

A snapshot of New Brunswick non-industrial forest owners in 2011

*Attitudes, behaviour, stewardship
and future prospects*



**A Snapshot of New Brunswick Non-Industrial Forest Owners in 2011:
*Attitudes, Behaviour, Stewardship and Future Prospects***

A study conducted for the Private Forest Task Force (Appendix A)

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We also want to express our gratitude to all the forest owners who, once they found our questionnaire in their mailbox, chose to respond to our invitation and be part of this study. As we mentioned in the letter accompanying the survey, this is a way for you to make sure that your voice, as a forest owner in NB, is heard. This report is the response from the research team to this commitment; in here, you will find out about the experiences and values you were willing to share with us and with other readers. Without your participation, this research would not have been possible.

1 Introduction

To guide provincial forest policy, it is essential to understand the values, aspirations, practices, and perspectives of the tens of thousands of New Brunswickers' who own forest land. Whether the issue is the fiber supply, biodiversity conservation, recreation, hunting, carbon management, forest certification, or global competitiveness, forest landowners factor into the provincial picture as they control nearly a third of the province's forest. The last significant attempt to scientifically examine forest landowners occurred in the early 1980s, around the time of the tabling of the Crown Lands and Forest Act of 1982, which has guided provincial forest policy for the last 30 years. Norfolk and Erdle (2005) have shown that, on average, privately owned forested parcels change hands about every 18 years. As well, by some measures, generational cohorts occur every 18–20 years. Therefore, it has been nearly two generations since a systematic attempt has been made to examine New Brunswick's forest landowners and, over that time, the average parcel may have changed owners twice.

The present New Brunswick government committed to holding a forest summit if they were elected. In November of 2010, the New Brunswick Forestry Summit was convened with the intent to develop strategies to support forest industry in the province. One outcome of that event was a desire on the part of the new government to obtain a better picture of the state of public and private forest land across the province. The government appointed and funded the Private Land Task Force (PLTF) to undertake part of this enquiry. This report, commissioned by the PLTF, presents results from a survey that was developed to provide the PLTF and the government with a profile of non-industrial forest owners in New Brunswick, including: their values, the use they make of their forest land, and their attitudes toward key forestry issues.

A research team headed by Dr. Solange Nadeau (Natural Resources Canada) and Dr. Thomas Beckley (University of New Brunswick (UNB)) was commissioned to develop the survey and to collect and analyze the results. Feedback during the survey development phase was provided by faculty members at UNB, forest managers at the Department of Natural Resources (DNR), and members of the Private Land Task Force. DNR also supplied the database from which a sample was selected. Due to tight deadlines imposed upon the Task Force, the survey was delivered to respondents in the early summer of 2011. Data entry and analysis took place over the summer months to allow the research team to deliver a draft report of findings to the Task Force in September and a complete report in December 2011.

This report presents results for each of the questions asked in the survey, as well as an analysis of these results based on the size of forested parcel owned. To respond to the PLTF's interest regarding the impact of size of ownership, we constructed a sampling framework that allowed us to collect information from three sub-groups of forest holdings, with the assumption that owners' attitudes and behavior (particularly with respect to forest management and timber harvesting) might vary according to how much forest land they own. Indeed, researchers in other jurisdictions have shown that owners of larger parcels are more likely to manage their forest land, at least in part, for fiber (Nadeau 2011, Butler 2008). The groups are owners of small (<30 ha), medium (30–<100 ha), or large (100+ ha) forest lands. We obtained a response rate of 35%, thus the results

should be interpreted keeping in mind that the sampling error is $\pm 7\%$ for owners of small forest lands, $\pm 6\%$ for owners of medium forest lands, $\pm 6\%$ for owners of large forest lands, and $\pm 4\%$ for the total sample, 19 times out of 20 (Table S1.1). Supplement 1: Methods presents a brief analysis of potential bias regarding the type of forest landowners who responded to our questionnaire.

The following sections present results on the non-industrial forest owners and their forest, their behavior in relation to forest management and timber harvesting, and their attitudes toward forestry issues. Readers should note that, due to a substantially different research method used by the team who conducted the woodlot owners survey in the early 1980s, the results from then and now are not directly comparable. As Roy (1982) mentioned, their study did not use a random sampling method, and this had certain disadvantages— a serious one being the difficulty in extrapolating their results to the total population of NB woodlot owners (Roy 1982: 11). Because methodological differences prevent us from knowing the degree to which differences between the 1982 results and ours are due to the different approaches or because of changes in the current forest owner population, we chose not to draw any comparison between the two studies. The results section is followed the conclusion and appendices, which present in greater detail methodological aspects of this study as well as more detail about the results.

2 Forest landowners and the land they own

2.1 *Forest landowners in NB, in the study sample and in the study*

Over 85% of the land mass of New Brunswick is forested. Of this, 2% is under the jurisdiction of various federal government departments (Parks Canada, Department of National Defense, etc.). The provincial government is responsible for 48%, which is typically referred to as Crown forest land (and was the subject of the New Brunswick Crown Land Task Force Report, 2011). The remaining 50% is privately owned. Of the half of the province that is in private hands, 20% is owned by forest industry firms, and the remaining 30% (some 1.7 million ha) is owned by non-industrial private owners. The size of ownership of these private holdings varies considerably. The very smallest parcels (<5 ha), although treasured and sometimes used intensively by their owners, do not provide much in the way of fiber or ecosystem services, such as wildlife habitat, carbon sequestration, or water quality maintenance. As a result, we excluded these very small ownerships from our consideration. The interest of DNR and the PLTF focused largely around the ability of privately owned forests to supply timber for the forest economy, as well as wildlife habitat and other ecosystem services that are best provided by larger holdings.

NBDNR had access to Service New Brunswick property data (boundaries, names, and addresses of owners, etc.). They cross-referenced this information with data maintained by their Forest Management Branch regarding area of productive forest and, after some tedious work to resolve issues such as adding up multiple parcels belonging to a single owner, they created a database of non-industrial forest owners that also contained information on the area of forest they own and their location. This was the database from which we drew our sample. This database was also used to create a profile of the general population of non-industrial forest landowners in New Brunswick. We excluded some forest landowners (those with <4.9 ha of forest, some industrial or public forest owners). Our selection process resulted in the identification of 41,900 non-industrial owners of forest land. Figure 2.1 shows the distribution of these owners according to the size of forest land they own, as well as the total area of forest owned under each size class of forest land.

The study used a stratified random sampling process to select forest landowners from three size classes: small (<30 ha), medium (30–99.9 ha), large (100 ha and more). Figure 2.2 shows the distribution of the non-industrial forest owners in New Brunswick and contrasts it with the proportion of forest land that is owned under small, medium, or large forest holdings. It shows that 6% of the owners own more than a third (38%) of the non-industrial forest.

Figure 2.1: Forest land area belonging to how many non-industrial owners, by size class.

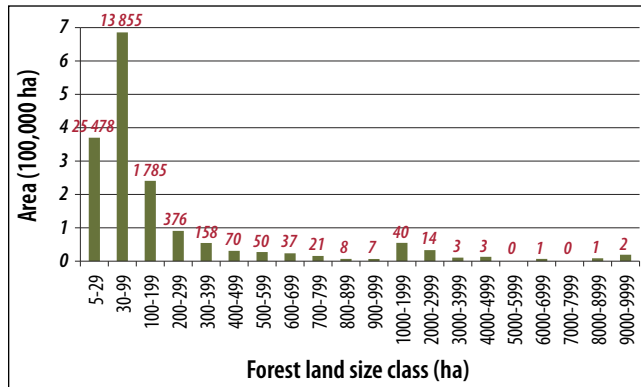
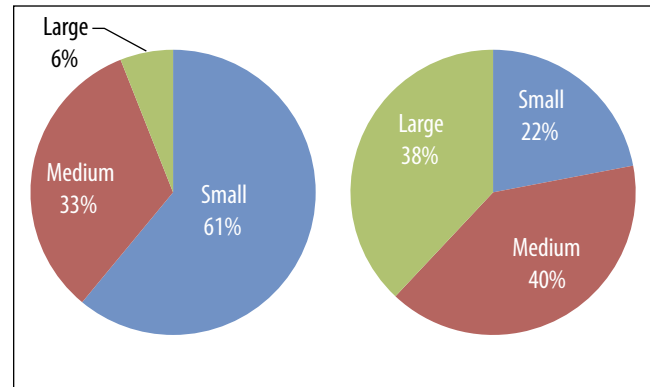


Figure 2.2: Number of non-industrial forest owners in NB by size class (n=41 909) and proportion of forest land owned by size class (total=1.7 million ha).

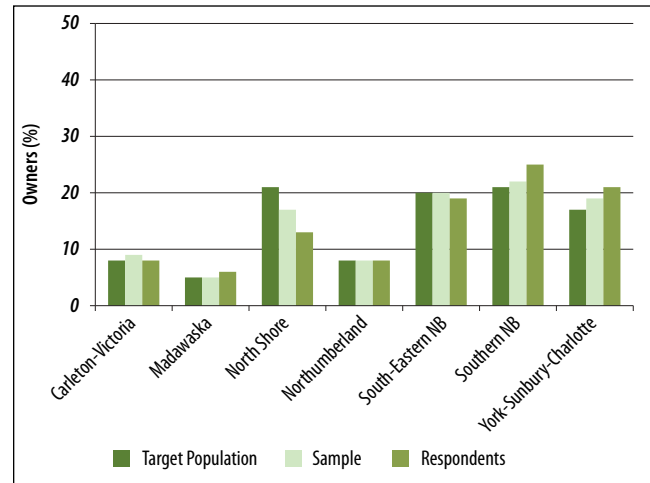


As one of the objectives of the survey was to examine the influence of size of forest ownership on other variables, we adjusted the sampling intensity to ensure that we would obtain enough owners from each of our three groups to obtain statistically valid results for each group. This means, for example, that we oversampled the group of owners of large forest lands in order to have enough respondents in that ownership category to report on. Because of our sampling strategy, the contribution from each size of ownership to the total response is weighted in the analysis to more accurately reflect the proportion that each of these groups actually has in the total number of non-industrial forest owners in NB. More details about the sampling frame and the use of weights are presented in the Methods (Supplement 1).

A total of 2176 forest landowners were invited to fill out a questionnaire; of these, 728 returned a useable questionnaire. We received 559 questionnaires in English and 169 in French. For more detailed information on the number of surveys mailed compared with those that were completed, as well as on how we handled the language issue, see Supplement 3. From this point forward, when we refer to forest landowners, we are referring to the study respondents; however, the sample was drawn randomly and we obtained a reasonable response rate (35%), so our respondents are a good representation of the total population of forest landowners, as well as of each class of ownership. As mentioned earlier, the Supplement 1 also presents a brief analysis of potential bias regarding the type of forest landowners who responded to our questionnaire.

Figure 2.3 contrasts the distribution of respondents by marketing board, the distribution of our sample, and the target population (non-industrial forest owners in NB). It shows that the sample selection, despite not controlling for geographic location of forest land, led to a good distribution of selected forest land across various areas of the province. As well, relatively representative proportions of owners of forest land in each of these areas took part in the survey. Please note that this distribution is about forest land properties, which is not necessarily the same as owners' residences. For more details concerning the breakdown of respondents grouped by marketing board, please refer to Table S3.1.

Figure 2.3: Population, sample and respondents by marketing board.



2.2 Demographic characteristics of NB forest landowners

A disproportionate number of respondents are male (82%), compared with New Brunswick as a whole (49%) (Statistics Canada 2007). The age distribution of forest landowners is also markedly different from that of New Brunswick; whereas 93% of forest landowners are age 45 or older, the same is true for only 45% of New Brunswickers. This makes intuitive sense, as most owners are middle aged by the time they either inherit or have the means to purchase forest land, and these are the most common means of obtaining forest land.

Figure 2.4: Type of area respondents grew up in and where they lived in for most of their adult life.

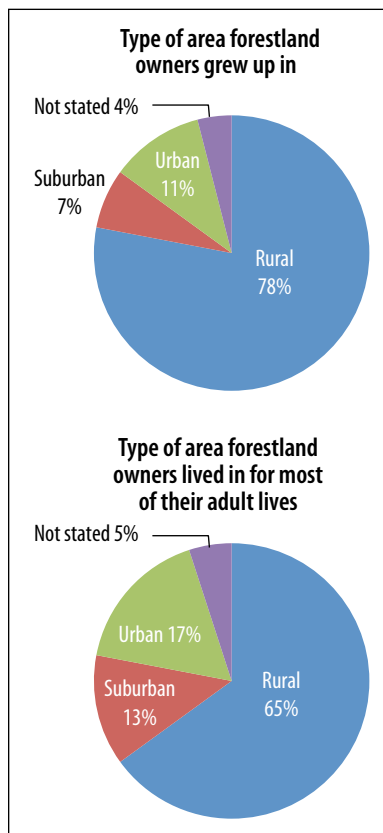


Figure 2.4 shows that a great majority (78%) of forest landowners grew up in rural areas. Just over one-tenth of owners grew up in urban settings, whereas only 7% grew up in suburban areas. This Figure also reveals that the majority (65%) of forest landowners have spent most of their adult lives in rural settings. This majority is smaller than the number of people with a rural upbringing, which is not surprising as demographic trends show more rural residents moving to cities. That does not mean that these rural-to-urban migrants necessarily sell their forest land when they move. More owners have spent most of their adult lives in urban (17%) or suburban (13%) areas, compared with the areas in which they grew up.

Figure 2.5: Distance owners live from their closest forested property.*

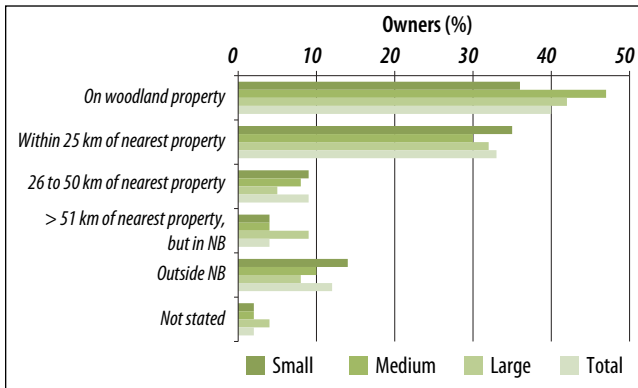
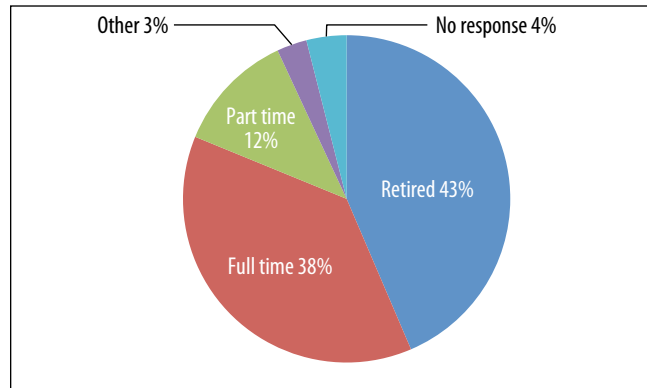


Figure 2.6: Employment status of forest landowners.*



Forty percent of owners live on their forested land, whereas another third of owners live within 25 km of their closest forest parcel (Figure 2.5). Twelve percent of owners live outside New Brunswick, almost all in other parts of Canada or in the United States. There is a significant difference between sizes of ownership regarding the distance between the owners and their forest land: 36% of owners of small forest lands live on their nearest property, compared with 47% of owners of medium forest lands, and 42% of owners of large forest lands.

Forty-three percent of respondents are retired, whereas one-half are either full- or part-time workers (Figure 2.6). It is very likely that the proportion of owners who are retired will grow, based on New Brunswick’s age structure (Statistics Canada 2007). There is a significant difference between size classes with respect to employment: 42% of owners of small properties are full-time workers, whereas only 31% of owners of medium forest lands are in the same category.

Table 2.1 breaks down the types of employment forest landowners wrote down when asked to identify their occupation. As with Figure 2.6, the highest proportion of forest landowners (45%) are retired. About one-tenth of respondents are in skilled trades, another one-tenth are general laborers/wage earners, and another one-tenth are in business or commercial-related jobs; this type includes store/business owners, among other things. Only 3% of forest landowners work in forestry-related jobs.

Table 2.1: Main occupations of forest landowners.

Occupation category	Total (%)
Retired	45
Skilled tradesman/technician	11
Labourer/wage earner	10
Business/commercial	9
Professional	6
Not stated	6
Forestry	3
Fisheries/Natural resources	2
Trucking	2
Other	2
Self employed	2
Farming/agriculture	1
Unemployed/disabled/not applicable	1

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Figure 2.7: Educational attainment of forest landowners.*

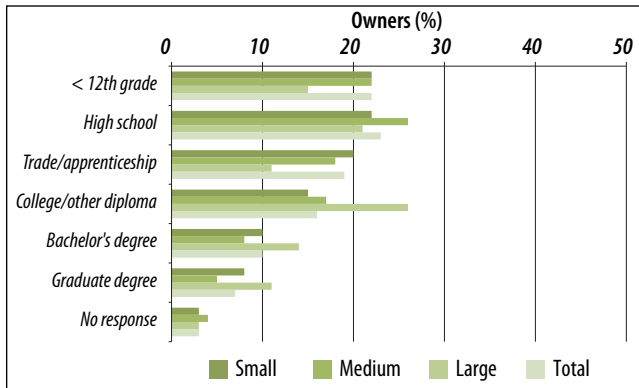
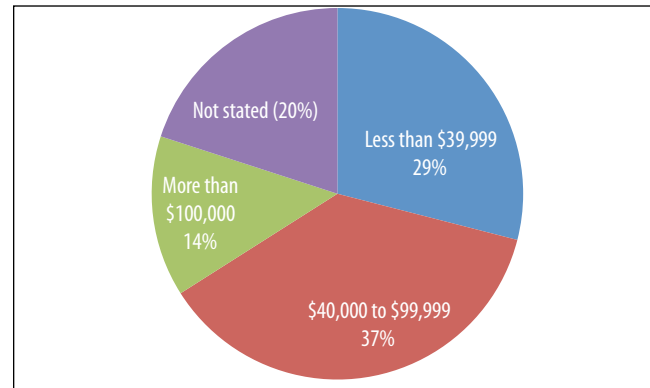


Figure 2.8: Household income of forest landowners before taxes.*

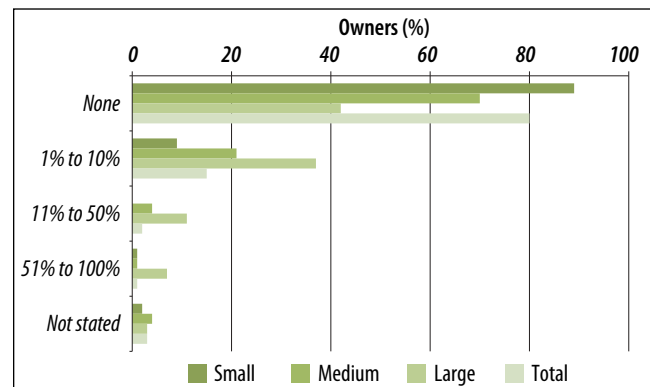


Forty-five percent of respondents have a high school diploma or less (Figure 2.7), compared with 55% across New Brunswick (Statistics Canada 2007). Respondents are also more likely to have trade certificates than the average New Brunswicker (Statistics Canada 2007). In general, owners of large forest lands tend to have a higher level of education than the other owners.

Twenty-nine percent of respondents' households earn less than \$40,000 per year, which is lower than New Brunswick's median household income of \$45,194 before taxes (Statistics Canada 2007). Fourteen percent of respondents' households earn over \$100,000 a year (Figure 2.8). One-fifth of respondents chose not to state their household income, which is typical in surveys. There is a significant difference in income between owners in different size classes.

Eighty percent of respondents said that, on average, none of their household income comes from their forest land (Figure 2.9). This is similar to what has also been observed in some regions of Quebec (Nadeau 2001). Not surprisingly, there is a significant difference in this category among owners of small (89%), medium (70%), and large (42%) forest properties. Given reports from other jurisdictions all across North America, we anticipated that owners of larger holdings would be more likely to derive income from managing their forest land, and this expectation was evident.

Figure 2.9: Percentage of income earned from forest land.*



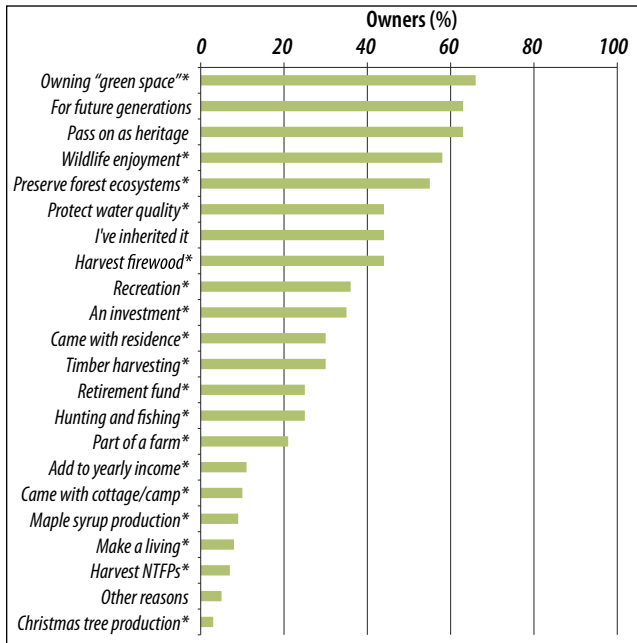
2.3 Motivations of forest land ownership

It is common in surveys of this nature to ask owners to identify their motivations for owning forest land. The most popular choices (from a list we provided) include enjoyment from owning green space (66%), for the sake of future generations (63%), and to pass on as heritage (63%) (Figure 2.10). Wildlife enjoyment (58%) and preservation of forest ecosystems (55%) were also rated important by more than half the respondents. Many of the most popular responses identify

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

environmental or heritage values over economic ones, and this seems consistent with other studies (Nadeau 2001, Mercker and Hodges 2007, Butler 2008, Urquhart and Courtney 2011).

Figure 2.10: Motivations for owning forest land.

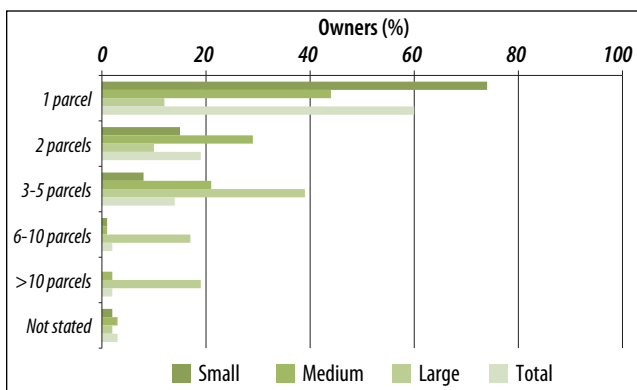


Significant differences among size classes were found, however, for most of the motivations above. Owners of small- and medium-sized forest lands tend to list environmental reasons, such as water quality, wildlife enjoyment, and ecosystem preservation, as stronger motivators for owning land. Owners of medium-sized forest lands also tend to obtain forest land as part of their residence and for firewood harvesting. Owners of large parcels are more likely to cite financial reasons (as an investment, for timber harvesting, as a retirement fund, maple syrup production, and to make a living) as reasons for owning their land. Owners of small parcels tend to own forest land as part of a cottage or camp. Thirty percent of respondents deemed timber harvesting important.

2.4 Characteristics of forest land ownership

Figure 2.11 illustrates that a majority (60%) of respondents own a single parcel of forest land. Another third owns between two to five parcels, whereas a small proportion of landholders (less than 10%) own six parcels or more. There are significant differences in the number of parcels owned across size classes: three-quarters of owners of small forest lands own a single parcel, compared with only 12% of owners of large forest lands. For higher numbers of parcels (three or more), landholders tend to be owners of large forest land properties.

Figure 2.11: Number of forest land parcels owned.*



It is possible that owners of multiple parcels may use different parcels for different purposes. For example, owners of large forest lands who own multiple parcels and harvest trees may have some parcels set aside or lightly harvested that they use for hunting, recreation, or conservation, whereas other parcels are more intensively managed for fiber.

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Figure 2.12: Length of time of forest land ownership by size class.*

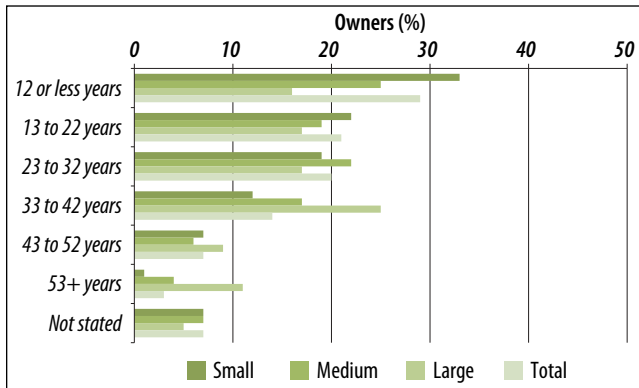
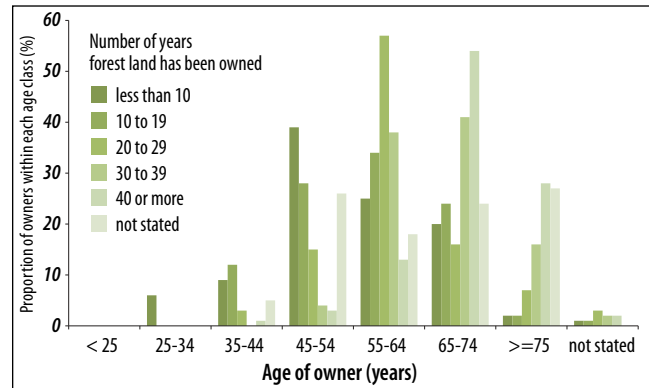


Figure 2.13: Proportion of forest land own for specific length of time by age class.



As for duration of ownership, we analyzed this question in two different ways: first, examining how long owners have had their forest land, and second, looking at the relationship between length of ownership and age of owners. Regarding length of ownership, Figure 2.12 shows that 29% of forest land owners have owned their forest land for 12 years or less. There are significant differences between sizes of ownership, with owners of large forest lands being more likely to have owned their land for longer than other owners. Sixty percent of owners of large forest lands have had their land for 23 years or more, whereas about half the owners of medium-sized holdings, and 40% of owners of small forests are in the same situation. This pattern supports a general belief that forest land is being subdivided and that people are now more likely to acquire smaller forest estates than before.

In looking at the relationship between length of ownership of forest land and the age of the owners, we notice that, in each age class, some owners have obtained forest land during the last 10 years (Figure 2.13). In the last 10 years, owners aged between 45 and 54 were, by far, the most active in obtaining forest land. This result provides a better sense of who constitutes the new generation of forest landowners, and there is no reason to believe that this demographic profile will change in the near future as “baby boomers” retire.

Figure 2.14: Means by which forest land was obtained.

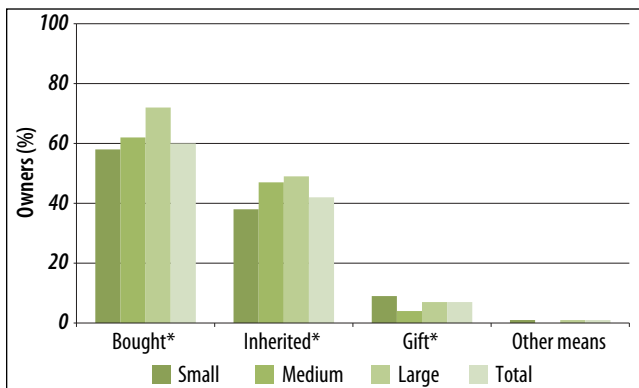
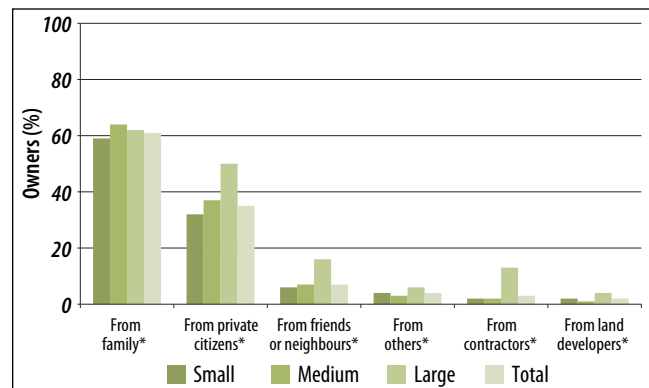


Figure 2.15: Who forest land was obtained from.



We were interested in how owners obtained their land. Sixty percent of owners purchased some or all of their forest land, whereas 41% inherited some or all of their land. Very few owners received forest land as a gift (7%) or through other means (1%) (Figure 2.14). Significant differences were

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

found between size classes for owners who have purchased forest land: 58% of owners in the small category va. 72% of owners in the large category.

A majority (61%) of owners obtained some or all of their forest land from family members, whereas one-third obtained some or all of their land from private citizens (Figure 2.15). Only 10% of owners obtained some or all of their forest land from the other listed sources. Significant differences exist on the matter of acquisition of forest land among ownership size classes. Most notably, owners of larger parcels were more likely to have purchased some of their land from friends and neighbors, from contractors, or private citizens than owners from other size classes.

Figure 2.16: Length of time of ownership in the family (n = 404).

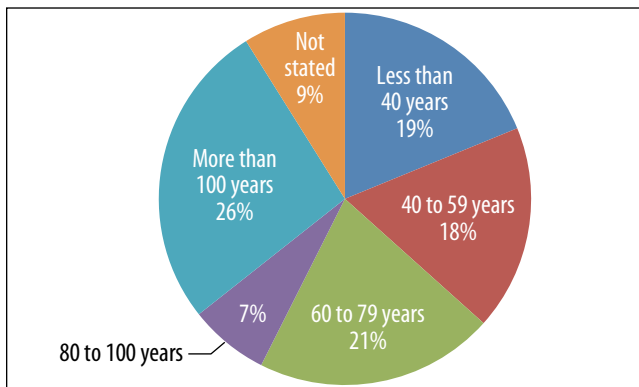
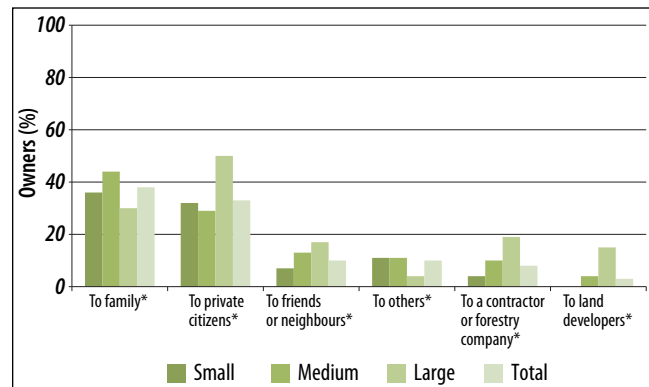


Figure 2.17: Who forest land was sold or given to (n = 172).



As we assumed, survey results show that, for a large proportion of owners in NB, forest land involves family ties. To get a better sense of how long the forest land has been in the owner’s family, we asked those who had inherited forest land how long it had been in their family. Figure 2.16 shows that 26% of owners who have inherited forest land have had this land in their family for over 100 years. About one-fifth of owners who inherited forest land have had it in their family for less than 40 years, whereas another 40% have had forest land in their family for between 40 and 80 years.

In addition to asking how they obtained their land, we asked respondents if they had ever sold or given away any forest land. Seventeen percent of the owners have sold or given away forest land (Table S3.17). This practice is more than two times more common among owners of large forest lands (37%) than among owners of small forest lands (15%). Of the owners who have sold or given away forest land, the most common recipient was family (38%), followed by private citizens (32%) (Figure 2.17). About one third of owners relinquished, sold, or gave away forest land to the other listed recipients. Significant differences among size classes were found in each category. Most owners who have sold or given away forest land to family are in the medium size class (43%). In all other categories, owners of large forest lands were the most common sellers or donors of land; this is consistent with the fact that they are more likely to sell or give forest land in the first place. Based on Figure 2.11, it is likely that landholders in the large category have multiple parcels of forest land, making it more likely that they would have more experience buying and selling land; some parcels may represent investments whereas others would not be considered for sale or donation.

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table 2.2: Type of ownership under which the majority of respondents' property is held.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Individual ownership	58	53	42	56
Joint	39	39	34	39
Other	2	2	6	2
Formal partnership agreement	0	3	4	1
Forestry company	0	0	6	1
Non forestry company	0	2	5	1
Not stated	1	1	2	1

Almost all (95%) of landholders own their forest land as individuals (56%) or jointly (39%) with another person (Table 2.2). Note that the latter category most likely comprises husband–wife agreements. There are significant differences between size classes: 58% of owners of small forest lands are individual owners, whereas the same is true for 42% of owners of large forest lands. Most of the 5% of owners who own forest land in another type of ownership hold large parcels.

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

3 Forest landowner behaviour

3.1 Factors affecting forest land management

Most forest landowners use their land for a wide range of purposes and orient their management toward those uses. We expected, based on research in other jurisdictions, that few forest owners had written management plans that guided these activities (Nadeau 2011). We asked forest landowners whether they have or aspire to have a written management plan. Fifty-nine percent of respondents do not have a formal (written) management plan and are not interested in having one. The proportion of owners who do have a plan or who are developing one increases according to the size class of ownership, moving from 8% among owners of small forest lands to 38% among owners of large forest lands (Figure 3.1).

Figure 3.1: Current situation of forest landowners with respect to having a management plan.*

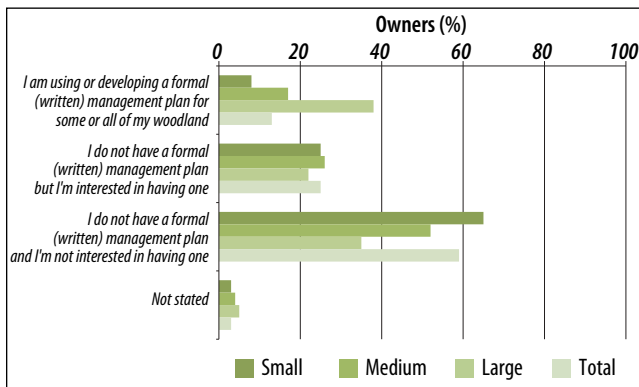
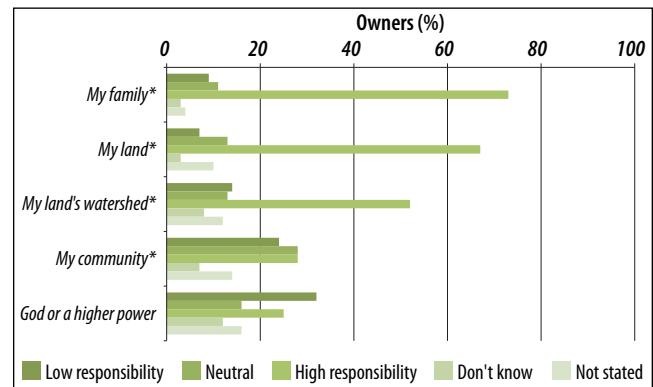


Figure 3.2: Entities toward which owners feel moral responsibility or obligations.



The various motivations that underlie stewardship have rarely been asked in previous surveys of forest landowners anywhere in North America. We asked forest landowners the degree to which they are motivated by moral responsibilities to human, land, or spiritual entities when making decisions about their land. This is one method of trying to determine what sorts of issues and concerns are at the forefront when owners make choices that shape the future disposition of their land. Overall, the entities toward which owners feel the most responsibility are their family (73%), their own land (67%), and the watershed of which their land is a part (52%) (Figure 3.2). With two of the top three elements being land related, this suggests that owners find it important to keep in mind what is best for the land when making management decisions. Social obligations are mostly confined to family members, as only 28% cited moral obligations to their local community. A sense of duty or moral obligation to a higher power or deity was cited less frequently across all ownership categories (25%). There are significant differences in responses according to size class, but it appears to be mostly due to “don’t know”, neutral, and not stated responses.

Our respondents were split regarding self-assessments of their own level of knowledge and the degree to which they are informed with respect to forest management. Close to 40% of forest landowners do not feel informed about forest management, and the same proportion (39%) feel

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

somewhat informed (Figure 3.3). Owners of large forest lands are more likely to self-assess as being very informed about forest management.

Figure 3.3: How informed respondents are, by size class, about forest management.*

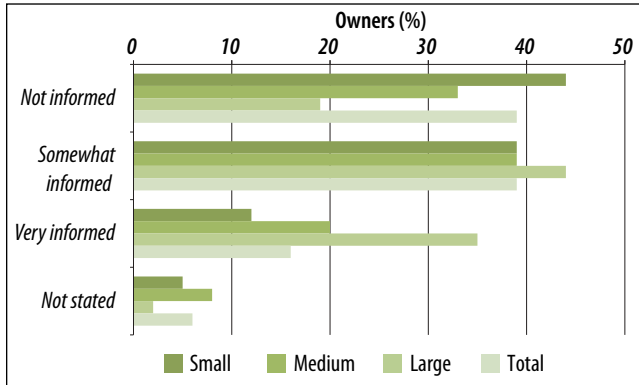
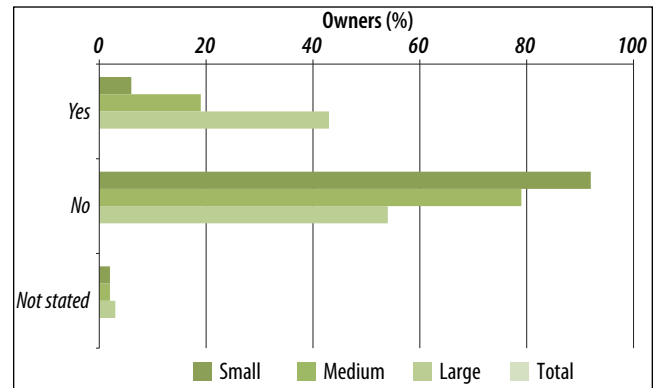


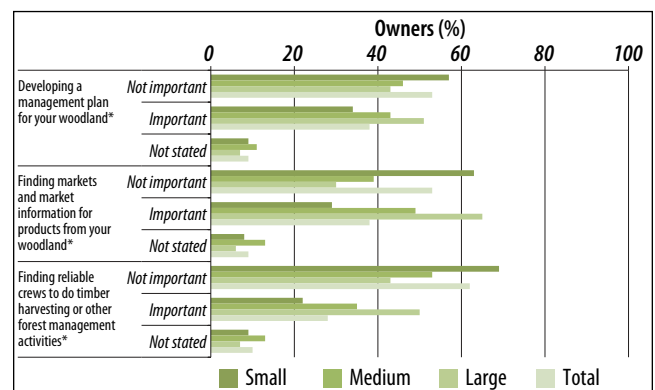
Figure 3.4: Proportion of owners who have received financial support from the provincial government or a forest products marketing board for forest land management over the last 10 years.*



For several decades, the provincial government (and formerly the federal government) has provided financial incentives for certain forest management activities. In recent years, these programs, although funded by the provincial government, have been administered through regional forest products marketing boards. Thirteen percent of owners have received financial support in the last 10 years from the provincial government or a forest products marketing board for forest management activities (Figure 3.4). Although this percentage may seem low, the proportion of owners who received financial support increases significantly with ownership size. In fact, it increases by a magnitude of seven times between owners of small forest lands (6%) and owners of large forest lands (43%). This is further evidence that owners of larger parcels are treating at least some portion of their land as an investment and managing to produce fiber, as most of the incentive programs involve planting, thinning, and other activities oriented toward growing fiber.

Over the years, various organizations— such as marketing boards, INFOR, and formerly, DNR’s Forest Extension— have provided advice and certain services to forest owners. Overall, 38% of owners feel it is important to have assistance in developing a management plan for their forest land (Figure 3.5). The same proportion (38%) feel it is important to have assistance in finding markets and market information for products, and a lower percentage (28%) find it important to have assistance in finding reliable crews to conduct harvesting or other forestry activities. The results vary by size class, with the importance of assistance increasing with increasing size class. Moreover, owners of large forest lands felt that each activity was more important than unimportant.

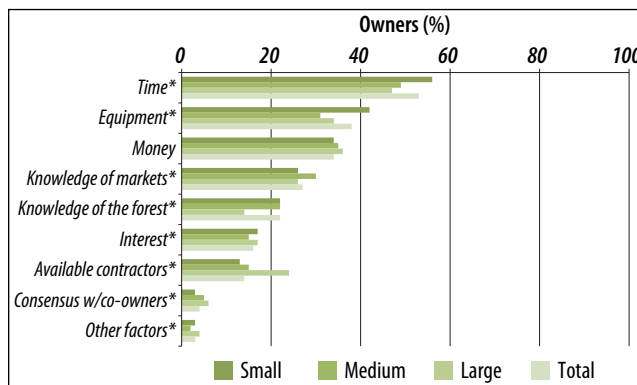
Figure 3.5: Importance of access to assistance, by size class, for conducting specific activities.



* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

There are many factors that enhance or reduce forest owners' capacity to manage their land. We asked primarily about constraints regarding their capacity to do more active management. Lack of time has the highest impact on NB owners' decisions about managing their forest land (Figure 3.6). It is the only factor for which there was a majority (53%) who agreed it was of moderate-to-high influence. The second-most common responses were a lack of equipment (38%) and lack of money (34%). Lack of time (56%) and equipment (42%) are factors that have more influence on owners of small forest lands. Lack of knowledge of the forest has the same level of influence for owners of small and medium forest lands (22%), but is less influential (14%) on owners of large forest lands. Lack of available contractors (24%) is a factor that is more influential for owners of large forest lands.

Figure 3.6: The percentage of respondents who cited these factors as a constraint on their forest management decisions, by size class.



3.2 Past harvesting frequency and future harvesting intentions

One of the PLTF's motivations for commissioning this survey (and DNR's willingness to fund it) was an interest in determining the number of owners and the amount of land that might be available for future timber harvest. Conversely, the PLTF was also interested in finding out if very large numbers and/or a large amount of land would likely be unavailable for harvest in the future. In either case, information on this topic could also help planners at DNR and other players in the forest sector (firms, marketing boards, etc.) plan more effectively. Therefore, we asked a series of questions on the survey that dealt with timber harvesting. For many of these questions, it is important to point out that fewer respondents were asked to respond as the questions sometimes targeted owners who have harvested timber or those who have not. The total number of respondents is provided when a question was not answered by all the survey respondents.

Overall, 32% of owners have harvested or removed trees from their forest land at least once each year over the last 10 years, whereas 18% have harvested at least once over the last 5 years (Figure 3.7). Twelve percent stated that they had not harvested in the last 5 years, but did so at least once in the last 10 years. The fact that only a small percentage of owners that harvest timber do so on a regular basis, may explain why timber harvesting had low importance as a reason for owning forest land. The group of forest landowners who have harvested timber over the last 10 years (62%) is referred to as the Frequent or Recent Harvest (FRH) owners in subsequent questions. The Rare or Never Harvest (RNH) owners (totalling 37%) are those who stated that they have never harvested their forest land (16%) or had not in the last 10 years but did at least once before then (21%).

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Figure 3.7: Frequency of having removed or harvested trees in the past 10 years.*

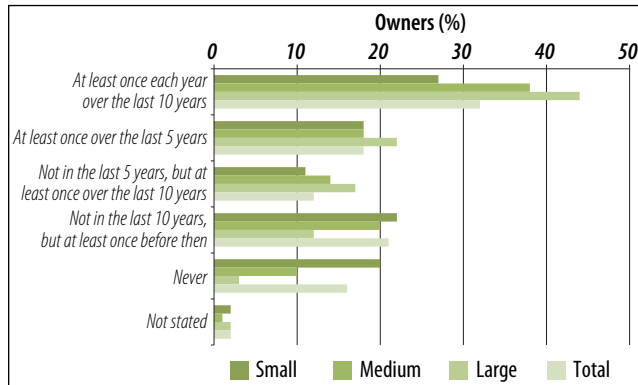
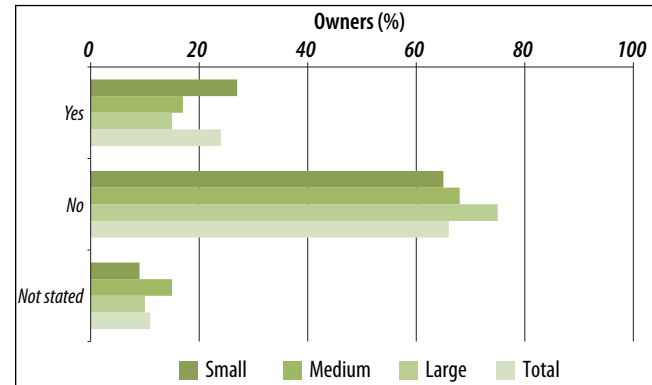


Figure 3.8. Respondents who did not harvest in the last 10 years and intend to never harvest, indicated by a yes response (n=202).*



Of the FRH owners, the proportion who harvested timber annually increased with increasing ownership size (Figure 3.7). The proportion who had not harvested in the last 5 years but at least once in the last 10 also increased with increasing ownership size. A higher proportion of owners of large forest lands (22%) harvested at least once over the last 5 years. When asked if they would have harvested timber if they did not need it for personal use or for income, nearly 40% of FRH owners said yes (38%) (Table S3.26). Owners of larger forest lands were more likely to indicate this than other owners. This is a relatively high percentage who would harvest even though they do not have a financial need to do so or a direct use for their products. Those who harvest “just for the sake of doing so” may feel that it is good management to harvest mature trees when they deem them of sufficient size. They may do so for supplemental income, but they may not need the money as part of their regular income. They may also do so for the enjoyment of it (recall the high proportion of respondents who are retirees). These owners may be simply harvesting out of a desire to maintain their forest land in a managed state. Later, we show that, indeed, a third of owners believe that forest land that is not actively managed is wasted (Figure 4.14); it may be some of these owners who also agreed they would still have harvested whether or not they needed the timber or income from timber sales.

Owners of larger forests represent a smaller percentage (12%) of the RNH group. The proportion of owners in the RNH category decreases with increasing ownership size. The RNH owners were asked if their intention is to never harvest timber, and 24% said yes (Figure 3.8). A higher proportion of owners of small forest lands indicated this than other owners.

3.3 Implications for wood supply of harvesting intentions and practices

In addition to asking about past harvest experience (which is often a good predictor of future behavior), we also asked respondents directly about their future intentions regarding harvesting or removing trees from their land. Overall, 9% of all the owners plan never to harvest (Table 3.1). The owners who might harvest in the future are those who have not harvested in the last 10 years, but express interest in harvesting, although not in the next 10 years. Twenty-nine percent of all owners fall within this category, whereas another 54% of owners plan to harvest in the next 10 years. The proportion of owners who intend never to harvest decreases with increasing ownership size

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

(Table 3.1). Finally, the proportion of owners who might harvest in the next 10 years increases with increasing ownership size.

Knowing the proportion of forest landowners who are interested in harvesting timber in the short or long term does not give any indication of the area of forest land where this activity might take place or the consequences for timber supply. To address this issue, we looked for a way to use our data to obtain a sense, not only of the number of owners who plan to engage in timber harvesting, but also the amount of land they own. For example, if we found out that a large number of owners intend never to harvest but that these owners only own a small portion of the land base, the consequences for the timber supply may be minimal. Conversely, if the smaller number of owners who own a high portion of the land base are all willing to harvest in the future, this will have positive consequences for the amount of fiber available going forward. There is a substantial trade-off, however, associated with looking at our data that way. The trade-off is that, although we know our sample is representative and can use weights to calculate total results that are informative about the entire population of NB forestland owners, we have no data from which to draw inferences about the area of forest land owned and, therefore, we cannot extrapolate this to a larger population. Thus, results presented in Table 3.2 should be used with caution, keeping in mind that they concern only our respondents and should not be extrapolated to any other groups, because we are taking into account the acreage of forest they owned.

Table 3.1: Timber harvest intentions of forest landowners, by ownership size.*

Intention	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Never intend to harvest	11	5	2	9
Might harvest in future	33	25	18	29
Might harvest in next 10 years	49	61	68	54
Not stated	7	9	12	8

Table 3.2: Timber harvest intentions and affected forest land area.

Intention	Number of	Size of Ownership			Total
		Small	Medium	Large	
Never intend to harvest	Owners	21	14	6	41
	Hectares	258	627	1,766	2,652
Might harvest in future	Owners	61	73	47	181
	Hectares	912	3,783	11,197	15,893
Might harvest in next 10 years	Owners	92	177	172	441
	Hectares	1,503	10,428	84,443	96,373
Not stated	Owners	13	27	25	65
	Hectares	169	1,537	13,979	15,685
Total	Owners	187	291	250	728
	Hectares	2,842	16,376	111,385	130,603

Table 3.1 should be used only to discuss the proportion of owners who plan to harvest or not harvest in the future and draw inferences to the larger population. Table 3.2 enables us to see how much forest area could actually be affected by future harvesting conducted by respondents and get a sense of what this means for timber supply. Overall, there is a fairly small number of both respondents and their corresponding forest land that can be considered to be unavailable

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

for the wood supply (i.e., never intend to harvest). Past behaviour indicates, however, that many of those who plan to harvest in the future may only engage in low-intensity harvests for personal use of the wood.

3.4 Timber harvesting on forest lands

3.4.1 FRH owners' reasons for harvesting timber and products harvested

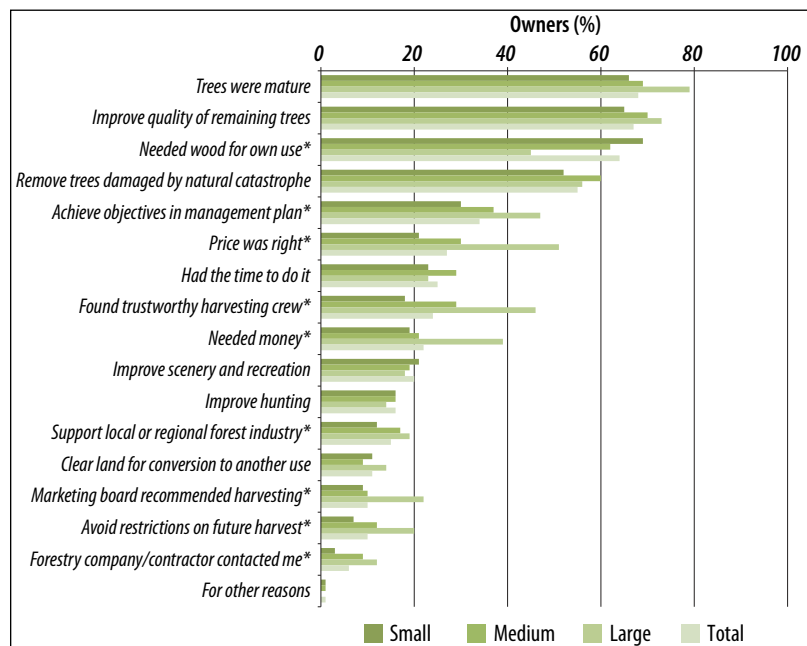
Only FRH owners ($n = 513$) were asked to answer questions explored in section 3.4.1, unless otherwise noted by $n = 728$ (i.e., all forest landowners).

When asked the reasons that came in to play when deciding to harvest in the last 10 years, most FRH owners agreed that the trees were mature (68%), they desired to improve the quality of the remaining trees (67%), they needed for wood for personal use (64%), and it was important to remove trees damaged by natural catastrophe (55%) (Figure 3.9). About a third harvested to achieve objectives in their management plan (34%). About a quarter of owners found each of the following reasons to be important: the price was right (27%), they had the time to do it (25%), and they were able to find a trustworthy harvesting crew (24%). Around 20% of owners stated that they harvested because they needed the money (22%) or to improve scenic or recreational opportunities on their land (20%). A smaller proportion of owners cited such reasons as: to improve hunting opportunities (16%), to support the local or regional forest industry (15%), to clear land for conversion to another use (11%), a forest marketing board or forest cooperative recommended the harvesting (10%), to avoid possible government restrictions on future harvests (10%), or that a forestry company or a contractor contacted them to encourage them to harvest and sell wood (6%).

Many of the motivations to harvest were of higher importance to owners of large forest lands (Figure 3.9). These include the price (51%), the ability to find a trustworthy harvesting crew (46%), the need for money (39%), and the fact that a forest marketing board or forest cooperative recommended harvesting (22%). Need for wood for the owners' own use is the only reason where the importance decreased as ownership size increased.

In addition to determining the number of owners who harvested in the past 10 years and why they harvested, we asked how the harvested wood was used (Figure 3.10). Firewood, posts, poles or pilings, and Christmas trees are

Figure 3.9: Proportion of respondents for which these motives were important for having harvested in the last 10 years.



* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

products that were more frequently cited as being harvested for personal use than sale. Many of these products, and perhaps especially firewood, may be sold or traded within a cash market, and thus, the reporting of product sales may be underestimated. Sawlogs or studwood, biomass, and other products were sold more often than used by owners. We assumed that pulp and veneer were products that were not likely harvested for personal use and, therefore, forest landowners were only asked about the sale of these items.

Figure 3.10: Proportion of FRH owners who harvested specific timber products for personal use or sale in the last 10 years.

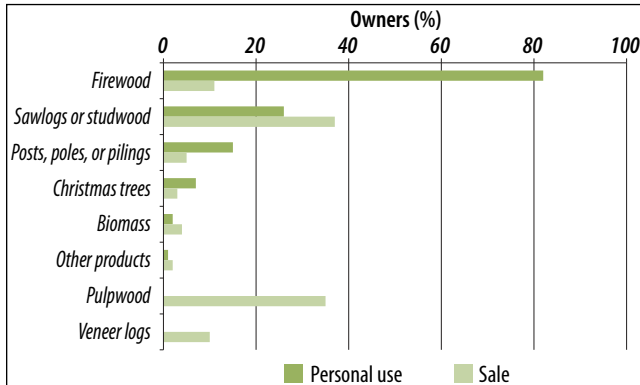
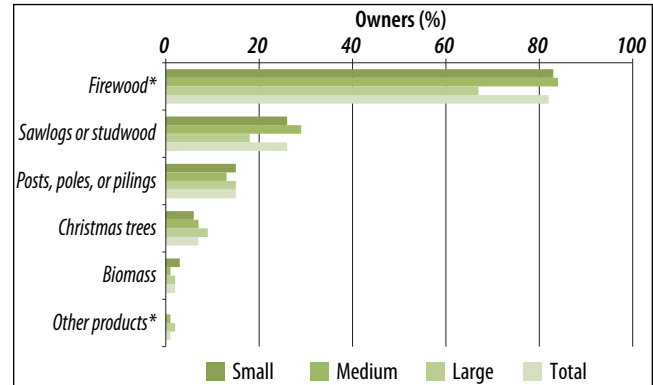


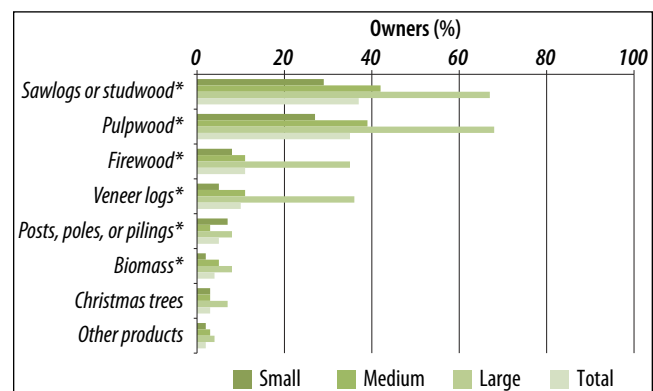
Figure 3.11: Proportion of FRH owners who harvested products for personal use in the last 10 years.



A vast majority of the FRH owners (82%) indicated that they harvested firewood for personal use (Figure 3.11). About a quarter harvested sawlogs or studwood, and 15% harvested posts, poles, or pilings. A minority of owners indicated that they personally used Christmas trees (7%), biomass (2%) or other products (1%). There was a significant difference in the proportion of owners who harvested firewood for personal use, with owners of small (83%) and medium (84%) forest lands having harvested this product more than owners of large forest lands (67%).

Just over a third of FRH owners sold sawlogs/ studwood (37%) or pulpwood (35%) (Figure 3.12). About one out of ten owners sold firewood (11%) or veneer (10%). Five percent or less sold posts, poles or pilings (5%); biomass (4%); Christmas trees (3%); or other products (2%). The sale of the following products had a statistically significant difference according to size of ownership: sawlogs/ studwood, pulpwood, veneer logs, and biomass. The prevalence of having sold these products increased with ownership size, with a magnitude of difference from two to seven times between owners of small and large forests. A higher proportion of owners of large forest lands sold firewood (35%) than any other owners.

Figure 3.12: Proportion of FRH owners who have harvested products for sale in the last 10 years.



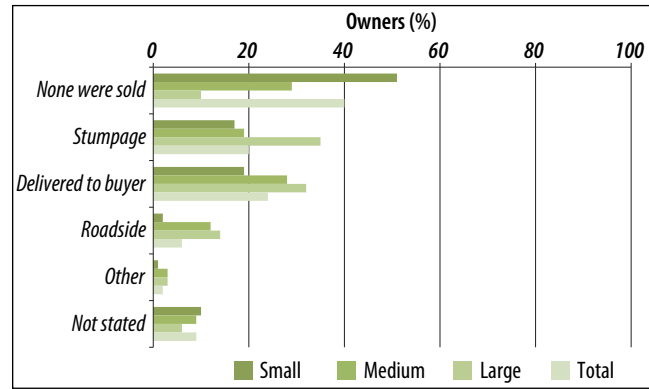
As stated before, one (but not the only) objective of the PLTF in sponsoring this study was to better understand the potential contributions of private forest landowners to the industrial fiber

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

supply. Past harvesting activities and future intentions provide some information regarding the potential timber supply from private forest lands. Market-oriented forest landowners may best be characterized as those who have sold products. These are the owners who are currently participating in market relations and thus contributing to the provincial wood supply. Industrial wood users are most interested by sawlogs, studwood, pulpwood, veneer logs, posts, poles, and pilings, and biomass. Of all forest landowners ($n = 728$), 28% have sold at least one of these products over the last 10 years (Table S3.31). Sale of these products increased with increasing ownership size, with owners of large forest lands being three times more likely (64%) than owners of small holdings (20%) to have sold these products. Although this refers to owners' past sales activity, as stated previously, past behavior is a good indicator of future activity.

The most common methods of sale were stumpage and delivery to the buyer (Figure 3.13). The sale of wood through stumpage, delivery to buyer, and roadside are all methods that increased in likelihood with larger size classes of owners. Conversely, the percentage of people who indicated that they harvested but did not sell their wood decreased with increasing size class.

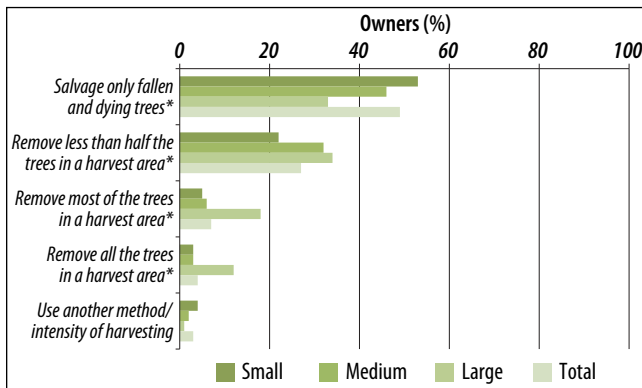
Figure 3.13: Proportion of FHR owners who used different methods to sell forest products in the last 10 years.*



3.4.2 Harvesting methods, who does the harvest, and experience with contractors

Many forest owners reported having used low-intensity harvest methods over the last 10 years (Figure 3.14). About half of those who harvested said that they salvaged only dead and dying trees, and an additional 27% said they removed less than half the trees in a given harvest area. The prevalence of salvaging only fallen and dying trees decreased as ownership size increased. A smaller percentage of owners of small parcels (22%) stated that they removed less than half the trees in a harvest area than did other owners. A greater percentage of owners of large forest lands removed most (18%) or all of the trees (12%) in a harvest area than did other owners.

Figure 3.14: Proportion of FHR owners who used these harvesting methods most or all of the time in the last 10 years.



A high percentage of FRH owners (83%) stated that they or members or their family did the harvesting on their forest land (Figure 3.15). This proportion was significantly different according to size of ownership: owners of smaller forest lands were more likely to rely on their family and themselves to do the harvesting. As well, the probability of having hired and supervised a crew or an independent contractor or forestry company increased with increasing ownership size. These trends, along with the method of harvesting and products harvested, start to

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

paint a picture regarding harvesting on private forest lands. It appears that owners themselves are conducting low-intensity harvesting of single stems for stand improvement or for firewood. This type of harvesting activity may be vital to owners' well-being and to their enjoyment of their forest land and likely results in useful and important products (home heating being one of the most important). This low-intensity harvest activity practiced by the largest number of owners, however, does not likely produce as much wood for the industrial supply as the more intensive activities of a much smaller group of owners who own larger areas of forest land. It is clear, however, that the contribution of wood fiber from this minority of owners has been significant in the past, and explains how private non-industrial forest owners have contributed, on average, 24% of the provincial harvest volume for the past 50 years (DNR 1960–2011).

Figure 3.15: Proportion of FRH owners who got most of their timber harvesting in the last 10 years done by these actors.*

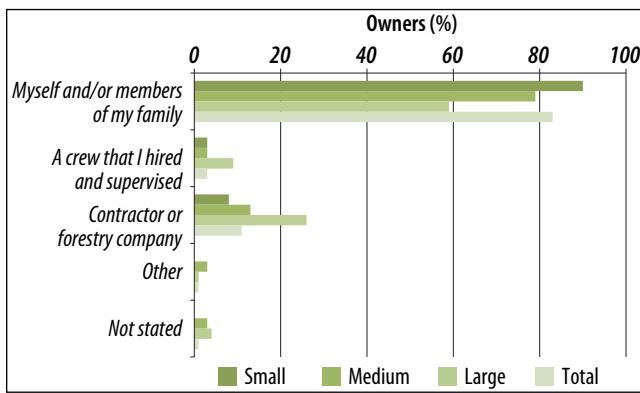
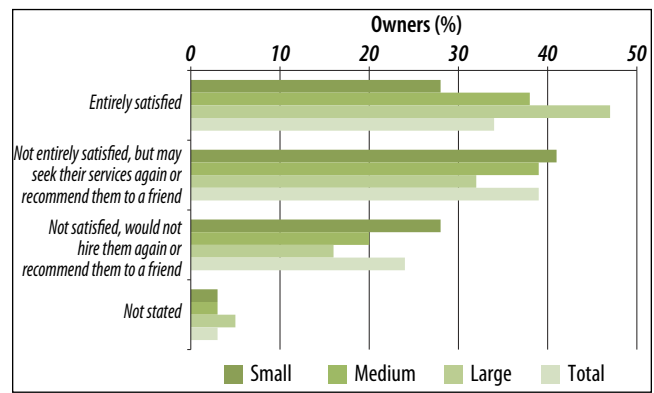


Figure 3.16: Level of satisfaction of among respondents who had experience with logging contractors in the last ten years (n=218).



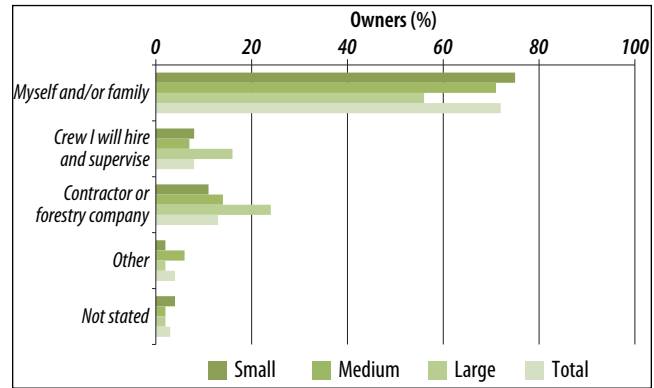
Of the FRH forest landowners, 34% had experience with logging contractors (Table S3.36). The larger the ownership size, the more likely it is that the landowners have had experience with contractors. Of these owners with contractor experience, about one-third stated that they were entirely satisfied (34%) and a slightly higher proportion (39%) stated that, although they were not entirely satisfied, they might seek their services again or recommend them to a friend (Figure 3.16). Roughly a quarter said that that they were not satisfied and would not hire them again or recommend them to a friend. Although about three-quarters of the owners who had experience with contractors were somewhat or entirely satisfied with contractors, 69% of the total population agreed that harvesting contractors should be strictly regulated. Owners of large forest lands agreed with this statement less frequently than did other owners (Table S3.38).

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

3.4.3 Who might conduct the harvest in the next ten years

We asked the 54% of owners who indicated that they might harvest in the next 10 years (Table 3.1), who would likely conduct that harvest. Of these owners, a large majority (72%) plan do to the harvesting themselves or have it done by members of their family (Figure 3.17). Owners of large forest lands are more likely to indicate that a crew (16%) or an independent contractor (24%) will conduct their future harvests. This is not surprising when considering that the intensity of the harvest operations is likely to be much higher than that of other owners. It is also not surprising to see that this mimics the trends observed regarding who did the harvest in the past.

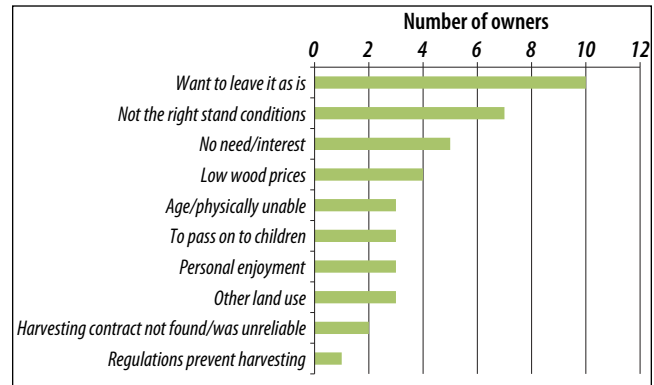
Figure 3.17: Who would do the harvesting for those who might harvest in the next 10 years (n=441).*



3.4.4 Motivations of RNH owners for not harvesting timber in the last ten years

There are a number of reasons why forest landowners might have decided not to harvest any timber in the last 10 years. To find out about these, we first asked if it was because they had no intention ever to harvest. As reported earlier, about a quarter (24%) of the owners who have not harvested timber in the last 10 years have no intention ever to harvest. We asked these owners to describe, in their own words, the reason behind their decision. Their answers were grouped into similar categories and are shown in Figure 3.18. The reasons expressed most often by these owners related to conservation values or a desire to leave the woodlot in a natural state. Some replied that the stand conditions were not right for harvest, and others expressed a lack of interest or need.

Figure 3.18: Number of respondents who stated these reasons for why they never plan to harvest timber on their forest land (n=41).



Two-thirds of the RNH owners may harvest in the future (Table S3.27). For these owners, their top reasons for not harvesting in the last 10 years include (in order of importance): the trees not being large enough (47%); no financial need (40%); concerns about damaging the land, soil, or remaining trees (38%); and being too busy with other activities (37%) (Table 3.3).

There was a statistically significant difference between owners of different forest sizes for only some of the reasons for not harvesting. Owners of medium-sized parcels tended to answer differently. The following reasons were of greater importance to owners of medium-sized forest lands, but had more or less the same level of importance for owners of small and large forest lands: the extra income tax they would have to pay (24%), not being able to find a trustworthy harvesting crew (21%), accessibility or road problems (21%), and being physically unable to do the harvest

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

(21%). Small owners cited the lack of financial need to harvest (45%) and being too busy with other activities (41%) as most important reasons for not harvesting. Not harvesting due to hearing about other people's bad experiences was a more important reason for owners of medium-sized forested parcels (24%), followed by owners of small (16%) then large forests (7%). Inability to find a market, having recently acquired the forest land, and being absent from the area are all reasons for which the importance decreased as size of ownership increased. Low prices increased in importance as a reason for not harvesting as ownership size class increased.

Table 3.3: Proportion of owners likely to harvest timber in the future and for whom these reasons were an important factor in choosing not to harvesting timber in the last ten years (n=138).

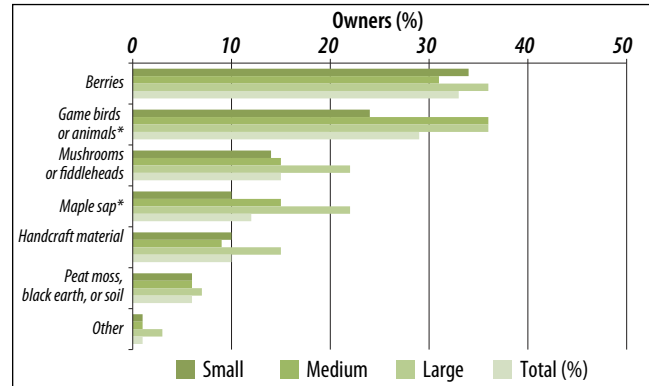
Reason	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Trees not large enough	49	43	50	47
No financial need*	45	26	38	40
Harvesting could damage forest land	39	33	44	38
Too busy*	41	26	33	37
Prices too low*	18	33	53	23
Recently acquired forest land	25	16	13	22
Heard about other peoples' bad experiences*	16	24	7	18
Didn't know what/how to harvest*	18	17	13	17
Couldn't find trustworthy crew*	16	21	13	17
Couldn't find a market*	18	16	13	17
Absent from area*	18	10	7	15
Fear of increased income tax*	10	24	13	14
Accessibility or road problems.*	10	21	13	13
Didn't have access to market information	10	12	13	11
Physically unable*	6	21	7	10
Fear of losing old age pension supplement.*	4	9	7	5

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

3.5 Non-timber forest products uses

Non-timber forest products (NTFPs) are important forest values to some forest landowners, either for personal use or for sale. Game birds or animals and berries had the highest personal use collection over the last 10 years (Figure 3.19). Game birds or animals had the same collection rates amongst medium and large owners (36%), but less for small owners (24%). Overall, few forest landowners sold NTFPs; at most, 3% of owners sold a given product (Table S3.43).

Figure 3.19: Non timber forest products collected over the past 10 years for personal use.



3.6 Past and future management activities

The majority (57%) of owners undertook at least one management activity over the last 10 years (Figure 3.20). The prevalence of having undertaken an activity increased with increasing size of ownership. Nearly the same percentage of owners (56%) plan to conduct at least one activity on their forest land over the next 10 years. There is a difference according to size class for future management intentions, however, in this case, more owners of large parcels (64%) plan to engage in management activities, followed by owners of small parcels (57%) and then owners of medium parcels (53%)(Figure 3.21).

Figure 3.20: The proportion of forest landowners who have engaged in management activities over the last 10 years.

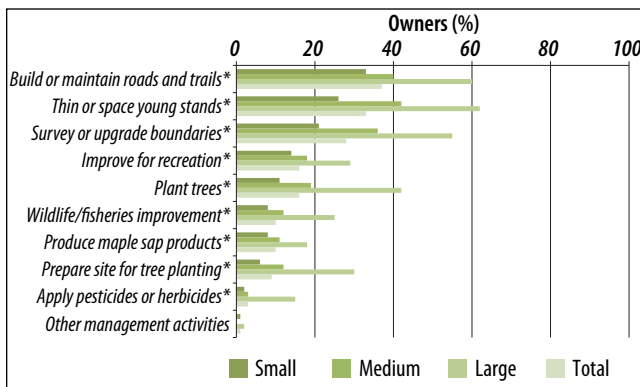
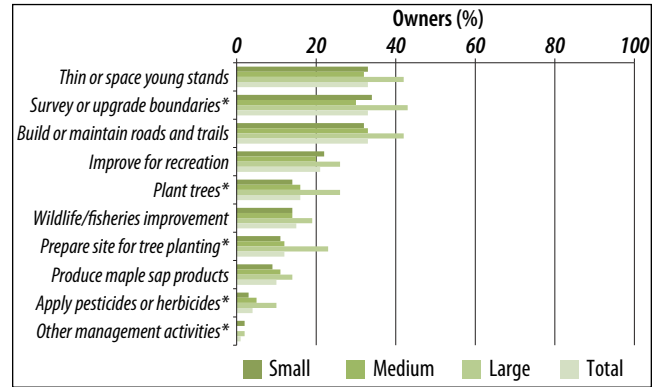


Figure 3.21: The proportion of forest landowners who intend to engage in management activities over the next 10 years.



Looking back over the past 10 years, roughly a third of forest landowners engaged in each of the following activities: building or maintaining roads and trails (37%), thinning or spacing young stands (33%), or surveying or upgrading boundary lines (28%) (Figure 3.20). The Figure illustrates the degree of participation by size class. What is perhaps most striking about these results is that owners of larger parcels are much more likely to take part in activities associated with intensive fiber production. They are more than twice as likely and nearly four times more likely to plant trees or do site preparation for planting than owners of medium and small parcels, respectively.

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Similarly, the use of pesticides and herbicides is rare among all size classes, but owners of large parcels are much more likely to use these tools than owners of small and medium-sized parcels.

Looking into the future, in the next 10 years, a third of owners plan to engage in each of the following activities: thinning or spacing young stands, surveying or upgrading roads and boundary lines, or building or maintaining roads and trails (Figure 3.21). There are 21% of owners who plan to improve their forest land for recreation. Roughly 15% (each) plan to plant trees or conduct wildlife habitat/fisheries improvement projects. Around 10% (each) plan to conduct site preparation for tree planting or produce maple sap products. A small number of owners plan to apply pesticides or herbicides (4%) or to conduct other activities (1%). Overall, there are fewer significant differences between size classes for future plans than there were for past activities. Site preparation, planting, and pesticide/herbicide application are all activities in which future plans increase with size. Survey or upgrade boundary lines is an activity that is planned most often for owners of large forest lands (43%), followed by owners of small (34%) and then medium parcels (30%).

Past and future activities correspond quite closely, suggesting that for forest landowners past behavior is a good indication of future behavior, or at least behavioral intentions. The two activities for which forest landowners anticipate higher levels of participation in the future are wildlife habitat/fisheries improvement projects and recreation improvement projects (each increased by 5% between past and future). There does not seem to be a great desire to intensify fiber production on private woodlots in the future.

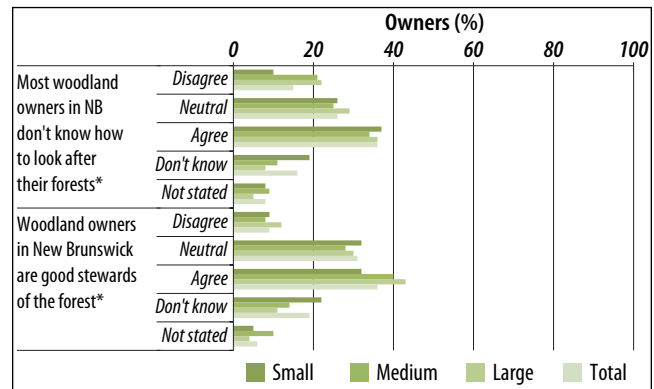
4 Forest landowner attitudes

One disadvantage of surveys of this nature is that it is difficult to gain a nuanced picture of what drives woodlot owner behavior and what “makes them tick.” This is due to the fact that we are limited to “check the box” sorts of answers, rather than having a conversation with them. However, we can gain a limited insight into the collective picture of woodlot owners’ values and perspectives by asking a range of attitudinal questions. We asked attitudinal questions about stewardship, laws, certification, incentives, willingness to collaborate, and many more themes. This section discusses those results.

4.1 Attitudes toward land stewardship

When asked to assess the land stewardship of their peers, overall, about a third of forest landowners had a positive attitude (Figure 4.1). There were significant differences between size of ownership, with owners of larger forest parcels more likely to voice stronger support regarding the forest landowner’s stewardship of the land but also slightly higher level of concern about this stewardship.

Figure 4.1: Attitudes toward stewardship.



4.2 Attitudes toward sustainability of the wood supply

Three questions were asked to assess the attitudes of forest landowners regarding the overall amount of timber harvesting on private land in New Brunswick and the sustainability of that supply. A majority of forest landowners expressed high concern about the amount of timber that is being cut (Table 4.1). The level of concern tends to decrease with the size of ownership, but it is still relatively consistent across categories.

Forest landowners’ opinions are divided regarding the potential shortage of harvestable timber in private forests in the next 10 to 20 years, and on the capacity of NB forests to supply timber to all users. There is no agreement among forest landowners about whether there will be little harvestable wood on private forest land in the next 10 to 20 years. About a quarter agree (26%) with the statement, whereas a similar proportion disagree (27%) (Figure 4.2). There is also no agreement

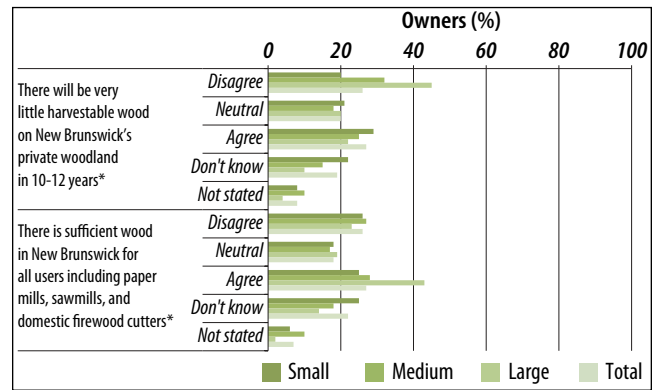
Table 4.1: Concerns about level of harvesting.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Too much wood being cut.*	Lower concern	14	15	21	15
	Neutral	20	17	19	19
	Higher concern	55	51	49	53
	Not stated	10	18	11	13

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

among forest landowners on the suggestion that there is sufficient wood in NB for all users (paper mills, sawmills, firewood cutters). Opinions about these two statements vary with size of ownership: owners of larger forests being more likely to disagree with the notion that there will be a shortage of harvestable timber in the next 10 to 20 years and more likely to agree with the notion that there is sufficient wood in NB for all users.

Figure 4.2: Attitudes toward sustainability of the wood supply.



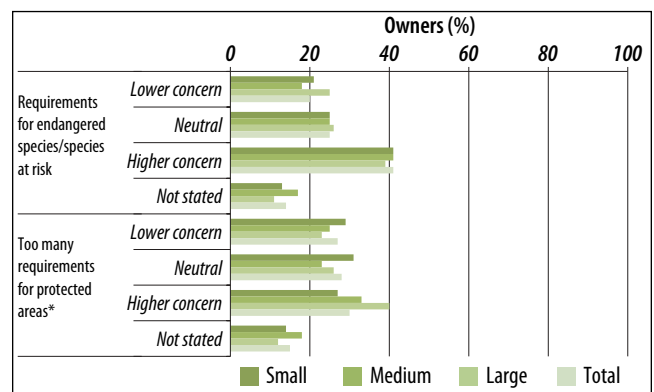
The attitudes of forest owners regarding the wood supply from both on Crown and private land, if they translate into behavior, could have implications for wood supply. Owners who believe that too much wood is being cut may be more reluctant to harvest their lands if they see that as contributing to the problem or think that it will impair the provision of wildlife habitat or other goods and services in the area where their forest is located.

4.3 Attitudes toward conservation issues

Private forest landowners were asked a series of questions related to conservation issues such as protected areas, endangered species (sometimes referred to as species at risk), and the role of government in supporting conservation on private forest land. Some 41% of forest landowners expressed higher levels of concern about potential management requirements related to endangered species and species at risk. The level of concern was lower with regard to the amount number of requirements for protected areas, as only 30% of forest landowners express high concern on this issue.

The level of concern among owners of large parcels was quite stable, with about 40% expressing high concern about requirements related to either endangered and at-risk species or protected areas (Figure 4.3). The level of concern expressed regarding the amount number of requirements for protected areas increased significantly as the size class of ownership increased.

Figure 4.3: Concerns regarding conservation issues.

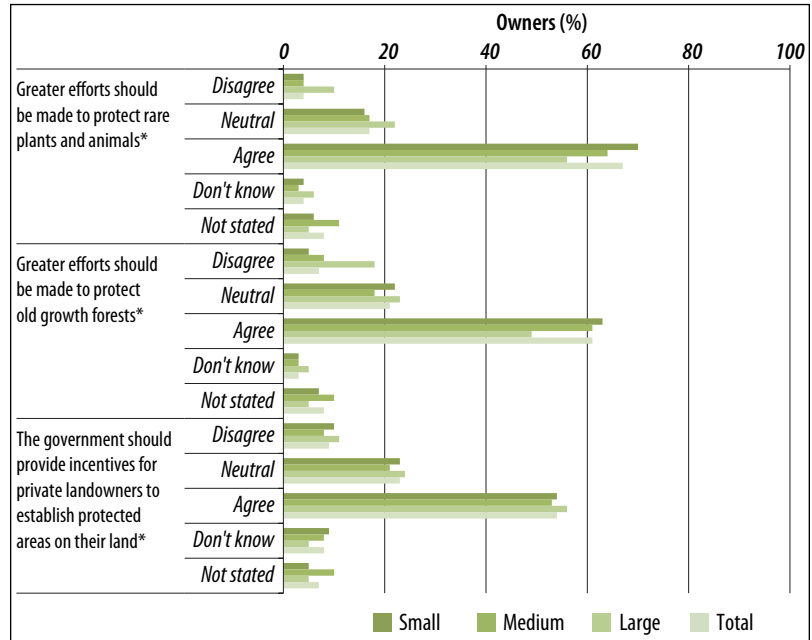


Despite concerns voiced regarding the level of requirements related to conservation, two-thirds of the forest landowners agreed that greater effort should be made to protect rare plants and animals, and 61% also agreed that greater effort should be made to protect old-growth forests. A majority (54%) also agreed that government should provide incentives for private landowners to establish protected areas on their land.

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Although a majority of owners in all size categories agreed that greater effort is needed to protect rare plants and animals and to protect old-growth forests, owners of large parcels express less concern on these issues (Figure 4.4). A majority of owners in each size of ownership also support the idea that government should provide incentives for private landowners to establish protected areas. In this case, however, the differences in responses appear to be more important for the “don’t know” and “not stated” categories.

Figure 4.4: Attitudes toward conservation issues.

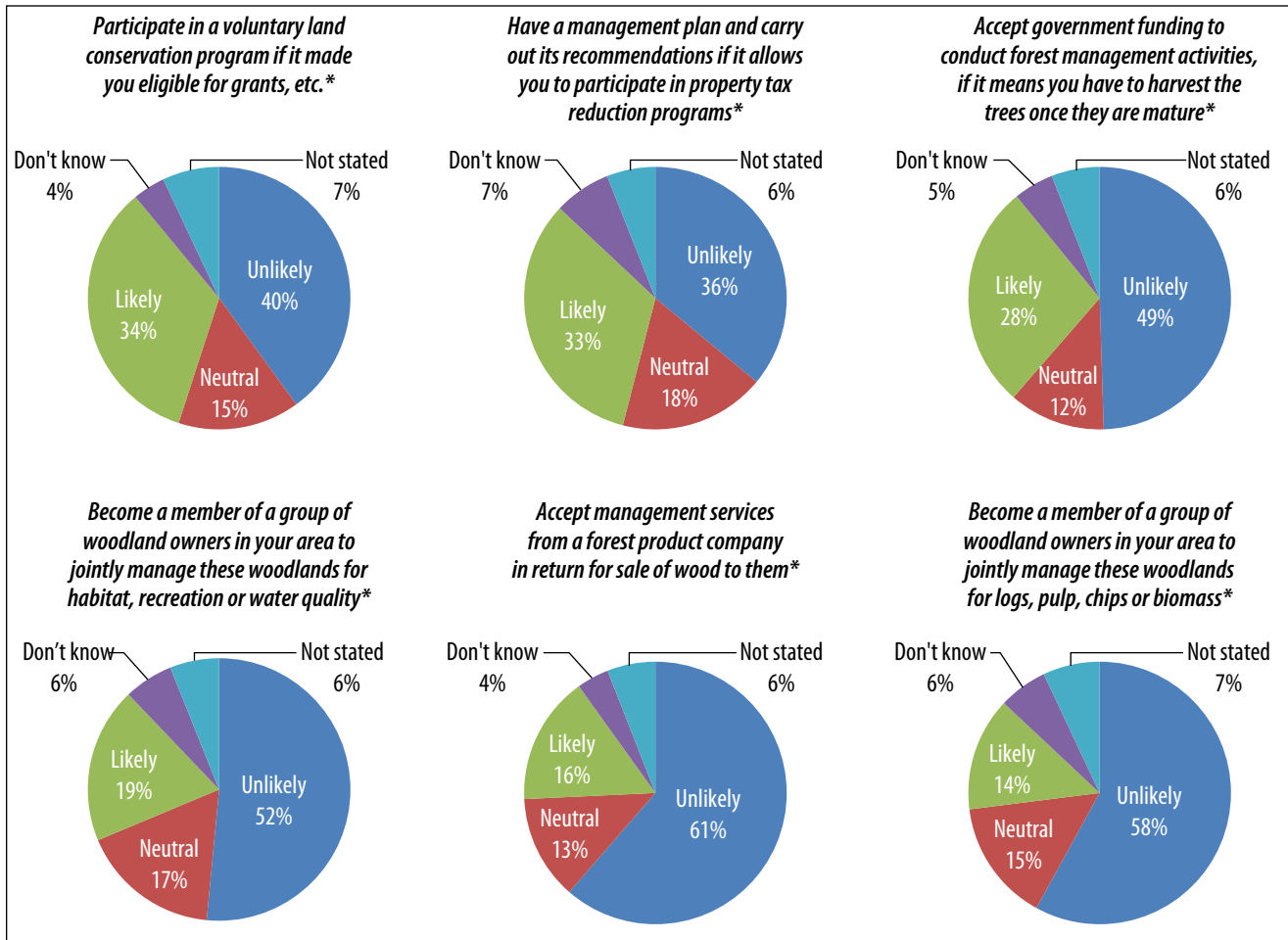


4.4 Attitudes towards forest management approaches and programs

Consistent with the stereotype of forest landowners throughout much of North America, the landowners who responded to our survey value their independence and the freedom to choose management options for their land with minimal interference from other parties. We asked if they would be willing to collaborate with one another, with the forest products private sector, or with the government, and in each case, there was little interest. In each question, we asked the likelihood of participating in an activity where there were some “strings attached” in order for forest landowners to achieve a benefit. The most interest expressed by our respondents was for participating in conservation activities in order to be eligible for grants or other assistance (Figure 4.5). Thirty-four percent were likely to participate in such an activity, however, more (40%) were unlikely. Thirty-three percent were interested in having management plans and following through with their recommendations in return for tax breaks, but 36% were unlikely to participate. Nearly twice as many were unlikely to accept money from government for management activities if it meant a commitment to harvest (49%) than those who said they were likely to do so (28%). Respondents were nearly four times more unlikely to accept management services from industry in exchange for wood sales, and forest owners were even quite skeptical about collaborating with one another on joint management initiatives, at a ratio of about three to one.

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

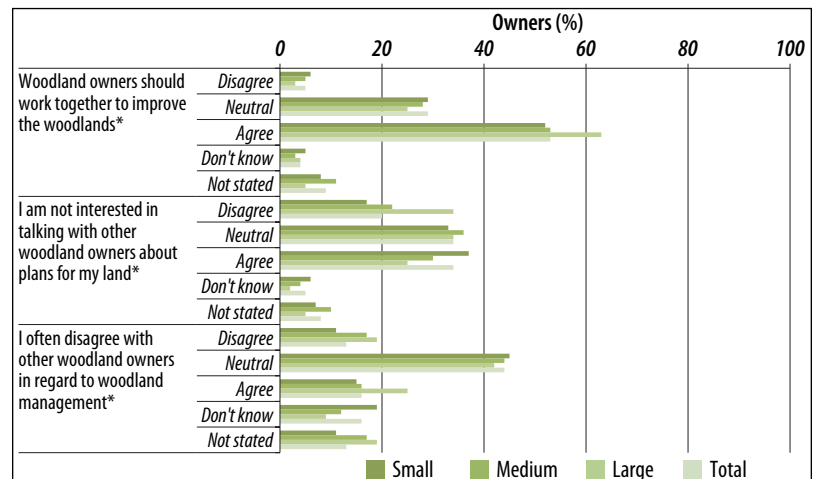
Figure 4.5: Likelihood of participation in various programs and approaches to forest management.



Conservation easements are another tool that targets landowners, but this time the goal is to ensure the protection of natural values on their property. A majority (51%) of forest owners say that they are not informed about conservation easements (Table S3.52). Only 11% are very informed, with about a third claiming to be somewhat informed.

Through the years, various initiatives and programs have been put in place to meet the needs of forest owners, and we were curious to assess whether the access to technical advice was an element of concern for forest owners. Overall, there is not a high level of concern among forest landowners regarding their ability to find technical advice from outsiders (Figure 4.6). Less than a quarter of respondents

Figure 4.6: Attitudes toward working with other woodland owners.



* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

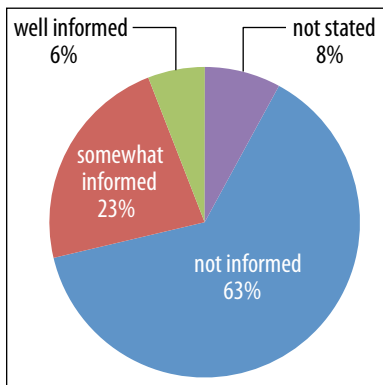
had a higher concern over this issue, whereas roughly a third, respectively, were neutral or had lower concern.

The differences in the wording of the three questions discussed here are subtle but important. When asked in general terms if forest landowners should cooperate, work together, a majority of owners (53%) agree and only 5% disagree. However, when the idea of collaboration becomes personal, more owners say that they are not interested in talking with other forest landowners (34%) than those who say they are (20%). One possible explanation for the reluctance to speak with other forest landowners may be a feeling that their own views are not in tune with the majority view, however, three-quarters of the respondents were either neutral, did not know or did not answer when presented with the statement, "I often disagree with other forest landowners in regard to forest land management." The remainder were nearly evenly split, with slightly more agreeing with the statement.

4.4.1 Interest and attitudes towards forest certification

Before delving into the issue of forest certification, respondents were provided with the following information: *The intent of forest certification is to ensure that forests are managed in a sustainable manner and trees are harvested with environmentally sound practices. These management practices are certified by independent third parties. Landowner participation is voluntary.* Forest landowners do not feel well informed about forest certification. Overall, 64% of forest owners acknowledge that they are not well informed compared with only 6% of owners who consider themselves well informed (Figure 4.7). Although owners of larger parcels are four times more likely to state that they are very informed compared with owners of small parcels, there are still fewer than 20% of owners of large parcels who claim to be well informed, whereas over 40% in that large ownership class say they are not well informed.

Figure 4.7: How informed respondents are about forest certification.*



Although respondents claimed to know very little about certification, many do believe that it is important. On the question whether certification is necessary for NB to compete in international markets, a combined 54% were either neutral, didn't know, or did not state an answer; however, over four times more respondents agree that certification is important (38%) over respondents who said it was not (8%).

Results were more mixed regarding whether certification lessens the need for regulation. An even proportion of respondents agree (23%) and disagree (22%) with the statement, "certification lessens the need for forestry regulations," but once again, more respondents were either neutral, stated that they did not know, or did not answer the question (55%).

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Figure 4.8: The proportion of respondents who agreed that they would consider certification for these reasons.



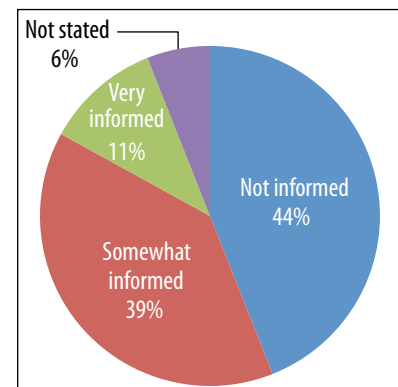
We asked forest landowners if a set of factors might impact their decision whether or not to consider certification. Overall, there was a <10% difference between yes and no responses with regard to whether ecological factors—such as making a healthier forest, improving wildlife habitat, or helping to protect the environment—would provide motivation to get certified (Figure 4.8). Economic motivations, such as selling wood for a higher price or gaining access to wood markets that would otherwise not be available do not appear to be important factors. More than twice as many respondents (67%) answered “no” to “I could sell my wood for a higher price,” than those who answered “yes” (28%). Nearly three times as many respondents answered no than yes with regard to whether certification would open up new markets (71% vs. 24%). An overwhelming

majority (90%) disagreed with a statement that suggested owners had time and money to obtain certification. Only 19% said that they would never consider certifying their forest land, and an even smaller proportion of large landholders (9%) indicated a reluctance to certify their land. The fact that few owners feel that certification is something they can afford leaves the future of certification on non-industrial private land in some doubt.

4.5 Attitudes toward ownership rights

Few forest landowners claimed to be very informed about laws related to private forest land. Roughly an equal number were split between being somewhat informed and not being informed (Figure 4.9). There was a significant difference by size class, with owners of larger forest lands generally claiming to be more informed and owners of small forest lands suggesting that they were less informed.

Figure 4.9: How informed respondents are about laws and regulations applying to woodland.*

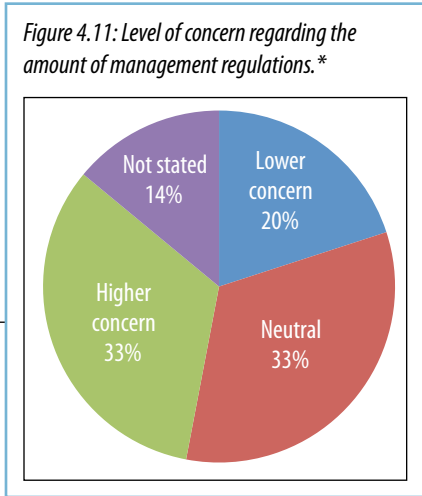
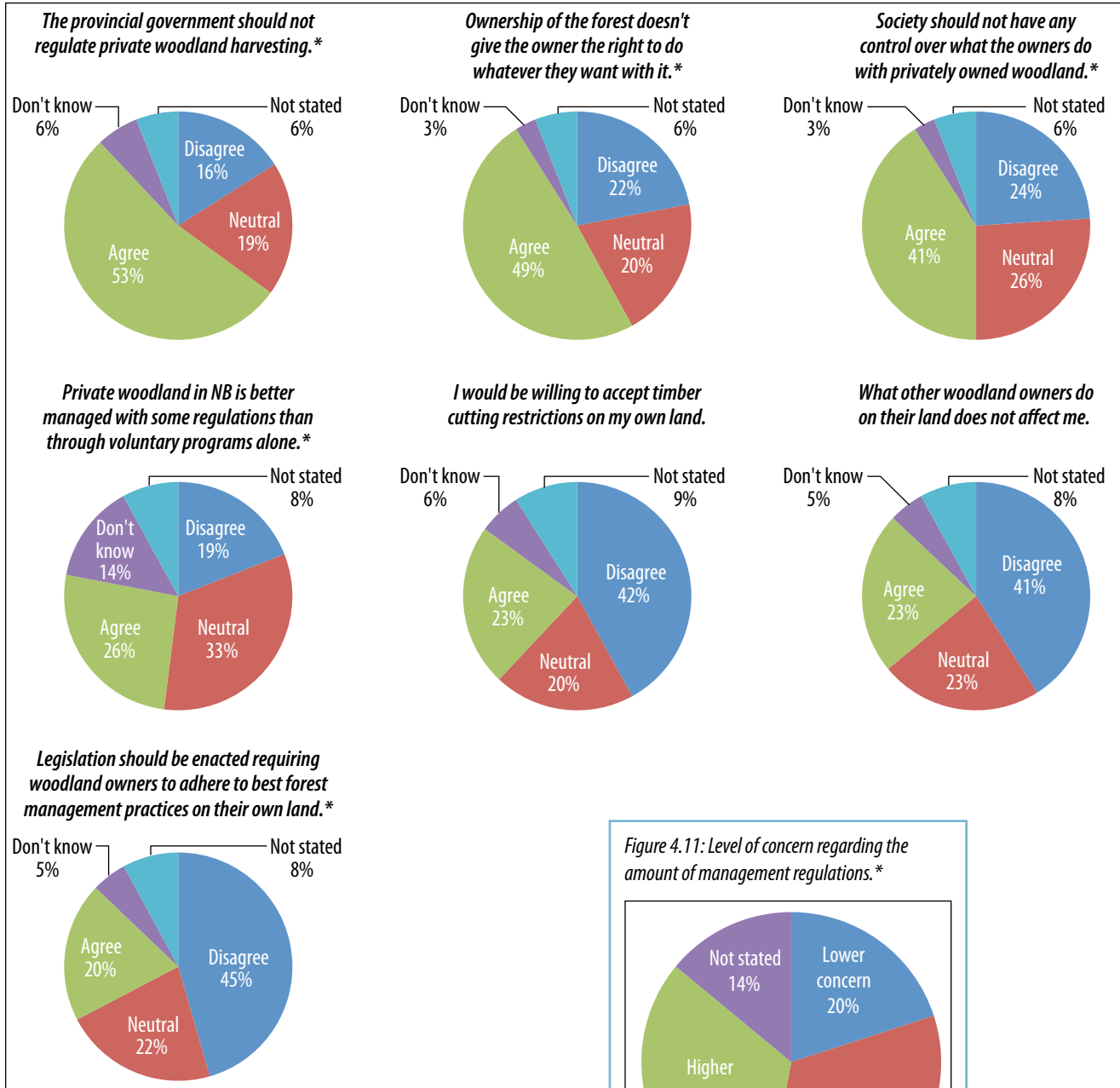


Forestland owners in New Brunswick had mixed views regarding landowner rights vs. responsibilities. Whereas about half of forest landowners agree that title to land does not give an owner the right to do whatever he or she wishes, there was little agreement that government, societal control, or legislation are the best vehicles for inducing “good behaviour.” We asked for agreement or disagreement for a series of statements (some framed positively, some negatively) about respondents’ views toward regulating behaviour or creating legislation requiring best practices regarding harvesting (Figure 4.10). Between 40% and 55% of respondents were opposed to

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

regulation and legislation. Strong property rights appear to be highly valued by forest landowners, even though they also recognize their responsibility to manage their land well. However, as depicted in Figure 4.11, only a third of respondents had a high concern about the amount of regulation, one-fifth had a lower concern, and half were either neutral or did not answer the question. As the ownership size class increases, there is a greater support for property rights.

Figure 4.10: Attitudes toward ownership rights.

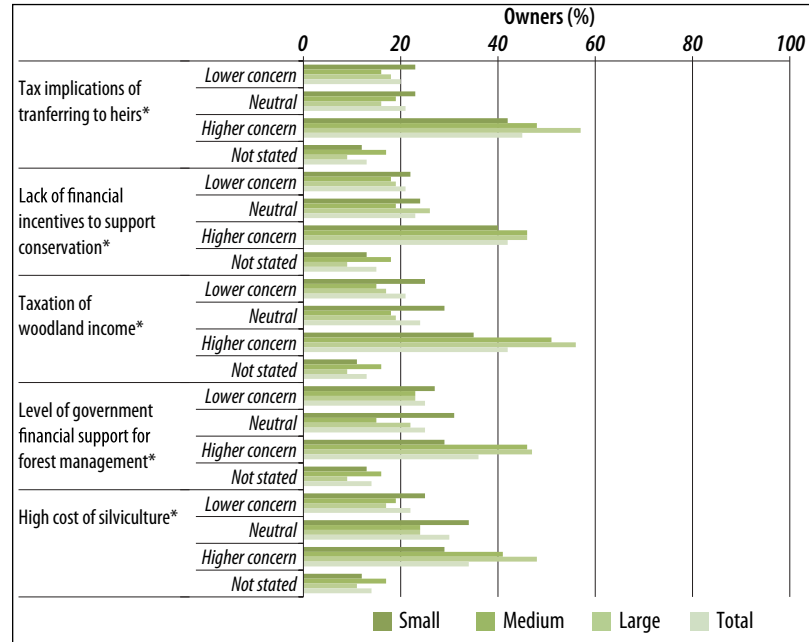


* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

4.6 Attitudes toward financial issues

When asked about financial aspects of owning and managing forest land, owners expressed some concern. Regarding the costs of silviculture, taxation levels, and financial incentives for conservation and forest management, there were always at least twice as many who expressed greater concern on these issues than those with fewer concerns, however, between 20% and 25% were neutral on these issues, and around 10% failed to answer (Figure 4.12). Concerns over financial aspects of forest management increase as ownership size increases, which makes sense as many other questions suggest owners of larger parcels take a more economic view of their land, or at least some portion of it.

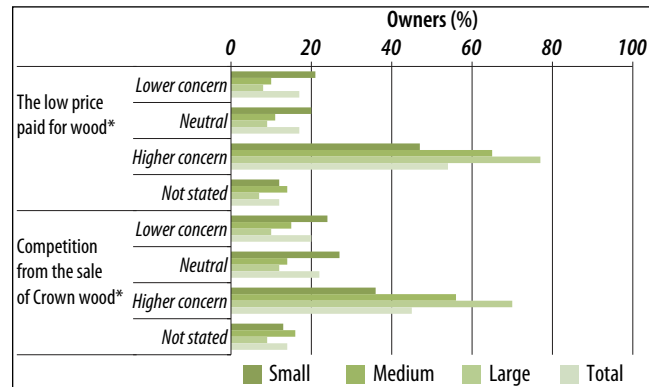
Figure 4.12: Attitudes toward financial issues.



4.6.1 Attitudes toward market issues

There was considerable difference between ownership classes regarding attitudes toward wood prices and competition from Crown wood. This is reflective of the greater likelihood of large owners being more frequent players in wood markets. Although a majority of all owners were highly concerned with the low price paid for wood (54%), over three-quarters of owners of large forest lands said this was a high concern compared with 47% of owners of small woodlands (Figure 4.13). Nearly half of all respondents said that competition from the sale of Crown wood was a high concern (45%), but again, a disproportionate amount of owners of large forest lands identified this as a high concern (70%) compared with owners of small woodlands (36%). Owners of medium-sized parcels fall in between (56%) on this issue.

Figure 4.13: Attitudes toward market issues.



* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

4.7 Attitudes toward forest management and forest practices

Close to equal proportions of forest landowners agree (33%) and disagree (36%) with the statement “I believe that forest land that is not actively managed is wasted” (Figure 4.14). Four times as many forest owners feel that what they do on their forest land matters (63%) vs. those who do not (15%), and this pattern holds for all sizes of ownership.

Figure 4.14: Attitudes toward forest management.

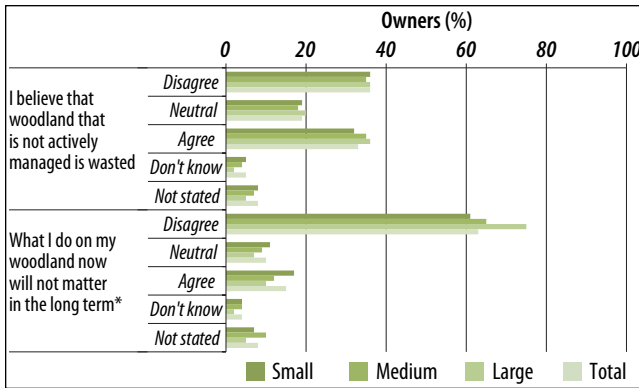
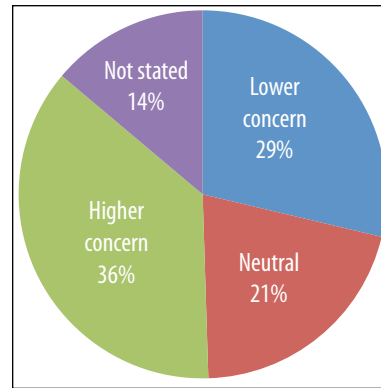


Figure 4.15: Concerns with negative public perceptions of timber harvesting.*



There is some concern among forest landowners regarding negative public perceptions of timber harvesting, but it is only a high concern for slightly over a third of all respondents (Figure 4.15). Twenty-nine percent feel it is a lower concern. As with most questions that deal with market-related issues, respondents in the larger ownership category expressed greater concern than others.

Pesticide and herbicide use in NB forestry have been controversial issues for half a century. Interestingly, our respondents are quite divided on this issue. Close to the same proportion agreed and disagreed with statements regarding the acceptability and usefulness of these forest management tools (Figure 4.16). Owners of larger forest lands were slightly, but significantly, more favorable regarding the use of these tools than smaller owners. Their support for these tools is not surprising considering the fact that they were also more likely to have used herbicides and pesticides in the past and also more likely to plan to use them.

Figure 4.16: Attitudes toward herbicides and insecticides.

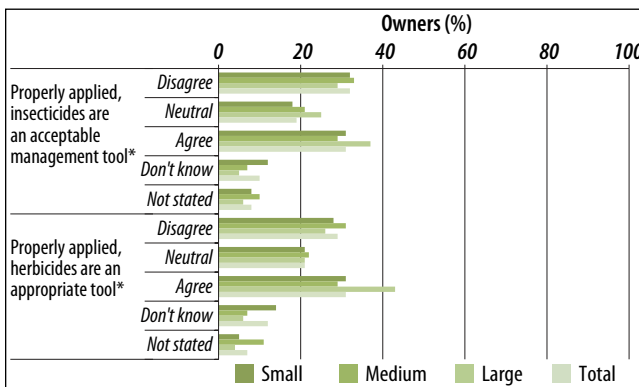
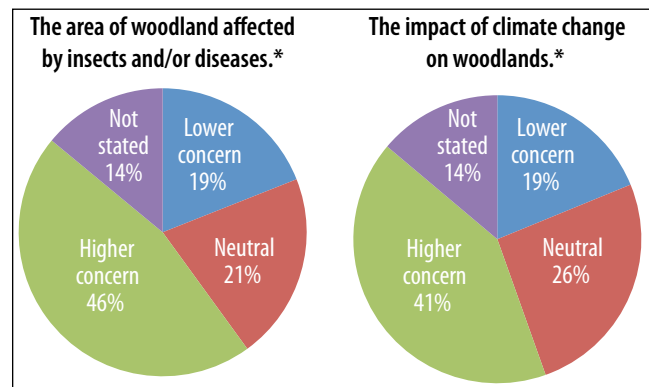


Figure 4.17: Attitudes toward natural disturbances and climate change.



* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

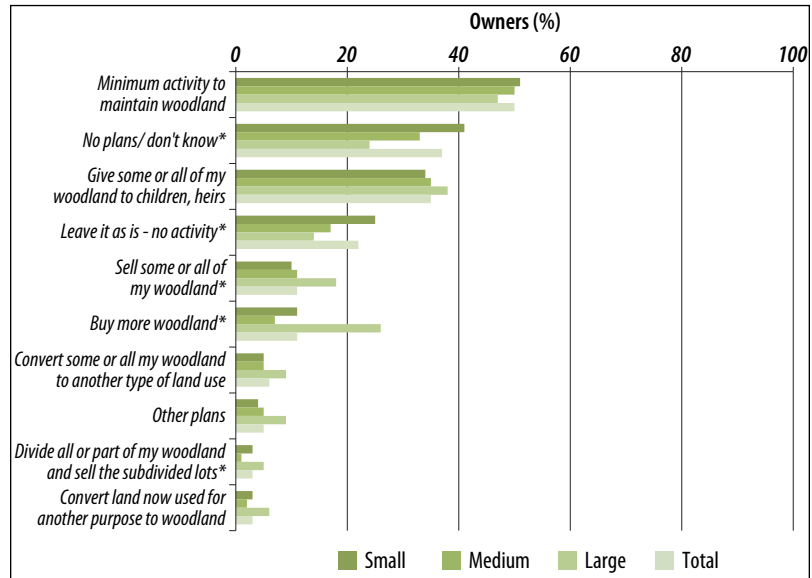
A fair number of forest landowners expressed concern over the issues of insects and diseases and climate change. We cannot be certain of the degree to which forest landowners understand the potential connections between these issues, but the responses were very similar, with over 40% being highly concerned about both, and <20% expressing lower concern (Figure 4.17). Around one-fifth were neutral regarding the threat of insects and diseases, and a quarter were neutral regarding the impact of climate change.

5 Future of woodlands

A majority of owners (50%) plan to engage in minimum activities to maintain their forest land over the next 10 years, and this holds for all sizes of ownership (Figure 5.1). About a third have no plans for their forest land over this period, whereas a similar proportion are planning to pass some of their forest land to their children or heirs. Owners of smaller woodlands are more likely to have no plans for their forest land or to leave it as it is.

As for interest in selling or buying forest land, only one in ten owners express an interest for either of these activities. Owners of large parcels show about twice as much interest than owners of small or medium parcels in selling or buying forest land as well as in dividing their forest land in order to sell the subdivided lots.

Figure 5.1: Respondents' plans for their woodland over the next 10 years.



* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

6 Conclusions

Although it is easy to slip into thinking about non-industrial private forest owners in terms of a particular stereotype, the fact is that New Brunswick's forest owners are nearly as diverse as the population of the province itself. Of course, the population of forest owners does include some unspecified number of graying or perhaps slightly balding, late middle-aged men in plaid shirts, who own tractors and chainsaws and who enjoy hunting and fishing. However, that population also includes female doctors, male nurses, widows, teachers, artists, shopkeepers, car salespeople, fishers, politicians, and other people from all walks of life. Some are young, although more are older. Our survey respondents were primarily men, but many women also own forest land or co-own it with family members. As well, although most of our respondents have rural roots, many also reside in urban centers or even outside the province. The point here is simply to remind the reader that the population of non-industrial forest landowners is extremely diverse, and therefore, it should not be surprising that their attitudes, behavior, stewardship values, and future plans and prospects are also quite diverse. For certain policy purposes, it might be convenient to fall back on stereotypes or to wish that all or most owners would act in a particular manner. We suggest that society should actually celebrate forest landowners' diversity, the diversity of their land, and their willingness to manage it for a broad spectrum of values both for their own benefit but also the benefit of others.

The non-industrial forest owners of New Brunswick collectively own some 1.7 million hectares of forests that provide both commodities (pulp and sawlogs, maple sugar products, and fir tips), essential environmental services (air and water quality, wildlife habitat), and the aesthetic beauty of our forested rural landscapes. The choices these forest owners make regarding their land and how it is managed and used directly and indirectly affect other New Brunswickers. The contribution of the non-industrial private forests of NB to the industrial supply is at the heart of the mandate of the Private Land Task Force that was put in place by the provincial government. Although there has been interest for over a decade in learning more about this unique segment of the population, forest landowners' future harvest intentions were a major reason that DNR decided to fund this survey research. In order to fulfill their mandate, the PLTF needed detailed information about the owners of the province's non-industrial forest land. In particular, they needed information on the owners, their motivations, and their attitudes toward key forestry issues and so they commissioned the present research survey.

One of the key results of this research, though not necessarily a surprising one, is that the size of ownership matters. Many of the results show significant differences between past behavior, future intentions, and attitudes according to the three sizes of ownership into which our sample was divided. Owners of large forests were more likely to attach importance to financial motivations, to be regularly harvesting trees from their land and selling products, and to be conducting other forest management activities. They were also more likely to rely on contractors to conduct work in their forests. They were more concerned with financial aspects of forest management, as well as with forest products markets. Many owners of medium and small-sized forests also actively

manage their land and harvest some wood, but often at a much smaller scale and for their own use.

We were surprised to learn that fully 80% of our respondents said that they derive no regular income from their forest land. Although this may give the impression that few people are active on their forest land any longer, this would be inaccurate. Nearly a third, 32% claim to harvest some wood every year, and an additional 18% reported harvesting at least once in the last 5 years. Among the products most frequently harvested, firewood is far and above the most common. So, although 50% of our respondents are frequent or regular harvesters, a much smaller subset appear to be motivated by financial need.

Although size is the only variable that we took in consideration for our first analysis, this should not be seen as the only factor that influences what is taking place on non-industrial forest land. Many studies conducted in different regions of the world have shown a great diversity of among non-industrial private woodlot owners in terms of motivations for owning a forest, or their uses of these forests (Nadeau et al. 2005, Butler 2008, Hodgdon et al. 2011, Urquhart and Courtney 2011). Future analysis of our data could be used to go beyond the somewhat simplistic dichotomy that would have forest owners split between conservation and commodity users. Urquhart and Courtney (2011) suggest a forest owner's typology that is articulated around three dimensions: consumption (mainly for personal use), production, and protection. This may be a more useful way to describe forest landowners in New Brunswick. There is clearly a sizable group who are active in management activities, including harvesting, but who are not presently delivering product into the industrial wood supply. Future policies, programs, and services for NB non-industrial forest owners should perhaps take into account that some owners firmly intend never to harvest, some intend to harvest only for personal use or as a hobby, and others run active commercial enterprises. Another future application of this survey data could be to look at geographical differences such as those that were noticed in the NB woodlot owners study in the early 1980s, where the Madawaska region and Northumberland County appeared to have their own unique forest landowner characteristics (Roy 1983).

With the current state of the forest industry in NB, caution must be exercised about extrapolating too far into the future. Harvest levels from private land have varied significantly in the past few years. In the survey, we tried to obtain information regarding intentions over the next 10 years. For the last couple of years, the market for forest products has been quite depressed across the province. This situation may have influenced some of the responses we received, however, we also asked about harvesting 10 years in the past, and there have been several good years with relatively high sales from private forests within the last decade. Currently, interest in harvesting and marketing timber may be reduced due to low prices. Representatives of woodlot owner organizations claim that many small contractors cannot break even in their operations with the prices being offered. They also report provincial sales down to \$30 million, from \$100 million just a few years earlier (personal communication: Dave Palmer 24 June 2010, CBC News). Industry spokespersons, on the other hand, claim that they are in a globally competitive market and that they also must keep their costs of production down if they are to compete successfully in those markets. It is not the case that only one of these perspectives can be correct. Both assertions may be true, however, low prices for stumpage will ultimately result in fewer owners playing an active

role in marketing fiber from their forest land. A recovery of the traditional markets or emergence of new markets might encourage more owners to harvest. It is unlikely that owners who say they never intend to harvest will change their mind, but some of those who intend to harvest might do so earlier or in a more intensive way with better market conditions.

The owners who are active in the marketplace usually rely on logging contractors do most of their timber harvesting. Some are contractors themselves, however, in order to maintain or even increase the amount of timber currently harvested on non-industrial forests, a critical mass of logging contractors is required. Furthermore, the existence of contractor capacity is not enough. There must be a sufficient number of contractors that forest landowners trust. A report produced about the timber management and supply situation in NS highlights the danger of having timber activity that is below the critical mass to allow contractors to run sustained and viable operations (Woodbridge 2011). Continued reduction in the contracting sector might constrain the timber supply as non-industrial forest owners would face an even greater challenge in finding harvesting crews. As our survey shows, about a third (35%) of owners of large forest lands in NB depend on a crew they hire or an independent contractor to conduct most of their harvesting. So, if that group has more problems finding trustworthy logging crews and contractors, it may impact their harvesting behavior.

Forest landowners are not unlike many other primary producers. They are often skeptical of government, but are willing to accept incentives and financial support from the government, provided that there are not too many strings attached. In our study, a majority of forest landowners agreed in principle that collaboration with other landowners for mutual gain was laudable goal. However, a majority also stated that they were unlikely to participate in any forest management activities with other landowners, whether for conservation or commercial purposes. This may stem from traditional views toward private property and a strong desire to maintain independence. Most owners do not favor regulation of timber harvests on private land. They believe that they are good stewards, although they may be wary of their neighbors' practices or their capacity to do a good job of forest management. Because most have confidence in their own abilities and believe that they are good stewards, they do not feel the need to collaborate with other owners, or feel that it is necessary for society to direct their activities. Whereas it is not surprising they are more open to incentives than regulation as a means to induce behavior, the prospects for the certification of non-industrial private land seem poor given the current conditions and owners' understanding of certification programs.

It is impossible to infer a trend from past activity to future plans, but this report represents baseline data. If the same questions are asked again in 10 years' time, we would begin to see emergent trends. We could measure the degree to which the values, attitudes, and practices of forest landowners are changing as new cohorts of owners come to possess land. Value changes do occur in populations. The forest owner population is already diverse, but a new generation of owners may make it still more diverse. Changing values may come from internal orientations (experiential and social psychological) or external forces (market conditions, employment profile of owners, etc.) that emerge with each new cohort of landowners. Broader cultural trends, such as environmental beliefs or knowledge, or declining participation in outdoor pursuits such as hunting and camping, may also influence future management of private forests.

Future surveys of this nature will be required to say much about long-term trends, however, this work provides a snapshot in time that may still inform policy and program design. The government has a long history of helping non-industrial forest owners adapt their uses and management of their forests. The diversity of types of forest owners evident through this research suggests that a “one size fits all” policy is not likely to meet the needs of all owners or of society. Although forest owners are primarily interested in the needs of their own families, they also demonstrate a keen sense of responsibility to the land itself. This concern with stewardship also serves the needs of society. When private land is managed well, local environments and local economies are better off, and so too is society as a whole.

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Supplement 1: Methods

This supplement presents in more details the method used to conduct this study.

Development of the sampling frame

Defining the target population

As it is the case for many survey studies, one of the first goals in designing a study is to define the target population precisely, keeping in mind that you need a way to identify the people who are part of that population and a way to contact them. To understand who the target population for this study was, it is easiest to first describe which forest landowners were excluded from the DNR database. Forest landowners who met any of the following criteria were excluded:

- Owners of very small forest lands – individuals owning <5 ha. In New Brunswick, this group comprises roughly 23,000 individuals owning a total of about 65,000 ha of productive forest land. First, it was assumed that this group of owners was less likely to put timber on the market, and thus their response to the survey would not be as informative and useful to the PLTF. Second, including this group in the study would have increased the cost of conducting this study.
- Crown land – In a few cases, there were properties belonging to the Crown in the database. These properties were excluded based on not being the appropriate type of ownership.
- Industrial freehold properties – any properties known to be owned by a mill or wood-processing facility. These properties were excluded based on not being the appropriate type of ownership.
- Owners who had more than 100,000 ha – In this case, although the size of forest land would be quite appropriate to be part of the land base that will contribute to timber supply, we followed DNR's recommendation and removed them from our study as they were also excluded from models created to estimate timber supply from non-industrial forest land.

Thus, the target population comprised any private forest landowners who hold 5–100,000 ha and who do not own a mill or wood-processing facility. Forest lands belonging to municipalities were included because they are not considered as Crown land and could also contribute to timber supply. There were only a few cases of this type of ownership.

Sampling frame

A stratified random sampling was used to generate a sample of forest landowners. All the forest landowners of the target population ($n = 41,909$) were stratified into three groups: small (5–29.9 ha), medium (30–99.9 ha), or large (100+ ha). Past research in New Brunswick has shown that owners of large properties are more likely to harvest timber (Jamnick and Beckett 1988). As large property owners represent only 6% of the overall forest landowner population (Figure 2.2), a simple random sample would likely have resulted in a relatively low number of these owners being selected. The same logic applies for owners of medium-sized parcels, who represent about a third of the population. This design intentionally oversamples the owners of large and medium forest

lands and undersamples owners of small forest properties. Table S1.1 presents more details about the sampling frame.

Questionnaire design and administration

The questionnaire was developed in the spring of 2011. It was based, in part, on previous surveys of woodlot owners from New Brunswick and other jurisdictions (Roy 1982, Mercker and Hodges 2007, Belzile and Wyatt 2011, Duinker 2011, Nadeau 2011). It was pre-tested with staff of the New Brunswick Department of Natural Resources, and with members of the Private Land Task Force, the New Brunswick Federation of Woodlot Owners, and the University of New Brunswick's Faculty of Forestry and Environmental Management. We determined the sample size for each stratum based on the expectation of receiving a 50% response rate. This resulted in mailing surveys to 757 small, 748 medium, and 669 large forest landowners. We followed a modified Tailored Design Method (Dillman 2000) and mailed the surveys during the summer of 2011. A postcard was sent about 10 days later to remind people about the survey. A second letter and questionnaire were sent about a month after the first mailout to reiterate to respondents the importance of the study and of their participation.

To reduce printing and postage costs, we used information from Statistics Canada to identify, based on postal codes, the predominant language in each region of the province. This enabled us to then associate a language with each selected respondent and send them a bilingual letter explaining the goal of the study and mentioning to call us if they wanted a questionnaire in a different language. This approach was seen as the most efficient of reducing the costs involved in sending everyone a questionnaire in both English and French. Some respondents did contact us to get a questionnaire in the other language, but most used the one they were sent.

Response rate

There were 728 completed surveys returned, accounting for an overall response rate of 35% (Table S1.1). There were 116 undeliverable surveys. These were surveys that were returned due to an invalid address or the recipient having moved ($n = 60$). In addition, several surveys were returned indicating that the recipient did not own 5 ha of forest land or was deceased ($n = 56$).

From this, we estimate that 2,061 actual forest landowners received the survey. There were 27 surveys that were unusable because they were returned blank.

Table S1.1: Information about the mail survey and sampling error.

	Forest land ownership Size			Total
	Small	Medium	Large	
Estimated population	25477	13855	2577	41909
Mailed out surveys	758	748	670	2176
Revised to reflect owners' assessment of acreage	714	785	677	2176
Undeliverable surveys	57	31	28	116
Delivered surveys	657	754	649	2060
Unusable surveys	11	8	8	27
Completed surveys	187	292	249	728
Response rate	28	39	38	35
Sampling error (for a 95% confidence level)	0.07	0.06	0.06	0.04

Data analysis

Completed surveys (including those that were partially completed) were imported into IBM SPSS Statistics 19 (Statistical Package for the Social Sciences). Weight factors were calculated for each of the three strata and used to adjust the calculation of the total of our response to represent the distribution of owners of small, medium, and large forest lands in our target population (Table S1.2). This is needed when using a stratified sample where members of each stratum have unequal chances of being selected in the sample. For example, whereas large forest landowners represented only 6% of the overall ownership population, they represented a much higher proportion of our sample (33%). The weight factor calculated for this group is used to bring back its contribution in the total response to 6%. Unless otherwise noted, all tables presenting frequencies are weighted distributions and refer to the total number of respondents ($n = 728$).

Table S1.2: Information on weighted sample.

Size of forest land	Estimated population		Useable questionnaires		Weight factor
	Number of owners	Proportion of total	Number	Proportion of total	
Small woodlands	25477	61	187	26	6.7
Medium woodlands	13855	33	292	40	2.33
Large woodlands	2577	6	249	34	0.51
All woodlands	41909	100	728	100	

For each question of the survey, we ran Chi-Square test to verify if there were any significant differences according to size of ownership. Throughout the report, we use an asterisk "*" to flag the statistically significant results.

Differences between early and late respondents

To investigate non-response bias, the first 100 and last 100 respondents were identified and then compared. This was done in order to identify significant differences in answer patterns between these groups, which may indicate differences in non-respondents. Mail-based surveys (across many fields) have shown differences in responses between early and late respondents for small subsets of questions. Early responders have shown a tendency to be more interested in the survey content, as well as be less likely to leave questions blank (Green 1991).

Chi-square tests were run on selected questions, spanning three general areas: demographic and socioeconomic variables, ownership characteristics, and harvesting activity. The following table presents any variables with significant test statistics, thereby identifying which questions had significantly different answer patterns at $p \leq 0.05$ when comparing early and late respondents.

Table S1.3: Summary of variables checked for differences between early and late respondents.

Category	Variables
Demographic and socio-economic	Gender*, education, occupation status, income, income from forest land*
Harvesting activity	Harvest activity over past 10 years*
Ownership and management	Number of parcels*, forest land size, distance from forest land, development/use of a management plan*, past management activities undertaken*

Key differences

- Income from forest land: Early respondents tend to be more likely to have at least some of their income come from their forest land (45%, as opposed to 27% of late respondents).
- Harvest activity in the past 10 years: There are significantly more early respondents who have harvested on their forest land in the past 10 years (82%, as opposed to 65% of late respondents).
- Development/use of a management plan: There are significantly more early respondents who are either using or developing a management plan for their forest land (33%, as opposed to 11% of late respondents).
- Past management activities: Results are significantly different for the following activities undertaken in the past 10 years: site preparation, planting trees, thinning/spacing, surveying and upgrading boundary lines, and constructing roads and trails. In all cases, there are more early respondents who have done the above activities.

Summary

The above results indicate that early respondents tend to be more active managers, as more of them depend on their woodlot for income. These early respondents are also more likely to harvest and tend to have management plans in place. There was no significant difference in size-class distribution among early and late respondents.

This also shows the importance of following up with the postcard reminder and the second questionnaire as it contributes not only to increasing the response rate but also to broadening the type of owners who return a questionnaire.

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Supplement 2: Survey questionnaire

2011

A Survey of New Brunswick Woodland Owners



Photos: Marie Anick Liboiron



Your views are important as we aim at getting a better understanding of how woodland owners value and manage their woodland. We use the single term "woodland" to refer to woodlots or forested land. The results will inform the work of the provincial Private Land Task Force and will help the provincial government with decisions pertaining to forestland in the future. This survey is one way to ensure that your views are captured.

This survey is completely voluntary. Please try to answer all questions by checking (✓) boxes, circling items that best describe your answer, or writing in the space provided. If there are any questions you do not wish to answer, please leave them blank and move on to the next question.

All information you provide is confidential. Your name will never appear with your answers; only a summary of everyone's answers will be made public. If you choose to leave your name and address in the marked area, your name will be enter in a draw of three 150\$ gift cards from Canadian Tire, this information will be used for this purpose only.

Please return your completed questionnaire in the postage-paid envelope provided.

Si vous désirez un questionnaire en français, veuillez communiquer avec Dr. Solange Nadeau (sondageboisenb@gmail.com) ou au 506-451-1364, et nous vous en enverrons un.

If you have any questions regarding the survey, please do not hesitate to contact:
Dr. Tom Beckley,
Faculty of Forestry and Environmental Management
University of New Brunswick
Phone: 506-453-4917

Instructions

- ✓ The owner who makes most of the decisions about your woodland should answer this questionnaire.
- ✓ Please provide answers for all the woodland that you own in New Brunswick.

General questions about your woodland

Woodland is a piece of land that is at least 5 hectares (12.5 acres) in size; where trees grow, or where trees were removed and are getting re-established.

1. Do you currently own 5 hectares (12.5 acres) or more of woodland in New Brunswick?

Yes

No

If no, please return this questionnaire in the postage-paid enveloped provided. *Thank you!*

2. How many individual tracts or parcels of woodland do you own in New Brunswick?

(Check (✓) only **ONE**)

1 parcel

3-5 parcels

more than 10 parcels

2 parcels

6-10 parcels

3. In what year did you first obtain or acquire woodland that you currently own in New Brunswick?

4. If you have inherited some of your woodland, for how many years has this woodland been part of your extended family?

5. Thinking about all of your woodland, how many hectares or acres did you obtain or acquire through:

Buying it: _____ hectares **or** _____ acres

Inheriting it: _____ hectares **or** _____ acres

A gift: _____ hectares **or** _____ acres

Other (please specify how you obtained it and how many hectares or acres):

6. From whom did you obtain or acquire your woodland? (Check (✓) **ALL** that apply)

Family

Land developer or investment group

Friends or neighbours

Logging contractor or forestry company

Other private citizen

Other (please specify): _____

7. Have you ever sold or given away any woodland in New Brunswick?

Yes

No **please, go to** question 8

If yes, to who was it sold or given? (Check (✓) **ALL** that apply)

Family

Land developer or investment group

Friends or neighbours

Logging contractor or forestry company

Other private citizen

Other (please specify): _____

8. How would you describe the type of ownership in which the major portion of your woodland is held? (Check (✓) only **ONE**)

- | | |
|---|--|
| <input type="checkbox"/> Individual ownership | <input type="checkbox"/> Joint (including husband and wife as co-owners) |
| <input type="checkbox"/> Formal partnership agreement | <input type="checkbox"/> Informal partnership agreement |
| <input type="checkbox"/> Forestry company | <input type="checkbox"/> Non forestry company |
| <input type="checkbox"/> Non profit organization | <input type="checkbox"/> Other (please specify): _____ |

9. Where do you live in relation to your closest woodland property? (Check (✓) only **ONE**)

- | | |
|--|--|
| <input type="checkbox"/> On my woodland property | <input type="checkbox"/> 51-100 km from it, but in NB |
| <input type="checkbox"/> Within 25 km of it | <input type="checkbox"/> More than 100 km from it, but in NB |
| <input type="checkbox"/> 26-50 km from it | <input type="checkbox"/> Outside NB |

Your reasons for owning woodland

10. People own woodland for many reasons. How important are the following reasons for why you own woodland in New Brunswick? (Circle **ONE** number for **EACH** item)

	Very important	Important	Slightly important	Not important
To pass on as a heritage	4	3	2	1
For maple syrup production	4	3	2	1
Because I've inherited it	4	3	2	1
To preserve forest ecosystems	4	3	2	1
For the sake of future generations	4	3	2	1
For Christmas tree production	4	3	2	1
As a retirement fund	4	3	2	1
As an investment	4	3	2	1
Because woodland came with my cottage or camp	4	3	2	1
Because woodland came with my permanent residence	4	3	2	1
For wildlife enjoyment	4	3	2	1
For enjoyment from owning "green space"	4	3	2	1
To make a living	4	3	2	1
To supplement my yearly income	4	3	2	1
To harvest firewood	4	3	2	1
Because woodland is part of a farm	4	3	2	1
For hunting and fishing	4	3	2	1
For recreation (besides hunting and fishing)	4	3	2	1
For timber harvesting	4	3	2	1
To protect water quality	4	3	2	1
To harvest non-timber forest products such as mushrooms, berries	4	3	2	1
For other reasons (please specify): _____	4	3	2	1

Decision-making about your woodland

11. Please check the statement that most closely matches your current situation.

(Check (✓) only **ONE**)

- I am using or developing a formal (written) management plan for some or all of my woodland
- I do not have a formal (written) management plan but I'm interested in having one
- I do not have a formal (written) management plan and I'm not interested in having one

12. When making decisions about your woodland, to what degree are you motivated by a moral responsibility to each of the following:

(Circle **ONE** number for **EACH** item)

	Level of responsibility					Don't know
	Very high	High	Neutral	Low	Very low	
My family (including past, present, and future generations)	5	4	3	2	1	DK
My community	5	4	3	2	1	DK
My land (including wildlife and/or plants)	5	4	3	2	1	DK
The watershed that my land is a part of	5	4	3	2	1	DK
God or higher power	5	4	3	2	1	DK

13. How often have you, or someone on your behalf, harvested or removed trees from your woodland?

(Check (✓) only **ONE**)

- at least once each year over the last 10 years
- at least once over the last 5 years
- not in the last five years, but at least once over the last 10 years
- not in the last 10 years, but at least once before then
- Never

**Please, go to
question 21**

14. How important were these reasons in your decision to harvest?

(Circle **ONE** number for **EACH** item)

	Very important	Important	Slightly important	Not important
To achieve objectives in my management plan	4	3	2	1
Trees were mature	4	3	2	1
To clear land for conversion to another use	4	3	2	1
Had the time to do it	4	3	2	1
Was able to find a trustworthy harvesting crew to do the harvesting	4	3	2	1
Needed money	4	3	2	1
Needed the wood for my own use	4	3	2	1
Price was right	4	3	2	1
To avoid possible government restrictions on future harvest	4	3	2	1
To improve hunting opportunities	4	3	2	1
A forest marketing board or forest cooperative recommended harvesting	4	3	2	1
To improve scenic and recreational opportunities	4	3	2	1
To remove trees damaged by natural catastrophe (i.e. insects, fire, ice, or wind)	4	3	2	1
To support local or regional forest industry	4	3	2	1
To improve quality of remaining trees	4	3	2	1
A forest company or a contractor contacted me about doing some harvesting	4	3	2	1
Other (please specify): _____	4	3	2	1

15. Over the past 10 years, which timber products were harvested or removed from your woodland, and for what use? (Check (✓) **ALL** that apply)

	Harvested for	
	Personal use	For sale
Firewood	<input type="checkbox"/>	<input type="checkbox"/>
Post, poles or pilings	<input type="checkbox"/>	<input type="checkbox"/>
Sawlogs or stud wood	<input type="checkbox"/>	<input type="checkbox"/>
Pulpwood	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Veneer logs	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Biomass (woody material)	<input type="checkbox"/>	<input type="checkbox"/>
Christmas trees	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>

21. If you have not harvested wood from your woodland during the last 10 years, is it because your intention is to never harvest?

- Yes No

go to question 22

if yes, please tell us the main reason why you decided not to harvest any wood from your woodland: _____

Please, go to question 24

22. How important were the following reasons in your decision to not harvest trees in the last 10 years? (Circle **ONE** number for **EACH** item)

	Very important	Important	Slightly important	Not important
I was too busy with other activities.	4	3	2	1
I did not have any financial need to do so.	4	3	2	1
I could not find a trustworthy harvesting crew.	4	3	2	1
I did not know what or how to harvest.	4	3	2	1
The prices were too low.	4	3	2	1
Tree cutting operations could damage the land, the soil, or remaining trees.	4	3	2	1
The trees were not large enough to harvest.	4	3	2	1
I could not find a market.	4	3	2	1
I did not have access to market information from a trustworthy source.	4	3	2	1
Extra income could increase the income tax I have to pay.	4	3	2	1
There were accessibility or road problems.	4	3	2	1
Extra income could decrease or make me lose my old age pension supplement.	4	3	2	1
I was physically unable to do the harvest.	4	3	2	1
I have heard about other peoples' bad experience related to timber harvesting.	4	3	2	1
I was unable to due to absence from the area.	4	3	2	1
I have recently bought or inherited the woodland.	4	3	2	1
Other (please specify): _____	4	3	2	1

23. Do you plan to harvest timber on your woodland in the next 10 years?

- Yes No **please, go to** question 24

If yes, who would likely do the harvesting?

- Myself and/or members of my family
 A crew I will hire and supervise
 An independent contractor or a forestry company
 Other (please specify): _____

24. Have you or your family, collected (or harvested) the following forest products from your woodland in the last 10 years?

Please indicate **for each** if they were not collected/harvested or if they were collected/harvested for either one or more of these reasons: personal use, for sale.

(Check (✓) **ALL** that apply)

	Not collected	Collected for Personal use	Collected for For sale
Game birds or animals (e.g. partridge , moose)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fur bearing animals (e.g. beaver)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mushrooms or fiddleheads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maple sap	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Berries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Handcraft material (e.g. fir tips, black Ash for baskets)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Peat moss, black earth or soil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. Please indicate if:

a) you have done any of the following activities on any of your woodland in the last 10 years and

b) you are planning to undertake any of the following activities in the next 10 years

(Check (✓) **ALL** that apply)

	Done in the past 10 years	Plan to do in the next 10 years
Prepare site for tree planting	<input type="checkbox"/>	<input type="checkbox"/>
Plant trees	<input type="checkbox"/>	<input type="checkbox"/>
Apply pesticides or herbicides	<input type="checkbox"/>	<input type="checkbox"/>
Thin or space young stands	<input type="checkbox"/>	<input type="checkbox"/>
Produce maple sap products	<input type="checkbox"/>	<input type="checkbox"/>
Survey or upgrade boundary lines	<input type="checkbox"/>	<input type="checkbox"/>
Build or maintain roads and trails	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife habitat/fisheries improvement projects	<input type="checkbox"/>	<input type="checkbox"/>
Improve woodland for recreation	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>

Support in managing your woodland

26. In the last 10 years, have you received financial support from the provincial government or a forest products marketing board to conduct management activities on your woodland?

Yes No

27. In managing your woodland, how important is it for you to have access to assistance for each of the following items? (Circle **ONE** number for **EACH** item)

	Very important	Important	Slightly important	Not important
Developing a management plan for your woodland	4	3	2	1
Finding markets and market information for products from your woodland	4	3	2	1
Finding reliable crews to do timber harvesting or other forest management activities	4	3	2	1

Woodland management

28. How informed are you about:
(Circle **ONE** number for **EACH** item)

	Very informed	Somewhat informed	Not informed
Woodland management	3	2	1
Conservation easements	3	2	1
Laws and regulations applying to woodland	3	2	1
Forest certification	3	2	1

29. Indicate to what extent the following factors influence or don't influence your decisions about managing your woodland. Circle **ONE** number for **EACH** item.

	Level of influence			
	A lot	Some	Little	None
Lack of time	4	3	2	1
Lack of equipment	4	3	2	1
Lack of money to hire out work	4	3	2	1
Lack of available contractors	4	3	2	1
Lack of interest	4	3	2	1
Lack of consensus among my co-owners	4	3	2	1
Lack of knowledge of the forest	4	3	2	1
Lack of knowledge of markets and opportunities	4	3	2	1
Other (please specify): _____	4	3	2	1

30. There are different approaches and programs to help in managing woodland. Please indicate how likely it is that you would:

(Circle **ONE** number for **EACH** item)

	Very likely	Likely	Neutral	Unlikely	Very unlikely	Don't know
Become a member of a group of woodland owners in your area to jointly manage these woodlands for logs, pulp, chips or biomass.	5	4	3	2	1	DK
Accept government funding to conduct forest management activities on your woodland, if it means you have to harvest the trees once they are mature.	5	4	3	2	1	DK
Become a member of a group of woodland owners in your area to jointly manage these woodlands for habitat, recreation, or water quality.	5	4	3	2	1	DK
Participate in a voluntary land conservation program if it made you eligible for grants, assistance programs, or other benefits.	5	4	3	2	1	DK
Have a management plan and carry out its recommendations if it allows you to participate in a property tax reduction program.	5	4	3	2	1	DK
Accept management services from a forest products company in return for sale of wood to them	5	4	3	2	1	DK

Please read the following definition of *forest certification* and answer the questions that follow:

The intent of forest certification is to ensure that forests are managed in a sustainable manner and trees are harvested with environmentally sound practices. These management practices are certified by independent third parties.

Landowner participation is voluntary.

31. Indicate your level of agreement or disagreement with the following statements.

(Circle **ONE** number for **EACH** item)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know
Certification lessens the need for forestry regulations.	5	4	3	2	1	DK
Certification is necessary for NB forest products to compete in international markets.	5	4	3	2	1	DK

32. Indicate the reasons why you might consider certification of your woodland.

(Check (✓) **ALL** that apply)

- I could sell my wood products for a higher price.
- It could help protect the environment.
- I could gain access to wood markets that would not otherwise be available.
- It could improve wildlife habitat.
- I can afford, both the time and money, to obtain certification.
- It may make my forest healthier.
- To demonstrate that I practice sustainable forest management on my woodland.
- I would never consider certification of my woodland.
- Other (please specify) _____

33. Indicate your level of concern regarding the following problems facing woodland owners today.

(Circle **ONE** number for **EACH** item)

	Level of concern				
	Great	Some	Neutral	Little	Not any
Negative public perceptions of timber harvesting.	5	4	3	2	1
Taxation of woodland income.	5	4	3	2	1
The lack of strong landowner organizations.	5	4	3	2	1
The level of government financial support for forest management.	5	4	3	2	1
The lack of financial incentives to support conservation.	5	4	3	2	1
Requirements for endangered species/species at risk.	5	4	3	2	1
Amount of regulations regarding woodland management.	5	4	3	2	1
The high cost of silviculture.	5	4	3	2	1
Too much wood being cut.	5	4	3	2	1
Too many requirements for protected areas.	5	4	3	2	1
The area of woodland affected by insects and/or diseases.	5	4	3	2	1
The impacts of climate change on woodlands.	5	4	3	2	1
The low price paid for wood.	5	4	3	2	1
Competition from the sale of Crown wood.	5	4	3	2	1
Difficulty in finding reliable technical advice on woodlot management.	5	4	3	2	1
Tax implications of transferring woodland to heirs.	5	4	3	2	1

34. People have different opinions about woodland management. Please indicate your level of agreement or disagreement with **EACH** of the following statements.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Don't know
I believe that woodland that is not actively managed is wasted.	5	4	3	2	1	DK
I often disagree with other woodland owners with regard to woodland management.	5	4	3	2	1	DK
I would be willing to accept timber cutting restrictions on my own land.	5	4	3	2	1	DK
Properly applied, insecticides are an acceptable management tool.	5	4	3	2	1	DK
Legislation should be enacted requiring woodland owners to adhere to best forest management practices on their own land.	5	4	3	2	1	DK
What other woodland owners do on their land does not affect me.	5	4	3	2	1	DK
Greater efforts should be made to protect old growth forests.	5	4	3	2	1	DK
Most woodland owners in NB don't know how to look after their forests.	5	4	3	2	1	DK
What I do on my woodland now will not matter in the long term.	5	4	3	2	1	DK
Woodland owners should work together to improve the woodlands.	5	4	3	2	1	DK
There will be very little harvestable wood on New Brunswick's private woodland in 10-20 years.	5	4	3	2	1	DK
Private woodland in NB is better managed with some regulations than through voluntary programs alone	5	4	3	2	1	DK
I am not interested in talking with other woodland owners about plans for my land.	5	4	3	2	1	DK
Greater efforts should be made to protect rare plants and animals.	5	4	6	2	1	DK

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Don't know
The provincial government should not regulate private woodland harvesting.	5	4	3	2	1	DK
Properly applied, herbicides are an appropriate tool.	5	4	3	2	1	DK
There is sufficient wood in New Brunswick for all users including paper mills, sawmills, and domestic firewood cutters.	5	4	3	2	1	DK
Timber harvesting contractors should be strictly regulated.	5	4	3	2	1	DK
Society should not have any control over what the owners do with privately owned woodland.	5	4	3	2	1	DK
Woodland owners in New Brunswick are good stewards of the forest.	5	4	3	2	1	DK
Ownership of the forest doesn't give the owner the right to do whatever they want with it.	5	4	3	2	1	DK
The government should provide incentives for private landowners to establish protected areas on their land.	5	4	3	2	1	DK

The future of your woodland

35. In the next 10 years, which of the following are parts of your plans for your woodland in New Brunswick?

(Check (✓) **ALL** that apply)

- no plans/ don't know
- leave it as it is- no activity
- minimum activity to maintain woodland
- sell some or all my woodland
- give some or all my woodland to children, heirs
- divide all or part of my woodland and sell the subdivided lots
- buy more woodland
- convert some or all my woodland to another type of land use
- convert land now used for another purpose to woodland
- other (please specify): _____

Background information

36. What is your gender?

- Male Female

37. What is your age?

- under 25 years 45-54 years 75 years or more
 25-34 years 55-64 years
 35-44 years 65-74 years

38. What is your current main occupation: _____

39. Are you:

- Full time year round worker Part time seasonal worker
 Part time year round worker Retired
 Full time seasonal worker Other (please specify): _____

40. What is the highest level of education that you have completed?

- Less than 12th grade College, CEGEP, or other non-university certificate or diploma
 High school diploma or equivalent
 Registered Apprenticeship or other trades certificate or diploma University bachelor's degree
 University graduate degree

41. We are interested in knowing where you grew up and the place where you have lived most of your adult life. We define an urban area as a place with 10,000 residents or more. Suburban areas include suburbs and "bedroom communities" of urban areas. Rural areas are geographically distinct from urban areas and have less than 10,000 residents.

Check (✓) **ONE** box for each time period.

	Rural area	Suburban area	Urban area
Where I grew up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Where I have lived most of my adult life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

42. On average, what part of your household income would you say comes from your woodland:

- None 11% to 30% 51% to 75%
 1% to 10% 31% to 50% 76% to 100%

43. What is your household's annual income before taxes?

- Less than \$20,000\$ \$40,000-\$59,999 \$100 000\$ or more
 \$20,000-\$39,999\$ \$60,000-\$99,999\$

If you want to enter the prizes draw, please write your name and complete address:

Name: _____
Address: _____

***Thank you for participating in this survey
Please return the questionnaire in the enclosed, postage-paid envelope.***

Supplement 3: Detailed Tables

Table S3.1: Respondents by marketing board.

Marketing Board	Area (ha)	Average property size (ha)	Median property size (ha)	Number of properties	Number of forest landowners	Forest landowners by board (%)
Carleton Victoria	9,889	38	28	283	56	8
Madawaska	7,102	53	42	140	44	6
North Shore	13,408	76	27	294	94	13
Northumberland	6,666	39	35	177	60	8
South-Eastern New Brunswick	15,511	41	28	388	137	19
Southern New Brunswick	45,667	51	36	1,057	180	25
York Sunbury Charlotte	32,250	65	36	640	154	21
Unknown	110	30	21	4	3	0
Total	130,603	53	32	2,983	728	100

Table S3.2: Gender of respondents.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Male	82	83	86	82
Female	18	14	13	16
Not stated	1	3	1	2

Table S3.3: Age of respondents.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
44 years or younger	8	6	7	7
45 to 64 years	56	49	51	53
65 years or older	36	42	42	39
Not stated	1	3	1	1

Table S3.4: Area in which respondents grew up.

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Rural	78	77	82	78
Suburban	8	8	4	7
Urban	11	11	10	11
Not stated	4	4	4	4

Table S3.5: Area in which respondents lived most of their adult life.

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Rural	63	67	72	65
Suburban	14	12	7	13
Urban	18	15	17	17
Not stated	5	5	4	5

Table S3.6: Distance between residence and closest forest land property.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
On woodland property	36	47	42	40
Within 25 km from nearest property	35	30	32	33
26 to 50 km from nearest property	9	8	5	9
More than 51 km from nearest property, but in NB	4	4	9	4
Outside NB	14	10	8	12
Not stated	2	2	4	2

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.7: Employment status of respondents.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Full time	42	31	36	38
Part time	10	14	12	12
Retired	43	46	45	44
Other	3	4	3	3
No response	3	5	4	4

Table S3.8: Highest level of education attained by respondents.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Less than 12th grade	22	22	15	22
High school diploma or equivalent	22	26	21	23
Registered apprenticeship or other trades certificate program	20	18	11	19
College, CEGEP, or other non-university certificate or diploma	15	17	26	16
University bachelor's degree	10	8	14	10
University graduate degree	8	5	11	7
No response	3	4	3	3

Table S3.9: Annual household income of respondents before taxes.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Less than \$39,999	26	34	30	29
\$40,000 to \$99,999	40	31	35	37
More than \$100,000	16	11	17	14
Not stated	19	24	18	20

Table S3.10: Proportion of household income that comes from forest land.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
none	89	70	42	80
1% to 10%	9	21	37	15
11% to 50%	0	4	11	2
51% to 100%	1	1	7	1
not stated	2	4	3	3

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.11: Reasons for owning forest land.

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
For enjoyment from owning "green space"*	Not important	22	21	30	22
	Important	68	63	57	66
	Not stated	10	16	13	12
For the sake of future generations	Not important	22	21	20	22
	Important	64	62	67	63
	Not stated	14	17	13	15
To pass on as heritage	Not important	27	26	26	27
	Important	64	61	66	63
	Not stated	9	13	9	10
For wildlife enjoyment*	Not important	33	24	33	30
	Important	57	61	53	58
	Not stated	10	16	14	12
To preserve forest ecosystems*	Not important	33	23	33	30
	Important	55	58	50	55
	Not stated	13	19	17	15
To protect water quality*	Not important	44	34	41	41
	Important	42	48	42	44
	Not stated	13	18	17	15
Because I've inherited it	Not important	39	38	37	38
	Important	44	43	41	44
	Not stated	17	19	22	18
To harvest firewood*	Not important	49	38	45	45
	Important	41	49	45	44
	Not stated	10	13	10	11
For recreation (besides hunting and fishing)*	Not important	53	43	47	49
	Important	35	38	37	36
	Not stated	12	19	16	15
As an investment*	Not important	54	44	31	49
	Important	33	36	55	35
	Not stated	13	20	14	16
Because woodland came with my permanent residence*	Not important	55	47	55	52
	Important	29	34	26	30
	Not stated	16	20	19	17
For timber harvesting*	Not important	64	51	38	58
	Important	25	33	53	30
	Not stated	11	16	9	12
As a retirement fund*	Not important	64	52	43	59
	Important	21	30	41	25
	Not stated	14	19	16	16

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
For hunting and fishing*	Not important	63	52	55	59
	Important	22	29	30	25
	Not stated	15	19	16	16
Because woodland is part of a farm*	Not important	67	54	47	62
	Important	16	25	38	21
	Not stated	17	21	15	18
To supplement my yearly income*	Not important	78	66	51	73
	Important	7	15	37	11
	Not stated	15	19	12	16
Because woodland came with my cottage or camp*	Not important	71	66	70	69
	Important	10	9	8	10
	Not stated	19	25	23	21
For maple syrup production*	Not important	77	70	71	74
	Important	8	11	12	9
	Not stated	16	20	18	17
To make a living*	Not important	82	67	51	75
	Important	3	14	34	8
	Not stated	16	19	15	17
To harvest NTFPs such as mushrooms, berries*	Not important	76	75	75	76
	Important	9	4	9	7
	Not stated	16	21	16	17
For other reasons	Not important	0	0	1	0
	Important	5	5	8	5
	Not stated	95	95	92	95
For Christmas tree production*	Not important	83	75	75	80
	Important	2	3	6	3
	Not stated	14	22	19	17

Table S3.12: Number of individual forest land parcels owned.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
1 parcel	74	44	12	60
2 parcels	15	29	10	19
3-5 parcels	8	21	39	14
6-10 parcels	1	1	17	2
More than 10 parcels	0	2	19	2
Not stated	2	3	2	3

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.13: Length of time of ownership.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
12 or fewer years	33	25	16	29
13 to 22 years	22	19	17	21
23 to 32 years	19	22	17	20
33 to 42 years	12	17	25	14
43 to 52 years	7	6	9	7
53 or more years	1	4	11	3
Not stated	7	7	5	7

Table S3.14: Length of time forest land has been in the family (n=404).*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Less than 40 years	21	16	18	19
40 to 59 years	19	16	17	18
60 to 79 years	21	22	13	21
80 to 100 years	6	8	7	7
More than 100 years	24	28	37	27
Not stated	8	11	8	9

Table S3.15: Means of obtaining forest land.

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Bought woodland*	Yes	58	62	72	60
	No	36	33	22	34
	Not stated	6	4	6	6
Inherited woodland*	Yes	38	47	49	42
	No	55	48	45	52
	Not stated	7	5	6	6
Received woodland as a gift*	Yes	9	4	7	7
	No	85	91	87	87
	Not stated	6	4	6	6
Obtained woodland through other means	Yes	1	0	1	1
	No	93	95	93	94
	Not stated	6	4	6	6

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.16: Source from which respondents obtained forest land.

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
From family*	Yes	59	64	62	61
	No	41	35	36	39
	Not stated	0	1	2	0
From private citizens*	Yes	32	37	50	35
	No	68	62	47	65
	Not stated	0	1	2	0
From friends or neighbours*	Yes	6	7	16	7
	No	94	92	82	93
	Not stated	0	1	2	0
From others*	Yes	4	3	6	4
	No	96	96	92	96
	Not stated	0	1	2	0
From contractors*	Yes	2	2	13	3
	No	98	97	85	97
	Not stated	0	1	2	0
From land developers*	Yes	2	1	4	2
	No	98	99	94	98
	Not stated	0	1	2	0

Table S3.17: Percentage of respondents who have sold or given away forest land.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Yes	15	18	37	17
No	85	80	61	82
Not stated	0	2	2	1

Table S3.18: Who respondents sold or gave land to.

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
To family*	Yes	36	44	30	38
	No	54	55	71	56
	Not stated	11	2	0	6
To private citizens*	Yes	32	29	50	33
	No	57	70	50	61
	Not stated	11	2	0	6
To friends or neighbours*	Yes	7	13	17	10
	No	82	85	84	84
	Not stated	11	2	0	6
To others*	Yes	11	11	4	10
	No	79	87	96	84
	Not stated	11	2	0	6
To a contractor or forestry company*	Yes	4	10	19	8
	No	86	89	81	86
	Not stated	11	2	0	6
To land developers*	Yes	0	4	15	3
	No	89	94	85	91
	Not stated	11	2	0	6

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.19: Current situation of owners with respect to having a management plan.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
I am using or developing a formal (written) management for some or all of my woodland	8	17	38	13
I do not have a formal (written) management plan but I'm interested in having one	25	26	22	25
I do not have a formal (written) management plan and I'm not interested in having one	65	52	35	59
Not stated	3	4	5	3

Table S3.20: Entities toward which owners feel moral responsibility or obligations.

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
My family*	Low responsibility	11	7	7	9
	Neutral	11	12	13	11
	High responsibility	72	74	74	73
	Don't know	3	1	2	3
	Not stated	3	6	4	4
My land*	Low responsibility	8	6	6	7
	Neutral	13	11	15	13
	High responsibility	66	68	69	67
	Don't know	4	2	2	3
	Not stated	9	13	9	10
The watershed that my land is a part of*	Low responsibility	15	12	15	14
	Neutral	12	14	20	13
	High responsibility	52	53	52	52
	Don't know	10	5	2	8
	Not stated	11	16	11	12
My community*	Low responsibility	22	26	26	24
	Neutral	29	25	26	28
	High responsibility	27	27	33	28
	Don't know	9	3	3	7
	Not stated	12	19	12	14
God or a higher power	Low responsibility	33	30	34	32
	Neutral	17	13	16	16
	High responsibility	24	26	24	25
	Don't know	12	12	10	12
	Not stated	14	19	15	16

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.21: How informed respondents are about forest management.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Not informed	44	33	19	39
Somewhat informed	39	39	44	39
Very informed	12	20	35	16
Not stated	5	8	2	6

Table S3.22: Received financial support from the provincial government or a forest products marketing board for forest land management in the last 10 years.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Yes	6	19	43	13
No	92	79	54	85
Not stated	2	2	3	2

Table S3.23: Importance of access to assistance for conducting specific activities.

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Developing a management plan for your woodland*	Not important	57	46	43	53
	Important	34	43	51	38
	Not stated	9	11	7	9
Finding markets and market information for products from your woodland*	Not important	63	39	30	53
	Important	29	49	65	38
	Not stated	8	13	6	9
Finding reliable crews to do timber harvesting or other forest management activities*	Not important	69	53	43	62
	Important	22	35	50	28
	Not stated	9	13	7	10

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.24: The level of influence of various factors on forest management decisions.

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Lack of time*	Low or no influence	36	36	42	36
	Moderate to high influence	56	49	47	53
	Not stated	9	15	11	11
Lack of equipment*	Low or no influence	47	53	52	49
	Moderate to high influence	42	31	34	38
	Not stated	12	17	14	14
Lack of money	Low or no influence	54	50	51	53
	Moderate to high influence	34	35	36	34
	Not stated	12	16	13	13
Lack of knowledge of markets and opportunities*	Low or no influence	61	52	61	58
	Moderate to high influence	26	30	26	27
	Not stated	13	18	13	15
Lack of knowledge of the forest*	Low or no influence	64	60	72	63
	Moderate to high influence	22	22	14	22
	Not stated	14	18	14	15
Lack of interest*	Low or no influence	63	58	64	62
	Moderate to high influence	17	15	17	16
	Not stated	20	27	19	22
Lack of available contractors*	Low or no influence	72	66	63	69
	Moderate to high influence	13	15	24	14
	Not stated	15	20	13	17
Lack of consensus among my co-owners*	Low or no influence	80	71	75	77
	Moderate to high influence	3	5	6	4
	Not stated	18	24	19	20
Other factors*	Low or no influence	0	1	0	0
	Moderate to high influence	3	2	4	3
	Not stated	97	98	96	97

Table S3.25: Frequency of having removed or harvested trees in the past 10 years.*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Never	20	10	3	16
At least once each year over the last 10 years	27	38	44	32
At least once over the last 5 years	18	18	22	18
Not in the last 5 years, but at least once over the last 10 years	11	14	17	12
Not in the last 10 years, but at least once before then	22	20	12	21
Not stated	2	1	2	2

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.26: Proportion of respondents who would still harvest timber if they did not need it for personal use or for income (n=513).*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Yes	33	41	51	38
No	56	52	38	53
Not stated	11	7	10	9

Table S3.27: Harvest intentions of those respondents who have not harvested in the last 10 years (n=202).*

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
If you have not harvested wood from your woodland during the last 10 years, is it because your intention is to never harvest?	Yes	27	17	15	24
	No	65	68	75	66
	Not stated	9	15	10	11

Table S3.28: Importance of various reasons in the decision to harvest in the last 10 years (n=513).

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Because trees were mature	Not important	22	19	13	20
	Important	66	69	79	68
	Not stated	12	12	8	12
To improve quality of remaining trees	Not important	24	18	16	21
	Important	65	70	73	67
	Not stated	11	12	11	12
Because I needed wood for my own use*	Not important	26	30	45	29
	Important	69	62	45	64
	Not stated	6	9	10	7
To remove trees damaged by natural catastrophe (i.e. Insects, fire, ice, or wind)	Not important	38	30	34	35
	Important	52	60	56	55
	Not stated	10	10	10	10
To achieve objectives in my management plan*	Not important	56	47	41	51
	Important	30	37	47	34
	Not stated	14	16	12	15
Because the price was right*	Not important	60	51	32	54
	Important	21	30	51	27
	Not stated	19	20	18	19
Because I had the time to do it	Not important	60	54	53	57
	Important	23	29	23	25
	Not stated	17	17	23	18
Because I was able to find a trustworthy harvesting crew to do the harvesting*	Not important	66	52	40	59
	Important	18	29	46	24
	Not stated	16	19	14	17

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Because I needed money*	Not important	67	63	49	64
	Important	19	21	39	22
	Not stated	14	15	12	15
To improve scenic and recreational opportunities	Not important	62	63	66	63
	Important	21	19	18	20
	Not stated	17	18	16	17
To improve hunting opportunities	Not important	68	67	69	67
	Important	16	16	14	16
	Not stated	16	17	17	17
To support local or regional forest industry*	Not important	71	63	63	67
	Important	12	17	19	15
	Not stated	17	20	18	18
To clear land for conversion to another use	Not important	72	73	68	72
	Important	11	9	14	11
	Not stated	16	19	18	17
Because a forest marketing board or forest cooperative recommended harvesting*	Not important	74	71	62	72
	Important	9	10	22	10
	Not stated	17	19	17	18
To avoid possible government restrictions on future harvest*	Not important	75	67	62	71
	Important	7	12	20	10
	Not stated	18	20	18	19
A forestry company or a contractor contacted me about doing some harvesting*	Not important	80	71	71	76
	Important	3	9	12	6
	Not stated	17	20	17	18
For other reasons	Not important	0%	0%	0%	0%
	Important	1	1	0	1
	Not stated	99	99	100	99

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.29: Products harvested for personal use in the last 10 years (n=513).

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Firewood*	Yes	83	84	67	82
	No	16	15	31	17
	Not stated	1	2	2	1
Sawlogs or studwood	Yes	26	29	18	26
	No	73	69	80	72
	Not stated	1	2	2	1
Posts, poles, or pilings	Yes	15	13	15	15
	No	84	85	83	84
	Not stated	1	2	2	1
Christmas trees	Yes	6	7	9	7
	No	93	92	89	92
	Not stated	1	2	2	1
Biomass	Yes	3	1	2	2
	No	96	98	96	97
	Not stated	1	2	2	1
Other products*	Yes	0	1	2	1
	No	99	98	96	98
	Not stated	1	2	2	1

Table S3.30: Percentage of respondents who have sold forest products in the last 10 years (n=728).*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Yes	21	39	66	30
No	77	59	30	68
Not stated	2	2	4	2

Table S3.31: Products harvested for sale in the last 10 years (n=513).

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Sawlogs or studwood*	Yes	29	42	67	37
	No	71	57	31	62
	Not stated	1	2	2	1
Pulpwood*	Yes	27	39	68	35
	No	72	59	30	64
	Not stated	1	2	2	1
Firewood*	Yes	8	11	35	11
	No	91	88	64	88
	Not stated	1	2	2	1
Veneer logs*	Yes	5	11	36	10
	No	94	88	63	89
	Not stated	1	2	2	1

		Size of Ownership (%)			Total (%)
		Small	Medium	Large	
Posts, poles, or pilings*	Yes	7	3	8	5
	No	92	96	91	94
	Not stated	1	2	2	1
Biomass*	Yes	2	5	8	4
	No	97	94	90	95
	Not stated	1	2	2	1
Christmas trees	Yes	3	3	7	3
	No	96	96	92	96
	Not stated	1	2	2	1
Other products	Yes	2	3	4	2
	No	97	96	94	97
	Not stated	1	2	2	1

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.32: Methods in which forest products were sold in the last 10 years (n=513).*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
None were sold	51	29	10	40
Stumpage	17	19	35	20
Delivered to buyer	19	28	32	24
Roadside	2	12	14	6
Other	1	3	3	2
Not stated	10	9	6	9

Table S3.33: Harvesting methods used by those who have harvested in the last 10 years (n=513).

Harvesting method	Frequency	Size of ownership (%)			Total (%)
		Small	Medium	Large	
Salvage only fallen and dying trees*	Seldom or never	30	38	51	35
	Most/all of the time	53	46	33	49
	Don't know	3	2	3	3
	Not stated	13	15	13	14
Remove less than half the trees in a harvest area*	Seldom or never	53	46	51	51
	Most/all of the time	22	32	34	27
	Don't know	6	2	3	4
	Not stated	19	20	13	19
Remove most of the trees in a harvest area*	Seldom or never	67	69	67	67
	Most/all of the time	5	6	18	7
	Don't know	5	3	2	4
	Not stated	24	22	13	22
Remove all the trees in a harvest area*	Seldom or never	74	76	73	75
	Most/all of the time	3	3	12	4
	Don't know	5	2	2	4
	Not stated	18	19	13	18
Use another method/intensity of harvesting	Seldom or never	0	0	1	0
	Most/all of the time	4	2	1	3
	Don't know	5	5	4	5
	Not stated	91	94	94	92

Table S3.34: Percentage of respondents who have sold sawlogs or studwood; pulpwood; veneer logs; or posts poles, or pilings in the last 10 years (n=728).*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Yes	20	37	64	28
No	80	62	34	71
Not stated	1	1	2	1

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.35: Who did most of the harvesting on the forest land* (n=513).

Harvester(s)	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Myself and/or members of my family	90	79	59	83
A crew that I hired and supervised	3	3	9	3
An independent contractor or a forestry company	8	13	26	11
Other	0	3	1	1
Not stated	0	3	4	1

Table S3.36: Have had experience with logging contractors in the last 10 years* (n=513).

Past experience	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Yes	30	34	57	34
No	69	63	39	64
Not stated	1	3	4	2

Table S3.37: Satisfaction of respondents who had experience with logging contractors (n=218).

Level of satisfaction	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Yes, I was entirely satisfied	28	38	47	34
I was not entirely satisfied, but it is possible that I will seek their services again or recommend them to a friend	41	39	32	39
No, I was not satisfied, and I would not hire them again or recommend them to a friend	28	20	16	24
Not stated	3	3	5	3

Table S3.38: Timber harvesting contractor should be strictly regulated.*

Level of agreement	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Disagree	4	3	9	4
Neutral	17	13	22	16
Agree	69	69	59	69
Don't know	5	4	6	5
Not stated	5	10	5	7

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.39: Who would conduct the harvesting for those who might harvest in the next 10 years* (n=441).

Harvester(s)	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Myself and/or members of my family	75	71	56	72
A crew that I will hire and supervise	8	7	16	8
An independent contractor or a forestry company	11	14	24	13
Other	2	6	2	4
Not stated	4	2	2	3

Table S3.40 Reasons for choosing never to harvest.

Reason	Number of respondents
Age/physically unable	3
Conservation/leave as is	10
No need/interest	5
Harvesting contract not found/was unreliable	2
To pass on to children	3
Prices	4
Not the right stand conditions	7
Regulations prevent harvesting	1
Personal enjoyment	3
Other land use	3
Total	41

Table S3.41: Main reasons stated by respondents who have not harvested in the last ten years and but might harvest in the future (n=138).

Reason		Size of ownership (%)			Total (%)
		Small	Medium	Large	
The trees were not large enough to harvest	Not important	35	33	31	34
	Important	49	43	50	47
	Not stated	16	24	19	18
I did not have the financial need to do so*	Not important	45	48	38	46
	Important	45	26	38	40
	Not stated	10	26	25	15
Tree cutting operations could damage the land, the soil, or remaining trees	Not important	43	40	31	42
	Important	39	33	44	38
	Not stated	18	27	25	21
I was too busy with other activities*	Not important	51	50	47	51
	Important	41	26	33	37
	Not stated	8	24	20	13
The prices were too low*	Not important	71	43	27	62
	Important	18	33	53	23
	Not stated	12	24	20	16

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Reason		Size of ownership (%)			Total (%)
		Small	Medium	Large	
I have recently bought or inherited the woodland.	Not important	53	57	60	54
	Important	25	16	13	22
	Not stated	22	27	27	23
I have heard about other peoples' bad experiences related to timber harvesting.*	Not important	69	43	73	62
	Important	16	24	7	18
	Not stated	16	33	20	21
I did not know what or how to harvest*	Not important	65	52	60	61
	Important	18	17	13	17
	Not stated	18	31	27	22
I could not find a trustworthy harvesting crew*	Not important	67	52	60	62
	Important	16	21	13	17
	Not stated	18	27	27	21
I could not find a market*	Not important	67	53	60	63
	Important	18	16	13	17
	Not stated	16	31	27	20
I was unable to due to absence from the area.*	Not important	69	60	73	67
	Important	18	10	7	15
	Not stated	14	29	20	18
Extra income could increase the income tax I have to pay.*	Not important	72	48	60	65
	Important	10	24	13	14
	Not stated	18	27	27	21
There were accessibility or road problems.*	Not important	74	48	60	67
	Important	10	21	13	13
	Not stated	16	31	27	20
I did not have access to market information from a trustworthy source.	Not important	70	59	60	67
	Important	10	12	13	11
	Not stated	20	30	27	23
I was physically unable to do the harvest.*	Not important	80	52	73	72
	Important	6	21	7	10
	Not stated	14	27	20	18
Extra income could decrease or make me lose my old age pension supplement.*	Not important	79	60	73	73
	Important	4	9	7	5
	Not stated	18	31	20	21

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.42: Proportion of respondents who might harvest in the next 10 years (n=441)*

	Size of Ownership (%)			Total (%)
	Small	Medium	Large	
Yes	49	61	68	54
No	42	29	20	36
Not stated	9	11	12	10

Table S3.43: Non-timber forest product collection and use

Item	Use	Response	Size of ownership (%)			Total (%)
			Small	Medium	Large	
Game birds or animals	Not collected*	Yes	66	52	52	61
		No	31	46	45	37
		Not stated	3	2	2	3
	Personal use*	Yes	24	36	36	29
		No	73	61	61	68
		Not stated	3	2	2	3
Fur bearing animals	Not collected*	Yes	82	78	74	81
		No	14	20	23	17
		Not stated	3	2	2	3
	Personal use*	Yes	1	2	5	2
		No	96	96	92	96
		Not stated	3	2	2	3
	Sale	Yes	3	3	4	3
		No	94	95	94	94
		Not stated	3	2	2	3
Mushrooms or fiddleheads	Not collected	Yes	73	70	65	71
		No	24	28	33	26
		Not stated	3	2	2	3
	Personal use	Yes	14	15	22	15
		No	83	82	75	82
		Not stated	3	2	2	3
	Sale	Yes	0	0	0	0
		No	97	98	98	97
		Not stated	3	2	2	3
Maple sap	Not collected*	Yes	75	71	65	73
		No	22	27	33	24
		Not stated	3	2	2	3
	Personal use*	Yes	10	15	22	12
		No	87	83	76	85
		Not stated	3	2	2	3
	Sale*	Yes	0	1	2	1
		No	97	97	95	97
		Not stated	3	2	2	3

Item	Use	Response	Size of ownership (%)			Total (%)
			Small	Medium	Large	
Berries	Not collected	Yes	53	54	52	53
		No	44	44	46	44
		Not stated	3	2	2	3
	Personal use	Yes	34	31	36	33
		No	63	67	61	64
		Not stated	3	2	2	3
	Sale*	Yes	0	1	2	1
		No	97	97	95	97
		Not stated	3	2	2	3
Handcraft material	Not collected	Yes	75	72	69	74
		No	22	26	29	24
		Not stated	3	2	2	3
	Personal use	Yes	10	9	15	10
		No	87	88	83	87
		Not stated	3	2	2	3
	Sale*	Yes	1	4	5	2
		No	96	93	93	95
		Not stated	3	2	2	3
Peat moss, black earth, or soil	Not collected	Yes	79	77	76	78
		No	18	21	22	19
		Not stated	3	2	2	3
	Personal use	Yes	6	6	7	6
		No	90	92	91	91
		Not stated	3	2	2	3
	Sale*	Yes	0	0	1	0
		No	97	98	97	97
		Not stated	3	2	2	3
Other	Not collected*	Yes	18	12	11	15
		No	79	86	87	82
		Not stated	3	2	2	3
	Personal use	Yes	1	1	3	1
		No	96	96	95	96
		Not stated	3	2	2	3
	Sale*	Yes	0	1	2	0
		No	97	97	96	97
		Not stated	3	2	2	3

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.44: Respondents who have undertaken at least one management activity over the last 10 years.*

Response	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Yes	50	66	83	57
No	46	30	16	39
Not stated	4	3	2	4

Table S3.45: Respondents who will undertake at least one management activity in the next 10 years.*

Response	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Yes	57	53	64	57
No	39	44	34	40
Not stated	4	3	2	4

Table S3.46: Past and future management activities.

Activity	Time period	Response	Size of ownership (%)			Total (%)
			Small	Medium	Large	
Prepare site for tree planting	Done in past 10 years*	Yes	6	12	30	9
		No	90	85	69	87
		Not stated	4	3	2	4
	Planned for next 10 years*	Yes	11	12	23	12
		No	84	85	76	84
		Not stated	4	3	2	4
Plant trees	Done in past 10 years*	Yes	11	19	42	16
		No	84	78	57	81
		Not stated	4	3	2	4
	Planned for next 10 years*	Yes	14	16	26	16
		No	81	80	73	80
		Not stated	4	3	2	4
Apply pesticides or herbicides	Done in past 10 years*	Yes	2	3	15	3
		No	94	94	84	93
		Not stated	4	3	2	4
	Planned for next 10 years*	Yes	3	5	10	4
		No	93	92	89	92
		Not stated	4	3	2	4
Thin or space young stands	Done in past 10 years*	Yes	26	42	62	33
		No	70	54	36	63
		Not stated	4	3	2	4
	Planned for next 10 years	Yes	33	32	42	33
		No	63	65	57	63
		Not stated	4	3	2	4

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Activity	Time period	Response	Size of ownership (%)			Total (%)
			Small	Medium	Large	
Produce maple sap products	Done in past 10 years*	Yes	8	11	18	10
		No	88	86	81	87
		Not stated	4	3	2	4
	Planned for next 10 years	Yes	9	11	14	10
		No	87	86	85	86
		Not stated	4	3	2	4
Survey or upgrade boundary lines	Done in past 10 years*	Yes	21	36	55	28
		No	74	61	43	68
		Not stated	4	3	2	4
	Planned for next 10 years*	Yes	34	30	43	33
		No	62	67	56	63
		Not stated	4	3	2	4
Build or maintain roads and trails	Done in past 10 years*	Yes	33	40	60	37
		No	63	57	39	60
		Not stated	4	3	2	4
	Planned for next 10 years	Yes	32	33	42	33
		No	64	64	57	64
		Not stated	4	3	2	4
Wildlife habitat/ fisheries improvement projects	Done in past 10 years*	Yes	8	12	25	10
		No	89	84	74	86
		Not stated	4	3	2	4
	Planned for next 10 years	Yes	14	14	19	15
		No	81	83	80	82
		Not stated	4	3	2	4
Improve woodland for recreation	Done in past 10 years*	Yes	14	18	29	16
		No	82	79	70	80
		Not stated	4	3	2	4
	Planned for next 10 years	Yes	22	20	26	21
		No	74	77	72	75
		Not stated	4	3	2	4
Other management activities	Done in past 10 years	Yes	1	0	2	1
		No	95	96	96	95
		Not stated	4	3	2	4
	Planned for next 10 years*	Yes	2	0	2	1
		No	94	97	96	95
		Not stated	4	3	2	4

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.47: Attitudes towards stewardship.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Most woodland owners in NB don't know how to look after their forests.*	Disagree	10	21	22	15
	Neutral	26	25	29	26
	Agree	37	34	36	36
	Don't know	19	11	8	16
	Not stated	8	9	5	8
Woodland owners in New Brunswick are good stewards of the forest.*	Disagree	9	8	12	9
	Neutral	32	28	30	31
	Agree	32	40	43	36
	Don't know	22	14	11	19
	Not stated	5	10	4	6

Table S3.48: Attitudes towards sustainability of wood supply.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
There will be very little harvestable wood on New Brunswick's private woodland in 10-20 years.*	Disagree	20	32	45	26
	Neutral	21	18	20	20
	Agree	29	25	22	27
	Don't know	22	15	10	19
	Not stated	8	10	4	8
There is sufficient wood in New Brunswick for all users including paper mills, sawmills, and domestic firewood cutters.*	Disagree	26	27	23	26
	Neutral	18	17	19	18
	Agree	25	28	43	27
	Don't know	25	18	14	22
	Not stated	6	10	2	7

Table S3.49: Level of concern towards conservation issues.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Requirements for endangered species/ species at risk.	Lower concern	21	18	25	20
	Neutral	25	25	26	25
	Higher concern	41	41	39	41
	Not stated	13	17	11	14
Too many requirements for protected areas.*	Lower concern	29	25	23	27
	Neutral	31	23	26	28
	Higher concern	27	33	40	30
	Not stated	14	18	12	15

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.50: Attitudes toward conservation issues.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Greater efforts should be made to protect rare plants and animals.*	Disagree	4	4	10	4
	Neutral	16	17	22	17
	Agree	70	64	56	67
	Don't know	4	3	6	4
	Not stated	6	11	5	8
Greater efforts should be made to protect old growth forests.*	Disagree	5	8	18	7
	Neutral	22	18	23	21
	Agree	63	61	49	61
	Don't know	3	3	5	3
	Not stated	7	10	5	8
The government should provide incentives for private landowners to establish protected areas on their land.*	Disagree	10	8	11	9
	Neutral	23	21	24	23
	Agree	54	53	56	54
	Don't know	9	8	5	8
	Not stated	5	10	5	7

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.51 Likelihood of participation in various programs and approaches to forest management.

Activity		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Participate in a voluntary land conservation program if it made you eligible for grants, assistance programs, or other benefits.*	Unlikely	44	34	32	40
	Neutral	13	18	20	15
	Likely	33	36	40	34
	Don't know	4	4	4	4
	Not stated	6	8	5	7
Have a management plan and carry out its recommendations if it allows you to participate in a property tax reduction program.*	Unlikely	40	31	26	36
	Neutral	20	15	13	18
	Likely	28	40	52	33
	Don't know	7	7	3	7
	Not stated	5	8	5	6
Accept government funding to conduct forest management activities on your woodland, if it means you have to harvest the trees once they are mature.*	Unlikely	55	43	31	50
	Neutral	11	12	12	12
	Likely	24	32	47	28
	Don't know	4	5	5	5
	Not stated	6	7	5	6
Become a member of a group of woodland owners in your area to jointly manage these woodlands for habitat, recreation, or water quality.*	Unlikely	56	46	42	51
	Neutral	16	19	18	17
	Likely	17	21	31	19
	Don't know	6	5	5	6
	Not stated	5	8	5	6
Accept management services from a forest products company in return for sale of wood to them.*	Unlikely	65	57	50	62
	Neutral	11	14	17	13
	Likely	14	17	25	16
	Don't know	5	4	3	4
	Not stated	5	8	5	6
Become a member of a group of woodland owners in your area to jointly manage these woodlands for logs, pulp, chips or biomass.*	Unlikely	64	52	39	58
	Neutral	14	17	16	15
	Likely	10	18	35	14
	Don't know	6	5	6	6
	Not stated	6	9	4	7

Table S3.52: How informed respondents are about conservation easements.*

	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Not informed	56	45	34	51
Somewhat informed	28	32	44	30
Very informed	10	12	18	11
Not stated	6	11	5	8

Table S3.53: Level of concern about finding reliable technical advice on forest land management.*

	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Lower concern	33	26	33	30
Neutral	36	28	30	33
Higher concern	17	30	26	22
Not stated	14	17	12	15

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.54: Attitudes toward other forest landowners.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Woodland owners should work together to improve the woodlands.*	Disagree	6	5	3	5
	Neutral	29	28	25	29
	Agree	52	53	63	53
	Don't know	5	3	4	4
	Not stated	8	11	5	9
I am not interested in talking with other woodland owners about plans for my land.*	Disagree	17	22	34	20
	Neutral	33	36	34	34
	Agree	37	30	25	34
	Don't know	6	4	2	5
	Not stated	7	10	5	8
I often disagree with other woodland owners in regard to woodland management.*	Disagree	11	17	19	13
	Neutral	45	44	42	44
	Agree	15	16	25	16
	Don't know	19	12	9	16
	Not stated	11	17	19	13

Table S3.55: How informed respondents are about forest certification.*

	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Not informed	71	56	41	64
Somewhat informed	19	26	38	23
Very informed	4	8	17	6
Not stated	6	10	4	8

Table S3.56: Attitudes towards forest certification.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Certification is necessary for NB forest products to compete in international markets.*	Disagree	5	12	12	8
	Neutral	25	17	26	22
	Agree	35	42	44	38
	Don't know	31	21	12	26
	Not stated	5	9	5	6
Certification lessens the need for forestry regulations.*	Disagree	22	22	35	23
	Neutral	25	20	21	23
	Agree	20	24	28	22
	Don't know	28	22	12	25
	Not stated	5	11	5	7

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.57: Reasons why forest landowners would consider certification for their forest land.

Statement	Response	Size of ownership (%)			Total (%)
		Small	Medium	Large	
It may make my forest healthier.*	Yes	49	51	54	50
	No	47	42	44	45
	Not stated	4	7	2	5
It could improve wildlife habitat.	Yes	43	43	47	43
	No	53	51	51	52
	Not stated	4	7	2	5
It could help protect the environment.*	Yes	41	44	48	42
	No	55	50	51	53
	Not stated	4	7	2	5
To demonstrate that I practice sustainable forest management on my woodland.*	Yes	29	36	44	32
	No	67	58	54	63
	Not stated	4	7	2	5
I could sell my wood products for a higher price.*	Yes	21	38	54	28
	No	75	56	45	67
	Not stated	4	7	2	5
I could gain access to wood markets that would not otherwise be available.*	Yes	18	31	48	24
	No	78	63	51	71
	Not stated	4	7	2	5
I can afford both the time and money to obtain certification.*	Yes	3	9	12	6
	No	93	85	86	90
	Not stated	4	7	2	5
Other reasons*	Yes	5	3	4	4
	No	92	90	95	91
	Not stated	4	7	2	5
I would never consider certification of my woodland.*	Yes	22	13	9	19
	No	73	80	89	77
	Not stated	4	7	2	5

Table S3.58: How informed respondents are about laws and regulations applying to forest land.*

	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Not informed	49	40	26	44
Somewhat informed	40	34	49	39
Very informed	7	17	24	11
Not stated	4	9	2	6

Table S3.59: Concerns about the amount of management regulations.*

	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Lower concern	21	18	17	20
Neutral	37	25	27	33
Higher concern	28	41	45	33
Not stated	13	16	12	14

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.60: Attitudes toward ownership rights.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
The provincial government should not regulate private woodland harvesting.*	Disagree	18	12	14	16
	Neutral	21	18	14	19
	Agree	49	59	64	53
	Don't know	8	4	4	6
	Not stated	5	7	5	6
Ownership of the forest doesn't give the owner the right to do whatever they want with it.*	Disagree	21	21	30	22
	Neutral	21	18	19	20
	Agree	50	49	45	49
	Don't know	3	3	3	3
	Not stated	5	9	4	6
Society should not have any control over what the owners do with privately owned woodland.*	Disagree	26	20	21	24
	Neutral	28	22	19	26
	Agree	37	46	54	41
	Don't know	4	3	2	3
	Not stated	5	9	4	6
Private woodland in NB is better managed with some regulations than through voluntary programs alone.*	Disagree	16	22	27	19
	Neutral	37	28	28	33
	Agree	24	27	33	26
	Don't know	16	13	7	14
	Not stated	8	10	5	8
I would be willing to accept timber cutting restrictions on my own land.	Disagree	40	44	53	42
	Neutral	19	20	22	20
	Agree	26	20	15	23
	Don't know	6	6	5	6
	Not stated	8	10	5	9
What other woodland owners do on their land does not affect me.	Disagree	41	39	46	41
	Neutral	24	22	22	23
	Agree	22	25	23	23
	Don't know	5	4	4	5
	Not stated	8	10	6	8
Legislation should be enacted requiring woodland owners to adhere to best forest management practices on their own land.*	Disagree	43	49	54	46
	Neutral	23	21	19	22
	Agree	21	17	19	20
	Don't know	5	4	4	5
	Not stated	8	10	5	8

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.61: Attitudes toward financial issues.

Issue		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Tax implications of transferring to heirs.*	Lower concern	23	16	18	20
	Neutral	23	19	16	21
	Higher concern	42	48	57	45
	Not stated	12	17	9	13
The lack of financial incentives to support conservation.*	Lower concern	22	18	19	21
	Neutral	24	19	26	23
	Higher concern	40	46	46	42
	Not stated	13	18	9	15
Taxation of woodland income.*	Lower concern	25	15	17	21
	Neutral	29	18	19	24
	Higher concern	35	51	56	42
	Not stated	11	16	9	13
The level of government financial support for forest management.*	Lower concern	27	23	23	25
	Neutral	31	15	22	25
	Higher concern	29	46	47	36
	Not stated	13	16	9	14
The high cost of silviculture.*	Lower concern	25	19	17	22
	Neutral	34	24	24	30
	Higher concern	29	41	48	34
	Not stated	12	17	11	14

Table S3.62: Attitudes toward market issues.

Issue		Size of ownership (%)			Total (%)
		Small	Medium	Large	
The low price paid for wood.*	Lower concern	21	10	8	17
	Neutral	20	11	9	17
	Higher concern	47	65	77	54
	Not stated	12	14	7	12
Competition from the sale of Crown wood.*	Lower concern	24	15	10	20
	Neutral	27	14	12	22
	Higher concern	36	56	70	45
	Not stated	13	16	9	14

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.63: Attitudes toward forest management.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
I believe that woodland that is not actively managed is wasted.	Disagree	36	35	36	36
	Neutral	19	18	20	19
	Agree	32	35	36	33
	Don't know	5	4	2	5
	Not stated	8	7	5	8
What I do on my woodland now will not matter in the long term.*	Disagree	61	65	75	63
	Neutral	11	9	7	10
	Agree	17	12	10	15
	Don't know	4	4	2	4
	Not stated	7	10	5	8

Table S3.64: Concern with negative public perceptions of timber harvesting.*

	Size of ownership (%)			Total (%)
	Small	Medium	Large	
Lower concern	30	27	25	29
Neutral	23	19	19	21
Higher concern	35	37	46	37
Not stated	12	18	10	14

Table S3.65: Attitudes toward herbicides and insecticides.

Statement		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Properly applied, insecticides are an acceptable management tool.*	Disagree	32	33	29	32
	Neutral	18	21	25	19
	Agree	31	29	37	31
	Don't know	12	7	5	10
	Not stated	8	10	6	8
Properly applied, herbicides are an appropriate tool.*	Disagree	28	31	26	29
	Neutral	21	22	21	21
	Agree	31	29	43	31
	Don't know	14	7	6	12
	Not stated	5	11	4	7

Table S3.66: Attitudes toward natural disturbances and climate change.

Issue		Size of ownership (%)			Total (%)
		Small	Medium	Large	
The area of woodland affected by insects and/or diseases.*	Lower concern	20	18	19	19
	Neutral	23	18	21	21
	Higher concern	45	48	49	46
	Not stated	12	17	12	14
The impact of climate change on woodlands.*	Lower concern	18	19	22	19
	Neutral	29	20	22	26
	Higher concern	40	44	46	42
	Not stated	13	17	10	14

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)

Table S3.67: Plans for forest land in the next 10 years.

Activity		Size of ownership (%)			Total (%)
		Small	Medium	Large	
Minimum activity to maintain woodland	Yes	51	50	47	50
	No	48	47	52	48
	Not stated	2	3	1	2
No plans/ don't know*	Yes	41	33	24	37
	No	57	65	75	61
	Not stated	2	3	1	2
Give some or all of my woodland to children, heirs	Yes	34	35	38	35
	No	64	63	62	64
	Not stated	2	3	1	2
Leave it as is - no activity*	Yes	25	17	14	22
	No	74	80	85	77
	Not stated	2	3	1	2
Sell some or all of my woodland*	Yes	10	11	18	11
	No	88	86	81	87
	Not stated	2	3	1	2
Buy more woodland*	Yes	11	7	26	11
	No	87	90	74	87
	Not stated	2	3	1	2
Convert some or all my woodland to another type of land use	Yes	5	5	9	6
	No	93	92	91	93
	Not stated	2	3	1	2
Other plans	Yes	4	5	9	5
	No	95	92	91	94
	Not stated	2	3	1	2
Divide all or part of my woodland and sell the subdivided lots*	Yes	3	1	5	3
	No	95	96	94	95
	Not stated	2	3	1	2
Convert land now used for another purpose to woodland	Yes	3	2	6	3
	No	96	95	93	95
	Not stated	2	3	1	2

* Significant differences between size of ownership at $p \leq 0.05$ (Chi-square test)