
Green Tag Forestry	0	67
Total	2,671	64,967

Source: FSC 2005; SFI 2005; ATFS 2005; GTF 2005.

* Acreage may be double counted as some entities have certified their lands under multiple certification systems.

* Includes approximately 5,000 acres of family forest land.

D. Other Programs Supporting Certification Efforts

Guideline Implementation Monitoring

Since 1999, comprehensive guidelines have been available to assist Minnesota forest land managers and loggers in applying timber harvesting and forest management practices that protect important forest resource values. These voluntary guidelines address seven topical areas: riparian zone management, forest soil productivity, cultural resource protection, wildlife habitat, water quality protection, wetlands protection, and visual quality management.

The same state legislation that required the development of guidelines also directed the MN DNR and MFRC to develop collaboratively a program to monitor the application of the guidelines across the state on both public and private forests. Using air photos and satellite imagery, recently harvested sites are selected randomly across northern Minnesota. An independent contractor conducts on-site field evaluations of all sites selected with permission of the landowner.

Each site evaluation includes a profile of the site (including maps indicating site features), information from the landowner about primary land management objectives, perceptions about resources and conditions on the site, use of the guidelines, the level of discussion and interaction between the landowner and logger regarding the use of guidelines, and an assessment of measurable timber harvesting and forest management guidelines (e.g., width of the riparian management zone, residual basal area within the riparian management zone, number of leave trees and size of leave tree clumps).

With the exception of 2003, guideline implementation monitoring has been conducted annually since 2000. Each year, approximately 100 sites are evaluated. To date, forest land owned and/or managed by the USDA-Forest Service, state, county land departments, corporate private, American Indian tribal, and family forest lands have been monitored.

While Minnesota's monitoring data currently has no direct link to forest land certification efforts, the state's guideline implementation monitoring activities have the potential to support forest land certification. Consider, for example, the following similarities between Minnesota's guideline implementation monitoring and third-party auditing activities associated with forest land certification. Both focus a significant portion of their field monitoring activities on the same type of activities, namely recently harvested sites. For the monitoring program, the focus is exclusive. For certification, third-party auditing reviews other forest management activities in addition to timber harvesting (e.g., reforestation). Second, when evaluating specific practices, both guideline implementation monitoring and third-party auditing use the same practice standards, namely Minnesota's timber harvesting and forest management guidelines. The process by which sites are selected for review in both activities is also the same, namely a random selection process conducted by a third party. Finally, the results of both monitoring and auditing activities are also made available to the public at some level.

A final note. Guideline implementation monitoring includes site reviews across all forest land ownership categories in Minnesota, whereas forest certification monitoring is ownership-specific. Should future forest land certification programs include provisions to certify several ownership categories (e.g., public, private) under a single certificate, Minnesota's guideline implementation monitoring program could prove useful for such efforts.

Sustainable Forest Incentive Act

In 2001, the Minnesota Legislature passed the Sustainable Forest Incentive Act (SFIA). This is a preferential property tax incentive program available to forest landowners in

Minnesota. To receive preferential treatment, given in the form of an annual payment check to the landowner from the state, the following conditions must be met:

- Land must be a minimum of 20 acres and at least 50 percent forested.
- There are no delinquent taxes.
- Cannot be enrolled in a number of other incentive programs.
- Cannot be used for residential or agricultural purposes.
- Must be enrolled for a minimum of eight years.
- Must have a forest management plan.
- Management activities must meet the MFRC forest management guidelines.

As a condition of enrollment into the SFIA program, especially in regard to the last two conditions, any parcel should meet most, if not all, of the requirements of the various certification systems available to Minnesota family forest landowners. As of January 1, 2005, there were approximately 550,000 acres enrolled in the SFIA program of which 103,698 acres were family forest land (MN DOR 2005).

IV. Case Studies: Certification Systems Directed At Family Forest Land

While certain forest certification systems available to Minnesota forest landowners contain provisions specific to small acreage forest landowners (e.g., FSC's Family Forests and Group Certification programs) or were developed specifically for the family forest landowner (e.g., ATFS, Green Tag), their use within the state by family forest landowners has been very minimal. Lack of knowledge of forest land certification among Minnesota family forest landowners, requirements to obtain certification under available systems, and certification costs in relation to perceived certification benefits have been major impediments to substantial enrollment of the state's family forest land in a certification program.

The section describes the forest land certification programs of two countries—Finland's Finnish Forest Certification System (FFCS) and Norway's Living Forest Standards. Both countries' forest land certification programs have been developed under the auspices of PEFC—an umbrella framework for forest land certification. These two certification programs are presented because they have been, by many measures, particularly successful in certifying family forest land in their respective countries. These countries also have a large number of family forest landowners facing many of the same challenges as Minnesota. With the exception of Canada, Finland and Norway have certified the largest amount of forest land within the PEFC system of 20+ countries. Moreover, Finland and Norway's forest certification systems are particularly focused on family forest landowners, offering insight on how other countries have been successful in recruiting family forest landowners to certify their land.

Readers will note important differences in Finland and Norway's forest land certification programs. Each country uses different performance standards to assess whether forests are sustainably managed, as well as approaches to certifying multiple owners under one certificate. The general approach taken by each country with respect to forest certification is also quite different, with Norway placing much greater emphasis on an "environmental management system" approach to forest sustainability than Finland. Recognizing the political and cultural differences between Scandinavian countries and the US, these case studies illustrate how many of the common challenges associated with certification of small acreage forest tracts have been successfully addressed.

A. Programme for the Endorsement of Forest Certification Schemes (PEFC)

PEFC is a mutual recognition forest certification system that endorses country-specific systems throughout the world. PEFC was established in 1999 through the collective action of 11 European countries. The primary objectives of PEFC are to establish the minimum requirements to judge the forest certification systems, and use these minimum standards and evaluate and endorse forest land certification systems of other countries. These two objectives are accomplished through PEFC's governing body, the PEFC Council (PEFC 2005a). It is important to recognize the PEFC certification requirements

are minimum standards. Most certification systems impose more restrictive eligibility requirements and standards than established by the PEFC Council.

PEFC uses as a common framework for evaluating national forest certification systems the six criteria and 27 indicators identified in the Pan-European Criteria and Indicators for Sustainable Forest Management in European Forests (PEFC 2004). For those countries that are not party to the Pan European Criteria and Indicators, PEFC recognizes seven additional Intergovernmental Processes for sustainable forest management (e.g., Montreal Process Criteria and Indicators) (Dovetail Partners 2004).

PEFC recognizes three methods for certifying forest land: individual, group, and regional certification. Individual certification certifies the forest holding of a specific landowner. Group certification certifies forest land owned by two or more owners under a single certificate, typically small- to medium-size forest land holdings. Regional certification certifies forest land of participating forest landowners within a defined geographic area under one certificate (PEFC 2004).

In order to apply for a regional certificate under PEFC, a majority vote of the organization representing the forest landowners in the region is needed. Because individual landowner participation in regional certification is voluntary, greater than 50 percent of the forest area within the region needs to be represented in the application in order to be eligible for regional certification. If the region is certified, only timber harvested from the forests of participating owners or managers can be recognized as sourced from certified forests. The certification standards used to judge timber harvesting and forest management practices within the region apply uniformly to all forests in the region under the certificate. When selecting sites to assess conformance to the certification standards (i.e., field audits), all participating forest lands within the region are eligible to be reviewed (PEFC 2004).

PEFC is the world's largest forest certification system. As of April 2005, more than 300 million acres of forest land has been certified under 17 PEFC-endorsed certification systems in four continents (Table 4) (PEFC 2005a).

B. PEFC Finland

Overview

Finland has approximately 118,000 square miles of surface area, roughly two-thirds of which are forested (78,000 square miles) (Finnish Forest Research Institute 2005). In contrast, Minnesota has 87,000 square miles of surface area and 26,000 square miles of forest land (MN DNR 2004a). Finland's forests are largely located within the boreal coniferous forest zone, characterized by short growing seasons and limited forest tree species. While four coniferous and more than 20 deciduous tree species are native to the country's forests, three species dominate: Scots pine, Norway spruce, and silver birch (Finland Ministry of Agriculture and Forestry 2000). A typical management regime for softwood management for central and southern Finland can be characterized as reforestation through planting or natural regeneration, two release treatments to eliminate competing vegetation (one at 10 years, another at 15 years), a first thin (typically

precommercial) at 25 years, followed by one to two subsequent commercial thinnings before a final harvest when the stand reaches 60-80 years of age (Laitenen 2005). Most timber harvesting operations are quite small—averaging approximately five to 12 acres each (Rummukainen 2005).

Table 4. PEFC forest certification systems and associated acreage, 2005.

PEFC countries endorsed certified forest area	Total acres certified	Method of certification		
		Individual certification	Group certification	Regional certification
Australia	4,554,061	4,554,061		
Austria	9,696,415			9,696,415
Belgium	579,729			579,729
Canada	157,558,332	147,303,459	10,254,873	
Chile	3,836,113	3,836,113		
Czech Republic	4,782,053			4,782,053
Denmark	33,648	9,348	24,300	
Finland	55,241,881			55,241,881
France	8,900,894		1,423	8,899,471
Germany	17,273,986			17,273,986
Italy	879,826	7,198	706,207	166,421
Latvia	93,554	20,930		72,624
Norway	22,812,028		22,812,028	
Spain	904,011	790,372		113,639
Sweden	15,844,765	8,792,009	7,052,756	
Switzerland	782,953	782,953		
United Kingdom	22,548		22,548	
TOTAL:	303,796,797	166,096,443	40,874,135	96,826,219

Source: <http://www.pefc.org/internet/html/> Accessed June 20, 2005.

Family Forests and Their Owners

Family forests dominate the forest landscape in Finland, controlling more than half of the country's total forest land area. Like Minnesota, forest industry has a relatively minor share of the forest land base in Finland, owning less than 8 percent. As a source of wood fiber, Finland's family forests are a major contributor to the country's wood-based economy. This 35 million acre forest land base provided 84 percent of the commercial harvest volume in 2004, and had contributed more than 80 percent of the harvest each of the last ten years (Finnish Forest Research Institute 2003).

There are an estimated 446,000 private forest land parcels in Finland, with the average parcel size just less than 80 acres—slightly more than the average size of a Minnesota family forest parcel. The country's largest family forest holdings are in the northern part of the country where average parcel size exceeds 162 acres (MTK 2005). In most of Finland, however, most family forest parcels are less than 100 acres (Finnish Forest Research Institute 2003). Forest land tenure trends suggest the middle-size forest holdings, those 50–125 acres, are decreasing in number while the smallest and largest landholdings are increasing. Most of the increase in the smallest holdings is a result of forest land being divided among the estate's heirs. It is estimated that nearly 900,000 individuals have an ownership stake in the country's forests—one of every five Finnish citizens is a forest landowner (Finland Ministry of Agriculture and Forestry 2000).

Farmers and retirees are the two largest categories of Finland family forest landowners, controlling 33 percent and 32 percent of all such land, respectively. Over time, the proportion of forest landowners generating the majority of their annual income from farming has decreased while the number of forest landowners retired or earning income from nonagricultural pursuits has increased (Finland Ministry of Agriculture and Forestry 2000). Like Minnesota, few family forest landowners in Finland are less than 40 years old. Nearly 90 percent of the family forest landowners are 40+ years old, with 40 percent exceeding 60 years of age. In 1999, 60 percent of Finland's family forest landowners resided on their land, and an additional 15 percent lived within the same municipality. Only a quarter of the owners are considered "absentee" owners (Finnish Forest Research Institute 2003). When characterized according to the size of the community where Finnish forest landowners reside, 70 percent live in rural areas, with an additional 10 percent living in communities with a population less than 20,000. Only 20 percent live in large metropolitan areas (Finland Ministry of Agriculture and Forestry 2000).

Surveys of the country's family forest landowners suggest changing attitudes about forest landownership. Two family forest surveys conducted in Finland in 1990 and 1999 found the portion of owners who had multiple ownership objectives (e.g., financial, recreational, environmental) increased substantially from 35 percent in 1990 to nearly half of all owners in 1999. The percent of owners expressing recreation and investment as the single most important ownership objective remained stable, while those who look to their forests as the major source of their household income decreased from 27 percent in 1990 to only 18 percent in 1999 (Finland Ministry of Agriculture and Forestry 2000).

Unlike Minnesota, where less than one-quarter of family forests have associated with them a forest management plan, forest management planning in Finland is much more common. In southern Finland, for example, forest management plans have been prepared for roughly 60 percent of the area's family forests (The Union of Forest landowners 2005). Countrywide, more than 140,000 individual forest management plans have been prepared, covering nearly 18 million acres (Finland Ministry of Agriculture and Forestry 2000).

Nationally, about half of the forest landowners (controlling 60 percent of the forests) have a forest management plan that is no more than ten years old. Owners with a forest plan hold, on average, approximately twice as much forest land as owners without a forest management plan. Forest plans are most common among farmers, while least common in inherited estates (Hänninen 2004).

Finland's Everyman's Right Law provides free right of access to the country's land and waterways, and the right to collect natural products such as wild berries and mushrooms, no matter who owns the land. These rights also generally apply to foreign citizens, with certain exceptions related to local boating, fishing and hunting rights. Everyman's right means that access to the land is free of charge, and does not require the landowner's permission. Everyman's right consists of a set of generally accepted traditions formalized in various laws and regulations (The Finnish Ministry of the Environment 2005).

Legal Framework for Forestry

Finland has a long history of policies and programs that influence the management, use, and protection of its family forests. Legislation explicitly dealing with forestry dates back well over 100 years when the Forest Act of 1886 was passed to deal with forest destruction. Since that time, several laws governing forest practices and planning have been enacted. However, the most significant reforms of Finland's forest policy have occurred over the past decade with passage of the following forestry legislation or amendments to existing forestry laws (Finland Ministry of Agriculture and Forestry 2000, Finnish Forest Certification System 2005).

The Forest Act: Promotes economically, ecologically, and socially sustainable management and utilization of forests to ensure long-term, productive forests while concurrently retaining forest biodiversity. A new aspect in the Forest Act is securing forest nature biodiversity, with key habitats listed in the act. The act obligates the forest landowner to inform the relevant Forestry Centre about all harvesting and regeneration work two weeks before the work can begin. The act requires Forestry Centres to draw up regional target programs for the sustainable use of the forests.

Act on the Financing of Sustainable Forestry: Provides financial support to implement the provisions of the Forest Act. The act guarantees government subsidies for management activities on private forests that would not be profitable for the landowner if required to underwrite the entire cost. The types of activities financed include but are not limited to: young stand release, precommercial thinning forest regeneration, afforestation of agricultural land, prescribed burning, harvesting of energy wood, forest fertilization in some specific cases, improvement ditching, and forest road construction.

Forest Management Association Act: Authorizes the role of forest management associations to promote the profitability of forestry by providing assistance to family forest landowners and promoting economically, ecologically and socially sustainable forest management and utilization. It also authorizes forest management associations to receive public financing to accomplish their mission.

Nature Conservation Act: Establishes policies and processes to maintain natural biodiversity and to support sustainable use of natural resources and the natural environment. In addition to traditional nature conservation areas, the act makes it possible to establish production areas for rare or unique flora or fauna for a set period of time.

Institutional Framework for Forestry

Finland has a complex web of organizations that support forestry and forest management (Figure 3). Major organizations and their respective roles are as follows (Finland Ministry of Agriculture and Forestry 2000, MTK 2005).

Ministry of Agriculture and Forestry. The highest government authority governing forestry matters, the Ministry's responsibility is to promote a climate for the sustainable use and enjoyment of Finland's renewable natural resources. It is the lead entity in the development and implementation of national forestry legislation.

Finnish Forest Research Institute. A national research organization that supports research related to the management and utilization of Finland's forests.

The Forestry Development Centre Tapio. The Centre provides development and expert services for the country's forest-based sector. It also provides administrative and coordinating functions to the regional forestry centers.

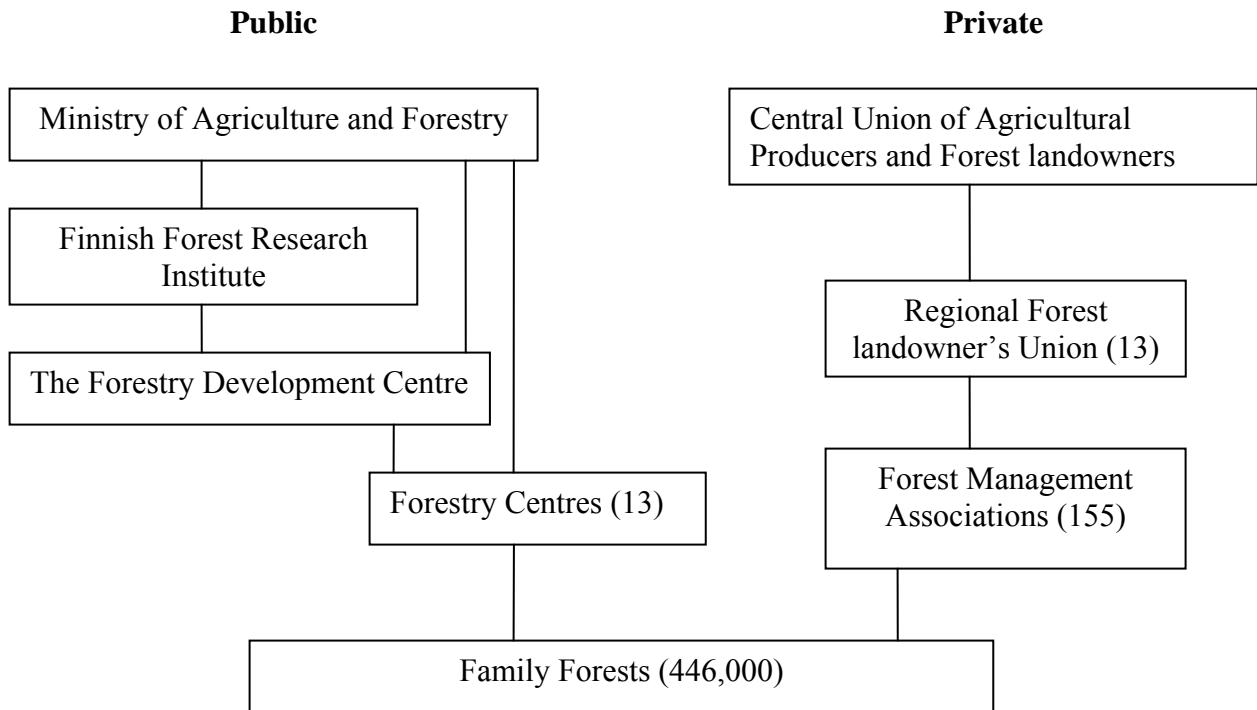


Figure 3. Finland's institutional framework for private/family forestry and forest management.

Forestry Centers. The 13 centers are responsible for field implementation of Finland's forestry legislation through monitoring, collaboration with other organizations, education and training, and planning.

Central Union of Agricultural Producers and Forest landowners (MTK). A national organization of Finland's private forest landowners providing economic and legislative services to its members. Areas of emphasis include timber trade, forest policy legislation development, and education and outreach activities to the regional forest landowner's unions.

Regional Forest Owner's Union. These 13 unions serve as coordinating mechanisms for the local forest management associations. Their role is to promote private forestry and protect the interests of Finland's family forest landowners, guide and develop the activities of the forest management associations, and provide forest products marketing assistance. Their geographic boundaries are identical to those of the regional forestry centers. They apply for certification with the Finnish Forest Certification System on

behalf of individual forest landowners within their respective regions (except when certification takes place at the level of the forest management association).

Forest Management Associations. These 155 organizations are a service organization to Finland's family forest landowners, providing training and professional assistance, technical services, marketing services. They are also the organization that applies for certification with (and holds the certificate to) the Finnish Forest Certification System on behalf of individual forest landowners within their respective region.

Finland's Forest Certification System

Finland was one of the first countries endorsed by the PEFC Council. Established in 1999, the Finnish Forest Certification System (FFCS) was endorsed by PEFC in 2000. The FFCS consists of several standards and 28 economic, ecological, and social criteria for forest management, which were updated 2002-2003 on the basis of first-time criteria established in 1997 (Table 5). Each criterion is evaluated using one or more performance indicators specific to the (two optional) levels of regional certification (i.e., forest centre or forest management association). Table 6 identifies the criterion, performance indicators, and definitions for forest management planning (criteria #6), one of the 28 criteria used by the FFCS.

The Finnish Forest Certification Council, a 12-member organization represented by a broad range of the country's forest resources, owns the FFCS standards. The standards and criteria are reviewed and, where needed, updated approximately every five years. In 2003, the FFCC completed its first review and revision of Finland's certification standards. Through the review and revision process, all eight standards were revised, and the number of criteria was decreased from 37 to 28 (Finnish Forest Certification Council 2005). Today, an estimated 95 percent of Finland's forests (approximately 54 million acres) are certified (Finland Ministry of Agriculture and Forestry 2000, Finnish Forest Certification Council 2005).

FFCS uses regional certification (as one option) as the means by which to grant forest landowners certification status. In Finland, regional certification can occur at two alternative administrative levels—forestry centers or more localized forest management associations. At the forestry center, the 28 certification criteria listed in Table 48 apply. At the forest management association level, there are 26 certification criteria (criteria 2 and 26 are not used). Interpretation of identical criteria may vary slightly with the size of the region being certified (i.e., forestry center versus forest management associations). Certification can also occur at the level of an individual forest holding or group of forest landowners. At the individual owner or group level, there are 25 certification standards. Any regional or group applicant is required to establish a regional forest certification committee to oversee the administrative details associated with the application and certification of the region's forests (Finnish Forest Certification Council 2004). At the present time, all forest land certified under the FFCS has been accomplished through regional certification (PEFC 2005a).

The decision to be certified under a regional FFCS certificate is made by organizational entities (e.g., forest management associations and forest owner's unions), not individuals. To apply for an application for a regional certificate, a two-thirds majority vote by the association's members is needed. However, participation is voluntary, and individual members of an association or union seeking certification status can choose not to have their holding part of the regional certification holding. Regional certification is also available to other forest owners in the region (e.g., forest industries, companies, municipalities, and the state). Additionally, forest landowners within the region who are not members of the organization applying for certification (e.g., forest management association) can also enroll their forest land, as can other related interests (e.g., loggers).

Table 5. Finnish forest certification criteria at the forestry center level (table shows the 2003 criteria).

Number	Criteria
1	The requirements enacted by legislation are complied with.
2	The sustainable allowable cut is not exceeded in the area.
3	Spreading the infection of root rot is prevented.
4	Finnish native tree species are used in forest regeneration.
5	Avoidance of forest harvesting damage in thinnings.
6	Forest management planning promotes sustainable forest management.
7	Seedling stands are tended.
8	Promotion of first thinnings and delivery logging in private forests.
9	Conservation value of protected areas and sites included in ratified national nature conservation programmes are not endangered.
10	Typical features of habitats of special importance are preserved.
11	Known habitats of endangered species are safeguarded.
12	Retention trees are left on regeneration areas.
13	Gene modified seed and plant material is not used.
14	Forest road plans include an environmental impact assessment.
15	Diversity of species dependent on burned areas and forest health are promoted by prescribed burning.
16	Bufferzone is left along watercourses and small water bodies to capture solid and nutrient runoff.
17	Peatland nature is preserved.
18	Water protection is safeguarded in draining sites.
19	The quality of groundwater areas is not deteriorated with chemical pesticides or fertilizers.
20	Use of chemical herbicides and pesticides is avoided in forest management.
21	Employees' competence and ability to work are safeguarded.
22	Preconditions for the high quality and safe working are ensured.
23	Adherence to statutory obligations of employers.
24	Forest landowners' know-how is improved.
25	Responsible rights of access to forests are safeguarded.
26	Know-how on forests is increased among children and adolescents.
27	Safeguarding of Sámi culture and the traditional livelihoods in Sámi homelands.
28	Integration of reindeer husbandry and forestry.

Source: Finnish Forest Certification Council (2004).

Table 6. Criterion, performance indicators, and definitions for forest management planning, criteria 6 of the FFCS.

Title	6. Forest management planning promotes sustainable forest management
Criterion	The coverage of holding-level forest management plans ⁽¹³⁾ is at least 50% of the area of the forest holdings ⁽¹⁴⁾ not less than 20 hectares. In regional forest management planning, holding-level forest management plans are provided for the holdings with an area less than 20 hectares. The new forest management plans include, in addition to wood procurement aspects, natural sites ⁽¹⁵⁾ and consider other uses of forests ⁽¹⁶⁾ according to the management objectives of the forest landowner.
Indicators	The area of valid ⁽¹⁷⁾ holding-level forest management plans is compared with the corresponding area of forestry land.
Definitions	<p>13) <u>Holding-level forest management planning</u> contains the compartment specific inventory of holding's forest resources and the integration of inventory summary results into a holding-level forest management plan. Continually updated holding-level forest management plans, annually updated according to completed measures and other relevant information, are included in the area of holding-level forest management planning. Holding-level forest management plan must include, as forest production factors, stand specific data on trees and soil, needs of silvicultural treatments, and allowable cut.</p> <p>14) <u>Forest holding</u> is an entirety consisting of forest stands owned by a forest landowner.</p> <p>15) <u>Natural sites</u> included in forest management plans are:</p> <ul style="list-style-type: none"> - Areas included in national nature conservation programmes ratified by the Council of State but currently unaccomplished. - Habitats of special importance defined in criterion 10 and recognized habitats of threatened species defined in criterion 11, - Nature management and environmental sites funded by State. <p>16) Important areas on <u>other uses of forests</u> contain e.g.:</p> <ul style="list-style-type: none"> - Important game management areas, e.g., capercaillie mating sites, - Trails for outdoor recreation and hiking. <p>17) The time of validity of the forest management plans, not under continuous updating, referred to in this criterion, is 10 years in southern Finland, and 15 years in Kainuu and northern Ostrobothnia province, and 20 years in Lapland.</p>

Source: Finnish Forest Certification Council (2004).

C. PEFC Norway

Overview

Approximately 37 percent of Norway is forested—some 30 million acres. The country's mountainous topography covering nearly one-third of the landscape limits the large, contiguous forest areas to eastern and central Norway (Norway Ministry of Agriculture 2005). Combined with Norway's considerable northern latitude (reaching 71°), nearly half of its forest are not considered productive for commercial timber management purposes. Of the country's remaining 18 million acres of productive forest land, 30 percent is legally protected from commercial timber harvesting or considered non-economic due to difficult terrain and long distance transport (Living Forests Norway 1998b). Consequently, less than half of the country's productive forests (approximately 13 million acres) are considered viable for commercial forest management (Nordic Family Forestry 2005).

Like Finland, Norway is dominated by three principle commercial species: Norway spruce (45 percent of the forest area), Scots pine (33 percent), and birch species (15 percent). The remaining commercial trees consist of a variety of hardwood species (e.g., aspen, alder, oak) (Norway Ministry of Agriculture 2005). Spruce contributes 77 percent of the harvest, pine 20 percent, and hardwoods (primarily birch) the remaining 3 percent (Living Forests Norway 1998a). Three-fourths of the harvest volume is pulpwood, with the other quarter sold as sawtimber (Norway Ministry of Agriculture 2005). Norway's annual timber harvest is nearly identical to that of Minnesota, namely approximately 3.6 million cords harvested each year. While management of Norway's softwoods includes intermediate treatments (e.g., thinning), the extent to which these treatments are applied across the landscape is less than in Sweden and Finland.

Family Forests and Their Owners

As with Finland, family forests dominate the ownership of Norway's forests. There are an estimated 125,000 forest properties, 96 percent of which are family owned. Collectively, family forests constitute 80 percent of the country's forest area (Norwegian Forest landowners' Federation 2005). With few exceptions, these private forests are kept within the family from generation to generation. Norway has several laws that strictly regulate the use and ownership of its private forests. For example, Norway's Act of Allodial Rights gives the first-born child the first option to the family property (Living Forests, Norway 1998b). Other laws influence the use and management of Norway's forests in several ways by restricting ownership of forest land by noncitizens, controlling subdivision of forest land, and requiring individuals owning greater than 25 acres of forest to live on the forest or within the municipality where the forest is located (Loken 2005; Norwegian Forest landowners' Federation 2005).

The average size of a family forest holding is about 125 acres, slightly larger than the average parcel size in Finland and twice that of Minnesota's family forests (Norwegian Forest Landowners' Federation 2005). Many of these properties, particularly the smaller holdings, are not managed with timber production as a primary ownership objective. In fact, only 24 percent of Norwegian forest landowners are actively engaged in managing their forest through timber harvesting (Living Forests Norway 1998b). The Norwegian Forest landowners' Federation estimates the average size of actively managed family forest parcels is about 500 acres, with approximately 45,000 parcels (36 percent) accounting for the country's wood fiber sourced from its private forests. The size of a harvested area on family forests is small—averaging only 3.5 acres (Nordic Family Forestry 2005; Norwegian Forest landowners' Federation 2005; Norway Ministry of Agriculture 2005).

Norwegian law (The Nature Protection Act) provides that the public has year-round access (nonmotorized) to all noncultivated land in the country. Although free access dates back centuries, it has only been within the past 50 years that this ancient right has been codified in law. Typical public uses of family forests include berry and mushroom picking, hiking and cross-country skiing, and fuelwood gathering. Hunting and fishing rights, however, are the property of forest landowners. Off-road motorized vehicle use is prohibited (Nordic Family Forestry 2005).

Forest management plans have been prepared on an estimated 70 percent of Norway's family forests. The content of these plans are very similar to those that might be prepared for Minnesota's family forest landowners (e.g., aerial photos, detailed maps and forest descriptions). In Norway, the decision whether to have a forest management plan prepared rests with the forest landowner. However, for purposes of national forest planning and data collection, legislation authorizes government organizations to collect basic information on individual forest properties. Consequently, data is collected on most forest properties even when an owner is not interested in having a plan prepared. For those seeking a forest management plan for their property, government grants are available to help underwrite a significant portion of the plan's cost (Living Forests Norway 1998c).

One of the more interesting aspects of private forest management in Norway is the Forest Trust Fund. The fund was established in 1932 in response to concern about the lack of investment in silvicultural practices on private forests. When enacted, the law levied a tax equal to 1 percent of the gross timber sale value to be deposited in a trust fund on behalf of the owner's property. Today, forest landowners are required to deposit a certain portion of timber sale receipts into a dedicated account. Although the Ministry of Agriculture determines the minimum and maximum percentages of gross timber sale revenue to be deposited, typically between 8-25 percent, the owner decides how much will be set aside. All funds set aside accrue to the land, and not the owner. Landowners can draw on the funds deposited in the account for their property for a variety of land management and planning activities such as reforestation, forest road development, forest management planning, and protecting important environmental values. Any interest generated on these accounts does not accrue to the landowner, but is used to underwrite the administrative costs of the fund and support local forest management and planning activities. An estimated 45 percent of all long-term silviculture investments are financed by proceeds of the forest trust fund (Living Forests Norway 1998d; Center for International Forestry Research 2005).

Legal Framework for Forestry

Norway's forest policy strategy aims to address three major goals: (1) promoting long-term resource management; (2) contributing to added value and employment in the country's forest-based sector; and (3) conserving and enhancing forest-based environmental values (Norway Ministry of Agriculture 2005). To do so, a wide range of policy tools are used to implement this strategy including legislation, taxation, economic support schemes, research, extension services, and administrative procedures (Norwegian Ministry of Agriculture 2004). Additionally, a large number of laws directly or indirectly impact private forest land. Of these, four are commonly cited as having the greatest and most direct impact on Norway's family forests.

The Forest and Forest Protection Act. This law is the main legal framework for encouraging sustainable forest management in Norway. It promotes forest production, protection, and reforestation of forest land, and the management of forests for a wide range of uses and values. Under the law, timber harvesting on more than 400,000 acres of forest land has been severely restricted due to the presence of special environmental or

recreational values. The act also classifies approximately 20 percent of all forest land as protection forest whose management must be given special consideration due to location or physical characteristics. A notable provision of the act is the Forest Trust Fund to fund long-term investments on private forests (Lindstad 2002; Norwegian Ministry of Agriculture 2004; Nordic Family Forestry 2005).

Nature Conservation Act. Provides for the classification of specific areas under various degrees of protection. Under the act, 6 percent of Norway's forests is designated as national parks (most types of commercial timber harvesting is banned), 4 percent as landscape protection areas (areas with distinctive landscape features where forest operations are normally subject to restrictions), and 1 percent as nature reserves (distinctive areas totally protected against commercial or industrial activity and interference of any kind) (Nordic Family Forestry 2005).

Planning and Building Act. Protects Norway's forest land from nonforestry development through comprehensive land use planning and building standards.

Open Air Recreation Act. Provides individuals the right to access and use uncultivated land for most outdoor recreation purposes, regardless of who owns the land.

Institutional Framework for Forestry

Like Finland, Norway's institutional framework influencing the management, use, and protection of family forests is extensive (Figure 4). Although quite distinct from Finland in several respects, Norway's family forests exist within a highly structured institutional environment. The following describes the major public and private organizations and their respective roles influencing Norway's family forests.

Public Framework. Public forest administration in Norway is organized along three levels. Nationally, the Ministry of Agriculture and Food has authority over forestry through its Department of Forestry and Natural Resource Policy. At the county level, authority over forest matters is delegated to the county governor and its Department of Agriculture, Forestry Section. Norway's 450 municipalities deal with the most localized forestry and forest management issues. The responsibilities of these organizations are to ensure the Forest Act and other relevant acts are complied with, administer cost share and grants to forest landowners, provide guidance and technical support, and participate in land management planning processes (Nordic Family Forestry 2005).

Private Framework. The Norwegian Forest landowners' Federation is a cooperative organization for the country's family forest landowners, representing its 57,000 members with regard to legislation, information, marketing, and trade issues affecting forests. The regional forest landowner associations (and through them local forest landowner associations) are involved with marketing roundwood, negotiating stumpage prices, preparing timber sales, assistance in forest management planning activities, and providing forest extension and training assistance to its members (Nordic Family Forestry 2005; Viken Skog 2005).

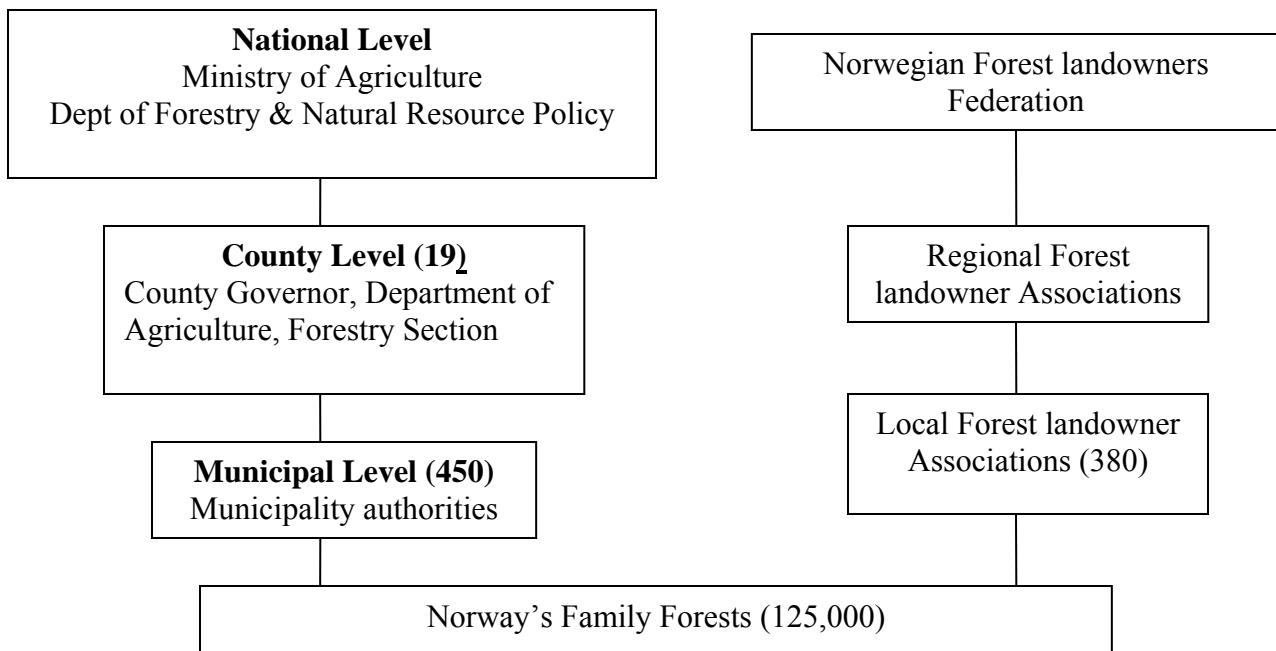


Figure 4. Norway's institutional framework affecting family forests.

Norway's Forest Certification System

The dominant forest land certification system in Norway is PEFC-Norway. This certification system is based on an environmental management system (ISO 14001) that uses Living Forests as its environmental standard. The Living Forests standards were initiated in 1995 with the following two major objectives:

- Help create Norwegian and international confidence in the raw materials from the Norwegian forest industry being based on sustainable and environmentally friendly Norwegian forest management.
- Indicate the will and ability of Norwegian forestry in long-term resource management through R&D, competence building and information, making the raw material an asset and thereby develop and secure employment and added value in Norwegian forests and forest industries.

The Living Forests initiative spanned three years and involved a broad range of Norway's forest resource-based interest groups. Its work focused on defining how Norway's forests should be managed, followed by developing and testing performance standards for defining sustainable forest management based on existing data and available science. Because the Living Forests initiative was established prior to and independent of Norway's forest land certification initiative (e.g., PEFC-Norway), it was not until 1997 (two years into the initiative) that forest land certification was addressed. Through a certification committee of the initiative, linkages between the Living Forest Standards and other forest land and environmental management system certification systems were developed and defined (Living Forests Norway 2005).

In 1998, the working group responsible for developing the Living Forests standards reached agreement on 23 standards for defining sustainable forest management in Norway. These standards, along with 95 indicators, constitute the means by which sustainable management of Norway's forests is defined and evaluated (Living Forests Norway 2005). Table 7 describes the subject material addressed in the 23 Living Forests standards.

Table 7. Subject areas addressed in Norway's 23 Living Forests standards.

Number	Standard
1	Afforestation / Introduction of new species in afforestation areas
2	Areas of biological importance—key biotopes
3	Bogs and wetland forest
4	Cultural landscapes
5	Distribution of species
6	Fertilizing
7	Forests affected by fire
8	Forest area protection
9	Forest roads
10	Harvest methods
11	Herbicide spraying
12	Heritage sites
13	Landscape ecology
14	Long-term wood production
15	Mountain forest
16	Off-road transport
17	Old, large trees and deadwood
18	Outdoor recreation
19	Protection of genetic material—forest trees
20	Scarification
21	The work force and skills
22	Waste management
23	Water protection

Source: Living Forests Norway (2005).

For each subject area, one or more standards have been developed. Table 8 identifies the standard used to address the management of old, large trees and deadwood (#17) and water protection (#23). While the standard for retaining trees is quite specific, others are less prescriptive. For example, the Water Protection standard (Living Forest Standard 23) simply states “a multi-level border zone must be maintained or developed against water and water courses,” without giving specific metrics as to what the dimensions or harvest practices within this zone should be.

Table 8. Norway's Living Forests Standard and metrics for old, large trees and deadwood and water protection.

Standard (number)	Standard Metric(s)
Old, Large Trees and Deadwood (17)	<p>In the harvesting process, an average of 5-10 wind-resistant trees must be left standing per hectare as eternity or lifetime trees, possibly in groupings. The eternity or lifetime trees should preferably be selected among the older trees in the stand, and consist of both dominating and possibly exceptional species. Preference given to eternity trees should particularly involve forest trees of great visual value, trees containing bird nests, old large aspen trees and older hardwood trees where the branches have been cut for cattle feeding purposes. Eternity trees that die must be left standing.</p> <p>Large windfalls that have been on the ground for more than 5 years must be left in the forest.</p> <p>Damage to dead trees during their middle and late deterioration stage must be avoided by any forest operation.</p>
Water Protection (23)	<p>A multiple level border zone must be maintained or developed against water and watercourses where natural. The border zones contain many important ecological functions and serve a number of important functions related to nature environment and water quality, to the landscape and outdoor life, and for this reason must be adjusted in width and function according to local conditions.</p> <ul style="list-style-type: none"> • Transport in the direct vicinity of, and crossings of watercourses, must take place with minimal damage to border zone and the riverbank/riverbed. • Forest management alongside watercourses must take appropriate consideration for established resting areas, fishing and swimming sites, and heavily used trails and tracks.

Source: Living Forests Norway (2005).

PEFC-Norway is a group certification system that uses Norway's forest landowner's associations as the vehicle by which group certification is carried out. This certification structure was proposed because approximately 85 percent of the annual roundwood deliveries in Norway come from either the forest landowners' districts organizations (75 percent) or the Norwegian Forestry Association. Group certification through local forest landowner's associations occurs through one of three methods:

- **The Membership Scheme.** The bylaws of the forest landowners' association state members have to belong to the Living Forests Standards independent of whether the association markets their timber or not.
- **The Agreement Scheme.** Commits the forest landowner to meet the Living Forests Standards, as well as confirms the forest landowner wants to join a group (pool) to obtain certification.
- **The Sales Contract Scheme.** Commits the forest landowner to meet the Living Forests Standards, if they want the association to market their timber (PEFC-Norway 1999).

Because PEFC-Norway uses the Living Forest Standards as its environmental standard, any changes in the Living Forests Standards must be presented to the PEFC Council for assessment by an independent consultant to ensure that PEFC's requirements still are

fulfilled. Individual forest properties and forest landowners' district associations in Norway are certified according to ISO 14001 and the Living Forests Standards. Forest industry companies that are purchasers of this timber and holders of a chain-of-custody certificate can apply to PEFC-Norway for sublicense to use the PEFC-logo (PEFC Norway 2005). To date, PEFC-Norway has issued 10 group certificates that cover nearly 23 million acres of forest land—more than three-fourths of all forest land in Norway.

D. Discussion

Finland and Norway illustrate approaches to forest land certification taken by two countries where forest land ownership is dominated individuals or families. Each country's forest land certification system has important similarities and differences. For example, both countries have highly developed forest landowner institutions that assist forest landowners in managing and marketing their forest products. They also have both developed the standards used in their respective certification systems through multistakeholder collaborative processes. The governments in both countries also play a prominent role in assisting private owners in managing their forests through financial and technical assistance and regulation. Important distinctions between each country's certification programs can be seen with respect to the emphasis on forest land (Finland) versus environmental management system (Norway) certification, the method by which certification occurs (Norway uses group certification while Finland uses regional certification), and the specific performance standards by which forest management and timber harvesting practices are evaluated.

Acknowledging the economic, institutional, cultural, and social differences between Nordic countries and the US with respect to forest management, a number of important observations can be discerned. They include:

- **Areas dominated by family forests can have significant acreage certified.** With Finland and Norway having 95 percent and 76 percent of their forest land base certified, respectively. Forest land certification programs can be successful in capturing a large share of the family forest land base. The keys to both programs' success is designing certification systems that address important issues and barriers associated with certifying small acreage parcels.
- **Alternatives to individual parcel certification make sense.** Both countries rely on forest land certification systems that allow family forest tracts to be pooled in applying for and maintaining certification status. Finland's regional certification process certifies all participating forest landowners within a given geographic region, while Norway allows groups of small- and medium-sized forest landowners to be certified under one certificate. Both approaches recognize the high costs and practical limitations associated with certifying small acreage forests on a parcel-by-parcel basis.
- **Successful certification systems acknowledge the realities and limitations associated with owning and managing small acreage forests.** These include: the extensive period of time (frequently decades) that can occur between forest

management and timber harvesting activity; owner interest in and need for a forest management plan; owner willingness to underwrite the entire cost of forest land certification; owner's ability to be actively involved in all aspects of the forest land certification process; and owner access to the technical resources needed to apply for and maintain forest land certification.

- **Minnesota's institutional framework for forest management is similar to Finland and Norway in several important respects.** The collaborative nature Minnesota has employed to engage a wide range of stakeholders in the development of its forest policies and programs is similar to processes used to develop Norway's Living Forests standards and the standards used in Finland's Forest Certification System. Examples include development of the Minnesota's Sustainable Forest Resources Act and subsequent to it Minnesota's timber harvesting and forest management guidelines, landscape-based planning and coordination initiatives, and the Minnesota Forest Resources Council.
- **Minnesota's institutional framework for forest management is different than Finland and Norway in several important respects.** Chief among these is the highly organized structure of regionally based forest management or owner associations found in the Nordic countries that readily facilitates group or regional certification processes.
- **Minnesota is no less attentive to the environmental aspects of timber harvesting and forest management than Norway or Finland.** Minnesota's timber harvesting and forest management guidelines address many of the same environmental aspects of forestry (e.g., protecting water quality, visual quality management, wildlife habitat) found in Finland and Norway's certification standards. With respect to specific practices, Minnesota's guidelines are arguably as or more aggressive in suggesting practices to mitigate potential adverse impacts in several areas (e.g., riparian area management) than are the certification performance standards used in Finland and Norway.

Table 9 contrasts selected aspects of certification systems that are currently available to Minnesota forest landowners with those available to forest landowners in Finland and Norway. These comparisons highlight important distinctions in both the types of certification systems as well as standards used to evaluate timber harvesting and forest management practices.

Table 9. Comparison of certification systems and selected standards available to forest landowners in Minnesota, Finland, and Norway.

	Certification programs available to MN forest landowners	Finnish forest certification system (PEFC-Finland)	Norway's Living Forest standard (PEFC-Norway)
Method of certification	Primarily individual, although limited group opportunities exist	Regional	Group
Existence of regional forest management/forest landowner associations	No	Yes	Yes
Parcel-specific forest management plan required	Yes	No, existing forest management plans cover \geq 50% of forest area of holdings at least 50 acres	No
Riparian management practices	Generally 100-200 ft partial harvest zone, depending on type of management*	No restrictions on logging within 10-16 ft. buffer zone, 90% of soil surface remains intact in 10-16 feet zone that is defined by slope, soil, and harvesting conditions	A multiple level border zone must be maintained or developed against water and watercourses
Leave trees	Min. of 6 live trees per acre, 6" min. dbh. Leave dead trees where safety permits*	An average of 2-4 standing trees (dead or alive) per acre, 4" min. dbh	An average of 2-4 wind-resistant trees must be left standing per hectare as eternity or lifetime trees, possibly in groupings

* Recommendations contained in Minnesota's voluntary site-level forest management guidelines.

V. Minnesota Family Forest Landowner Attitudes and Perceptions of Forest Land Certification

A. Review of Previous Family Forest Surveys

There has been considerable conjecture as to the perceptions and attitudes of family forest landowners regarding forest land certification in the US and around the world. Very little research has been conducted up to this point to understand the perceptions and attitudes of this important constituency of forest land certification. They include studies conducted by Newsom et al. (2003) and Lindstrom et al. (1999). The results of their findings are summarized below.

Both of these studies involved surveys of family forest landowners. The Newsom et al. (2003) surveyed landowners in Alabama, whereas the Lindstrom et al. (1999) surveyed landowners in Great Britain and Finland. Both surveys were administered with the intention of better understanding the level of knowledge and attitudes toward forest land certification.

Regarding the level of awareness of forest land certification, Newsom et al. (2003) found that males and those using forestry incentive programs, receiving a substantial portion of income from forestry, interacting frequently with professional foresters, and belonging to landowner groups were more likely to be familiar with the concept and details of forest certification. They also found that 69 percent of those surveyed wanted to be further educated about certification. Lindstrom et al. (1999), in a survey of some European landowners, found the knowledge of these programs to be essential to participation. With at least a cursory understanding of certification, 42 percent of surveyed landowners in Alabama thought certification could significantly improve forest management, while 50 percent viewed certification as another layer of regulation (Newsom et al. 2003).

Lindstrom et al. (1999) found that most family forest landowners were unsure of the benefits of certification and did not consider certifying their land as a worthwhile activity.

The surveys of family forest landowners examined a number of program characteristics that could influence the likelihood of certification. The age of landowners, costs of certification, and the administrating body proved to be significant factors contributing to the likelihood of certification. In Finland, younger landowners were more likely to certify than older landowners (Lindstrom et al. 1999). Regarding the costs of certification, both surveys found that at least half of the landowners were unwilling to participate if they were required to pay any direct costs. The majority of landowners in Great Britain were willing to participate only if the costs were less than 2 percent of their timber income (Lindstrom et al. 1999). In Alabama, the main reasons for owning family forest land were improving wildlife habitat, enhancing timber productivity, and protecting the environment (Newsom et al. 2003). This finding further diminishes the prospects in landowners' willingness to certify if certification costs are attributed directly to the landowner as the reasons for ownership are primarily nonmonetary. However, 58 percent of those surveyed would be willing to certify if it reduces their forest management costs (Newsom et al. 2003).

Both surveys found trust to be an issue with the likelihood of having their land certified. The European survey found landowners preferred governmental bodies and landowner groups to be most desirable and trustworthy to administer the certification process (Lindstrom et al. 1999). In Alabama, landowner associations and professional foresters were indicated as being most trustworthy to administer a forest land certification scheme, whereas nonprofit or industry groups were found to be least trustworthy (Newsom et al. 2003).

To summarize, the two studies found that many landowners were unfamiliar with certification and there is a need to educate landowners. Some landowners were found to be more knowledgeable and open to certification than others. Newsome et al. (2003) also found that most were at least open to group certification and other cooperative initiatives, especially among younger landowners. Trust was an important element to any certification program and landowner groups, professional foresters, and some government entities were found to be most trustworthy regarding the administration of certification programs.

B. Survey of Minnesota Family Forest Landowners

Objectives

During the spring of 2005, the University of Minnesota conducted a mail survey of forest landowners who were selected randomly from property tax records in Aitkin, Cass, Itasca, and St. Louis counties. The overall purpose of the survey was to gather information from family forest landowners to use in efforts to design a family forest certification framework. This survey was the first family forest certification survey conducted in Minnesota. Prior to the survey, pertinent information such as family forest landowner attitudes about forest certification, interest in certifying their forest land, and preferences for various certification components was unknown.

The specific objectives of the 2005 Minnesota Forest Land Owner Opinion Survey were to:

- Identify family forest landowner interest in forest certification.
- Evaluate family forest landowner familiarity or understanding of forest certification.
- Assess the attitudes of family forest landowners about forest certification across a number of alternative certification program characteristics.
- Identify family forest landowner perceptions of benefits and drawbacks of forest certification.
- Assess family forest landowner willingness-to-pay for forest certification.
- Determine current forest management practices of family forest landowners.
- Collect sociodemographic information about family forest landowners in Aitkin, Cass, Itasca, and St. Louis counties.

Methods

Questionnaire

Minnesota family forest landowners were surveyed, using a mailback questionnaire, to assess their opinions about forest certification. The questionnaire was developed using academic literature, forest certification websites, other documents, and input from the Charles K. Blandin Foundation and family forest landowner experts. See Appendix A for additional information on the questionnaire.

The survey was comprised of three sections. The first section concerned forest certification and asked respondents to answer questions regarding:

- Familiarity with forest certification.
- Possible benefits and drawbacks of forest certification.
- Forest certification program design characteristics.
- Willingness-to-pay for forest certification.
- Likelihood of certification their forest land.

The second section inquired about the owner's forest land and forest management activities. The information collected included:

- Number of acres and parcels of forest land owned in Minnesota.
- Number of years forest land has been owned.
- Absentee owner status.
- Importance of economic and noneconomic reasons for owning forest land.
- Timber harvest history and future plans.
- Forest management plan status.
- Enrollment in government programs and tax incentive programs.
- Whether a professional forester had ever been consulted.

The third section of the survey collected sociodemographic information, including:

- Size of respondent's community.
- Age.
- Gender.
- Highest level of education.
- Employment status.

Survey Administration

In February and March of 2005, surveys were sent to 469 family forest landowners selected randomly from the population of landowners with more than ten forested acres in Aitkin, Cass, Itasca, and St. Louis counties. Names and addresses were acquired from property tax records. Following Dillman's Tailored Design Method (2000), pre-notification postcards, and cover letters explaining the purpose of the study were mailed along with the questionnaire. Then follow-up reminder postcards and remailings of questionnaires to those who had not responded were used to increase the response rate.

A total of 236 completed and useable questionnaires were returned; 45 questionnaires were returned but unusable. Another 16 questionnaires were undeliverable. The overall

response rate to the questionnaire was 62 percent [(236+45)/ (469-16)], which is considered a high response rate for mailed questionnaires. Due to the high response rate, a nonresponse bias check was unnecessary. The distribution of counties where respondents owned forest land reflects the fact that participant selection was proportional to the number of family forest landowners in a county. Forty-three percent of the respondents were from St. Louis County, followed by Itasca (21 percent), Aitkin (20 percent), and Cass (16 percent) (Table 10).

Table 10. Distribution of respondents by county.

County	N	%
St. Louis	99	42.7
Cass	38	16.4
Itasca	49	21.1
Aitkin	46	19.8
Total	232	100.0

Data Analysis

The data from the survey were analyzed using the Statistical Package for Social Sciences (SPSS) statistical software. To protect anonymity and confidentiality, names and addresses were not included in the data set. Descriptive statistics, such as mean, median, mode, standard deviation, and frequency distributions, were estimated for all questionnaire items and are reported in the findings section. Comparisons between subgroups of interest involved t-test, chi-square, and ANOVA statistical tests.

Findings

Analysis of Survey Population

Profile of Responding Family Forest Landowners

The 2005 Minnesota Forest Land Owner Opinion Survey collected several different demographic variables, including age, gender, and education among other variables (Table 11). The majority of respondents were male (89 percent) and clustered in the 50-69 year-old age groups (58 percent of the respondents). The findings indicate a wide range of educational attainment among the respondents. Nearly 40 percent had a bachelor's degree or higher, and all but 2 percent had a high school diploma. Most of the survey respondents were either working full-time (50 percent) or retired (35 percent). The survey participants were geographically diverse; 37 percent lived in rural areas, 28 percent lived in small to large rural communities, and 36 percent lived in a large metropolitan area or a suburb of a large metropolitan area. Finally, most of the landowners who responded to the survey were absentee owners (did not live on their forest land) (64 percent). Permanent/seasonal residents accounted for 24 percent of the respondents.

More than 50 percent of the respondents owned less than 100 acres of forest land (Table 12). The median acreage owned was 80 acres. However, the mean acreage size was 183 acres, reflecting that seven responding landowners owned 1,000 acres or more of forest land. About 60 percent of the respondents owned one or two parcels, and the median number of parcels owned was two (Table 13).

Table 11. Sociodemographic characteristics of respondents.

Variable		N	Percent
Age	20-29	4	1.8
	30-39	15	6.7
	40-49	43	19.1
	50-59	70	31.1
	60-69	60	26.7
	70-79	25	11.1
	80-89	8	3.6
	Total	225	100.0
Gender	Male	203	88.6
	Female	26	11.4
	Total	229	100.0
Education	Some High School or less	5	2.2
	High School/GED	43	19.0
	Some College	40	17.7
	Technical/Community College Degree	48	21.2
	Bachelor's Degree	39	17.3
	Some Graduate School	19	8.4
	Graduate Degree	32	14.2
	Total	226	100.0
Employment	Working full-time	115	50.4
	Retired	80	35.1
	Working part-time	10	4.4
	Homemaker	5	2.2
	Unemployed	1	.4
	Student	0	0.0
	Other	17	7.5
	Total	228	100.0
Community	Rural area	85	36.8
	Small rural town (less than 5,000 people)	29	12.6
	Large rural community (more than 5,000 people)	35	15.2
	Suburb of a metropolitan area	54	23.4
	Metropolitan area	28	12.1
	Total	231	100.0
Absentee	Permanent/seasonal resident	54	24.0
	Absentee owner	144	64.0
	Other	27	12.0
	Total	225	100.0

Table 12. Acres of forest land owned by respondents.

Number of acres	N	%
1 to 99 acres	121	54.0
100 to 199 acres	57	25.4
200 to 499 acres	30	13.4
500 to 999 acres	9	4.0
1000 acres or more	7	3.1
Total	224	100.0

Source: Question 7.

Mean: 183 acres Median: 80 acres

Table 13. Number of parcels of forest land owned by respondents.

Number of parcels	N	%
1	33	28.2
2	37	31.6
3	14	12.0
4	14	12.0
5 or more	19	16.2
Total	117	100.0

Source: Question 7.

Respondents were also asked about their forest land tenure. The findings indicate that many of the landowners owned their property for a considerable amount of time (Table 14). Thirty-seven percent of the respondents had owned their forest land for at least 25 years. Owners that had owned their land for one year or less accounted for only 3 percent of the respondents.

Table 14. Number of years respondents owned forested land in Minnesota.

Number of years	N	%
One year or less	6	2.6
1 to 5 years	32	13.9
5 to 15 years	53	22.9
15 to 25 years	55	23.8
25 to 50 years	66	28.6
50 years or more	19	8.2
Total	231	100.0

Source: Question 8.

The family forest landowners who responded to the survey tended to own their forest land for a multitude of reasons. The top three reasons for owning forest land were noneconomic: wildlife watching, hunting, and hiking (Table 15). Fifty percent of the respondents said wildlife watching was a very important reason for owning their land (rated 5 on a 5-point scale), and 57 percent rated hunting a very important reason. These reasons were followed by investment, seasonal residence, and timber production in order of mean importance. The three least important reasons were permanent residence, cross-country skiing, and fishing.

A significant portion of the survey collected information about the respondent's history and involvement in forest management. It was discovered that 77 percent of the respondents did not have a forest management plan for their forest land (Table 16). Also, only 42 percent had sought advice from or had been contacted by a professional forester during the time they had owned the forest land (Table 17).

Forty-eight percent of the landowners had commercially harvested trees on their forest land (Table 18). The most recent harvest had occurred anywhere from within the last year (11 percent), 1 to 5 years ago (36 percent), 5 to 10 years ago (38 percent), to more than 10 years ago (15 percent) (Table 19). When that harvest was conducted, 29 percent followed Minnesota's forest management guidelines, 14 percent were not sure whether the guidelines were followed, and 57 percent reported that the guidelines were not

Table 15. Importance of reasons for owning forest land.

Reasons	N	Mean*	Med.	SD	Total sample					
					1	2	3	4	5	Not sure
Wildlife watching	218	4.14	5	1.16	6.3	4.1	9.5	28.4	50.0	1.8
Hunting	223	4.01	5	1.44	13.7	4.4	5.3	18.6	56.6	1.3
Hiking	215	3.89	4	1.26	8.2	7.3	11.9	30.1	40.6	1.8
Investment	218	3.66	4	1.46	15.7	6.7	11.2	26.0	38.1	2.2
Seasonal residence (i.e., your cabin)	204	3.48	4	1.51	17.1	11.8	10.9	21.8	35.1	3.3
Timber production	218	3.22	3	1.40	18.1	10.2	21.7	25.7	20.8	3.5
Camping	209	3.19	3	1.49	19.6	15.0	17.8	18.2	27.1	2.3
Fishing	209	3.17	3	1.55	23.3	12.1	14.4	20.0	27.4	2.8
Cross-country skiing	205	2.94	3	1.49	23.3	18.6	19.0	14.3	22.4	2.4
Permanent residence	199	2.92	3	1.53	24.4	19.1	13.9	15.3	22.5	4.8
Other	37	3.62	5	1.71	15.8	3.5	3.5	8.8	33.3	35.1

* Responses based on a five-point scale: 1=very unimportant, 5=very important.

Source: Question 10.

Table 16. Response to “Do you have a forest management plan prepared for your forest land?”

	N	%
Yes	52	23.0
No	174	77.0
Total	226	100.0

Source: Question 13.

Table 17. Response to “Since owning your property, have you sought advise from/been contacted by a professional forester?”

	N	%
Yes	95	42.0
No	131	58.0
Total	226	100.0

Source: Question 11.

Table 18. Response to “Have you commercially harvested trees on your forest land while being the owner?”

	N	%
Yes	110	47.8
No	120	52.2
Total	230	100.0

Source: Question 12a.

Table 19. Most recent harvest.

	N	%
Within the last year	13	10.9
1 to 5 years ago	43	36.1
5 to 10 years ago	45	37.8
More than 10 years ago	18	15.1
Total	119	100.0

Source: Question 12b.

consulted (Table 20). The final timber harvesting question asked was whether the respondent intended to harvest timber from their property in the near future (defined as 10 years). Forty percent of respondents answered “yes,” 34 percent were “not sure,” and about a quarter of respondents said they had no intention to harvest in the next ten years (Table 21).

Table 20. Response to “Did you consult Minnesota’s timber harvesting/forest management guidelines when you harvested?”

	N	%
Yes	35	28.9
No	69	57.0
Not sure	17	14.0
Total	121	100.0

Source: Question 12c.

Table 21. Response to “Do you intend to harvest trees on your forest land in the next ten years?”

	N	%
Yes	50	39.7
No	33	26.2
Not sure	43	34.1
Total	126	100.0

Source: Question 12d.

The last set of forest management questions concerned the landowners’ involvement in government programs, tax incentive programs, and forestry-related organizations. About 19 percent had participated in a government program that assisted them with managing their forest land (Table 22), and only 5 percent were enrolled in Minnesota’s new tax program, the SFIA (Table 23). Organizational membership was highest for wildlife organizations (17 percent of respondents said they a member of such an organization), and lowest for local woodland owner associations (2 percent) (Table 24). Eight percent of respondents reported being a member of the Minnesota Forestry Association.

Table 22. Response to “Have you participated in any government programs to assist you in managing your forest land?”

	N	%
Yes	43	18.8
No	176	76.9
Not sure	10	4.4
Total	229	100.0

Source: Question 15.

Table 23. Response to “Are you enrolled in Minnesota’s new forest property tax program that provides an annual incentive check to participating forest landowners?”

	N	%
Yes	12	5.2
No	217	94.8
Total	229	100.0

Source: Question 14.

Table 24. Response to “Are you a member of the following organizations?”

Organization	N	% Yes	% No
Wildlife organization	218	17.4	82.6
Conservation/environmental organization	215	11.6	88.4
Minnesota Forestry Association	218	7.8	92.2
Local woodland owner association	212	2.4	97.6

Source: Question 16.

Landowner Understanding and Perceptions of Forest Certification

Familiarity with forest certification among the family forest landowners that completed the survey was not high (Table 25). The majority of respondents (53 percent) had never heard of forest certification prior to receiving this survey. Another 27 percent of the

respondents reported a minimal understanding of forest certification. Seventeen percent of respondents rated themselves as having some understanding, while only about 3 percent of the respondents indicated they had extensive understanding of forest certification.

Table 25. Familiarity with forest certification

Familiarity	N	%
Extensive understanding	6	2.8
Some understanding	38	17.4
Minimal understanding	59	27.1
Never heard of it	115	52.8
Total	218	100.0

Source: Question 1.

Respondents were asked to rate the importance of six different potential benefits and drawbacks of forest certification on a 5-point Likert scale (1=very unimportant, 5=very important). Improved wildlife habitat, increased timber growth and productivity, and environmentally sound timber harvesting were the top three potential benefits the respondents believed to be most important associated with forest certification (Table 26). Respectively, 86 percent, 80 percent, and 72 percent of respondents said these three benefits were either important or very important benefits. This compares to only 47 percent of the respondents who said a price premium, 46 percent who said expanded markets, and 37 percent who said public recognition of good forestry practices were important or very important.

Respondents noted a number of potential drawbacks associated with forest certification (Table 27). The mean average rating for all of the possible drawbacks ranged between 3 (neither unimportant nor important) and 4 (important). A majority of the respondents rated nearly all of the possible drawbacks of forest certification as important or very important. Loss of control was a top-rated concern. Seventy-two percent of respondents felt that loss of control over who can harvest and 67 percent said loss of control over the types of timber harvesting practices were important or very important drawbacks. With similar numbers of respondents, increased costs (68 percent) and paperwork (66 percent) that might result from having the land certified were the next two drawbacks in order of mean importance. Another 57 percent of respondents rated the need to follow a forest management plan as important or very important, followed by 40 percent rating the need for on-site inspections as important or very important drawbacks.

Landowner Interest in Certification: Alternative Program Arrangements and Outcomes
Survey participants were asked to assess their likelihood of participating in a forest certification program under various alternative forest certification program arrangements in eight different categories on a 5-point Likert scale (1=very unlikely to participate, 5=very likely to participate) (Tables 28 and 29). They were also asked about likelihood of participation based on two potential outcomes of forest certification. This section outlines family forest landowners' participation interest under these different arrangements.

Table 26. Importance of possible benefits that can be associated with forest certification.

Possible benefits	N	Mean*	Med.	SD	Total sample					
					Percent of respondents by response category					
Improved wildlife habitat	228	4.32	5	1.11	7.0	0.9	6.1	25.3	60.3	0.4
Increased timber growth and health	224	4.04	4	1.13	7.5	2.2	8.8	40.1	40.1	1.3
Use environmentally-sound timber harvesting/ Forest management practices	219	3.94	4	1.17	7.5	3.9	12.3	36.0	36.4	3.9
A price premium for forest products harvested	215	3.32	4	1.40	14.0	12.3	20.6	24.1	23.2	5.7
Expanded markets for forest products harvested	216	3.23	3	1.32	14.5	12.3	22.5	28.2	17.6	4.8
Public recognition for practicing good forestry	219	2.98	3	1.32	17.3	19.1	23.6	22.7	14.7	2.7

* Responses based on a five-point scale from 1 (very unimportant) to 5 (very important).

Source: Question 2.

Table 27. Importance of possible drawbacks that can be associated with forest certification.

Possible drawbacks	N	Mean*	Med.	SD	Total sample					
					Percent of respondents by response category					
Less control over who can harvest my forest	222	3.89	4	1.29	9.7	6.6	9.7	30.8	41.0	2.2
Less control over the types of timber harvesting practices that can be used	223	3.79	4	1.28	9.2	7.9	13.6	30.7	36.4	2.2
Increased cost of forest management	220	3.74	4	1.14	8.4	3.5	17.2	43.6	24.2	3.1
Increased record-keeping and paperwork	223	3.74	4	1.17	7.0	7.9	17.1	37.3	28.5	2.2
Need to follow a forest management plan	218	3.44	4	1.28	12.4	9.7	17.3	36.7	20.4	3.5
Need for periodic on-site inspections of my forestry practices	215	3.25	3	1.24	9.7	15.4	29.5	21.6	18.5	5.3

*Responses based on a five-point scale from 1 (very unimportant) to 5 (very important).

Source: Question 3.

First, landowners were asked about their desired level of involvement in forest certification. The highest mean response regarding involvement was for being required to be involved only at certain stages of the certification process (2.96); 38 percent of the respondents said that under this kind of program they would be likely or very likely to participate. In contrast, the lowest rating was for not being involved at all in the forest certification process (2.42) and only 22 percent indicated they would be likely or very likely to participate in the certification program under these conditions.

Second, the landowners who responded to the survey had varying interest in participating in a forest certification program depending on which organization was administering the program. The highest rated administering organization was a forest landowner association (3.25). Fifty-one percent said they would be likely or very likely to participate if a forest landowner association was the administering group of the forest certification program. An educational institution also received a mean average above 3.0 (3.11). The organization associated with the lowest ratings was a government organization. In that case, 51 percent of the respondents indicated they would be unlikely or very unlikely to participate if a government organization ran the program.

When it came to the costs of the certification program, the family forest landowners were more likely to participate if they had to pay none of the costs of certification (3.56) and were least likely to participate if they had to pay all of the costs of certification (1.58).

The survey results indicated that family forest landowners were near the neutral point of the scale (3) when it came to various designs of on-site inspections (i.e., third-party audits). Participants were found to be indifferent toward whether on-site inspections were required (2.69), a possibility (2.92), or not required (3.02). Also, the likelihood of participation was higher when the results of the on-site survey were not made available to the public (2.92) as opposed to being made fully available to the public (2.54). In other words, between 26-27 percent of respondents would be likely or very likely to participate if the results were not available or only available in summary form, and that percentage dropped to 19 percent when the program made the results fully available to the public.

If a forest management plan was a requirement of certification, the results indicated that 28 percent of the family forest landowners surveyed would be unlikely or very unlikely to participate. Conversely, 34 percent of respondents would be likely or very likely to participate if a forest management plan was required. The highest mean rating within the program options related to forest management plans was for encouraging but not requiring a forest management plan (3.17).

Family forest landowners indicated they wanted to retain control over their ability to select the professional forester and logger of their choice, if they chose to work with them at all. For instance, 34 percent of respondents said they would be unlikely or very unlikely to participate if they were required to use a professional forester when managing their forest or harvesting timber. This percentage declined to 25 percent when the program did not require the use of a professional forester. Also, there was more support for being able to choose any logger to work with (3.44), rather than being required to use

Table 28. Likelihood of participating in a forest land certification program.

	Total sample									
	Percent of respondents by response category									
	N	Mean*	Med.	SD	1	2	3	4	5	Not sure
Would you participate if you were:										
required to be involved throughout the process of certifying your forest?	208	2.82	3	1.51	26.5	16.8	13.7	16.8	18.1	8.0
required to be involved only at certain stages of the certification process?	211	2.96	3	1.43	21.0	17.9	17.0	21.0	17.4	5.8
not involved in the certification process?	198	2.42	2	1.38	33.3	17.4	17.8	12.3	9.6	9.6
Would you participate in the certifying organization was:										
a government organization?	208	2.37	2	1.39	38.4	12.9	18.8	14.3	8.5	7.1
a forest products industry association?	216	2.77	3	1.52	28.4	14.2	20.9	20.0	12.4	4.0
a forest landowner association?	219	3.25	4	1.42	19.4	8.4	18.1	30.0	20.7	3.5
an educational institution?	215	3.11	3	1.46	22.7	8.4	20.4	24.0	20.0	4.4
an organization not affiliated with any particular organization or group?	195	2.79	3	1.41	23.2	13.4	21.9	15.2	13.4	12.9
Would you participate if you had to pay:										
none of the cost to certify your forest?	217	3.56	4	1.50	18.1	5.8	11.1	26.1	35.0	4.0
Some of the cost to certify your forest?	212	2.44	2	1.37	35.4	16.4	13.7	22.1	6.2	6.2
all of the cost to certify your forest?	210	1.58	1	1.06	64.0	16.0	5.8	3.6	4.0	6.7
Would you participate if on-site inspections of your property were:										
required?	216	2.69	3	1.54	35.8	8.0	19.0	15.5	17.3	4.4
a possibility?	212	2.92	3	1.43	23.1	13.3	21.8	19.6	16.4	5.8
not required?	207	3.02	3	1.42	21.0	11.2	23.7	18.3	18.3	7.6
Would you participate of the results of on-site inspections were?										
Made fully available to the public?	183	2.54	3	1.33	27.3	12.0	25.9	11.1	8.3	15.3
made available to the public only in summary form?	191	2.77	3	1.26	20.3	13.4	27.6	19.4	7.4	12.0
not made available to the public?	198	2.92	3	1.28	17.4	11.9	34.7	13.2	13.2	9.6

*Responses based on a five-point scale from 1 (very unlikely to participate) to 5 (very likely to participate).

Source: Question 4.

Table 29. Likelihood of participating in a forest land certification program (continued).

	Total sample									
	N	Percent of respondents by response category								
		Mean*	Med.	SD	1	2	3	4	5	Not sure
Would you participate in a forest management plan was:										
required?	173	3.03	3	1.44	19.2	8.4	19.6	17.8	15.9	19.2
encouraged but not required?	195	3.17	3	1.30	15.1	8.2	27.4	23.3	15.1	11.0
not required?	187	3.02	3	1.38	17.1	12.9	24.4	15.2	16.6	13.8
Would you participate if you were:										
required to use a professional forester when managing your forest or harvesting timber?	178	2.81	3	1.52	27.1	7.8	14.2	18.3	14.2	18.3
not required to use a professional forester when managing your forest or harvesting timber?	180	3.14	3	1.32	13.9	10.6	23.6	20.4	14.8	16.7
Would you participate if you:										
were required to notify the certifying organization of your intent to harvest timber	185	2.97	3	1.50	22.7	9.5	16.4	18.2	17.3	15.9
were required to use only loggers who were trained in environmentally-responsible practices?	196	3.27	4	1.52	21.0	6.4	14.6	22.8	24.7	10.5
Could use any logger you choose?	183	3.44	4	1.44	14.8	6.9	14.4	23.1	25.5	15.3
Would you participate if you:										
received a higher price for your timber?	198	3.47	4	1.47	16.7	5.9	14.0	24.4	28.5	10.4
did not receive a higher price for your timber?	173	2.70	3	1.24	20.2	10.8	29.6	14.6	6.1	18.8
Would you participate if forest products mills gave:										
preference to buying timber from certified forests?	190	3.24	4	1.48	19.1	6.8	16.4	22.3	21.8	13.6
no preference to buying timber from certified forests?	174	2.66	3	1.20	18.5	14.4	30.6	10.6	6.5	19.4

* Responses based on a five-point scale from 1 (very unlikely to participate) to 5 (very likely to participate).

Source: Question 4.

only loggers who were certified or trained in environmentally responsible practices (3.27).

Family forest landowners were queried as to their likelihood of participation based on two program outcomes. First, respondents were asked their likelihood of participation with and without receiving a price premium for their timber. Not surprising, survey respondents reported they were more likely to participate if they could receive a higher price for their certified timber (3.24). The mean rating was 2.70 when the program outcome involved no higher prices for certified timber. Second, if forest products mills gave preference to buying timber from certified forests, then the respondents reported they would be more likely to participate (3.24) than if the mills did not have a preference (2.66).

Landowner Willingness to Pay for Forest Certification

Family forest landowners were asked to indicate their willingness-to-pay to have their forest land certified. They were presented with six different costs, ranging from \$0 to “\$6 or more” per acre per year. Respondents were asked to indicate “yes” or “no” as to whether they would pay that amount per acre per year to certify. Table 30 demonstrates that as the annual cost to certify forest lands increased, the number of family forest land owners indicating they would be willing to pay that amount declined. The closest point to which 50 percent of the survey respondents said “yes” they would be willing to pay, and 50 percent said “no” they would not be willing to pay was at \$1 per acre per year for each acre certified. At \$1 per acre per year, 48 percent of the respondents said “yes.” At the highest bid amount, \$6 or more, only 3 percent of the survey participants were willing to pay for forest certification.

Table 30. Price respondents are willing to pay to have forest land certified.

Price	N	% Yes	% No
\$0 per acre per year for each acre certified	215	84.2	15.8
\$1 per acre per year for each acre certified	214	47.7	52.3
\$2 per acre per year for each acre certified	214	25.7	74.3
\$3 per acre per year for each acre certified	214	14.0	86.0
\$4 per acre per year for each acre certified	214	7.5	92.5
\$5 per acre per year for each acre certified	214	6.1	93.9
\$6 or more per acre per year for each acre certified*	214	3.3	96.7

* If respondents answered “\$6 or more per acre per year,” they were asked to indicate how much they were willing to pay per acre per year for each acre certified. Three respondents replied to this question. Two respondents indicated they would be willing to pay \$10 per acre per year to have their forest land certified, and one respondent indicated a willingness to pay \$20 per acre per year to have the land certified.

Source: Question 5.

Landowner Interest in Certifying Their Forest Land

After asking the survey participants about their familiarity with forest certification, perceptions of benefits and drawbacks, preferences for program characteristics, and willingness to pay for forest certification, they were asked, “Based on your current understanding of forest certification, how likely are you to have your forest certified?” The results show that only very small percentage of family forest landowners were very likely to have their forest land certified (4 percent) (Table 31). However, there were large

numbers of respondents that could be considered in the “persuadable” category. Thirty-four percent selected the category, “I may want my forest land certified but need additional information before deciding,” and another 44 percent selected the category, “I am not likely to certify my forest land, but could change my mind.” About one in five family forest landowners indicated they would never want their forest land certified (19 percent).

Table 31. Likeliness to have forest land certified.

Likeliness	N	%
I am very likely to have my forest land certified	8	3.5
I may want my forest land certified, but need additional information before deciding	77	33.5
I am not likely to certify my forest land, but could change my mind	102	44.3
I am certain I will never want my forest land certified	43	18.7
Total	230	100.0

Source: Question 6.

Analysis of Selected Respondent Subgroups

In order to determine whether family forest landowner opinions and attitudes about forest land certification could be differentiated according to certain characteristics about them or the forest land they own, survey respondents were grouped according to several key characteristics. The following describes the results of this analysis of the survey respondents based on whether the landowner:

- Had a forest management plan.
- Owned a large amount of forest land.
- Was familiar with forest certification.
- Was likely to have forest land certified.

Landowners with a Management Plan vs. Landowner without a Management Plan

Opinions regarding forest certification were compared between landowners with management plan and those without a management plan to determine if significant differences exist. For this study, we directly asked survey participants whether they had a forest management plan. In total, 52 respondents (22 percent of total sample) had a management plan while 174 did not (77 percent of total sample). Statistical tests (i.e., chi-square, ANOVA, t-tests) were conducted to determine where significant differences (at $p \leq 0.05$) exist between these two groups. Detailed tables of these analyses can be found in Appendix B.

*Similarities--*Landowners with a management plan and those without a management plan were similar with regards to their sociodemographic composition. There were no significant differences between the two groups based on age, gender, education, employment status, community size, or absentee status. The two groups of landowners were similar in the number of parcels owned and length of land tenure. The presence of a management plan did not seem to be related to reasons for owning forest land. With one exception, there was no significant difference in reasons for owning forest land between the two groups. Both groups of landowners joined local woodland owner associations, wildlife organizations, and conservation/environmental organizations at similar rates. They also rated most of the possible benefits (all but two) and all of the possible

drawbacks as similarly important. In most instances, there were few significant differences between landowners with a management plan and those without a management plan when it came to likelihood of participating under different forest certification program designs. Willingness to pay for forest certification was similar between those with and without management plans. The likelihood of having their forests certified was similar between those with and without management plans.

Differences--A number of significant differences did exist between landowners with and without a forest management plan. For example, landowners with a management plan tended to own more forest land than those landowners without a management plan. In addition, the landowners with a management plan reported timber production as a more important reason for owning forest land relative to those landowners without management plans. It appeared that landowners with management plans were more active landowners as they had higher percentages of contact with professional foresters, conducted more commercial harvesting, used the guidelines more frequently, participated in government programs, enrolled in the SFIA, and were members of the Minnesota Forestry Association.

Related to forest certification, it was discovered that landowners with a management plan were almost twice as likely to be as familiar with forest certification (33 percent of respondents reported some to extensive understanding) than landowners without a forest management plan (17 percent). The landowners with a management plan rated expanded markets and a price premium as more important possible benefits of certification than the landowners without a management plan. There were also a few program characteristics where landowners with a forest management plan indicated they were more likely to participate than the landowners without a plan. Table 32 shows a summary of the significant differences.

Table 32. Summary of significant differences between landowners with and without a forest management plan.

- Landowners without management plans were more likely to have heard of forest certification than those with management plans.
- Landowners with management plans rated the possible benefits of expanded markets and price premiums higher than those without management plans.
- Landowners with management plans were more likely to participate in forest certification if their involvement was required throughout, they had to pay none of the costs, on-site inspections were required or a possibility, and a management plan was required.
- Landowners with a management plan owned more acres than those without a management plan.
- Timber production was a more important reason for ownership for landowners with a management plan than those without a management plan.
- Landowners with a management plan had sought advice or been contacted by a professional forester more often than those without a management plan.
- Commercial harvesting and guideline consultations were more common among landowners with a management plan than those without a management plan.
- Landowners with a management plan were more likely to have participated in government assistance programs than those without a management plan.
- Landowners with a management plan were more likely to belong to the Minnesota Forestry Association than those without a management plan.

Smaller Acreage Landowners vs. Larger Acreage Landowners

Comparisons were made between landowners that owned smaller amounts of forest land and those landowners owning larger amounts of forest land to determine if significant differences exist regarding their opinions of forest certification. One-hundred acres was chosen as the distinction between smaller and larger acreage landowners because that divided the sample population into approximately equal halves. In total, 125 respondents (55 percent of total sample) were categorized as smaller acreage owners while 103 respondents (45 percent of total sample) were grouped in the larger acreage owner category. Statistical tests (i.e., chi-square, ANOVA, t-tests) were conducted to determine where significant differences (at $p \leq 0.05$) exist between these two groups. Detailed tables of these analyses can be found in Appendix C.

Similarities--Smaller and larger acreage landowners were similar with regards to age, education, and community size. Land tenure was similar between the two groups, as were most reasons for owning forest land. When they did harvest, the two groups were similar in the length of time since their most recent harvest and consultation with the Minnesota timber harvesting guidelines. As for forest certification, the two groups were similar in their ratings of most possible benefits and all possible drawbacks. There were also many similarities in the survey section concerning alternative certification program designs.

Differences--Although both percentages were low, there was a greater prevalence of women who completed the survey from the smaller acreage landowner group than the larger acreage landowner group. The smaller acreage landowners were more likely to be working full-time and to be absentee owners than the larger acreage landowner group. Timber production was more important for larger acreage landowners than smaller acreage landowners. The larger acreage landowners were also more active in their forest management and participation in programs and organizations. Consistently, where there were differences in the mean likelihood of participating under different program designs, it was larger acreage landowners who were more likely to participate than smaller acreage landowners. Table 33 shows a summary of the significant differences.

Table 33. Summary of significant differences between smaller acreage and larger acreage landowners.

- Landowners owning less than 100 acres were more likely to be female than larger acreage landowners
- Landowners owning less than 100 acres were more likely to be working full-time than larger acreage landowner
- Landowners owning less than 100 acres tended to be absentee owners more often than landowners owning 100 acres or more.
- Timber production was a more important reason for ownership among larger acreage landowners than smaller acreage landowners.
- Larger acreage landowners were more involved than smaller acreage landowners in forest management in terms of having a forest management plan, seeking advice from professional foresters, commercially harvesting their trees, intending to harvest trees in the future, participating in government programs, enrolling in SFIA, and joining the Minnesota Forestry Association.
- Smaller acreage landowners rated expanded markets and a price premium as less important possible benefits of forest certification than larger acreage landowners.
- In instances where smaller acreage landowners had significantly different mean likelihood of participation for different certification program designs, they were less likely to have their land certified than larger acreage landowners.

Landowners Familiar with Forest Certification vs. Not Familiar with Forest Certification

Opinions regarding forest certification were compared between landowners familiar with forest certification and those that had never heard of forest certification prior to receiving the survey. The goal was to determine if significant differences exist based on their understanding of forest certification. For this subgroup comparison, we grouped respondents who said they had extensive, some, and minimal knowledge of forest certification. The not familiar group was composed of those respondents who said they had never heard of forest certification. In total, 103 respondents (47 percent of total sample) had some familiarity with forest certification while 115 (53 percent of total sample) were not familiar with forest certification. Statistical tests (i.e., chi-square, ANOVA, t-tests) were conducted to determine where significant differences (at $p \leq 0.05$) exist between these two groups. Detailed tables of these analyses are in Appendix D.

Similarities--Demographically, landowners familiar with forest certification were not significantly different from landowners who were not familiar. Age, gender, education, and employment status among the two groups were also similar. Landownership and tenure were equally comparable between the two groups. Also, the importance of most reasons for ownership were similar between landowners familiar and those unfamiliar with forest certification. Forest management activity was statistically equivalent as measured by seeking advice from professional foresters, commercial harvesting, length of time since most recent harvest, consulting guidelines, intentions to harvest in the next ten years, and enrollment in SFIA. Overall, there was a lot of similarity in ratings of possible benefits and possible drawbacks. Participation under different program designs were not statistically different for varying requirements of on-site inspections, forest management plans, professional forester use, and trained logger use. Willingness to pay was comparable between the two groups. Certification familiarity was not statistically related to likelihood of wanting to certify the landowner's forest land.

Differences--Landowners who were familiar with forest certification were more likely to come from rural communities. They were also less likely to be an absentee owner. Timber production was a more important reason for ownership among familiar landowners than unfamiliar landowners. Furthermore, familiar landowners were more likely to have a forest management plan than unfamiliar landowners. Landowners familiar with forest certification were more than twice as likely as unfamiliar landowners to have participated in a government assistant program. Familiar owners were also more likely to be members of the Minnesota Forestry Association. Familiar landowners rated expanded markets and a price premium as more important benefits of forest certification, while unfamiliar landowners rated increased record keeping and paperwork as more important drawbacks. Where there were significant differences in likelihood of participation under different program designs, landowners familiar with forest certification were more likely to participate than landowners not familiar with forest certification. A summary of the significant differences are shown in Table 34.

Table 34. Summary of significant differences between landowners familiar and not familiar with forest certification.

- Landowners familiar with certification more likely live in rural communities than landowners not familiar with certification.
- Landowners familiar with certification were more likely to live on their land (permanent or seasonal residence) than landowners not familiar with certification.
- Timber production was important as a reason for ownership among landowners familiar with certification relative to those not familiar.
- Landowners familiar with forest certification were more likely to have a forest management plan than those not familiar.
- Landowners familiar with forest certification were more likely to have participated in a government assistant program than those not familiar.
- Membership in the Minnesota Forestry Association and local woodland owner associations was higher among landowners familiar with certification than those not familiar.
- Expanded markets and price premiums were rated more important possible benefits of forest certification by landowners familiar with forest certification than landowners not familiar with forest certification.
- Increased record-keeping and paperwork was rated a more important possible drawback of forest certification by landowners not familiar with forest certification than landowners familiar with forest certification.
- Landowners familiar with forest certification were more likely than those not familiar to participate in forest certification under the following program design options:
 - Required to be involved throughout the process of certifying your forest.
 - Required to be involved only at certain stages of the certification process.
 - A government organization administered the program.
 - A forest landowner association administered the program.
 - An educational institution administered the program.
 - An organization not affiliated with any particular organization or group administered the program.
 - None of the costs to certify were paid by the landowner.
 - Some of the costs to certify were paid by the landowner.
 - On-site inspections were a possibility.
 - On-site inspections were not required.
 - A higher price for certified timber was received.
 - Preference was given to timber from certified forests.

Landowners Likely to Have Their Forest Certified vs. Not Likely to Certify

Opinions were compared between landowners more likely to certify, less likely to certify, and never want to certify to check for significant differences. Survey respondents who said, “I am very likely to have my forest land certified” or “I may want my forest land certified, but need additional information before deciding” were classified as “more likely to certify.” The not likely to certify group included those who selected the option, “I am not likely to certifying my forest land, but could change my mind.” Finally, the last group of “never want to certify” was composed of those who chose the response option, “I am certain I will never want my forest land certified” In total, 85 respondents (37 percent of total sample) were in the more likely to certify group, 102 (44 percent of total sample) were in the not likely to certify group, and 43 (19 percent of the total sample) were in the never want to certify group. Statistical tests (i.e., chi-square, ANOVA, t-tests) were conducted to determine where significant differences (at $p \leq 0.05$) exist between these two groups. Appendix E has detailed tables of these analyses.

Similarities-- Except for absentee ownership, there was a great similarity in demographic characteristics between landowners with varying levels of interest in forest certification. They were also comparable in terms of acres owned, parcels owned, land tenure, and several reasons for owning forest land. Their forest management activity level was also similar. Forest management plans, seeking advice from professional foresters, commercial timber harvest, length since most recent timber harvest, use of guidelines, participation in government assistance programs, and membership in most organizations were alike. Familiarity with forest certification was not significantly different between those more likely to certify, not likely to certify, and the never want to certify group.

Differences--Absentee landowner status was the only statistically significant sociodemographic variable. The highest concentration of absentee landowners was in the not likely to certify group, and the highest concentration of permanent or seasonal residents was in the never want to certify group. There were a few significant differences related to reasons for ownership. Those most likely to certify were different from those never wanting to certify in that they rated cross-country skiing, wildlife watching, investment, and timber production as more important reasons for ownership. There were some slight indications that those most likely to certify were more actively managing their timber. Intention to harvest timber in the next ten years, for instance, was more prevalent among those likely to certify than those not interested. Furthermore, those more likely to certify were more often enrolled in SFIA and more likely to be a member of their local woodland owner association. For most of the significant differences in importance of possible benefits, landowners more likely to certify were similar to those not likely to certify. However, these two groups rated the benefits significantly higher than those who said they would never certify their forest land. For possible drawbacks, it was landowners who said they were not likely to certify that rated the need for periodic on-site inspections of forestry practices, need to follow a management plan, and less control over the types of timber harvesting practices more important than either those more likely to certify or those who said they would never want to certify. The overall interest in certifying forest land carried through to individual ratings for different program design characteristics. Basically, if the survey participant reported being more likely to participate in the overall general interest question, and this sentiment carried through to their responses when asking about specific program alternatives. Finally, those more likely to certify their forest land had higher willingness to pay than those less interested in forest certification for all costs, as long as those costs remained under \$5 per acre per year.

Table 35. Summary of significant differences based on landowner likelihood of wanting to certify their forest land.

- Absentee landowner status was the only statistically significant sociodemographic variable. The highest concentration of absentee landowners was in the not likely to certify group, and the highest concentration of permanent or seasonal residents was in the never want to certify group.
- Those most interested in forest certification were different from those never wanting to certify in that they rated cross-country skiing, wildlife watching, investment, and timber production as more important reasons for ownership.
- Those saying they never want to certify were much more likely to have no intention of timber harvesting in the next ten years. Both those more likely to certify and not likely to certify had greater intentions to harvest.
- Those more likely to certify were enrolled in SFIA more often than those not likely to certify or never want to certify.
- Membership in local woodland owner associations correlated with interest in certifying forest land.
- For most of the significant differences in importance of possible benefits (all but two), landowners more likely to certify were similar to those not likely to certify. However, these two groups rated the benefits significantly higher than those who said they would never certify their forest land.
- For possible drawbacks, it was landowners who said they were not likely to certify that rated the need for periodic on-site inspections of forestry practices, need to follow a management, and less control over the types of timber harvesting practices more important than either those more likely to certify or those who said they would never want to certify.
- The overall interest in certifying forest land carried through to individual ratings for different program design characteristics. That is, those in the more likely to want to certify group were generally more likely to say they would participate given most of the program design alternatives.
- Those most interested in certifying their forest land had higher willingness to pay than those not likely to certify. Those not likely to certify generally had higher willingness to pay than those never wanting to certify.

Conclusions

The findings from the 2005 Minnesota Forest Land Owner Opinion Survey indicated that developing an appealing forest certification program for Minnesota's family forest landowners will be a considerable challenge. Landowner interest in forest certification at the time of the survey was very reserved. Only 4 percent were definitely interested in certifying, and a solid 19 percent of respondents were sure they would never want to certify their forest lands.

Familiarity with forest certification was also low. Prior to receiving the survey, 53 percent of the respondents had never heard of forest certification. However, a subgroup comparison of landowners who were familiar versus those not familiar demonstrated that greater knowledge of forest certification did not statistically relate to greater interest in certifying forest lands.

Also, most of the existing forest certification programs require that certified landowners possess a forest management plan. In this sample, only 23 percent of landowners had a forest management plan. Adopting a program that required management plans of all landowner would require effort to develop forest management plans for a large number of Minnesota's family forest landowners.

Family forest landowner preferences for the design of a forest certification program also indicated there may be challenges in developing an acceptable program. By taking the

highest mean score from each of the eight design characteristic categories, the ideal program, according to this sample of landowners, would: require involvement only at certain stages of the certification process, be run by a forest landowner association, require landowners to pay none of the costs of certification, not require on-site inspections, not make on-site inspection results available to the public, encourage but not require a forest management plan, not require the use of a professional forester, and not require the use of trained or certified loggers. They would also prefer to receive a price premium for certified timber and receive a preference from the forest products mills for selling certified timber. A forest certification program does not currently exist that would meet all of these preferences.

The least desired program as expressed by survey respondents would not involve the landowner in the certification process, be run by a government organization, have all of the certification costs paid by the landowner, require on-site inspections, make on-site inspection results fully available to the public, not require a forest management plan, require the use of a professional forester, require the use of trained or certified loggers, did not feature a higher price for certified timber, and did not receive a preference from the forest products mills.

Willingness to pay for forest certification was also quite limited. About half of the landowners would not be willing to pay more than \$1 per acre per year to have their forest land certified. A forest certification program designed for Minnesota's family forest landowners would need to be inexpensive or perhaps even offer an economic incentive for participation.

The subgroup analysis showed that while larger acreage landowners and those with management plans were more likely to be familiar with forest certification, neither group was more interested in certifying their land relative to smaller acreage landowners or those without management plans, respectively. In the analysis based on participant's likelihood or interest in forest certification, an interesting result was that those not likely to want to certify rated periodic inspections and the need to follow a management plan as more important than both those more likely to certify and those who never want to certify. This may indicate two areas of significant concern. Perhaps if the program addressed these two concerns, more of those currently not likely to certify would become more likely to certify their forest lands.

C. Focus Groups of Minnesota Family Forest Landowners

Objectives

This section of the report summarizes the findings of three forest certification focus groups conducted by the University of Minnesota. During the summer of 2005, the University of Minnesota conducted three focus groups in the Twin Cities and Grand Rapids communities. The overall purpose of the focus groups was to gather additional information from family forest landowners as a follow up to the 2005 Minnesota Forest Land Owner Opinion Survey. The desire was to better understand family forest landowner needs in general, impressions of forest certification, and discover what affects their interest in forest certification. The findings are to be used in efforts to design a

forest certification framework for Minnesota that captures the involvement of family forest landowners.

The objectives of the focus groups were to:

- Understand family forest landowner impressions of forest certification.
- Provide insight into survey results about preferred program design characteristics.
- Identify areas that constrain and encourage interest in forest certification.

Methods

Focus Group Participants

The three focus groups were designed to sample a cross-section of the survey respondents to the 2005 Minnesota Forest Land Owner Opinion Survey. The survey featured a question asking respondents if they were interested in participating in future focus groups. All of the participants contacted had completed the survey and had answered either “yes” or “maybe.” The Twin Cities focus group aimed at providing an opportunity for absentee landowners to participate. This group was a mixture of those with varying attitudes about forest certification and varying familiarity with certification. The first Grand Rapids focus group was composed of primarily landowners not likely to want to certify and contained a mixture of those familiar and not familiar with forest certification. The second Grand Rapids focus group was, conversely, composed of landowners likely to certify. They, too, featured a mix of forest certification familiarity or knowledge.

Focus Group Questions

Six focus group questions were designed to meet the objectives of the project. The first question presented to participants asked them to describe their impressions of forest certification and currently available certification systems. This question was modified after the first focus group to be “What questions or concerns do you have about forest certification?” This modification was made because many forest landowners were unable to answer the original question due to lack of knowledge about forest certification. The modified question provided the same kind of information, but was easier for landowners not familiar with forest certification to answer.

The second discussion question presented participants with a handout titled, “Example Programs Sheet” (Appendix F). This sheet listed the design alternatives most and least preferred from the survey results as described in the Survey Conclusions section of this report. After allowing participants time to review the two programs, they were asked which one they preferred and why. For each of the program characteristic categories, the participants were probed for their preference and reasons behind their preference. For example, participants were asked whether they preferred a forestry landowner association or a government organization to administer the forest certification program. After stating their preference, they were asked why they favored one organization over the other.

Finally, the participants were asked to design their own program by mixing and matching the program characteristics. This was marked individually on their handouts and returned to the focus group leader.

Knowing the factors that create barriers or incentives to participate in forest certification is important. To gather this information from the focus group participants, they were

asked to list the one thing that would keep them from certifying their forest land. Following that, they were asked what one thing would lead them to having their forests certified.

The last activity required focus group participants to answer two questions by either a show of hands or a written response. First, they were asked how their impression of forest certification had changed during the focus group. They were asked whether they were, (A) more likely to certify; (B) less likely to certify; or (C) did not change in their likelihood of certifying. Then they were asked if they would participate in forest certification program given a scenario where they would be compensated \$3-\$4 per acre per year, need to have a forest management plan, need to follow harvest guidelines, and allow for the possibility of periodic, randomly selected site inspections. The response categories provided were: (A) yes; (B) no; or (C) not sure.

Focus Group Protocol

The focus groups were scheduled to last two hours each, including time for participants to eat a meal. The meeting started with general introductions and a welcome to the focus group. Logistical matters (honorarium, discussion ground rules, confidentiality, etc.) were then addressed. Landowners introduced themselves and described their single most important reason for owning forest land. A brief review of forest certification was provided as many of the focus group participants were unfamiliar with certification programs. Next, the focus group questions were asked of the participants. Notes were made on a flip chart for all participants to see. Additional researchers took handwritten notes of the discussion and the focus groups were also tape recorded. The meeting was adjourned after participants were given the opportunity to ask questions of the focus group leader.

Findings

Description of the Focus Group Participants

In total, 37 family forest landowners participated in the three focus groups. Thirteen landowners comprised the Twin Cities focus group, and 12 landowners participated in each of the two Grand Rapids focus groups. In the Twin Cities group, the largest acreage landowner had 240 acres and the smallest acreage landowner had 15 acres. Most important reasons for ownership included scenic beauty, investment, hunting, timber production, recreation, open space, keeping land in the family, solitude, and fishing. Nine of the participants had never heard of forest certification prior to receiving the mail survey. In the first Grand Rapids focus group, the largest acreage landowner had 720 acres and the smallest acreage landowner had 80 acres. They had similar reasons for ownership as the Twin Cities focus group participants: keeping land in the family, recreation, hunting, timber production, maple syruping, farming, and investment. In this group, only two participants had never heard of forest certification, six knew a little, and three reported they knew a lot about forest certification. In the second Grand Rapids focus group, the participants held forest land that ranged from 80 to 360 acres in size. Their most important reasons for ownership included wildlife, hunting, solitude, recreation, and timber production. This group was split with about 50 percent having no prior awareness of forest certification and 50 percent having some awareness.

Impressions and Questions about Forest Certification

The family forest landowners who participated in the focus groups had many questions about forest certification. These questions can be used to guide future educational outreach efforts and help shed light into the thought processes landowners may go through during their decision to certify. The questions generated by the participants have been summarized and are presented below:

Monetary Concerns:

- Will it reduce my property taxes?*
- How is the certification program related to SFIA?
- What will it cost?*
- Will I be able to sell timber that is not certified?

Benefit Concerns:

- What are the benefits of being certified?*
- What if I already feel good about my responsible forest management?

Control Concerns:

- Will it lead to less control over the forest land?*
- Will it protect the land from eminent domain?
- Does certification help protect from subdivision? Other forms of development?*

Eligibility Concerns:

- Do you need to be commercially harvesting timber to benefit or be eligible?
- What are the requirements for a forest management plan?*
- Will certification require the land to be open for public hunting or other recreation use?

Program Administration Concerns:

- Who are the certifying organizations? What are their goals?*
- How does one leave the program? What are the penalties?*
- How long does the land have to be certified/in the program?
- What are the standards or guidelines for environmentally-responsible behavior?

Additional Concerns:

- Why aren't loggers certified instead of forest landowners?
- Are the forest products companies certified?

*indicates questions asked multiple times

Discussion of Program Design Characteristics

Level of landowner involvement-- There was strong opposition expressed in the focus groups over the possibility that landowners might not be involved throughout the forest certification process. Many of the participants wanted to be involved throughout the entire process. They felt that they would lose their rights or control if not involved

throughout the entire certification process. This is somewhat different than the mail survey response, where the dominant attitude was being involved only at certain stages of the forest certification process.

Certifying organization--Government organizations tended to be perceived as bureaucratic and confusing. Participants made statements like “please not another government program” and told stories of signing up for programs only to find out later there were “fine print” restrictions that they did not find agreeable. The government was seen as “too involved already.” Forest landowner associations, on the other hand, were seen as more efficient and more in-tune with family forest landowners. A few participants did express concern about the regulatory power, “the teeth,” of this kind of group. Also, nearly all of the participants were not familiar with organizations, like the Minnesota Forestry Association, that fell into that category.

On-site inspections and inspection results--There was not a clear consensus on the acceptability of on-site inspections. Some participants did not want the results shared with the public because they were concerned it would share too much information (particularly financial information) with the public. Others thought it could raise their property taxes. Overall, the concern over on-site inspections seemed related to issues of maintaining control.

Forest management plan--Requiring a forest management plan was not seen as a “sticking point” for forest certification. Although many of the participants did not have a plan, those that did appeared to be pleased with them. One landowner even brought a Forest Stewardship Plan to the meeting to share with others. Several participants stressed that forest management plans did not need to be focused on timber production and could benefit landowners managing their land for other purposes such as hunting and wildlife.

Among some of the landowners, there seemed to be the idea that forest management plans involved professional foresters telling, rather than suggesting, how the landowners should manage their property. If requiring a forest management plan meant that someone would mandate how the landowners managed their property, then they were not supportive.

Harvest notification--Requirements about notifying the certifying organization prior to timber harvest were not raised as concerns during the three focus groups.

Use of a professional forester--The concern over requiring the use of a professional forester appeared related, at least in part, to costs. Most of the Twin Cities focus group participants said they did not want to have to pay for a service if they did not need or want the advice. Others argued that it should be required because professional foresters “have the expertise landowners need” and stressed the importance of “having a professional walk the property with you.”

Use of trained loggers--Many landowners wanted freedom to select loggers of their choice. Concern that logging costs would be higher for certified loggers versus

noncertified loggers was articulated. A few had developed long-standing relationships with loggers and did not want to sever that relationship. Others were concerned that a logger certification program may harm small logging operations. Smaller logging operations were able to handle harvests that were not of interest to the larger businesses. One participant thought that smaller loggers were more environmentally responsible. Despite the concerns over requiring the use of only trained loggers, several landowners were supportive of the requirement. They had negative experiences with loggers that had left them disappointed and were concerned about loggers' ethics. Landowners that discussed these experiences were more receptive to logger training because they felt the loggers would then do a better job in terms of being environmentally responsible, following forest management plans, and communicating with the landowner.

Desired Forest Certification Program

After discussing the program characteristics of two sample programs, participants were allowed to "mix and match" design options to create a more preferred forest certification program (Table 36). In some cases, participants wrote in their own design. For instance, many participants wanted to be involved throughout the forest certification process. That accounts for the 53 percent "Other" responses for that program characteristic. Their ideal program, using the highest percentage option among each of the eight program characteristics, was relatively similar to the ideal program identified in the mail survey. It would involve the landowner at all stages of the process, be run by a forest landowner association, require on-site inspections, not share the inspection results with the public, encourage but not require a forest management plan, and not require notification of harvesting. Additionally, the groups were divided among their preferences for the use of a professional forester and use of loggers.

Table 36. Focus group participant preferences for certification designs.

Level of landowner involvement	Twin Cities		Grand Rapids #1		Grand Rapids #2		All focus groups combined	
	N	%	N	%	N	%	N	%
Not involved	0	0	0	0	0	0	0	0
Involved only at certain stages	7	54	7	64	2	20	16	47
Other	6	46	4	36	8	80	18	53
Certifying organization								
Government organization	4	36	1	11	0	0	5	17
Forest landowner association	5	45	8	89	10	100	23	77
Other	2	18	0	0	0	0	2	7
On-site inspections								
Required	8	67	3	30	6	50	17	50
Not required	3	25	7	70	3	25	13	38
Other	1	8	0	0	3	25	4	12
Results of inspections								
Made fully available to public	5	42	3	25	0	0	8	22
Not made available to public	6	50	9	75	11	92	26	72
Other	1	8	0	0	1	8	2	6
Forest management plan								
Not required	0	0	1	8	0	0	1	3
Encouraged but not required	11	92	11	92	8	67	30	83
Other	1	8	0	0	4	33	5	14
Required to notify of harvesting								
Yes	4	40	2	17	4	33	10	29
No	6	60	10	83	7	58	23	68
Other	0	0	0	0	1	8	1	3
Use of professional forester								
Required	8	62	4	36	5	42	17	47
Not required	4	31	7	64	6	50	17	47
Other	1	8	0	0	1	8	2	6
Use of loggers								
Only loggers trained in environmentally responsible practices	10	77	3	25	6	50	19	51
Any logger you choose	3	23	9	75	6	50	18	49
Other	0	0	0	0	0	0	0	0

Factors that Encourage Certification

Focus group participants were given the opportunity to list the one greatest thing that would prevent them from participating in forest certification and the one greatest thing that would lead them to certify their forests. The lists generated by the three groups were combined, as they were very similar. For example, participants would list costs of certification as something that would prevent them from certifying their forest lands, and they would list an economic incentive as something that would encourage them to certify their forest lands. The participants' recommendations were:

- **The forest certification program would need to have an economic incentive.** This could include a tax break or credit, or some other mechanism for covering all of the forest certification costs or preventing future increases in taxes.

- **The forest certification program would need to allow landowners to retain a sense of control.** Landowners said a barrier to participation would be if they were not able to participate in the entire process. Others listed bureaucracy and too much governmental involvement as their greatest deterrent to certification. The sentiment regarding loss of control was related to the inspection requirement, public sharing of inspection results, harvest notification, and forest management plan requirements. One person was also willing to certify if it meant there would not be additional forest regulations in the future.
- **The forest certification program would need to provide benefits to the forest landowner.** The participants had difficulty identifying benefits from forest certification, but they said they would lean toward forest certification if they felt it would improve their land management—if their forests would be healthier, if their trees would be healthier and produce more, and if they could provide better wildlife management. One participant named the opportunity for more professional help from foresters as something that would lead him to certification. Another benefit that participants wanted certification to provide was to help keep the land in the family, protected from development, and protected from eminent domain.

Additionally, landowners said they would be encouraged to pursue certification if it did not require too many changes in current forest management in order to qualify. They also said it would help if the organization running the program was “good” and helped with forest management and planning.

Changes in Certification Interest

At the conclusion of the focus groups, participants were asked how their attitude or opinion about forest certification had changed. They were given the response options of: (1) more likely to certify; (2) less likely to certify; or (3) no change. In the Twin Cities focus group, they showed their response by raising their hands. In the Grand Rapids focus groups, they wrote their responses down on a sheet of paper and anonymously handed in their responses.

Looking at the combined results, it would appear that 51 percent of the participants were more likely to certify after spending two hours discussing and learning about forest certification. However, the responses within each of the focus groups were very distinct. The Twin Cities focus group was a mixed-attitude group. Their results were 62 percent more likely to certify and 38 percent had no change. The Grand Rapids focus groups were not at all mixed. One focus group was filled with participants with negative attitudes, and they became even less likely to want certification after the focus group (67 percent less likely, 33 percent no change). However, the focus group featuring landowners with positive attitudes became even more positive about forest certification. Ninety-two percent of participants in that focus group were more likely to want certification after participating in the two-hour meeting.

Table 37. Self-reported change in attitude after focus group participation.

Change in attitude	Twin Cities		Grand Rapids #1		Grand Rapids #2		All focus groups combined	
	N	%	N	%	N	%	N	%
More likely to certify	8	62	0	0	11	92	19	51
Less likely to certify	0	0	8	67	1	8	9	24
No change	5	38	4	33	0	0	9	24

Response to Hypothetical Forest Certification Scenario

The focus group participants were also presented with a hypothetical forest certification program described in detail in the focus group questions section of this report. This program was very similar to the current SFIA program. When presented with this program, 62 percent of the participants said they would probably participate. Only 16 percent said they would definitely not participate in the program. Even in the Grand Rapids focus groups with negative attitudes about forest certification, 33 percent of the participants said yes and another 33 percent said not sure.

Table 38. Hypothetical forest certification program participation.

Would you participate in hypothetical forest certification program?	Twin Cities		Grand Rapids #1		Grand Rapids #2		All focus groups combined	
	N	%	N	%	N	%	N	%
Yes	9	69	4	33	10	83	23	62
No	2	15	4	33	0	0	6	16
Not sure or N/A	2	15	4	33	2	17	8	22

Conclusions

The focus groups were designed to compliment the mail survey, and they provided in-depth information that both supported and explained the survey results. In the course of conducting the focus groups, it was found that family forest landowners were largely unfamiliar with forest certification. They had many legitimate questions about forest certification that would need to be addressed in an education outreach effort once a program is designed. In addition to the standard eligibility and administrative information, landowners want to know: (1) the costs of participating; (2) the benefits (economic and noneconomic) of participating; and (3) how the forest certification program will allow them to maintain a sense of control over their land management and use decisions. These critical components became evident throughout the focus groups, especially when landowners were asked about the things that would encourage or discourage their participation in a forest certification program. Many landowners in the focus groups had a change of opinion about forest certification as a result of participating in the meeting. There appeared to be indications that those with positive attitudes became more positive after the focus group, while those with negative attitudes coming into the focus groups became more negative. This may affect how forest certification education is approached in the future. A majority of landowners said they would participate in a hypothetical forest certification program that compensated them \$3-4 per acre per year, required a forest management plan and harvest guidelines, and allowed for the possibility of periodic, randomly selected site inspections.

VI. Minnesota Logger Attitudes and Perceptions of Logger Certification

A. Review of Previous Logger Certification Surveys

There has been much written regarding various forms of logger certification programs, but almost no work done in directly soliciting the opinion of loggers regarding certification of either practices or forest land certification. Egan et al. (1997) conducted the only identified survey of logger attitudes and perceptions regarding logger certification. The survey was administered to loggers in West Virginia and found that many were agreeable to such a program, but only if they deemed it worthwhile. The quality of certification was indicated mostly to be related to the content and quality of training efforts. Those with the most logging experience were the least enamored with a logging certification program. The major concerns regarding logger certification included significant costs to loggers and redundant certification.

B. Survey of Minnesota Loggers

Objectives

Logger certification programs are a potential avenue for assuring responsible forest management activities occur across all landowner classes including family forest landowners. These certification programs include goals of documenting the use of sound harvesting practices to conserve forests for their environmental, economic, and social benefits.

To better assess the potential to develop a logger certification program in the state, this study sought to gain an understanding of loggers':

- Harvesting activity and number of years in the logging business.
- Familiarity with logger certification.
- Understanding and perceptions of logger certification.
- Likelihood of participation under alternative certification program arrangements.
- Willingness to pay for a certification program.
- Perception of need for a certification program.
- Interest in becoming certified.

Methods

Questionnaire

Loggers in Minnesota were surveyed using a mailed questionnaire to assess their opinions regarding logger certification. The questionnaire was four pages in length and contained ten questions (Appendix G). The questionnaire was developed using academic literature, other documents, and input from the Charles K. Blandin Foundation and other timber harvesting experts.

Survey Administration

In February and March of 2005, questionnaires were sent to 413 members of the Minnesota Logger Education Program. Following Dillman's Tailored Design Method (2000), pre-notification postcards, cover letters explaining the purpose of the study were mailed along with the questionnaire, and follow-up reminder postcards and remailings of

questionnaires to those who had not responded were used to increase the response rate. One participant's correct address was not located resulting in a total sample size of 412. Of the 412 participants, a total of 230 responded with usable surveys and 12 respondents returned incomplete questionnaires. The overall response rate was 59 percent [(230 + 12)/(413-1)] while the usable response rate was 56 percent [230/ (413-1)].

Findings

Profile of Responding Loggers

Number of years in logging business--Findings from the survey indicate respondents had substantial experience in the logging business. For instance, a majority of them (57 percent) had been logging for greater than 25 years (Table 39). Approximately 30 percent had been in the logging business between 15 and 25 years.

Table 39. Number of years logging

	%
One year or less to 5 years	1.3
5+ to 15 years	12.7
15+ to 25 years	29.3
25+ to 50 years	52.0
Greater than 50 years	4.8
Total (n=229)	100.0

Source: Question 6.

Timber harvesting activity--Survey respondents consisted of both small and large harvesters. Figure 5 demonstrates that approximately 60 percent of the loggers harvested fewer than 5,000 cords during 2004 while another 30 percent harvested more than 10,000 cords.

Nonindustrial private forest land was the main source of wood volume accounting for 37 percent of the wood volume harvested (Table 40). Nearly one-quarter of the wood volume harvested came from MN DNR land while another 22 percent was harvested from county-administered forest land.

Table 40. Percent of wood volume harvested from various sources.

	Mean (%)
<i>Source:</i>	
Industry land	9.2
NIPF land	37.4
National Forest land	5.1
State DNR land	23.5
County land	22.2
Tribal land	<1
Other	1.8
Total (n=221)	100.0

Source: Question 7.

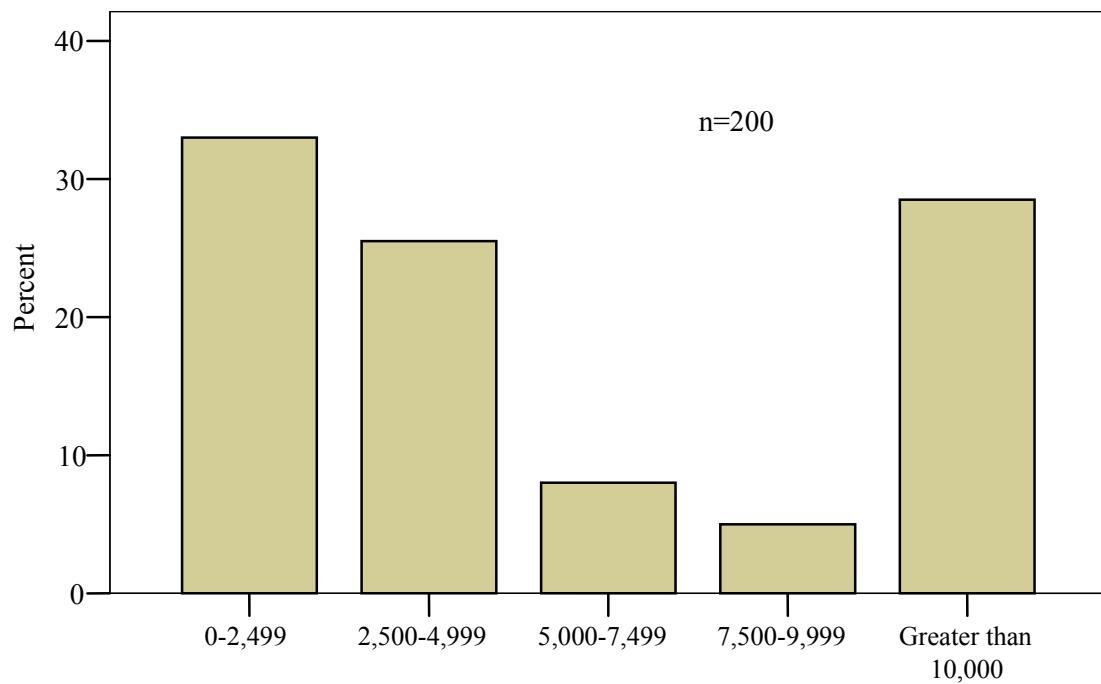


Figure 5. Cords of wood harvested in 2004.

Source: Question 5.

Logger Understanding and Perceptions of Logger Certification

Familiarity with logger certification--Most loggers had at least some familiarity with logger certification. Fifty-eight percent of respondents indicated they had some familiarity with certification while another 28 percent indicated they had an extensive understanding (Figure 6).

Importance of possible benefits and costs of logger certification--Using a four-point scale (1=very important, 4=very unimportant), respondents were asked to rate the level of importance associated with eight different possible outcomes of certifying their logging business. Respondents indicated the most important possible outcome of certifying their business would be higher prices paid for their wood (Table 41), with 64 percent of the respondents having indicated higher prices paid for their wood as a very important outcome. The second most important outcome of certifying their logging business was recognition for good logging practices, with almost half of the respondents reporting this reason as important.

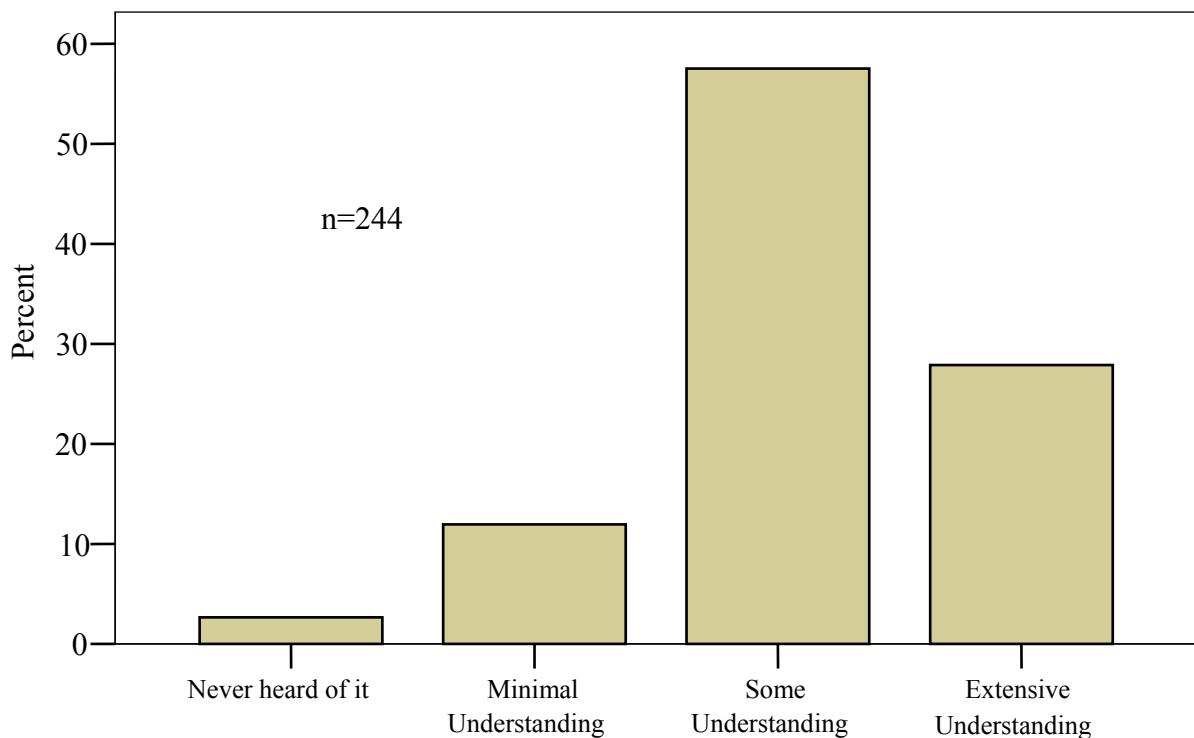


Figure 6. Logger familiarity with logger certification.

Source: Question 1.

Table 41. Importance of various outcomes if logging business is certified.

Possible outcomes	Total sample								
	N	Mean*	Med	SD	1	2	3	4	Not sure
Higher prices paid for my wood	222	1.42	1	0.66	63.5	29.3	2.3	2.3	2.7
Recognition for good logging practices	218	1.63	2	0.70	47.2	42.7	6.9	1.8	1.4
Easier to purchase wood on private lands	217	1.82	2	0.84	40.1	36.4	15.7	3.7	4.1
More restrictions on harvesting practices	213	1.95	2	1.01	39.4	32.9	12.2	11.3	4.2
Access to new markets for my wood	221	1.99	2	0.84	28.5	45.7	16.3	5.4	4.1
Buyers preferring wood from certified logging operation	222	2.01	2	0.86	28.4	42.8	18.0	5.9	5.0
More record keeping and paperwork	210	2.27	2	1.00	23.3	38.6	19.0	15.2	3.8
Additional training courses to attend	214	2.49	2	0.98	14.5	37.4	23.4	18.7	6.1

*Central tendency and dispersion statistics exclude "Not sure" responses.

** 1= Very Important; 2 = Important; 3 = Unimportant; 4 = Very Unimportant.

Source: Question 2.

*Likelihood of realizing possible benefits and costs of logger certification--*Respondents were asked to rate the likelihood of eight various outcomes if their logging business is certified using a four-point scale (1=very likely, 4=very unlikely). The top two perceived outcomes indicated by respondents were additional training courses to attend and more restrictions on harvesting practices (Table 42). For both of these perceived outcomes, 58 percent of the respondents indicated that these consequences were very likely to happen.

More record keeping and paperwork was also perceived as a likely to very likely outcome if loggers' business was certified. In fact, a majority of the respondents perceived this reason as a very likely outcome.

Table 42. Likelihood of various outcomes if logging business is certified.

Possible outcomes	Total sample								
	N	Mean*	Med	SD	Percent of respondents by response category**				
					1	2	3	4	Not sure
Additional training courses to attend	219	1.51	1	0.75	58.0	25.1	7.8	2.3	6.8
More restrictions on harvesting practices	218	1.51	1	0.75	57.8	26.1	7.3	2.3	6.4
More record keeping and paperwork	213	1.60	1	0.78	51.2	29.1	9.9	2.3	7.5
Recognition for good logging practices	216	2.43	2	0.93	14.4	36.6	27.3	13.4	8.3
Buyers preferring wood from certified logging operation	214	2.58	2.5	0.92	10.3	36.0	28.5	17.8	7.5
Easier to purchase wood on private lands	216	2.82	3	0.89	6.5	23.6	35.6	20.8	13.4
Higher prices paid for my wood	215	2.88	3	0.90	6.0	23.3	33.5	25.1	12.1
Access to new markets for my wood	212	2.88	3	0.78	2.4	25.9	41.0	19.8	10.8

*Central tendency and dispersion statistics exclude "Not sure" responses.

** 1= Very Important; 2 = Important; 3 = Unimportant; 4 = Very Unimportant.

Source: Question 2.

Logger Interest in Logger Certification

Using a four-point scale (1=very likely, 4=very unlikely), loggers were asked to indicate their likelihood of participating in a logger certification program under alternative program arrangements. This section outlines loggers' interest in participating under these different arrangements.

Affiliation of logger certification organization--Loggers were most likely to participate in a logger certification program if a logger education program such as the MLEP administered it (Table 43). Seventy-eight percent of respondents indicated they would be likely to very likely to participate if a logger education association ran the program. Loggers were least likely to participate in a certification program if it was operated by an independent organization or a government organization. Forty-five percent indicated they would be unlikely to very unlikely to participate if the certification program was affiliated with an independent organization.

Affiliation of logger certification program--Harvesters were more inclined to participate in a logger certification program affiliated with a regional certification program versus a separate program (i.e., neither a regional nor national affiliation). Forty-seven percent indicated they would likely participate in a certification program affiliated with a regional logger certification program (Table 43). Forty-three percent indicated they were unlikely to very unlikely to participate in a logger certification program affiliated with a national certification program.

Origin of standards used to certify loggers--Loggers were most likely to participate if logging operation audits were based solely on Minnesota standards (Table 43). Nearly three-quarters (73 percent) indicated they would be likely to very likely to participate if

Table 43. Likelihood of participation in logger certification program under various scenarios.*

Likelihood of participation if...	Total Sample								
	N	Percent of respondents by response category**							
		Mean*	Med	SD	1	2	3	4	Not Sure
Program is run by:									
Logger education association	216	1.92	2	0.90	32.4	45.4	6.5	9.3	6.5
Logger trade association	216	2.23	2	0.93	19.4	42.1	17.1	11.6	9.7
Forest products industry association	216	2.37	2	0.91	13.4	43.5	19.4	13.4	10.2
Forest landowner association	216	2.56	2	0.94	9.7	38.4	23.1	18.5	10.2
Educational institution	210	2.57	2	0.93	8.6	38.1	22.4	18.1	12.9
Government organization	216	2.67	3	1.00	11.1	29.6	23.6	23.1	12.5
Independent organization	215	2.72	3	1.00	9.3	26.0	22.8	22.3	19.5
Other	115	2.97	3	1.09	8.7	12.2	15.7	27.8	35.7
Standards used to audit logging operations are:									
Based solely on MN standards	215	1.90	2	0.88	32.1	40.9	8.8	7.0	11.2
Nationally set, but adapted to fit MN	207	2.44	2	0.96	13.0	38.6	18.8	15.9	13.5
Nationally set	200	3.05	3	0.91	4.5	18.5	27.5	32.0	17.5
The program was:									
Affiliated with a regional logger certification program	208	2.33	2	0.87	11.1	47.1	15.9	11.5	14.4
Affiliated with a national logger certification program	211	2.63	3	0.95	9.0	32.2	23.7	19.0	16.1
Separate program not affiliated with either a national or regional program	209	2.67	3	0.98	7.7	31.1	18.7	20.6	22.0
The results of logging operation audits were:									
Were not made available to the public	215	2.54	2	1.00	11.6	29.8	18.6	17.2	22.8
Made available to the public in summary form	211	2.59	2	0.90	5.7	38.9	18.5	17.1	19.9
Made fully available to the public	215	2.67	3	1.02	9.8	29.8	18.1	22.8	19.5
Failure to pass an audit resulted in:									
Losing your certified status only after repeated failure to pass audits	213	2.28	2	0.86	12.7	52.1	14.6	11.7	8.9
Not losing your certified status, but requiring additional training	212	2.43	2	0.93	11.3	40.6	19.3	14.6	14.2
Not losing your certified status and not requiring additional training	208	2.77	3	1.04	11.5	22.1	24.0	26.0	16.3
Losing your logger certification status	212	2.98	3	0.96	8.0	16.5	31.1	30.7	13.7

Table 43. Likelihood of participation in logger certification program under various scenarios (continued).*

Likelihood of participation if...	N	Mean	Med	SD	Total Sample				
					Percent of respondents by response category**				
					1	2	3	4	Not Sure
<i>Program auditors reviewing logging operations were:</i>									
Loggers and professional foresters	212	2.16	2	0.84	17.0	53.3	13.2	9.4	7.1
Only loggers	212	2.35	2	0.95	17.0	38.2	21.7	13.2	9.9
Loggers, professional foresters and other resource professionals	213	2.42	2	0.90	12.7	39.9	25.4	12.7	9.4
Loggers, professional foresters, other resource professionals and IG representatives	211	2.84	3	0.97	9.0	23.7	29.9	27.0	10.4
Only auditors from MN	214	2.54	2	0.98	12.6	34.1	22.9	18.7	11.7
Included auditors from outside MN	214	3.05	3	0.95	6.1	17.8	27.6	34.1	14.5
Only auditors from outside MN	213	3.42	4	0.84	4.2	7.0	23.5	52.6	12.7

*Central tendency and dispersion statistics exclude “Not sure” responses.

** 1= Very Important; 2 = Important; 3 = Unimportant; 4 = Very Unimportant.

Source: Question 3.

the auditing standards were based solely on Minnesota standards. Loggers indicated they would be unlikely to participate in a certification program if the standards were nationally set. Nearly 60 percent reported they would be unlikely to very unlikely participants if national standards were used to audit logging operations.

Review of logging practices: Characteristics of on-site reviewers--Loggers were most likely to participate in certification programs where program auditors consisted solely of loggers and professional foresters (Table 43). In fact, 53 percent indicated they were likely to participate if auditors included only loggers and professional foresters. They were least likely to participate if program auditors included teams of loggers, professional foresters, other resource professionals, and interest group representatives.

Survey respondents had a preference for auditors who were only from Minnesota (Table 43). Sixty-two percent of respondents indicated they were unlikely to very unlikely to participate if auditing teams included auditors from outside Minnesota. Further, loggers indicated they were unlikely to participate if auditors were only from outside Minnesota. Fifty-three percent reported they were very unlikely to participate in a logger certification program under these arrangements.

Review of logging practices: On-site inspections--The survey results indicate that loggers were unlikely to participate if the results of logging audits were made available to the public in any form. For instance, 41 percent of the respondents indicated they would be unlikely to very unlikely to participate if the results of logging operation audits were made fully available to the public (Table 43). If the results of logging audits were not made available to the public, harvesters were still unlikely to participate in a certification program. However, the opinions were mixed as 30 percent indicated they would still likely participate, while 36 percent reported they were unlikely to very unlikely to participate. Twenty-three percent were not sure if they would participate, even when the results were not made available to the public.

Logger Willingness to Pay to Become Certified

Paying for a logger certification program--Loggers were asked to indicate who should help pay for a Minnesota logger certification program at various annual costs to their logging business. Table 44 demonstrates that as the annual cost to certify a logging business increased, the number of harvesters indicating the certified logger should either fully or partially fund the program decreased. Conversely, the number of respondents indicating the government should fully or partially fund the program increased as the annual cost to the logging business increased.

Table 44. Number of loggers indicating who should pay for a logger certification program.

Funding Source:	Annual cost				
	\$100	\$250	\$500	\$750	\$1000
Certified Logger	110	63	33	30	28
Forest Industry	72	103	114	103	101
Government	32	37	56	70	73
Other	18	20	23	27	29

Source: Question 4.

Forty-six percent of respondents indicated the certified logger should be the sole funder of a certification program at an annual cost to their business of \$100 per year (Table 45). At an annual cost of \$250 and \$500, this decreased to 27 percent and 8 percent, respectively. As the annual cost of a certification program increased from \$100 to \$500, the number of harvesters indicating industry, government or others should assist in paying for these programs increased.

Table 45. Paying for a certified logger program at various annual costs.

	N	%
If annual cost is \$100:		
Industry, government or others should (co)fund certification program	113	53.8
Certified logger should be sole funder of certification program	97	46.2
Total	210	100.0
If annual cost is \$250:		
Industry, government or others should (co)fund certification program	144	73.5
Certified logger should be sole funder of certification program	52	26.5
Total	196	100.0
If annual cost is \$500:		
Industry, government or others should (co)fund certification program	177	92.2
Certified logger should be sole funder of certification program	15	7.8
Total	192	100.0

Source: Question 6.

Logger Perception of Need for Minnesota Logger Certification Program

The perception of a need for a Minnesota logger certification program was mixed among the survey respondents. Less than one-quarter indicated a logger certification program should be developed in Minnesota (Table 46). Thirty-seven percent indicated they were not sure whether a certification program should be developed, while 40 percent indicated one should not be developed.

Table 46. Logger attitudes toward developing a logger certification program in Minnesota.

	N	%
Yes, a logger certification program should be developed.	53	24.0
No, a logger certification program should not be developed.	87	39.4
Not sure if a logger certification program should be developed.	81	36.7
Total	221	100.0

Source: Question 8.

Logger Interest in Becoming a Certified Logger

Interest among loggers in certifying their logging business was quite high. Nearly three-fourths of the respondents indicated they are somewhat to very likely to certify their logging business. Only 8 percent of the respondents indicated they never intend to certify their business.

Table 47. Likelihood of logger certifying its logging business.

Likelihood of certifying	%
Never	8
Not very likely	18
Somewhat likely	45
Very likely	29
Total (n=221)	100

Source: Question 9.

Analysis of Selected Logger Subgroups

To determine whether the opinions and attitudes of Minnesota's loggers about logger certification varied according to certain characteristics about them, survey respondents were grouped according to whether the logger:

- Was a large producer of timber.
- Was willing to pay the entire cost of certification.
- Purchased the majority of Minnesota wood from family forests.
- Thought a Minnesota logger certification program should be developed.
- Would likely have their logging business certified.

Large Producers versus Small Producers

Opinions regarding logger certification were compared between large and small harvesters to determine if significant differences exist. For this study, large producers were defined as those who harvested greater than the mean number of cords, 7,962 cords, during 2004, whereas small producers were defined as harvesting 7,962 cords or less. In total, 68 percent (N=165) of the respondents were classified as small harvesters while 32 percent were considered large harvesters. Statistical tests (i.e., chi-square, ANOVA, t-tests) were conducted to determine where significant differences (at $p \leq 0.05$) exist between these two groups. Detailed tables of these analyses are in Appendix H.

Similarities--Large and small producers shared many opinions regarding logger certification programs in the state. For instance, nearly 30 percent of both groups had an extensive understanding of logger certification. The percentage of both small and large producers indicating a need for a logger certification program in the state was not significantly different. Large and small producers were both unlikely to participate in a logger certification program if run by a government entity (e.g., DNR, MFRC), forest landowner association (e.g., MFA) or an educational institution (U of MN Extension). Alternatively, both groups were more likely to participate in a certification program run by a forest products industry association (e.g., MFI) or a logger education association (e.g., MLEP).

Large and small producers were more likely to participate in a logger certification program if it was affiliated with a regional certification program. Large and small producers were unlikely to participate if the standards used to audit logging operations were nationally set. For both groups, participation was likely if the standards were established solely for Minnesota. Further, both groups indicated they were unlikely to participate if the results of logging audits were made available to the public, even in summary form. If failure of logging operation audits resulted in losing logger

certification status or required additional training, both groups were unlikely to participate. Both groups were more likely to participate if losing logger certification status was a result of repeated audit failures.

The importance of possible outcomes of certification was similar between large and small producers. For instance, both groups reported that higher prices paid for their wood was very important. Further, both large and small producers rated each of the following as important:

- Access to new markets.
- Recognition for good logging practices.
- More record keeping and paperwork.
- Buyers preferring wood from certified operations.
- More restrictions on harvesting practices.
- Easier to purchase wood on private lands.
- Additional training courses to attend.

Differences--A number of significant differences existed between the large and small producers. For example, large producers were more likely than small producers to participate in a logger certification program if a logger trade association administered it. In addition, large producers were less likely than small producers to participate in a certification program if failure to pass an audit meant not losing their certification status and not requiring additional training. The percentage of small producers indicating the certified logger should pay all or some of the annual costs to certify their logging business was significantly less than the percentage of large producers. A summary of the significant differences can be found in Table 48.

Table 48. Summary of significant differences between large and small producers.

- Large producers harvested a significantly larger percent of wood volume from industry land than did small producers.
- Small producers harvested a significantly larger percent of wood volume from NIPF land than did large producers.
- Large producers were more likely than small producers to participate in a logger certification program if a logger trade association runs it.
- Large producers were less likely to participate than small producers if failure to pass an audit resulted in not losing certification status and not requiring additional training.
- The percentage of large producers logging for 25 years or less was significantly less than the percentage of small producers.
- The percentage of small producers indicating the certified logger should pay all or some of the annual certification costs (i.e., \$250, \$500, \$750 and \$1,000) to a logging business were significantly less than the percentage of large producers.
- The percentage of small producers indicating the forest products industry association (e.g., MFI) should help pay the annual cost of \$250 to certify a logging business was significantly more than the percentage of large producers.

Loggers Willing to Pay Entire Cost of Certification

Logger opinions were compared and contrasted between those willing to pay the entire annual cost for a certification program and those only willing to share or pay none of the cost. Similarities and differences between these two groups were compared at two

different annual costs (i.e., \$100 and \$250) and were identified using various statistical tests (at $p \leq 0.05$). At an annual cost of \$100, 47 percent ($N=208$) of respondents indicated the certified logger should pay the entire cost for a certification program while 53 percent indicated the certified logger should share or pay none of the cost. When the annual cost was increased to \$250, 27 percent ($N=196$) of respondents indicated the certified logger should pay the entire cost of a certification program while 74 percent indicated the certified logger should share or pay none of the cost. Detailed tables outlining these comparisons are in Appendix I.

Annual Cost of \$100 for Minnesota Logger Certification Program

Similarities--A number of similarities existed between those willing to pay entirely for a logger certification program and those who prefer to only share or pay none of the cost. For instance, a majority of both groups had minimal to some understanding of logger certification. Each group harvested roughly 8,000 cords of wood in 2004 with approximately 40 percent coming from family forest land for both groups. Over half of both groups had been logging for more than 25 years.

Loggers willing to pay the entire annual cost of a certification program and those willing to pay a portion or none of the cost were both unlikely to participate in a certification program run by a government entity. Further, the two groups indicated they were also unlikely to participate if the standards used to audit logging operations were nationally set. Both were unlikely to participate if auditors reviewing logging operations included loggers, professional foresters, other resource professionals and interest group representatives. In addition, these two groups were unlikely to participate if the results of logging audits were made fully available to the public. Both groups were likely to participate if the program is affiliated with a regional program and if losing certification status only occurred after repeated failures of logging audits.

Loggers willing to pay the entire annual cost of a certification program were similar to those only willing to share or pay none of the cost in that both groups indicated higher prices paid for their wood as a very important possible outcome of certifying their business. Other important outcomes as indicated by both groups included:

- Access to new markets.
- Recognition for good logging practices.
- More record keeping and paperwork.
- More restrictions on harvesting practices.
- Easier time purchasing wood on private lands.

The two groups also indicated it was likely that more record keeping and paperwork would accompany any logger certification program, along with more restrictions on harvesting practices and additional training courses to attend. Both groups considered higher prices paid for their wood, buyer preference for wood from certified logging operations and an easier time purchasing wood from private land as unlikely outcomes of certifying their logging business.

Differences--Loggers sharing or paying none of the annual costs of a certification program were less likely to participate than those paying the entire cost if any of the following run the program: forest products industry, forest landowner association, logger trade association, educational institution, logger education association, or an independent organization. In addition, those paying a portion or none of the costs were less likely to participate in a certification program if it was affiliated with a separate program (i.e., neither a nationally or regionally affiliated program). Loggers paying the entire annual cost of a certification program were more likely to participate in a program if the standards used to review logging operations were nationally set, but adapted to fit Minnesota conditions.

Loggers who indicated they were willing to share or pay none of the annual cost of a certification program believed that recognition for good logging practices was an unlikely outcome of certifying their business, whereas those paying the entire cost perceived it as a likely outcome. The percentage of loggers willing to pay the entire annual cost of a certification program who indicated a program should be developed was significantly more than the percentage of loggers willing to pay only a portion or none of the annual cost. A summary of the significant differences can be found in Table 49.

Table 49. Summary of significant differences between harvesters willing to pay entire annual cost of a certification program and those sharing or paying none of the cost at \$100 per year.

- Harvesters willing to pay the entire annual cost of a certification program were more likely to participate than those sharing or paying none of the annual costs if:
 - The program was run by the forest products industry, forest landowner association, logger trade association, educational institution, logger education association, or an independent organization.
 - The standards used to audit logging operations were nationally set, but adapted to fit Minnesota or if the standards were based solely on Minnesota standards.
 - The program was affiliated with a separate program (i.e., neither a regional or national affiliation).
- The percentage of harvesters willing to pay the entire annual cost of a certification program indicating that a program should be developed in Minnesota was significantly more than the percentage among those only paying a portion or none of the annual cost.
- The importance of buyers preferring wood from a certified logging operation as a potential outcome of certification was higher among loggers willing to pay the entire annual cost of a certification program than those paying only a portion or none of the annual costs.

Annual Cost of \$250 to Certify Logging Business

Similarities--In many ways, harvesters willing to pay the entire annual cost (\$250) of a certification program were similar to those only willing to share or pay none of the cost. For instance, both groups had similar levels of understanding regarding logger certification. Approximately one-third of each group reported an extensive understanding of logger certification.

Loggers willing to pay the entire annual cost of a certification program were equally likely to participate in a logger certification program as those willing to pay a portion or none of the annual cost if the standards used to audit logging operations were nationally set, but adapted to Minnesota. Similarly, both groups were likely to participate if standards used to audit logging operations were based on Minnesota standards. Both groups indicated they were likely to participate in a certification program if the auditors

reviewing logging operations included loggers and professional foresters. Their likelihood of participation decreased when representatives from interest groups were included as program auditors. Also, both were unlikely to participate if these program auditors were from outside Minnesota. Both groups were unlikely to participate if failure to pass logging audits resulted in losing their certification status. However, their likelihood of participation increased when losing certification status resulted only after repeated failure to pass audits. Loggers paying the entire annual cost and those only paying a portion or none of the cost to certify their business were equally likely to participate in a logger certification program if it was affiliated with a regional certification program.

Loggers willing to pay the entire annual cost of a certification program and those willing to pay only a portion or none of the cost agreed that higher prices paid for their wood was a very important reason for certifying their business. Other important outcomes as indicated by both groups included:

- Access to new markets.
- Recognition for good logging practices.
- More record keeping and paperwork.
- More restrictions on logging practices.
- Easier time purchasing wood on private lands.

Both groups indicated that higher prices paid for their wood, access to new markets and easier ability to purchase wood from private lands were unlikely outcomes of certifying their business. They perceived more record keeping and paperwork, more restrictions on logging practices and additional training courses to attend as likely outcomes.

Differences--Significant differences were identified between those willing to pay the entire annual cost of a certification program and those willing to pay a portion or none of the cost. For instance, those willing to pay the entire cost were likely to participate in a certification program administered by a government entity, educational institution, forest landowner association, or an independent organization, whereas those willing to share or pay none of the cost were unlikely to participate under any of these program administration arrangements. Further, loggers paying a portion or none of the annual certification program costs were less likely to participate than those paying the entire cost if a forest products industry association, logger trade association, or a logger education association ran the program. Neither group was likely to participate if the certification program included auditors from outside Minnesota. However, those willing to pay the entire cost were more likely to participate than those willing to share or pay none of the cost if auditors were included from outside the state.

Recognition for good logging practices as well as buyers preferring wood from certified logging operations as possible outcomes of certification programs were more important to those paying all of the costs than to those willing to pay a share or none of the costs. The percentage of those willing to pay a portion or none of the cost for a certification program indicating they had been logging for greater than 25 years was significantly more than the percentage among those willing to pay the entire annual cost. The

percentage among those willing to pay the entire cost of a certification program indicating a program should be established in the state was significantly greater than the percentage among those willing to pay only a portion or none of the annual cost to certify. A summary of the differences can be found in Table 50.

Table 50. Summary of significant differences between harvesters willing to pay entire annual cost of a certification program and those sharing or paying none of the cost at \$250 per year.

- Harvesters willing to pay the entire annual cost of certification program were more likely to participate in a program than those sharing or paying none of the annual costs if:
 - The program was run by a government entity, forest products industry association, forest landowner association, logger trade association, educational institution, logger education association or an independent organization.
 - The auditors reviewing logging operations included individuals who were not from Minnesota.
 - The standards used to audit logging operations were based solely on Minnesota standards.
- Possible outcomes of certification including recognition for good logging practices and buyers preferring wood from certified logging operations were more important to those willing to pay entire annual cost of a certification program than to those willing to pay a portion or none of the cost.
- The percentage of harvesters willing to pay the entire annual cost of a certification program indicating a program should be developed in Minnesota was significantly greater than among those willing to pay a portion or none of the cost to certify.
- The mean percentage of wood volume harvested from MN DNR land by harvesters willing to pay a portion or none of the annual cost of a certification program was significantly greater than the percentage among those willing to pay the entire cost of certifying their business.
- The percentage of harvesters sharing or paying none of the annual cost of a certification program indicating they were in the logging business for greater than 25 years was significantly more than the percentage of harvesters willing to pay the entire cost.

Loggers Who Purchased the Majority of Minnesota Wood from Family Forests

Survey respondents were divided into two groups, those who harvested 50 percent or more of their wood volume from family forest landowners (major family forest harvesters) and those harvesting less than 50 percent (minor family forest harvesters). In total, 146 respondents were classified as minor family forest harvesters while 75 were considered major family forest harvesters. These two groups were compared to determine if significant differences existed between them using various statistical tests. Tables detailing these comparisons can be found in Appendix J.

Similarities--Overall, major family forest harvesters shared many similar opinions and characteristics with minor family forest land harvesters. For instance, more than half in each group had been harvesting for more than 25 years. Seventy percent or more of the respondents in both groups indicated they had minimal to some understanding of logger certification.

Major and minor family forest landowners were both likely to participate in a logger certification program if it was administered by a forest products industry association, logger trade association, or a logger education association, while they were unlikely to participate under programs administered by a government entity, an educational institution, or an independent organization. Their preference included logging audits where standards were exclusive to Minnesota along with program auditors that involved loggers, professional foresters and/or other resource professionals. Both groups were unlikely to participate if representatives from interest groups were involved in audits or if

auditors were only from outside Minnesota. Major and minor harvesters were likely to participate in a logger certification program if it was affiliated with a regional program. Both groups were unlikely to participate in a certification program if results of logging operation audits were made fully available to the public or if failure to pass an audit resulted in losing their certification status. Neither group was opposed to losing their certification status but felt this should only occur after repeated failures of audits and should include additional training. In fact, both groups were unlikely to participate in a logger certification program if failure to pass logging audits resulted in not losing their certification status and not requiring additional training.

Major and minor family forest landowners shared similar opinions regarding the importance and likelihood of various possible outcomes of certifying their logging business. For example, both groups indicated that higher prices paid for their wood was a very important reason as a possible outcome of certifying their business. However, neither group believed these higher prices were a likely outcome of certification. Similarly, major and minor harvesters indicated that access to new markets and an easier time purchasing wood on private lands were important reasons to certify their business, but neither group believed these were likely outcomes. Recognition for good logging practices was important to both groups as a reason to certify their logging business. In this instance, however, both groups believed this was not a likely outcome of certification.

The percentage among major and minor family forest land harvesters indicating the certified logger should pay all or a portion of the cost for a certification program was similar across different annual funding levels. For instance, approximately 50 percent of the major family forest land harvesters and 54 percent of the minor family forest land harvesters indicated the certified logger should fully or partially pay for a Minnesota logger certification program at an annual cost of \$100. This decreased to approximately 30 percent among both groups when the annual cost increased to \$250. When the annual cost was \$500, the percentage of major and minor family forest land harvesters decreased to roughly 15 percent.

As the annual cost to pay for a certification program increased, the percentage of both major and minor family forest land harvesters indicating a forest industry association or government entity should fully or partially contribute to the program increased. For example, at an annual cost of \$100 per year, 31 percent and 37 percent of the major and minor family forest land harvesters, respectively, indicated a forest industry association should partially or fully pay for the certification program. When the annual cost increased to \$250, the percentage among both groups indicating the forest industry association should fully or partially pay increased to more than 50 percent and 60 percent when the annual cost increased to \$500 per year. Similarly, as the annual funding level increased from \$100 to \$250, the percentage of major family forest land harvesters indicating the government should fully or partially contribute to a certification program increased from 18 percent to 22 percent, while the percentage of minor family forest land harvesters increased from 14 percent to 18 percent. When the annual funding level increased to \$500, the percentage of major family forest land harvesters indicating government should

pay increased to 27 percent while minor family forest land harvesters increased to 35 percent.

Approximately one-quarter of both the minor and major family forest land harvesters indicated a logger certification program should be developed in Minnesota while roughly 40 percent in each group were not sure. Approximately three-quarters of each group were somewhat to very likely to certify their logging business.

Differences--Very few statistically significant differences existed between major and minor family forest land harvesters. One difference identified by this analysis included a variation in the mean number of cords harvested between the two groups. In 2004, major family forest land harvesters harvested an average of 3,900 cords (from all sources) whereas minor family forest land harvesters harvested an average of nearly 10,000 cords.

Loggers Who Think a Minnesota Logger Certification Program Should be Developed
Harvesters responding to the survey were divided into three groups: those in favor, those opposed to, or those not sure about certifying their logging business. Thirty-nine percent (N=221) of the harvesters indicated they were opposed to the development of a logger certification program in the state, while 24 percent and 37 percent of harvesters indicated they were in favor of or not sure, respectively. Statistical tests were conducted to determine where these three groups were similar and different. Results of these tests can be found in Appendix K.

Similarities--In many ways, those opposed to, in favor of, and those not sure about a logger certification program in the state were similar. For instance, no significant differences existed in the percentage of wood volume these three groups harvested from different sources. Among the three groups, the largest sources of wood volume (i.e., approximately 35 percent) came from family forest land. Roughly one-quarter of the wood volume came from MN DNR land while approximately one-fifth came from county-administered forest land.

Under alternative program arrangements, those opposed to, in favor of, or not sure about logger certification were equally likely or unlikely to participate in a logger certification program. For example, the three groups indicated they were likely to participate in a program run by a logger education association (e.g., MLEP). The groups were likely to participate if the standards used to audit logging operations were based solely on Minnesota conditions rather than nationally set. Those in favor of, opposed to, or not sure about logger certification were equally likely to participate if program auditors reviewing logging operations included loggers and professional foresters. However, if other resources professionals and representatives from interest groups were included, all three groups indicated they would be unlikely to participate in a logger certification program. Further, auditors would need to be from Minnesota for the groups to consider participating. Logger participation in a certification program was unlikely if auditors were included from outside the state or auditors were exclusively from other states. All three groups indicated they were unlikely to participate in a certification program if failure to pass a logging operation audit resulted in losing their certification status. In

addition, they were unlikely to participate if failing an audit resulted in not losing their certification status and not requiring additional training.

Respondents from the three groups indicated higher prices paid for their wood, access to new markets, and greater ability to purchase wood on private land were important possible outcomes of certifying their logging business. However, each of the three groups believed these three outcomes were unlikely to happen as a result of certifying their business. In addition, more record keeping and additional restrictions on harvesting practices were important outcomes to all three groups, with each perceiving the outcomes likely as a result certifying their business.

Differences--Differences existed between those in favor of, opposed to, and not sure about developing a logger certification program in the state. For instance, the percentage of harvesters in the logging business for greater than 25 years opposed to certification (46 percent) was significantly greater than the percent opposed among those harvesting for 25 years or less (30 percent). The percentage of harvesters with an extensive understanding of certification favoring development of a certification program (41 percent) was significantly greater than the percentage of harvesters with only minimal to some understanding (18 percent). The percentage of unlikely certifiers opposed to logger certification (74 percent) was significantly greater than the percentage (26 percent) indicating they were likely to certify.

Harvesters in favor of logger certification were more likely to participate than those opposed to or not sure about certification if a government organization ran the program. Further, those opposed to developing a logger certification program in the state were less likely to participate than those in favor of or not sure about certification if the program is administered by a forest products industry association, forest landowner association, or a logger trade association. Harvesters opposed to developing a logger certification program in the state were less likely to participate than those in favor of a program if an education institution or an independent organization administered it.

Harvesters opposed to a logger certification program were less likely to participate than those in favor of a program if the standards used to audit logging operations were nationally set. Those in favor were more likely to participate than those opposed or not sure about certification if the standards are nationally set, but adapted to Minnesota. Additionally, harvesters opposed were less likely to participate than those not sure about certification if logging operation audits were based solely on Minnesota standards. Those not sure about logger certification were less likely to participate than those in favor of logger certification if standards were exclusive to Minnesota.

Respondents opposed to certification program development were less likely to participate than those in favor of or not sure about certification if the program auditors included loggers, professional foresters, and/ or other resource professionals. Those in favor of certification were more likely than those opposed to participate if program auditors include loggers, professional foresters, other resource professionals and interest group representatives. Further, those in favor of certification program development were more

likely to participate than those opposed if the auditors were exclusively from Minnesota or if they were included from outside the state. Harvesters opposed to logger certification were less likely to participate than those not sure about a certification program if results of logging operation audits were made available to the public in summary form. Further, if repeated failures of logging operation audits meant losing their certification status, those opposed to a certification program were less likely to participate than those in favor. Those opposed were also less likely to participate than the other two groups if failing a logging audit did not mean losing certification status, but required additional training.

Recognition for good logging practices and buyer preference for wood from certified logging operations were more important outcomes of certification to harvesters in favor of logger certification than to those opposed to or not sure about certification. In addition, those opposed to logger certification believed these outcomes were unlikely whereas those in favor of a certification program indicated they were likely to happen. More restrictions on logging practices were more important outcomes to harvesters opposed to certification than to those in favor of the program.

The percentage of harvesters in favor of developing a logger certification program indicating the certified logger should pay a portion or all of the annual cost (77 percent) was significantly greater than the percent among those opposed to program development (39 percent). The percentage of harvesters who opposed logger certification and indicating the government should fully or partially fund a certification program with an annual cost of \$100 or \$250 was significantly greater than the percent among those harvesters in favor of a certification program. A summary of the significant differences between the three groups can be found in Table 51.

Table 51. Summary of significant differences between harvesters in favor of, opposed to, or not sure about development of a logger certification program in the state.

- Harvesters logging for greater than 25 years were more likely to oppose the development of a logger certification program than those harvesting for 25 years or less.
- Harvesters with an extensive understanding of certification were more likely to favor development of a certification program than those with only minimal to some understanding.
- Harvesters in favor of developing a logger certification program were more likely than those opposed to participate if program auditors included loggers, professional foresters, other resource professionals, and interest group representatives.
- More restrictions on harvesting practices were more important to harvesters opposed to certification than to those in favor of program development.
- Harvesters in favor of logger certification were more likely willing to pay all or a portion of the annual cost of certifying their logging business. Those opposed to developing a logger certification program in the state indicated the government should pay all or a portion of the annual cost.

Loggers Who Would be Likely to Have Their Logging Business Certified

The questionnaire investigated respondents' likelihood of certifying their logging business based on their overall understanding of logger certification. Two groups were identified: harvesters likely to certify their logging business and those unlikely to certify. Twenty-six percent (N=221) were classified as those unlikely to certify their business while 74 percent were likely to certify. Statistical tests were conducted to determine

where similarities and differences existed between these two groups. Complete tables displaying these results are located in Appendix L.

Similarities--Harvesters likely to certify shared relatively few opinions regarding logger certification with those unlikely to certify. For instance, significant differences did not exist between the two groups in terms of their sources of wood. Approximately 40 percent of the wood volume was harvested from family forest land by both likely and unlikely certifiers. Roughly one-quarter of both group's wood volume was harvested from MN DNR land while an equal amount was harvested from county-administered forest land.

The percentage of likely certifiers in the business for greater than 25 years (53 percent) was similar to the percentage of unlikely certifiers in the business for the same amount of time (64 percent). The percentage of likely certifiers with an extensive understanding of certification (30 percent) was similar to the percentage of unlikely certifiers with the same level of understanding (24 percent).

Likely and unlikely certifiers indicated that higher prices paid for their wood was a very important outcome of certifying their business. At the same time, neither believed this was a very likely outcome. Other important outcomes of certification to both groups included access to new markets and an easier time purchasing wood on private lands. Again, both groups perceived these as unlikely outcomes. More record keeping and paperwork, more timber harvesting restrictions, and additional training courses were important outcomes to likely and unlikely certifiers, with both groups perceiving these outcomes as likely to happen.

Harvesters likely to certify their business were similar to those unlikely to certify in their preference for a certification program run by a logger education program. In addition, the two groups preferred a certification program whereby standards used to audit logging operations were based solely on Minnesota standards. Both groups' preferences included a program where failure to pass an audit of their logging operation does not result in losing their certification status. Further, both groups were unlikely to participate in a certification program where failing an audit resulted in not losing their certification status and not requiring additional training.

Significant differences did not exist between likely and unlikely certifiers on whether government should pay all or a portion of the annual cost to certify a logging business. The percentage of both groups indicating the government should pay all or a portion of the cost to certify was similar at annual costs of \$100, \$250, \$500, \$750, and \$1,000. As the annual cost increased, so did the percentage in both groups indicating government should pay all or a portion of the cost for a certification program.

Differences--Harvesters who were likely to certify their logging business were often significantly different than those who were unlikely to certify. The percentage of likely certifiers indicating a certification program in the state should be developed (26 percent) was significantly less than the percentage of unlikely certifiers (74 percent). A number of

these differences occurred in their preferences for the design of a logger certification program. For instance, those who were unlikely to certify were unlikely to participate regardless of the program administrator with the exception of a logger trade association. In this case, both groups were equally likely to participate. Those in favor of certifying their logging business were more likely to participate under any program administrator.

If a certification program included nationally set standards for auditing logging operations, both groups were unlikely to participate; although those likely to certify were more inclined to do so. If the certification program included nationally set standards that were adapted to fit Minnesota, those unlikely to certify their logging business were less likely to participate in a logger certification program whereas those likely to certify their logging business were likely to participate. Both groups were likely to participate in a program where standards are exclusive to Minnesota. However, those likely to certify their business were more likely to participate than those unlikely to certify.

Harvesters likely to certify their logging business were more likely than unlikely certifiers to participate in a certification program regardless of who was included as part of the audit team reviewing logging operations (e.g., loggers, professional foresters, resource professionals, and/or interest group representatives). In addition, likely certifiers were more likely to participate no matter where these auditors came from (e.g., only from Minnesota, included from outside Minnesota, or only from outside Minnesota). Those likely to certify their business were more likely to participate than unlikely certifiers if a certification program included full or summary reports of logging audits made available to the public. In addition, likely certifiers were more likely than unlikely certifiers to participate in logger certification if the program included losing certification status after repeated failures to pass audits or if the program included not losing certification status, but required additional training.

Likely and unlikely certifiers placed different levels of importance on various outcomes of certifying their business. For instance, both groups indicated that recognition for good logging practices and buyers preferring wood from certified logging operations as important outcomes of certifying their business. However, both outcomes were significantly more important to those likely to certify. Likely certifiers perceived these two outcomes as likely to happen whereas those unlikely to certify perceived them as unlikely outcomes. An easier time purchasing wood on private lands was an important outcome of certification to both likely and unlikely certifiers. In this case, however, both groups perceived this as an unlikely outcome.

The percentage of likely certifiers indicating the certified logger should pay all or a portion of the \$100 annual cost of a logger certification program (61 percent) was significantly greater than the percentage among unlikely certifiers (32 percent). Similarly, the percentage of likely certifiers indicating the certified logger should pay all or a portion of the annual cost of a certification program at \$250 and \$500 (38 percent and 20 percent, respectively) was significantly greater than the percentage of unlikely certifiers (13 percent and 6 percent, respectively).

Table 52. Summary of significant differences between loggers likely and those unlikely to certify their logging business.

- Harvesters who were likely and those who were unlikely to certify their logging business significantly differed in their preferences for the design of a logger certification program including:
 - which entity should oversee the program
 - the affiliation of a certification program with a national, regional or separate program
 - at what level (i.e., national versus local) should standards be set
 - who should be included as logging operation auditors
 - the availability of logging operation audit reports to the public
 - the implications to loggers for failing logging audits
- Likely certifiers placed a higher importance than unlikely certifiers on the following possible outcomes:
 - recognition for good logging practices
 - buyers preferring wood from certified logging operations
 - easier to purchase wood on private lands
 - additional training courses to attend
- The percent of likely certifiers willing to pay for all or a portion of a logger certification program (at annual costs of \$100, \$250, and \$500) was significantly greater than the percent among those unlikely to certify.
- The percentage of unlikely certifiers (74 percent) indicating a logger certification program should not be developed was significantly greater than the percentage of likely certifiers (26 percent) indicating a certification program should not be developed.

Summary and Conclusions

More than half of the responding harvesters had been in the logging business for more than 25 years while another 30 percent had been in the business between 15 and 25 years. Further, respondents annual timber production ranged from small operations harvesting approximately 100 cords to large-scale operations harvesting upwards of 140,000 cords. Their years of experience and wide-ranging annual production levels provided invaluable insight into loggers' opinions regarding the potential for certification programs in the state.

Harvesters' Understanding and Perception of Certification

As a whole, respondents indicated they had at least some understanding of logger certification. The size of their logging operation (i.e., both large and small producers) had no influence on harvesters' level of understanding of logger certification. Harvesters acquiring a majority of their wood volume from family forest lands had similar levels of understanding as compared to those who acquired wood from other sources. Results from the survey found that the percentage of harvesters with an extensive understanding of certification indicating they were likely to certify was similar to the percentage of harvesters with the same understanding who were unlikely to certify. This suggests harvesters' level of understanding of logger certification did not affect their overall likelihood of certifying their logging business. Harvesters with an extensive understanding of logger certification were, however, more likely to favor the development of a certification program than harvesters with only minimal to some understanding.

Harvesters indicated that higher prices paid for wood, access to new markets, and an easier time purchasing wood on private lands were important outcomes of certifying their business. At the same time, harvesters perceived each of these outcomes to be unlikely to

happen. Their perception was that more record keeping, more restrictions on harvesting practices, and additional training courses to attend are likely outcomes of certifying their logging business.

Preferences for the Design of a Logger Certification Program

Harvesters' preferred characteristics of a logger certification program include the following:

- Administered by a logger education association (e.g., MLEP).
- Standards used to audit logging operations are exclusive to Minnesota.
- Program auditors includes loggers and professional foresters and were only from Minnesota.
- Results of logging audits are not made available to the public.
- Repeated failure to pass logging audits results in losing certification status.
- Affiliated with a regional logger certification program.

The least desirable program characteristics included one that was:

- Administered by an independent organization.
- Used nationally set standards to audit logging operations.
- Included program auditors, loggers, professional foresters, other resource professionals and interest group representatives who are only from outside Minnesota.
- Results of inspections are made fully available to the public.
- Failing logging audits results in losing certification status.
- Affiliated with a separate program (i.e., neither a national or regional certification program).

Harvesters indicating they were unlikely to certify or were opposed to the development of a certification program in Minnesota were unlikely to participate under most alternative program arrangements.

Willingness to Pay for a Logger Certification Program

As the annual cost to a logging business increased in order to pay for a logger certification program, the percentage of harvesters indicating the certified logger should pay the entire cost decreased. Alternatively, loggers indicated that as the annual cost increased, so should the government or forest industry contribution toward paying for a certification program. This held true for both large and small producers at an annual cost to the certified logger of \$100. However, as the cost increased to \$1,000 per year, the percentage of large producers indicating the certified logger should pay all or some of the cost for the certification program was significantly more than the percentage of small producers.

The percentage of harvesters opposed to developing a logger certification program indicating the certified logger should pay all or some of the annual cost for the program was significantly less than the percentage of harvesters in favor of or not sure about developing a certification program. Similarly, harvesters unlikely to certify their business were less supportive than likely certifiers of having the certified logger pay all or a

portion of the cost for a state logger certification program. Harvesters opposed to developing a logger certification program were much more likely to show support if the program was fully or partially funded by the government.

The percentage of harvesters willing to pay the entire annual cost of a certification program and having an extensive understanding of logger certification was similar to those with the same understanding and indicating the certified logger should share or pay none of the annual cost. This may suggest harvesters' familiarity with logger certification has little effect on their willingness to pay for a state certification program. Harvesters who had been in the logging business for greater amounts of time (i.e., greater than 25 years) were only willing to partially pay for the annual costs of a certification program whereas those in the business for less time were more likely to pay the entire annual cost.

Perception of Need and Logger Interest Regarding a Logger Certification Program

Most harvesters did not perceive a need to develop a logger certification program in the state. In fact, less than one in four indicated a logger certification program should be developed. Those most likely to support the development of a certification program were those indicating the certified logger should pay the entire annual cost of a certification program and those most likely certify if a program is developed. While a significant percentage of respondents did not perceive a need to develop a certification program in the state, nearly three-fourths indicated they were somewhat to very likely to certify their business if a program was established. Those most likely to certify included those indicating the certified logger should pay the entire annual cost for a certification program.

VII. Summary Observations

This study provides one of, if not, the most comprehensive assessments of family forest certification opportunities within a state. It documents Minnesota's family forest landowner attitudes toward and interest in forest land certification. It also identifies attitudes and perspectives of the state's timber harvesters regarding logger certification. These perspectives are essential in order to accurately evaluate the likelihood of substantially increasing the presence of certification among Minnesota's family forests, either through certification of the land base (i.e., forest land certification) or the logging of timber from that land base (logger certification).

Below are summary observations of those conditions that contribute and present major challenges to substantially increasing the presence of certified family forest land in Minnesota. They are based on the landowner and timber harvester survey findings, as well as information gleaned from the focus groups with family forest owners. Collectively, these observations provide a context for the recommendations identified in Section IX of this report.

A. Conditions Contributing Toward Increased Forest Certification

Interest in and support within Minnesota for increasing the amount of family forest land is considerable and growing. The amount of certified forest land in Minnesota has grown substantially over the past decade. In 2000, the state had only 850,000 acres of third-party certified forest land. Five years later, the amount of third-party certified forest land in Minnesota exceeds 2.4 million acres. Efforts to expand forest land certification and initiate logger certification programs in the state are being advanced on several fronts. Several Minnesota wood products companies are actively encouraging certification of forest land among other ownerships (including family forests). The MLEP and a logger cooperative are also actively pursuing the development of certification programs for the state's loggers. The Minnesota Legislative Commission on Minnesota Resources (LCMR) has funded several initiatives to expand forest land certification. Additionally, the Blandin Foundation and other nonprofit organizations are actively promoting an expanded presence of forest land and logger certification within the state.

Many of the state's large public and private forest land management organizations are certified. Nearly all Minnesota forest land owned by large corporations is certified, as is the forest land managed by several county land departments. In some instances, an owner or manager's forest land has been certified under more than one forest land and/or environmental management system. Additionally, the MN DNR is currently pursuing dual SFI and FSC certification on its forest land, and several counties are in various stages of having the forest lands they manage certified. If these efforts are successful, Minnesota's certified forest land base will exceed 7.7 million acres, roughly 46 percent of the state's forests where logging can occur.

Minnesota's guidelines define sustainable forest management and timber harvesting standards. Forest land certification systems benchmark timber harvesting and forest

management practices against defined performance standards. In Minnesota, these standards are Minnesota's timber harvesting and forest management guidelines, which address the protection and/or enhancement of many important forest attributes such as riparian forest systems and wildlife habitat. Moreover, the collaborative nature by which they were developed would likely satisfy the procedural requirements of many forest land certification systems, including certification systems (e.g., PEFC) not presently available to Minnesota forest landowners.

Minnesota has a process for systematically monitoring the application of guidelines across public and private forest lands. The SFRA called for the development of a process for monitoring the implementation of Minnesota's guidelines. This monitoring process reflects many of the same characteristics used by forest land certification programs to conduct third-party field audits, namely: sites selected for evaluation are randomly determined; field reviews are conducted by independent auditors; practices are evaluated against clearly defined performance standards; the practices evaluated in the field are described and quantified relative to specific standards, and monitoring results are made available to the public. Should future certification programs allow forest land owned by different ownership categories (e.g., public, private) to be jointly certified under a single certificate, the state's guideline implementation monitoring program is an excellent prototype for establishing field auditing procedures across a mixed ownership forest land base.

Minnesota's loggers express a strong interest in logger certification. While not a substitute for forest land certification, logger certification can be an effective means of demonstrating that environmentally responsible practices are being applied when harvesting timber. It is also one of the few options for advancing certification when the majority of forest landowners are either not interested in having their land certified or do not have the required prerequisites to be certified (e.g., a written forest management plan for the property). The fact that nearly three-fourths of the state's loggers stated they were somewhat to very likely to participate in a logger certification program indicates considerable potential for the development of such a program in Minnesota.

Minnesota's SFIA provides a framework for group certifying family forest landowners. As a method of simultaneously certifying multiple properties under one certificate, group certification represents one of the greatest opportunities for increasing the amount of certified family forest land in Minnesota. Many PEFC countries that have successfully certified a considerable portion of their family forest land base have in place the institutional structures (e.g., forest landowner associations) that enable group certification. Without similar structures, significantly expanding the certified family forest acreage in Minnesota will be extremely challenging. Minnesota's forest tax law, the SFIA, is the most promising vehicle by which group certification of Minnesota's family forests can occur at a meaningful scale. Many of the prerequisites for forest land certification are also requirements of the SFIA program, namely participating forest landowners are required to have and follow a forest management plan and use Minnesota's guidelines when conducting timber harvesting or forest management activities.

B. Conditions Detracting From Increased Forest Certification

Awareness of and interest in forest land certification among the state's family forest landowners is extremely low. The majority of Minnesota's family forest landowners know nothing about forest land certification. When combined with those landowners whose understanding of forest certification is self-described as only minimal, the percentage increases to 80. In contrast, only 3 percent of the state's family forest landowners have an extensive understanding of forest certification. Moreover, just a fraction (4 percent) state they are very likely to certify their forest land, while 19 percent say they would never do so. This low level of awareness and interest in certification presents a formidable challenge to increasing the acreage of the state's certified family forest land.

Minnesota family forest landowners are not interested in certifying their land unless the benefits of certification exceed the costs. Family forest landowners view forest certification like any other investment. They are willing to participate if there is the expectation that a financial return will be realized. Unfortunately, forest certification currently provides few monetary rewards to the family forest landowner—at least to the degree where certification benefits more than cover the cost. Until it does, making a compelling case why Minnesota's family forest landowners should certify their land will be a considerable challenge.

Minnesota family forest landowners realize few, if any, tangible benefits of forest certification. Within the state, price premiums are not paid for wood products sourced from certified forests. Until a monetary benefit from certification is realized, it will be difficult to generate interest in certification among a substantial segment of Minnesota's family forest landowners.

Minnesota family forest landowners perceive few, if any, tangible benefits of forest certification. The state's family forest landowners believe forest certification produces insufficient benefits to warrant their participation. In particular, many landowners have a difficult time discerning how certifying their land adds value, land management capability, or furthers their ownership objectives, the latter being primarily nontimber oriented. Even for the minority of Minnesota landowners who have a forest management plan for their property, many do not see certification providing any additional benefit. Many are also unclear about the relationship between having a forest management plan and having their forest land certified.

The benefits of certification important to Minnesota's family forest landowners are not financial. Improved wildlife habitat, increased timber growth and productivity, and environmentally sound timber harvesting are the top three potential benefits family forest landowners believe are associated with forest certification. Yet these benefits will produce few, if any, monetary returns to the owners of certified forests. This apparent disconnect between the nonmonetary certification benefits that landowners say are

important and the types of benefits needed for their participation is a major obstacle to expanding certification among the state's family forest landowners.

Minnesota family forest landowners are not willing to pay the cost required to have their land certified. The majority of the state's family forest landowners are not willing to pay more than \$1 per acre per year to certify their forests. Yet the cost of certification can be much higher under most systems currently available to these landowners. Unless the out-of-pocket certification costs are decreased, either through group certification and/or providing financial assistance to underwrite a substantial portion of the cost, significantly increasing the acreage of certified family forest land appears unlikely.

Minnesota family forest landowners object to several key requirements of existing forest certification programs available to them. The landowners surveyed in this study indicated that loss of control over decisions regarding the use and management of their land is a major concern. This includes the ability to determine the types of logging practices applied, the selection of loggers who will cut their timber, and relinquishing many decision-making responsibilities. Additionally, landowners expressed concern about having field evaluations conducted on their land and the possibility of the evaluation results becoming public. Yet these are precisely the requirements of the certification programs available to these owners.

Relatively few Minnesota family forests would qualify for enrollment under any certification programs currently available to them. A requirement of all certification programs available to Minnesota family forest landowners is a forest management plan. Yet less than 20 percent of the state's family forests have such a plan. When considering the requirements of certification programs regarding plan content and owner use of the plan, the percentage of these lands that would qualify under existing certification programs is likely lower.

The capacity to expand the acreage of Minnesota family forest land for which a forest management plan has been prepared is limited. Over the last few years, the MN DNR estimates the total acreage for which new forest management plans have been prepared averages only 60,000–70,000 acres per year. If a substantial segment of the state's family forest landowners were interested in certifying their land, the lack of management plans covering these forests would be a major constraint. Without expanding the capacity to prepare forest management plans for these owners, it would take more than a decade to prepare the plans needed to certify one million acres of family forest land currently without such plans.

Few organizational structures exist that would enable all multiple family forest landowners to certify their forest land under a single certificate. Group or regional certification holds substantial potential for certifying a large number of the state's family forest land in a cost-effective manner. Yet the requisite organizational structures for doing so are, for the most part, lacking. Moreover, most Minnesota family forest landowners are not interested in forming cooperatives or being part of other similar structures that would facilitate such efforts.

Family forest enrollment in the SFIA is very limited. As one of the few mechanisms that could be used to group certify family forest lands, enrollment in the SFIA by the state's family forest landowners is extremely modest (approximately 100,000 acres). The lack of an adequate financial incentive, requirement to place a restrictive covenant on the land, inability to get a management plan prepared in a timely fashion, and cumbersome application processes have been cited as reasons for the program's limited appeal among many family forest landowners.

VIII. Principles and Goals of an Effective Certification Framework for Minnesota Family Forest Landowners

The development of a strategy to increase substantially the amount of certified family forest land in Minnesota should be guided by the following goals and principles.

A. Goals

Goals are desired future conditions or outcomes. They provide direction and clarity for the type and magnitude of accomplishments to be associated with an action. Specific to the objective of increasing the amount of certified Minnesota family forest land, any strategy should lead toward the following outcomes.

- **The acreage of Minnesota family forest land certified under a recognized and credible third-party certification system is substantial.** Any strategy should result in tens of thousands, possibly millions of acres, of additional certified family forest land in Minnesota.
- **Minnesota is recognized nationally as a leader in certification of family forest land.** Minnesota should serve as a model for other states that have an interest in substantially increasing the amount of certified family forest land.
- **Minnesota's family forests are owned and managed for a range of economic and ecological benefits.** Certified family forests should continue to provide for a range of uses, services, and values consistent with the interests of their owners.
- **Minnesota's family forest landowners have an enhanced commitment to sustainably managing their forests.** Certification should increase family forest landowner awareness of and commitment to good forestry practices as expressed in Minnesota's guidelines.
- **Minnesota's family forest landowners have an increased awareness of and support for forest certification.** A considerable portion of the state's family forest landowners should recognize the role forest certification plays in promoting the use of sustainable forestry practices.
- **Timber harvesting and forest management practices applied to Minnesota's family forests improve the ability to sustain forest resources for a wide range of uses, values, and outputs.** Certification should increase the ability of family forest landowners to manage their forests for timber and nontimber resources.
- **Minnesota's wood-based industries are more competitive in a global market.** A substantially expanded certified family forest land base should enhance the competitive position of the state's primary and secondary wood-based processing and manufacturing industries.

- **Minnesotans have an enhanced awareness of and appreciation for forest certification and the role it plays in promoting sustainable forest management.** Increasing the acreage of certified Minnesota's family forest land should contribute to an improved understanding among the state's citizens of the importance of forest certification for achieving economic and environmental objectives.
- **Minnesotans have an enhanced awareness of and appreciation for the role and importance of family forests to the state's environment and economy.** As the state's largest forest landowner group, family forests are a major provider of the many economic, recreational, and environmental benefits derived from forests. Through forest certification, the recognition of the importance of these lands should be increased.

B. Principles

Principles are standards used to identify those actions most useful in accomplishing stated goals. Any strategy to increase the amount of certified family forest land in Minnesota should be guided by a number of fundamental precepts. To be successful, such a strategy needs to acknowledge the following principles.

- **Recognize that family forest landowner participation in any certification program is completely voluntary.** Previous assessments of certification and other related programs in Minnesota and other states have repeatedly concluded these programs must be voluntary if they are to have the broad support from private forest landowners needed to achieve their long-term goals.
- **Recognize Minnesota's legal, institutional, and economic setting within which timber harvesting and forest management is practiced.** Strategies to increase the acreage of certified family forest land needs to acknowledge the policies and programs that guide forest management and forest harvesting in the state, notably the SFRA.
- **Recognize the procurement requirements of purchasers of Minnesota wood products as they relate to fiber sourced from sustainably managed forests.** Strategies to increase the acreage of certified family forest land need to help satisfy the procurement requirements for the state's wood-based processing and manufacturing industries.
- **Recognize the importance of having broad support from a wide range of interests through credible standards and processes, independent verification of practices, and timely and public reporting of certification activities and outcomes.** Broad-based support from a wide range of interests is vital to the credibility and long-term success of any family forest certification strategy.
- **Recognize the need for cost-effective certification systems, regardless of the size or location of family forest holding.** Given the relatively small tract size of

most family forests, certification costs need to be reasonable for owners of the small as well as large forest parcels.

- **Recognize the need for certification costs to be commensurate with certification benefits.** The level of “out-of-pocket” costs to a landowner associated with certifying their forest needs to take into account the fact that most family forest landowners will not realize substantial economic benefits from certification.
- **Recognize the variety of reasons why individuals own and manage Minnesota forest land.** The majority of Minnesota’s family forest landowners hold their land for reasons other than growing timber. It is important that any strategy for increasing the amount of certified family forest land acknowledge the importance of the noneconomic uses of this land base by their owners.
- **Recognize the importance of forest management planning, yet the economic and practical limitations of requiring forest management plans on the smallest family forest landownerships.** Management plans and other planning activities are important tools used to help landowners realize their long-term ownership objectives, be they growing timber, managing for wildlife, or providing recreation opportunities. A strategy to increase the acreage of certified family forest land needs to recognize that a management plan is not always practical or necessary on the smallest forested parcels.
- **Recognize the extent to which Minnesota’s family forests have forest management plans, and the existing capacity to increase the family forest acreage covered by forest management plans.** At present, less than 20 percent of the state’s family forest acreage have forest management plans. Moreover, the state’s capacity to write new plans is limited—currently covering only 60,000–70,000 additional acres per year. These factors need to be taken into account in designing a strategy for substantially increasing the amount of Minnesota’s certified family forest land.
- **Recognize the existence of Minnesota’s timber harvesting and forest management guidelines as the state’s standard for defining sustainable forestry.** These guidelines were developed using processes required of many forest land certification systems. As such, they should be the centerpiece of any certification strategy, as these guidelines have been tailored specifically to Minnesota’s ecological and economic conditions, and have wide support throughout the forest resource community.
- **Recognize the existence of initiatives in Minnesota that compliment forest land certification efforts (e.g., guideline implementation monitoring, logger education, training, and certification).** Within the state, a number of programs exist that could compliment efforts to increase the amount of certified family

forest land. To the extent possible and practical, these programs should leverage any family forest certification strategy.

- **Recognize the importance of continuously improving forestry and timber harvesting practices to protect and enhance ecological, economic, and social forest values.** Forest certification can be an extremely effective way of elevating the level and quality of forest management and timber harvesting practices. Any family forest land certification strategy should have associated with it a means by which the quality of these practices improve over time.

IX. Recommendations

A. Implementation Strategy

At the outset of this project, it was anticipated that a framework (i.e., strategy) for substantially increasing the certified acreage of Minnesota family forest land could be identified. This expectation had associated with it a number of key assumptions about the attitudes of the owners of these forests. Chief among them was the assumption that landowner awareness of forest certification was a (possibly the) major barrier to increasing the amount of certified family forest land in the state. Put another way, it was presumed that once these owners were made aware of forest certification programs, a sizable portion would be receptive to having their forests certified.

This assumption turned out to be incorrect. Through both the mail survey and focus group meetings with family forest landowners, the study documented there are major impediments to family forest land certification beyond simply awareness. As has been documented in previous research on the state's family forest landowners, this study confirmed again the vast majority of these owners are not managing the land with timber production as a primary objective. This is not to say timber harvesting does not occur on these lands...it does. However, a timber sale is often incidental to the owner's primary reasons for ownership, which are for nonmonetary purposes such as hunting or other forms of outdoor recreation.

Specific to forest land certification, the study found that family forest landowners clearly see little need to have their forest land certified. Given the predominant focus on nontimber reasons for forest landownership documented in the study, this finding is not surprising. In order to have their land certified, family forest landowners indicate there needs to be financial benefit that more than covers the cost of certification. Presently, the economics of forest certification preclude this condition. Additionally, landowners are loath to relinquish control over their land management and use decisions simply to satisfy the requirements of a forest certification program. Moreover, many landowners feel forest land certification could eventually lead to other organizations (including government) having a greater say over what can and cannot be done on their land.

The study also documented the prerequisites for forest land certification are not in place on many of the state's family forest lands. Most notable among these is a forest management plan. In addition to having forest management plans on only a relatively small portion of family forest acreage, writing new plans is severely constrained by the existing plan writing capacity in the state. Until a certification program becomes available to these owners that addresses the forest management plan requirement (as has been done in many PEFC countries), the prospect of substantially increasing the amount of certified family forest land is bleak.

So what can be done to increase the presence of certification among Minnesota's family forests? Despite the preponderance of factors limiting expansion of family forest certification in the state, there are actions that will advance the level of certification activity among Minnesota's family forest lands. Identified below are immediate and long-

term strategies that should be considered as a means for increasing the acreage of certified family forest lands in Minnesota. They include:

B. Immediate Actions

- **Group certify family forest lands enrolled in the SFIA.** The MN DNR should initiate efforts to group certify forest land enrolled in Minnesota's forest property tax law, the SFIA. Minnesota's SFIA requires participating owners to have and follow a forest management plan, use the state's guidelines when conducting timber harvesting and forest management operations, and maintain the land in an undeveloped, forested state—conditions required of all forest certification systems. Consequently, the program represents the state's single greatest opportunity for family forest group certification. Wisconsin's Managed Forest Law (MFL) uses American Tree Farm System's (ATFS) Group Certification program to certify participating family forest landowners and is an excellent model to follow for certifying considerable family forest acreage under a group certificate. As with the MFL, participation in a group certificate for SFIA landowners should be entirely voluntary and done at no cost to the landowner.
- **Explore opportunities to significantly expand family forest landowner enrollment in the SFIA.** A thorough review of Minnesota's SFIA program should be conducted with the objective of identifying opportunities to increase the level of participation among the state's family forest landowners. The focus of this review should be on obtaining perspectives from SFIA participants and nonparticipants about desirable and undesirable program attributes. Anecdotal evidence suggests the limited incentive payment, restrictive covenant, application procedures, and a landowner's inability to obtain a forest management plan are major deterrents to growth of the program. These areas should be given special attention in such a review. Additionally, the state should set ambitious goals for family forest use of this program, and conduct frequent evaluations to assess progress toward achieving these enrollment goals.
- **Support efforts to establish a Minnesota logger certification program.** Without clear evidence that a sizable portion of Minnesota's family forest landowners are likely to certify their forests, logger certification holds the most promise for expanding the forest certification activity in the state. If, for example, all loggers who are members of MLEP were certified, more than 90 percent of the state's harvested wood would come from certified loggers. The study clearly indicates strong support among the state's loggers for a logger certification program. In response, MLEP recently initiated the development of a Minnesota Logger Certification Program. By doing so, MLEP had set a goal of issuing the first certified logger certificates by the end of 2005. To achieve this ambitious goal, considerable work needs to be completed before the program is operational. This includes, for example, identifying an organization structure for administering the program, developing application procedures, establishing program performance standards, developing field auditing protocols, and training and

establishing credentialing procedures. Support and assistance to MLEP in developing Minnesota's Master Logger Program will further the state's interests in increasing certification activity among the state's family forest landowners.

- **Identify effective methods for informing Minnesota's family forest landowners about and encouraging their participation in forest certification.** When presented additional information on forest certification, family forest landowners participating in the focus groups who were initially negative became even more negative toward certification. Conversely, family forest landowners participating in the focus groups whose initial views toward certification were favorable grew even more favorable when they became more informed about the concept. These findings suggest a landowner's predisposition toward certification is an important determinant about how attitudes change as they become more informed about its features—findings that have important implications for landowner certification outreach strategies. More information is needed to confirm whether these findings are unique to the study's focus group participants, or reflect the sentiments of the state's family forest landowners as a whole. Additional focus groups and/or queries of family forest landowners are recommended methods for developing this understanding. Such information is needed prior to embarking on a major initiative to inform forest landowners about forest land certification.
- **Target forest certification outreach efforts toward the largest family forest tracts.** The study found individuals owning larger tracts of forest land (defined as at least 100 acres in this study) were more positive about forest certification in nearly all respects than owners of small forested parcels. They were also significantly more likely to have their land certified. Consequently, initial outreach strategies should specifically focus on family forest landowners with considerable forest holdings. Doing so makes the most efficient use of limited resources by targeting those owners more likely to participate and whose participation will produce the greatest incremental increase in certified family forest acreage within the state.

C. Long-term Strategy

In addition to the aforementioned tasks that should be acted on immediately, the state should strategically address the long-term needs regarding forest certification and family forest landowners. These needs focus on the two fundamental issues: (1) the availability of certification programs that address important constraints limiting Minnesota family forest participation; and (2) the need to develop more efficient ways of certifying forest land across a landscape of mixed forest ownerships. Specific actions include:

- **Seek opportunities to make available to Minnesota's family forest landowners certification programs that do not require a forest management plan on the smallest parcels.** Even if interest in certification was high among the state's family forest landowners, the requirement to have a forest management plan by all certification programs available to these owners is a major constraint

that would limit participation. For small tracts of forest land, this requirement makes little sense. Forestry-related activity on these tracts is usually very infrequent, often with decades passing between timber harvests. Additionally, the owners of these tracts are less inclined to see the value of having a management plan for their property. Many PEFC countries such as Finland and Norway have effectively addressed this issue without compromising the quality of harvesting practices applied on their private forests. Minnesota should engage in discussions with officials of certification systems currently available to Minnesota forest landowners to effectively address this issue.

- **Seek opportunities to promote the development of a certification program that jointly certifies participating public and private forest landowners in Minnesota.** Minnesota should play a leadership role in facilitating discussion about developing a program for certifying all participating forest landowners within a given geographic area. Under this concept of “blanket certification” forest land in an entire region (possibly an entire state) would be certified regardless of land ownership. Such a certification process would provide a more accurate characterization of the degree to which good forest stewardship is being practiced than existing certification systems that recognize only a subset of the land base as being subject to environmentally sound timber harvesting and forest management practices. To have standing within the marketplace and among various stakeholder groups, such a blanket certification system needs to be recognized under an existing umbrella certification framework like PEFC. Its focus should be a national certification system that contains minimum requirements and implementation rules that would apply to individual states that wish to participate. National forestry organizations with strong linkages back to individual states like the National Association of State Foresters (NASF) are logical venues for taking a lead role in developing such a blanket certification program.

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Appendix A
Minnesota Family Forest Landowner Survey

Minnesota Forest Landowner



Opinion Survey

University of Minnesota
Department of Forest Resources

We want your opinion about forest certification! You do not need any prior knowledge of forest certification in order to complete this survey. In fact, the survey was written with the assumption that most Minnesota forest landowners have never heard of forest certification.

What is Forest Certification?

Forest certification is an increasingly popular way of recognizing good forestry. Owners of certified forest land agree to use only environmentally-responsible practices (for example, practices that protect water quality and promote wildlife habitat when harvesting timber). In the U.S. and worldwide, several certifying organizations have been established that set standards for environmentally-responsible forestry practices. In order for forest land to be certified, the following typically takes place.

- A landowner voluntarily makes the decision to certify his/her forests.
- The landowner files a written application to the certifying organization to have his/her forest land certified.
- The certifying organization reviews information (for example, the landowner's forest management plan) and conducts an on-site inspection of the forest to verify that the standards for forest management and timber harvesting specified by the certification organization are being met.
- The certifying organization decides whether the forest meets the standards required for forest certification.
- If the forest is certified, periodic on-site inspections of the forest are conducted by an independent third-party reviewer to verify that the certification standards continue to be met. If the independent review finds the standards for certification are not being met, the forest land could lose its status as being certified.

1. Prior to receiving this questionnaire, which of the following best describes your familiarity with forest certification? (*check only one*)

- Extensive understanding
- Some understanding
- Minimal understanding
- Never heard of it

23. Thank you for your help! Any other comments, ideas, suggestions, or concerns you have about forest certification are welcomed. Please use the space below and/or the back of this survey to write your comments.

THANK YOU FOR YOUR PARTICIPATION!

Please return this questionnaire using the pre-paid, self-addressed envelope provided.

If you want more information about this survey, please contact Dr. Michael Kilgore, Department of Forest Resources, University of Minnesota, 115 Green Hall, 1530 N. Cleveland Ave., St. Paul, MN 55108, (612) 624-6298.

20. What is the highest level of formal education you have completed? (*check only one*)

- | | |
|---|---|
| <input type="checkbox"/> Some High School or less | <input type="checkbox"/> Bachelor's Degree |
| <input type="checkbox"/> High School/GED | <input type="checkbox"/> Some Graduate School |
| <input type="checkbox"/> Some College | <input type="checkbox"/> Graduate Degree |
| <input type="checkbox"/> Technical/Community College Degree | |

21. What is your employment situation? (*check only one*)

- | | |
|--|--|
| <input type="checkbox"/> Working full-time | <input type="checkbox"/> Working part-time |
| <input type="checkbox"/> Homemaker | <input type="checkbox"/> Unemployed |
| <input type="checkbox"/> Retired | <input type="checkbox"/> Student |
| <input type="checkbox"/> Other (please specify): _____ | |

22. We will be organizing meetings with a small number of landowners to discuss how forest certification can meet the needs of Minnesota's forest landowners. These meetings will be held in the evening, last approximately 1-2 hours, and involve around 10-15 forest landowners. Would you be interested in participating in one of these meetings?

Yes No Maybe

If you answered "Yes" or "Maybe", please indicate a phone number and/or e-mail address where you can be reached.

Phone: (_____) _____

E-mail: _____

2. Below are **possible benefits** that can be associated with forest certification. Indicate how important or unimportant these possible benefits are to you as an owner of forest land (*please circle one number for each item*).

Possible Benefits	Very unimportant	Unimportant	Neither unimportant nor important	Important	Very important	Not sure
Increased timber growth and health.....	1	2	3	4	5	9
Improved wildlife habitat.....	1	2	3	4	5	9
Expanded markets for forest products harvested....	1	2	3	4	5	9
A price premium for forest products harvested.....	1	2	3	4	5	9
Public recognition for practicing good forestry.....	1	2	3	4	5	9
Use environmentally-sound timber harvesting/ forest management practices.....	1	2	3	4	5	9

3. Below are **possible drawbacks** that can be associated with forest certification. Indicate how important or unimportant these possible drawbacks are to you as an owner of forest land (*please circle one number for each item*).

Possible Drawbacks	Very unimportant	Unimportant	Neither unimportant nor important	Important	Very important	Not sure
Increased cost of forest management.....	1	2	3	4	5	9
Increased record-keeping and paperwork.....	1	2	3	4	5	9
Need for periodic on-site inspections of my forestry practices.....	1	2	3	4	5	9
Need to follow a forest management plan.....	1	2	3	4	5	9
Less control over who can harvest my forest.....	1	2	3	4	5	9
Less control over the types of timber harvesting practices that can be used.....	1	2	3	4	5	9

4. Based on your understanding of forest certification, how likely are you to participate in a forest land certification program that has the following characteristics?
(please circle one number for each item)

Would you participate if you were:	<i>Very unlikely to participate</i>	<i>Somewhat unlikely to participate</i>	<i>Neutral/Doesn't matter</i>	<i>Somewhat likely to participate</i>	<i>Very likely to participate</i>	<i>Not sure</i>
• required to be involved throughout the process of certifying your forest?.....	1	2	3	4	5	9
• required to be involved only at certain stages of the certification process?.....	1	2	3	4	5	9
• not involved in the certification process?.....	1	2	3	4	5	9

Would you participate if the certifying organization was:

• a government organization?.....	1	2	3	4	5	9
• a forest products industry association?.....	1	2	3	4	5	9
• a forest landowner association?.....	1	2	3	4	5	9
• an educational institution?.....	1	2	3	4	5	9
• an organization not affiliated with any particular association or group?.....	1	2	3	4	5	9

Would you participate if you had to pay:

• none of the cost to certify your forest?.....	1	2	3	4	5	9
• some of the cost to certify your forest?.....	1	2	3	4	5	9
• all of the cost to certify your forest?.....	1	2	3	4	5	9

(certification costs can range from less than \$1 to \$10 or more per acre)

Would you participate if on-site inspections of your property were:

• required?.....	1	2	3	4	5	9
• a possibility?.....	1	2	3	4	5	9
• not required?.....	1	2	3	4	5	9

15. Have you participated in any government programs to assist you in managing your forest land? (For example, technical and financial assistance for tree planting or obtaining a forest management plan)

Yes No Not sure

16. Are you a member of the following organizations? (*check all that apply*)

Minnesota Forestry Association	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Local woodland owner association	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Wildlife organization (e.g., Minnesota Deer Hunters Association)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Conservation/environmental organization (e.g., The Nature Conservancy)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Section 3. Some Information About You

17. Which of the following best describes the community where you live?

- Rural area
- Small rural town (less than 5,000 people)
- Large rural community (more than 5,000 people)
- Suburb of a metropolitan area
- Metropolitan area

18. What is your age? _____ Years

19. Are you? Male Female

11. Since owning your property, have you sought advice from/been contacted by a professional forester?

Yes No

12. Have you commercially harvested trees on your forest land while being the owner?

No, GO TO QUESTION 13

Yes

When was your most recent harvest (*check only one*)?

- Within the last year
- 1 – 5 years ago
- 5+ to 10 years ago
- more than 10 years ago

Did you consult Minnesota's timber harvesting/forest management guidelines when you harvested your timber?

- Yes
- No
- Not sure

Do you intend to harvest trees on your forest land in the next ten years?

- Yes
- No
- Not sure

13. Do you have a forest management plan prepared for your forest land?

Yes No

14. Are you enrolled in Minnesota's new forest property tax program that provides an annual incentive check to participating forest landowners (the Minnesota Sustainable Forest Incentive Act)?

Yes No

	Very unimportant	Unimportant	Neither unimportant nor important	Important	Very important	Not sure
Would you participate if the results of on-site inspections were:						
• made fully available to the public?.....	1	2	3	4	5	9
• made available to the public only in summary form?.....	1	2	3	4	5	9
• not made available to the public?.....	1	2	3	4	5	9
Would you participate if a forest management plan was:						
• required?.....	1	2	3	4	5	9
• encouraged but not required?.....	1	2	3	4	5	9
• not required?.....	1	2	3	4	5	9
Would you participate in you were:						
• required to use a professional forester when managing your forest or harvesting timber?.....	1	2	3	4	5	9
• not required to use a professional forester when managing your forest or harvesting timber?.....	1	2	3	4	5	9
Would you participate if you:						
• were required to notify the certifying organization of your intent to harvest timber?.....	1	2	3	4	5	9
• were required to use only loggers who were trained in environmentally-responsible practices?.....	1	2	3	4	5	9
• could use any logger you choose?.....	1	2	3	4	5	9
Would you participate if you:						
• received a higher price for your timber?.....	1	2	3	4	5	9
• did not receive a higher price for your timber?.....	1	2	3	4	5	9
Would you participate if forest products mills gave:						
• preference to buying timber from certified forests?.....	1	2	3	4	5	9
• no preference to buying timber from certified forests?.....	1	2	3	4	5	9

5. Based on your understanding of forest certification, what price would you be willing to pay in order to have your forest land certified? (check only one)

\$0 per acre per year for each acre certified	<input type="checkbox"/> Yes	<input type="checkbox"/> No
\$1 per acre per year for each acre certified	<input type="checkbox"/> Yes	<input type="checkbox"/> No
\$2 per acre per year for each acre certified	<input type="checkbox"/> Yes	<input type="checkbox"/> No
\$3 per acre per year for each acre certified	<input type="checkbox"/> Yes	<input type="checkbox"/> No
\$4 per acre per year for each acre certified	<input type="checkbox"/> Yes	<input type="checkbox"/> No
\$5 per acre per year for each acre certified	<input type="checkbox"/> Yes	<input type="checkbox"/> No
\$6 or more per acre per year for each acre certified	<input type="checkbox"/> Yes	<input type="checkbox"/> No

If you answered "\$6 or more per acre per year", indicate how much you would be willing to pay: \$ _____ per acre per year for each acre certified.

6. Based on your current understanding of forest certification, how likely are you to have your forest certified? (check only one)

- I am very likely to have my forest land certified
- I may want my forest land certified, but need additional information before deciding
- I am not likely to certify my forest land, but could change my mind
- I am certain I will never want my forest land certified

Section 2. Your Forestland and Forest Management

7. How many acres and number of parcels of forest land do you own in Minnesota?

_____ forested acres _____ forest parcels

8. How many years have you owned forested land in Minnesota? (check only one)

- One year or less
- 1+ to 5 years
- 5+ to 15 years
- 15+ to 25 years
- 25+ to 50 years
- 50+ years

9. Do you live on your forest land? (check only one)

- Yes, my *permanent* or *seasonal* residence is on my forest land
- No, I'm an absentee owner
- Other (please specify) _____

10. How important are each of the following reasons for owning forest land? (please circle one number for each item).

Possible Drawbacks	Very unimportant	Unimportant	Neither unimportant nor important	Important	Very important	Not sure
Permanent residence.....	1	2	3	4	5	9
Seasonal residence (i.e., your cabin).....	1	2	3	4	5	9
Hunting.....	1	2	3	4	5	9
Fishing.....	1	2	3	4	5	9
Hiking.....	1	2	3	4	5	9
Cross-country skiing.....	1	2	3	4	5	9
Camping.....	1	2	3	4	5	9
Wildlife watching.....	1	2	3	4	5	9
Investment.....	1	2	3	4	5	9
Timber production.....	1	2	3	4	5	9
Other (please specify): _____	1	2	3	4	5	9

Appendix B.

Respondent Subgroup Analysis:

Landowners With and Without a Forest Management Plan

Table B.1. Age comparison of landowners with and without a management plan

	With a Mgmt. Plan			Without a Mgmt. Plan		
	N	Mean	Std dev	N	Mean	Std dev
Age (years)	50	56.58	12.071	171	56.85	12.270

Table B.2. Gender comparison of landowners with and without a management plan

Gender	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
Male	44	86.3	156	89.7	
Female	7	13.7	18	10.3	X ² =0.456

¹ Percent based on total number of respondents in each group (with a management plan N=51, without a management plan N=174).

Table B.3. Educational comparison of landowners with and without a management plan

Education	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
Some High School or less	1	2.1	3	1.7	
High School/GED	8	16.7	33	19.2	X ² = 6.972
Some College	10	20.8	30	17.4	
Technical/Community College Degree	9	18.8	37	21.5	
Bachelor's Degree	5	10.4	34	19.8	
Some Graduate School	8	16.7	11	6.4	
Graduate Degree	7	14.6	24	14.0	

¹ Percent based on total number of respondents in each group (with a management plan N=48, without a management plan N=172).

Table B.4. Employment comparison of landowners with and without a management plan

Employment Status	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	%¹	N	%¹	
Working full-time	22	44.9	91	52.6	
Homemaker	2	4.1	2	1.2	$X^2= 8.540$
Retired	16	32.7	62	35.8	
Other	4	8.2	13	7.5	
Working part-time	4	8.2	5	2.9	
Unemployed	1	2.0	0	0	

¹ Percent based on total number of respondents in each group (with a management plan N=49, without a management plan N=173).

Table B.5. Community comparison of landowners with and without a management plan

Community Size	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	%¹	N	%¹	
Rural area	22	42.3	59	33.9	
Small rural town (less than 5,000 people)	6	11.5	22	12.6	$X^2= 2.244$
Large rural community (more than 5,000 people)	7	13.5	28	16.1	
Suburb of a metropolitan area	13	25.0	41	23.6	
Metropolitan area	4	7.7	24	13.8	

¹ Percent based on total number of respondents in each group (with a management plan N=52, without a management plan N=174).

Table B.6. Absentee landownership comparison of landowners with and without a management plan

Absentee Status	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	%¹	N	%¹	
Permanent/seasonal residence	15	30	38	22.2	
Absentee owner	26	52	115	67.3	$X^2=4.155$
Other	9	18	18	10.5	

¹ Percent based on total number of respondents in each group (with a management plan N=50, without a management plan N=171).

Table B.7. Forest land ownership comparison of landowners with and without a management plan

	With a Mgmt. Plan			Without a Mgmt. Plan		
	N	Mean	Std dev	N	Mean	Std dev
Forested acres owned*	51	320.588	474.57	169	142.27	319.07
Forest parcels owned	27	5.41	10.066	89	4.03	7.901

*p≤0.05

Table B.8. Land tenure comparison of landowners with and without a management plan

Number of years	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
One year or less	1	1.9	5	2.9	
1 to 5 years	2	3.8	29	16.7	X ² = 8.268
5 to 15 years	17	32.7	35	20.1	
15 to 25 years	11	21.2	43	24.7	
25 to 50 years	17	32.7	48	27.6	
50 years or more	4	7.7	14	8.0	

¹ Percent based on total number of respondents in each group (with a management plan N=52, without a management plan N=174).

Table B.9. Comparison of reasons for owning land between landowners with and without a management plan

Reasons:	With a Mgmt. Plan			Without a Mgmt. Plan		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Permanent residence</i>	48	2.83	1.534	148	2.97	1.527
<i>Seasonal residence (i.e. your cabin)</i>	46	3.22	1.576	155	3.53	1.496
<i>Hunting</i>	51	4.08	1.246	167	3.97	1.507
<i>Fishing</i>	50	3.16	1.530	155	3.15	1.549
<i>Hiking</i>	50	4.10	1.035	161	3.80	1.317
<i>Cross-country skiing</i>	47	3.26	1.437	155	2.82	1.488
<i>Camping</i>	50	3.22	1.389	155	3.15	1.524
<i>Wildlife watching</i>	51	4.18	1.053	163	4.12	1.185
<i>Investment</i>	50	3.70	1.298	165	3.65	1.497
<i>Timber production**</i>	51	3.71	1.171	163	3.07	1.410

** p≤0.01

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table B.10. Comparison of landowners with and without a management plan based on contact with forester

Sought Advice/Been Contacted by a professional forester	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	%¹	N	%¹	
Yes	42	82.4	53	30.6	$X^2=43.134$
No	9	17.6	120	69.4	

¹ Percent based on total number of respondents in each group (with a management plan N=51, without a management plan N=173).

***p≤0.001

Table B.11. Comparison of landowners with and without a management plan based on past commercial timber harvest

Commercially harvested trees on forest land while being the owner	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	%¹	N	%¹	
Yes	36	69.2	74	42.5	$X^2=11.426$
No	16	30.8	100	57.5	

¹ Percent based on total number of respondents in each group (with a management plan N=52, without a management plan N=174).

***p≤0.001

Table B.12. Most recent timber harvest comparison between landowners with and without a management plan

Most recent timber harvest	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	%¹	N	%¹	
Within the last year	6	15.4	7	8.9	
1 to 5 years ago	15	38.5	28	35.4	$X^2= 3.279$
5 to 10 years ago	15	38.5	29	36.7	
More than 10 years ago	3	7.7	15	19.0	

¹ Percent based on total number of respondents in each group (with a management plan N=39, without a management plan N=79).

Table B.13. MN Forest Guidelines comparison between landowners with and without a management plan

Consulted Guidelines	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
Yes	22	55	13	16.3	
No	13	32.5	55	68.8	X ² = 20.030
Not sure	5	12.5	12	15.0	

¹ Percent based on total number of respondents in each group (with a management plan N=40, without a management plan N=80).

***p≤0.001

Table B.14. Intention to harvest comparison between landowners with and without a management plan

Intend to harvest in next 10 years	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
Yes	22	55	28	32.9	
No	7	17.5	26	30.6	X ² = 5.725
Not sure	11	27.5	31	36.5	

¹ Percent based on total number of respondents in each group (with a management plan N=52, without a management plan N=174).

Table B.15. Participation in government programs comparison between landowners with and without a management plan

Participated in government programs	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
Yes	25	48.1	18	10.3	
No	22	42.3	152	87.4	X ² = 45.892
Not sure	5	9.6	4	2.3	

¹ Percent based on total number of respondents in each group (with a management plan N=52, without a management plan N=174).

***p≤0.001

Table B.16. Participation in SFIA comparison between landowners with and without a management plan

Enrolled in SFIA	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
Yes	12	23.1	0	0	
No	40	76.9	173	100	$X^2=42.172$

¹ Percent based on total number of respondents in each group (with a management plan N=52, without a management plan N=173).

***p≤0.001

Table B.17. Organization membership comparison between landowners with and without a management plan

Member of...	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹ Yes	N	% ¹ Yes	
Minnesota Forestry Association	10	20.8	7	4.2	$X^2=14.058***$
Local woodland owner association	3	6.7	2	1.2	$X^2=4.448$
Wildlife organization	9	19.1	29	17.4	$X^2=0.08$
Conservation/environmental organization	8	17.4	16	9.7	$X^2=2.113$

¹ Percent based on total number of respondents in each group.

***p≤0.001

Table B.18. Familiarity with forest certification comparison between landowners with and without a management plan

Familiarity	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
Extensive understanding	3	6.3	3	1.8	
Some understanding	13	27.1	25	15.1	
Minimal understanding	14	29.2	44	26.5	$X^2= 8.352$
Never heard of it	18	37.5	94	56.6	

¹ Percent based on total number of respondents in each group (with a management plan N=48, without a management plan N=166).

*p≤0.05

Table B.19. Comparison of possible benefits between landowners with and without a management plan

Possible benefits:	With a Mgmt. Plan			Without a Mgmt. Plan		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Increased timber growth and health	51	4.06	1.223	169	4.05	1.101
Improved wildlife habitat	52	4.21	1.210	171	4.35	1.092
Expanded markets for forest products harvested**	51	3.65	1.180	160	3.11	1.327
A price premium for forest products harvested*	49	3.67	1.281	161	3.22	1.369
Public recognition for practicing good forestry	51	3.08	1.426	164	2.94	1.295
Use environmentally-sound timber harvesting/ forest management practices	51	3.94	1.333	163	3.96	1.113

*p≤.05, ** p≤.01

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table B.20. Comparison of possible drawback between landowners with and without a management plan

Possible drawbacks:	With a Mgmt. Plan			Without a Mgmt. Plan		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Increased cost of forest management	51	3.63	1.199	165	3.77	1.130
Increased record-keeping and paperwork	51	3.69	1.257	168	3.76	1.161
Need for periodic on-site inspections of my Forestry practices	50	3.06	1.202	161	3.32	1.252
Need to follow a forest management plan	51	3.35	1.324	163	3.46	1.287
Less control over who can harvest my forest	51	3.86	1.342	167	3.89	1.296
Less control over the types of timber harvesting practices that can be used	52	3.77	1.337	167	3.78	1.281

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table B.21. Landowners with a management plan vs. without a management plan preferences for the design of a forest certification program

	With a Mgmt. Plan			Without a Mgmt. Plan		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation if you were:						
<i>Required to be involved throughout the process of certifying your forest*</i>	48	3.23	1.547	157	2.70	1.487
<i>Required to be involved only at certain stages of the certification process</i>	49	3.12	1.550	159	2.92	1.399
<i>Not involved in the certification process</i>	40	2.40	1.429	155	2.43	1.377
Would you participate in the certifying organization was:						
<i>A government organization</i>	48	2.58	1.485	157	2.31	1.363
<i>A forest products industry association</i>	51	2.94	1.420	162	2.74	1.547
<i>A forest landowner association</i>	52	3.40	1.418	164	3.21	1.416
<i>An educational institution</i>	50	3.44	1.402	162	3.01	1.466
<i>An organization not affiliated with any particular organization or group</i>	44	2.98	1.338	148	2.76	1.426
Would you participate if you had to pay:						
<i>None of the cost to certify your forest*</i>	48	3.96	1.352	165	3.45	1.536
<i>Some of the cost to certify your forest</i>	49	2.76	1.422	159	2.34	1.349

	With a Mgmt. Plan			Without a Mgmt. Plan		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>All of the cost to certify your forest</i>	48	1.73	1.144	158	1.53	1.032
Would you participate if on-site inspections of your property were:						
<i>Required*</i>	49	3.14	1.581	163	2.56	1.512
<i>A possibility*</i>	50	3.28	1.400	158	2.82	1.417
<i>Not required</i>	45	3.09	1.579	158	3.00	1.378
Would you participate of the results of on-site inspections were?						
<i>Made fully available to the public</i>	43	2.79	1.264	136	2.46	1.338
<i>Made available to the public only in summary form</i>	45	2.96	1.296	142	2.73	1.250
<i>Not made available to the public</i>	44	2.95	1.397	150	2.93	1.248
Would you participate in a forest management plan was:						
<i>Required**</i>	44	3.55	1.405	126	2.85	1.415
<i>Encouraged but not required</i>	48	3.38	1.248	144	3.10	1.324
<i>Not required</i>	40	3.13	1.488	145	2.98	1.356
Would you participate if you were:						
<i>Required to use a professional forester when managing your forest or harvesting timber</i>	47	3.06	1.509	129	2.69	1.509
<i>Not required to use a professional forester when managing your forest or harvesting timber</i>	43	3.19	1.239	135	3.13	1.335
Would you participate if you:						
<i>Were required to notify the certifying organization of your intent to harvest timber</i>	43	3.09	1.493	141	2.93	1.505
<i>Were required to use only loggers who were trained in environmentally-responsible practices</i>	50	3.38	1.576	144	3.22	1.511
<i>Could use any logger you choose</i>	47	3.72	1.394	134	3.35	1.452
Would you participate if you:						
<i>Received a higher price for your timber</i>	48	3.73	1.440	148	3.41	1.461
<i>Did not receive a higher price for your timber</i>	42	2.79	1.298	129	2.69	1.217
Would you participate if forest products mills gave:						
<i>Preference to buying timber from certified forests</i>	47	3.60	1.455	140	3.14	1.472
<i>No preference to buying timber from certified forests</i>	43	2.91	1.269	128	2.58	1.168

^a Responses based on a five-point scale from 1 (very unlikely to participate) to 5 (very likely to participate).

*p≤0.05, **p≤0.01

Table B.22. Willingness to pay for forest certification comparison between landowners with and without a management plan

Price	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹ Yes	N	% ¹ Yes	
\$0 per acre per year for each acre certified	44	89.8	136	84.0	$X^2=1.026$
\$1 per acre per year for each acre certified	27	56.3	75	46.3	$X^2=1.469$
\$2 per acre per year for each acre certified	12	25.0	43	26.5	$X^2=0.046$
\$3 per acre per year for each acre certified	5	10.4	25	15.4	$X^2=0.761$
\$4 per acre per year for each acre certified	3	6.3	13	8.0	$X^2=0.166$
\$5 per acre per year for each acre certified	2	4.2	11	6.8	$X^2=0.439$
\$6 or more per acre per year for each acre certified	2	4.2	5	3.1	$X^2=0.134$

¹ Percent based on total number of respondents in each group.

Table B.23. Likelihood of having forest land certified between landowners with and without a management plan

Likeliness	With a Mgmt. Plan		Without a Mgmt. Plan		Group differences
	N	% ¹	N	% ¹	
I am very likely to have my forest land certified	2	3.9	6	3.4	
I may want my forest land certified, but need additional information before deciding	20	39.2	57	32.8	$X^2= 0.905$
I am not likely to certify my forest land, but could change my mind	21	41.2	77	44.3	
I am certain I will never want my forest land certified	8	15.7	34	19.5	

¹ Percent based on total number of respondents in each group (with a management plan N=51, without a management plan N=174).

Appendix C

Respondent Subgroup Analysis:

Landowners Owning a Large Versus Small Amount of Forest Land

Table C.1. Age comparison of landowners owning less than 100 acres versus 100 acres or more

	Less than 100 acres			100 acres or more		
	N	Mean	Std dev	N	Mean	Std dev
Age (years)	120	56.23	12.884	102	57.06	11.502

Table C.2. Gender comparison of landowners owning less than 100 acres versus 100 acres or more

Gender	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
Male	104	84.6	96	93.2	
Female	19	15.4	7	6.8	$X^2 = 4.121$

¹ Percent based on total number of respondents in each group (less than 100 acres N=123, 100 acres or more N=103).

*p≤.05

Table C.3. Educational comparison of landowners owning less than 100 acres versus 100 acres or more

Education	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
Some High School or less	0	0	4	3.9	
High School/GED	29	24.2	14	13.7	$X^2 = 12.047$
Some College	19	15.8	21	20.6	
Technical/Community College Degree	30	25.0	17	16.7	
Bachelor's Degree	19	15.8	20	19.6	
Some Graduate School	8	6.7	11	10.8	
Graduate Degree	15	12.5	15	14.7	

¹ Percent based on total number of respondents in each group (less than 100 acres N=48, 100 acres or more N=172).

Table C.4. Employment comparison of landowners owning less than 100 acres versus 100 acres or more

Employment Status	Less than 100 acres		100 acres or more		Group differences
	N	%¹	N	%¹	
Working full-time	69	57.0	45	43.7	
Homemaker	2	1.7	3	2.9	$X^2= 15.762$
Retired	44	36.4	33	32.0	
Other	5	4.1	12	11.7	
Working part-time	1	0.8	9	8.7	
Unemployed	0	0	1	1.0	

¹ Percent based on total number of respondents in each group (less than 100 acres N=121, 100 acres or more N=103).

***p≤.001

Table C.5. Community comparison of landowners owning less than 100 acres versus 100 acres or more

Community Size	Less than 100 acres		100 acres or more		Group differences
	N	%¹	N	%¹	
Rural area	42	33.9	42	40.8	
Small rural town (less than 5,000 people)	18	14.5	10	9.7	$X^2= 4.995$
Large rural community (more than 5,000 people)	21	16.9	14	13.6	
Suburb of a metropolitan area	32	25.8	21	20.4	
Metropolitan area	11	8.9	16	15.5	

¹ Percent based on total number of respondents in each group (less than 100 acres N=124, 100 acres or more N=103).

Table C.6. Absentee landownership comparison of landowners owning less than 100 acres versus 100 acres or more

Absentee Status	Less than 100 acres		100 acres or more		Group differences
	N	%¹	N	%¹	
Permanent/seasonal residence	25	20.3	29	29	
Absentee owner	87	70.7	55	55	$X^2=6.126$
Other	11	8.9	16	16	

¹ Percent based on total number of respondents in each group (less than 100 acres N=123, 100 acres or more N=100).

*p≤0.05

Table C.7. Forest land ownership comparison of landowners owning less than 100 acres versus 100 acres or more

	Less than 100 acres			100 acres or more		
	N	Mean	Std dev	N	Mean	Std dev
Forested acres owned***	121	48.6616	24.892	103	339.95	493.61
Forest parcels owned*	60	2.57	5.016	56	6.20	10.691

*p≤0.05, ***p≤.001

Table C.8. Land tenure comparison of landowners owning less than 100 acres versus 100 acres or more

Number of years	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
One year or less	4	3.2	2	1.9	
1 to 5 years	21	16.8	11	10.7	X ² = 4.206
5 to 15 years	31	24.8	22	21.4	
15 to 25 years	30	24.0	24	23.3	
25 to 50 years	30	24.0	34	33.0	
50 years or more	9	7.2	10	9.7	

¹ Percent based on total number of respondents in each group (less than 100 acres N=125, 100 acres or more N=103).

Table C.9. Comparison of reasons for owning land between landowners owning less than 100 acres versus 100 acres or more

Reasons:	Less than 100 acres			100 acres or more		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Permanent residence</i>	107	2.89	1.574	90	2.98	1.491
<i>Seasonal residence (i.e. your cabin)</i>	115	3.50	1.575	87	3.47	1.445
<i>Hunting</i>	119	3.93	1.539	101	4.15	1.276
<i>Fishing</i>	116	3.12	1.611	90	3.23	1.477
<i>Hiking</i>	117	3.78	1.390	95	4.04	1.061
<i>Cross-country skiing</i>	112	2.84	1.522	91	3.09	1.443
<i>Camping</i>	116	3.19	1.537	90	3.20	1.432
<i>Wildlife watching</i>	118	4.03	1.277	97	4.29	.968
<i>Investment</i>	117	3.61	1.497	99	3.70	1.417
<i>Timber production***</i>	115	2.89	1.400	100	3.63	1.269

** p≤0.001

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table C.10. Comparison of landowners owning less than 100 acres versus 100 acres or more based on presence of forest management plan

Have a Forest Management Plan	Less than 100 acres		100 acres or more		Group differences
	N	%¹	N	%¹	
Yes	15	12.2	37	36.6	$X^2=18.582$
No	108	87.8	64	63.4	

¹ Percent based on total number of respondents in each group (less than 100 acres N=123, 100 acres or more N=101).

***p≤0.001

Table C.11. Comparison of landowners owning less than 100 acres versus 100 acres or more based on contact with forester

Sought Advice/Been Contacted by a professional forester	Less than 100 acres		100 acres or more		Group differences
	N	%¹	N	%¹	
Yes	31	25.2	62	61.4	$X^2=29.904$
No	92	74.8	39	38.6	

¹ Percent based on total number of respondents in each group (less than 100 acres N=123, 100 acres or more N=101).

***p≤0.001

Table C.12. Comparison of landowners owning less than 100 acres versus 100 acres or more based on past commercial timber harvest

Commercially harvested trees on forest land while being the owner	Less than 100 acres		100 acres or more		Group differences
	N	%¹	N	%¹	
Yes	41	33.1	68	66.0	$X^2=24.480$
No	83	66.9	35	34.0	

¹ Percent based on total number of respondents in each group (less than 100 acres N=124, 100 acres or more N=103).

***p≤0.001

Table C.13. Most recent timber harvest comparison between landowners owning less than 100 acres versus 100 acres or more

Most recent timber harvest	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
Within the last year	1	2.2	11	15.1	
1 to 5 years ago	18	40.0	25	34.2	
5 to 10 years ago	17	37.8	28	38.4	$X^2= 5.847$
More than 10 years ago	9	20.0	9	12.3	

¹ Percent based on total number of respondents in each group (less than 100 acres N=45, 100 acres or more N=73).

Table C.14. MN Forest Guidelines comparison between landowners owning less than 100 acres versus 100 acres or more

Consulted Guidelines	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
Yes	14	29.3	21	28.8	
No	26	55.3	43	58.9	$X^2=0.215$
Not sure	7	14.9	9	12.3	

¹ Percent based on total number of respondents in each group (less than 100 acres N=47, 100 acres or more N=73).

Table C.15. Intention to harvest comparison between landowners owning less than 100 acres versus 100 acres or more

Intend to harvest in next 10 years	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
Yes	6	12.2	44	57.9	
No	23	46.9	10	13.2	$X^2=29.648$
Not sure	20	40.8	22	28.9	

¹ Percent based on total number of respondents in each group (less than 100 acres N=49, 100 acres or more N=76).

***p≤0.001

Table C.16. Participation in government programs comparison between landowners owning less than 100 acres versus 100 acres or more

Participated in government programs	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
Yes	11	8.9	30	29.1	
No	108	87.1	68	66.0	$X^2=16.091$
Not sure	5	4.0	5	4.9	

¹ Percent based on total number of respondents in each group (less than 100 acres N=124, 100 acres or more N=103).

***p≤0.001

Table C.17. Participation in SFIA comparison between landowners owning less than 100 acres versus 100 acres or more

Enrolled in SFIA	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
Yes	1	0.8	11	10.8	
No	123	99.2	91	89.2	$X^2=11.082$

¹ Percent based on total number of respondents in each group (less than 100 acres N=124, 100 acres or more N=102).

***p≤0.001

Table C.18. Organization membership comparison between landowners owning less than 100 acres versus 100 acres or more

Member of...	Less than 100 acres		100 acres or more		Group differences
	N	% ¹ Yes	N	% ¹ Yes	
Minnesota Forestry Association ***	3	2.5	14	14.4	$X^2=10.337$
Local woodland owner association	1	0.9	4	4.3	$X^2=2.691$
Wildlife organization	16	13.4	22	22.9	$X^2=3.276$
Conservation/environmental organization	12	10.2	12	12.8	$X^2=0.351$

¹ Percent based on total number of respondents in each group.

***p≤0.001

Table C.19. Familiarity with forest certification comparison between landowners owning less than 100 acres versus 100 acres or more

Familiarity	Less than 100 acres		100 acres or more		Group differences $X^2 = 14.483$
	N	% ¹	N	% ¹	
Extensive understanding	2	1.7	4	4.2	
Some understanding	14	11.6	24	25.3	
Minimal understanding	28	23.1	30	31.6	
Never heard of it	77	63.6	37	38.9	

¹ Percent based on total number of respondents in each group (less than 100 acres N=121, 100 acres or more N=95).

**p≤0.01

Table C.20. Comparison of possible benefits between landowners owning less than 100 acres versus 100 acres or more

Possible benefits:	Less than 100 acres			100 acres or more		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Increased timber growth and health	120	4.05	1.107	102	4.09	1.109
Improved wildlife habitat	122	4.29	1.110	103	4.34	1.134
Expanded markets for forest products harvested**	113	2.99	1.326	100	3.54	1.226
A price premium for forest products harvested**	114	3.07	1.381	98	3.65	1.269
Public recognition for practicing good forestry	117	3.00	1.339	100	2.95	1.321
Use environmentally-sound timber harvesting/ forest management practices	115	3.95	1.123	101	3.95	1.211

** p≤.01

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table C.21. Comparison of possible drawback between landowners owning less than 100 acres versus 100 acres or more

Possible drawbacks:	Less than 100 acres			100 acres or more		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Increased cost of forest management	115	3.78	1.082	103	3.71	1.168
Increased record-keeping and paperwork	118	3.68	1.176	103	3.80	1.175
Need for periodic on-site inspections of my Forestry practices	114	3.18	1.294	99	3.33	1.169
Need to follow a forest management plan	118	3.48	1.293	99	3.40	1.285
Less control over who can harvest my forest	119	3.85	1.369	101	3.94	1.215
Less control over the types of timber harvesting practices that can be used	119	3.70	1.356	103	3.90	1.192

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table C.22. Landowners owning less than 100 acres versus 100 acres or more preferences for the design of a forest certification program

	Less than 100 acres			100 acres or more		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation if you were:						
<i>Required to be involved throughout the process of certifying your forest***</i>	115	2.51	1.429	92	3.22	1.525
<i>Required to be involved only at certain stages of the certification process*</i>	115	2.75	1.375	94	3.23	1.470
<i>Not involved in the certification process</i>	110	2.29	1.357	86	2.57	1.402
Would you participate in the certifying organization was:						
<i>A government organization*</i>	112	2.19	1.372	94	2.60	1.394
<i>A forest products industry association**</i>	117	2.51	1.622	97	3.10	1.327
<i>A forest landowner association**</i>	118	2.99	1.441	99	3.57	1.334
<i>An educational institution</i>	117	2.93	1.513	96	3.31	1.364
<i>An organization not affiliated with any particular organization or group</i>	102	2.62	1.417	91	2.98	1.366
Would you participate if you had to pay:						
<i>None of the cost to certify your forest*</i>	119	3.34	1.586	96	3.81	1.348
<i>Some of the cost to certify your forest</i>	114	2.28	1.392	97	2.63	1.333
<i>All of the cost to certify your forest</i>	115	1.50	1.029	93	1.69	1.093
Would you participate if on-site inspections of your property were:						
<i>Required*</i>	117	2.48	1.584	97	2.93	1.474
<i>A possibility</i>	113	2.79	1.485	97	3.07	1.356
<i>Not required</i>	111	2.92	1.472	94	3.13	1.378
Would you participate of the results of on-site inspections were?						
<i>Made fully available to the public</i>	98	2.45	1.348	84	2.65	1.303
<i>Made available to the public only in summary form</i>	100	2.64	1.210	90	2.93	1.305
<i>Not made available to the public</i>	107	2.93	1.298	90	2.92	1.265
Would you participate in a forest management plan was:						
<i>Required</i>	88	2.90	1.494	83	3.14	1.372
<i>Encouraged but not required</i>	103	3.15	1.375	91	3.20	1.222
<i>Not required</i>	98	3.06	1.427	87	2.95	1.337
Would you participate if you were:						
<i>Required to use a professional forester when managing your forest or harvesting timber</i>	93	2.71	1.564	83	2.92	1.491
<i>Not required to use a professional forester when managing your forest or harvesting timber</i>	92	3.12	1.397	86	3.15	1.251
Would you participate if you:						
<i>Were required to notify the certifying organization of your intent to harvest timber</i>	97	3.02	1.521	86	2.91	1.492
<i>Were required to use only loggers who were trained in environmentally-responsible practices</i>	106	3.25	1.572	88	3.28	1.477
<i>Could use any logger you choose</i>	96	3.36	1.516	85	3.53	1.368
Would you participate if you:						
<i>Received a higher price for your timber*</i>	106	3.23	1.488	91	3.76	1.401
<i>Did not receive a higher price for your timber</i>	90	2.61	1.206	81	2.78	1.275
Would you participate if forest products mills gave:						
<i>Preference to buying timber from certified forests*</i>	103	3.04	1.508	85	3.48	1.428

	Less than 100 acres			100 acres or more		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
No preference to buying timber from certified forests	91	2.56	1.240	81	2.74	1.160

^a Responses based on a five-point scale from 1 (very unlikely to participate) to 5 (very likely to participate).

*p≤0.05, **p≤0.01, ***p≤.001

Table C.23. Willingness to pay for forest certification comparison between landowners owning less than 100 acres versus 100 acres or more

Price	Less than 100 acres		100 acres or more		Group differences
	N	% ¹ Yes	N	% ¹ Yes	
\$0 per acre per year for each acre certified*	93	80.2	86	89.6	X ² =3.540
\$1 per acre per year for each acre certified	52	45.2	49	51.0	X ² =0.711
\$2 per acre per year for each acre certified	31	27.0	23	24.0	X ² =0.247
\$3 per acre per year for each acre certified	19	16.5	11	11.5	X ² =1.10
\$4 per acre per year for each acre certified	12	10.4	4	4.2	X ² =2.933
\$5 per acre per year for each acre certified	10	8.7	3	3.1	X ² =2.808
\$6 or more per acre per year for each acre certified	5	4.3	2	2.1	X ² =0.836

¹ Percent based on total number of respondents in each group.

*p≤0.05

Table C.24. Likelihood of having forest land certified between landowners owning less than 100 acres versus 100 acres or more

Likeliness	Less than 100 acres		100 acres or more		Group differences
	N	% ¹	N	% ¹	
I am very likely to have my forest land certified	3	2.4	5	4.9	
I may want my forest land certified, but need additional information before deciding	40	32.0	36	35.3	X ² = 4.772
I am not likely to certify my forest land, but could change my mind	53	42.4	48	47.1	
I am certain I will never want my forest land certified	29	23.2	13	12.7	

¹ Percent based on total number of respondents in each group (less than 100 acres N=125, 100 acres or more N=102).

Appendix D

Respondent Subgroup Analysis:

Landowners Familiar Versus Not Familiar With Forest Certification

Table D.1. Age comparison of landowners not familiar with forest certification versus those who are familiar

	Not Familiar w/ Certification			Familiar w/ Certification		
	N	Mean	Std dev	N	Mean	Std dev
Age (years)	113	55.65	12.548	100	57.04	11.628

Table D.2. Gender comparison of landowners not familiar with forest certification versus those who are familiar

Gender	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	% ¹	N	% ¹	
Male	98	86	92	90.2	
Female	16	14	10	9.8	$X^2=0.910$

¹ Percent based on total number of respondents in each group (not familiar N=114, familiar N=102).

Table D.3. Educational comparison of landowners not familiar with forest certification versus those who are familiar

Education	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	% ¹	N	% ¹	
Some High School or less	4	3.6	1	1.0	
High School/GED	19	17.1	23	22.5	$X^2= 3.172$
Some College	18	16.2	19	18.6	
Technical/Community College Degree	23	20.7	22	21.6	
Bachelor's Degree	22	19.8	16	15.7	
Some Graduate School	9	8.1	8	7.8	
Graduate Degree	16	14.4	13	12.7	

¹ Percent based on total number of respondents in each group (not familiar N=111, familiar N=102).

Table D.4. Employment comparison of landowners not familiar with forest certification versus those who are familiar

Employment Status	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
Working full-time	61	54.5	49	48.0	
Homemaker	3	2.7	2	2.0	
Retired	35	31.3	37	36.3	
Other	9	8.0	7	6.9	
Working part-time	4	3.6	6	5.9	
Unemployed	0	0	1	1.0	

¹ Percent based on total number of respondents in each group (not familiar N=112, familiar N=102).

Table D.5. Community comparison of landowners not familiar with forest certification versus those who are familiar

Community Size	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
Rural area	26	22.6	51	50.0	
Small rural town (less than 5,000 people)	19	16.5	9	8.8	
Large rural community (more than 5,000 people)	23	20.0	11	10.8	
Suburb of a metropolitan area	29	25.2	23	22.5	
Metropolitan area	18	15.7	8	7.8	

¹ Percent based on total number of respondents in each group (not familiar N=115, familiar N=102).

***p≤.001

Table D.6. Absentee landownership comparison of landowners not familiar with forest certification versus those who are familiar

Absentee Status	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
Permanent/seasonal residence	19	16.8	31	31.0	
Absentee owner	83	73.5	54	54.0	
Other	11	9.7	15	15.0	

¹ Percent based on total number of respondents in each group (not familiar N=113, familiar N=100).

*p≤.05

Table D.7. Forest land ownership comparison of landowners not familiar with forest certification versus those who are familiar

	Not Familiar w/ Certification			Familiar w/ Certification		
	N	Mean	Std dev	N	Mean	Std dev
Forested acres owned	110	136.192	353.32	102	212.99	350.06
Forest parcels owned	60	3.43	6.127	50	5.52	10.876

Table D.8. Land tenure comparison of landowners not familiar with forest certification versus those who are familiar

Number of years	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	% ¹	N	% ¹	
One year or less	3	2.6	3	2.9	
1 to 5 years	20	17.4	12	11.7	$X^2 = 2.766$
5 to 15 years	25	21.7	23	22.3	
15 to 25 years	30	26.1	23	22.3	
25 to 50 years	28	24.3	33	32.0	
50 years or more	9	7.8	9	8.7	

¹ Percent based on total number of respondents in each group (not familiar N=115, familiar N=103).

Table D.9. Comparison of reasons for owning land between landowners not familiar with forest certification versus those who are familiar

Reasons:	Not Familiar w/ Certification			Familiar w/ Certification		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Permanent residence</i>	96	2.76	1.513	94	3.10	1.539
<i>Seasonal residence (i.e. your cabin)</i>	101	3.57	1.538	93	3.45	1.463
<i>Hunting</i>	109	4.11	1.423	101	4.01	1.418
<i>Fishing</i>	102	3.06	1.597	95	3.24	1.514
<i>Hiking</i>	104	3.83	1.424	98	4.02	1.015
<i>Cross-country skiing</i>	102	2.79	1.556	91	3.15	1.437
<i>Camping</i>	104	3.17	1.548	94	3.20	1.478
<i>Wildlife watching</i>	107	4.05	1.299	98	4.32	.869
<i>Investment</i>	108	3.61	1.484	98	3.79	1.401
<i>Timber production**</i>	104	2.91	1.387	102	3.56	1.332

** p≤0.01

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table D.10. Comparison of landowners owning not familiar with forest certification versus those who are familiar based on presence of forest management plan

Have a Forest Management Plan	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
Yes	18	16.1	30	29.4	$X^2= 5.460$
No	94	83.9	72	70.6	

¹ Percent based on total number of respondents in each group (not familiar N=112, familiar N=102).

*p≤0.05

Table D.11. Comparison of landowners not familiar with forest certification versus those who are familiar based on contact with forester

Sought Advice/Been Contacted by a professional forester	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
Yes	45	39.8	44	43.6	$X^2= 0.307$
No	68	60.2	57	56.4	

¹ Percent based on total number of respondents in each group (not familiar N=113, familiar N=101).

Table D.12. Comparison of landowners not familiar with forest certification versus those who are familiar based on past commercial timber harvest

Commercially harvested trees on forest land while being the owner	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
Yes	65	56.5	48	47.1	$X^2= 1.940$
No	50	43.5	54	52.9	

¹ Percent based on total number of respondents in each group (not familiar N=115, familiar N=102).

Table D.13. Most recent timber harvest comparison between landowners not familiar with forest certification versus those who are familiar

Most recent timber harvest	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
Within the last year	2	3.6	9	15.5	
1 to 5 years ago	21	38.2	22	37.9	$X^2= 5.093$
5 to 10 years ago	23	41.8	21	36.2	
More than 10 years ago	9	16.4	6	10.3	

¹ Percent based on total number of respondents in each group (not familiar N=55, familiar N=58).

Table D.14. MN Forest Guidelines comparison between landowners not familiar with forest certification versus those who are familiar

Consulted Guidelines	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	% ¹	N	% ¹	
Yes	15	26.8	17	29.3	
No	32	57.1	33	56.9	$X^2= 0.164$
Not sure	9	16.1	8	13.8	

¹ Percent based on total number of respondents in each group (not familiar N=56, familiar N=58).

Table D.15. Intention to harvest comparison between landowners not familiar with forest certification versus those who are familiar

Intend to harvest in next 10 years	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	% ¹	N	% ¹	
Yes	17	29.3	29	47.5	
No	20	34.5	12	19.7	$X^2= 5.082$
Not sure	21	36.2	20	32.8	

¹ Percent based on total number of respondents in each group (not familiar N=58, familiar N=61).

Table D.16. Participation in government programs comparison between landowners not familiar with forest certification versus those who are familiar

Participated in government programs	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	% ¹	N	% ¹	
Yes	13	11.3	27	26.5	
No	98	85.2	70	68.6	$X^2= 8.931$
Not sure	4	3.5	5	4.9	

¹ Percent based on total number of respondents in each group (not familiar N=115, familiar N=102).

*p≤0.05

Table D.17. Participation in SFIA comparison between landowners not familiar with forest certification versus those who are familiar

Enrolled in SFIA	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	% ¹	N	% ¹	
Yes	3	2.6	8	7.9	$X^2= 3.136$
No	112	97.4	93	92.1	

¹ Percent based on total number of respondents in each group (not familiar N=115, familiar N=101).

Table D.18. Organization membership comparison between landowners not familiar with forest certification versus those who are familiar

Member of...	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹ Yes	N	%¹ Yes	
Minnesota Forestry Association***	1	0.9	15	16.0	$X^2=16.345$
Local woodland owner association *	2	0	4	4.5	$X^2=5.136$
Wildlife organization	16	14.3	20	21.3	$X^2=1.732$
Conservation/environmental organization	8	7.1	14	15.2	$X^2=3.423$

¹ Percent based on total number of respondents in each group.

*p≤0.05, ***p≤0.001

Table D.19. Comparison of possible benefits between landowners not familiar with forest certification versus those who are familiar

Possible benefits:	Not Familiar w/ Certification			Familiar w/ Certification		
	N	Mean^a	Std dev	N	Mean^a	Std dev
Increased timber growth and health	110	4.00	1.100	103	4.18	1.055
Improved wildlife habitat	113	4.29	1.041	103	4.42	1.071
Expanded markets for forest products harvested**	106	2.96	1.316	98	3.58	1.192
A price premium for forest products harvested*	105	3.12	1.405	98	3.60	1.241
Public recognition for practicing good forestry	107	2.93	1.315	102	3.14	1.305
Use environmentally-sound timber harvesting/ forest management practices*	109	3.82	1.156	99	4.17	1.040

*p≤.05, ** p≤.01

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table D.20. Comparison of possible drawback between landowners not familiar with forest certification versus those who are familiar

Possible drawbacks:	Not Familiar w/ Certification			Familiar w/ Certification		
	N	Mean^a	Std dev	N	Mean^a	Std dev
Increased cost of forest management	109	3.86	1.076	101	3.68	1.122
Increased record-keeping and paperwork*	111	3.93	1.110	102	3.61	1.153
Need for periodic on-site inspections of my Forestry practices	107	3.38	1.286	98	3.14	1.158
Need to follow a forest management plan	108	3.56	1.306	100	3.38	1.196
Less control over who can harvest my forest	111	3.89	1.282	100	3.95	1.250
Less control over the types of timber harvesting practices that can be used	110	3.75	1.281	103	3.91	1.205

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

*p≤0.05

Table D.21. Landowners not familiar with forest certification versus those who are familiar preferences for the design of a forest certification program

	Not Familiar w/ Certification			Familiar w/ Certification		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation if you were:						
<i>Required to be involved throughout the process of certifying your forest*</i>	104	2.61	1.431	93	3.17	1.530
<i>Required to be involved only at certain stages of the certification process*</i>	104	2.75	1.349	95	3.23	1.455
<i>Not involved in the certification process</i>	99	2.45	1.402	89	2.36	1.342
Would you participate in the certifying organization was:						
<i>A government organization*</i>	105	2.21	1.371	93	2.61	1.376
<i>A forest products industry association</i>	108	2.59	1.612	98	2.97	1.396
<i>A forest landowner association***</i>	108	2.94	1.433	99	3.59	1.309
<i>An educational institution***</i>	107	2.78	1.469	97	3.53	1.331
<i>An organization not affiliated with any particular organization or group**</i>	97	2.57	1.414	88	3.12	1.326
Would you participate if you had to pay:						
<i>None of the cost to certify your forest*</i>	111	3.32	1.550	95	3.84	1.386
<i>Some of the cost to certify your forest**</i>	106	2.16	1.325	95	2.73	1.340
<i>All of the cost to certify your forest</i>	107	1.50	1.058	92	1.66	1.041
Would you participate if on-site inspections of your property were:						
<i>Required</i>	108	2.49	1.519	97	2.89	1.533
<i>A possibility**</i>	107	2.65	1.428	94	3.24	1.357
<i>Not required*</i>	104	2.85	1.467	92	3.29	1.347
Would you participate of the results of on-site inspections were?						
<i>Made fully available to the public</i>	91	2.64	1.379	82	2.38	1.234
<i>Made available to the public only in summary form</i>	93	2.78	1.293	88	2.81	1.230
<i>Not made available to the public</i>	98	2.96	1.331	90	2.97	1.231
Would you participate in a forest management plan was:						
<i>Required</i>	83	2.89	1.473	80	3.21	1.384
<i>Encouraged but not required</i>	90	3.10	1.366	96	3.32	1.192
<i>Not required</i>	89	3.09	1.354	88	3.05	1.372
Would you participate if you were:						
<i>Required to use a professional forester when managing your forest or harvesting timber</i>	84	2.76	1.557	83	2.89	1.465
<i>Not required to use a professional forester when managing your forest or harvesting timber</i>	84	3.07	1.360	85	3.21	1.273
Would you participate if you:						
<i>Were required to notify the certifying organization of your intent to harvest timber</i>	90	3.08	1.545	84	2.86	1.424
<i>Were required to use only loggers who were trained in environmentally-responsible practices</i>	95	3.25	1.598	90	3.32	1.405
<i>Could use any logger you choose</i>	89	3.34	1.492	83	3.58	1.345
Would you participate if you:						
<i>Received a higher price for your timber*</i>	96	3.25	1.529	90	3.69	1.379
<i>Did not receive a higher price for your timber</i>	87	2.63	1.259	76	2.76	1.165

Would you participate if forest products mills gave:							
<i>Preference to buying timber from certified forests*</i>	96	3.00	1.522	84	3.54	1.384	
<i>No preference to buying timber from certified forests</i>	90	2.68	1.288	74	2.57	1.048	

^a Responses based on a five-point scale from 1 (very unlikely to participate) to 5 (very likely to participate).

*p≤0.05, **p≤0.01, ***p≤0.001

Table D.22. Willingness to pay for forest certification comparison between landowners not familiar with forest certification versus those who are familiar

Price	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹ Yes	N	%¹ Yes	
\$0 per acre per year for each acre certified	89	82.4	83	88.3	X ² =1.379
\$1 per acre per year for each acre certified	47	43.5	51	54.8	X ² =2.563
\$2 per acre per year for each acre certified	32	29.6	21	22.6	X ² =1.279
\$3 per acre per year for each acre certified	18	16.7	12	12.9	X ² =0.557
\$4 per acre per year for each acre certified	10	9.3	6	6.5	X ² =0.538
\$5 per acre per year for each acre certified	8	7.4	5	5.4	X ² =0.341
\$6 or more per acre per year for each acre certified	3	2.8	4	4.3	X ² =0.345

¹ Percent based on total number of respondents in each group.

Table D.23. Likelihood of having forest land certified between landowners not familiar with forest certification versus those who are familiar

Likeliness	Not Familiar w/ Certification		Familiar w/ Certification		Group differences
	N	%¹	N	%¹	
I am very likely to have my forest land certified	2	1.7	5	4.9	
I may want my forest land certified, but need additional information before deciding	32	27.8	40	38.8	X ² = 5.953
I am not likely to certify my forest land, but could change my mind	55	47.8	43	41.7	
I am certain I will never want my forest land certified	26	22.6	15	14.6	

¹ Percent based on total number of respondents in each group (not familiar N=115, familiar N=103).

Appendix E

Respondent Subgroup Analysis: Landowners Likely Versus Unlikely to Have Their Forest Land Certified

Table E.1. Age comparison based on landowner likelihood of certifying their forest land

	More Likely to Certify			Not Likely to Certify			Never Want to Certify			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
Age (years)	84	57.85	12.533	99	54.75	12.340	40	59.23	11.599	

Table E.2. Gender comparison based on landowner likelihood of certifying their forest land

Gender	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Male	72	84.7	93	92.1	36	87.8	$X^2=2.501$
Female	13	93	8	7.9	5	12.2	

¹ Percent based on total number of respondents in each group (more likely to certify N=85, not likely to certify N=101, and never want to certify N=41).

Table E.3. Education comparison based on landowner likelihood of certifying their forest land

Education	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Some High School or less	0	0	4	4	1	2.5	X ² =19.678
High School/GED	15	17.9	20	20	7	17.5	_____
Some College	11	13.1	22	22	7	17.5	_____
Technical/Community College Degree	11	13.1	23	23	13	32.5	_____
Bachelor's Degree	20	23.8	14	14	5	12.5	_____
Some Graduate School	11	13.1	5	5	3	7.5	_____
Graduate Degree	16	19.0	12	12	4	10.0	_____

¹ Percent based on total number of respondents in each group (more likely to certify N=84, not likely to certify N=100, and never want to certify N=40).

Table E.4. Employment comparison based on landowner likelihood of certifying their forest land

Employment Status	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Working full-time	43	51.2	54	53.5	18	43.9	X ² =13.526
Homemaker	3	3.6	2	2.0	0	0	_____
Retired	30	35.7	30	29.7	18	43.9	_____
Other	3	3.6	10	9.9	4	9.8	_____
Working part-time	5	6.0	5	5.0	0	0	_____
Unemployed	0	0	0	0	1	2.4	_____

¹ Percent based on total number of respondents in each group (more likely to certify N=84, not likely to certify N=101, and never want to certify N=41).

Table E.5. Community comparison based on landowner likelihood of certifying their forest land

Community Size	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Rural area	33	38.8	35	34.7	15	34.9	$X^2=11.849$
Small rural town (less than 5,000 people)	8	9.4	14	13.9	7	16.3	
Large rural community (more than 5,000 people)	6	7.1	22	21.8	7	16.3	
Suburb of a metropolitan area	26	30.6	18	17.8	10	23.3	
Metropolitan area	12	14.1	12	11.9	4	9.3	

¹ Percent based on total number of respondents in each group (more likely to certify N=85, not likely to certify N=101, and never want to certify N=43).

Table E.6. Absentee landownership comparison based on landowner likelihood of certifying their forest land

Absentee Status	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Permanent/seasonal residence	17	20.5	25	25	11	26.8	$X^2=10.560$
Absentee owner	53	63.9	70	70	21	51.2	
Other	13	15.7	5	5	9	22.0	

¹ Percent based on total number of respondents in each group (more likely to certify N=83, not likely to certify N=100, and never want to certify N=41).

*p≤0.05

Table E.7. Forest landownership comparison based on landowner likelihood of certifying their forest land

	More Likely to Certify			Not Likely to Certify			Never Want to Certify			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
Forest acres owned	84	205.450	369.29	98	192.094	408.401	41	83.4146	72.76640	
Forest parcels owned	47	4.23	7.727	54	5.07	9.992	16	2.25	1.390	

Table E.8. Land tenure comparison based on landowner likelihood of certifying their forest land

Number of Years	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
One year or less	3	3.5	3	2.9	0	0	X ² =14.806
1 to 5 years	7	8.2	21	20.6	4	9.3	
5 to 15 years	18	21.2	24	23.5	10	23.3	
15 to 25 years	19	22.4	23	22.5	13	30.2	
25 to 50 years	30	35.3	21	20.6	15	34.9	
50 years or more	8	9.4	10	9.8	1	2.3	

¹ Percent based on total number of respondents in each group (more likely to certify N=85, not likely to certify N=102, and never want to certify N=43).

Table E.9. Comparison of reasons for owning land based on landowner likelihood of certifying their forest land

Reasons:	More Likely to Certify (ML)			Not Likely to Certify (NL)			Never Want to Certify (NO)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
<i>Permanent residence</i>	71	2.89	1.608	92	2.97	1.402	35	2.91	1.704	
<i>Seasonal residence (i.e. your cabin)</i>	73	3.40	1.525	94	3.52	1.427	36	3.58	1.697	
<i>Hunting</i>	82	3.87	1.497	100	4.22	1.244	40	3.88	1.667	
<i>Fishing</i>	78	3.06	1.523	93	3.31	1.489	37	3.05	1.763	
<i>Hiking</i>	81	3.96	1.188	96	3.94	1.131	37	3.68	1.651	
<i>Cross-country skiing**</i>	75	3.24	1.505	94	2.90	1.415	35	2.40	1.538	ML>NO
<i>Camping</i>	76	3.39	1.415	94	3.18	1.444	38	2.82	1.722	
<i>Wildlife watching**</i>	83	4.29	1.110	97	4.19	.939	37	3.73	1.592	ML,NL>NO
<i>Investment**</i>	80	3.93	1.357	100	3.65	1.417	37	3.16	1.608	ML>NO
<i>Timber production***</i>	80	3.65	1.323	99	3.23	1.292	38	2.32	1.378	ML>NL>NO

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

p≤0.01, *p≤.001

Table E.10. Forest management plan comparison based on landowner likelihood of certifying their forest land

Have a Forest Management Plan	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Yes	22	25.9	21	21.4	8	19.0	X ² =.901
No	63	74.1	77	78.6	34	81.0	

¹ Percent based on total number of respondents in each group (more likely to certify N=85, not likely to certify N=98, and never want to certify N=42).

Table E.11. Contact with forester comparison based on landowner likelihood of certifying their forest land

Sought Advice/Been Contacted by a professional forester	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Yes	41	48.8	42	42.4	11	26.2	$X^2=5.920$
No	43	51.2	57	57.6	31	73.8	

¹ Percent based on total number of respondents in each group (more likely to certify N=84, not likely to certify N=101, and never want to certify N=42).

Table E.12. Commercial harvesting history comparison based on landowner likelihood of certifying their forest land

Commercially harvested trees on forest land while being the owner	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Yes	42	49.4	50	49.5	28	65.1	$X^2=3.431$
No	43	50.6	51	50.5	15	34.9	

¹ Percent based on total number of respondents in each group (more likely to certify N=85, not likely to certify N=101, and never want to certify N=43).

Table E.13. Most recent timber harvest comparison based on landowner likelihood of certifying their forest land

Most recent timber harvest	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
One year or less	5	10.6	6	10.7	1	6.7	$X^2=3.123$
1 to 5 years	13	27.7	24	42.9	6	40.0	
5 to 10 years	21	44.7	18	32.1	6	40.0	
More than 10 years ago	8	17.0	8	14.3	2	13.3	

¹ Percent based on total number of respondents in each group (more likely to certify N=47, not likely to certify N=56, and never want to certify N=15).

Table E.14. MN Forest Guidelines comparison based on landowner likelihood of certifying their forest land

Consulted Guidelines	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Yes	13	28.3	20	35.7	2	11.1	$X^2=4.643$
No	25	54.3	30	53.6	13	72.2	
Not sure	8	17.4	6	10.7	3	16.7	

¹ Percent based on total number of respondents in each group (more likely to certify N=46, not likely to certify N=56, and never want to certify N=18).

Table E.15. Intention to harvest comparison based on landowner likelihood of certifying their forest land

Intend to harvest in next ten years	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Yes	20	41.7	24	41.4	5	26.3	$X^2=11.286$
No	14	29.2	9	15.5	10	52.6	
Not sure	14	29.2	25	43.1	4	21.1	

¹ Percent based on total number of respondents in each group (more likely to certify N=48, not likely to certify N=58, and never want to certify N=19).

*p≤0.05

Table E.16. Participation in government programs comparison based on landowner likelihood of certifying their forest land

Participation in government programs	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Yes	18	21.2	21	20.8	4	9.5	$X^2=3.724$
No	63	74.1	75	74.3	37	88.1	
Not sure	4	4.7	5	5.0	1	2.4	

¹ Percent based on total number of respondents in each group (more likely to certify N=85, not likely to certify N=101, and never want to certify N=42).

Table E.17. Participation in SFIA comparison based on landowner likelihood of certifying their forest land

Enrolled in SFIA	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Yes	8	9.4	2	2	1	2.3	$X^2=6.218$
No	77	90.6	98	98	42	97.7	

¹ Percent based on total number of respondents in each group (more likely to certify N=85, not likely to certify N=100, and never want to certify N=43).

*p≤0.05

Table E.18. Organization membership in government programs comparison based on landowner likelihood of certifying their forest land

Member of...	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹ Yes	N	% ¹ Yes	N	% ¹ Yes	
Minnesota Forestry Association	9	11.5	8	8.2	0	0	X ² =5.075
Local woodland owner association *	3	4.1	2	2.1	0	0	X ² =2.009
Wildlife organization	15	19.5	20	20.4	3	7.1	X ² =3.902
Conservation/environmental organization	13	17.1	9	9.4	3	7.1	X ² =3.50

¹ Percent based on total number of respondents in each group.

*p≤0.05

Table E.19. Familiarity with forest certification comparison based on landowner likelihood of certifying their forest land

Familiarity	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹	N	% ¹	N	% ¹	
Extensive understanding	3	3.8	3	3.1	0	0	X ² =6.275
Some understanding	17	21.5	15	15.3	6	14.6	
Minimal understanding	25	31.6	25	25.5	9	22.0	
Never heard of it	34	43.0	55	56.1	26	63.4	

¹ Percent based on total number of respondents in each group (more likely to certify N=79, not likely to certify N=98, and never want to certify N=41).

Table E.20. Comparison of possible benefits for owning land based on landowner likelihood of certifying their forest land

Possible Benefits:	More Likely to Certify (ML)			Not Likely to Certify (NL)			Never Want to Certify (NO)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
Increased timber growth and health *	84	4.19	1.187	99	4.12	.940	40	3.63	1.254	ML,NL>NO
Improved wildlife habitat	84	4.30	1.240	10 2	4.39	.956	41	4.24	1.113	
Expanded markets for forest products harvested **	80	3.55	1.311	98	3.24	1.185	37	2.57	1.405	ML,NL>NO
A price premium for forest products harvested*	79	3.67	1.327	97	3.31	1.286	38	2.68	1.416	ML,NL>NO
Public recognition for practicing good forestry*	80	3.36	1.295	10 0	2.89	1.230	38	2.47	1.409	ML>NL>NO
Use environmentally-sound timber harvesting/ forest management practices**	82	4.20	1.082	98	3.97	1.020	38	3.37	1.441	ML,NL>NO

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

*p≤.05, **p≤0.01

Table E.21. Comparison of possible drawbacks for owning land based on landowner likelihood of certifying their forest land

Possible Drawbacks:	More Likely to Certify (ML)			Not Likely to Certify (NL)			Never Want to Certify (NO)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
Increased cost of forest management	82	3.70	1.085	99	3.85	.993	38	3.61	1.516	
Increased record-keeping and paperwork	82	3.63	1.128	10 1	3.93	1.032	39	3.51	1.502	
Need for periodic on-site inspections of my Forestry practices*	81	3.09	1.086	96	3.49	1.142	37	2.97	1.641	NL>ML,NO
Need to follow a forest management plan*	81	3.27	1.194	99	3.72	1.143	37	3.16	1.642	NL>ML,NO
Less control over who can harvest my forest	81	3.79	1.232	10 0	4.05	1.123	40	3.75	1.691	
Less control over the types of timber harvesting practices that can be used*	81	3.60	1.221	10 1	4.00	1.131	40	3.70	1.620	NL>ML,NO

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

Table E.22. Comparison of preferences for the design of a forest certification program based on landowner likelihood of certifying their forest land

	More Likely to Certify (ML)			Not Likely to Certify (NL)			Never Want to Certify (NO)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
Likelihood of participation if you were:										
<i>Required to be involved throughout the process of certifying your forest**</i>	77	3.47	1.353	91	2.68	1.444	39	1.90	1.410	ML>NL>NO
<i>Required to be involved only at certain stages of the certification process***</i>	79	3.72	1.270	93	2.75	1.299	38	1.92	1.217	ML>NL>NO
<i>Not involved in the certification process**</i>	72	3.01	1.449	88	2.31	1.263	37	1.57	.929	ML>NL>NO
Would you participate in the certifying organization was:										
<i>A government organization***</i>	74	3.07	1.368	94	2.24	1.301	39	1.38	.847	ML>NL>NO
<i>A forest products industry association***</i>	81	3.51	1.286	94	2.61	1.553	40	1.70	1.067	ML>NL>NO
<i>A forest landowner association***</i>	82	3.95	1.053	95	3.22	1.362	41	1.95	1.244	ML>NL>NO
<i>An educational institution***</i>	81	3.80	1.239	93	3.01	1.339	40	1.95	1.358	ML>NL>NO
<i>An organization not affiliated with any particular organization or group*</i>	69	3.29	1.405	87	2.72	1.313	38	2.11	1.311	ML>NL>NO
Would you participate if you had to pay:										
<i>None of the cost to certify your forest***</i>	85	4.36	1.022	90	3.53	1.317	41	2.00	1.449	ML>NL>NO
<i>Some of the cost to certify your forest***</i>	81	3.19	1.286	90	2.21	1.259	40	1.45	.932	ML>NL>NO
<i>All of the cost to certify your forest***</i>	77	1.94	1.291	92	1.42	.892	40	1.25	.670	ML>NL,NO
Would you participate if on-site inspections of your property were:										
<i>Required***</i>	83	3.54	1.337	93	2.28	1.402	39	1.87	1.472	ML>NL,NO
<i>A possibility***</i>	80	3.83	1.111	91	2.64	1.278	40	1.80	1.244	ML>NL>NO
<i>Not required*</i>	77	3.55	1.283	91	3.04	1.324	38	1.92	1.343	ML>NL>NO
Would you participate of the results of on-site inspections were?										
<i>Made fully available to the public***</i>	67	2.78	1.165	81	2.72	1.416	34	1.68	1.065	ML,NL>NO
<i>Made available to the public only in summary form**</i>	72	3.26	1.100	84	2.77	1.236	34	1.76	1.046	ML>NL>NO
<i>Not made available to the public***</i>	70	3.14	1.067	90	3.09	1.286	37	2.14	1.357	ML,NL>NO
Would you participate in a forest management plan was:										
<i>Required***</i>	66	3.39	1.251	74	3.23	1.420	32	1.88	1.289	ML,NL>NO
<i>Encouraged but not required**</i>	76	3.72	1.091	83	3.24	1.154	35	1.83	1.098	ML>NL>NO
<i>Not required***</i>	70	3.27	1.239	81	3.27	1.304	35	1.94	1.327	ML,NL>NO
Would you participate if you were:										
<i>Required to use a professional forester when managing your forest or harvesting timber*</i>	69	3.32	1.312	77	2.79	1.567	31	1.81	1.352	ML>NL>NO

	More Likely to Certify (ML)			Not Likely to Certify (NL)			Never Want to Certify (NO)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
<i>Not required to use a professional forester when managing your forest or harvesting timber***</i>	68	3.49	1.099	81	3.28	1.247	30	2.00	1.390	ML,NL>NO
Would you participate if you:										
<i>Were required to notify the certifying organization of your intent to harvest timber***</i>	74	3.41	1.215	78	2.99	1.550	32	1.97	1.534	ML,NL>NO
<i>Were required to use only loggers who were trained in environmentally-responsible practices**</i>	77	3.87	1.162	85	3.21	1.465	33	2.06	1.638	ML>NL>NO
<i>Could use any logger you choose***</i>	68	3.78	1.183	81	3.53	1.333	33	2.61	1.802	ML,NL>NO
Would you participate if you:										
<i>Received a higher price for your timber**</i>	79	4.06	1.158	83	3.43	1.354	35	2.29	1.582	ML>NL>NO
<i>Did not receive a higher price for your timber***</i>	69	3.07	1.075	74	2.72	1.200	29	1.83	1.256	ML,NL>NO
Would you participate if forest products mills gave:										
<i>Preference to buying timber from certified forests**</i>	74	3.93	1.197	82	3.32	1.341	33	1.58	.969	ML>NL>NO
<i>No preference to buying timber from certified forests***</i>	68	3.21	1.045	76	2.55	1.076	29	1.69	1.168	ML>NL>NO

^a Responses based on a five-point scale from 1 (Very Unimportant) to 5 (Very Important).

*p≤.05, **p≤0.01, ***p≤0.001

Table E.23. Willingness to pay for forest certification based on landowner likelihood of certifying their forest land

Price	More Likely to Certify		Not Likely to Certify		Never Want to Certify		Group differences
	N	% ¹ Yes	N	% ¹ Yes	N	% ¹ Yes	
\$0 per acre per year for each acre certified***	80	98.8	78	84.8	23	57.5	$X^2=35.721$
\$1 per acre per year for each acre certified***	61	75.3	37	40.7	4	10.0	$X^2=49.297$
\$2 per acre per year for each acre certified***	33	40.7	20	22.0	2	5.0	$X^2=19.108$
\$3 per acre per year for each acre certified**	19	23.5	9	9.9	2	5.0	$X^2=9.891$
\$4 per acre per year for each acre certified*	11	13.6	4	4.4	1	2.5	$X^2=6.981$
\$5 per acre per year for each acre certified	9	11.1	3	3.3	1	2.5	$X^2=5.676$
\$6 or more per acre per year for each acre certified	4	4.9	2	2.2	1	2.5	$X^2=1.107$

¹ Percent based on total number of respondents in each group.

*p≤0.05, **p≤0.01, ***p≤0.001

Appendix F

Focus Group Example Forest Certification Programs

Example Forest Certification Programs

Program Characteristic	Program A	Program B
<i>Level of Landowner Involvement</i>	Not Involved	Involved Only at Certain Stages
<i>Certifying Organization</i>	Government Organization	Forest Landowner Association
<i>On-site Inspections</i>	Required	Not Required
<i>Results of Inspections</i>	Made Fully Available to Public	Not Made Available to Public
<i>Forest Management Plan</i>	Not Required	Encouraged but Not Required
<i>Required to Notify of Harvesting</i>	Yes	No
<i>Use of Professional Forester</i>	Required	Not Required
<i>Use of Loggers</i>	Only Loggers Trained in Environmentally Responsible Practices	Any Logger You Choose

Appendix G
Minnesota Logger Certification Survey

7. In 2004, about what percent of the wood volume you harvested in Minnesota came from the sources listed below?

- % Industry land
- % Non-industrial private land
- % National Forest land
- % State DNR land
- % County land
- % Tribal land
- % Other: _____

100% TOTAL

8. Do you think a logger certification program should be developed for Minnesota loggers? (Check one)

- Yes
- No
- Not sure

9. Based on your understanding of logger certification, how likely would you be to have your logging business certified if a logger certification program was established for Minnesota loggers? (Check one)

- Very likely
- Somewhat likely (maybe, but need more information)
- Not very likely
- No (never intend to certify my business)

10. Please use the space below to share any comments, ideas, suggestions or concerns you have about logger certification.



**MINNESOTA
LOGGER CERTIFICATION
SURVEY**

1. How familiar are you with logger certification? (Check one)

- Extensive understanding
- Some understanding
- Minimal understanding
- Never heard of it

2. How important and how likely are each of the following possible outcomes if your logging business is certified? (Circle one number for 'important to me' and one number for 'likely to happen' for each item)

	Important to Me				Likely to Happen					
	Very Important	Important	Unimportant	Very Unimportant	Not Sure	Very Likely	Likely	Unlikely	Very Unlikely	Not Sure
POSSIBLE OUTCOMES:										
Higher prices paid for my wood.....	1	2	3	4	9	1	2	3	4	9
Access to new markets for my wood	1	2	3	4	9	1	2	3	4	9
Recognition for good logging practices	1	2	3	4	9	1	2	3	4	9
More record keeping and paperwork	1	2	3	4	9	1	2	3	4	9
Buyers preferring wood from my certified logging operation	1	2	3	4	9	1	2	3	4	9
More restrictions on my harvesting practices	1	2	3	4	9	1	2	3	4	9
Easier to purchase wood on private lands	1	2	3	4	9	1	2	3	4	9
Additional training courses to attend.....	1	2	3	4	9	1	2	3	4	9

THANKS! Please return this questionnaire using the pre-paid, self-addressed envelope provided. If you want more information about this study, please contact the Department of Forest Resources, University of Minnesota, 115 Green Hall, 1539 N. Cleveland Ave., St. Paul, MN 55108, (612) 624-2721.

3. How likely is it that you would participate in a logger certification program if . . .

(Circle one number for each item)

	Likely to Participate				Likely to Participate				
	Very Likely	Likely	Unlikely	Very unlikely	Very Likely	Likely	Unlikely	Very unlikely	Not sure
• The program was run by a . . .									
Government organization (e.g., DNR, Forest Resources Council).	1	2	3	4	9				
Forest products industry association (e.g., MN Forest Industries).	1	2	3	4	9				
Forest landowner association (e.g., MN Forestry Association).....	1	2	3	4	9				
Logger trade association (e.g., ACLT, TPA).....	1	2	3	4	9				
Educational institution (e.g., Extension).....	1	2	3	4	9				
Logger education association (e.g., MLEP).....	1	2	3	4	9				
Independent organization.....	1	2	3	4	9				
Other: _____	1	2	3	4	9				
• The standards used to audit your logging operations were . . .									
Nationally set standards	1	2	3	4	9				
Nationally set standards, but adapted to fit Minnesota conditions.	1	2	3	4	9				
Based solely on Minnesota standards	1	2	3	4	9				
• Program auditors reviewing your logging operations were . . .									
Only loggers	1	2	3	4	9				
Loggers and professional foresters	1	2	3	4	9				
Loggers, professional foresters, and other resource professionals.	1	2	3	4	9				
Loggers, professional foresters, other resource professionals, and representatives of interest groups.....	1	2	3	4	9				
Only auditors from Minnesota	1	2	3	4	9				
Included auditors from outside Minnesota	1	2	3	4	9				
Only auditors from outside Minnesota	1	2	3	4	9				
• The program was . . .									
Affiliated with a national logger certification program	1	2	3	4	9				
Affiliated with a regional logger certification program	1	2	3	4	9				
Separate program not affiliated with either a national or regional logger certification program.....	1	2	3	4	9				
• The results of on-site audits of individual logging operations . . .									
Were made fully available to the public	1	2	3	4	9				
Were made available to the public only in summary form.....	1	2	3	4	9				
Were not made available to the public	1	2	3	4	9				

• Failure to pass an audit of your logging operations resulted in...

Losing your logger certification status.....	1	2	3	4	9
Losing your logger certification status only after repeated failure to pass audits of your logging operation.....	1	2	3	4	9
Not losing your logger certification status, but requiring you to attend additional training.....	1	2	3	4	9
Not losing your logger certification status and not requiring you to attend additional training.....	1	2	3	4	9

**4. Who do you think should pay for a Minnesota logger certification program if the annual cost
to a logging business was? (Circle all that apply for each different hypothetical annual cost)**

Annual Cost	Who Should Pay			
	The Certified Logger	Forest Industry	Government	Other
\$100 per year	1	2	3	4
\$250 per year	1	2	3	4
\$500 per year	1	2	3	4
\$750 per year	1	2	3	4
\$1,000 per year	1	2	3	4

5. How many cords of wood did you harvest in 2004? _____ cords

6. How many years have you been in the logging business? (Check one)

One year or less 5+ to 15 years 25+ to 50 years
 1+ to 5 years 15+ to 25 years 50+ years

Appendix H

Respondent Subgroup Analysis: Large Versus Small Production Loggers

Table H.1. Large and small producer preferences for the design of a logger certification program

	Large Producers			Small Producers		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation in logger certification program if program is run by:						
<i>Government organization</i>	60	2.65	1.01	108	2.69	0.96
<i>Forest products industry</i>	61	2.36	0.91	112	2.39	0.91
<i>Forest landowner association</i>	60	2.53	0.95	113	2.57	0.91
<i>Logger trade association*</i>	62	2.05	0.82	114	2.32	0.93
<i>Educational institution</i>	57	2.58	0.91	107	2.58	0.91
<i>Logger education association</i>	63	1.92	0.89	118	1.97	0.93
<i>Independent organization</i>	55	2.56	1.00	102	2.79	0.95
Likelihood of participation in logger certification program if standards used to audit logging operations were:						
<i>Nationally set</i>	47	3.09	0.91	103	3.01	0.89
<i>Nationally set, but adapted to fit Minnesota</i>	51	2.49	0.95	111	2.41	0.94
<i>Based solely on Minnesota standards</i>	54	1.80	0.79	116	1.92	0.89
Likelihood of participation in logger certification program if program auditors reviewing your logging operations were:						
<i>Only loggers</i>	58	2.52	1.00	112	2.27	0.91
<i>Loggers and professional foresters</i>	60	2.23	0.87	117	2.14	0.81
<i>Loggers, professional foresters, and other resource professionals</i>	57	2.42	0.80	115	2.40	0.89
<i>Loggers, professional foresters, other resource professionals, and representatives of interest groups</i>	58	2.79	0.99	111	2.85	0.95
<i>Only from Minnesota</i>	59	2.47	0.95	111	2.59	0.98
<i>Included from outside Minnesota</i>	55	2.96	1.05	108	3.11	0.86
<i>Only from outside Minnesota</i>	56	3.36	0.94	110	3.47	0.73
Likelihood of participation in logger certification program if the program was affiliated with:						
<i>A national logger certification program</i>	57	2.63	0.99	106	2.60	0.92
<i>A regional logger certification program</i>	52	2.27	0.82	110	2.34	0.86
<i>A separate program (i.e., neither regional nor national)</i>	47	2.62	1.03	103	2.67	0.93
Likelihood of participation in logger certification program if the results of logging operation audits were:						
<i>Made fully available to the public</i>	55	2.64	1.01	102	2.67	0.98
<i>Made available to the public in summary form</i>	54	2.52	0.95	101	2.58	0.84
<i>Not made available to the public</i>	51	2.59	0.98	102	2.45	0.97
Likelihood of participation in logger certification program if failure of logger to pass audit resulted in:						
<i>Losing certification status</i>	57	3.02	1.03	111	2.97	0.91
<i>Losing certification status after repeated failure to pass audits</i>	60	2.20	0.84	118	2.32	0.84
<i>Not losing certification status, but requiring additional training</i>	56	2.55	0.97	110	2.38	0.89
<i>Not losing logger certification status and not requiring additional training*</i>	58	3.03	0.94	101	2.66	1.03

*p≤.05

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table H.2. Importance to large and small producers of possible outcomes of logger certification

Possible Outcomes of Logger Certification*:	Large Producers			Small Producers		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	65	1.45	0.53	128	1.38	0.69
<i>Access to new markets for my wood</i>	62	2.05	0.78	127	1.93	0.84
<i>Recognition for good logging practices</i>	64	1.56	0.69	127	1.65	0.73
<i>More record keeping and paperwork</i>	60	2.25	1.02	121	2.34	1.01
<i>Buyers preferring wood from certified logging operation</i>	64	1.92	0.84	125	2.07	0.87
<i>More restrictions on harvesting practices</i>	56	1.89	1.00	126	1.96	1.01
<i>Easier to purchase wood on private lands</i>	63	1.79	0.72	122	1.80	0.88
<i>Additional training courses to attend</i>	58	2.47	0.96	120	2.48	0.99

^ano significant differences at p≤.05^a Responses based on a four-point scale from 1 (Very Important) to 4 (Very Unimportant).

Table H.3. Large and small producer opinions regarding likelihood of possible outcomes of logger certification

Likely Outcomes of Logger Certification:	Large Producers			Small Producers		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	59	2.88	0.85	108	2.90	0.94
<i>Access to new markets for my wood</i>	55	2.85	0.76	113	2.86	0.80
<i>Recognition for good logging practices</i>	58	2.50	0.96	117	2.41	0.89
<i>More record keeping and paperwork</i>	60	1.58	0.72	115	1.64	0.83
<i>Buyers preferring wood from certified logging operation</i>	61	2.67	0.94	116	2.52	0.90
<i>More restrictions on harvesting practices</i>	62	1.50	0.72	118	1.50	0.75
<i>Easier to purchase wood on private lands</i>	58	2.76	0.82	107	2.88	0.89
<i>Additional training courses to attend</i>	63	1.48	0.67	117	1.52	0.78

^ano significant differences at p≤.05^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table H.4. Sources of wood for large and small producers

Percent of wood volume harvested in Minnesota from various sources:	Large Producers (N=64)		Small Producers (N=134)	
	Mean (%)	Std dev	Mean (%)	Std dev
<i>Industry land**</i>	17.3	26.6	5.2	18.5
<i>NIPF land***</i>	26.1	27.0	42.5	37.9
<i>National Forest land</i>	7.5	17.8	4.1	15.6
<i>State DNR land</i>	25.0	22.7	22.5	25.9
<i>County land</i>	24.8	21.4	21.5	28.5
<i>Tribal land</i>	<1	1.5	<1	8.7
<i>Other</i>	1.1	8.8	2.3	11.4

p≤.01, *p≤.001

Table H.5. Number of years in logging business: large and small producers

Years in logging business	Large Producers		Small Producers		Group differences
	N	% ¹	N	% ¹	
25 years or less	22	34	71	53	$X^2 = 6.20^{**}$
Greater than 25 years	43	66	64	47	

¹ Percent based on total number of respondents in each group (large producers N=65, Small producers N=135).

**p≤.01

Table H.6. Familiarity with logger certification: large and small producers

Familiarity with logger certification	Large Producers		Small Producers		Group differences*
	N	%¹	N	%¹	
Extensive understanding	17	27	39	30	$X^2= 0.216$
Minimal to some understanding	46	73	90	70	

¹ Percent based on total number of respondents in each group (large producers N= 63, Small producers N=129).

*no significant differences at p≤.05

Table H.7. Large and small producer perception of need for a logger certification program in Minnesota

Should a logger certification program be developed in Minnesota?	Large Producers		Small Producers		Group differences*
	N	%¹	N	%¹	
No	19	30	55	41	$X^2= 5.39$
Yes	23	36	28	21	
Not sure	22	34	50	38	

¹ Percent based on total number of respondents in each group (large producers N=64, Small producers N=133).

*no significant differences at p≤.05

Table H.8. Interest in becoming certified: small and large producers

Likelihood of certifying logging business	Large Producers		Small Producers		Group differences*
	N	%¹	N	%¹	
Very likely	25	40	33	24	$X^2= 5.92$
Somewhat likely	27	43	64	48	
Not very likely	7	11	28	21	
No (never intend to certify logging business)	4	6	10	7	

¹ Percent based on total number of respondents in each group (large producers N=63, Small producers N=135).

*no significant differences at p≤.05

Table H.9. Logger willingness to pay to certify their logging business: large and small producers

Who should (co)pay for a Minnesota logger certification program in the state at various annual costs?	-----Small Producer-----		-----Large Producer-----		χ^2
	N	% of small producers ¹	N	% of large producers ¹	
<i>Certified logger</i>					
\$100 per year	69	54	31	52	0.12
\$250 per year	32	26	25	43	5.01*
\$500 per year	12	10	18	31	11.60***
\$750 per year	13	11	14	25	5.43*
\$1,000 per year	12	11	13	23	4.59*
<i>Forest Industry Association</i>					
\$100 per year	43	33	20	33	0.00
\$250 per year	72	60	24	41	5.46*
\$500 per year	75	64	28	49	3.56
\$750 per year	63	54	30	54	0.001
\$1,000 per year	60	52	31	54	0.109
<i>Government</i>					
\$100 per year	22	17	6	10	1.67
\$250 per year	25	21	7	12	2.10
\$500 per year	35	30	14	25	0.59
\$750 per year	44	38	18	32	0.55
\$1,000 per year	45	39	19	33	0.55

¹ Percent based on total number of respondents in each group (Small producer N≈120, Large producer N≈58).

*p≤0.05, ***p≤0.001

Appendix I

Respondent Subgroup Analysis: Loggers Willing Versus Not Willing to Pay the Entire Cost of Logger Certification

Timber Harvesters Who are Willing to Pay Entire Annual Cost of Certification (\$100)

Table I.1. Preferences for the design of a logger certification program: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

	Harvesters sharing or paying none of the annual cost			Harvesters willing to pay entire annual cost		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation in logger certification program if program is run by:						
<i>Government organization</i>	94	2.74	0.97	83	2.54	1.04
<i>Forest products industry*</i>	97	2.51	0.93	85	2.18	0.86
<i>Forest landowner association*</i>	96	2.70	0.91	85	2.38	0.93
<i>Logger trade association**</i>	96	2.42	0.96	87	2.00	0.84
<i>Educational institution*</i>	92	2.70	0.91	79	2.41	0.91
<i>Logger education association**</i>	98	2.09	0.95	92	1.72	0.79
<i>Independent organization**</i>	85	2.88	0.96	76	2.47	1.00
Likelihood of participation in logger certification program if standards used to audit logging operations were:						
<i>Nationally set</i>	85	3.12	0.88	73	2.99	0.97
<i>Nationally set, but adapted to fit Minnesota*</i>	88	2.59	0.94	81	2.27	0.96
<i>Based solely on Minnesota standards**</i>	91	2.04	0.98	87	1.68	0.69
Likelihood of participation in logger certification program if program auditors reviewing your logging operations were:						
<i>Only loggers</i>	95	2.38	0.99	84	2.24	0.87
<i>Loggers and professional foresters</i>	98	2.23	0.89	87	2.02	0.75
<i>Loggers, professional foresters, and other resource professionals</i>	96	2.47	0.92	87	2.31	0.84
<i>Loggers, professional foresters, other resource professionals, and representatives of interest groups</i>	95	2.86	1.00	84	2.80	0.93
<i>Only from Minnesota</i>	95	2.62	1.03	84	2.37	0.89
<i>Included from outside Minnesota</i>	93	3.09	0.95	80	2.96	0.93
<i>Only from outside Minnesota</i>	93	3.45	0.81	83	3.39	0.85
Likelihood of participation in logger certification program if the program was affiliated with:						
<i>A national logger certification program</i>	87	2.74	0.98	79	2.53	0.89
<i>A regional logger certification program</i>	86	2.42	0.90	81	2.21	0.79
<i>A separate program (i.e., neither regional nor national)**</i>	79	2.86	0.94	76	2.42	0.96
Likelihood of participation in logger certification program if the results of logging operation audits were:						
<i>Made fully available to the public</i>	90	2.66	1.07	74	2.61	0.93
<i>Made available to the public in summary form</i>	84	2.65	0.96	76	2.43	0.81
<i>Not made available to the public</i>	83	2.65	1.03	74	2.35	0.96
Likelihood of participation in logger certification program if failure of logger to pass audit resulted in:						
<i>Losing certification status</i>	91	2.95	1.03	82	2.98	0.90
<i>Losing certification status after repeated failure to pass audits</i>	96	2.39	0.89	89	2.16	0.81

	Harvesters sharing or paying none of the annual cost			Harvesters willing to pay entire annual cost		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Not losing certification status, but requiring additional training*</i>	93	2.58	0.90	81	2.23	0.93
<i>Not losing logger certification status and not requiring additional training</i>	89	2.67	1.06	77	2.83	1.04

*p≤.05, **p≤.01

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table I.2. Importance of possible outcomes of logger certification: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

Possible Outcomes of Logger Certification:	Harvesters sharing or paying none of the annual cost			Harvesters willing to pay entire annual cost		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	103	1.45	0.75	97	1.40	0.57
<i>Access to new markets for my wood</i>	103	2.05	0.91	94	1.89	0.70
<i>Recognition for good logging practices</i>	103	1.71	0.75	95	1.54	0.62
<i>More record keeping and paperwork</i>	100	2.18	1.03	86	2.37	0.93
<i>Buyers preferring wood from certified logging operation**</i>	103	2.17	0.87	93	1.83	0.79
<i>More restrictions on harvesting practices</i>	102	1.92	1.00	88	1.95	1.02
<i>Easier to purchase wood on private lands</i>	102	1.88	0.86	89	1.73	0.81
<i>Additional training courses to attend</i>	101	2.50	1.02	86	2.49	0.92

**p≤.01,

^a Responses based on a four-point scale from 1 (Very Important) to 4 (Very Unimportant).

Table I.3. Logger opinions regarding likelihood of possible outcomes of logger certification: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

Likely Outcomes of Logger Certification:	Harvesters sharing or paying none of the annual cost			Harvesters willing to pay entire annual cost		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	96	2.97	0.95	79	2.77	0.82
<i>Access to new markets for my wood***</i>	96	3.03	0.75	79	2.66	0.75
<i>Recognition for good logging practices**</i>	98	2.57	0.96	85	2.27	0.80
<i>More record keeping and paperwork</i>	100	1.51	0.76	81	1.70	0.80
<i>Buyers preferring wood from certified logging operation</i>	102	2.61	0.95	81	2.53	0.88
<i>More restrictions on harvesting practices</i>	101	1.52	0.83	88	1.49	0.64
<i>Easier to purchase wood on private lands</i>	99	2.85	0.92	75	2.73	0.81
<i>Additional training courses to attend</i>	103	1.48	0.84	86	1.53	0.63

p≤.01, *p≤.001

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table I.4. Sources of wood: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

Percent of wood volume harvested in Minnesota from various sources*:	Harvesters sharing or paying none of the annual cost (n=110)		Harvesters willing to pay entire annual cost (n=94)	
	Mean (%)	Std dev	Mean (%)	Std dev
<i>Industry land</i>	8.4	20.7	9.7	23.9
<i>NIPF land</i>	36.6	36.6	40.1	36.1
<i>National Forest land</i>	4.7	14.9	6.1	18.9
<i>State DNR land</i>	25.2	25.0	20.9	25.1
<i>County land</i>	21.5	25.9	21.6	27.4
<i>Tribal land</i>	<1	0.5	1.4	10.5
<i>Other</i>	2.8	13.2	<1	5.5

*no significant differences at p≤.05

Table I.5. Number of years in logging business: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

Years in logging business	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences*
	N	% ¹	N	% ¹	
25 years or less	49	44	45	46	$X^2= 0.106$
Greater than 25 years	62	56	52	54	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=111, Harvesters paying entire cost N=97).

*no significant differences at p≤.05

Table I.6. Familiarity with logger certification: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

Familiarity with logger certification	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences*
	N	% ¹	N	% ¹	
Extensive understanding	26	25	31	33	$X^2= 1.77$
Minimal to some understanding	79	75	62	67	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=105, Harvesters paying entire cost N=93).

*no significant differences at p≤.05

Table I.7. Perception of need for a logger certification program in Minnesota: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

Should a logger certification program be developed in Minnesota?	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences
	N	% ¹	N	% ¹	
No	51	48	26	28	$X^2 = 17.1^{***}$
Yes	15	14	36	38	
Not sure	41	38	32	34	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=107, Harvesters paying entire cost N=94).

***p≤0.001

Table I.8. Interest in becoming certified: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$100 per year

Likelihood of certifying logging business	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences
	N	% ¹	N	% ¹	
Very likely	27	25	35	37	$X^2 = 12.22^{**}$
Somewhat likely	43	39	47	49	
Not very likely	28	26	10	10	
No (never intend to certify logging business)	11	10	4	4	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=109, Harvesters paying entire cost N=96).

**p≤0.01

Timber Harvesters Who are Willing to Pay Entire Annual Cost of Certification (\$250)

Table I.9. Preferences for the design of a logger certification program: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

	Harvesters sharing or paying none of the annual cost			Harvesters willing to pay entire annual cost		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation in logger certification program if program is run by:						
<i>Government organization**</i>	120	2.73	0.96	47	2.26	1.03
<i>Forest products industry**</i>	124	2.47	0.92	48	2.04	0.82
<i>Forest landowner association**</i>	124	2.66	0.92	48	2.23	0.93
<i>Logger trade association*</i>	125	2.30	0.94	50	1.96	0.83
<i>Educational institution***</i>	118	2.69	0.93	45	2.16	0.80
<i>Logger education association*</i>	129	2.00	0.94	51	1.71	0.76
<i>Independent organization*</i>	108	2.81	0.99	46	2.37	0.97
Likelihood of participation in logger certification program if standards used to audit logging operations were:						
<i>Nationally set</i>	109	3.12	0.88	40	2.83	1.01
<i>Nationally set, but adapted to fit Minnesota</i>	117	2.44	0.93	44	2.23	1.01
<i>Based solely on Minnesota standards*</i>	121	1.95	0.91	46	1.65	0.77
Likelihood of participation in logger certification program if program auditors reviewing your logging operations were:						
<i>Only loggers</i>	122	2.34	0.98	48	2.35	0.91
<i>Loggers and professional foresters</i>	130	2.20	0.87	46	1.96	0.76
<i>Loggers, professional foresters, and other resource professionals*</i>	125	2.47	0.92	48	2.13	0.82
<i>Loggers, professional foresters, other resource professionals, and representatives of interest groups</i>	123	2.89	0.98	47	2.57	0.95
<i>Only from Minnesota</i>	122	2.57	1.02	49	2.41	0.91
<i>Included from outside Minnesota**</i>	119	3.13	0.93	46	2.72	0.98
<i>Only from outside Minnesota</i>	122	3.50	0.77	46	3.17	1.02
Likelihood of participation in logger certification program if the program was affiliated with:						
<i>A national logger certification program</i>	113	2.67	0.98	47	2.38	0.85
<i>A regional logger certification program</i>	115	2.36	0.90	45	2.16	0.74
<i>A separate program (i.e., neither regional nor national)*</i>	104	2.78	0.96	43	2.33	0.97
Likelihood of participation in logger certification program if the results of logging operation audits were:						
<i>Made fully available to the public</i>	114	2.68	1.03	44	2.45	0.93
<i>Made available to the public in summary form</i>	109	2.61	0.92	45	2.38	0.78
<i>Not made available to the public</i>	107	2.52	1.05	43	2.49	0.86
Likelihood of participation in logger certification program if failure of logger to pass audit resulted in:						
<i>Losing certification status</i>	116	3.03	0.98	49	2.84	0.92
<i>Losing certification status after repeated failure to pass audits</i>	126	2.30	0.84	50	2.04	0.83
<i>Not losing certification status, but requiring additional training</i>	119	2.49	0.92	46	2.26	0.93
<i>Not losing logger certification status and not requiring additional training</i>	115	2.71	1.11	45	2.91	0.93

*p≤0.05, **p≤0.01, ***p≤0.001

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table I.10. Importance of possible outcomes of logger certification: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

Possible Outcomes of Logger Certification:	Harvesters sharing or paying none of the annual cost			Harvesters willing to pay entire annual cost		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	137	1.41	0.69	52	1.40	0.50
<i>Access to new markets for my wood</i>	137	1.98	0.90	50	1.96	0.61
<i>Recognition for good logging practices**</i>	136	1.68	0.70	52	1.40	0.53
<i>More record keeping and paperwork</i>	129	2.24	1.00	47	2.38	0.92
<i>Buyers preferring wood from certified logging operation**</i>	135	2.10	0.86	51	1.71	0.73
<i>More restrictions on harvesting practices</i>	131	1.89	1.02	48	2.04	0.97
<i>Easier to purchase wood on private lands</i>	132	1.84	0.88	50	1.66	0.63
<i>Additional training courses to attend</i>	130	2.51	1.03	48	2.44	0.85

**p≤0.01

^a Responses based on a four-point scale from 1 (Very Important) to 4 (Very Unimportant).

Table I.11. Logger opinions regarding likelihood of possible outcomes of logger certification: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

Likely Outcomes of Logger Certification:	Harvesters sharing or paying none of the annual cost			Harvesters willing to pay entire annual cost		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	122	2.95	0.94	46	2.78	0.73
<i>Access to new markets for my wood**</i>	123	2.93	0.81	45	2.67	0.64
<i>Recognition for good logging practices</i>	127	2.54	0.90	47	2.26	0.87
<i>More record keeping and paperwork</i>	126	1.57	0.79	47	1.60	0.65
<i>Buyers preferring wood from certified logging operation</i>	130	2.63	0.93	47	2.45	0.88
<i>More restrictions on harvesting practices</i>	131	1.49	0.78	50	1.52	0.68
<i>Easier to purchase wood on private lands*</i>	123	2.89	0.91	42	2.55	0.77
<i>Additional training courses to attend</i>	131	1.49	0.81	49	1.55	0.58

*p≤0.05, **p≤0.01

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table I.12. Sources of wood: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

Percent of wood volume harvested in Minnesota from various sources:	Harvesters sharing or paying none of the annual cost (n=143)		Harvesters willing to pay entire annual cost (n=49)	
	Mean (%)	Std dev	Mean (%)	Std dev
<i>Industry land</i>	7.7	19.5	14.8	29.7
<i>NIPF land</i>	37.1	34.5	37.5	36.5
<i>National Forest land</i>	4.3	13.8	9.0	24.1
<i>State DNR land**</i>	25.8	26.0	15.2	19.3
<i>County land</i>	21.3	25.9	22.4	24.7
<i>Tribal land</i>	<1	8.5	<1	1.4
<i>Other</i>	2.5	12.3	<1	4.5

**p≤.01

Table I.13. Number of years in logging business: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

Years in logging business	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences
	N	% ¹	N	% ¹	
25 years or less	60	42	30	58	$X^2=3.95^*$
Greater than 25 years	84	58	22	42	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=144, Harvesters paying entire cost N=52).

*p≤0.05

Table I.14. Familiarity with logger certification: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

Familiarity with logger certification	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences*
	N	% ¹	N	% ¹	
Extensive understanding	40	29	17	35	$X^2=0.51$
Minimal to some understanding	97	71	32	65	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=137, Harvesters paying entire cost N=49).

*no significant differences at p≤.05

Table I.15. Perception of need for a logger certification program in Minnesota: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

Should a logger certification program be developed in Minnesota?	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences
	N	% ¹	N	% ¹	
No	58	42	15	29	$X^2=12.48^{**}$
Yes	25	18	22	43	
Not sure	25	40	14	28	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=107, Harvesters paying entire cost N=94).

**p≤0.01

Table I.16. Interest in becoming certified: Harvesters willing to pay entire cost and those sharing or paying none of the certification program cost at \$250 per year

Likelihood of certifying logging business	Harvesters sharing or paying none of the annual cost		Harvesters willing to pay entire annual cost		Group differences $X^2= 5.96*$
	N	%¹	N	%¹	
Somewhat to very likely	101	71	45	88	
Never to not very likely	41	29	6	12	

¹ Percent based on total number of respondents in each group (Harvesters sharing or paying none of the cost N=142, Harvesters paying entire cost N=51).

*p≤0.05

Appendix J

Timber Harvesters Who Purchase the Majority of Minnesota Wood from Family Forests

Table J.1. Preferences for the design of a logger certification program: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

	Minor family forest harvesters			Major family forest harvesters		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation in logger certification program if program is run by*:						
<i>Government organization</i>	125	2.63	0.99	61	2.70	1.04
<i>Forest products industry</i>	128	2.42	0.91	62	2.27	0.93
<i>Forest landowner association</i>	129	2.64	0.92	62	2.40	0.97
<i>Logger trade association</i>	130	2.22	0.91	62	2.26	0.97
<i>Educational institution</i>	120	2.53	0.94	61	2.64	0.91
<i>Logger education association</i>	133	1.95	0.88	66	1.89	0.95
<i>Independent organization</i>	116	2.70	1.01	56	2.75	0.98
Likelihood of participation in logger certification program if standards used to audit logging operations were*:						
<i>Nationally set</i>	105	2.98	0.94	57	3.19	0.85
<i>Nationally set, but adapted to fit Minnesota</i>	117	2.43	0.97	58	2.50	0.96
<i>Based solely on Minnesota standards</i>	123	1.83	0.85	64	2.03	0.94
Likelihood of participation in logger certification program if program auditors reviewing your logging operations were*:						
<i>Only loggers</i>	124	2.42	0.96	62	2.18	0.92
<i>Loggers and professional foresters</i>	129	2.17	0.85	63	2.17	0.83
<i>Loggers, professional foresters, and other resource professionals</i>	127	2.40	0.88	61	2.48	0.91
<i>Loggers, professional foresters, other resource professionals, and representatives of interest groups</i>	122	2.84	0.95	62	2.82	1.00
<i>Only from Minnesota</i>	121	2.52	1.00	63	2.57	0.95
<i>Included from outside Minnesota</i>	119	3.02	0.97	59	3.14	0.86
<i>Only from outside Minnesota</i>	120	3.40	0.83	61	3.48	0.81
Likelihood of participation in logger certification program if the program was affiliated with*:						
<i>A national logger certification program</i>	115	2.57	0.98	58	2.72	0.89
<i>A regional logger certification program</i>	113	2.23	0.85	61	2.46	0.89
<i>A separate program (i.e., neither regional nor national)</i>	103	2.68	0.96	56	2.61	0.97
Likelihood of participation in logger certification program if the results of logging operation audits were*:						
<i>Made fully available to the public</i>	112	2.65	1.00	56	2.71	1.02
<i>Made available to the public in summary form</i>	108	2.60	0.92	57	2.54	0.89
<i>Not made available to the public</i>	108	2.45	1.00	53	2.66	0.94
Likelihood of participation in logger certification program if failure of logger to pass audit resulted in*:						
<i>Losing certification status</i>	119	2.99	0.97	61	2.95	0.96
<i>Losing certification status after repeated failure to pass audits</i>	127	2.20	0.83	64	2.45	0.91
<i>Not losing certification status, but requiring additional training</i>	117	2.44	0.89	62	2.44	1.02

	Minor family forest harvesters			Major family forest harvesters		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Not losing logger certification status and not requiring additional training</i>	114	2.75	0.99	57	2.77	1.13

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

*no significant differences at p≤.05

Table J.2. Importance of possible outcomes of logger certification: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

Possible Outcomes of Logger Certification*:	Minor family forest harvesters			Major family forest harvesters		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	140	1.43	0.68	72	1.42	0.62
<i>Access to new markets for my wood</i>	136	2.00	0.82	72	1.94	0.89
<i>Recognition for good logging practices</i>	140	1.65	0.70	71	1.58	0.71
<i>More record keeping and paperwork</i>	131	2.22	0.95	67	2.36	1.10
<i>Buyers preferring wood from certified logging operation</i>	138	2.09	0.84	69	1.90	0.88
<i>More restrictions on harvesting practices</i>	132	1.92	0.99	68	1.99	1.04
<i>Easier to purchase wood on private lands</i>	135	1.90	0.84	69	1.68	0.85
<i>Additional training courses to attend</i>	126	2.51	0.99	70	2.44	0.94

^a Responses based on a four-point scale from 1 (Very Important) to 4 (Very Unimportant).

*no significant differences at p≤.05

Table J.3. Logger opinions regarding likelihood of possible outcomes of logger certification: Harvesters willing to pay entire cost and those sharing or paying none of the certification cost at \$250 per year

Likely Outcomes of Logger Certification:	Minor family forest harvesters			Major family forest harvesters		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	120	2.85	0.91	61	2.85	0.89
<i>Access to new markets for my wood</i>	121	2.81	0.73	61	2.93	0.83
<i>Recognition for good logging practices</i>	127	2.43	0.90	63	2.43	0.91
<i>More record keeping and paperwork</i>	126	1.62	0.76	63	1.65	0.85
<i>Buyers preferring wood from certified logging operation</i>	127	2.47	0.94	64	2.70	0.85
<i>More restrictions on harvesting practices</i>	132	1.48	0.70	64	1.61	0.85
<i>Easier to purchase wood on private lands**</i>	124	2.69	0.86	56	3.09	0.88
<i>Additional training courses to attend</i>	130	1.52	0.74	66	1.55	0.81

**p≤0.01

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table J.4. Sources of wood: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

Percent of wood volume harvested in Minnesota from various sources:	Minor family forest harvesters (n=146)		Major family forest harvesters (n=75)	
	Mean (%)	Std dev	Mean (%)	Std dev
<i>Industry land***</i>	13.1	25.8	1.7	9.9
<i>NIPF land***</i>	14.8	12.9	81.5	20.3
<i>National Forest land***</i>	7.6	19.5	<1	1.2
<i>State DNR land***</i>	30.0	26.9	10.9	15.8
<i>County land***</i>	30.2	28.3	6.6	12.0
<i>Tribal land</i>	<1	8.4	<1	1.3
<i>Other</i>	2.7	12.4	<1	0.6

***p≤.001

Table J.5. Number of years in logging business: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

Years in logging business	Minor family forest harvesters		Major family forest harvesters		Group differences*
	N	% ¹	N	% ¹	
25 years or less	62	42	34	45	$X^2=0.166$
Greater than 25 years	84	58	41	55	

¹ Percent based on total number of respondents in each group (Minor family forest harvesters N=146, Major family forest harvesters N=75).

*no significant differences at p≤.05

Table J.6. Familiarity with logger certification: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

Familiarity with logger certification	Minor family forest harvesters		Major family forest harvesters		Group differences*
	N	% ¹	N	% ¹	
Extensive understanding	40	28	21	30	$X^2=0.138$
Minimal to some understanding	103	72	48	70	

¹ Percent based on total number of respondents in each group (Minor family forest harvesters N=143, Major family forest harvesters N=69).

*no significant differences at p≤.05

Table J.7. Perception of need for a logger certification program in Minnesota: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

Should a logger certification program be developed in Minnesota?	Minor family forest harvesters		Major family forest harvesters		Group differences*
	N	% ¹	N	% ¹	
No	58	41	26	35	$X^2=0.678$
Yes	34	24	19	26	
Not sure	50	35	29	39	

¹ Percent based on total number of respondents in each group (Minor family forest harvesters N=142, Major family forest harvesters N=74).

*no significant differences at p≤.05

Table J.8. Interest in becoming certified: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

Likelihood of certifying logging business	Minor family forest harvesters		Major family forest harvesters		Group differences*
	N	% ¹	N	% ¹	
Somewhat to very likely	107	75	54	72	$X^2=0.203$
Never to not very likely	36	25	21	28	

¹ Percent based on total number of respondents in each group (Minor family forest harvesters N=143, Major family forest harvesters N=75).

*no significant differences at p≤.05

Table J.9. Logger willingness to pay to certify their logging business: loggers harvesting a majority of their wood volume from family forests and those harvesting less than 50 percent from family forests.

Who should (co)pay for a Minnesota logger certification program in the state at various annual costs?*	Minor family forest harvesters		Major family forest harvesters		χ^2
	N	% of minor family forest harvesters ¹	N	% of major family forest harvesters ¹	
<i>Certified logger</i>					
\$100 per year	71	54	36	50	0.268
\$250 per year	41	32	19	29	0.214
\$500 per year	21	17	10	15	0.103
\$750 per year	19	16	10	15	0.003
\$1,000 per year	17	14	10	15	0.061
<i>Forest Industry Association</i>					
\$100 per year	49	37	22	31	0.815
\$250 per year	69	54	33	51	0.219
\$500 per year	72	60	39	60	0.004
\$750 per year	64	53	35	54	0.015
\$1,000 per year	64	53	33	51	0.049
<i>Government</i>					
\$100 per year	19	14	13	18	0.504
\$250 per year	23	18	14	22	0.325
\$500 per year	33	27	23	35	1.322
\$750 per year	43	36	26	40	0.361
\$1,000 per year	45	37	27	42	0.442

¹ Percent based on total number of respondents in each group (Minor family forest harvesters N≈125, Major family forest harvesters N≈68).

*no significant differences at p≤.05

Appendix K
**Respondent Subgroup Analysis: Loggers Indicating a Need Versus
No Need for a Logger Certification Program**

Timber Harvesters Who Think a Minnesota Logger Certification Program Should be Developed

Table K.1. Preferences for the design of a logger certification program: harvesters in favor of, opposed to, or not sure of logger certification program development.

	Harvesters opposed to logger certification ⁽ⁿ⁾			Harvesters in favor of logger certification ^(y)			Harvesters not sure about logger certification ^(ns)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
Likelihood of participation in logger certification program if program is run by:										
<i>Government organization**</i>	74	3.00	0.98	49	2.12	0.95	60	2.70	0.89	y<n,ns
<i>Forest products industry association***</i>	75	2.76	0.97	50	2.00	0.73	64	2.20	0.82	n>y,ns
<i>Forest landowner association*</i>	76	2.88	0.95	49	2.14	0.87	63	2.49	0.82	n>y,ns
<i>Logger trade association**</i>	75	2.61	1.00	50	1.76	0.69	64	2.14	0.79	n>y,ns
<i>Educational institution***</i>	72	2.85	0.94	47	2.19	0.88	59	2.54	0.84	n>y
<i>Logger education association*</i>	75	2.25	1.10	51	1.61	0.70	70	1.83	0.68	n>y,ns
<i>Independent organization***</i>	71	3.07	0.92	47	2.23	0.94	50	2.66	0.94	n>y
Likelihood of participation in logger certification program if standards used to audit logging operations were:										
<i>Nationally set*</i>	63	3.19	0.91	38	2.71	0.90	59	3.14	0.86	n>y
<i>Nationally set, but adapted to fit Minnesota*</i>	67	2.78	0.97	42	2.00	0.91	63	2.46	0.86	y<n,ns
<i>Based solely on Minnesota standards*</i>	74	2.20	1.02	46	1.43	0.54	65	1.86	0.73	n>ns>y
Likelihood of participation in logger certification program if program auditors reviewing your logging operations were:										
<i>Only loggers</i>	73	2.52	1.02	46	2.26	0.86	65	2.23	0.92	---
<i>Loggers and professional foresters**</i>	77	2.48	0.95	45	1.96	0.67	68	1.93	0.65	n>y,ns
<i>Loggers, professional foresters, and other resource professionals*</i>	74	2.72	0.91	46	2.09	0.81	65	2.31	0.81	n>y,ns
<i>Loggers, professional foresters, other resource professionals, and representatives of interest groups*</i>	73	3.01	0.95	45	2.53	0.92	64	2.88	0.97	n>y
<i>Only from Minnesota*</i>	70	2.81	1.00	45	2.18	0.91	67	2.49	0.93	n>y
<i>Included from outside Minnesota*</i>	72	3.17	0.89	42	2.74	0.96	62	3.15	0.90	n>y
<i>Only from outside Minnesota</i>	73	3.56	0.67	43	3.21	0.99	63	3.44	0.80	---
Likelihood of participation in logger certification program if the program was affiliated with:										
<i>A national logger certification program**</i>	70	2.87	1.00	47	2.34	0.84	55	2.62	0.91	n>y
<i>A regional logger certification program***</i>	71	2.70	0.93	44	1.98	0.70	57	2.16	0.75	n>y,ns
<i>A separate program (i.e., neither regional nor national)**</i>	66	2.94	0.93	40	2.68	1.00	52	2.33	0.90	n>ns

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

*p≤0.05, **p≤0.01, ***p≤0.001

Table k.2. Preferences for the design of a logger certification program: harvesters in favor of, opposed to, or not sure of logger certification program development in Minnesota (continued).

	Harvesters opposed to logger certification ⁽ⁿ⁾			Harvesters in favor of logger certification ^(y)			Harvesters not sure about logger certification ^(ns)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
Likelihood of participation in logger certification program if the results of logging operation audits were:										
<i>Made fully available to the public</i>	68	2.85	1.04	42	2.45	0.94	57	2.65	1.01	---
<i>Made available to the public in summary form*</i>	67	2.82	0.90	40	2.45	0.96	57	2.42	0.80	n>ns
<i>Not made available to the public</i>	67	2.63	1.03	39	2.56	0.88	54	2.41	1.04	---
Likelihood of participation in logger certification program if failure of logger to pass audit resulted in:										
<i>Losing certification status</i>	72	2.93	1.04	45	3.00	0.91	62	3.02	0.90	---
<i>Losing certification status after repeated failure to pass audits**</i>	75	2.48	0.98	48	1.98	0.76	66	2.27	0.74	n>y
<i>Not losing certification status, but requiring additional training**</i>	72	2.75	0.99	43	2.16	0.95	63	2.29	0.73	n>y,ns
<i>Not losing logger certification status and not requiring additional training</i>	71	2.69	1.12	39	3.10	0.94	61	2.67	0.96	---

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

*p≤0.05, **p≤0.01

Table K.3. Importance of possible outcomes of logger certification: harvesters in favor of, opposed to, or not sure of logger certification program development.

Possible Outcomes of Logger Certification:	Harvesters opposed to logger certification ⁽ⁿ⁾			Harvesters in favor of logger certification ^(y)			Harvesters not sure about logger certification ^(ns)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
<i>Higher prices paid for wood</i>	80	1.41	0.76	52	1.42	0.64	77	1.43	0.57	---
<i>Access to new markets for my wood</i>	79	2.09	0.95	50	1.84	0.68	76	1.99	0.83	---
<i>Recognition for good logging practices*</i>	80	1.75	0.77	51	1.33	0.55	78	1.69	0.67	y<n,ns
<i>More record keeping and paperwork</i>	79	2.34	1.11	48	2.33	0.93	71	2.14	0.92	---
<i>Buyers preferring wood from certified logging operation***</i>	80	2.24	0.96	51	1.69	0.71	73	2.05	0.78	y<n
<i>More restrictions on harvesting practices**</i>	79	1.71	0.92	46	1.89	0.92	73	2.22	1.06	ns>n
<i>Easier to purchase wood on private lands</i>	81	1.93	0.92	49	1.78	0.87	72	1.75	0.73	---
<i>Additional training courses to attend</i>	79	2.54	1.07	47	2.47	0.91	68	2.40	0.88	---

^a Responses based on a four-point scale from 1 (Very Important) to 4 (Very Unimportant).

*p≤0.05, **p≤0.01, ***p≤0.001

Table K.4. Logger opinions regarding likelihood of possible outcomes of logger certification: harvesters in favor of, opposed to, or not sure of logger certification program development.

Likely Outcomes of Logger Certification:	Harvesters opposed to logger certification ⁽ⁿ⁾			Harvesters in favor of logger certification ^(y)			Harvesters not sure about logger certification ^(ns)			Significant Group Differences
	N	Mean ^a	Std dev	N	Mean ^a	Std dev	N	Mean ^a	Std dev	
<i>Higher prices paid for wood</i>	73	2.93	1.045	45	2.78	.735	63	2.83	.853	---
<i>Access to new markets for my wood*</i>	72	3.11	.779	46	2.57	.655	63	2.78	.771	n>y,ns
<i>Recognition for good logging practices**</i>	75	2.65	.937	48	2.10	.881	66	2.42	.860	n>y
<i>More record keeping and paperwork**</i>	75	1.45	.684	46	1.91	.890	69	1.61	.771	y>n
<i>Buyers preferring wood from certified logging operation*</i>	74	2.74	.966	47	2.30	.832	69	2.57	.848	n>y
<i>More restrictions on harvesting practices</i>	76	1.41	.751	49	1.49	.681	70	1.70	.787	---
<i>Easier to purchase wood on private lands</i>	70	2.94	.961	43	2.65	.783	65	2.75	.848	---
<i>Additional training courses to attend</i>	76	1.51	.856	49	1.61	.702	70	1.49	.697	---

*p≤0.05, **p≤0.01

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

Table K.5. Sources of wood: harvesters in favor of, opposed to, or not sure of logger certification program development.

Percent of wood volume harvested in Minnesota from various sources*:	Harvesters opposed to logger certification (n=84)		Harvesters in favor of logger certification (n=53)		Harvesters not sure about logger certification (n=79)	
	Mean (%)	Std dev	Mean (%)	Std dev	Mean (%)	Std dev
<i>Industry land</i>	8	20	11.19	25	8.30	22
<i>NIPF land</i>	35	34	36.08	36	40.99	37
<i>National Forest land</i>	5	15	7.06	20	3.57	14
<i>State DNR land</i>	26.	26	20.21	22	23.03	26
<i>County land</i>	24	28	23.02	27	20.57	25
<i>Tribal land</i>	<1	2	2.08	14	.00	0
<i>Other</i>	<1	6	1.32	10	2.91	13

*no significant differences exist at p≤.05

Table K.6. Number of years in logging business: harvesters in favor of, opposed to, or not sure of logger certification program development.

Years in logging business	Harvesters opposed to logger certification		Harvesters in favor of logger certification		Harvesters not sure about logger certification		Group differences
	N	% ¹	N	% ¹	N	% ¹	
25 years or less	29	30	26	27	42	43	X ² =6.261*
Greater than 25 years	57	46	27	22	39	32	

¹ Percent based on total number of respondents in each group (Harvesters in logging business 25 years or less N=97, Harvesters in logging business greater than 25 years N=123).

*p≤0.05

Table K.7. Familiarity with logger certification: harvesters in favor of, opposed to, or not sure of logger certification program development.

Familiarity with logger certification	Harvesters opposed to logger certification		Harvesters in favor of logger certification		Harvesters not sure about logger certification		Group differences
	N	%¹	N	%¹	N	%¹	
Extensive understanding	22	37	24	41	13	22	$X^2=13.003^{**}$
Minimal to some understanding	60	40	28	18	63	42	

¹ Percent based on total number of respondents in each group (Harvesters with extensive understanding of certification N=59, Harvesters with minimal to some understanding N=151).

**p≤0.01

Table K.8. Interest in becoming certified: harvesters in favor of, opposed to, or not sure of logger certification program development.

Likelihood of certifying logging business	Harvesters opposed to logger certification		Harvesters in favor of logger certification		Harvesters not sure about logger certification		Group differences
	N	%¹	N	%¹	N	%¹	
Somewhat to very likely (likely certifiers)	42	26	52	33	66	41	$X^2=43.870^{***}$
Never to not very likely (unlikely certifiers)	42	74	1	2	14	24	

¹ Percent based on total number of respondents in each group (Harvesters somewhat to very likely to certify N=160, Harvesters never to not very likely to certify N=57).

***p≤0.001

Table K.9. Logger willingness to pay to certify their logging business: harvesters in favor of, opposed to, or not sure of logger certification program development.

Who should (co)pay for a Minnesota logger certification program in the state at various annual costs?	Harvesters opposed to logger certification		Harvesters in favor of logger certification		Harvesters not sure about logger certification		χ^2
	N	% of harvesters opposed ¹	N	% of harvesters in favor ¹	N	% of harvesters not sure ¹	
<i>Certified logger</i>							
\$100 per year	30	39	39	77	38	52	17.403***
\$250 per year	16	22	25	54	21	30	13.184***
\$500 per year	5	7	17	35	10	15	16.325***
\$750 per year	5	7	15	32	10	15	12.921**
\$1,000 per year	5	7	13	28	10	15	9.181**
<i>Forest Industry Association</i>							
\$100 per year	27	35	12	24	30	41	3.930
\$250 per year	34	47	22	47	43	62	4.304
\$500 per year	39	56	33	69	39	59	2.087
\$750 per year	38	54	26	55	36	55	0.038
\$1,000 per year	37	53	25	52	36	54	0.031
<i>Government</i>							
\$100 per year	21	27	3	6	7	10	13.921***
\$250 per year	22	30	3	6	10	15	11.859**
\$500 per year	26	37	9	19	19	29	4.661
\$750 per year	28	39	18	38	21	32	0.954
\$1,000 per year	25	36	21	44	24	35	1.034

¹ Percent based on total number of respondents in each group (Harvesters opposed to certification N≈77, Harvesters in favor of certification N≈51, Harvesters not sure of certification N≈74).

*p≤0.05, **p≤0.01, ***p≤0.001

Appendix L

Respondent Subgroup Analysis: Loggers Likely Versus Not Likely to Have Their Logging Business Certified

Timber Harvesters Who Would be Likely to Have Their Logging Business Certified

Table L.1. Preferences for the design of a logger certification program: loggers unlikely to certify their logging business and those likely to certify their logging business.

	Unlikely certifiers			Likely certifiers		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
Likelihood of participation in logger certification program if program is run by:						
<i>Government organization***</i>	48	3.29	0.97	138	2.45	0.93
<i>Forest products industry***</i>	51	2.96	0.97	140	2.15	0.81
<i>Forest landowner association***</i>	52	3.10	0.98	139	2.35	0.83
<i>Logger trade association***</i>	50	2.92	0.97	142	1.96	0.77
<i>Educational institution***</i>	47	3.11	1.01	133	2.37	0.82
<i>Logger education association***</i>	51	2.41	1.10	148	1.76	0.76
<i>Independent organization***</i>	45	3.31	0.95	126	2.49	0.92
Likelihood of participation in logger certification program if standards used to audit logging operations were:						
<i>Nationally set***</i>	45	3.42	0.89	118	2.91	0.89
<i>Nationally set, but adapted to fit Minnesota***</i>	46	2.96	1.05	130	2.28	0.85
<i>Based solely on Minnesota standard***</i>	51	2.39	1.06	135	1.70	0.71
Likelihood of participation in logger certification program if program auditors reviewing your logging operations were:						
<i>Only loggers**</i>	51	2.71	1.15	135	2.21	0.82
<i>Loggers and professional foresters***</i>	52	2.65	1.01	140	1.98	0.67
<i>Loggers, professional foresters, and other resource professionals***</i>	52	2.92	0.97	137	2.21	0.77
<i>Loggers, professional foresters, other resource professionals, and representatives of interest groups***</i>	51	3.31	0.93	134	2.66	0.92
<i>Only from Minnesota***</i>	51	2.96	1.10	134	2.37	0.88
<i>Included from outside Minnesota**</i>	51	3.49	0.83	128	2.88	0.92
<i>Only from outside Minnesota***</i>	52	3.63	0.72	130	3.35	0.85
Likelihood of participation in logger certification program if the program was affiliated with:						
<i>A national logger certification program***</i>	45	3.22	1.02	130	2.42	0.84
<i>A regional logger certification program***</i>	44	2.93	1.00	132	2.12	0.72
<i>A separate program (i.e., neither regional nor national)*</i>	43	2.98	1.06	118	2.53	0.91
Likelihood of participation in logger certification program if the results of logging operation audits were:						
<i>Made fully available to the public***</i>	44	3.18	1.06	126	2.49	0.94
<i>Made available to the public in summary form***</i>	45	3.00	0.93	122	2.43	0.84
<i>Not made available to the public</i>	46	2.65	1.06	117	2.47	0.97
Likelihood of participation in logger certification program if failure of logger to pass audit resulted in:						
<i>Losing certification status</i>	50	3.00	1.16	132	2.96	0.88
<i>Losing certification status after repeated failure to pass audits**</i>	51	2.67	1.09	142	2.14	0.72
<i>Not losing certification status, but requiring additional training***</i>	50	2.88	1.02	131	2.27	0.83

	Unlikely certifiers			Likely certifiers		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Not losing logger certification status and not requiring additional training</i>	49	2.78	1.16	124	2.76	0.99

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

*p≤0.05, **p≤0.01, ***p≤0.001

Table L.2. Importance of possible outcomes of logger certification: loggers unlikely to certify their logging business and those likely to certify their logging business.

Possible Outcomes of Logger Certification:	Unlikely certifiers			Likely certifiers		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood</i>	52	1.44	0.78	160	1.41	0.62
<i>Access to new markets for my wood</i>	52	2.17	1.04	157	1.92	0.76
<i>Recognition for good logging practices**</i>	52	1.88	0.86	158	1.54	0.63
<i>More record keeping and paperwork</i>	53	2.40	1.20	146	2.21	0.90
<i>Buyers preferring wood from certified logging operation***</i>	53	2.45	0.97	154	1.88	0.77
<i>More restrictions on harvesting practices</i>	51	1.86	1.08	150	1.97	0.97
<i>Easier to purchase wood on private lands*</i>	52	2.04	0.97	151	1.74	0.78
<i>Additional training courses to attend*</i>	48	2.75	1.08	148	2.39	0.92

^a Responses based on a four-point scale from 1 (Very Important) to 4 (Very Unimportant).

*p≤0.05, **p≤0.01

Table L.3. Logger opinions regarding likelihood of possible outcomes of logger certification: loggers unlikely to certify their logging business and those likely to certify their logging business.

Likely Outcomes of Logger Certification:	Unlikely certifiers			Likely certifiers		
	N	Mean ^a	Std dev	N	Mean ^a	Std dev
<i>Higher prices paid for wood**</i>	47	3.19	0.92	135	2.75	0.87
<i>Access to new markets for my wood***</i>	49	3.22	0.77	134	2.73	0.74
<i>Recognition for good logging practices*</i>	48	2.67	0.93	142	2.35	0.89
<i>More record keeping and paperwork</i>	48	1.44	0.80	143	1.69	0.77
<i>Buyers preferring wood from certified logging operation**</i>	50	2.88	0.92	142	2.45	0.88
<i>More restrictions on harvesting practices</i>	47	1.40	0.85	150	1.57	0.72
<i>Easier to purchase wood on private lands**</i>	48	3.06	0.91	132	2.70	0.86
<i>Additional training courses to attend</i>	49	1.47	0.92	148	1.54	0.70

^a Responses based on a four-point scale from 1 (Very Likely) to 4 (Very Unlikely).

*p≤0.05, **p≤0.01, ***p≤0.001

Table L.4. Sources of wood: loggers unlikely to certify their logging business and those likely to certify their logging business.

Percent of wood volume harvested in Minnesota from various sources*:	Unlikely certifiers (n=57)		Likely certifiers (n=161)	
	Mean (%)	Std dev	Mean (%)	Std dev
<i>Industry land</i>	6	18	10	24
<i>NIPF land</i>	40	35	37	36
<i>National Forest land</i>	6	18	5	16
<i>State DNR land</i>	22	24	24	26
<i>County land</i>	25	29	21	26
<i>Tribal land</i>	<1	<1	<1	8
<i>Other</i>	<1	4	2	12

*no significant differences exist at p≤.05

Table L.5. Number of years in logging business: loggers unlikely to certify their logging business and those likely to certify their logging business.

Years in logging business	Unlikely certifiers		Likely certifiers		Group differences $X^2=2.110^*$
	N	% ¹	N	% ¹	
25 years or less	21	36	77	47	
Greater than 25 years	37	64	86	53	

¹ Percent based on total number of respondents in each group (Unlikely certifiers N=58, Likely certifiers N=163).

*no significant differences exist at $p\leq.05$

Table L.6. Familiarity with logger certification: loggers unlikely to certify their logging business and those likely to certify their logging business.

Familiarity with logger certification	Unlikely certifiers		Likely certifiers		Group differences $X^2=0.842^*$
	N	% ¹	N	% ¹	
Extensive understanding	13	24	47	30	
Minimal to some understanding	42	76	109	70	

¹ Percent based on total number of respondents in each group (Unlikely certifiers N=55, Likely certifiers N=156).

*no significant differences exist at $p\leq.05$

Table L.7. Perception of need for a logger certification program in Minnesota: loggers unlikely to certify their logging business and those likely to certify their logging business.

Should a logger certification program be developed in Minnesota?	Unlikely certifiers		Likely certifiers		Group differences $X^2=43.870^{***}$
	N	% ¹	N	% ¹	
No	42	74	42	26	
Yes	1	2	52	33	
Not sure	14	24	66	41	

¹ Percent based on total number of respondents in each group (Unlikely certifiers N=57, Likely certifiers N=160).

*** $p\leq 0.001$

Table L.8. Logger willingness to pay to certify their logging business: loggers unlikely to certify their logging business and those likely to certify their logging business.

Who should (co)pay for a Minnesota logger certification program in the state at various annual costs?	Unlikely certifiers		Likely certifiers		χ^2
	N	% of unlikely certifiers ¹	N	% of likely certifiers ¹	
<i>Certified logger</i>					
\$100 per year	17	32	92	61	13.851***
\$250 per year	6	13	56	38	10.507***
\$500 per year	3	6	29	20	4.949*
\$750 per year	4	9	26	19	2.644
\$1,000 per year	4	9	24	17	1.932
<i>Forest Industry Association</i>					
\$100 per year	19	35	51	33	0.077
\$250 per year	23	49	78	53	0.287
\$500 per year	22	47	90	63	4.017*
\$750 per year	21	45	79	56	1.823
\$1,000 per year	20	44	78	55	1.826
<i>Government</i>					
\$100 per year	12	22	20	13	2.557
\$250 per year	12	26	25	17	1.568
\$500 per year	16	34	40	28	0.543
\$750 per year	18	38	52	37	0.020
\$1,000 per year	15	33	58	41	0.992

¹ Percent based on total number of respondents in each group (Unlikely certifiers N≈47, Likely certifiers N≈141).